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

Regional Direct Air Capture Hubs – Recurring Program

Funding Opportunity Number: DE-FOA-0003442

Concept Paper due: January 31, 2025, 11:59 pm ET

Pre-Application Submission due: January 31, 2025, 11:59 pm ET

Application due: July 31, 2025, 11:59 pm ET

Questions about this NOFO? Email: DAC-OCED@hq.doe.gov

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

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Before you begin

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. Doing so 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 have an active Grants.gov registration. Doing so requires a Login.gov registration as well.

Apply by

Concept Papers are due on January 31, 2025, 11:59 p.m. Eastern Time.

Pre-Application Submissions are due on January 31, 2025, 11:59 p.m. Eastern Time.

Applications are due by July 31, 2025, 11:59 p.m. Eastern Time.

STEP 1: REVIEW THE FUNDING OPPORTUNITY

IN THIS STEP

Basic Information

Eligibility

Program Description

Basic Information

Funding Detail

Announcement Type: Initial

Expected total available funding: up to $1,800,000,000, beginning in FY 2026

Expected number and type of awards:

Topic Area 1: 1 – 3 cooperative agreements or awards through the Department of Energy's Other Transaction (OT) authority, each up to $250M Federal share

Topic Area 2: 4 – 8 cooperative agreements, each up to $50M Federal share

Topic Area 3: 2 – 6 cooperative agreements, each up to $600M Federal Share

Expected dollar amount of individual awards: Up to $600,000,000 (depending on Topic Area).

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

Depending on the number and quality of Applications, DOE may not award the full NOFO funding amount. As funds remain available, DOE expects to issue additional re-openings to support the program's strategy, and/or additional strategies and approaches or incorporate lessons learned from earlier application rounds.

Agency Contact Information

Office of Clean Energy Demonstrations
U.S. Department of Energy
1000 Independence Ave SW
Washington, D.C. 20585
Email: OCED@hq.doe.gov
Phone: 202-586-OCED

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

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

KEY FACTS

Funding Opportunity Title:

Regional Direct Air Capture Hubs – Recurring Program

Funding Opportunity Number:

DE-NOFO-0003442

Assistance Listing:

81.255

KEY DATES

Concept Paper Deadline:

January 31, 2025, 11:59 pm

Pre-Application Submission Deadline:

January 31, 2025, 11:59 pm

Application Deadline:

July 31, 2025, 11:59 pm

Anticipated Selection:

December, 2025

Anticipated Timeframe for Completion of Award Negotiations:

Spring, 2026

Executive Summary

The Regional Direct Air Capture Hubs Recurring Program ("the Program")(comprising this initial Notice of Funding Opportunity (NOFO) and any subsequent re-openings and related solicitations) is designed to provide direct air capture (DAC) technology and project developers with support at various stages on their commercialization path towards the realization of four regional DAC hubs, building on the momentum and potential of projects selected under the first Funding Opportunity Announcement ("FOA-1") (DE-FOA-0002735), other DOE-supported initiatives, and privately funded activities.

The Program seeks to realize the potential of the diverse DAC technologies that have achieved or are approaching commercial readiness at or above Technology Readiness Level (TRL) 7 (as defined by DOE G 413.3-4A Technology Readiness Assessment Guide, 2011), while addressing the most critical Commercial Adoption Readiness Level (ARL) obstacles to their adoption and scaling.

The Program will support the DAC industry to achieve the Bipartisan Infrastructure Law (BIL) goals of four regional 1,000,000 tonns per annum (TPA) hubs by funding three complementary project types: large-scale commercial DAC facilities ("LSCs," Topic Area 3), mid-scale commercial DAC facilities ("MSCs," Topic Area 2), and infrastructure access platforms for commercializing new DAC technologies ("IAPs," Topic Area 1). The objectives of the Program are to:

- Encourage the development and expansion of four regional DAC hubs by funding the large-scale demonstration facilities that will comprise those hubs
- Provide complementary support for DAC developers' first commercial demonstration facilities as they advance to large scale, including facilitating access to reliable low carbon energy sources and CO_2 storage or utilization

The Program is authorized under the Regional Direct Air Capture (DAC) Hubs Program ("Regional DAC Hubs") (42 U.S.C. § 16298d(j)) established by the Bipartisan Infrastructure Law.

