U.S. Department of Energy

Office of Clean Energy Demonstrations

Point Source Carbon Capture Large-Scale Pilots, Commercial Demonstrations, and Networked Demonstration Commercialization

Funding Opportunity Number: DE-FOA-0003473

Carbon Capture Demonstration Projects Program

Topic Area 1 and Topic Area 3

Concept Papers due:
March 1, 2025, 5:00 pm ET

Application due:
July 1, 2025, 5:00 pm ET

Carbon Capture Large-Scale Pilot Projects Program

Topic Area 2

Concept Papers due:
March 1, 2025, 5:00 pm ET

Application due:
July 1, 2025, 5:00 pm ET

Questions about this NOFO? Email cc-oced@hq.doe.gov.

Problems with OCED eXCHANGE? Email OCED-ExchangeSupport@hq.doe.gov and include the NOFO title

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If you believe you are a good candidate for this funding opportunity, secure your SAM.gov and other registrations now. If you are already registered, make sure your registration is active and up to date. All registrations are free.

See Step 3: Submit Your Application.

SAM.gov Registration (this can take several weeks)

You must have an active account with SAM.gov. This includes having a Unique Entity Identifier (UEI).

OCED eXCHANGE (this can take 48-72 hours)

You must register with OCED eXCHANGE. Registration requires a Login.gov or ID.me registration.

FedConnect (this can take 48-72 hours)

You must register with FedConnect. Registering with FedConnect is fast, easy, and free. Only individuals who are designated as Points of Contact in SAM.gov can create a new company account.

Grants.gov Registration (this can take several days)

You must register with Grants.gov. Doing so requires a Login.gov registration.

Apply by

Concept Papers are due on March 1, 2025, 5:00 pm Eastern Time.

Applications are due by July 1, 2025, 5:00 pm Eastern Time.

STEP 1: REVIEW THE FUNDING OPPORTUNITY

IN THIS STEP:

Basic Information

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Basic Information

Funding Detail

Announcement type: Initial

Expected total available funding: $1,300,000,000 beginning in FY 2026

Expected number and type of awards: Up to 11 total cooperative agreements

Topic Area 1: 1–3 awards, each $175M – $400M, $750M max

Topic Area 2: 1–5 awards, each $75M – $135M, $450M max

Topic Area 3: 1–3 awards, each $20M – $30M, $100M max

Expected dollar amount of individual awards: Varies, based on Topic Area

Expected award project period: The expected project period of performance is 8–10 years; the scope of the proposed project would determine the specific project period of performance within the project period.

Depending on the number and quality of applications, DOE may not award the full NOFO funding amount.

Agency Contact Information

Office of Clean Energy Demonstrations
U.S. Department of Energy
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Phone: 202-586-OCED

For questions relating to this specific NOFO, please send emails to cc-oced@hq.doe.gov.

KEY FACTS

Funding Opportunity Title:

Point Source Carbon Capture Large-Scale Pilots, Commercial Demonstrations, and Networked Demonstration Commercialization

Funding Opportunity Number:

DE-FOA-0003473

Assistance Listing:

81.089; 81.255

KEY DATES

Concept Paper Deadline:

March 1, 2025, 5:00 pm ET

Application Deadline:

July 1, 2025, 5:00 pm ET

Anticipated Selection Date:

November 1, 2025, 5:00 pm ET

Anticipated Time Frame for Award Negotiations

November 2025 – March 2026

NOTE: The 2024 Revisions to the OMB Guidance for Federal Financial Assistance will be in effect for awards issued under this NOFO.

Executive Summary

The Department of Energy (DOE) estimates that reaching successful liftoff by 2050 will require capturing and storing 400 million to 1.8 billion tons[1] of carbon dioxide (CO_2) annually by 2050. Commercial demonstration of advanced carbon capture technologies, integrated with reliable transportation and storage infrastructure, is necessary for the widespread deployment of these technologies.

DOE's Office of Clean Energy Demonstrations (OCED) is issuing this Notice of Funding Opportunity (NOFO), in collaboration with the Office of Fossil Energy and Carbon Management (FECM) and National Energy Technology Laboratory (NETL), for integrated carbon capture, utilization, and storage (CCUS) projects that demonstrate substantial improvements in the efficiency, effectiveness, cost, and environmental performance of carbon capture technologies for power, industrial, and other commercial applications. The overarching goal of this NOFO is to unlock a wave of follow-on investment in low-carbon power and low-carbon industrial products by increasing the capital flow to sectors where it is already occurring and by expanding the CCUS market to additional power, industrial, and commercial applications. Awards made under this NOFO will be funded with funds appropriated by the Infrastructure Investment and Jobs Act, more commonly known as the Bipartisan Infrastructure Law (BIL).

The BIL is a once-in-a-generation investment designed to modernize and upgrade American infrastructure to enhance United States competitiveness, to drive the creation of good-paying jobs, to tackle the climate crisis, and to ensure stronger access to economic, environmental, and other benefits for disadvantaged communities. Furthermore, these investments will support efforts to build a clean and equitable energy economy that achieves reduced emissions economy-wide by no later than 2050 and a fifty percent reduction from 2005 levels in economy-wide net greenhouse gas (GHG) pollution by 2030. OCED's mission is to deliver clean energy technology demonstration projects at scale in partnership with the private sector to accelerate deployment, market adoption, and the equitable transition to a decarbonized energy system.

The BIL will invest up to $2.537 billion to fund domestic CCUS demonstration and commercial-scale projects that further the development, deployment, and commercialization of technologies to capture and geologically store CO_2 emissions. In addition, the BIL has a total appropriation of $937 million for fiscal years (FY) 2022 through 2025 for large-scale pilot projects that accelerate the development, deployment, and commercialization of innovative and transformative carbon capture technologies.

This NOFO makes available up to $1,300,000,000 for approximately 11 projects at maximum Federal cost shares ranging from 50% to 80%, depending on the Topic Area and Phase of the project. The NOFO is divided into three Topic Areas based on the technology readiness level (TRL) and scope of the proposed project. DOE will select projects that seek to demonstrate the following, based on the chosen Topic Area:

- Topic Area 1 – The technical and commercial viability of established carbon capture technologies (TRL >7) in both new applications and at commercial scale.
- Topic Area 2 – First-of-a-kind transformational technologies (TRL 5–6) at the large pilot scale.
- Topic Area 3 – Region-specific carbon management networks with multiple emitters to reduce offtake uncertainty and increase emitter access to storage facilities.

[1] Carbon Management – Pathways to Commercial Liftoff

Eligibility

Eligible Applicants

The proposed recipient and subrecipient(s) must be domestic entities except as provided in the Foreign Entities section. The following types of domestic entities are eligible to participate as a recipient or subrecipient of this Notice of Funding Opportunity (NOFO):

- Institutions of higher education
- For-profit organizations
- Nonprofit organizations
- States and local governments
- Indian Tribes, as defined in section 4 of the Indian Self-Determination and Education Assistance Act, 25 U.S.C. § 5304[2]

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.

U.S. Department of Energy (DOE)/National Nuclear Security Administration (NNSA) Federally Funded Research and Development Centers (FFRDC) are eligible to apply for funding as a subrecipient but are not eligible to apply as a recipient. However, NETL is not eligible for award under this announcement. The funding for the FFRDC will flow through the recipient. Non-DOE FFRDCs are eligible to participate as a subrecipient but are not eligible to apply as a recipient. Notwithstanding the above, Federal agencies, instrumentalities, and corporations (other than DOE) are eligible to participate as a subrecipient but are not eligible to apply as a recipient.

For non-DOE/NNSA 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 an FFRDC must be consistent with its authority under the award.

For DOE/NNSA 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 funding for the FFRDC will flow through the prime recipient. 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."

[2] "**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.

Entities that are debarred, suspended, or are otherwise excluded or ineligible from participating in Federal programs are ineligible to participate as recipients or subrecipients under this program and their applications will not be reviewed for consideration.

Entities identified on Department of the Treasury Office of Foreign Assets Control's (OFAC) 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).

Entities of Concern are prohibited from participating in projects selected under this NOFO (see the Entity of Concern Prohibition section for additional details and definitions).

Non-profit 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. For more information, review the *Applicant Eligibility Guidance* on the Required Application Documents page.

In Topic Area 3, emitters are required to be subrecipients, and pipeline and storage companies are required to be either prime recipients or subrecipients.

Eligibility for Topic Area 3 requires a multi-party application consisting of at least one entity that is developing, owns, or operates CO_2 transportation and/or storage facilities. Applications that do not include such entities will be deemed non-responsive.

Other Eligibility Criteria

Foreign Entities

In general, foreign entities are not eligible to apply as either a recipient or subrecipient. In limited circumstances, DOE may 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 a waiver request for the foreign entity's participation. Likewise, if the applicant seeks to include a foreign entity as a subrecipient, the applicant must submit a separate waiver request in the application for each proposed foreign subrecipient.

Foreign entity waiver request information can be found in the Waiver Requests section of this NOFO and in the *Foreign Entity Participation and Performance of Foreign Work in the United States Guidance* located on the What other Information may be Requested? page. 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.

Entity of Concern Prohibition

Prohibition

Entities of Concern are not eligible. DOE is prohibited by law from funding any grant, contract, cooperative agreement, or loan of $10 million or more in DOE funds to Entities of Concern. In addition, such entities (including an individual that owns or controls, is owned or controlled by, or is under common ownership or control with an Entity of Concern) are prohibited from receiving any funds or performing work under any award involving DOE activities authorized under Division A or B of Public Law 117-167, subject to certain penalties. See section 10114 of Public Law 117-167 (42 USC 18912) and section 310 of Public Law 118-42 and other applicable law for additional information.

By applying to this NOFO, the applicant is certifying that neither the applicant nor any of the project participants qualify as Entities of Concern.

Definitions

"Entity of Concern" is defined as in section 10114 of Public Law 117-167 (42 USC 18912), also known as the CHIPS and Science Act, as any entity, including a national, that is—

(a) Identified under section 1237(b) of the Strom Thurmond National Defense Authorization Act for Fiscal Year 1999 (50 U.S.C. 1701 note; Public Law 105–261);

(b) Identified under section 1260H of the William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021 (10 U.S.C. 113 note; Public Law 116– 283);

(c) On the Entity List maintained by the Bureau of Industry and Security of the Department of Commerce and set forth in Supplement No. 4 to part 744 of title 15, Code of Federal Regulations;

(d) Included in the list required by section 9(b)(3) of the Uyghur Human Rights Policy Act of 2020 (Public Law 116–145; 134 Stat. 656); or

(e) Identified by the Secretary, in coordination with the Director of the Office of Intelligence and Counterintelligence and the applicable office that would provide, or is providing, covered support, as posing an unmanageable threat—

(i) To the national security of the United States; or
(ii) Of theft or loss of United States intellectual property.

"National" is defined as in section 10114 of the CHIPS and Science Act as having the meaning given the term in section 101 of the Immigration and Nationality Act (8 USC 1101).

"Secretary" is defined as in section 10114 of the CHIPS and Science Act as the Secretary of Energy.

Cost Sharing

The non-Federal cost share must be at least 50% of the total project costs for demonstration projects in Topic Areas 1 and 3, and 30% in Topic Area 2 (Phases 1–4). The cost share must be at least 20% of total project costs for Topic Area 2 Phase 0. Each Budget Period of the project must also meet the aforementioned specific cost share requirements unless a different basis is sufficiently justified and negotiated. DOE funding is limited to the amount specified in the award. Any cost increases after award must be covered by additional non-Federal cost share.

Cost share may be provided in the form of cash or cash equivalents, or in-kind contributions. The cost share must come from non-Federal sources unless otherwise allowed by law. Cost share may come from project participants, state or local governments, or other third-party financing. Generally, realized tax credits may be used as cost share.[3] In general, deferred or avoided costs may not be used as cost share.

Non-Federal cost share can include funds received under the power program of the Tennessee Valley Authority, which is specifically allowed under the Energy Policy Act of 2005. See 42 U.S.C § 16352(c) (Section 988 of Energy Policy Act of 2005) and 2 CFR 910.130(d)(2)(v).

Federal financing, such as DOE Loan Guarantees, cannot be leveraged by applicants to provide the required cost share or to otherwise support the same scope that is proposed under the Carbon Capture Demonstrations Projects Program and the Carbon Capture Large-Scale Pilot Projects Program.

Program Income should not be included as cost share in an applicant's budget. More information on Program Income is available in the Program Income section of this NOFO.

To assist applicants in calculating proper cost share amounts, DOE included a cost share information sheet and sample cost share calculation within the *Cost Sharing Guidance* located on the Preparing Your Budget page.

[3] Tax credits authorized by the Inflation Reduction Act of 2022 (P.L. 117-169) are considered a non-Federal source and are not a federal award for purposes of cost sharing.

Program Description

Purpose

In 2023, the electricity generation and industrial sectors accounted for nearly half of all United States (U.S.) CO_2 emissions.[4] Those CO_2 emissions can be reduced by multiple and concurrent pathways including carbon capture, electrification, or fuel switching (including hydrogen and renewable fuels) in some industries, along with increasing the share of carbon-free electricity generation in the electricity sector. To reach the United States Government's ambitious domestic climate goal of reduced greenhouse gas emissions economy-wide by 2050, the U.S. will have to capture, transport, and sequester significant quantities of CO_2. There is growing scientific consensus[5] that, while the priority for addressing climate change must be to avoid emissions, CCUS technologies and permanent sequestration are essential to prevent the worst impacts of climate change.

Point-source carbon capture is a necessary decarbonization solution for the U.S. to build a clean and equitable energy economy that achieves a zero-carbon electricity system by 2035, and to put the U.S. on a path to achieve reduced emissions economy-wide by no later than 2050. Despite growing interest in carbon capture solutions, the pace of private investments has been slowing due to several key factors including:

- Lack of operational data for a wide variety of technologies and applications at scale, limiting investments – "Technology valley of death"
- Limited CCUS solutions able to economically capture CO_2 from a wide variety of flue gas streams given current market incentive structures – "Commercial valley of death"
- Slow pace of project development due to a "chicken-and-egg" problem in which both emitters and CO_2 transport, and storage providers hesitate to develop a project until the other party has committed

There are different types of CO_2 point sources. CCUS can apply to the power sector (e.g., coal- and natural gas-fired power plants), as well as the industrial sector (e.g., cement, steel, paper mills). There are some industrial processes that already capture CO_2 as part of normal operations (e.g., natural gas processing or fossil-fuel based hydrogen production) and others that yield a high-purity stream of CO_2 (e.g., ethanol or nitrogenous fertilizer production). However, per the International Energy Agency[6], as of March 2024, there are only approximately 50 operational projects globally (approximately 20 in the U.S.) that entail either capture, storage, and transportation or capture, and utilization on the entire value chain.

Although certain carbon capture technologies are already well-demonstrated and in deployment in some sectors, a new generation of transformational carbon capture technologies that demonstrate improvements in the efficiency, effectiveness, cost, and environmental performance over existing technologies are needed in parallel with efforts to apply existing technologies to new emitting sectors.

[4] U.S. Energy Information Administration – EIA – Independent Statistics and Analysis
[5] Energy Technology Perspectives 2020 – Analysis – IEA
[6] CCUS Projects Explorer – Data Tools – International Energy Agency

Transformational solutions (either technical or financial), including for sectors where carbon emissions are harder and more expensive to capture, will provide more opportunities for decarbonization, reduce costs, and facilitate faster liftoff. Expanded use of CCUS will also require further expansion of the transportation and storage infrastructure to safely store the much larger quantities of CO_2.

This NOFO is authorized under Section 962 of the Energy Policy Act of 2005 as amended by Section 41004 of the BIL, codified at 42 U.S.C. § 16292.

Based on the advancements necessary for liftoff, identified above, this NOFO is designed to:

- Drive initial market adoption today by supporting demonstrations of successful CCUS projects in key areas to inform future investment;
- Ensure greater market adoption tomorrow by both improving the economics of CCUS to incorporate a wider array of emitters and help ensure that CCUS infrastructure develops economically; and
- Demonstrate responsible and effective deployment of CCUS, including through community and workforce engagement, to encourage uptake and drive market adoption.

This NOFO makes available up to $1,300,000,000 for approximately 11 projects at maximum Federal cost shares ranging from 50% up to 80%, depending on Topic Area and Phase of the project. DOE has a history of investing in research and development (R&D) to make carbon management technologies safer, more reliable, and more efficient. With this NOFO, DOE continues to support development of carbon management approaches that can enable responsible deployment as the United States progresses toward its climate goals.

Carbon capture technology has the potential to reduce emissions of other kinds of pollutants in addition to CO_2, protect communities from increases in cumulative pollution, and maintain and create good, high-wage jobs across the country.[7] Therefore, applications to this NOFO must include a Community Benefits Plan (CBP) tailored to the scope of this NOFO discussing community and labor engagement; investing in the American workforce; Diversity, and Equity, Inclusion, and Accessibility (DEIA); and delivering benefits to disadvantaged communities while minimizing health and safety risks, especially with regard to direct health impacts to project host communities.

Detailed technical descriptions of the specific Topic Areas (TAs) and associated Technology Readiness Level (TRL) requirements are provided in the sections that follow.

[7] https://www.federalregister.gov/documents/2022/02/16/2022-03205/carbon-capture-utilization-and-sequestration-guidance

Funding Priorities

DOE anticipates selecting approximately 11 projects under three topic areas in this NOFO. The key characteristics outlined below are focus areas for each Topic Area. Requirements for application are listed in the Application Content and assessed project criteria are listed in the Review Criteria. Applicants must decide which of these programs to apply based on the TRL and scope of the proposed project.[8] The three distinct topic areas are:

Topic Area 1 (TA1): CCUS Demonstration

TA1 will support commercial-scale demonstrations of integrated carbon capture, transport, and storage at up to one coal-fired power plant and up to two industrial plants with a minimum capture capacity of 300,000 metric tons CO_2/year. TA1 is designed to increase investor confidence through funding fully integrated projects[9] at commercial scale. TA1 will be divided into two subtopic areas:

- **TA1a** – CCUS Demonstration at a Coal Electric Generation Facility
- **TA1b** – CCUS Demonstration at an Industrial Facility not Purposed[10] for Electric Generation

Proposed projects must demonstrate, as part of the application and during the award, high CO_2 capture efficiency over baseline emissions. Note that if the carbon capture project includes a new, on-site auxiliary system to generate power or steam for its operation, CO_2 capture, compression, and storage from the auxiliary system may need to be included for life cycle assessment (LCA) depending on the requirements given in the detailed TA1 description.

For TA1a, demonstrations may be conducted at a Coal Electric Generation-Only Facility or a Coal Combined Heat and Power Facility. For TA1b, projects applying to this topic area should have sufficient technical detail to support a technology readiness level consistent with an at-scale demonstration and potential replication leading to commercialization. Therefore, proposed CCUS technologies should be validated at a minimum TRL of 7 at the time of the full application. TRL 7 for coal electric generation (i.e., TA1a) is characterized by completion of an integrated, continuous, pilot-scale test (≥10 MWe, validated by a minimum of 2,000 hours continuous steady-state operations) using coal exhaust gas at 90% or higher carbon capture efficiency. TRL 7 for industrial CO_2 capture (i.e., TA1b) is characterized by completion of an integrated, continuous, pilot-scale test using actual exhaust gas from the selected process (preferred) or a reasonably similar alternative gas source (must justify in application) validated by a minimum of 2,000 hours continuous steady-state operations. Supporting operational data demonstrating that the proposed technology has met these target performance metrics will be assessed to determine whether the technologies funded can be readily replicated and deployed into commercial practice.

[8] In September 2022, DOE issued FOA Number: DE-FOA-0002738 titled "BIL: CARBON CAPTURE DEMONSTRATION PROJECTS PROGRAM FRONT-END ENGINEERING DESIGN STUDIES FOR INTEGRATED CARBON CAPTURE, TRANSPORT, AND STORAGE SYSTEMS" to fund Front-End Engineering Design (FEED) studies associated with large CCUS demonstration projects. Eligibility or awards made under that FOA do not impact eligibility for this NOFO. Applicants need not have applied for or been awarded funding from that FOA to apply for this NOFO.

[9] "Fully integrated" projects include capture, transport (if necessary), and storage of CO_2.

[10] "Not purposed for electric generation" is from the statute. The statute would not preclude OCED from funding projects in facilities that generate electricity as a byproduct of their industrial process.

Topic Area 2 (TA2): Large-Scale Pilot Projects

TA2 will support large-scale pilot projects[11] demonstrating transformative technical advances in point-source carbon capture. TA2 is designed to improve the economics of carbon capture through enabling the construction, commissioning, and testing of approaches with preferably increased capture efficiencies, reduced cost, reduced emissions, and improved environmental performance at a large pilot scale.

The overall objective of a project under TA2 is to test a transformational carbon capture technology[12] at a pilot scale with a design capacity to capture 1) a recommended minimum of 75,000 metric tons of CO_2/year from an exhaust stream at an existing or new domestic industrial/commercial facility, or 2) CO_2 from a recommended minimum 20 MWe slipstream at an existing coal electric generation or natural gas (NG) electric generation facility. NG electric generation facilities include simple cycle, combined cycle (NGCC) plants, and combined heat and power plants. The application must provide justification if the proposed scale is lower than the recommended minimum stated above.

The proposed technologies should have commissioned a small pilot prototype, completed TRL 6 validation, or be in the process of completing engineering scale (small pilot scale) testing to validate the technology at TRL 6. The large-scale pilot projects will validate scaling factors to enable the carbon capture technology to proceed to commercial-scale demonstration or commercial-scale application (TRL 7) after completion of projects in this topic area.

TA2 is divided into two subtopic areas, TA2a and TA2b, as described below, differentiated by level of advancement of the capture technology. Applicants should carefully consider the achieved capacity and steady-state runtime of their commissioned small pilot prototype when determining the appropriate subtopic area.

- **TA2a** – Large-scale pilot for applicants that have commissioned a small pilot prototype that has achieved a steady-state runtime of 1,000 hours with a recommended minimum capture capacity of 1,000 metric tons of CO_2/year with the flue gas / process exhaust intended for the large-scale pilot or synthetic exhaust conditions (similar CO_2 and O_2 concentrations as the flue gas). Justification must be provided for applications not meeting the recommended minimum; however, DOE will preference applications with higher capture capacity and runtime in all cases. Applicants selected under TA2a will enter Phase 1 (Detailed Planning and Front-End Engineering Design) of the OCED Large-Scale Pilot Projects Program.
- **TA2b** – Large-scale pilot for applicants that have commissioned and started operation of a small-scale pilot with realistic (or actual) flue gas and have some operational data at the time of the full application submission. Applicants that are selected under TA2b will enter an optional Phase 0 (Small-Scale Pilot Testing and data acquisition) of the OCED Large-Scale Pilot Projects Program. Upon successful completion of the Phase 0, the applicant is expected to achieve the recommended minimum capture capacity and operational runtime outlined in TA2a above. If the applicant plans to demonstrate a capacity lower than the recommended minimum, justification must be provided but DOE will preference applications with higher capture capacity and runtime.

[11] The term "large-scale pilot project" is pursuant to section 962(a)(1) of the Energy Policy Act of 2005 as amended (42 U.S.C. § 16292(a)(1)).
[12] The term “transformational technology” is pursuant to Section 962(a)(5) of the Energy Policy Act of 2005 as amended (42 U.S.C. § 16292(a)(5)).

Topic Area 3: Networked Demonstration Commercialization

TA3 will support activities that drive maturation of the CCUS market where key infrastructure is already developing. TA3 awards will support the integrated, coordinated planning and commercial development of the key components (CO_2 emitters, transport, and storage providers or operators) of a localized carbon management "network," particularly focusing on areas where carbon storage site development has already begun. By driving coordinated development in these key locations, TA3 seeks to reduce CO_2 transport and storage uncertainties. Awardees must demonstrate substantial characterization of storage sites at the time of application submission.

TA3 will provide the framework and increase emitter confidence through funding a comprehensive integrated FEED study at commercial scale and through the planning and development of localized carbon management networks. Establishing networks of shared transportation and storage among relevant entities who work together will demonstrate how closely located emitters may leverage integrated system designs to reduce transport and storage fees, thereby making CCUS a more economic option for new and existing facilities. TA3 will support commercial-scale demonstrations of integrated carbon capture, transport, and storage at coal-fired power plants, gas-fired power plants, and industrial plants not intended for power generation.

Preferred applications will contain the following key characteristics:

- Carbon capture technologies that have attained TRL 7 for the proposed applications
- A storage or utilization scale of at least 50 million metric tons of CO_2 within a 30-year period and at least 100,000 metric tons per year for the first five years
- Two or more CO_2 emitters
- Proof of detailed site characterization of the storage site in preparation for Class VI, Class II, or Outer Continental Shelf (OCS) "Authorization to Construct" permit
- Preliminary title research for the pipeline network

TA3 awards may include elements currently supported through other DOE programs, and those deliverables could be used as inputs, *but no duplication of funding will be provided to conduct same scope of work.*

Program Goals and Objectives

The overarching goal of this NOFO is to unlock a wave of follow-on investment in low-carbon power and low-carbon industrial products by increasing the capital flow to sectors where this investment is already occurring. This will be accomplished by expanding the CCUS market to power and to industrial and commercial applications that are difficult to fully electrify. The selected projects will demonstrate the technical and commercial viability of both established carbon capture technologies in new applications and at commercial scale (TA1), first-of-a-kind transformational technologies (TA2), and region-specific CCUS networks to reduce offtake uncertainty and increase emitter access to storage facilities (TA3).

The commercial-scale demonstration projects (TA1) will add to the body of evidence needed to de-risk CCUS technology and increase investor confidence. This is particularly important in key industrial sectors where CCUS is both critical and unproven today (such as cement, steel, and chemicals). Commercial success at scale, combined with key economic policies, such as 45Q and 45V, "Buy Clean" standards, and regional clean power standards, can help unlock a market valued at tens of billions of dollars within the decade.

This program will also improve the case to invest in CCUS by improving project economics, thus enabling CCUS in more applications. TA2, ideally, will result in a first-of-a-kind carbon capture system integrating transformational technologies that enable a power generation plant or an industrial/commercial facility to profitably capture CO_2. Activities in TA2 that will optimize capture efficiency and CO_2 purity while maintaining economic feasibility at large pilot scales could both increase the capital flow into CCUS for sectors where that is already occurring and expand the market to power and hard-to-decarbonize industrial applications.

By establishing investable, region-specific CCUS networks with strong community support, TA3 will enable both broader acceptance of CCUS as an industrial process and more assurance for the investment in CCUS. The economies-of-scale benefits of efficient networking, such as reduced development cost, fewer permits, coordinated workforce development to attract and retain skilled workers, and less community disruption, may show a path for how emitters farther from Class VI wells, particularly those in regions with suboptimal geology, can participate in the market. Successful TA3 awards should strengthen the business case for CCUS in areas where market development is already occurring and can have a particularly beneficial impact in areas where DOE is already supporting some, but not all, parts of the CCUS value chain.

All aspects of this program will help disseminate market knowledge on the ranges and timelines for CCUS development across different industries and locations, helping increase the knowledge base future project developers need.

Award Contribution to Goals and Objectives

TA1 should result in up to three fully integrated CCUS demonstration facilities as well as the infrastructure necessary to economically transport and geologically sequester the CO_2 from the project. CO_2 captured must be sequestered, but the project may leverage transport and storage infrastructure (existing or in development) independent from this project award to satisfy that requirement. Key operational data from TA1 Awardees, such as capture rates, levelized cost-of-capture, and community benefits, will be used to inform industry for follow-on projects, future investment decisions, and greater deployment probability of CCUS facilities.

TA2 should result in up to five full-scale CO_2 capture pilot projects that validate systems integration between critical components and balance of plant (BoP). Projects must include technology development, design, testing, and demonstration, thus enabling the technology or process to advance from large-scale pilot project application (TRL 6) to commercial-scale demonstration (TRL 7). These technologies should demonstrate a significant improvement in an operational capability with respect to the current state-of-the-art and have a reasonable potential to lower the cost of CO_2 capture beyond what is possible today. Activities in TA2 must aim to capture CO_2 under the most economical scenario by optimizing various parameters of the carbon capture system and BoP.

TA2 projects will generate operational data for verification and validation of the commercial potential of innovative and transformational technologies, including data on technology performance, costs, non-CO_2 emissions, life cycle impacts, scaling factors, and community benefits. The objective of TA2 is to advance the maturity of nascent CCUS technologies from TRL 6 to TRL 7.

TA3 will test the commercial viability of CO_2 transport and storage networks as an alternative approach to "one source – one sink." This approach, while theoretically viable, has not been proven in the market due to design complexity. TA3 is expected to produce, through a comprehensive FEED study, regional collections of investment-ready CCUS projects. TA3 awards should support the business case to coordinate construction of CCUS networks across the U.S., increasing investor confidence in CCUS in locations with favorable fundamentals (e.g., adequate geology, existing infrastructure). Each award will support the coordinated commercial development designs and key business, workforce, and community agreements necessary for the emitters, transport providers, and storage providers to reach final investment decision (FID) and attract private sector investment, or to obtain follow-on government funding, such as through the Loan Programs Office (LPO).

Local support or opposition for any large infrastructure project, including CCUS, can have a significant impact on project completion, thereby not only affecting the success of individual projects in this portfolio but broader liftoff of CCUS. Projects across all TAs must proactively work to increase the local support through mechanisms for accountability to and transparency with local communities in the project CBPs. CCUS is a transition opportunity for incumbent energy workers and projects are especially encouraged to describe strategies to retain skilled workers in the sector and create equitable pathways into CCUS jobs. For example, TA1 projects would incorporate community input on meaningful project aspects (e.g., pipeline routes and safety protocols) and develop options for financial benefit to fenceline communities (e.g., tax revenue, rights-of-way, pore space leasing). In addition to providing local benefits, projects must proactively work with local parties to minimize, mitigate, and monitor any potential negative impacts, especially related to CO_2 transport and storage safety, air quality, water use, and water quality.

Expected Performance Goals, Indicators, Targets, Baseline Data, and Data Collection

In furtherance of OCED's mission and to support increased private investment in and deployment of clean energy technologies, as well as to support clean energy markets, OCED expects to utilize specific data provisions that will enable OCED to publish aggregated and anonymized data derived from Protected Data sets provided to DOE under the awards. The goal is to appropriately share aggregated and anonymized data for the benefit of the nation's broader clean energy ecosystem while ensuring robust protection of any underlying protected/proprietary information or data.

DOE may share operational datasets obtained under award with DOE National Laboratory programs for a variety of reasons including improving system performance modeling capabilities and validating performance. Data shared may include limited rights data and/or protected rights data (See Rights in Technical Data section and What are the Rights in Technical Data Requirements in the NOFO Supplemental Requirements document for definitions of such data). Data shared will be kept confidential by DOE and the DOE National Laboratories in accordance with applicable law, the award terms, and operating contracts between DOE and DOE National Laboratories.

Findings from the analysis of such data may be supplied by DOE to projects and may be used by DOE to support performance claims to investors and/or end users but only to the extent that such use does not conflict with the non-disclosure provisions of the DOE intellectual property award terms and conditions regarding properly marked limited rights data and protected rights data.

Topic Area 1

TA1 will support commercial-scale demonstrations of integrated carbon capture, transport, and storage at up to one coal-fired power plant and up to two industrial plants. TA1 is designed to increase investor confidence through funding fully integrated projects[13] at commercial scale and providing multiple years of operational data to the public. TA1 will be divided into TA1a (coal electric generation facilities) and TA1b (industrial facility not purposed for electric generation). Projects awarded under TA1 of this NOFO are expected to have the following overall performance goals and success indicators:

- Demonstrate high-efficiency (as described below) CO_2 capture rates including the capture and storage of at least 300,000 metric tons CO_2/yr.
- Be designed to process flue gas from an entire unit, e.g., the entire exhaust stream, rather than a slipstream, associated with a single boiler or combustor.
- Provide transport and geological sequestration or utilization for all captured emissions.
- Exhibit commercial viability.
- Provide a minimum of 3 years of operational data covering the full spectrum of performance conditions (steady-state, startup and shutdown, dynamic operations) with continued operations beyond the financial assistance project period.
- Provide lessons learned for the project related to the capture technology, market responses, financial scaling, community reception, future scalability, and partnering with transport and storage providers.

Applicants must meet high-efficiency capture minimum requirements:

- TA1a – Applications must be at least consistent with EPA 111(d) requirements applicable to the proposed host plant (e.g., a presumptive standard of 88.4 percent reduction in annual emission rate, with a compliance deadline of January 1, 2032 for coal plants).
- TA1b – Applicants should meet or exceed a 90% nameplate capture rate. If applicants are unable to achieve this target, they must articulate the rationale for proposing a lower capture rate.

DOE uses a stage gate review process to divide the projects into key phases. DOE evaluates a project's viability to proceed to the next phase through Go/No-Go review by examining key metrics and collecting technical and financial data during the project to ensure that key milestones are met.

[13] "Fully integrated" projects include capture, transport (if necessary), and storage of CO_2.

Projects awarded under TA1 of this NOFO are expected to have the following performance goals and success indicators by the end of Phase 1:

- Complete results of engineering and design studies commissioned for capture and storage facilities, including a FEED study or storage field development plan with an Association for the Advancement of Cost Engineering (AACE) Class 3[14] cost estimate.
- Establish site control for the capture host site.
- Prove economic viability inclusive of cost and risk-based contingency estimates.
- Demonstrate capital investment or financing plan, and the schedule and requirements to reach final investment decision.
- Secure pore space in the form of a lease or an option including access to the proposed well site(s) or an option for access to proposed well site(s).
- Obtain firm commitments from project partners.
- Implement community and labor engagement, develop mechanisms for accountability (e.g., negotiated agreements), form partnerships, perform assessments, and develop plans for later phases to ensure benefits are delivered to communities and workers.

By the end of Phase 2, projects awarded under TA1 are expected to advance their transport plan, including completion of a FEED study (if necessary) and obtain pipeline easements or option agreements for 80% of the right-of-way including accesses and all necessary aboveground components for the maintenance of the pipeline:

- Pipeline design, including completion of a FEED study
- Environmental, Health, and Safety (EHS) assessments for the proposed transport method
- Pipeline operator CO_2 specifications

DOE may also request financial sustainability plans or long-term disposition and decommissioning plans to inform Continuation Decisions. Requested data may include proposed sources of funding/revenue and the business model that will support the projects beyond the DOE award. This may also include an estimate of profit and loss demonstrating how the projects will maintain financial self-sufficiency and strategies to grow beyond the initial award or retain sufficient funding for decommissioning and demolition, if appropriate. Projects selected under this NOFO are expected to submit baseline data supporting the stated TRL of the proposed system.

[14] AACE® International Recommended Practice No. 18R-97, Cost Estimate Classification System as Applied in Engineering, Procurement, and Construction for the Process Industries.

Topic Area 2

TA2 will support large-scale pilot projects[15] demonstrating transformative technical advances in point source carbon capture. Projects awarded under TA2 of this NOFO are expected to have the following performance goals and success indicators:

- Demonstrate the capture of either (1) 75,000 metric tons CO_2/yr from an industrial/commercial facility or (2) CO_2 from a recommended minimum 20 MWe slip stream at an existing coal or NG electric generation facility.
- Design the life to be approximately 5 years, with plans to decommission or operate after the financial assistance project period.
- Create a testing and operation plan sufficient to advance to TRL 7 by the end of the financial assistance project period, including:
    - At least one (1) year of large-scale pilot testing under realistic exhaust conditions covering the full spectrum of performance conditions (steady-state, startup and shutdown, dynamic operations), and parametric studies
    - At least 2,000 hours of operational data under steady-state at performance targets
- Collect and report the inlet and outlet criteria pollutants (e.g., NOx, SOx, particulate matter) and technology-related emissions (e.g., solvent/sorbent losses and their degradation by-products) during testing and operations.
- Provide lessons learned for the project related to the capture technology, market responses, financial scaling, community reception, and future scalability.
- Ensure that the technology meets pipeline or offtake CO_2 product specifications.
- Update process models with the data acquired during pilot testing.
- Implement community and labor engagement, perform assessments, and develop plans for later phases to ensure carbon capture projects maximize community benefits.

Applicants proposing coal and new NG electric generation applications must be consistent with EPA 111(d). All other applicants (existing NG plants and industrial/commercial applications) should meet or exceed a 90% carbon capture efficiency for the large-scale pilot. If applicants are unable to achieve the 90% capture efficiency target, they must include the rationale and supporting data for proposing a lower capture efficiency.

DOE will collect technical and financial data during the project to ensure that key milestones are being met during each phase. Projects selected under this NOFO are expected to submit baseline data supporting the stated TRL of the proposed system.

[15] The term "large-scale pilot project" is pursuant to section 962(a)(1) of the Energy Policy Act of 2005 as amended (42 U.S.C. § 16292(a)(1)).

Topic Area 3

TA3 will support activities that drive maturation of the CCUS market where key infrastructure is already developing or the development of such is ideal. TA3 awards will support the integrated, coordinated planning and commercial development of the key components (CO_2 emitters and transport, and storage providers or operators) of a localized carbon management "network," particularly focusing on areas where carbon storage site development has already begun. By driving coordinated development in these key locations, TA3 seeks to reduce offtake uncertainty for transport and storage providers and minimize transport and storage fees paid by emitters. TA3 awards may include elements currently supported through other DOE programs, and those deliverables could be used as inputs, but no duplication of scope or funding will be provided to conduct same scope of work.

Projects awarded under TA3 of this NOFO are expected to have the following performance goals and success indicators as a minimum:

- Complete a finalized FEED study for the carbon management network with at least two emitters within approximately 50 linear miles of each other and the storage site, including an AACE Class 3 cost estimate.
- Predict transport and storage capacity to be consistent with injectivity of at least 100,000 metric tons per year for the first 5 years and 50 million metric tons CO_2 within a 30-year period.
- Create the foundation for a regional CO_2 sequestration hub, including the composition of the management and organization team, project management approach, and financial structure.
- Accumulate lessons learned that can be leveraged for future projects, related to technology, market responses, financial scaling, carbon storage insurance and liability management, community reception, future scalability, and project team development.
- Demonstrate an economically viable project that shows the benefits of carbon management networks for prospective follow-on private sector investment and is demonstrated through techno-economic analysis (TEA) and financial models.
- Create an Excel-based financial model for CO_2 capture, transport, and storage that documents:
    - Assumptions tab containing all inputs and clearly indicating information source for each assumption. Assumptions must be supported by documentation to the extent possible.
    - Estimated capital expenditures broken down by category (informed by FEED to the extent possible)
    - Sources of upfront capital
    - Timing and amounts of capital inflows and outflows
    - All applicable tax credits
    - All required contingencies
    - 10 years of operating cash flows highlighting:

  - Amounts of CO_2 captured
  - Calculations supporting all ongoing revenue streams and total operating revenues
  - Calculations supporting all operating expense line items (including insurance) and total operating expenses
  - All applicable incentives
  - Earnings before interest, taxes, depreciation and amortization (EBITDA)
  - Paydown of any debt or obligations to investors
  - Resulting free cash flow
- Execute an offtake term sheet for transportation and storage (T&S) services and identify a path to a full offtake agreement.
- Provide essential agreements as executed or in process for the following: carbon capture technology provider; engineering, procurement, and construction (EPC); operations and maintenance (O&M); transport; and storage.
- Provide vendor and onsite storage agreements for equipment exceeding 10% of project capital expenditures (CapEx).
- Implement community and labor engagement, develop mechanisms for accountability (e.g., negotiated agreements), form partnerships, perform assessments, and develop plans for later phases to ensure benefits are delivered to communities and workers.
- Complete a Community Benefits Plan.
- Complete at least 90% technical design for CO_2 capture, transport, and storage.
- Demonstrate site control.
- Identify all state, local, tribal, and Federal permits and authorizations required to construct and operate the proposed project. For each, identify the issuing agency, controlling law, and expected time to achieve approvals.

Project Examples

Topic Area 1

An example TA1a award could demonstrate the retrofitting of a commercial-scale amine solvent carbon capture facility on an existing coal-powered electric generation facility in an electricity market in which coal-powered electric generation is likely to remain economically viable (i.e., near areas experiencing high load-growth volumes). It would also include the appropriate infrastructure to transport and store produced CO_2.

Transportation investments could be existing CO_2 pipelines or new, short pipeline spurs to a dedicated storage facility, and given the timeline requirements for this award, it is likely that storage facilities leveraged in TA1 have already completed some potential early development or siting work. This could include work funded through the FECM CarbonSAFE program.[16]

Topic Area 2

An example TA2 award could demonstrate the successful large-scale piloting of a novel carbon capture technology, such as a membrane-based system that has been demonstrated at the small pilot scale. This pilot demonstration could be installed as a retrofit at an industrial plant where point-source carbon capture is currently unproven. This pilot demonstration should reduce the operational cost of capture substantially from the current best-in-class carbon capture solutions. Ideally, this pilot will be located proximal to carbon transport and storage infrastructure, allowing the emissions to be permanently sequestered.

Topic Area 3

An example TA3 award would support the development activities needed to attract debt financing for the construction of multiple carbon capture retrofits on small emitters clustered in one region. The award will enable these emitters to perform the necessary engineering and design activities to refine the cost inputs required in their business models to establish an accurate estimate for the cost of capture, acquire the key approvals and permits needed for construction, and establish the terms and conditions needed for an offtake agreement with nearby transport and storage operators. The transport and storage operators in the award will have likely already begun early-stage development in the region and may be leveraging other DOE support for those activities—such activities will be excluded from the scope of an OCED TA3 award. The award will also enable the project partners to perform collaborative on-the-ground community and workforce engagement with affected communities and workers on future development plans and receive feedback.

Applications Specifically NOT of Interest

Overall

- Applications that do not meet the minimum Non-Federal cost share
- Applications that cannot provide cost share or do not have a cost share provider identified
- Applications that do not specifically target a Topic Area
- Applications for proposed technologies that are not based on sound scientific principles (e.g., violate the laws of thermodynamics)
- Applications that propose a host site that is not located in the United States
- Applications that include algae-based carbon capture technologies

[16] https://netl.doe.gov/carbon-management/carbon-storage/carbonsafe.

- Applications that include materials screening (computational or experimental) of novel sorbents, solvents, membrane, or electrochemical materials
- Applications to advance the maturation of direct air capture
- Applications proposing to capture or utilize GHG emissions other than carbon oxides such as methane, nitrous oxide, and sulfur hexafluoride

Topic Area 1 and Topic Area 3

- Applications primarily designed for basic research, bench- or pilot-scale testing, or research and development
- Applications proposing to include an existing host site that is not currently in commercial operation or with an announced closure date earlier than 15 years from the date of the NOFO
- Applications that include costs for activities not permitted in the Topic Area, including designing and constructing new electric generation and industrial facilities apart from the required design of a CCUS demonstration system
- Applications that do not have an identified sequestration site or utilization site for captured CO_2

Topic Area 1

- Applications that propose to capture carbon from ethanol plants, natural gas processing plants, ammonia plants, steam methane reforming, or autothermal reforming
- Applications without a technology provider memorandum of understanding (MOU) or letter of intent
- Applications without a host site letter of commitment
- Applications that propose to store CO_2 as biomass or its derivatives

Topic Area 2

- Technologies that are TRL 4 or below including but not limited to applications proposing lab/bench-scale R&D, and experimental activities or testing campaigns
- TA2a applications without a host site letter of commitment
- TA2b applications unable to demonstrate a commissioned small-scale pilot and relevant operational data with any realistic (or actual) flue gas during full application submission
- Applications that propose to capture carbon from ethanol plants, natural gas processing plants, ammonia plants, steam methane reforming, or autothermal reforming
- Applications proposing R&D of individual process steps, materials, chemistries, or non-integrated enabling technologies (e.g., solvent reclamation, carbon capture material manufacturing, monoliths, carbon oxides compression technologies) rather than a complete and fully integrated carbon capture large-scale pilot system

- Applications that include costs for activities not permitted in the Topic Area, including designing and constructing new electric generation and industrial/commercial facilities apart from the required design of a carbon capture system
- Applications to advance the maturation of carbon storage and transport technologies
- Applications to advance the maturation of carbon oxides conversion technologies
- Applications to advance the maturation of technologies to increase carbon oxides concentration in the flue gas (e.g., exhaust gas recirculation), other than engineering analysis

Topic Area 3

- Applications that include costs for activities that overlap in scope with an existing Federal award
- Applications that only include one carbon emitter
- Applications without a transport and storage provider selected
- Applications without host site letters of commitment from emitters

Expected Award and Project Management Structure

Awards selected under this NOFO will adhere to a four-phased project management structure for managing scope, schedule, deliverables, and budget, typically with one Budget Period per phase. Figure 1 shows an example of the phase progression, major work activities, funding proportion, and timeline. These activities will also be further defined during award negotiations and subsequent negotiations between phases.

DOE review and evaluation of deliverables reflecting activities in each phase will inform Go/No-Go review decisions that occur between and within phases. DOE anticipates all awarded projects would receive funding through Phase 4 pending successful Go/No-Go reviews, which will be designed to manage risk.

DOE uses a phased project management oversight approach incorporating well-established principles employed by both government and the private sector. The phased approach is designed to guide projects through the project development process incrementally. Each subsequent phase is structured to ensure that each award meets a standard level of maturity, employs a robust execution approach, and that technical and non-technical project risks are adequately and appropriately managed throughout DOE's award.

A stage gate review process is used to divide the projects into four key phases: 1) Detailed Planning; 2) Project Development, Permitting, and Financing; 3) Assembly, Installation, and Integration; and 4) Testing and Validation. TA1 projects that complete all four phases will reach technical and commercial viability under this NOFO and thus mature to TRL 8. TA2 projects that complete all four phases will achieve TRL 7 and will be ready for commercial/facility-wide demonstration. TA3 projects will be limited to Phase 1 ("Detailed Planning") of the OCED phased project approach; funding for Phases 2 through 4 is not available through this NOFO. TA3 projects will complete preliminary engineering, construction, and commercial-scale designs meeting AACE Class 3 estimates.

DOE evaluates a project's viability to proceed to the next phase by examining key metrics, which include a project's technical viability and risk profile, schedule and cost, market impacts, teaming structure and commitments, and community benefits commitments. Funds will be obligated for each phase and projects must pass these investment decisions before receiving the tranche of funding for the next phase.

While Figure 1 and the narrative text below provide approximate timetables for each phase, these timetables are representative only. It is DOE's intention to work with recipients to progress projects through the phased project implementation as prudently as possible. While phases are used to conceptually describe the progression of project development, awards will be managed in Budget Periods as defined in 2 CFR 200.1, "Budget period."[17]

	Pre-DOE Funding	Phase 1: Detailed Planning	Phase 2: Development, Permitting, Financing	Phase 3: Assembly, Installation, Integration	Phase 4: Testing and Validation
Approximate Proportion of Project Cost	**Pre-DOE Funding**	**10-20%**	**10-20%**	**30-40%**	**20-30%**
Approximate Duration	**NA**	**6-18 months**	**6-18 months**	**12-24 months**	**12-24 months**
Phase Summary	NA	Initial planning and analysis activities to ensure technological and financial viability.	Finalize engineering designs and test plans; business development; National Environmental Policy Act (NEPA) review; permitting; secure financing.	Assembly, installation, and integration of the system; subsystem testing and validation.	Pilot testing and validation; model refinement; dissemination of findings on system operations, performance, and financial viability.

Figure 1. Summary of the anticipated phase structure of the projects awarded under this NOFO. Note that Phase 0 is an optional intermediary stage between application and Phase 1.

Phase 0 – Small-Scale Testing (TA2b only)

Topic Area 2b is an optional phase for applicants that have not demonstrated sufficient prior scale data of 1,000 metric tons of CO_2/year carbon capture capacity and 1,000 hours of steady-state testing for the flue gas of interest. However, applicants for TA2b must demonstrate a commissioned operational small-scale pilot at the time of full application submission with any realistic (or actual) flue gas. DOE will prefer applications that provide significant operational data for substantial runtime. Accomplishments in Phase 0 will form the technical basis of Phase 1 Detailed Planning and Design, including a pre-FEED (Class 5) for the proposed large-scale pilot. TA2b applicants must also secure a host site commitment at the end of Phase 0.

Phase 1 – Detailed Planning

Phase 1 activities will focus on completing specific details about the overall project plan and analysis to refine projections submitted as part of the proposal. These activities must provide assurance to DOE that the overall project plan is technologically, financially, and legally viable, with buy-in from relevant local and community stakeholders.

[17] § 200.1 Definitions.

DOE expects recipients will complete preliminary engineering, construction, and commercial-scale designs meeting AACE Class 3 estimates during this phase. The outcomes of the preliminary engineering design work are expected to include but are not limited to any required FEED study, Storage Field Development Plan (if applicable), storage permit application materials or offtake agreements (as applicable), Measurement, Reporting, and Verification (MRV) Plan (if applicable), and Permitting Workflow Overview.

Other Phase 1 deliverables include finalization of a Technology Maturation Plan, Project Management Plan (PMP), Integrated Project Schedule (IPS), a Risk Register, the initial Safety Plan, an initial financial plan, financial model, and preliminary Engineering, Procurement, Construction, and Operations (EPCO) Plans for the entire four-phase effort.

As specified by DOE, the recipient will prepare an environmental information volume (EIV) or an environmental considerations summary (ECS) to support DOE's National Environmental Policy Act (NEPA) evaluation of potential construction and operating impacts. Applicants should be fully engaged with the DOE's NEPA team as they develop environmental and regulatory plans to prepare for permitting and approval processes in Phase 2.

Phase 1 should also include a continuation of analysis activities to refine and update TEA data provided in the application and expand the initial environmental impact evaluation into a quantitative LCA for the specific project. Community and labor engagement should continue throughout Phase 1 and projects should begin negotiating applicable Workforce and Community Agreements. Projects should develop relationships, conduct baseline analysis and goal setting, and create specific plans for implementing Community Benefits Activities in future phases.

Phase 2 – Project Development, Permitting, and Financing

Phase 2 encompasses advanced planning activities. Recipients will finalize their project development plans, commercial agreements, financial structure, fabrication plans, and complete the necessary permitting and approval activities required to begin construction. By the end of Phase 2, detailed engineering and operational designs should meet AACE Class 2 estimates to execute relevant fabrication, procurement, construction, and other project execution contracts.

Third-party financing and contingency agreements should be completed and relevant offtake or feedstock agreements for the carbon oxides should be in place. Plans for operational, validation, or other testing should be refined. Long-lead procurement activities may be started in Phase 2 with prior DOE approval. Risk management plans should be revised and updated to reflect progress made and risks mitigated, as well as new or emerging risks and corresponding management plans.

By the completion of Phase 2, safety and security plans should be finalized and execution ready. All necessary permits and regulatory approvals should be in place to prepare for construction, including completion of DOE's NEPA review. All procurement plans should be finalized. Final pre-implementation LCA and TEA activities should be completed according to DOE expectations and corresponding verification and validation (V&V) plans should be in place. Community and labor engagement should have progressed, and relevant Workforce and Community Agreements should be finalized. Updated comprehensive Community Benefits Commitments should reflect community and labor input and implementation experience to date and set the stage for ongoing engagement.

Community impact targets should be finalized, and tracking plans should be in place to monitor economic, environmental, and social impacts of the projects as they progress to implementation.

Phase 3 – Assembly, Installation and Integration

Phase 3 activities will focus on construction and systems integration. Recipients will employ industry standard project management tools and will be required to provide regular status updates and reports. Plans developed in the preceding phases will be revised and updated as appropriate to reflect actual performance. Engineering drawings may be further developed within this phase. Operational protocols and controls will be finalized within this phase.

Previously and newly developed risks will be tracked, actively managed, and regularly reported to DOE. Reporting frequencies and content requirements will be unique to each award and negotiated before Phase 3 commencement.

While recipients will manage implementation, DOE will closely monitor progress and evaluate it against the plans developed through Phase 2. DOE and/or its third-party representatives will visit the site(s) regularly to verify progress and collect data, including data related to community benefits, consistent with the established reporting requirements.

During Phase 3, recipients will continue to advance their Community Benefits Commitments and provide ongoing mechanisms for community and labor input that will support the realization of meaningful benefits and minimization of any project negative impacts. Outcomes and impacts related to community benefits efforts will be tracked to assess progress.

Phase 3 may look significantly different for each award as there will be varying amounts of construction and retrofitting. Specific details will be addressed for selected projects during negotiations. System commissioning should be complete at the end of Phase 3 in preparation for testing and operations in Phase 4. Phase 3 will likely include procurement, fabrication, site preparation, and installation. By the end of Phase 3, the project should be assembled, installed, integrated, and commissioned.

Phase 4 – Testing and Validation

In Phase 4, recipients will transition to testing and operations. Phase 4 activities will focus on integrated system performance and ramp-up. By the end of Phase 4, each award will have demonstrated fully functional operations over an extended period. Applicants should refer to Expected Performance Goals, Indicators, Targets, Baseline Data, and Data Collection subsection of the NOFO for the expected testing and validation metrics for each Topic Area.

A key objective is for DOE-funded demonstration projects to catalyze follow-on private sector investments while meeting community benefits goals. Recipients should show a clear path to replicability and extensibility of their solution. To meet this key objective, Phase 4 is likely to include financial, socio-economic, environmental, and operational data collection and reporting to DOE.

To the extent practicable and while ensuring the protection of sensitive and proprietary information first produced in the performance of the award, DOE will aggregate and anonymize site and operations data that qualifies as Protected Data from all awarded projects into quantitative and qualitative analyses that can be promulgated to external parties for the purpose of informing future private sector investment decisions.

Recipients are encouraged, though not required, to disseminate operational data, lessons learned, financial, planning, and O&M strategies to the broader community and the public. Specific details regarding dissemination will be finalized during negotiations.

Transitions between Budget Periods/Phases

All projects selected under TA1 and TA2a of this NOFO will be eligible to complete all four phases pending successful execution of milestones. TA2b projects upon successful completion of Phase 0 will be selected to proceed to Phase 1. Projects selected under TA3 of this NOFO are only eligible for Phase 1. DOE is not planning a competitive down-select process among projects after awards are made; however, to manage risk, all projects will be required to complete regular Go/No-Go reviews at the end of each Budget Period. Generally, these reviews will coincide with a transition from one phase to the next. Specific Go/No-Go review criteria will be negotiated with each selected project for transitions between each Budget Period.