The following entities are eligible to apply as recipients: (1) institutions of higher education; (2) for-profit organizations; (3) nonprofit organizations; (4) state and local governments; (5) and Indian Tribes. See the Applicant Eligibility Guidance on the Apply for Funding Opportunities page for details.

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, and
- Indian Tribes, as defined in section 4 of the Indian Self-Determination and Education Assistance Act, 25 U.S.C. § 5304[1]

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

U.S. Department of Energy (DOE)/National Nuclear Security Administration (NNSA) Federally Funded Research and Development Centers (FFRDC)s are eligible to apply for funding as a subrecipient but are not eligible to apply as a recipient. 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."

[1] "**Indian Tribe**," for the purposes of this NOFO and as defined in in section 4 of the Indian Self-Determination and Education Assistance Act (25 U.S.C. § 5304), means any Indian tribe, band, nation, or other organized group or community, including any Alaska Native village or regional or village corporation as defined in or established pursuant to the Alaska Native Claims Settlement Act (85 Stat. 688) [43 U.S.C. § 1601, et seq.], which is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians.

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 Treasury's Sanctions Program Specially Designated Nationals List are prohibited from doing business with the United States government and are not eligible. See OFAC - Sanctions List Service (treas.gov).

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.

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

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.

Project Eligibility

Specific project eligibility criteria for each Topic Area are discussed in Expected Goals, Indicators, Targets, Baseline Data, and Data Collection. The following applies to all Topic Areas.

The term "eligible project" means "a direct air capture project or a component project of a regional direct air capture hub." (42 U.S.C. § 16298d(j)(1)(A)).

The term "regional direct air capture hub" means "a network of direct air capture projects, potential carbon dioxide utilization off-takers, connective carbon dioxide transport infrastructure, subsurface resources, and sequestration infrastructure located within a region." (42 U.S.C. § 16298d(j)(1)(B)).

Cost Sharing

The cost share must be at least 50% of the total project costs for demonstration projects or a commercial application activity. Each Budget Period of the project must also meet the 50% cost share requirement 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.[2] 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. 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.

Program Description

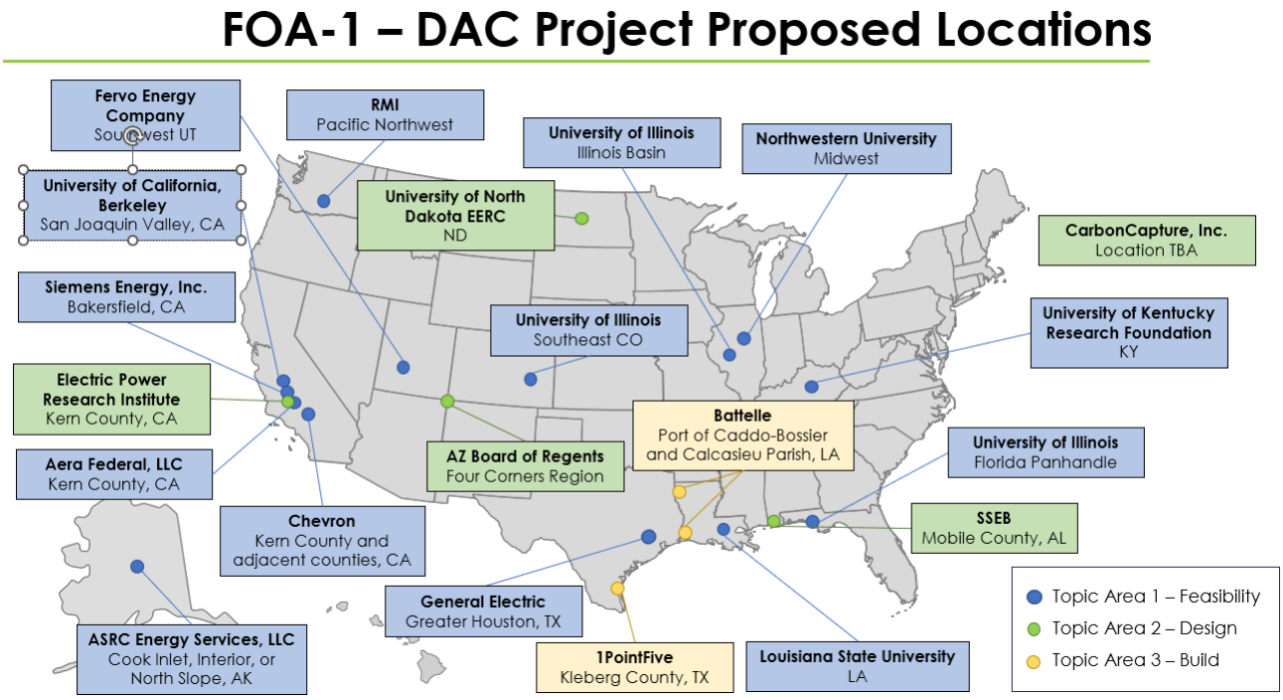
Purpose

Congress directed DOE to responsibly catalyze a commercial DAC industry in the US and establish the United States as the global leader in developing and demonstrating the commercial viability of direct air capture technology. To do so, the Program will contribute to the following goals:

1. *Commercial scale-up*: validate commercial scale demonstrations for a diversity of DAC technologies and facilities concepts that build confidence to catalyze private sector capital formation. This includes assessing technology scale-up risks, cost, performance, business models, host site, infrastructure, offtakers, markets and financing structures for the most promising technologies and approaches.
2. *Infrastructure*: build out the related infrastructure to sustainably scale up DAC technologies and facilities concepts, including clean power generation, heat integration, transport, and secure geologic storage and/or CO_2 conversion pathways.
3. *Climate impact*: prove at commercial scale that DAC technologies and different facilities concepts can maximize net-negative emissions goals as well as address other potential environmental impacts (e.g., water availability for at-scale projects).
4. *Responsible demonstrations*: develop the business models and Community Benefit Plans (CBPs) that provide the greatest positive benefits to communities while minimizing negative impacts, invest in the American workforce, advance Diversity, Equity, Inclusion, and Accessibility (DEIA), and promote strong Tribal, community, and workforce engagement.

[2] 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.

The boundaries of the four regional DAC hubs are not yet determined, and once determined, may be subject to revision through future offering rounds, changes to project locations, and private sector activities. Applicants will not be subject to geographic boundaries or restrictions for this first (CY24) NOFO opening, although future competitive funding rounds may have such restrictions. The following graphic shows the proposed locations of FOA-1 projects; the existing projects have already formed rough clusters, which, together with the projects selected under this NOFO, will inform the future definition of regional hubs:



Funding Priorities

Funding will be offered through the three complementary Topic Areas described below.

Topic Area 1: Infrastructure Access Platforms

Through TA-1, DOE intends to provide funding to create a host site—or infrastructure access platform (IAP)—for DAC developers at the early stages of commercialization (e.g., small-scale and mid-scale facilities). These IAP will give DAC developers a place to build and operate facilities with access to shared post-regeneration CO_2 conditioning processes, such as dehydration, oxygen removal, and compression. Additionally, IAPs will be expected to provide access to the other critical elements that are required to make a DAC facility commercially viable, namely, 1) clean energy and 2) CO_2 offtake, such as geologic storage, enhanced oil recovery, integration into a carbon-based conversion process or utilization in a valuable product, and/or a pipeline or other mode of CO_2 transportation to those facilities if not co-located at the IAP.

Some of the DOE and privately funded DAC projects already advancing in the U.S. may themselves be good candidates for IAPs. Funding will go towards the design, permitting, National Environmental Policy Act (NEPA) review, community benefits activities, construction, and operation of an IAP.