Transitions may include a requirement to submit a standardized set of data to provide quantitative and qualitative insight on metrics spanning the technological, environmental, economic, market, workforce, community benefits, and other components of the project's analysis activities. DOE may also require additional Go/No-Go reviews within phases (i.e., phases may include one or more budget periods with Go/No-Go reviews at the end of each budget period). Applicants must propose quantitative Go/No-Go review criteria for each budget period as defined in the Technical Volume section.

If DOE determines that an award is making insufficient progress, additional scrutiny and oversight by DOE or its representatives may be employed, including the use of corrective measures. Awards may be discontinued at any of the Continuation Decision points if the Go/No-Go review criteria, project, and/or program requirements are not met. If awards are proceeding on an accelerated schedule, it may be possible to move to a Go/No-Go review earlier than originally planned and advance to the next budget period if the review is successfully completed.

Specific project structure details for each recipient will be negotiated on a project-by-project basis to produce the best possible balance between project outcomes and DOE risk exposure. Examples of factors that may be considered as part of such negotiations include project and risk management processes, recipient capabilities, cost share amounts, financial contingencies, and engagement of independent monitors such as Independent Engineers and community benefits consultants.

DOE will require access to project performance and financial data necessary to track progress against a project baseline (or similar). As these projects are demonstrations, project progress data first produced in performance of the award will be shared with interested stakeholders to the greatest extent possible. If such data are Protected Data, they will only be shared publicly if aggregated and anonymized in accordance with OCED protocols.

If funded through all four phases, DOE expects that the projects selected under this NOFO will significantly advance technical and commercial viability. Achieving DOE's broad end goals will necessitate review and evaluation of proposed project characteristics that include cost, schedule, and scope; technology; environmental; business; market; financial; management; community and workforce support; and other factors throughout the project to validate assumptions made for determining technical and commercial viability.

The phased project management approach is designed to guide recipients through the project development process incrementally. Each subsequent phase is structured to ensure that each award meets a standard level of maturity, employs a robust execution approach, and that technical and non-technical project risks are adequately and appropriately managed throughout the award. If the project expects to continue operating fully independent of Federal funds, DOE may also request financial sustainability plans or long-term disposition or decommissioning plans as part of future decision points. DOE also may request proposed sources of funding/revenue and the business model that will support the project beyond the DOE award.

Cooperative Agreement Substantial Involvement

A Cooperative Agreement is an award funding type where there will be substantial Federal scientific or programmatic involvement. Substantial involvement includes but is not limited to the following:

1. DOE shares responsibility with the recipient for the management, control, direction, and performance of the project.
2. 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.
3. DOE may redirect or discontinue funding the project based on the outcome of DOE's evaluation of the project at the Go/No-Go review(s).
4. DOE participates in major project decision-making processes.

Unallowable Costs

All expenditures must be allowable, allocable, and reasonable in accordance with the applicable Federal cost principles. Pursuant to 2 CFR 910.352, the cost principles in the Federal Acquisition Regulations (48 CFR 31.2) apply to for-profit organizations. The cost principles contained in 2 CFR Part 200 Subpart E apply to all entities except as provided in 2 CFR 200.401(c).

Pre-Award Costs

Applicants selected for award negotiations (selectees) must request prior written approval to charge pre-award costs. Pre-award costs cannot be incurred until the Selection Official signs the Selection Statement and Analysis.

Pre-award expenditures are made at the applicant's risk. DOE is not obligated to reimburse costs. See the *Applicant Supplemental Budget and Cost Information* document on the Preparing Your Budget page for more details.

Performance of Work in the United States

All work performed under awards issued under this NOFO must be performed in the United States. The recipient must flow down this requirement to its subrecipients. To seek a waiver of this requirement, an applicant must submit a waiver request as part of their application and during performance of the award.

If the recipient fails to comply with the Performance of Work in the United States requirement, DOE may deny reimbursement for the work conducted outside the United States and such costs may not be recognized as allowable recipient cost share. The recipient is responsible should any work under this award be performed outside the United States, absent a waiver, regardless of whether the work is performed by the recipient, subrecipients, contractors, or other project partners.

Foreign work waiver request information can be found in the Waiver Requests section of this NOFO and in the *Foreign Entity Participation and Performance of Foreign Work in the United States Guidance* located on the What other Information may be Requested? Page. DOE's decision concerning foreign entity participation or foreign work is not appealable.

Buy 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.

Applicants should consult 2 CFR 184 and the *NOFO Supplemental Requirements* document located on the Funding Opportunities section of the Apply for Funding page 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 or schedule.

Davis-Bacon Act Requirements

Davis-Bacon requirements apply to awards funded through this NOFO. Applicants should the *NOFO Supplemental Requirements* document located on the Funding Opportunities section of the Apply for Funding page for more information.

Program Income

Program income is gross income earned by the recipient or subrecipient that is directly generated by a supported activity or earned as a result of the Federal award during the period of performance.

Recipients are encouraged to review 2 CFR 200.307 regarding program income and the *Applicant Supplemental Budget and Cost Information* guidance located on OCED's Preparing Your Budget page. Treatment of program income must be negotiated and approved by DOE.

Authorizing Statutes and Regulations

Section 962 of the Energy Policy Act of 2005, as amended by Section 41004 of the BIL, Pub. L. No. 117-58, codified at 42 U.S.C. § 16292.

Cooperative Agreements under this announcement will be issued consistent with the Office of Management and Budget Guidance for Federal Financial Assistance regulations in title 2 of the Code of Federal Regulations (CFR) and DOE regulations at 2 CFR Part 910.

STEP 2:
GET READY TO APPLY

IN THIS STEP:

Application Contents and Format

Application Contents and Format

Component and Subcomponent	File Naming Convention	TA1, TA3 Page Limit	TA2 Page Limit	Format
Concept Paper	ControlNumber_LeadOrganization_ConceptPaper.pdf	10	8	PDF
Initial Cash Flow Model spreadsheet	ControlNumber_LeadOrganization.ICFM.xlsx	1 worksheet	1 worksheet	Excel
Application				
Application for Federal Assistance	Standard Form SF-424 ControlNumber_LeadOrganization_App424.pdf	N/A	N/A	PDF
Technical Volume	ControlNumber_LeadOrganization_TechVol.pdf	55	40	PDF
Cash Flow Model Spreadsheet Analysis	ControlNumber_LeadOrganization_CFM.xlsx	1 worksheet	1 worksheet	Excel
LCA (TA-1, TA-2) or GHG Emissions Assessment (TA-3) Spreadsheet	ControlNumber_LeadOrganization_LCA.xlsx	1 worksheet	1 worksheet	Excel
Project Management Plan	ControlNumber_LeadOrganization_PMP.pdf	50	Not Required [18]	PDF
Cybersecurity Plan	ControlNumber_LeadOrganization_Cyber.pdf	N/A	N/A	PDF
Community Partnership Documentation	ControlNumber_LeadOrganization_Partner_Doc.pdf	3 pages each	3 pages each	PDF
Community Benefits Plan	ControlNumber_LeadOrganization_CBP.pdf	25	12	PDF
Impacted Indian Tribe Documentation	ControlNumber_LeadOrganization_IMT_Doc.pdf	3 pages each	3 pages each	PDF
Resumes	ControlNumber_LeadOrganization_Resumes.pdf	2 pages each	1 page each	PDF
Letters of Commitment	ControlNumber_LeadOrganization_LOCs.pdf	1 page each	1 page each	PDF
Budget SF-424A Budget Justification Workbook Subrecipient Budget	Standard Form SF-424A ControlNumber_LeadOrganization_App424A.pdf ControlNumber_LeadOrganization_Budget_Justification.xlsx ControlNumber_LeadOrganization_Subrecipient_Budget_Justification.xlsx	N/A N/A N/A	N/A N/A N/A	PDF and Excel Excel

[18] Although a PMP is not a requirement for TA2, please include a workplan including schedule of tasks, subtasks, milestones, and an integrated project schedule in the full application.

Transparency of Foreign Connections	ControlNumber_LeadOrganization_TransparencyFC.pdf	2	2	PDF
Foreign Entity Participation and Foreign Work Waiver Request	ControlNumber_LeadOrganization_Waiver.pdf	N/A	N/A	PDF
Current and Pending Support	ControlNumber_LeadOrganization_CPS.pdf	N/A	N/A	PDF
Potentially Duplicative Funding Notice	ControlNumber_LeadOrganization_PDFN.pdf	2	2	PDF
Certification and Disclosure of Lobbying Activities	ControlNumber_LeadOrganization_SFLLL.pdf ControlNumber_LeadOrganization_LDSC.pdf	N/A	N/A	PDF

Application Package

This application process includes two phases: Concept Paper and Application. The application and supplemental information you submit through electronic systems used by the DOE, including OCED eXCHANGE and FedConnect.net, constitute the authorized representative's approval and electronic signature.

Applicants should review Treatment of Application Information in Step 3, Submission Requirements and Deadlines, regarding business-sensitive information (e.g., commercial or financial information that is privileged or confidential), trade secrets, proprietary, or otherwise confidential information before submitting application materials.

Document Format Requirements

Your submission must conform to the form and content requirements described in this section, including maximum page lengths. A Control Number will be issued to you when you begin the OCED eXCHANGE application process. The control number must be included with all application documents. The control number must be prominently displayed on the upper-right corner of the header of every page and included in the file name (i.e., Control Number_Applicant Name_Application).

Format Requirements

1. Each document must be submitted in **Adobe PDF** format unless otherwise stated (e.g., Budget in Excel).
2. Include assigned **Control Number** in upper right corner of the header of every page along with the file name.
3. Page numbers must be included in the footer of every page.
4. You must not exceed the specified page limit. DOE will only review authorized number of pages.
5. All documents must be written in **English** language.
6. All pages must format to fit 8.5 x 11-inch paper with margins no less than 1 inch on all sides.
7. Use **Calibri** typeface, **black** font color, font size of **12 point** or larger. Figures and tables may use 10-point font.
8. References must be included as footnotes or endnotes in a **font size of 10** or larger. Footnotes and endnotes are counted toward the maximum page requirement.
9. The maximum file size that can be uploaded to the OCED eXCHANGE website is **50 megabytes (MB)**. Files in excess of 50 MB cannot be uploaded, and hence cannot be submitted for review.
10. If a file exceeds 50 MB but is still within the maximum page limit specified in the NOFO, it must be broken into parts and denoted to that effect.

Concept Paper Requirements

Concept Paper Content

- Cover Page
- Project Overview
- Project Organization
- Economic Viability
- Community Benefits Approach

Applicants must submit a Concept Paper by the specified due date and time to be eligible to submit an application. Applicants who do not submit a Concept Paper cannot submit an application. Each Concept Paper must be limited to a single project. The Concept Paper must conform to the requirements listed below, including the stated page limits. Each Concept Paper must be submitted as a single file in OCED eXCHANGE.

The Concept Paper must address all the requirements described in this subsection. Applicants should only include details they can substantiate during the full application. DOE will review only the authorized number of pages. DOE makes an independent assessment of each Concept Paper based on the Technical Review Criteria.

DOE will encourage a subset of applicants to submit applications and discourage other applicants from submitting an application; see Application Notifications. An applicant who receives a "discouraged" notification may still submit a full application. DOE will review all eligible full applications. However, by discouraging the submission of a full application, DOE intends to convey its lack of programmatic interest in the proposed project to save the applicant the time and expense of preparing an application that is unlikely to be selected for award negotiations.

The following are the Concept Paper components and their requirements. Each potential applicant must provide the following information as part of the Concept Paper.

Topic Area 1 and Topic Area 3

Cover Page (1 page maximum)

The cover page should include the project title, the specific announcement Topic Area being addressed, both the technical and business points of contact, names of all team member organizations, the potential project location(s), and any statements regarding confidentiality as described in the Notice of Restriction on Disclosure and Use of Data subsection.

Project Overview (3 pages maximum)

- Statement of the project goals and objectives, including an identification of the targeted improvements to the baseline technology, critical success factors, and expected outcomes. Applicants should explain why they are championing the proposed project and the driving force behind their commitment to its successful completion.
- Description of the host site, including a profile of the anticipated feed gas.
- Description of the proposed carbon capture technology, including an assessment of the current TRL, capability of meeting performance and cost targets, and innovation over current state-of-the-art at comparable scale.
- Description of the transport plan, including an overview of any new pipeline required or use of an existing pipeline.
- Description of the proposed storage site facilities with an overview of geologic characterizations completed to date. Any proposed off-take agreement partners should include an evaluation of adequate storage capacity at the proposed storage site.
- Summary of the current project development status (e.g., pre-FEED, permitting, rights-of-way, site commitment).

Project Organization (3 pages maximum)

- Description of key organizations involved and their respective roles including:
  - Host site owner or operator, capture technology developer or licensor (if applicable), pipeline operator (if applicable), storage site owner or operator (if applicable), EPC company, and financial partner(s);
  - Prior experience executing and developing large scale projects; and
  - Organization chart of proposed project team with partner responsibilities.
- Evidence that the Lead Project Manager, key personnel, and Project Team have the skills and expertise needed to successfully design, develop, and operate the proposed project and to achieve project objectives, including:
  - Brief summaries of roles, unique qualifications and expertise, and any relevant experience of previous work effort.
- Evidence the applicant has adequate access to equipment and facilities necessary to accomplish the effort and/or clearly explain how it intends to obtain access to the necessary equipment and facilities.

Economic Viability (2 pages maximum)

- Summary of Project Financing Plan that identifies the sources for the non-DOE share of the project costs, including contingency. Evidence of funding commitments provided, as available.
- Summary breakdown of cash flows over the life of the project with an Initial Cash Flow Model presented in Excel format.
- Summary business case including investment thesis, economic and business assumptions, sources of revenue, and duration of tax credits, if included.
- Preliminary description of commercialization strategy (facility-scale carbon capture demonstration), development plan, and timeline including key financial risks and mitigation strategies.

Community Benefits Approach (1 page maximum)

- Description of the local community where the project is located, including proximity of the proposed location to residential, agricultural, school, commercial, or other areas of local community interest.
- Brief explanation of how, or if, choice of proposed location included community and workforce input and any existing community-based partnerships or workforce agreements informed project planning.
- Brief description of the proposed strategies to engage the community and workforce and the benefits created from the project.

Topic Area 2

Cover Page (1 page maximum)

The cover page should include the project title, the specific announcement Topic Area being addressed, both the technical and business points of contact, names of all team member organizations, the potential project location(s), and any statements regarding confidentiality as described in Notice Concerning Application Information.

Project Overview (3 page maximum)

- Statement of the project goals and objectives, including an identification of the targeted improvements to the baseline technology and critical success factors. Applicants should explain why they are championing the proposed project and the driving force behind their commitment to its successful completion.
- Description of the proposed carbon capture technology, including an assessment of the current TRL, capability of meeting technical and cost targets, and innovation over current state-of-the-art at comparable scale.
- The proposed carbon capture large-scale pilot project, including a high-level description of the integrated design and scale of the technology to be developed, constructed, and operated at the host site (e.g., the intended industrial/commercial or electricity generation location, BoP requirements).
- Identification of key risks (management, technical, financial, permitting, community benefits, etc.) and challenges that will be addressed in the large-scale pilot operations.
- Description of the host site (TA2a only).
- Provide sufficient data of the highest steady-state capture efficiency that was achieved by the carbon capture technology under relevant prior scale and flue gas conditions.
- Concept Paper applicants choosing to apply for TA2b must include a plan for commissioning and data collection for the carbon capture system with any realistic (or actual) flue gas at a recommended capacity of 1,000 metric tons of CO_2/year. TA2b applicants must demonstrate a fully commissioned system and share operational data of the small-scale pilot carbon capture system by full application submission.

Economic Viability (2 page maximum)

- Summary of Project Financing Plan (Phases 1–4 or Phases 0–4) that identifies the sources for the non-DOE cost share of the project costs, including contingency. Evidence of funding commitments provided, as available. All funding commitments must be secured at the time of full application submission.
- Summary of Initial Cash Flow Model including project costs, sources of revenue, and duration of tax credits, if included. An Excel worksheet for the Initial Cash Flow Model is recommended to be included.

- Economic analysis of first-of-a-kind carbon capture system (including BoP) including but not limited to capital expenditures (CapEx), operating expenses (OpEx), levelized cost of electricity (electric generation) or levelized cost of product (industrial/commercial), and levelized cost of CO_2 capture.
- An estimate (back-of-envelope) of EPCO budget for the Concept Paper. The full application for TA2a must include an EPCO budget meeting AACE Class 5 estimates.
- Preliminary description of commercialization strategy (facility-scale carbon capture demonstration), development plan, and timeline including key financial risks and mitigation strategies.

Project Organization (1 page maximum)

- Description of key organizations involved and their respective roles including:
  - Host site owner or operator (TA2a only), capture technology developer or licensor, EPC company, financial partner(s), community benefits partner, and any other relevant project partner
  - Organization chart of proposed project team with partner responsibilities
- Evidence that the Prime Applicant and Project Team have the skill, expertise, and prior experience needed to successfully design, develop, and operate the proposed plan.
- Evidence the applicant team has adequate access to equipment and facilities necessary to accomplish the effort, or clearly explain how it intends to obtain access to the necessary equipment and facilities.

Community Benefits Approach (1 page maximum)

- Description of the local community where the project is located, including proximity of the proposed location to residential, agricultural, school, commercial, or other areas of local community interest.
- Brief description of the proposed strategies to engage the community and workforce and demonstrate the benefits created from the project.
- Description of plans for instrumentation, data collection, and analysis to assess impacts of commercial-scale carbon capture demonstrations or deployments.

Application

Technical Volume Content

- Cover Page
- Project Overview
- Technical Approach
- Financial and Market Viability
- Management, Organization, and Workplan

Note: Only applicants who have submitted a Concept Paper will be eligible to submit an application.

Applicants will have approximately 60 days from DOE's posting of the Concept Paper Encourage/Discourage notification on OCED eXCHANGE to prepare and submit an application.

Regardless of the date the applicant receives the Encourage/Discourage notification (see Concept Paper Notification), the submission deadline for the application remains the date and time stated on the NOFO cover page. Each application must be limited to a single proposal. Applications must conform to the content and form requirements listed below and must not exceed the stated page limits. Applicants must provide sufficient citations and references to justify the claims and approaches made to DOE. However, DOE and reviewers are under no obligation to review cited sources.

Technical Volume

The Technical Volume must include the table of contents, and all citations, charts, graphs, maps, photos, or other graphics, and must include all the components listed above.

The applicant should consider the weighting of each of the Technical Review Criteria when preparing the Technical Volume. All elements of the Technical Volume must be addressed; however, it is expected the applicant will tailor the information provided in the Technical Volume to the size and complexity of the proposed project.

Cover Page

1. Title
2. Topic Area
3. Points of Contact
4. Names of all team members including recipient name, subrecipient names, names of project managers, senior/key personnel, and their member organizations
5. Full address of each site of project work including zip code
6. Confidentiality statements

Project Overview

1. Background
2. Project goal
3. Impact of DOE funding
4. Impact on neighboring communities
5. Climate resilience strategy

Topic Area 1

Technical Approach and Site Suitability

1. Description of proposed capture technology. This may include:
    a. Preliminary process flow diagrams (PFD)
    b. Summary of site selection and host plant capabilities
    c. Desktop study of potential environmental impacts related to NEPA
    d. Mass and energy balances
    e. Steam and power requirements
    f. Plan for electrical, water, and waste management
    g. Flue gas source and pre-conditioning plan for contaminants
    h. Key considerations based on the capture technology pathway chosen, including:
        1) Management and impact of emissions originating in the carbon capture system
        2) A discussion of the absorption/desorption chemistry, degradation chemistry, and operating cycle for solvent and sorbent systems including recharging/regenerating if applicable
        3) A description of relevant membrane chemistry, including transport mechanism if applicable
        4) Material compatibility results
    i. Risks or challenges to scale-up or deployment of the proposed technology
2. An analysis of prior-scale testing completed which evaluates the readiness of the technology for deployment at the scale proposed. This may include:
    a. Summary of previously completed testing at the pilot- or demonstration-scale system using actual exhaust or similar. This could include experimental results, model predictions and schematics from previous and active research, as well as conceptual designs of future research.

b. An explanation of all analytical sources for all data reported and inconsistencies in data sources

c. Technology maturation plan

d. Completed DOE-provided tables demonstrating prior-scale CCUS technical readiness:

1) State Point Data Table[19]
2) Block flow diagram

3. An initial LCA that compares the proposed system against a baseline (i.e., the existing facility) shall be provided. The initial LCA should use data from NETL's CO2U Guidance Toolkit wherever possible and include the following:

a. A 3-page narrative (not including figures or tables) that describes the methodology, results, and completeness of the LCA

b. An Excel spreadsheet that details the LCA calculations, assumptions, and data sources

c. System diagrams for the baseline and proposed systems that clearly illustrate the emission sources, material and energy inputs, and the reference flows. The system boundary should encompass the full carbon capture system from fuel extraction to CO_2 transport and storage (i.e., cradle-to-grave).

d. Carbon intensity (CI) calculated for the baseline and proposed systems as CO_2-equivalent (CO_2e) normalized by functional unit (i.e., 1 megawatt-hour of delivered electricity or mass of product)

e. Annual captured and permanently stored carbon dioxide for the proposed project

f. A contribution analysis showing the breakdown of CI by emissions source for the baseline and proposed systems

g. Anticipated reductions in carbon intensity expressed as a percentage by comparing the carbon intensity from the proposed process to baseline levels

h. Key sensitivity analyses

2. Initial EHS Risk Assessment, outlining the impacts of the technology, as determined through the preliminary life cycle assessment or other key analyses, on:

a. Air emissions

1) Water utilization
2) Solid and liquid waste streams
3) Criteria pollutants
4) Noise impacts
5) Operator health and safety

[19]See State Point Data Table Template in OCED eXCHANGE under DE-FOA-0003473 – Application Forms and Templates.

Transport

1. A thorough description of the carbon transportation method
2. A summary of the current state of development of the transportation route, including:
    a. Proximity to population centers
    b. Proximity to disadvantaged communities
3. Preliminary title research on the identified route. This summary may also include:
    a. Type and quality of title research and due diligence
    b. If co-locating the pipeline within existing rights-of-way: preliminary title presenting legal feasibility of co-location and letter of commitment from the easement holder
4. Any other MOUs or letters of agreement (LOA) pertinent to the project, if applicable

Storage

1. A description of the carbon storage site, and a summary of the process of selecting the proposed site(s) over other potential sites. This may include:
    a. Pore space ownership, well site access and ownership (including existing surface use agreements), current land use, and existing infrastructure issues
    b. Proximity to population centers
    c. Proximity to disadvantaged communities and/or potential to provide benefits or avoid negative impacts to disadvantaged communities (as defined by Department of Energy)[20]
    d. Potential issues affecting the time frame for regulatory approval and construction of the CO_2 transport and storage infrastructure (required if proposing Class VI or Class II storage)
    e. Conflicts with existing resource development, surface or subsurface
2. Prior engineering and design work summary. This may include:
    a. Maps showing the CO_2 sources, geographic footprints for projected injection plumes, proposed injection wells, testing and observation wells, and potential environmental impacts related to NEPA
    b. Summary of geologic information (such as cross-sections, seismic with interpretation, plume models, resource assessments), that describe:
        1) Depositional system and strategic framework for overall storage complex
        2) Subsurface structural elements describing any unconformities.
        3) Contingent storage resources
        4) Storage reservoir(s) properties including but not limited to depth, thickness, porosity, permeability, aerial extent, and total dissolved solids (TDS)

[20] Justice40 Initiative | Department of Energy

5) Confining system formation type and thicknesses

c. A survey of nearby underground sources of drinking water depths, distances to sole source aquifers, and protection plans to ensure those sources are not affected by carbon storage development

d. Locations and depths of legacy wellbores that penetrate the proposed storage complex

e. Assessment of seismic risk based on the DOE's "Recommended Practices for Managing Induced Seismicity Risk Associated with Geologic Carbon Storage" (Templeton et al., 2021)

f. Prediction of future site performance based on forward geologic models informed by actual data from initial site characterization

g. Injectivity testing results and/or pressure transient analysis modeling

3. Summary of the level of maturity of the site development, including if available:

a. Well permit applications (for Class VI or Class II) or a plan for developing and submitting applications

b. Maturity of necessary leases

c. NEPA and permitting process documentation

d. Letters of intent signed by proximal emitters

4. Any other information, MOUs, or LOAs pertinent to the project, as applicable

Financial and Market Viability

Standalone project economics and financial feasibility

1. Cash flow model spreadsheet indicating, as a minimum, the following breakdown of expected cash flows for each year, through the life of the project, based on realistic assumptions:

a. Key operating revenues including volumes and unit prices for every key source of revenue

b. Revenues from sources other than operations

c. Operating costs including:

1) Wages, sales commissions, and transportation

2) Utilities including volume and unit price for power purchases, natural gas, steam, water, and any other relevant utilities

3) Key feedstocks and consumables including solvents, sorbents, catalysts, and others as applicable

4) Sales, general, and administrative expenses

5) Income from operations

d. Interest cost

1) Depreciation and amortization
2) Tax costs
3) Tax credits (e.g., 45Q)
4) Total cash flow from operating activities

e. Net income

1) Changes in operating assets and liabilities
2) Cash flow from financing activities

f. Dividend payments

1) Stock repurchases

2) Proceeds from sales of stock

3) Issuance and repayment of debt

4) Cash flow from investment activities

g. Investment in property plant and equipment

1) CapEx
2) Capital structure and balance sheet over time

h. Key financial metrics for the project including internal rate of return (IRR), return on equity (ROE), debt/equity ratio, debt/earnings before interest, taxes, depreciation, and amortization (EBITDA), interest coverage ratio

2. Key risks impacting project economics and sensitivities to each risk (e.g., tornado chart) and key risk mitigation options:

a. Discussion of High and Low scenarios

b. Support for key assumptions including conditional commitments and expressions of interest from key offtakers and vendors as available

3. Discussion on financial strategy

a. Sources and uses of funds

b. Capital stack over time including balance sheet financing, equity investors, debt, grants, and other expected sources of funding

c. Timing of capital inflows over the course of the project and major financing milestones (e.g., FID, funding rounds, loan closing, debt refinancing)

d. Support for feasibility of financial strategy in the form of conditional commitments, budget approvals, and formal expressions of interest from potential capital providers

e. Discussion of financial strategy, key risks, and mitigation plans

Growth potential of technology beyond current project

1. Vision for subsequent deployments of the technology, at this location or elsewhere; and vision for how this facility can contribute to a new or existing regional Carbon Capture hub

Synergies with other projects and infrastructure

1. Capacity for sharing infrastructure with future projects in the area
2. Financial efficiency: Degree to which the proposed project utilizes and leverages available resources to meet the required NOFO objectives
3. A timeline to financial investment decision
4. A summary of the sources of non-Federal cost share necessary to complete the project. This includes:
    a. The maturity of the description of non-DOE cost share within the Project Financing Plan
    b. Evidence of financial commitment from key project partners through Letters of Commitment, MOUs, or similar
    c. The financial strength of the project partners
    d. The applicant's ability to provide contingency to meet unknown project cost overruns often seen with large demonstration projects
2. A completed budget and spend plan covering both DOE funding and non-Federal cost share

Management, Organization, and Workplan

1. A description of the prime recipient team involved in the project. This must include:
    a. Resumes of key prime recipient staff indicating the number of years of experience of key prime recipient management staff in performing similar projects and the allocation of responsibility commensurate with this experience
    b. Descriptions of the time commitment allowed to successfully manage a project of substantial size and complexity
    c. Description of any relevant prior organizational experience, which demonstrates an ability to perform tasks of similar risk and complexity. If applicable, provide details on the applicant team's prior work together on projects.
2. A description of the broader team and a description of each team member's expertise. The team should include representation from each of these key areas:
    a. Capture tech developer or licensors
    b. Emitter owner or operators
    c. Pipeline operators
    d. Geologic storage operators
    e. EPC firms, identification of EPC alternative
    f. Land and right-of-way acquisitions firms

g. Financial partners
h. NEPA consultants
i. Community Benefits staff

3. A management plan that outlines how the award team plans to function to achieve project objectives. This may include:

   a. Letter(s) of commitment indicating the strength of the commitment of subrecipients as available

   b. Detailed workplans that integrate subrecipient activities

   c. Resumes of key subrecipient staff indicating the number of years of experience of key subrecipient recipient management staff in performing similar projects and the allocation of responsibility commensurate with this experience

   d. The time commitment to successfully execute the necessary tasks a project of substantial size and complexity

   e. Clearly defined organizational structures outlining the roles and responsibilities of each project partner as a part of the award

4. A description of the safety performance history of the project partners

5. A workplan that includes:

   a. A Technical Scope Summary, divided by budget periods in alignment with the four Project Phases described in Figure 1

   b. Proposed Continuation Decision Points for each project phase

   c. A WBS

   d. An IPS showing critical path for the entire project, and including task and subtask durations, milestones, NEPA and other permitting, CBP, and Continuation Decisions

   e. Task Description Summary, with a concise description of the specific activities to be conducted over the life of the project (including project construction and operations) for each task/subtask. This should include identification of the anticipated Federal, state, and local codes, regulations, and permitting requirements applicable to siting, construction, and operation of the proposed project.

   f. A summary of the End-of-Project Goal(s)

6. A risk management plan that includes:

   a. Identification of technical risks, including technology, systems integration, infrastructure, engineering, scale-up, and similar elements

   b. Identification of security risks, including cybersecurity, physical security, internal and external threat identification and response, and similar elements

c. Identification of financial risks including project finance, market and regulatory structures, commercial business models, and similar elements

d. Identification of organizational risks, including project team, project management structure, and similar elements

e. Identification of execution risks, including engineering, community perception, labor availability, procurement, construction, permitting, safety, testing, and similar elements

f. Assessment of the probability of occurrence of each risk and potential impacts

g. Identification of proposed mitigations for identified risks

7. Buy America Requirement for Infrastructure Projects: Within the first 2 pages of the proposed workplan or project description, include a short statement on whether the project will involve the construction, alteration, maintenance, or repair of public infrastructure in the United States. See the *NOFO Supplemental Requirements* document on the Funding Opportunities page and 2 CFR 184 for applicable definitions and other information regarding Infrastructure Projects and the Buy America Requirement.