Awards under TA-1 of this NOFO may, at the discretion of OCED, be executed through Other Transaction (OT) agreements and will follow a customized project phasing structure. Recipients funded through Cooperative Agreements will be expected to execute all four phases of their project.

Selectees funded through Cooperative Agreements will complete OCED's Phase 1 (Detailed Project Planning) before being considered and approved to continue into Phase 2 (Selectees or Recipients must complete each project Phase before being considered and approved for the next Phase). All applicants will be evaluated, in part, based on their Applications and demonstrated readiness for Phases 1 through 4.

DOE anticipates several profiles as potential locations for IAPs. Existing test centers, industrial facilities, power generation facilities, CO_2 conversion facilities, characterized CO_2 storage reservoirs, CO_2 pipeline hubs, and other locations may already have one or more of the critical elements for establishing an IAP. A stand-alone greenfield development of the clean energy and carbon transportation and storage resources for an IAP would also be eligible. DOE will welcome Applications from a diverse set of applicants to find the host sites that maximize the impact of Federal funding, provide benefits to DAC developers, and have a high potential for project success based on economic viability and community support. Potential TA-1 applicants are encouraged to explore additionality and other measurement, reporting, and verification requirements related to energy inputs that may be required by DAC tenants.

To be considered for TA-1, the applicant must submit the following: 1) plan to create access to, or develop, energy and offtake (i.e., CO_2 storage, transport, utilization) resources or services, 2) business plan, 3) initial list of potential DAC tenants, 4) plan to develop additional DAC-related balance-of-plant infrastructure, and 5) Community Benefits Plan including analysis of local community support or opposition to DAC.

Projects may propose a variety of carbon offtake applications, including but not limited to, permanent geologic storage and utilization in short-lived or long-lived products. Projects that vent their CO_2 ("catch-and-release") will not be considered.

Topic Area 2: Mid-Scale Commercial DAC Facilities

Through TA-2, DOE seeks to fund Mid-Scale Commercial (MSC) DAC facilities as supplemental contributors to the creation and expansion of four regional DAC hubs with megaton capacity. Funding may go towards the design, permitting, NEPA review, community benefits activities, construction, and early operation of an MSC facility. As needed, funding may also support developing or creating access to clean energy and carbon transportation, storage, and/or utilization facilities and resources. Recipients will be expected to execute all four phases of their project. Applicants will be evaluated, in part, based on their Applications and demonstrated readiness for Phases 1 through 4.

All selectees will complete or demonstrate completion of OCED's Phase 1 (Detailed Project Planning) before being considered and approved to continue into Phase 2 (Selectees or Recipients must complete each project Phase before being considered and approved for the next Phase).

DOE may also offer TA-2 projects funding for early design-phase work (e.g., pre-Front End Engineering and Design (pre-FEED) study or FEED study) for a large-scale facility as a fast-track towards a potential future TA-3 award[3] to shorten the timeline between initial mid-scale and subsequent large-scale facilities. Each MSC facility is expected to target a nominal gross capture capacity of between 2,000 and 25,000 TPA.

Individual Applications may propose one facility or may propose multiple facilities, with the requirement that each facility demonstrates a unique DAC technology, and that each facility individually can meet the Reference Facility[4] readiness and scale requirements at the time of application. Applicants will also need to convey a compelling vision for deploying each technology at a scale of at least 100,000 TPA following a successful mid-scale demonstration, whether at the proposed project site or another site.
Operational lifespan may vary based on the MSC facility's expected role in subsequent large-scale deployments. MSC projects are expected to demonstrate the first commercial application (e.g., integrated with storage or utilization, designed to generate revenue) of a DAC technology at this order-of-magnitude scale.