Topic Area 2

Technical Approach

1. Summary of scaling factor analysis demonstrating the readiness of the technology at the scale proposed, including:

   a. For TA2a entry, summary of prior-scale testing on small pilot or skid-scale system using actual exhaust or synthetic exhaust conditions (similar CO_2 and O_2 concentrations as the flue gas intended for large-scale pilot), temperature, flow rate, and pressure. This could include experimental results, model predictions, and schematics from previous and active research, as well as conceptual designs of future research. This is applicable for Phase 1 entry.

   a. Note: For TA2b entry, sufficient and relevant commissioning and operational data from a small-scale pilot must be provided at any flue gas of choice.

   b. Completed DOE-provided tables demonstrating CCUS technical readiness:

      1) State Point Data Table[21]

2. Overview of potential improvements that this capture technology can demonstrate relative to the state-of-the-art, including:

   a. Expected performance targets, such as:

      1) Capture efficiency
      2) CO_2 product purity
      3) Levelized cost of capture

[21] See State Point Data Table Template in OCED eXCHANGE under DE-FOA-0003473 – Application Forms and Templates.

4) Energy and water consumption

b. Experimental evidence of improvements in prior testing and engineering technical reports that justify performance targets

3. Description of proposed capture technology, including:

a. Preliminary process flow diagrams with corresponding stream table (inclusive of mass and energy balances)

b. Steam and electric power requirements

c. Key considerations based on the capture technology pathway chosen, including:

1) A discussion of the ab(d)sorption/desorption chemistry and operating cycle for solvent and sorbent systems including recharging/regenerating and pretreatment equipment, if applicable

2) A description of relevant membrane chemistry and pretreatment equipment, including transport mechanism, if applicable

3) A description of relevant cryogenic compression/constituent removal steps and pretreatment

4) A description of other carbon capture core chemical/mechanical removal pathways (e.g., chemical looping, molten salt, oxycombustion, hybrid approaches)

d. Remaining technical risks for the proposed carbon capture technology (specifically pertaining to scale-up)

4. Overview of any prior engineering and design work to demonstrate the suitability of the capture technology at the host facility. This could include:

a. Criteria pollutants (mandated by EPA and District/State-Governing body) that could enter the carbon capture system

b. Inlet flue gas conditions to carbon capture system (temperature, flow rate, pressure, estimated CO_2 concentration, etc.)

c. Expected impacts to status quo plant operations

d. Letter of commitment with the host facility indicating availability of host facility for permitting, construction, and operation (inclusive of Phases 2–4) (TA2a only)

5. Initial EHS Risk Assessment, outlining the downstream impacts of the technology, as determined through previous scale key analyses, on:

a. Air emissions
b. Water utilization
c. Solid and liquid waste streams
d. Criteria pollutants
e. Noise impacts

6. An initial LCA that compares the proposed system against a baseline (e.g., conventional technology or benchmark). The initial LCA should use data from NETL's CO_2U Guidance Toolkit wherever possible and includes the following:
    a. A narrative (not including figures or tables) that describes the methodology, results, and completeness of the LCA
    b. An Excel spreadsheet (see Application Contents and Requirements) that details the LCA calculations, assumptions, and data sources
    c. System diagrams for the baseline and proposed systems that clearly illustrate the emission sources, material and energy inputs, and the reference flow. The system boundary should encompass the full carbon capture system from fuel extraction to CO_2 dispatch to pipeline or offtake partner.
    d. CI calculated for the baseline and proposed systems as CO_2-equivalent (CO_2e) normalized by functional unit (i.e., 1 megawatt-hour of delivered electricity or mass of product)
    e. Annual captured and permanently stored carbon dioxide for the proposed project
    f. A contribution analysis showing the breakdown of CI by emissions source for the baseline and proposed systems
    g. Anticipated reductions in carbon intensity expressed as a percentage by comparing the carbon intensity from the proposed process to baseline levels
    h. Key sensitivity analyses
7. The State-Point Data Table is required to be completed and submitted with your application. Applicants that do not submit a State Point Data Table[22] or submit an incomplete table will be considered noncompliant and DOE will not review or consider noncompliant submissions.
8. Technology must meet pipeline or offtake CO_2 product specifications. If pipeline or offtaker CO_2 product specifications are not supplied at the time of full application submission, a purity of at least 95% CO_2 is recommended with an oxygen content less than 10 ppmv and hydrogen sulfide content less than 10 ppmv.

Financial and Market Viability

1. Analyses that support the financial viability of operations. These must include:
    a. Budget estimate for Total Project Costs for Phases 1–4 (TA2a) or Phases 0–4 (TA2b)
    b. AACE Class 5 cost estimate for Engineering, Procurement, Construction, and Operations
    c. Cash Flow Model (format and requirements are included in Financial and Market Viability Subsection under TA1) describing all expected/assumed cash flows and returns on investment for the operational life of the project

[22]See State Point Data Table Template in OCED eXCHANGE under DE-FOA-0003473 – Application Forms and Templates.

d. Sensitivity analyses that demonstrate how variability and tradeoffs in key assumptions were used to identify an optimized capture efficiency. Assumptions to test can include (but are not limited to):

   1) CapEx and OpEx of capture equipment

   2) CapEx and OpEx of additional purification/conditioning/pre-treatment equipment and BoP (i.e., not available at demonstration site)

   3) 45Q revenue

e. A TEA detailing the cost-curve pathway of the technology as it matures, as well as the cost-curve pathway as the technology is scaled from pilot to full-size commercial deployment. Sensitivity analysis for capture efficiency (with 90% capture efficiency as base case) must be performed to arrive at the best economic scenario (i.e., cost of CO_2 capture).

f. A discussion of the assumptions used in models. This includes:

   1) Technical inputs, such as:

      a) Estimates of heating and cooling duties (and need for auxiliary boiler/steam generator)

      b) Electric power and steam requirements covering the carbon capture system and BoP

      c) Capacity factor of facility and flue gas source (e.g., combustion turbine) on which carbon capture system will be demonstrated

   2) Financial inputs, such as:

      a) Breakdown of CapEx, OpEx (including fuel/power, steam) and parameters that impact the levelized cost of CO_2 capture for the CCUS and BoP systems

      b) Include explanation for performance gaps between prior scale (State Point and TEA)

      c) Cost of transport and storage

      d) Tax credits claimed and impact on project returns on investment, cost of capture, cost of transport and storage

      e) Financing strategies including expected sources and uses of funds, interest rates, and capital stack construction

      f) Power purchase strategy and expected terms and tenor

      g) Expected supply and offtake (sales) terms and tenor

2. A timeline to financial investment decision

3. A summary of the sources of non-Federal cost share necessary to complete the project. This includes:

a. Description of non-DOE cost share within the Project Financing Plan

b. Evidence of financial commitment from key project partners through Letters of Commitment, MOUs, or similar

c. The financial strength of the project partners, particularly cost share providers

d. The applicant's ability to provide contingency to meet unknown project cost overruns often seen with large demonstration projects

e. Clear instructions/requests for explicit contingency reserve for EPC

4. A clear business plan describing how the applicant intends to replicate technologies demonstrated through this award, if successful

5. A completed budget and spend plan covering both DOE funding and non-Federal cost share

Management, Organization, and Workplan

1. A description of the prime recipient team involved in the project. This can include:

   a. Resumes of key prime recipient staff indicating the number of years of experience of key prime recipient management staff in performing similar projects and the allocation of responsibility commensurate with this experience

   b. Descriptions of the time commitment to successfully manage a project of substantial size and complexity

   c. Description of any relevant prior organizational experience, which demonstrates an ability to perform tasks of similar risk and complexity. If applicable, provide details on the applicant team's prior work together on projects

2. A description of the broader team and a description of each team member's expertise. The team should include representation from each of these key areas:

   a. Capture tech developer or licensors
   b. Emitter owner or operators
   c. EPC firms
   d. Financial partners
   e. NEPA consultants
   f. CBP consultants

3. A management plan that outlines how the award team plans to function to achieve project objectives. This must include:

   a. Letter(s) of commitment indicating the strength of the commitment of subrecipients

   b. Detailed workplans that integrate subrecipient activities

   c. Resumes of key subrecipient staff indicating the number of years of experience of key subrecipient recipient management staff in performing similar projects and the allocation of responsibility commensurate with this experience

d. The time commitment allowed to successfully execute the necessary tasks a project of substantial size and complexity

e. Clearly defined organizational structures outlining the roles and responsibilities of each project partner as a part of the award

4. A description of the safety performance history of the project partners

5. A workplan that must include:

a. A Technical Scope Summary, divided by budget periods in alignment with the four Project Phases described in Figure 1

b. Proposed Continuation Decision Points for each project phase

c. A WBS

d. An IPS showing critical path for the entire project, and including task and subtask durations for management[23], technical milestones (including project engineering, design[24], construction, operations), financial milestones, NEPA, anticipated Federal/state/local codes, regulations, and permitting requirements applicable to siting, construction, and operation of the proposed project, CBP, and Continuation Decisions

e. Task Description Summary of all IPS activities above with a concise description of the specific activities to be conducted over the life of the project

f. A Data Sharing/Management Plan

g. Intellectual Property Management Plan (IPMP)

h. A summary of the End-of-Project Goal(s)

6. A risk management plan that must include:

a. Identification of technical risks, including technology, systems integration, infrastructure, engineering, scale-up, and similar elements

b. Identification of security risks, including cybersecurity, physical security, internal and external threat identification and response, and similar elements

c. Identification of financial risks including project finance, market and regulatory structures, commercial business models, and similar elements

d. Identification of organizational risks, including project team, project management structure, and similar elements

e. Identification of permitting risks

[23] The Project Management Plan is not required for TA2 but activities should be included in the IPS and workplan description.
[24] Workplan should describe Phase 1 engineering deliverables in more detail than Phase 2-4. Appendix A – Carbon Capture FEED Guidance, shows typical engineering deliverables in Phase 1. See OCED eXCHANGE under DE-FOA-0003473 – Application Forms and Templates.

f. Identification of execution risks, including EPC, permitting, safety, testing, and similar elements

g. Assessment of the probability of occurrence of each risk and potential impacts

h. Identification of proposed mitigations for identified risks

7. Buy America Requirement for Infrastructure Projects: Within the first two pages of the proposed workplan or project description, include a short statement on whether the project will involve the construction, alteration, maintenance, or repair of public infrastructure in the United States. See the *NOFO Supplemental Requirements* document located on the Funding Opportunities section of the Apply for Funding page and 2 CFR 184 for applicable definitions and other information regarding Infrastructure Projects and the Buy America Requirement.

Topic Area 3

Technical Approach and Site Suitability

Overall applicant team configuration[25]

- At least two (2) emitters within about 50 linear miles of each other
- At least one (1) developer, owner, or operator of CO_2 transport systems
- At least one (1) developer, owner, or operator of CO_2 storage systems
- Transport and storage developer may be the same entity

Capture

1. Description of proposed capture technologies. This could include:

   a. Preliminary process flow diagrams

   b. Mass and energy balances

   c. Steam and power requirements

   d. Plan for electrical, water, and waste management

   e. Plan for contaminants management

   f. Remaining technical challenges for the proposed carbon capture technology, if applicable

   g. Initial EHS Risk Assessment outlining impacts on air emissions, water utilization, solid and liquid waste streams, criteria pollutants, and noise impacts

[25] Carbon Matchmaker is an online information resource tool and platform that can be used to establish an applicant team. It is intended to help facilitate regional carbon management team formation by allowing carbon management producers, end-users, and other stakeholders to self-identify and align potential needs in specific geographic areas within the United States.

2. A justification of the selection of each of the (at least 2) emitter host facilities, including an overview of any prior engineering and design work to demonstrate the suitability of the capture technology at the host facility or similar facilities (if available). This could include:

    a. Heat and power integration potential
    b. Potential contaminants that could enter the carbon capture system
    c. Pre-processing steps to reduce contaminants entering the carbon capture system
    d. Inlet conditions
    e. Electrical, water, and waste management
    f. Process diagrams
    g. Emissions profiles
    h. Availability and quality of steam and/or waste heat (as applicable)
    i. Anticipated feed conditions for the stream targeted for capture
    j. Contaminants control
    k. Ability to avoid disruptions of existing plant operations

3. In-lieu of an initial LCA, applicants to TA3 are required to submit a screening-level GHG emissions assessment using any relevant data sources from NETL's CO_2U Guidance Toolkit. The screening-level assessment compares the proposed system against a baseline (i.e., the existing facility or a benchmark, conventional technology) and should include the following:

    a. A 1-page narrative (not including figures or tables) that summarizes methodology and results (e.g., key performance indicators such as carbon intensity (i.e., CO_2-eq/functional unit), yearly total CO_2 captured and permanently stored, capture efficiency, and total GHG emissions) of the assessment

    b. An Excel spreadsheet that details calculations, assumptions, and data sources

    c. The analysis should focus on on-site emissions for the facility (i.e., gate-to-gate).

Transport

1. A thorough description of the carbon transportation method, including any relevant prior engineering and design work such as a pre-FEED or conceptual study. This description could include:

    a. Engineering designs including volumetric capacity and pipeline material compositions, CO_2 stream treatment requirements, compressors and boosters

    b. Preliminary process flow diagrams

    c. Mass and energy balances

    d. Listing of any applicable industry standards or recommended practices incorporated in design

    e. Overview map(s) identifying the proposed locations of the sources, transportation route, any potential connection points or facilities, and geologic storage sites

2. A justification of the proposed route such that it limits the total number of linear miles of pipeline needed to successfully network all emitters and CO_2 storage providers included in the application. This could include:
    a. Maps showing several options of planned routes that demonstrate thoughtful local land-use considerations while minimizing the amount of new pipeline required
    b. Discussions of key land use considerations along said route and justifications for decisions made along those routes, such as avoidance of high population density areas, Tribal lands, and disadvantaged communities
3. A plan demonstrating the technical potential for the pipeline network to expand to serve more emitters in the area beyond those included in this application. This could include:
    a. Discussions of how the proposed pipeline could expand capacity to accommodate systemwide growth
    b. Letters of intent signed by proximal emitters beyond those in this application
    c. Maps highlighting nearby emitters and potential routes to access them
    d. CO_2 stream specifications, post-capture CO_2 stream treatment requirements, and risk assessment to achieve a successfully comingled stream
4. A summary of the current state of development of the transportation route, including required preliminary title research on the identified route. This summary can include:
    a. Maps of existing and planned route development and proximity to potential population centers and disadvantaged communities
    b. Type and quality of title research and due diligence
    c. Maturity of land acquisition, including necessary leases and rights-of-way
    d. Letters of intent signed by proximal emitters
    e. Current design status, including a pre-FEED study performed on the route
    f. Current permitting status, including comprehensive list of applicable local, state, and/or Federal permits
    g. Indications of community support
    h. Initial EHS Assessment for the proposed transport method, showing impacts on:
        1) Air emissions
        2) Water utilization
        3) Solid and liquid waste streams
        4) Criteria pollutants
        5) Noise impacts
5. Initial EHS Risk Assessment Adequacy, outlining the impacts of the technology, potential alternative mitigations as determined through the preliminary life cycle assessment or other key analyses, on:

a. Air emissions
b. Water utilization
c. Solid and liquid waste streams
d. Criteria pollutants
e. Noise impacts

6. Any MOUs or LOAs pertinent to the project, if applicable

Storage

1. A thorough description of the carbon storage site, and a brief summary of the process of selecting the proposed site(s) over other potential sites. This may include:

   a. Land usage near the project sites and along the rights-of-way (ROW) that could be impacted by the proposed project, including the Phase III site characterization activities and the construction and operation of the long-term CO_2 transport and storage infrastructure

   b. Potential conflict with protected and sensitive areas

   c. Pore space ownership, site access, and existing infrastructure issues

   d. Proximity to population centers

   e. Proximity to disadvantaged communities and/or potential to provide benefits or avoid negative impacts to disadvantaged communities (as defined per DOE)

   f. Potential issues affecting the time frame for regulatory approval and construction of the CO_2 transport and storage infrastructure

   g. The extent to which principles for Consent-Based Project Siting were used, and/or the extent to which community support and/or opposition were used to select this site

   h. Conflicts with existing resource development, surface or subsurface

2. Prior engineering and design work summary, including but not limited to:

   a. Thoughtfulness of the summary of any prior engineering and design work, including but not limited to pre-FEED studies at the site of interest

   b. Maps showing the CO_2 sources, projected injection plumes, proposed injection wells, land use, pipelines, test or observation wells, and pore space ownership

   c. Summary of geologic information (such as cross-sections, seismic lines with interpretation, plume models, resource and assessments, that describe:

      1) Depositional system and strategic framework for overall storage complex
      2) Subsurface structural elements, such as faults, synclines, and anticlines
      3) Potential contingent storage resources
      4) Storage reservoir(s) depth, thickness, porosity, permeability, aerial extent, TDS, etc.
      5) Confining system formation type and thicknesses

   d. A survey of nearby underground sources of drinking water depths, distances to sole source aquifers, and protection plans to ensure those sources are not affected by carbon storage development

e. Locations and depths of legacy wellbores that penetrate the proposed storage complex

f. Assessment of seismic risk based on DOE's "Recommended Practices for Managing Induced Seismicity Risk Associated with Geologic Carbon Storage" (Templeton et al., 2021)

g. Prediction of future site performance based on forward geologic models informed by actual data from initial site characterization

3. Summary of the level of maturity of the site development, including if available:

a. Well permits applications (Class VI or Class II) or plans to acquire those permits
b. Maturity of necessary leases
c. NEPA and permitting process documentation
d. Letters of intent signed by proximal emitters
e. Maturity of rights-of-way
f. Indications of community support

4. Any MOUs or LOAs pertinent to the project, if applicable

Financial and Market Viability

1. A quantitative discussion of how the networking of transport and storage in this application can reduce the fees for carbon transport and storage that emitters pay

2. Analyses that support above claims. These could include:

a. Detailed Excel-based financial models describing all expected cash flows and returns on investment for the operational life of the projects in the network, including sensitivity analyses demonstrating how these parameters could change, and impacts to returns

b. In conjunction with the Excel-based financial model, the methodology by which the tariffs for transport and storage fees are set, and the underlying capacity utilization assumption

c. Diagram showing a value-chain map of the participants within the network including the capture, transportation, storage, and offtake segments, including product flows and money flows between the participants and key contractual agreements

d. Financing strategies including sources and uses of funds

e. Power purchase strategy, feedstock supply, offtake (sales) agreements, transport and storage services, and other relevant project aspects

f. Letters of interest or MOUs with all key project participants suppliers and offtaker partners, that indicate their respective levels of commitment

g. A discussion on the financial condition and creditworthiness of key offtakers and suppliers

h. A discussion of all the key assumptions and inputs to the financial model

i. Sensitivity analyses that demonstrate how changes to business model assumptions and risks could impact the financial viability of the technology

3. A completed budget and spend plan covering both DOE funding and non-Federal cost share

Management, Organization, and Workplan

1. A description of the prime recipient team involved in the project. This can include:
    a. Resumes of key prime recipient staff indicating the number of years of experience of key prime recipient management staff in performing similar projects and the allocation of responsibility commensurate with this experience
    b. Descriptions of the time commitment allowed to successfully manage a project of substantial size and complexity
    c. Description of any relevant prior organizational experience, which demonstrates an ability to perform tasks of similar risk and complexity. If applicable, provide details on the applicant team's prior work together on projects.
2. A description of the broader team and a description of each team member's expertise. The team should include representation from each of these key areas:
    a. Capture tech developer or licensors
    b. Emitter owner or operators
    c. Pipeline operators
    d. Geologic storage operators
    e. EPC firms
    f. Land and right-of-way acquisitions firms
    g. Financial partners
    h. NEPA consultants
    i. CBP consultants
3. A management plan that outlines how the award team plans to function to achieve project objectives. This must include:
    a. Letter(s) of commitment indicating the strength of the commitment of subrecipients
    b. Detailed workplans that integrate subrecipient activities
    c. Resumes of key subrecipient staff indicating the number of years of experience of key subrecipient recipient management staff in performing similar projects and the allocation of responsibility commensurate with this experience
    d. The time commitment allowed to successfully execute the necessary tasks a project of substantial size and complexity
    e. Clearly defined organizational structures outlining the roles and responsibilities of each project partner as a part of the award
4. A summary of community involvement in the project to this point. This includes:
    a. Letters of support from community representatives and members
    b. A timeline of past engagements between any of the project partners and the community(ies) proposed to include development

5. A description of the safety performance history of the project partners
6. A workplan that must include:
    a. A Technical Scope Summary, divided by budget periods in alignment with the two planned Project Phases
    b. Proposed Continuation Decision Points for each project phase
    c. A WBS
    d. An IPS showing critical path for the entire project, and including task and subtask durations, milestones, NEPA and other permitting, CBP, and Continuation Decisions
    e. Task Description Summary, with a concise description of the specific activities to be conducted over the life of the project for each task/subtask. This should include identification of the anticipated Federal, state, and local codes, regulations, and permitting requirements.
    f. A summary of the End-of-Project Goal(s)
7. A description of the key development deadlines that affect multiple subrecipients of the award and the importance of aligning such deadlines in the workplan
8. A risk management plan that must include:
    a. Identification of technical risks, including technology, systems integration, infrastructure, engineering, scale-up, and similar elements
    b. Identification of security risks, including cybersecurity, physical security, internal and external threat identification and response, and similar elements
    c. Identification of financial risks including project finance, market and regulatory structures, commercial business models, and similar elements
    d. Identification of organizational risks, including project team, project management structure, and similar elements
    e. Identification of execution risks, including engineering, procurement, construction, permitting, safety, testing, and similar elements
    f. Assessment of the probability of occurrence of each risk and potential impacts
    g. Identification of proposed mitigations for identified risks

Project Management Plan (TA1 and TA3 only)

A PMP is required for implementing the proposed project and achieving the objectives of the NOFO. The Project Management Plan establishes the baseline for the scope, schedule, and budget for the project and shall include the information given below. Please use the template provided in OCED eXCHANGE under DE-FOA-0003473 – Application Forms and Templates.

1. A WBS to at least four levels identifying tasks to be performed.
2. A Project Schedule for the entire project at the task level of detail. The Project Schedule shall follow the task structure of the WBS. The schedule should include technical, business, financial, permitting, and other factors to substantiate that the project will achieve the objectives of the Announcement in a timely manner. The schedule should include milestones and decision points; including a Milestone Plan that identifies critical path project milestones for the entire project and serves as the baseline for tracking performance of the project.
3. A Baseline Cost Plan to establish the budget for accomplishing the planned work. The Baseline Cost Plan should identify the planned cost for each task on a monthly basis. The Baseline Cost Plan should follow the task structure of the WBS.
4. A description of the project management system to be used for monitoring and control of scope, schedule, and cost including the methodology and implementation of reporting earned value.
5. Project Communication Protocol, to establish the frequency and type of communication between the recipient and DOE, dependent on the complexity, value, and program significance of the project, to ensure the team has the information necessary to affect timely and effective project management. Under the award, DOE will require specific periodic technical and financial reporting as part of its Substantial Involvement.
6. A Risk Management Plan that includes a summary description of the proposed approach to identify, analyze, and respond to perceived risks associated with the proposed project. Project risk events are uncertain future events that, if realized, impact the success of the project. As a minimum, include the initial identification of significant technical, resource, and management issues that have the potential to impede project progress and strategies to minimize impacts from those issues.
7. An Environmental Management Plan (EMP) to establish a protocol for managing the potential environmental impacts of the project. The EMP shall establish protocols for monitoring and reporting the potential environmental impacts to air, land and water resources, and potential impacts of waste production.

Community Benefits Plan

Applications must include a Community Benefits Plan (CBP, or Plan). Projects funded under this funding opportunity must 1) support meaningful community and labor engagement; 2) invest in quality jobs; 3) advance diversity, equity, inclusion, and accessibility; and 4) ensure delivery of meaningful community benefits while minimizing any potential negative impacts.