Projects may propose a variety of carbon offtake applications, including but not limited to, permanent geologic storage, enhanced oil recovery, and utilization in short-lived or long-lived products. Projects that envision their captured CO_2 will be vented ("catch-and-release") will not be considered. Robust Life Cycle Analysis (LCA) and measurement, reporting, and verification (MRV) will be required. Projects will need to demonstrate potential to maximize CO_2 emissions reductions consistent with LCA (i.e., net of emissions associated with process inputs like solvents, sorbents, water, electricity, steam, or other forms of energy).

To be considered for TA-2, the applicant must submit, for each facility proposed, the following Reference Facility data: 1) at least 1,000 hours of testing data from the Reference Facility, 2) validation that all core processes handling capture, regeneration, and energy integration, when integrated, are not less than TRL 6 (as defined by DOE G 413.3-4A Technology Readiness Assessment Guide, 2011), 3) documentation of not less than 1/25th the nominal gross capture capacity of the proposed MSC facility (e.g., a minimum of 80 TPA Reference Facility for a proposed MSC facility of 2,000 TPA). Applicants who do not yet have complete Reference Facility data but can demonstrate their Reference Facility is operational and generating the required data will be considered. Applicants must also submit a Community Benefits Plan including analysis of local community support for or opposition to DAC.

Additionally, DOE will assess risk and readiness by examining any proposed changes to the components, design, materials, integration, or scale of the individual unit operations responsible for core capture, regeneration, and energy integration steps, relative to the Reference Facility. DOE expects that a TA-2 project may propose changes to the design and scale of these elements.

[3] Such additional funding would not be guaranteed and would be at DOE's discretion based on project performance, availability of funds, and other portfolio-level factors.

[4] Reference Facility means a smaller, operational facility utilizing the proposed technology. Requirements for Reference Facilities differ by Topic Area.

Topic Area 3: Large-Scale Commercial DAC Facilities

Through TA-3, DOE seeks to fund Large-Scale Commercial (LSC) DAC facilities as the primary contributors to the creation and expansion of four regional DAC hubs with megaton capacity.

Funding may support the design, permitting, NEPA review, community benefits activities, construction, and early operation of an LSC facility. Funding may also support developing or creating access to clean energy and carbon transportation, storage, and/or utilization facilities and resources. Recipients will be expected to execute all four phases of their project.

Applicants will be evaluated, in part, based on their Applications and demonstrated readiness for Phases 1 through 4. All selectees will complete or demonstrate completion of OCED's Phase 1 (Detailed Project Planning) before being considered and approved to continue into Phase 2 (Selectees or Recipients must complete each project Phase before being considered and approved for the next Phase).

Each LSC facility is expected to target a nominal gross capture capacity of at least 25,000 TPA. Individual Applications may propose one facility or may propose multiple facilities, with the requirement that each facility demonstrates a unique DAC technology, and that each facility individually can meet the Reference Facility readiness and scale requirements at the time of application. Applicants will also need to convey a compelling vision for subsequent deployments of each technology of at least 10x the proposed facility capacity. LSC projects are expected to demonstrate the scale-up of a DAC technology already deployed commercially (e.g., designed to generate revenue) at smaller scale.

Projects may propose a variety of carbon offtake applications, including but not limited to permanent geologic storage, enhanced oil recovery, and utilization in short-lived or long-lived products. Projects that envision captured CO_2 will be vented ("catch-and-release") will not be considered. Robust Life Cycle Analysis (LCA) and measurement, reporting, and verification (MRV) will be required. Projects will need to demonstrate potential to maximize CO_2 emissions reductions consistent with LCA (i.e., net of emissions associated with process inputs like solvents, sorbents, water, electricity, steam, or other forms of energy).

To be considered for TA-3, the applicant must submit, for each proposed facility, the following Reference Facility data: 1) operational data including at least 1,000 hours of continuous operations from a smaller commercial facility, 2) validation that all key processes handling capture, regeneration, and energy integration, when integrated, are not less than TRL 7 (as defined by DOE G 413.3-4A Technology Readiness Assessment Guide, 2011), 3) documentation of not less than 1/25th the nominal gross capture capacity of the proposed LSC facility (e.g., a minimum of 1,000 TPA for a proposed 25,000 TPA facility). Applicants must also submit a Community Benefits Plan including analysis of local community support for or opposition to DAC.