Within the CBP, the applicant is encouraged to provide specific detail on how to ensure accountability and the delivery of measurable benefits, ideally through the use of negotiated agreements between the applicant and the community or communities, impacted Indian Tribes, and the applicant and labor unions, referred to collectively here as "Workforce and Community Agreements."[26] Such agreements facilitate community and labor input and social buy-in, identify how concerns will be mitigated, and specify the distribution of community and economic benefits (including job quality, access to jobs and business opportunities for local residents, and mitigating community harms), thus reducing or eliminating these types of risks.

Plans should be specific, actionable, and measurable and move beyond vision or assessment to concrete goals, outcomes, and implementation plans. Each CBP section addressing one of the four goals should propose specific milestones and metrics to measure progress and use SMART milestones (specific, measurable, achievable, realistic, and time-bound), whenever possible. For multi-site projects, CBPs should address all impacted communities.

If a project is selected for award negotiations, DOE will provide feedback and negotiate community benefits activities into the award package. Public transparency around community benefit activities can support project success and buy-in, and DOE will make Community Benefits Commitment (CBC) summaries public after awards are made.

Recipients must implement their CBCs as part of carrying out the project and update them to incorporate community and labor input as the project progresses. During the life of the award, DOE or its representative(s) will independently evaluate the recipient's implementation status and effectiveness, including as part of the Go/No-Go review process.

Below is more detail on what each of the five sections of the plan should include. For additional information, see About Community Benefits Plans.

1. Community Benefits Resource Summary: Describe the resources the project will use to implement the CBP, including staff (number of staff and roles) and budget, including descriptions of planned expenditures. All expenditures must be allowable, allocable, and reasonable in accordance with the applicable Federal cost principles.

2. Community and Labor Engagement: Describe your plans to engage with Tribes, labor unions, state and local governments, and community partners such as community-based, environmental, and environmental justice organizations that support or work with underserved populations, as well as the goal of providing the greatest positive benefits to communities while minimizing negative impacts.

[26] Workforce and Community Agreements include good neighbor agreements, community benefits agreements, community workforce agreements, project labor agreements, and other collective bargaining agreements.

Engagement and collaboration should reflect the priorities of impacted groups, ensure community and labor input can affect project decisions, and support transparency and accountability.

Community and labor engagement should lay the groundwork for the negotiation of Workforce and Community Agreements, which could take the form of one or more kinds of negotiated agreements with Tribes, communities, labor unions, or each. Registered apprenticeship programs, labor-management training partnerships, quality pre-apprenticeship programs, and local and targeted hiring goals are key components of workforce agreements. Community agreements can include economic benefits for Tribes and local and disadvantaged communities as well as provisions such as a community steering committee and environmental, wealth-building, energy, or other benefits for communities or Tribes.

Although Tribal governments are included in this section on community and labor engagement, American Indian and Alaska Native Tribal Nations have rights as sovereign governments recognized under the Constitution of the United States, treaties, statutes, Executive Orders, and court decisions. Applicants are required to make Indian Tribes aware of potential impacts and obtain documentation of support when projects are on Tribal land or intersect with Tribal subsurface rights, as required under the Impacted Indian Tribes Documentation section.

If awarded, recipients will continue to work with their communities and DOE to identify Federally recognized Indian Tribes, including Alaska Native village or regional or village corporations (who are not project partners) who may have interests at the proposed project locations. The recipient will support DOE's Tribal engagement, which acknowledges Tribes' consultation policies, traditions, and expectations, and adheres to DOE Order 144.1[27] on Tribal consultation.

At minimum, the Community and Labor Engagement section should include the following elements:

- **Background and Experience.** Describe prior and ongoing efforts by the project team to engage community stakeholders, Tribes, and workforce organizations including labor unions in all impacted communities. At minimum, applicants must explain how, or if, choice of proposed location included local community input; describe any existing community-based partnerships informing project planning; and summarize current local community perceptions about CCUS. Applicants are encouraged to reference any prior work with DOE or other programs that include community benefit activities.
- **Engagement Plan**. Describe objectives, approaches, and timelines for engagement. Specify if engagement plans include collaboration with existing local or regional community initiatives.
- **Incorporating Feedback.** Describe how the project will incorporate community and labor input into project decision making and specify what elements of the project could change due to feedback (e.g., site selection, impact monitoring plan). Specify how the project will solicit and incorporate feedback related to safety and potential environmental impacts of CO_2 transport and storage.

[27] See DOE Order 144.1: Department of Energy American Indian Tribal Government Interactions and Policy (2009) for details: https://www.energy.gov/sites/default/files/DOE%20O%20144.1.pdf.

- **Workforce and Community Agreements.** Describe plans to negotiate a Community Benefits Agreement, Tribal Agreement, Project Labor Agreement, Community Workforce Agreement, or other Collective Bargaining Agreement(s). Applicants should consider pursuing multiple agreements. Projects impacting multiple communities should strongly consider developing such agreements with each community or labor organization. Describe any existing agreements that will cover the proposed project, along with any examples of current or previous agreements with any community or labor organization.

3. Investing in Quality Jobs: A well-qualified, skilled, and trained workforce is necessary to ensure project stability, continuity, and success. High-quality jobs are critical to attracting and retaining a qualified workforce. Describe the applicant's approach to investing in workforce education and training of both new and incumbent workers and ensuring jobs are of sufficient quality to attract and retain skilled workers in the industry.

At minimum, the Investing in Quality Jobs section should include the following elements:

- **Background and Experience.** A description of prior and ongoing efforts to provide quality jobs and workforce development opportunities.
- **Quality Jobs.** Describe the anticipated quality of jobs and anticipated number of jobs, including the number of construction, operations, and maintenance jobs. Describe plans to attract and retain a skilled, qualified, local, and diverse workforce for construction, operations, and maintenance, including plans to select contractors or vendors that will attract and retain a skilled, local, and diverse workforce if applicable. A collective bargaining agreement, labor-management partnership, or other similar agreement could provide evidence of such a plan. Alternatively, applicants may describe:
    - Wages, benefits, and other worker supports to be provided, benchmarked against prevailing wages for construction and local median wages for other relevant occupations as well as other measures of job quality
    - Efforts to engage employees in the design and execution of workplace safety and health plans
- **Workforce Development.** Describe any plans for investing in workforce development, including: investing in workforce education and training (e.g., labor-management training programs, registered apprenticeships, partnerships with community colleges, and sector-based approaches to workforce development); supporting workers' skill acquisition and opportunities for advancement; and utilizing an appropriately credentialed workforce (e.g., requirements for appropriate and relevant professional and safety training, certification, and licensure, including where appropriate utilization of graduates from registered apprenticeship programs).
- **Worker Rights.** Describe if and how the applicant plans to affirmatively support worker organizing and collective bargaining.

4. Diversity, Equity, Inclusion, and Accessibility (DEIA): This section should detail how DEIA objectives will be incorporated into the project and describe how you will partner with businesses majority owned or controlled by underrepresented[28] persons or groups of underrepresented persons ("underrepresented businesses"), educational institutions, and training or workforce development organizations that serve workers facing barriers to quality jobs, and other partners to help support DEIA.

At minimum, the DEIA section should include the following elements:

- **Background and Experience.** Describe the team's prior and ongoing DEIA efforts. Describe how DEIA is incorporated in the technical project objectives and identify specific actions to integrate into the research goals and project teams. Submitting an institutional DEIA plan without specific integration into the project will be deemed insufficient.
- **Implementation Plan.** Describe targeted DEIA outcomes and implementation strategies including milestones and timelines. Submitting an institutional DEIA plan without specific integration into the project will be deemed insufficient. Include any plans to:
    - Partner with Tribes
    - Partner with Minority-Serving Institutions (MSIs) and underrepresented businesses
    - Support underrepresented suppliers or subcontractors
    - Provide comprehensive supportive services (to improve representation and access to jobs) and work with other organizations serving underrepresented communities and those facing barriers to employment

5. Project Impacts: This section should include an assessment of project impacts and where they flow, including downstream impacts, the extent to which they flow to disadvantaged communities, and strategies to maximize benefits, minimize or avoid negative impacts, and track and report impacts.

At minimum, this section should include the following elements:

- **Assessment of disadvantaged communities.** An identification of the disadvantaged communities to which anticipated project benefits and negative impacts will flow by census tract as identified by the Climate and Economic Justice Screening Tool (https://screeningtool.geoplatform.gov/), including characterization of the existing burdens they are facing.
- **Assessment of project benefits.** Describe all anticipated project benefits to impacted communities and workers, including but not limited the DOE's policy priorities for disadvantaged communities. At minimum, this should include a discussion of the relevance of the following benefits: increases in quality job creation; increases in clean energy enterprise creation and contracting; increases in community ownership or other financial benefits to frontline and fenceline communities (e.g., tax revenue, rights-of-way, pore space leasing, etc.).

[28] Underrepresented" refers to populations sharing a particular characteristic, as well as geographic communities, that are shown to have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life, as exemplified by communities that have been denied fair, just, and impartial treatment, which may include Black, Latino, and Indigenous and Native American persons, Asian Americans and Pacific Islanders and other persons of color; members of religious minorities; lesbian, gay, bisexual, transgender, and queer (LGBTQ+) persons; persons with disabilities; persons who live in rural areas; persons otherwise adversely affected by persistent poverty or inequality; women; and veterans.

- For each benefit, include the expected magnitude of the benefit; metrics to track the benefit; time horizon for the benefit; and the percentage of the benefit that will flow to disadvantaged communities. Specify how well the anticipated benefits align with the surrounding community's/communities' priorities ascertained through community engagement or Community Needs Assessment(s).

- **Assessment of project negative impacts.** Describe all anticipated project negative impacts (including direct, indirect, and cumulative impacts). At minimum, this should include a discussion of potential for increases in consumer energy prices; anticipated increases in environmental exposure or burdens including air and water pollution and contamination; any potential ecological impacts including land and water use; and plans to ensure safety related to CO_2 transport and storage. For each negative impact, include the expected magnitude of the impact; metrics to track the impact; time horizon for the impact; and the percentage of the impact that will flow to disadvantaged communities. Describe how project negative impacts will interact with existing cumulative burdens.

- **Implementation Plan**. For each potential benefit and negative impact, applicants should propose strategies to maximize benefits; minimize negative impacts; and measure, track, and report impacts specifically to disadvantaged communities. Applicants should clearly describe how the plan includes accountability, feedback, and transparency mechanisms with disadvantaged communities, such as community agreements and access to / participation in collecting project data.

- **Instrumentation, data collection, and analysis to determine potential local impacts of commercial-scale carbon capture.** Applicants should provide a comprehensive and detailed description of their plans to collect and analyze data to assess how carbon capture impacts surrounding communities. This should include, at a minimum, plans to assess:

    - Non-CO_2 air pollution, emissions, or discharges, including criteria air pollutants and materials used in the capture unit such as solvents
    - Water use
    - Waste streams, including wastewater, spent solvent, and solvent degradation products
    - Any other process or construction inputs or outputs that could cause positive or negative environmental, health, economic, or other impacts
    - Changes to consumer energy prices

    These assessments should be done at the parametric and steady-state conditions reflected in other technical sections. This section can reference and should be consistent with information contained in other sections, including the Host Site Description and Carbon Capture Process Integration section.

Community Partnership Documentation

In support of the CBP, applicants may submit letters, MOUs, or other similar agreements from partnering Tribes, labor unions, environmental and public health organizations, and community entities specifically describing the nature of existing or planned partnerships. If the applicant intends to enter into a Workforce and Community Agreement, please include letters from proposed partners.

Impacted Indian Tribe Documentation

For any project that potentially impacts Indian Tribes, including when the potentially impacted Indian Tribe is the applicant, applicants are required to submit additional documentation at the time of application, and possibly during negotiation and before award. Potential impacts determined after application will also require additional documentation. See Community and Labor Engagements discussion on consultation.

Documentation from Potentially Impacted Indian Tribes

Applicants are required to submit documentation demonstrating that an authorized representative[29] of each potentially impacted Indian Tribe is, at a minimum, aware of the nature of the application and its potential impacts to the relevant Indian Tribes. The notified authorized representative must be holding their position while the award is open for applications, and documentation must demonstrate affirmative awareness of the application (e.g., a delivery record from certified mail, a reply by the authorized representative). Documentation of support (see Tribal Land or Tribal Subsurface Rights below) submitted at the time of application will be considered to also demonstrate awareness of an Indian Tribe.

An applicant's failure to submit documentation of an Indian Tribe's awareness, or a letter of support, when required as described in this section, may constitute grounds for determining an application ineligible, non-responsive to the NOFO, not subject to further review, and/or not otherwise subject to selection or award.

Tribal Land or Tribal Subsurface Rights

For any project intended to be sited on tribal land(s)[30] or intersecting with tribal subsurface rights, applicants are required to submit documentation demonstrating support from the relevant Indian Tribes at the time of application.

Documentation may include either:

- A letter of support from tribal leadership. The letter must be signed by an authorized representative of the Indian Tribe. The signer(s) must be holding their position while the award is open for applications.

[29] An authorized representative must be an elected official or designated leader according to the traditions, constitution, or charter of the Indian Tribe, or someone with relevant delegated authority within the Tribal government. Examples include: Chief, Chairman, Chairwoman, Governor, Nation Representative, President, Chief Executive Officer, Chief Financial Officer, Speaker of the Council, Speaker of the Congress, Tribal administrator.

[30] Tribal land means "Indian land" and "tribal land" as defined by 25 U.S.C. § 3501. https://www.govinfo.gov/content/pkg/USCODE-2023-title25/pdf/USCODE-2023-title25-chap37-sec3501.pdf.

- A Tribal Council Resolution, Board resolution (including the Board of Directors of an Alaska Native Corporation (ANC)), or similar act passed by the legislative body of the Tribal government or Board of Directors of an ANC, expressing support for the project.

Applicants are encouraged to reference any applicable community benefits agreements in the tribal support documentation, and to also reference any Tribal support documentation in the Community Benefits Plan as appropriate.

Other Potential Impacts

For projects not intended to be sited on Tribal land(s) or not intersecting with tribal subsurface rights, but that may have other potential impacts on Tribal resources or reserved rights, letters of support or resolutions of support are strongly encouraged and, depending on the nature of the impact, may be required if selected for negotiation of an agreement.

Applicants are encouraged to reach out to Indian Tribes as early as possible in the application process to give Indian Tribes ample time to evaluate and respond. Other potential impacts include impacts to cultural sites, sacred sites, water rights, fishing rights, and hunting rights. The following resources may be useful to help determine if a project may impact an Indian Tribe(s) resources or reserved rights and the appropriate contacts:

- Map of Indian Lands: https://bia-geospatial-internal.geoplatform.gov/indianlands/
- Tribal Treaties Database: https://treaties.okstate.edu/
- Directory of Federally recognized Tribes and Tribal leaders: https://www.bia.gov/service/tribal-leaders-directory
- Best Practices for Identifying and Protecting Tribal Treaty Rights, Reserved Rights, and other similar rights in Federal regulatory actions: https://www.bia.gov/sites/default/files/media_document/best_practices_guide.pdf

These resources are not exhaustive, and many Indian Tribes have resources or reserved rights which extend beyond their Tribal lands, or are covered within treaties, statutes, or case-law.

Identification of Potential Impacts

Applicants are required to document any efforts taken to identify any potential impacts to Indian Tribes and to address or mitigate those impacts, including any correspondence with Indian Tribes. This documentation should be available on request to DOE.

In addition to the required documentation from Indian Tribes, if the proposed project has potential impacts to an Indian Tribe(s), the applicant must submit the following information in its application: provide the project location and whether it is on tribal land or intersects with subsurface rights, identify the potentially impacted Indian Tribe(s), and describe the potential impacts explaining any sources of uncertainty or confidentiality.[31]

[31] Applicants do not need to reveal specific details about sacred sites such as specific location or specific ceremonies.

The applicant must also describe how the applicant has engaged with potentially impacted Indian Tribe(s) before applying and plans to engage with potentially impacted Indian Tribe(s) during the period of performance of the agreement, and, if necessary, after the end of the period of performance. If the applicant is an Indian Tribe, these elements should be addressed to ascertain potential impacts to Indian Tribes other than the applicant.

OCED's *Standard Terms and Conditions,* located on the Award Terms and Conditions page require a recipient to obtain approval by DOE before any activities take place that could impact Tribal resources or reserved rights, including but not limited to lands, cultural sites, sacred sites, water rights, mineral rights, fishing rights, and hunting rights. DOE will determine if formal government-to-government consultation is needed, and DOE will conduct that consultation accordingly.

Notice Concerning Application Information

Any application that may potentially impact Indian Tribe(s) may be shared with the potentially impacted Indian Tribe(s). Accordingly, for any sensitive information, Applicants should include a Notice of Restriction on Disclosure and Use of Data identifying any business sensitive, trade secrets, proprietary, or otherwise confidential information. Data properly marked with the Notice would only be shared under a signed nondisclosure agreement. See the Treatment of Application Information section for additional information.

Resumes

A resume must be provided for all senior and key personnel. A resume provides information that can be used by reviewers to evaluate the individual's relevant skills and experience. Resumes may be up to two pages in length. Resumes must include the following at a minimum:

Resume Requirements	
Contact Information	Phone, email, and address.
Education	All academic institutions attended, major/area, degree.
Training	Examples include certification or credential from a Registered Apprenticeship or Labor Management Partnership.
Professional Experience	Beginning with the current position, list professional/academic positions in chronological order with a brief description.
Current Appointments	All current academic, professional, or institutional appointments, foreign or domestic, at the applicant institution or elsewhere, whether or not remuneration is received, and whether full-time, part-time, or voluntary.
Additional Criteria	There should be no lapses in time over the past 10 years or since age 18, whichever period is shorter.

Letters of Commitment

Submit letters of commitment from all subrecipient, key contractor, and third-party cost share providers. If applicable, the letter must state that the third-party cost share provider is committed to providing a specific minimum dollar amount or value of in-kind contributions allocated to cost sharing. The following information for each third party contributing to cost sharing should be identified: (1) the name of the organization; (2) the proposed dollar amount to be provided; and (3) the proposed cost sharing type (cash or in-kind contributions). Each letter must not exceed one page.

Application for Federal Assistance (SF-424)

The Standard Form SF-424 represents the government-wide standard form for grant application packages, and requires basic information about the applicant (name, address, telephone number, type of applicant, etc.), including a list of sources of proposed funding and a description of the proposed project. Complete all required fields in accordance with the instructions on the form. In Field 21 of the SF-424, the authorized representative must certify and agree with the Certification and Assurances found at SAM.gov | Home.

Note: The dates and dollar amount on the SF-424 are for the complete project.

Budget and Budget Justification Workbook

Applicants must provide a Budget and a Budget Justification Workbook. A separate Budget Justification Workbook must be provided for each subaward listed in the application. See the Required Application Documents section and the Applicant Supplemental Budget and Cost Information document for guidance.

Budget

Applicants must use the Standard Form SF-424A BUDGET INFORMATION – Non-Construction Programs to submit their budget.

Budget Justification Workbook

Applicants are encouraged to use the Budget Justification Workbook template available on OCED eXCHANGE at https://oced-exchange.energy.gov/, or it can be found on the Apply for Funding Opportunities page. The Budget Justification Workbook includes built-in calculations to support a detailed and robust budget and a narrative that supports the information you provide in the Standard Form SF-424A. Applicants must complete each tab within the Budget Justification Workbook for the project, including all work to be performed by the recipient and its subrecipients and contractors. If the applicant elects not to use the Budget Justification Workbook template, they must provide all data elements and justifications that follow the SF-424A and the Budget Justification Workbook template.

Applicants must include costs associated with implementing award requirements (e.g., Buy America requirements, Davis-Bacon, CBP, reporting, oversight, construction signage[32]) and with required annual audits and incurred cost proposals in their proposed budget documents. Such costs may be reimbursed as a direct or indirect cost.

Transparency of Foreign Connections

Applicants must provide information on foreign connections as they relate to the proposed recipient and subrecipient(s). Include a separate disclosure for the applicant and each proposed subrecipient.

Disclosure exceptions by entity type:

- U.S. National Laboratories and domestic government entities are not required to respond to the Transparency of Foreign Connections disclosure.
- Institutions of higher education are only required to respond to items with an asterisk symbol (*).

Applicants, regardless of entity type, must provide complete responses for project team members that are not U.S. National Laboratories, domestic government entities, or institutions of higher education.

Disclosure Information	
***Entity Name**	Complete legal name of the lead organization.
***Website Address**	Link to the entity's website address.
***Mailing Address**	Complete mailing address for the entity to include zip code.
***Project Participants Party to ANY Malign Foreign Talent Recruitment Program**	The identity of all owners and senior and key personnel who are a party to any Malign Foreign Talent Recruitment Program. As part of this requirement, the entity must also certify that each owner and senior and key personnel has been made aware of the Malign Foreign Talent Recruitment Program prohibition and complied with the certification requirement via the Current and Pending Support disclosure.
Country of Risk Joint Venture or Subsidiary	The existence of any joint venture or subsidiary that is based in, funded by, or has a foreign affiliation with any foreign country of risk (i.e., the People's Republic of China, Iran, North Korea, and Russia).
Current or Pending Foreign Contractual or Financial Obligation	Any current or pending contractual or financial obligation or other agreement specific to a business arrangement, or joint venture-like arrangement with an enterprise owned by a foreign state or any foreign entity.
Percentage Foreign Ownership or Control	Percentage, if any, that the proposed recipient or subrecipient has foreign ownership or control.
Percentage Country of Risk Ownership	Percentage, if any, that the proposed recipient or subrecipient is wholly or partially owned, directly or indirectly, by an entity incorporated or otherwise formed in a foreign country of risk or foreign state-owned entity.

[32] After receiving a DOE award, recipients are encouraged to display DOE Investing in America signage during and after construction. Guidance can be found at: (https://www.energy.gov/design). Proposed signage costs that meet these specifications are an allowable cost and should be included in the proposed project budget.

Percentage Country of Risk Investment	Percentage, if any, of venture capital or institutional investment by an entity that has a general partner or individual holding a leadership role in such entity who has a foreign affiliation with any foreign country of risk.
***Country of Risk Technology Licensing of Intellectual Property Sales**	Any technology licensing, transfer, or intellectual property sales to a foreign country of risk, in effect during the 5-year period preceding submission of the proposal within the same technology area as the application (e.g., batteries, biotechnology, grid, energy generation and storage, advanced computing).
***Foreign Equipment**	Any of the following foreign equipment proposed for use on the project: i. Unmanned aircraft, control, and communications components originally made or manufactured in a foreign country of risk (including relabeled or rebranded equipment). ii. Coded equipment where the source code is written in a foreign country of risk. iii. Equipment from a foreign country of risk that will be connected to the internet or other remote communication system. iv. Any entity from a foreign country of risk that will have physical or remote access to any part of the equipment used on the project after delivery.
Foreign Entity Relationships	Any foreign business entity, offshore entity, or entity outside the United States related to the proposed recipient or subrecipient.
List of Company Directors (and Board Observers)	Complete list of all directors (and board observers), including their full name, citizenship and shareholder affiliation, date of appointment, duration of term, as well as a description of observer rights as applicable.
Complete Capitalization Table	Complete capitalization table for your entity, including all equity interests (including LLC and partnership interests, as well as derivative securities). Include both the number of shares issued to each equity holder, as well as the percentage of that series and all equity on a fully diluted basis. Identify the principal place of incorporation (or organization) for each equity holder. If the equity holder is a natural person, identify the citizenship(s). If the recipient or subrecipient is a publicly traded company, provide the above information for shareholders with an interest greater than 5%.
Principal Place of Incorporation	Identify the principal place of incorporation (or organization) for each equity holder. If the equity holder is a natural person, identify the citizenship(s). If the recipient or subrecipient is a publicly traded company, provide the above information for shareholders with an interest greater than 5%.
Rounds of Financing Table	A summary table identifying all rounds of financing, the purchase dates, the investors for each round, and all the associated governance and information rights obtained by investors during each round of financing.
Organization Chart	An organization chart to illustrate the relationship between your entity and the immediate parent, ultimate parent, and any intermediate parent, as well as any subsidiary or affiliates. Identify where each entity is incorporated.

DOE reserves the right to request additional or clarifying information based on the information submitted.

Foreign Entity Participation

For projects selected under this NOFO, all recipients and subrecipients must qualify as domestic entities. To request a waiver of this requirement, the applicant must submit a waiver request in the Application. The Waiver Requests section of this NOFO lists the information that must be included in a foreign entity waiver request.

Performance of Work in the United States (Foreign Work Waiver Request)

All work for projects selected under this NOFO must be performed in the United States. To request a waiver of this requirement, the applicant must submit a waiver request in the Application. The Waiver Requests section of this NOFO lists the information that must be included in a foreign work waiver request.

Current and Pending Support

Current and pending support is intended to allow the identification of potential duplication, overcommitment, potential conflicts of interest or commitment, and all other sources of support. All senior/key personnel at the recipient and subrecipient level must provide a list of all sponsored activities, awards, and appointments, whether paid or unpaid; provided as a gift with terms or conditions or provided as a gift without terms or conditions; full-time, part-time, or voluntary; faculty, visiting, adjunct, or honorary; cash or in-kind; foreign or domestic; governmental or private-sector; directly supporting the individual's research or indirectly supporting the individual by supporting students, research staff, space, equipment, or other research expenses. All senior/key personnel involved in the project must disclose all other foreign or domestic government or non-profit support of the work to be done under the award. All involvement with malign foreign talent recruitment programs must be identified in current and pending support.

For every sponsored or supported activity, list the following items:

- The sponsor of the activity or the source of funding;
- The award or other identifying number;
- The title of the award or activity. If the title of the award or activity is not descriptive, add a brief description of the research being performed that would identify any overlaps or synergies with the proposed research;
- The total cost or value of the award or activity, including direct and indirect costs and cost share. For pending proposals, provide the total amount of requested funding;
- The award period (start date through end date); and
- The person-months of effort per year dedicated to the award or activity.

More information on this requirement can be found in the *Current and Pending Support Guidance* which is located on OCED's Award Negotiations page under the What other Information may be Requested? section.

Potentially Duplicative Federal Funding Notice

If the applicant or project team member has other active awards of Federal funds, the applicant must determine whether the activities of those awards potentially overlap with the activities set forth in its application to this NOFO. If there is a potential overlap or the appearance of an overlap, the applicant must notify DOE in writing of the potential overlap and state how it will ensure any project funds (i.e., recipient cost share and Federal funds) will not be used for identical cost items under multiple awards.

Likewise, for projects that receive funding under this NOFO, if a recipient or project team member receives any other award of Federal funds for activities that potentially overlap with the activities funded under the DOE award, the recipient must promptly notify DOE in writing of the potential overlap and state whether project funds from any of those other Federal awards have been, are being, or are to be used (in whole or in part) for one or more of the identical cost items under the DOE award. If there are identical cost items, the recipient must promptly notify the DOE Grants and Agreements Officer in writing of the potential duplication and eliminate any inappropriate duplication of funding.

Other Required Application Forms

Disclosure of Lobbying Activities (SF-LLL)

Recipients and subrecipients may not use any Federal funds to influence or attempt to influence, directly or indirectly, any officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress, in connection with any Federal contract, grant, loan, or cooperative agreement.

Applicants must complete and submit a Certification Regarding Lobbying form (OMB 4040-0013) available at: https://apply07.grants.gov/apply/forms/sample/GG_LobbyingForm-V1.1.pdf.

If any registrants under the Lobbying Disclosure Act of 1995 have made a lobbying contact on behalf of the applicant with respect to this funding opportunity, the applicant must complete and submit SF-LLL, "Disclosure of Lobbying Activities."

Other Submission Requirements

Applicant Disclosure of Existing Work or Relationship with National Laboratories

The applicant shall disclose pre-existing work or a relationship with National Lab(s) that is before this NOFO's application and that is or may be relevant to the NOFO application.

Supplemental Submissions

Additional supporting information, including but not limited to pre-FEEDs, FEEDs, Class II Permits, Class VI Permits, easements, pore space leases, or updated information regarding ongoing technology development will be required for submission if the application material makes assumptions or assertions based upon the data or information contained in the aforementioned documents. The documents are not a comprehensive list and other supporting documentation may be requested.

Cybersecurity Plan

As described in the *NOFO Supplemental Requirements* document located on the Funding Opportunities page, pursuant to Section 40126 of the BIL, a selectee must submit a Cybersecurity Plan to DOE before the issuance of an award. A Cybersecurity Plan explains how basic cybersecurity practices throughout the life of the proposed project will be maintained.

Carbon Capture FEED Study Guidance

Proposed activities in a carbon capture FEED study should include, but are not limited to, those listed below:

1. Project Scope and Design that includes deployment/business objectives and the summary of the proposed project. The roles and scope of work for the different parties involved in the project must be clearly delineated. The arrangement with the base plant/facility during the planning/construction phase and capture plant operation phase should be made clear.

2. Project Design Basis including, but not limited to site characteristics and ambient conditions, fuel feedstock and flue gas characteristics, flue gas quality controls, CO2 offtake specifications, safety requirements, process life expectancy, high-level testing requirements, commissioning requirements, code of records, and host site environmental requirements. The design basis shall clearly identify all permits and environmental reviews necessary to initiate construction. All internal or corporate approvals required by the host site to initiate construction shall be identified. If after completing the FEED, it is decided that a different plant configuration should be considered, and that the reported design is not viable, this information should be communicated clearly up front. If major design changes are required, this should be reflected in the project timeline, and a path forward clearly outlined.

3. Engineering Design Package shall meet AACE Class 3 estimates. The package shall include design of the carbon capture system that shall result in equipment sizing fully substantiated with kinetic, heat and mass transfer data, as well as justification for choice of materials of construction.

The cost estimate shall include preparation of a capital cost estimate, including the cost of capture in $/ton carbon oxides captured, operations and maintenance costs, and levelized cost of electricity (electric generation sites) or levelized cost of product (industrial/commercial sites). The FEED shall include, at a minimum: block flow diagram, process flow diagrams; carbon capture process model scaled up for the proposed powerplant or industrial facility; utility flow diagrams; piping and instrumentation diagrams; heat and material balances; site plan; final layout drawings; complete engineered process and utility equipment lists with all major equipment with specifications and sizing; single line diagrams for electrical; electrical equipment and motor schedules; vendor quotations; detailed project execution plans; resourcing and workforce plans; a hazard and operability study (HAZOP) review; and a constructability review. The FEED shall incorporate all engineering disciplines necessary to perform the final design and construction, which include, but are not limited to process, civil, architectural, structural, mechanical, piping, electrical, and control systems engineering. A list of all referenced work should be provided. Engineering design shall cover both the carbon capture system and BoP.

BoP includes, but is not limited to, utilities necessary to power the carbon capture system and final delivery for offtake such as: compression, cooling water, water treatment, waste treatment, and the sources of energy, electricity, and/or steam. The latter may include integration of an external energy source (e.g., natural gas-fueled, solar, wind, geothermal). All BoP components shall be incorporated in the updated Cash Flow Model (and/or TEA) and LCA. If the carbon capture system is designed to purchase renewable electricity or to generate it on site, then the plant must include a method of energy storage or back-up power generation to supply electricity when renewable electricity is not available. If the carbon capture system requires a cogeneration system and/or an auxiliary boiler for generation of steam, then the CapEx, OpEx (fixed and variable, including fuel costs) and relevant cost inputs should be included in the Cash Flow Model and/or TEA. Similarly, CO2 emissions produced from the unit should be accounted for in the LCA.

The engineering design package shall also cover the integration of the carbon capture process within the power or industrial facility, including but not limited to the following: novel approaches to recover waste heat from the facility and integrate it with the carbon capture system; pressure drop controls; and design of pollution control and monitoring systems encompassing upstream/downstream of the carbon capture system. Details of the base plant shall be highlighted before and after retrofit. This includes the year the plant was built, expected plant life, any plans for extension of plant life; and the current and expected capacity factor and operational mode (base load or flexible operation).

Applicants are required to integrate FEED study activities with relevant Community Benefit Plans as appropriate for the project into an overall integrated project schedule.

It is understood that the FEED study package content is tailored to the type of project and the needs of the owner. The goal of the FEED study is for the owner and EPC firm to collaboratively define as much of the project's scope as possible to reduce risk and uncertainty prior to executing the project.

Example Cover Page for Concept Papers and Applications

Project Title:			**OCED eXCHANGE Control Number:**
Applicant Name:			
Applicant Entity Type and Explanation of Eligibility:			
Project Location by city, state, and zip code +4:			
Proposed Energy Storage **Carbon Capture Technology:**			
Proposed System Capacity (kW/MW and kWh/MWh):			
Team Member Organizations (e.g., Subrecipients, Key Technology Providers, and Project Partners):			
Senior/Key Personnel and Their Organizations:			
Do the proposed recipient and <u>all</u> subrecipients qualify as domestic entities*? ☐ Yes ☐ No **If not, specify which entities do not qualify as domestic entities will require a foreign entity waiver here and include necessary foreign entity waiver requests with the application:**			* 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; have majority domestic ownership and control; and have a physical place of business in the United States.
Points of Contact	Name	Email	Phone Number
Demonstration Project Manager			
Business Point of Contact			
Confidentiality Statement (if applicable):			
Total DOE Funding Request ($M USD):			
Total Non-Federal Cost Share ($M USD):			
Total Project Costs ($M USD):			
Total Period of Performance (yr):			

STEP 3:
SUBMIT YOUR APPLICATION

IN THIS STEP:

Submission Requirements and Deadlines

Submission Requirements and Deadlines

Request Application Package

All applications, concept paper, forms, and instructions are available on OCED eXCHANGE. To access these materials, go to https://OCED-exchange.energy.gov and select the Notice of Funding Opportunity Number DE-FOA-0003474.

Submission Instructions

Actions Needed Prior to Applying

You must complete several one-time actions before applying to this funding opportunity. Some actions may take several weeks, and failure to complete them could interfere with your ability to apply to this funding opportunity, or to meet the negotiation deadlines and receive an award if the application is selected. These requirements are as follows:

SAM.gov

Effective January 1, 2020, the System for Award Management (SAM) is the central repository for common government-wide certifications and representations required of Federal grants recipients. As registration in SAM is required for eligibility for a Federal award and registration must be updated annually, Federal agencies use SAM information to comply with award requirements and avoid increased burden and costs of separate requests for such information, unless the recipient fails to meet a Federal award requirement, or there is a need to make updates to their SAM registration for other purposes.

You must have an active account with SAM.gov. This includes having a Unique Entity Identifier (UEI). SAM.gov registration can take several weeks. Begin that process today. 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:

- Be registered in SAM.gov before submitting an application
- Provide a valid Unique Entity Identifier in the application
- 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

Note: Start the UEI and SAM registration process as soon as possible. If you have technical difficulties with the UEI validation or SAM registration process, use the Help feature on SAM.gov. Additional entity validation resources can be found here: GSAFSD Tier 0 Knowledge Base – Validating your Entity.

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, DOE will determine that the applicant is not qualified to receive a Federal award.

OCED eXCHANGE

You must register with and submit application materials through OCED eXCHANGE at https://oced-exchange.energy.gov, OCED's online application portal. See detailed instructions at Financial Opportunities: Manuals (energy.gov). OCED eXCHANGE is designed to enforce the deadlines specified in this funding opportunity. The "Apply" and "Submit" buttons will automatically disable at the defined submission deadlines. If an applicant experiences technical difficulties with a submission, the applicant should contact the OCED eXCHANGE helpdesk for assistance (OCED-exchangeSupport@hq.doe.gov).

FedConnect

Register in FedConnect at https://www.fedconnect.net.

Grants.gov

Register in Grants.gov (http://www.grants.gov) to receive automatic updates when modifications to this NOFO are posted. However, please note that Concept Papers and applications will not be accepted through Grants.gov. As applicable, modifications to this funding opportunity will be posted on the OCED eXCHANGE website and the Grants.gov system. However, you will only receive an email when a modification is posted if you register for email notifications for this NOFO in Grants.gov. OCED recommends that you register as soon after the release of the NOFO as possible to ensure you receive timely notice of any amendments or other NOFOs.

Submission Dates and Times

Concept Paper

You must submit your Concept Paper by March 1, 2025, 5:00 pm ET.

Application

You must submit your application by July 1, 2025, 5:00 pm ET.

Intergovernmental Review

Applications under this program are not subject to Executive Order 12372, "Intergovernmental Review of Federal Programs."

Standards for Application Evaluation

Applications that are determined to be eligible will be evaluated in accordance with this NOFO and the "DOE Merit Review Guide for Financial Assistance." The Selection Official may consider the technical merit, the Federal Merit Review Panel's recommendations, program policy factors, risk reviews, and the amount of funds available in arriving at selections for this NOFO.

Evaluation and Administration by Non-Federal Personnel

In conducting the merit review evaluation and the Go/No-Go reviews, the government may seek the advice of qualified non-Federal personnel as reviewers. The government may also use non-Federal personnel to conduct routine, nondiscretionary administrative activities, including DOE contractors. The applicant, by submitting its application, consents to the use of non-Federal reviewers/administrators. Non-Federal reviewers must sign conflict of interest and non-disclosure acknowledgements (NDA) before reviewing an application. Non-Federal personnel conducting administrative activities must sign an NDA.

Treatment of Application Information

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

If an application includes business-sensitive, trade secrets, proprietary, or otherwise confidential information, it is furnished to the Federal government (government) in confidence with the understanding that the information shall be used or disclosed only for evaluation of the application. Such information will be withheld from public disclosure to the extent permitted by law, including the Freedom of Information Act. Without assuming any liability for inadvertent disclosure, DOE will seek to limit disclosure of such information to its employees and to outside reviewers when necessary for merit review of the application or as otherwise authorized by law. This restriction does not limit the government's right to use the information if it is obtained from another source.

Applications, and other pre-selection or pre-award submissions containing confidential, proprietary, or privileged information must be marked as described below.

Failure to comply with these marking requirements may result in the disclosure of the unmarked information under the Freedom of Information Act or otherwise. The U.S. Government is not liable for the disclosure or use of unmarked information and may use or disclose such information for any purpose as authorized by law.

The cover sheet of the application, and other submissions must be marked as follows and identify the specific pages containing business sensitive, trade secrets, proprietary, or otherwise confidential information:

> ***Notice of Restriction on Disclosure and Use of Data:***
>
> "Pages [list applicable pages] of this document may contain business sensitive, trade secrets, proprietary, or otherwise confidential information that is exempt from public disclosure. Such information shall be used or disclosed only for evaluation purposes. The Government may use or disclose any information that is not appropriately marked or otherwise restricted, regardless of source."

In addition, (1) the header and footer of every page that contains business sensitive, trade secret, proprietary, or otherwise confidential information must be marked as follows: "Contains Business Sensitive, Trade Secrets, Proprietary, or otherwise Confidential Information Exempt from Public Disclosure," and (2) every line or paragraph containing such information must be clearly marked with double brackets or highlighting. DOE will make its own determination about the confidential status of the information and treat it according to its determination.

Applicants should be aware that DOE may share information about an applicant's submission, which is not properly marked business sensitive, trade secrets, proprietary, or otherwise confidential, with other Federal agencies on a limited, confidential basis to prevent two or more agencies funding the same activity twice. Consideration by another agency for funding will not negatively affect a DOE applicant.

Aggregation, Anonymization, and Publication of Unmarked Applicant Data

In furtherance of OCED's mission, and to increase private investment in and deployment of clean energy technologies, as well as to support clean energy markets, OCED may publish aggregated and anonymized data derived from unmarked application information (information that is not marked as business sensitive, trade secret, proprietary, or otherwise confidential information with the Notice of Restriction). The goal is to appropriately share aggregated and anonymized applicant data for the benefit the nation's broader clean energy ecosystem while ensuring robust protection of the underlying information or data.

Rights in Technical Data Under this Award

The Treatment of Applicant Information section discusses data generated before the award that the applicant is submitting as part of the application. This section discusses data that will be part of or arises from the award itself. The applicant should review this section in the *NOFO Supplemental Requirements* document located on the Funding Opportunities section of the Apply for Funding page before proceeding further.

Pursuant to special statutory authority, OCED has determined for awards under this NOFO that Protected Data first produced in the performance of corresponding awards may be protected from public disclosure for up to ten years after the data are first produced. Protected Data are technical data or commercial or financial data first produced in the performance of the award which, if they had been obtained from and first produced by a non-Federal party, would be a trade secret or commercial or financial information that is privileged or confidential under the meaning of 5 U.S.C. 552(b)(4) and which data are marked as being protected data by a party to the award. Such Protected Data must be marked as set forth in the award's intellectual property terms and conditions.

Intellectual Property Management Plan

Recipients may be required to prepare and submit an executed Intellectual Property Management Plan (IPMP) between the members of the team. While the award IP terms will set forth the treatment of and obligations related to intellectual property rights between DOE and the individual members, the IPMP should describe how the members will handle intellectual property rights and issues between themselves while ensuring compliance with Federal intellectual property laws, regulations, and policies.

Refer to the *NOFO Supplemental Requirements* document on the Funding Opportunities page for additional information on IPMPs.

Retention of Submissions

DOE expects to retain copies of all applications and other submissions. No submissions will be returned. By applying to DOE for funding, applicants consent to DOE's retention of their submissions.

Personally Identifiable Information

All information provided by the applicant must to the greatest extent possible exclude personally identifiable information (PII), which is information that can be used to distinguish or trace an individual's identity, such as their name, social security number, biometric records, alone, or when combined with other personal or identifying information that is linked or linkable to a specific individual, such as date and place of birth, or mother's maiden name.

See OMB Memorandum M-07-16 dated May 22, 2007, found at: https://www.whitehouse.gov/wp-content/uploads/legacy_drupal_files/omb/memoranda/2007/m07-16.pdf.

By way of example, applicants must screen resumes to ensure that they do not contain PII such as personal addresses, personal landline or cell phone numbers, and personal emails.

Under no circumstances should Social Security Numbers (SSNs) be included in the application. Federal agencies are prohibited from collecting, using, and displaying unnecessary SSNs. See the Federal Information Security Modernization Act of 2014 (Pub. L. No. 113-283, Dec 18, 2014; 44 U.S.C. § 3551).

Informational Webinar

DOE will conduct one or more informational webinars during the NOFO process. It will be held after the initial NOFO release but before the due date for Concept Papers.

Attendance is not mandatory and will not positively or negatively impact the overall review of any applicant submissions. As the webinar will be open to all applicants who wish to participate, applicants should refrain from asking questions or communicating information that would reveal confidential or proprietary information specific to their project.

Teaming Partner List

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

Updates to the Teaming Partner List will be available in the OCED eXCHANGE website. The Teaming Partner List will be regularly updated to reflect new teaming partners who provide their organization's information.

Submission Instructions: Any organization or individual that would like to be included on this list should submit the following information: Organization's Name (if an organization), Contact Name, Organization's Website Address (if an organization) or Individual's Website Address (if the individual has one that is relevant to the individual's proposed involvement), Contact Address, Contact Email, Contact Phone, Organization Type (if an organization), Area of Technical Expertise, Brief Description of Capabilities, and Area of Interest. Interested parties should email the information to *cc-oced@hq.doe.gov* with the subject line "Teaming Partner Information."

Disclaimer: By submitting a request to be included on the Teaming Partner List, the requesting individual or organization (if an 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 self-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 individuals or organizations for the development of such information.

STEP 4: LEARN ABOUT REVIEW AND AWARD

IN THIS STEP:

Application Review Information

Risk Review

Award Notices

Application Review Information

Responsiveness Review

Concept Papers

Concept Papers are evaluated based on consideration of the overall NOFO responsiveness and viability of the project as described in section Concept Paper Requirements:

- Project Overview
- Project Organization
- Economic Viability
- Community Benefits Approach

Concept Papers must succeed in all four viability criteria for the applicant to be encouraged to proceed to the full application stage.

Review Criteria

Full Applications

Compliance Criteria

All applicant submissions for Concept Papers and applications must:

- Comply with the applicable content and form requirements listed in Submission Requirements and Deadlines section of the NOFO
- Include all required documents
- Upload successfully in OCED eXCHANGE including clicking the “Submit” button
- Comply with the submission deadline stated in the NOFO

DOE will not review or consider submissions submitted through means other than OCED eXCHANGE, submissions submitted after the applicable deadline, or incomplete submissions.

Technical Review Criteria

Applications Topic Area 1

Criterion 1: Technical Approach and Site Suitability [15% Capture, 10% Storage, 5% Transport for a total of 30%]

This criterion involves consideration of the following factors for capture, transport, and storage:

1. **Preliminary life cycle impact:** The adequacy and completeness of the life cycle assessment of the entire carbon capture, transport, and storage system proposed in the application, and the quantified reductions in GHG emissions and carbon intensity that could be achieved by the project.
2. **Project objectives:** Degree to which the proposed project approach will advance the technical maturity and commercial readiness of the proposed carbon capture technology.
3. **Project relevance:** Extent to which the application specifically and reasonably demonstrates how the proposed project will be capable of meeting the technical objectives and system requirements.
4. **Project description:** Degree to which the proposed technology, site, testing plan, and commercialization activities are clearly described in the application.
5. **Project environmental evaluation:** Adequacy of the details in the preliminary environmental impact evaluation and desktop study to assess relative environmental value of the technology proposed versus existing technologies, the environmental viability of the technology if widely commercialized, and the impact to the facility sites.
6. **Project technical risks:** Adequacy and clarity of the project technical risk assessment and management discussion, including technology, systems integration, control approach, infrastructure, engineering, scale-up and similar elements, as well as the quality of the mitigation strategies to address them.
7. **Project security:** Adequacy and clarity of the security risk assessment and management discussion, including preliminary cybersecurity, physical security, and internal and external threat identification and response planning.

Capture [15%]

Project technical approach and impact:

1. **Scale readiness:** Degree to which the proposed carbon capture technology is ready for demonstration on the proposed commercial process at the scale proposed, with preference given to applicants that performed prior-scale testing using the exact same flue gas proposed in the application.
2. **Data completeness:** Degree to which the applicant provided all analytical sources for all data reported and explained inconsistencies in data sources.

3. **Tech description:** Degree to which the proposed carbon capture technology is thoughtfully and maturely described, and the degree to which the proposed design can credibly achieve the improvements in efficiency, effectiveness, cost, scale, or environmental performance of the carbon capture technology identified.
4. **Host site suitability and readiness:** Degree to which the applicant justifies the selection of the host site and the degree that the carbon capture technology is technically suited to integrate into the existing processes at the proposed host site. This includes the degree to which the host site has already demonstrated progress towards integrating CCUS into unit operations.
5. **Environmental, health, and safety (EHS):** Adequacy and completeness of the Initial Environmental, Health, and Safety Risk Assessment for the proposed capture technology.

Liftoff technical approach and impact:

1. **Design scalability and replicability:** Degree to which the proposed project's approaches are replicable, scalable, and extensible to commercial-scale technologies and systems.
2. **Industry adoption:** Degree to which the industry that the proposed project intends to capture CO_2 from needs to use CCUS as a primary decarbonization lever, as determined by DOE's *Carbon Management Liftoff Report*.
3. **Liftoff technical risks:** Adequacy and clarity of the technical risk assessment of scale-up and future market adoption, including needed technology improvements and cost reductions, manufacturing and supply chain expansion, broader infrastructure engagement, and similar elements as well as the quality of the mitigation strategies to address them.

Storage [10%]

Project technical approach and impact:

1. **Characterization maturity:** The degree to which the applicant has performed characterization activities to identify key geologic characteristics of the storage site, including static or dynamic models and well development plans.
2. **Site suitability:** The degree to which the geologic storage site contains suitable geologic characteristics to store all the CO_2 that must be captured during the life of the project, including the degree to which the cap rock and confining intervals can contain the stored CO_2, the degree of seismic risk identified at the site, and the capacity of the site.
3. **EHS:** Adequacy and completeness of the Initial Environmental, Health, and Safety Risk Assessment for the proposed storage site, including precautions taken to protect sources of drinking water.
4. **Commercial readiness:** The level of commitment of the storage site development demonstrated through well permit progress, advanced market commitments, royalty contract structures, or other key agreements.

5. **Site control:** The degree to which the applicant has pore space leases and surface rights to be able to use the land.

Liftoff technical approach and impact:

1. **Replicability:** The degree to which experience injecting into this geology would unlock carbon storage reservoirs in other locations.
2. **Regional impact:** Degree to which the proposed storage site can accommodate CO_2 from future potential projects.

Transport [5%]

Project technical approach and impact:

1. **Commercial readiness:** The maturity and level of commitment of the transportation route development as demonstrated through advanced commitments, acquisition of rights-of-way, or other key agreements.
2. **Tech description:** Degree to which the proposed carbon transportation method is technically and maturely described, including any relevant prior engineering and design work such as a pre-FEED or FEED study.
3. **EHS**: Adequacy and completeness of the Initial Environmental, Health, and Safety Risk Assessment for the proposed transport method.

Liftoff technical approach and impact:

1. **Replicability:** Degree to which the proposed project's approaches are replicable and extensible to commercial-scale technologies and systems.
2. **Industry adoption:** Degree to which the industry that the proposed project intends to capture CO_2 from needs to use CCUS as a primary decarbonization lever, as determined by DOE's *Carbon Management Liftoff Report*.
3. **Design scalability:** Sufficiency of technical detail provided in the application addressing whether the proposed technologies and systems would be commercially viable at scale.
4. **Liftoff technical risks:** Adequacy and clarity of the technical risk assessment of scale-up and future market adoption, including needed technology improvements and cost reductions, manufacturing and supply chain expansion, broader infrastructure engagement, and similar elements as well as the quality of the mitigation strategies to address them.

Criterion 2: Financial and Market Viability (30%)

This criterion involves consideration of the following factors:

1. **Standalone project economics and financial feasibility:** Cash Flow Model Spreadsheet[33] indicates the minimum breakdown of expected cash flows for each year, through the life of the project. Cash Flow Model Spreadsheet and Financial Strategy are based on realistic assumptions.
2. **Growth potential of technology beyond current project:** Vision for subsequent deployments of the technology, at this location or elsewhere. Vision for how this facility can contribute to a new or existing regional Carbon Capture hub.
3. **Synergies with other projects and infrastructure:** Degree to which the proposed project utilizes and leverages available resources such as testing infrastructure, workforce, supplies, or equipment to meet the required NOFO objectives.
4. **Project competitiveness:** Degree to which the applicant assesses and demonstrates potential market competitiveness for the proposed project through project assessment using the **Adoption Readiness Level (ARL)** framework.
5. **Project TEA:** The degree to which the techno-economic analysis (TEA) completely and accurately identifies performance target projections in the proposed project, and the degree to which potential cost reductions for future Nth-of-a-kind builds can improve the business case for the first-of-a-kind plant.
6. **Project financing:** Availability, credibility, and risk/terms of non-Federal cost share sources and funds necessary to meet ongoing cost share needs. This includes the ability to leverage DOE financial assistance funding from this NOFO with state and local incentives and private financing.
7. **Financial commitment:** Degree to which the applicant addresses each key participating organization's financial commitment to the proposed project including overall financial strength and financial capability to implement the proposed plan.
8. **Project budget**: Adequacy and justification of the proposed budget and spend plan covering both DOE funding and non-Federal cost share. This includes applicant's ability to provide contingency to meet unknown project cost overruns often seen with demonstration projects.
9. **Project development plan:** Adequacy of the business plan for developing key project agreements such as financing, acquisition strategies, supply chain, and other relevant project documents.
10. **Impact of DOE funding:** Degree to which DOE funding is necessary to achieve the demonstration project objectives.
11. **Financial viability:** The degree to which achieving performance targets could enable financially viable operations independent of further DOE support.

[33] Cash Flow Model format and requirements are included in Financial and Market Viability Sub-section under TA1.

12. **Sensitivity analysis:** The degree to which the applicant assessed how changes to the market or system performance can affect project financials through sensitivity analyses.
13. **Capital structure:** Strength of capital structure and sources of funding including level of demonstrated commitment to the project.

Liftoff financial and market viability:

1. **Demonstration impact:** Degree to which project mitigates or reduces barriers to broader market adoption identified in ARL assessment.
2. **Liftoff potential:** Degree to which the application justifies the economic viability, and potential replication or extension beyond DOE funding of the system to be demonstrated, including securing follow-on investments.
3. **Financial risk assessment:** Adequacy and clarity of the **financial** risk assessment and management discussion including project finance, market and regulatory structures, commercial business models, and similar elements as well as the quality of the mitigation strategies to address them.
4. **Catalytic impact:** The degree to which cost-downs realized by the proposed demonstration site could catalyze future similar projects to be developed without government support.
5. **Regional impact:** Degree to which the proposed project could reduce infrastructure cost barriers for other future potential CCUS projects near where the project proposes to be constructed.

Criterion 3: Management, Organization, and Workplan (20%)

This criterion involves consideration of the following factors:

1. **Management capability:** Capability of the recipient, the proposed team, and key personnel to manage and address all aspects of the proposed work with a high probability of success.
2. **Project work scope:** Degree to which technical work scope to achieve full operation is clearly defined, including testing and validation plans, project development, and construction, commissioning, and testing.
3. **Team experience:** Qualifications and relevant experience, including number of years and specific project experience, of the key project participants in performing similar projects and the allocation of responsibility commensurate with this experience.
4. **Time commitment:** Reasonableness of time commitment from key personnel to successfully manage a project of this size and complexity.
5. **Safety history:** The safety performance history of all team organizations involved and the adequacy of the environmental management plan.
6. **Participation:** Level of participation by project participants as evidenced by letter(s) of commitment and how well they are integrated into the workplan.

7. **Facilities and infrastructure use:** Degree to which existing facilities and infrastructure provided by the applicant team are leveraged to support the project.
8. **Project management discussion:** Strength of the project management discussion in the project workplan to give confidence in a high likelihood of project success.
9. **Project management structure:** Degree to which the applicant has defined and described a project management structure that addresses interfaces with DOE and key team members.
10. **Team roles:** Clarity and appropriateness of the roles of the team members.
11. **Organizational risk:** Adequacy and clarity of the **organizational** risk assessment and management discussion, including project team, project management structure, and similar elements as well as the quality of the mitigation strategies to address them.
12. **Project schedule:** Overall reasonableness of the Integrated Project Schedule based on the associated complexity of the proposal.
13. **Quality of workplan:** The clarity, detail, and reasonableness of the workplan, schedule, and deliverables to be ready for construction by Phase 3 and give confidence in a high likelihood of project success. This includes the degree to which key NEPA and CBP activities and deliverables are identified, considered, and resourced.
14. **Milestone clarity:** Strength and level of clarity in the definition of the project phases, metrics, Integrated Project Schedule, and Go/No-Go criteria.
15. **Deliverables:** Strength of the deliverables as defined in the application, such that DOE and independent experts will be able to evaluate key technical, financial, regulatory, permitting, and community benefit milestones during appropriate project Go/No-Go reviews to mitigate project risk and enable the successful design, procurement, construction, and operation of the proposed project.
16. **Community benefits plan integration:** Extent to which the CBP is integrated into the project management schedule and provides mechanisms with measurable actions that enable impacts to project direction in a timely manner.
17. **Execution risk:** Adequacy and clarity of the execution risk assessment and management discussion, including engineering, procurement, construction, permitting, safety, testing, operations, and similar elements as well as the quality of the mitigation strategies to address them.
18. **Prime applicant suitability:** The degree to which the prime recipient demonstrates its capability, experience, and commitment to manage and address all aspects of the proposed work with a high probability of success.

Criterion 4: Community Benefits Plan (20%)

This criterion involves consideration of the following factors:

Overall approach

1. **Overall:** Extent to which the team and resources—including staff and budget—are capable of implementing plans outlined in the CBP.

Community and labor engagement

1. **Engagement plan:** Extent to which the project demonstrates a clear and appropriately robust plan to meaningfully engage Tribes and local stakeholders, including community-based organizations, organizations that support or work with disadvantaged communities, and labor organizations, in a manner that can impact project decisions, including any plans to negotiate enforceable Workforce and Community Agreements (e.g., community benefit agreements, workforce agreements, project labor agreements, collective bargaining agreements, and similar agreements).
2. **Accountability and transparency:** Extent to which the project will incorporate accountability to and transparency with affected workers and community groups, including those most vulnerable to project activities.

Investing in Quality Jobs

1. **Quality jobs:** Extent to which the jobs supported by the proposed project will be quality jobs and the project will provide a robust and credible plan to attract, train, and retain skilled local workers (e.g., through a Workforce and Community Agreements, commitments to wages above prevailing wage requirements, benefits, or other worker support).
2. **Worker rights:** Extent to which the project provides employees, subject to state and local law, with the ability to organize, bargain collectively, and participate, through labor organizations of their choosing, in decisions that affect them.

Diversity, Equity, Inclusion, and Accessibility (DEIA)

1. Extent to which the CBP includes specific and high-quality actions to meet DEIA goals, which may include DEIA recruitment procedures, equitable pathways to employment and training, plans to support underrepresented suppliers and contractors, partnerships with MSIs, and other DEIA initiatives.
2. Quality of any partnerships and agreements with apprenticeship readiness programs, or community-based workforce training and support organizations serving workers facing systematic barriers to employment to facilitate participation in the project's construction and operations.

Project impacts

1. Potential benefits: Extent to which CBP identifies specific and measurable project benefits and how the benefits will flow, and provides strategies to maximize benefits to disadvantaged communities in collaboration with local community.
2. Potential negative impacts: Extent to which the CBP identifies potential negative impacts and provides strategies to minimize, mitigate, and monitor those impacts in collaboration with local community. Applications Topic Area 2

Criterion 1: Technical Approach and Impact (35%)

This criterion involves consideration of the following factors:

Project technical approach and impact

1. **Project objectives:** Degree to which the proposed project approach will advance the technical maturity and commercial readiness of the proposed carbon capture technology.
2. **Project relevance:** Extent to which the application specifically and reasonably demonstrates how the proposed project will be capable of meeting the technical objectives and system requirements.
3. **Project timeline:** Degree to which the proposed project can substantiate an ability to quickly achieve its technical objectives.
4. **Project description:** Degree to which the proposed technology, site, testing plan, and commercialization activities are clearly described in the application.
5. **Project work scope:** Degree to which technical work scope to achieve full operation is clearly defined, including testing and validation plans, project development, and construction, commissioning, and testing.
6. **Project environmental evaluation:** Adequacy of the details in the preliminary environmental impact evaluation to assess relative environmental value of the technology proposed versus existing technologies and the environmental viability of the technology if widely commercialized.
7. **Project government collaboration:** Where appropriate, the extent to which the applicant demonstrates how it plans to leverage other Federal and/or state programs and partnerships.
8. **Project technical risks:** Adequacy and clarity of the project **technical** risk assessment and management discussion, including technology, systems integration, controls approach, infrastructure, engineering, scale-up, and similar elements as well as the quality of the mitigation strategies to address them.
9. **Project security:** Adequacy and clarity of the **security** risk assessment and management discussion, including preliminary cybersecurity, physical security, and internal and external threat identification and response planning.

10. **Scale readiness:** Degree to which the proposed carbon capture technology is ready for pilot demonstration on the proposed process and scale (i.e., at least TRL 6 for TA2a, or at least TRL 5 for TA2b), and the degree to which the testing data provided demonstrated sufficient operations on an identical (ideal) or similar/synthetic (required) flue gas. The degree to which the applicant justifies the choice of flue gas if not identical to the proposed pilot.
11. **Technical impact and novelty:** Degree to which the proposed project would demonstrate transformative improvements in the efficiency, effectiveness, cost, emissions reduction, and environmental performance of a carbon capture technology for power, industrial/commercial, or other commercial applications when compared to the state of the art. This includes the ability for the carbon capture pilot to accommodate rapid start-up and shutdown of the carbon capture system and the resiliency of the capture system to contaminant-rich flue gas streams.
12. **Technical description and efficacy:** Degree to which the proposed carbon capture technology is thoughtfully and maturely described, and the degree to which the proposed design can achieve consumer grade CO_2 purity / customer specification.
13. **Host site suitability:** Degree to which the applicant justifies the selection of the host site and the degree that the carbon capture technology is technically suited to integrate into the existing processes at the proposed host site.
14. **EHS:** Adequacy and completeness of the Initial Environmental, Health, and Safety Risk Assessment for the proposed pilot.
15. **Preliminary life cycle assessment:** The adequacy and completeness of the Life Cycle Assessment of the entire carbon capture, transport, and storage system proposed in the application, and the quantified reductions in GHG and carbon intensity that could be achieved by the project.

Liftoff technical approach and impact:

1. **Industry adoption:** Degree to which the proposed project reasonably expects to enable, encourage, and accelerate broader industry-wide implementation. Degree to which the industry that the proposed project intends to capture CO_2 from needs to use CCUS as a primary decarbonization lever, as determined by the Department of Energy's *Carbon Management Liftoff Report*.
2. **Design scalability:** Sufficiency of technical detail provided in the application addressing whether the proposed technologies and systems would be commercially viable at scale.
3. **Liftoff technical risks:** Adequacy and clarity of the **technical** risk assessment of scale-up and future market adoption, including needed technology improvements and cost reductions, manufacturing and supply chain expansion, broader infrastructure engagement, and similar elements as well as the quality of the mitigation strategies to address them.

Criterion 2: Financial and Market Viability (25%)

This criterion involves consideration of the following factors:

1. **Standalone project economics and financial feasibility:** Cash Flow Model Spreadsheet[34] indicates the minimum breakdown of expected cash flows for each year, through the life of the project. Cash Flow Model Spreadsheet and Financial Strategy are based on realistic assumptions.
2. **Growth potential of technology beyond current project:** Vision for subsequent or full-scale deployments of the technology, at this location or elsewhere.
3. **Project TEA:** Adequacy of the details in the preliminary TEA to justify viability and feasibility of the project and the value proposition and timeline of the technology to be replicated and the degree to which potential cost reductions for future Nth-of-a-kind, full-scale commercial builds can improve the business case for the pilot.
4. **Project financing:** Availability, credibility, and risk/terms of non-Federal cost share sources and funds necessary to meet ongoing cost share needs. This includes the ability to leverage DOE financial assistance funding from this NOFO with state and local incentives and private financing.
5. **Financial commitment:** Degree to which the applicant addresses each key participating organizations' financial commitment to the proposed project including overall financial strength and financial capability to implement the proposed plan.
6. **Project budget**: Adequacy and justification of the proposed budget and spend plan covering both DOE funding and non-Federal cost share. This includes applicant's ability to provide contingency to meet unknown project cost overruns often seen with large scale projects.
7. **Project development plan:** Adequacy of the business plan for developing key project agreements such as financing, procurement, supply chain, and other relevant project documents.
8. **Impact of DOE funding:** Degree to which DOE funding is necessary to achieve the large-scale pilot project objectives.

Liftoff financial and market viability:

1. **Liftoff potential:** Degree to which the application justifies the economic viability, sustainability, and potential replication and/or extension beyond DOE funding of the system to be demonstrated, including securing follow-on investments.

[34] Cash Flow Model format and requirements are included in Financial and Market Viability Subsection under TA1.

Criterion 3: Management, Organization and Workplan (20%)

This criterion involves consideration of the following factors:

1. **Management capability:** Capability of the recipient, the proposed team, and key personnel to manage and address all aspects of the proposed work with a high probability of success.
2. **Team experience:** Qualifications and relevant experience, including number of years and specific project experience, of the key project participants in performing similar projects and the allocation of responsibility commensurate with this experience.
3. **Time commitment:** Reasonableness of time commitment from key personnel to successfully manage a project of this size and complexity.
4. **Safety history:** Demonstrated safety performance history of all team organizations.
5. **Participation:** Level of participation by project participants as evidenced by letter(s) of commitment and how well they are integrated into the workplan.
6. **Facilities and infrastructure use:** Degree to which existing facilities and infrastructure, workforce, supplies, or equipment provided by the applicant team are leveraged to support the project.
7. **Project management discussion:** Strength of the project management discussion in the project workplan to give confidence in a high likelihood of project success.
8. **Project management structure:** Degree to which the applicant has defined and described a project management structure that addresses interfaces with DOE and key team members.
9. **Team roles:** Clarity and appropriateness of the roles of the team members.
10. **Organizational risk:** Adequacy and clarity of the organizational risk assessment and management discussion, including project team, project management structure, and similar elements as well as the quality of the mitigation strategies to address them.
11. **Project schedule:** Overall reasonableness of the Integrated Project Schedule based on the associated complexity of the proposal.
12. **Workplan clarity:** Degree to which the proposed workplan and critical path have been clearly and thoroughly described and thoughtfully considered.
13. **Workplan tasks:** Degree to which the task descriptions are clear, detailed, timely, and reasonable, resulting in a high likelihood that the proposed workplan will succeed in meeting the project goals.
14. **Milestone clarity:** Strength and level of clarity in the definition of the project phases, metrics, Integrated Project Schedule, and Go/No-Go criteria.

15. **Deliverables:** Strength of the deliverables as defined in the application, such that DOE and independent experts will be able to review key technical, financial, regulatory, permitting, and community benefit milestones at appropriate project Continuation Decision points to mitigate project risk and enable the successful design, procurement, construction, and operation of the proposed project.
16. **Community benefits plan integration:** Extent to which the CBP is integrated into the project management schedule and provides mechanisms with measurable actions that enable impacts to project direction in a timely manner.
17. **Execution risk:** Adequacy and clarity of the execution risk assessment and management discussion, including engineering, procurement, construction, permitting, safety, testing, operations, and similar elements as well as the quality of the mitigation strategies to address them.

Criterion 4: Community Benefits Plan (20%)

This criterion involves consideration of the following factors:

Overall approach

1. Extent to which the team and resources—including staff and budget—are capable of implementing plans outlined in the CBP.

Community and labor engagement

1. Extent to which the project demonstrates a clear and appropriately robust plan to meaningfully engage Tribes and local stakeholders, including community-based organizations, organizations that support or work with disadvantaged communities, and labor unions, in a manner that can impact project decisions, including any plans to negotiate enforceable Workforce and Community Agreements (e.g., community benefit agreements, workforce agreements, project labor agreements, collective bargaining agreements, and similar agreements).
2. Extent to which the project will collaborate and partner with experts in just and equitable implementation to inform project planning, execution, and assessments.

Investing in Quality Jobs

1. Extent to which the CBP demonstrates that the jobs supported by the proposed project will be quality jobs and provides robust and credible plan to attract, train, and retain skilled local workers (e.g., through a Workforce and Community Agreements, commitments to wages above prevailing wage requirements, benefits, or other worker support).
2. Extent to which the approach to document the worker knowledge, skills, and abilities required to manufacture, construct, operate, and maintain this technology will result in improved understanding of the workforce implications of commercial deployment of CCUS.

Diversity, Equity, Inclusion, and Accessibility (DEIA)

1. Extent to which the CBP includes specific and high-quality actions to meet DEIA goals, which may include DEIA recruitment procedures, equitable pathways to employment and training, plans to support underrepresented suppliers and contractors, partnerships with MSIs, and other DEIA initiatives.
2. Extent to which the plans to extend benefits to Tribes, disadvantaged communities, Low and Minority Income (LMIs), Minority Serving Institution (MSIs), and underrepresented businesses include specific and high-quality actions to advance DEIA in the future.

Project impacts

1. Extent to which the CBP identifies specific and measurable project benefits, how the benefits will flow, and how negative impacts would be mitigated—and specifically describes these impacts on disadvantaged communities.
2. Extent to which the plans for data collection and analysis related to community impacts, including changes to non-CO_2 air and water pollution, will result in improved understanding of public impacts related to CCUS impacts related to CCUS.

Applications Topic Area 3

Criterion 1: Technical Approach and Impact (25%)

This criterion involves consideration of the following factors:

Project technical approach and impact

1. **Project objectives:** Degree to which the proposed project approach will advance the technical maturity and commercial readiness of the proposed carbon capture, transport, and storage network.
2. **Project relevance:** Extent to which the application specifically and reasonably demonstrates how the proposed project will be capable of meeting the technical objectives and system requirements.
3. **Project timeline:** Degree to which the proposed project can substantiate an ability to quickly achieve its technical objectives.
4. **Project description:** Degree to which the proposed technology, site, testing plan, and commercialization activities are clearly described in the application.
5. **Project work scope:** Degree to which technical work scope to achieve full operation is clearly defined, including testing and validation plans, project development, and construction, commissioning, and testing.

6. **Project environmental evaluation:** Adequacy of the details in the preliminary environmental impact evaluation to assess relative environmental value of the technology proposed versus existing technologies and the environmental viability of the technology if widely commercialized.
7. **Project GHG emissions reductions:** The screening-level GHG emission assessment provides adequate detail to indicate potential for significant yearly total CO_2 captured and permanently stored or reductions in total GHG emissions and carbon intensity (i.e., CO_2-eq/functional unit).
8. **Project government collaboration:** Where appropriate, the extent to which the applicant demonstrates how it plans to leverage other Federal and/or state programs and partnerships.
9. **Project technical risks:** Adequacy and clarity of the project **technical** risk assessment and management discussion, including technology, systems integration, control approach, infrastructure, engineering, scale-up, and similar elements as well as the quality of the mitigation strategies to address them.
10. **Project security:** Adequacy and clarity of the **security** risk assessment and management discussion, including preliminary cybersecurity, physical security, and internal and external threat identification and response planning.
11. **Scale readiness:** Degree to which the proposed carbon capture technologies are ready for demonstration on the proposed commercial processes at the scales proposed, with preference given to applicants that performed prior-scale testing using the exact same flue gases proposed in the application.
12. **Carbon capture host sites suitability and readiness:** Degree to which the applicant justifies the selection of the carbon capture host sites and the degrees that the carbon capture technologies are technically suited to integrate into the existing processes at the proposed host sites. This includes the degree to which the host site has already demonstrated progress towards integrating CCUS into unit operations.
13. **Storage site characterization maturity:** The degree to which the applicant has performed characterization activities to identify key geologic characteristics of the storage site(s), including static or dynamic models and well development plans.
14. **Storage site suitability:** The degree to which the geologic storage site contains suitable geologic characteristics to store all the CO_2 that must be captured during the life of the project, including the degree to which the cap rock and confining intervals can contain the stored CO_2, the degree of seismic risk identified at the site, and the capacity of the site.
15. **Transport network commercial readiness:** The maturity and level of the transportation route development.
16. **Transport network technology description:** Degree to which the proposed carbon transportation method is technically and maturely described, including any relevant prior engineering and design work such as a pre-FEED study.

Liftoff technical approach and impact

1. **Regional impact:** The potential for the proposed transport and storage network to expand to serve more emitters in the area beyond those included in this application, including if the pipeline proposed is common carrier.
2. **Replicability:** Degree to which the proposed project's approaches are replicable and extensible to commercial-scale technologies and systems.
3. **Industry adoption:** Degree to which the proposed project reasonably expects to enable, encourage, and accelerate broader industry-wide implementation.
4. **Design scalability:** Sufficiency of technical detail provided in the application addressing whether the proposed technologies and systems would be commercially viable at scale.
5. **Liftoff technical risks:** Adequacy and clarity of the technical risk assessment of scale-up and future market adoption, including needed technology improvements and cost reductions, manufacturing and supply chain expansion, broader infrastructure engagement, and similar elements as well as the quality of the mitigation strategies to address them.

Criterion 2: Financial and Market Viability (30%)

This criterion involves consideration of the following factors:

1. **Standalone project economics and financial feasibility:** Cash Flow Model Spreadsheet[35] indicates the minimum breakdown of expected cash flows for each year through the life of the project. Cash Flow Model Spreadsheet and Financial Strategy are based on realistic assumptions.
2. **Growth potential of technology beyond current project:** Vision for subsequent deployments of the technology, at this location or elsewhere. Vision for how this facility can contribute to a new or existing regional Carbon Capture hub.
3. **Synergies with other projects and infrastructure:** Degree to which the proposed project utilizes and leverages available resources such as testing infrastructure, workforce, supplies, or equipment to meet the required NOFO objectives.
4. **Realized economies of scale:** The degree to which networking of multiple emitters with transport and storage can reduce the fees paid by emitters through realizing economies of scale.
5. **Financial viability:** The degree to which each entity has demonstrated that, by achieving performance targets including anticipated reduced transport and storage fees, financially viable operations independent of further DOE support could be achieved.
6. **Project competitiveness and sustainability:** Degree to which the applicant assesses and demonstrates potential market competitiveness and sustainability for the proposed project through project assessment using the **Adoption Readiness Level (ARL)** framework.

[35] Cash Flow Model format and requirements are included in Financial and Market Viability Subsection under TA1.

7. **Project TEA:** Adequacy of the details in the preliminary TEA to justify viability and feasibility of the project and the value proposition and timeline of the technology to be replicated.
8. **Project financing:** Availability, credibility, and risk/terms of non-Federal cost share sources and funds necessary to meet ongoing cost share needs. This includes the ability to leverage DOE financial assistance funding from this NOFO with state and local incentives and private financing.
9. **Financial commitment:** Degree to which the applicant addresses each key participating organization's financial commitment to the proposed project including overall financial strength and financial capability to implement the proposed plan.
10. **Project budget**: Adequacy and justification of the proposed budget and spend plan covering both DOE funding and non-Federal cost share. This includes applicant's ability to provide contingency to meet unknown project cost overruns often seen with demonstration projects.
11. **Project development plan:** Adequacy of the business plan for developing key project agreements such as financing, acquisition strategies, supply chain, and other relevant project documents.
12. **Impact of DOE funding:** Degree to which DOE funding is necessary to achieve the demonstration project objectives.
13. **Sensitivity analysis:** The degree to which the applicant assessed how changes to the market can affect project financials through sensitivity analyses.

Liftoff financial and market viability

1. **Expansion potential:** The degree to which the proposed network could catalyze further capture, transport, or storage development beyond the network partners proposed.
2. **Demonstration impact:** Degree to which project mitigates or reduces barriers to broader market adoption identified in ARL assessment.
3. **Liftoff potential:** Degree to which the application justifies the economic viability, sustainability, and potential replication or extension beyond DOE funding of the system to be demonstrated, including securing follow-on investments.
4. **Financial risk assessment:** Adequacy and clarity of the financial risk assessment and management discussion including project finance, market and regulatory structures, commercial business models, and similar elements as well as the quality of the mitigation strategies to address them.

Criterion 3: Management, Organization, and Workplan (25%)

This criterion involves consideration of the following factors:

1. **Prime applicant suitability**: The degree to which the prime recipient demonstrates its capability, experience, and commitment to manage and address all aspects of the proposed work with a high probability of success.
2. **Management capability:** Capability of the recipient, the proposed team, and key personnel to manage and address all aspects of the proposed work with a high probability of success.
3. **Team experience:** Qualifications and relevant experience, including number of years and specific project experience, of the key project participants in performing similar projects and the allocation of responsibility commensurate with this experience.
4. **Team suitability:** The completeness and suitability of the assembled award team and subrecipients.
5. **Community representation:** The degree to which community representation is manifested in the project team.
6. **Time commitment:** Reasonableness of time commitment from key personnel to successfully manage a project of this size and complexity.
7. **Safety history:** Demonstrated safety performance history of all team organizations involved and the adequacy of the environmental management plan.
8. **Facilities and infrastructure use:** Degree to which existing facilities and infrastructure provided by the applicant team are leveraged to support the project.
9. **Project management structure:** Degree to which the applicant has defined and described a project management structure that addresses interfaces with DOE and key team members.
10. **Quality of deliverables:** The strength of the deliverables as defined in the application, such that DOE and independent experts will be able to review key technical, financial, regulatory, permitting, and community benefit milestones at appropriate project Continuation Decision points to mitigate project risk and enable the successful design, procurement, construction, and operation of the proposed project.
11. **Risk management:** The adequacy and clarity of the execution risk assessment and management discussion, including engineering, procurement, construction, permitting, safety, testing, operations, and similar elements as well as the quality of the mitigation strategies to address them.
12. **Project schedule:** Overall reasonableness of the Integrated Project Schedule based on the associated complexity of the proposal.
13. **Quality of workplan:** The strength and reasonableness of the of the workplan, schedule, and deliverables to achieve construction readiness by the end of the award.

14. **Workplan coordination:** The degree to which the project workplan considers the alignment of key timelines to reduce development uncertainty for other project partners.
15. **Milestone clarity:** Strength and level of clarity in the definition of the project phases, metrics, Integrated Project Schedule, and Go/No-Go criteria.
16. **Community benefits plan integration:** Extent to which the CBP is integrated into the project management schedule and provides mechanisms with measurable actions that enable impacts to project direction in a timely manner.

Criterion 4: Community Benefits Plan (20%)

This criterion involves consideration of the following factors:

Overall approach

Extent to which the team and its resources can implement plans outlined in the initial CBP, including an Initial Community Analysis Summary that describes the following: how entities were identified; the sectors, labor unions, communities, or organizations the entities represent; and current or anticipated level of engagement.

Community and labor engagement assessment

1. **Social Characterization:** The social characterization assessment provides a summary of the current and historical social, cultural, economic, labor, and environmental landscape, decision-making structures, and other relevant information about the project's affected areas and groups.
2. **Existing community and labor support:** An assessment and evidence of (e.g., letters of support, MOUs, etc.) existing labor and community support and concerns with the project.
3. **Workforce and training needs:** Describe the activities and analyses the team plans to undertake to develop an assessment of workforce needs and relevant labor unions and training partners, including assessments for jobs, knowledge, skill gaps, and training opportunities that will be needed to create a CBP with the community. This could include prospective plans or commitments to negotiate enforceable Workforce and Community Agreements for future work (e.g., community benefit agreements, good neighbor agreements, workforce agreements, project labor agreements, collective bargaining agreements, and similar agreements).

DEIA assessment

1. **DEIA considerations:** This assessment focuses on (a) who, in terms of which specific groups and communities, bears risks and potential benefits; and (b) cumulative burdens, i.e., how this project adds to and interacts with the impacts that these groups and communities are already facing from energy and other types of projects, past and present, which can inform future development of recruitment procedures, equitable pathways to employment and training, plans to support underrepresented suppliers and contractors, partnerships with MSIs, and other DEIA initiatives.
2. **Impacted disadvantaged communities and groups:** Assessment should describe all applicable impacted communities, groups, and Tribal Entities to which the anticipated project impacts could flow. Please describe what methods, tools, and resources the team plans to use to create an assessment of impacted communities and groups.

Project impacts

1. **Potential benefits assessment:** Describe what methods, tools, and resources the team plans to use to create an assessment of anticipated project benefits.
2. **Potential negative impacts assessment:** Describe what methods, tools, and resources the team plans to use to create an assessment of potential negative project impacts.

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. Degree to which the proposed project exhibits diversity in technology and implementation approach when compared to the existing DOE project portfolio and other projects selected from the subject NOFO.
2. Degree to which the proposed capture technology exhibits high carbon capture efficiency.
3. Degree to which the proposed project demonstrates highest total volumes of CO_2 captured, transported, and/or stored.
4. Degree to which the proposed project demonstrates novel approaches to carbon storage or utilization.
5. Degree to which the proposed project exhibits diversity and differentiation in business model and valuation approaches when compared to existing DOE project portfolio and existing operational systems.
6. Degree to which the proposed project, including proposed cost share, optimizes the use of available DOE funding to achieve programmatic objectives.
7. Degree to which the proposed project, or group of projects, represent a desired geographic distribution (considering past awards and current applications).

8. Degree to which the project's solution or strategy will maximize deployment or replication.
9. Level of regulatory, permitting, and/or local policy support for the proposed project.
10. Degree to which the proposed demonstration supports secure, resilient domestic clean energy supply chains.
11. Degree to which the proposed demonstration leverages permanent storage in a Class VI well (TA1 and TA3).
12. Level of community support.
13. Degree to which the portfolio satisfies strategic capture priorities, including rapid start-up and shutdown or high-contaminant capture.
14. Carbon capture from unit operations underrepresented in DOE's portfolio where it is known to be difficult to decarbonize and require further technology development (TA2).
15. Degree to which the proposed demonstration is located close to multiple other plants with potentially capturable emissions (TA1).
16. Degree to which the proposed demonstration networks with the largest number of emitter partners (TA3).
17. Degree to which the project is proposing to support the development of existing CCUS developments occurring nearby, including regional storage hubs (TA1, TA3).
18. Degree to which the project can leverage existing government support, additional local policies, or additional state policies that help drive CCUS adoption, including but not limited to emission reduction mandates, clean firm power mandates, transport and storage incentives, or additional financial incentives.
19. Storage resources drastically exceed the requirements for a small number of emitters and the project can become a regional storage hub (TA1).
20. Degree to which the project contributes to a portfolio that meets the goals reflected in the CBP criteria by producing additional benefits to communities, particularly disadvantaged communities, such as reducing co-pollutants and other environmental (e.g., air, water) burdens.
21. The degree to which the proposed project incorporates applicant or team members from Minority Serving Institutions (e.g., Historically Black Colleges and Universities (HBCUs) / Other Minority Institutions (OMIs)) and partnerships with underrepresented businesses or Indian Tribes.

Review and Selection Process

Overview

The evaluation process consists of multiple phases, each including an initial eligibility review and a thorough technical review. Rigorous technical reviews of eligible submissions are conducted by reviewers that are experts in the subject matter of the NOFO. Ultimately, the Selection Official considers the recommendations of the reviewers, along with other considerations such as the program policy factors and risk reviews, in determining which applications to select as described in the Selection section below.

Pre-Selection Interviews

As part of the evaluation and selection process, DOE may invite one or more applicants to participate in pre-selection interviews or pre-selection site visits. Pre-selection interviews are distinct from and more formal than Pre-Selection Clarifications. The invited applicant(s) will meet with DOE representatives to provide information on the contents of the applications and to provide DOE an opportunity to ask questions regarding the proposed project. The information provided by applicants to DOE through pre-selection interviews contributes to DOE's selection decisions. DOE will not reimburse applicants for travel and other expenses relating to the pre-selection interviews or site visits, nor will these costs be eligible for reimbursement as pre-award costs.

Any pre-selection interviews and site visits may also include discussions with affected stakeholders or communities potentially impacted to understand their concerns/risks.

Pre-Selection Clarification

DOE may determine that pre-selection clarifications are necessary from one or more applicants. Pre-selection clarifications are distinct from and less formal than pre-selection interviews and are sought solely to clarify the application. Pre-selection clarifications may occur before, during, or after the merit review evaluation process. Information provided by an applicant that is not necessary to address the pre-selection clarification question will not be reviewed or considered. Typically, a pre-selection clarification will be carried out through either written response to DOE's written clarification questions or video or conference calls with DOE representatives.

The information provided by applicants to DOE through pre-selection clarifications is incorporated into the applications and contributes to the merit review evaluation and DOE's selection decisions. If DOE contacts an applicant for pre-selection clarification, it does not signify that the applicant has been selected for negotiation of award or that the applicant is among the top-ranked applications.

DOE will not reimburse applicants for expenses relating to the pre-selection clarifications, nor will these costs be eligible for reimbursement as pre-award costs.

Due Diligence Review for Research, Technology, and Economic Security

All applications submitted to DOE are subject to a due diligence review.

As DOE invests in critical infrastructure and funds critical and emerging technology areas, DOE considers possible threats to United States research, technology, and economic security from undue foreign government influence when evaluating risk. If high risks are identified and cannot be sufficiently mitigated, DOE may elect to not fund the applicant. As part of the research, technology, and economic security risk review, DOE may contact the applicant or proposed project team members for additional information to inform the review. This risk review is conducted separately from the technical merit review.

The due diligence review of senior/key personnel includes but is not limited to the review of resumes and disclosures, as required in the NOFO and the *NOFO Supplemental Requirements* document. DOE reserves the right to ask for disclosures on project participants not defined as senior/key personnel. The applicant need not submit any additional information on non-senior/key personnel, unless requested by DOE. The volume and type of information collected may depend on various factors associated with the award.

Note that this review is separate and distinct from DOE Order 142.3B, “Unclassified Foreign National Access Program.”

Selection

The Selection Official may consider the technical merit, the Federal Merit Review Panel’s recommendations, program policy factors, risk reviews, and the amount of funds available in arriving at selections for this NOFO.

Risk Review

Pursuant to 2 CFR 200.206, DOE will conduct an additional review of the risk posed by applications submitted under this NOFO.

Such risk assessment will consider:

- Financial stability
- Quality of management systems and ability to meet the management standards prescribed in 2 CFR Part 200 as adopted and supplemented by 2 CFR Part 910
- History of performance
- Audit reports and findings
- The applicant's ability to effectively implement statutory, regulatory, or other requirements imposed on recipients

DOE may make use of other publicly available information and the history of an applicant's performance under DOE or other Federal agency awards. Depending on the severity of the findings and whether the findings were resolved, DOE may elect not to fund the applicant.

In addition to this review, DOE must comply with the government-wide suspension and debarment guidance in 2 CFR Part 180 and DOE suspension and debarment requirements in 2 CFR 910. DOE must also require recipients to comply with these requirements. These requirements restrict making Federal awards, subawards, and contracts with certain parties that are debarred, suspended, or otherwise excluded from receiving Federal awards or participating in Federal awards.

The risk assessment may include assessment of community opposition, potential labor disputes, availability of a skilled workforce, public and worker health and safety considerations, etc.

The applicant should consider that for large construction projects, DOE may require a Project Labor Agreement (PLA), an agreement between a private entity (or entities) and a labor organization (or organizations) representing individuals who will be working on a construction project. Assessment of applicability will be conducted on a case-by-case basis.

Before making a Federal award, with a total amount of Federal share greater than the simplified acquisition threshold, DOE must review and consider any information about the applicant that is in the responsibility/qualification records available in SAM.gov (see 41 U.S.C. 2313). The applicant can review and comment on any information in the responsibility/qualification records available in SAM.gov. Before making decisions in the risk review required by 2 CFR § 200.206, DOE will consider any comments by the applicant, along with information available in the responsibility/qualification records in SAM.gov.

Award Notices

Concept Paper Notifications

DOE will notify applicants of its determination to encourage or discourage the submission of an application. DOE will post these notifications to OCED eXCHANGE.

Applicants may submit an application even if they receive a notification discouraging them from doing so. By discouraging the submission of an application, DOE intends to convey its lack of programmatic interest in the proposed project. Such assessments do not necessarily reflect judgments on the merits of the proposed project. The purpose of the Concept Paper phase is to save applicants the considerable time and expense of preparing an application that is unlikely to be selected for award negotiations.

Application Notifications

DOE may stagger its selection determinations. As a result, some applicants may receive their notification letter in advance of other applicants. DOE will notify applicants of its determination via a notification letter by email to the technical and administrative points of contact designated by the applicant in OCED eXCHANGE. The notification letter will inform the applicant whether or not its application was selected for award negotiations. Alternatively, DOE may notify one or more applicants that a final selection determination on particular applications will be made at a later date, subject to the availability of funds or other factors.

Successful Applicants

Receipt of a notification letter selecting an application for award negotiations does not authorize the applicant to commence performance of the project. DOE's selection of an application for award negotiations is not a commitment by DOE to issue an award. Applicants do not receive an award until award negotiations are complete and the Grants and Agreements Officer executes the funding agreement, accessible by the recipient in FedConnect.

Applicants must designate a primary and a backup point-of-contact in OCED eXCHANGE with whom DOE will communicate to conduct award negotiations.

The applicant must be responsive during award negotiations by providing requested documentation, including post-selection documentation, and meet the negotiation deadlines. If the applicant fails to do so or if award negotiations are otherwise unsuccessful, DOE will cancel the award negotiations and rescind the selection. DOE reserves the right to terminate award negotiations at any time for any reason. More information is available in the *NOFO Supplemental Requirements* document located on the Funding Opportunities section of the Apply for Funding page.

Alternate Selection Determinations

In some instances, an applicant may receive a notification that its application was not selected for award and DOE designated the application to be an alternate. As an alternate, DOE may consider the application for Federal funding in the future. A notification letter stating the application is designated as an alternate does not authorize the applicant to commence performance of the project. DOE may ultimately determine to select or not select the application for award negotiations.

Unsuccessful Applicants

DOE will promptly notify in writing each applicant whose application has not been selected for award or whose application cannot be funded because of the unavailability of appropriated funds.

Award Conditions and Reporting

Recipients of an award made under this NOFO must comply with all applicable Federal, state, and local laws, regulations, DOE policy and guidance, instructions in this NOFO, and the award terms and conditions. Recipients must require subrecipients' compliance with all applicable requirements.

STEP 5: LEARN ABOUT POST-SELECTION AND POST-AWARD REQUIREMENTS

IN THIS STEP:

Post-Selection Information Requests and Submissions

Post-Award Requirements and Administration

Terms and Conditions

Reporting

NEPA Compliance

Subrecipients and Contractors

Administrative Requirements

Post-Selection Information Requests and Submissions

If selected for award negotiations, DOE reserves the right to require that selected applicants provide additional or clarifying information regarding the application submissions, the project, the project team, the award requirements, and any other matters related to the anticipated award.

To reduce burdens in the application process required under Memorandum M-24-11, Reducing Burden in the Administration of Federal Financial Assistance, DOE has instituted Post-Selection Information Requests and Submissions procedures. These procedures allow certain elements of an application to be submitted later in the application process, either before merit review or after merit review when the application is under consideration for funding.

Applicants will be notified (primarily by email) when Post-Selection Information is needed. This notification is not a Notice of Award, nor should it be construed to be an indicator of possible funding. Applicants should only submit this information when requested. DOE will notify an applicant as to what documents and materials to submit, the format required, and where and when to submit. Information requested by DOE could include details of the pre-FEED, FEED, Class VI Permit, and completed pre-award and updated information regarding technology development completed before selection.

The Post-Selection Information Requests and Submissions are detailed in the *NOFO Supplemental Requirements* document located on the Funding Opportunities section of the Apply for Funding page. Please review this document before applying.

NOTE: These submissions are not requested during the initial application process.

Post-Award Requirements and Administration

If applicants are selected for funding, DOE will require 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, as applicable; Davis-Bacon Act requirements, as applicable; Foreign Entity Participation and Foreign Work Waiver; BIL-Specific Requirements; Fraud, Waste and Abuse requirements; Safety, Security, and Regulatory requirements; and Environmental Review in accordance with NEPA requirements.

The Post-Award Requirements and Administration are detailed in the *NOFO Supplemental Requirements* document located on the Funding Opportunities section of the Apply for Funding page. Please review this document before applying.

Terms and Conditions

The OCED award terms and conditions are determined by statutory, regulatory, and policy requirements, as well as the circumstances of each individual award. If selected for funding, the applicant must apply the terms and conditions of the award to all subrecipients (and contractors, as appropriate).

The award terms will consist of the three distinct documents, the Cooperative Agreement Standard Terms and Conditions, Cooperative Agreement Program and Award-Specific Terms and Conditions, and Cooperative Agreement Intellectual Property Terms and Conditions.

The *Cooperative Agreement Standard Award Terms and Conditions*, located on the Award Terms and Conditions page, apply to all OCED cooperative agreement awards.

The Program and Award-Specific and the Intellectual Property Terms and Conditions will be unique to each award.

Reporting

DOE must measure performance to show achievement of program goals and objectives, share lessons learned, improve program outcomes, and foster the adoption of promising practices. Project vision and objectives will be established during negotiations and incorporated into the award.

To clearly communicate the specific reporting requirements to meet the program goals and objectives in the Federal award, DOE combined the requirements into one document, the Federal Assistance Reporting Checklist. This document provides any expected outcomes (such as outputs, service performance, or public impacts of any of these), indicators, targets, baseline data, or data collections that the applicant will be responsible for measuring and reporting. The Federal Assistance Reporting Checklist is part of the award agreement. See the *NOFO Supplemental Requirements* document located on the Funding Opportunities section of the Apply for Funding page. for more information.

DOE may require specific data collection to track progress toward key departmental goals: ensuring equity, investing in quality jobs, boosting domestic manufacturing, reducing GHG emissions, and advancing a pathway to private sector deployment. Examples of data that may be collected include:

- New manufacturing production or recycling capacity
- Jobs data, including:
    - Number and types of jobs provided, wages and benefits paid
    - Workforce demographics, including local hires
    - Efforts to minimize risks of labor disputes and disruptions
    - Dollar value of contributions to worker training; number of new employee certificates and training credentials; ratio of apprentice- to journey-level workers employed

  - Number of individuals trained, number of trainees placed in new full-time employment, number of trainings partnering with community-based organizations or labor unions (if applicable)
- Equity data, including:
  - Underrepresented businesses acting as vendors and subcontractors for bids on supplies, services, and equipment
  - Value, number, and type of partnerships with MSIs
  - Community engagement process and events
  - Other relevant indicators from the CBP
- Number and type of energy-efficient and clean energy equipment installed
- Funding leveraged and follow-on-funding
- Intellectual property generation and utilization

National Environmental Policy Act Compliance

All Federally funded projects are subject to review in accordance with the National Environmental Policy Act (NEPA; 42 U.S.C. 4321, et seq.), which requires Federal agencies to integrate environmental values into their decision-making processes by considering the potential environmental impacts of their proposed actions. For additional background on NEPA, please see DOE's Office of NEPA Policy and Compliance and OCED's Guide to NEPA websites.

Selectees and recipients will be required to provide information to support DOE's execution of the NEPA review processes at multiple points during the financial assistance agreement and will be expected to cooperate fully with DOE in the preparation of the NEPA documents and implementation of the NEPA process.

After selection, Selectees will be required to prepare an environmental considerations summary (ECS) for all proposed Phase 1 activities to inform DOE's NEPA review for Phase 1. Before the end of Phase 1, recipients will be required to prepare an ECS for all proposed Phase 2 activities to inform DOE's NEPA review for Phase 2.

During Phase 1, recipients will be required to prepare an environmental information volume (EIV) for all proposed Phase 3 and 4 activities. OCED has prepared guidance on preparation of the EIV to assist recipients in preparing a high-quality and complete deliverable. The EIV provides comprehensive environmental information about the proposed project and will be used by DOE to determine what level of NEPA review (categorical exclusion, environmental assessment, or environmental impact statement) is required before entering into a Phase 3 financial assistance agreement (e.g., before commencing construction). At DOE's discretion, an ECS for proposed Phase 3 and 4 activities could be required instead of an EIV. The required NEPA review for Phases 3 and 4 will be completed during Phase 2.

Depending on the scope and scale of the proposed project, the baseline environmental conditions at the proposed project site, and the potential environmental effects that could result from the proposed project, an environmental assessment (EA) or environmental impact statement (EIS) may be required. If an EA or EIS is required, DOE expects the recipient to hire a NEPA Contractor to prepare the EA or EIS at the direction, and on behalf, of DOE. The cost and time associated with completion of an EA or EIS should be incorporated into the project schedule and budget.

Subrecipients and Contractors

All subrecipient and contractor relationships must comply with all Federal regulations for financial assistance as defined by 2 CFR 200.

Refer to 2 CFR 200.331, "subrecipient and contractor determinations," to determine whether an entity should be a subrecipient or contractor. To assist Applicants in determining the difference between a subrecipient and a contractor, please refer to the "subrecipient vs. contractor checklist," developed by the Association of Government Accountants. A DOE/NNSA and non-DOE/NNSA FFRDC may be proposed as a subrecipient on another entity's application.

Characteristics that support the classification of the non-Federal entity as a subrecipient include when the non-Federal entity:

1. Determines who is eligible to receive what Federal assistance.
2. Has its performance measured in relation to whether objectives of a Federal program were met.
3. Has responsibility for programmatic decision-making.
4. Is responsible for adherence to applicable Federal program requirements specified in the Federal award.
5. In accordance with its agreement, uses the Federal funds to carry out a program for a public purpose specified in an authorizing statute, as opposed to providing goods or services for the benefit of the pass-through entity.

All contractual agreements must be compliant with Federal regulations for competitive procurement as outlined in 2 CFR 200.320. Characteristics indicative of a procurement relationship between the non-Federal entity and a contractor are when the contractor:

1. Provides the goods and services within normal business operations.
2. Provides similar goods or services to many different purchasers.
3. Normally operates in a competitive environment.
4. Provides goods or services that are ancillary to the operation of the Federal program.
5. Is not subject to compliance requirements of the Federal program as a result of the agreement, though similar requirements may apply for other reasons.

See the Subaward and Contract Review Guidance in the General Negotiation Guidance section in the Award Negotiations page.

Administrative Requirements

Foreign Travel

If international travel is proposed for your project, please note that your organization must comply with the International Air Transportation Fair Competitive Practices Act of 1974 (49 U.S.C. § 40118), commonly referred to as the "Fly America Act," and implementing regulations at 41 CFR 301-10.131 through 301-10.143. The law and regulations require air transport of people or property to, from, between, or within a country other than the United States, the cost of which is supported under this award, to be performed by or under a cost-sharing arrangement with a United States flag carrier, if service is available. Foreign travel costs are allowable only with the written prior approval of the Grants and Agreements Officer assigned to the award.

Prohibition Related to Malign Foreign Talent Recruitment Programs

As required by law,[36] senior/key personnel participating in a Malign Foreign Talent Recruitment Program[37] are prohibited from participating in projects selected for federal funding under this NOFO. Should an award result from this NOFO, the recipient must exercise ongoing due diligence to reasonably ensure that no such individuals participating on the DOE-funded project are participating in a Malign Foreign Talent Recruitment Program. Consequences for violations of this prohibition will be determined according to applicable law, regulations, and policy. Further, the recipient must notify DOE within five (5) business days upon learning that an individual on the project team is or is believed to be participating in a foreign government talent recruitment program of a foreign country of risk. DOE may modify and add requirements related to this prohibition to the extent required by law.

[36] See sections 10631-10632 of P.L. 117-167 (42 USC 19231-19232); OSTP-Foreign-Talent-Recruitment-Program-Guidelines.pdf (whitehouse.gov).
[37] Malign Foreign Talent Recruitment Program is defined in Section 10638(4) of P.L. 117-167.

See the What is a Malign Foreign Talent Recruitment Program and What is the Prohibition Related to Malign Foreign Talent Recruitment Programs in the *NOFO Supplemental Requirements* document located on the Funding Opportunities section of the Apply for Funding page.

Updated Current and Pending Support

If an application is selected for award negotiations, the selectee must submit: 1) current and pending support disclosures and resumes for any new senior/key personnel, and 2) updated disclosures if there have been any changes to the current and pending support submitted with the Application.

Throughout the life of the award, the recipient has an ongoing responsibility to submit: 1) current and pending support disclosure statements and resumes for any new senior/key personnel at the recipient and subrecipient level, and 2) updated disclosures if there are changes to the current and pending support disclosures previously submitted to DOE. See the *What is the Current and Pending Support Disclosure Update?*, in the *NOFO Supplemental Requirements* document located on the Funding Opportunities section of the Apply for Funding page.

Export Control

The United States government regulates the transfer of information, commodities, technology, and software considered to be strategically important to the United States to protect national security, foreign policy, and economic interests without imposing undue regulatory burdens on legitimate international trade. There is a network of federal agencies and regulations that govern exports that are collectively referred to as "Export Controls."

All recipients and subrecipients are responsible for ensuring compliance with all applicable United States Export Control laws and regulations relating to any work performed under a resulting award.

The recipient must immediately report to DOE any export control investigations, indictments, charges, convictions, and violations, at the recipient or subrecipient level, and provide the corrective action(s) to prevent future violations.

Waiver Requests for Foreign Entity Participation and Foreign Work

Waiver for Foreign Entity Participation

Many of the technology areas DOE funds fall in the category of critical and emerging technologies (CETs). CETs are a subset of advanced technologies that are potentially significant to United States national and economic security.[38] For projects selected under this NOFO, all recipients and subrecipients must be organized, chartered, or incorporated (or otherwise formed) under the laws of a state or territory of the United States; have majority domestic ownership and control; and have a physical location for business operations in the United States. To request a waiver of this requirement, an applicant must submit a waiver request in the Application.

Waiver Criteria

Foreign entities seeking to participate in a project funded under this NOFO must demonstrate to the satisfaction of DOE that:

a. Its participation is in the best interest of the United States industry and United States economic development;
b. The project team has appropriate measures in place to control sensitive information and protect against unauthorized transfer of scientific and technical information;
c. Adequate protocols exist between the United States subsidiary and its foreign parent organization to comply with export control laws and any obligations to protect proprietary information from the foreign parent organization;
d. The work is conducted within the United States; and
e. The foreign entity will satisfy other conditions that may be deemed necessary by DOE to protect United States government interests.

Content for Waiver Request

A Foreign Entity waiver request must include the following:

a. Information about the entity: name, point of contact, physical address, and proposed type of involvement in the project;
b. Country of incorporation, the extent of the ownership/level control by foreign entities, whether the entity is state owned or controlled, a summary of the ownership breakdown of the foreign entity, and the percentage of ownership/control by foreign entities, foreign shareholders, foreign state, or foreign individuals. In all cases, the foreign country in question should be clearly identified;
c. The rationale for proposing a foreign entity participate (must address criteria above);
d. A description of the project's anticipated contributions to the United States economy;
    - How the project will benefit the United States, including manufacturing, contributions to employment in the United States and growth in new markets and jobs in the United States;
    - How the project will promote manufacturing of products and/or services in the United States;

[38] See Critical and Emerging Technologies List Update (whitehouse.gov).

e. A description of how the foreign entity's participation is essential to the project;
f. A description of the likelihood of Intellectual Property (IP) being created from the work and the treatment of any such IP; and
g. Countries where the work will be performed. (Note: if any work is proposed to be conducted outside the United States, the applicant must also complete a separate request foreign work waiver.)

DOE may also require a risk assessment with respect to IP and data protection protocols that includes the export control risk based on the data protection protocols, the technology being developed, and the foreign entity and country. These submissions could be prepared by the project lead (if not the prime recipient), but the prime recipient must make a representation to DOE as to whether it believes the data protection protocols are adequate and make a representation of the risk assessment – high, medium, or low risk of data leakage to a foreign entity. DOE may require additional language be added to any agreement or subagreement to protect IP, mitigate risk, or other related purposes.

DOE may require additional information before considering the waiver request. DOE's decision concerning a waiver request is not appealable.

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

All work funded under this NOFO must be performed in the United States. To seek a waiver of the Performance of Work in the United States requirement, the applicant must submit a waiver request in the Application. A separate waiver request must be submitted for each entity proposing performance of work outside of the United States.

Overall, a waiver request must demonstrate to the satisfaction of DOE that it would further the purposes of this NOFO and is otherwise in the economic interests of the United States to perform work outside of the United States. A request for a foreign work waiver must include the following:

1. The rationale for performing the work outside the United States ("foreign work");
2. A description of the work proposed to be performed outside the United States;
3. An explanation as to how the foreign work is essential to the project;
4. A description of the anticipated benefits to be realized by the proposed foreign work and the anticipated contributions to the U.S. economy;
5. The associated benefits to be realized and the contribution to the project from the foreign work;
6. How the foreign work will benefit the United States, including manufacturing, contributions to employment in the United States and growth in new markets and jobs in the United States;
7. How the foreign work will promote manufacturing of products and/or services in the United States;
8. A description of the likelihood of IP being created from the foreign work and the treatment of any such IP;

9. The total estimated cost (DOE and recipient cost share) of the proposed foreign work;
10. The countries in which the foreign work is proposed to be performed; and
11. The name of the entity that would perform the foreign work.

DOE may require additional information before considering the waiver request. DOE's decision concerning a waiver request is not appealable.

STEP 6:
CONTACTS AND SUPPORT

IN THIS STEP:

Agency Contacts

Helpful Websites

Acronyms

Agency Contacts

NOFO and Program Questions

Carbon Capture Demonstration Projects Program
Topic Area 1 and Topic Area 3
Project Management Division

U.S. Department of Energy, Office of Clean Energy Demonstrations

Email: cc-oced@hq.doe.gov. Note that DOE staff are only allowed to communicate with applicants about this NOFO by posting responses to questions received through this email address above.

You must submit questions to this email address (cc-oced@hq.doe.gov) at least three business days before the concept paper or application due date and time.

Carbon Capture Large-Scale Pilot Projects Program
Topic Area 2
Project Management Division

U.S. Department of Energy, Office of Clean Energy Demonstrations

Email: cc-oced@hq.doe.gov. Note that DOE staff are only allowed to communicate with applicants about this NOFO by posting responses to questions received through this email address above.

You must submit questions to this email address (cc-oced@hq.doe.gov) at least three business days before the concept paper or application due date and time.

Grants.gov

Grants.gov provides 24/7 support. You can call 1-800-518-4726 or email support@grants.gov. Keep a copy of your ticket number.

SAM.gov

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

Helpful Websites

Office of Clean Energy Demonstrations | Department of Energy

OCED Application Process

Award Negotiations

Acronyms and Abbreviations

AACE	Association for the Advancement of Cost Engineering
ANC	Alaska Native Corporation
ARL	adoption readiness level
BIL	Bipartisan Infrastructure Law
BoP	balance of plant
CapEx	capital expenditures
CBC	Community Benefits Commitment
CBP	Community Benefits Plan
CCUS	carbon capture, utilization, and storage
CETs	critical and emerging technologies
CHIPS	Creating Helpful Incentives to Produce Semiconductors
CI	carbon intensity
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
Co-PD	co-project director
Co-PI	co-principal investigator
DEIA	Diversity, Equity, Inclusion, and Accessibility
DOE	United States Department of Energy
EA	environmental assessment
EBITDA	Earnings Before Interest, Taxes, Depreciation and Amortization
ECS	environmental considerations summary

EHS	environmental, health, and safety
EIS	environmental impact statement
EIV	environmental information volume
EMP	Environmental Management Plan
EPA	U.S. Environmental Protection Agency
EPC	engineering, procurement, and construction
EPCO	engineering, procurement, construction, and operations
FECM	Office of Fossil Energy and Carbon Management
FEED	front-end engineering design
FFRDC	Federally Funded Research and Development Center
FID	final investment decision
FOA	Funding Opportunity Announcement
FOIA	Freedom of Information Act
FY	fiscal year
GHG	greenhouse gas
GPU	gas permeation unit
HBCUs	Historically Black Colleges and Universities
IPMP	Intellectual Property Management Plan
IPS	integrated project schedule
IRR	internal rate of return
LCA	life cycle assessment
LCOE	levelized cost of electricity
LCOP	levelized cost of product
LGBTQ+	lesbian, gay, bisexual, transgender, and queer
LMI	Low and Minority Income
LOA	letter of agreement
LPO	Loan Programs Office
MB	megabytes
MOU	memorandum/memoranda of understanding

MRV	Measurement, reporting, and verification
MSI	Minority-Serving institution
NDA	non-disclosure acknowledgement
NEPA	National Environmental Policy Act
NETL	National Energy Technology Laboratory
NG	natural gas
NGCC	natural gas combined cycle
NNSA	National Nuclear Security Administration
NNSA	National Nuclear Security Administration
NOFO	Notice of Funding Opportunity
NSF	National Science Foundation
O&M	operations and maintenance
OCED	Office of Clean Energy Demonstrations
OCS	Outer Continental Shelf
OFAC	Department of the Treasury Office of Foreign Assets Control
OMB	Office of Management and Budget
OMI	Other Minority Institution
OpEx	operating expenses
ORCID	Open Researcher and Contributor ID
PD	project director
PFD	process flow diagram
PI	principal investigator
PII	personally identifiable information
PLA	Project Labor Agreement
PMP	project management plan
R&D	research and development
RD&D	research, development, and demonstration
RFI	request for information
RMP	risk management plan

ROE	return on equity
ROW	rights of way
SAM	System for Award Management
SMART	specific, measurable, achievable, realistic, and time-bound
SSN	Social Security Number
T&S	transportation and storage
TA1	Topic Area 1
TA2	Topic Area 2
TA3	Topic Area 3
TDS	total dissolved solids
TEA	techno-economic analysis
TRL	technology readiness level
UCC	Uniform Commercial Code
UEI	Unique Entity Identifier
V&V	verification and validation
WBS	work breakdown structure