Additionally, DOE will assess risk and readiness by examining any proposed changes to the components, design, materials, integration, or scale of the individual unit operations responsible for core capture, regeneration, and energy integration steps as well as the scale-up of, or changes to, the integrated system. DOE expects that a TA-3 project will propose no changes or relatively few and/or independently validated changes to these elements.

Program Goals and Objectives

This Program aims to support projects that (1) build confidence in the DAC industry through catalyzing commercial scale-up of DAC technologies and related infrastructure, (2) maximize climate impact by proving net-negative emissions goals at commercial scale, and (3) provide the greatest positive benefits to communities.

Through its supported projects, the Program aims to build confidence in the DAC industry by directly addressing several of the key obstacles hindering DAC's commercial adoption, including high delivered costs, infrastructure and siting challenges, high capital costs due to supply chain underdevelopment and technical risk, and community concerns. This Program aims to enable a stronger understanding of the DAC industry's potential to reduce atmospheric carbon through its incorporation of rigorous MRV requirements that support assessment of net-negative emissions at commercial scale.

To achieve the greatest positive benefit from this once-in-a-generation investment in infrastructure, it is critical that BIL-funded projects invest in America's workforce, mitigate potential impacts, and deliver tangible and measurable benefits to impacted communities. Projects that fail to do this may fail to gain social support and may in turn decrease support for future projects.

Award Contribution to Goals and Objectives

TA-1: Projects selected for TA-1 (IAPs) will help to build confidence in the DAC industry by creating access to the support infrastructure that assists in catalyzing commercial scale-up of DAC technologies. TA-1 projects will be expected to achieve this outcome by creating one or more IAPs, each with multiple small-scale or mid-scale DAC tenants hosted at the site and utilizing shared energy and offtake infrastructure that supports multiple tenants advancing to subsequent larger-scale deployments. DOE expects TA-1 IAPs will substantially lower infrastructure, value chain, and project development Adoption Readiness Level (ARL) obstacles for TA-2 projects, FOA-1 technology partners, and other future hub contributors. Ideally, the IAP's business model is self-sustaining without ongoing operational support from DOE.

TA-2 and TA-3: Projects selected for TA-2 (MSC) and TA-3 (LSC) will build confidence in the DAC industry through catalyzing commercial scale-up of DAC technologies and maximize climate impact by proving net-negative emissions goals at commercial scale. TA-2 and TA-3 projects will be expected to achieve these outcomes through successful design, construction, and operation of mid-scale or large-scale DAC facilities, respectively, and infrastructure to support the DAC facility. TA-2's mid-scale facilities will serve as the first commercial validation of a new technology and enable subsequent large-scale demonstrations. TA-3's large-scale facilities will result in the emergence of four megaton DAC hubs and help validate subsequent commercial-scale deployments. TA-2 and TA-3 projects will de-risk technology operations and business models, enabling DAC developers to secure private capital and revenue from the sale of CO_2 or DAC carbon removal credits using credible, third-party MRV.

All Topic Areas: This Program aims to provide the greatest positive benefits to communities through selecting projects across all three topic areas that (1) support meaningful community and workforce engagement; (2) invest in America's workforce; (3) advance diversity, equity, inclusion, and accessibility; and (4) contribute to the greatest positive benefits to communities while minimizing negative impacts. All supported projects will include community benefits commitments to ensure they support these goals.

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

This section details the expected performance goals, indicators, targets, baseline data, data collection, and other outcomes OCED expects recipients to achieve.

Each MSC facility (TA-2) is expected to target a nominal gross capture capacity of between 2,000 and 25,000 TPA. Each LSC facility (TA-3) is expected to target a nominal gross capture capacity of at least 25,000 TPA.

TA-1 (Infrastructure Access Platforms):

At a minimum, by the conclusion of Phase 1, TA-1 Recipients should have completed the activities described below. The continuation decision for the Project to proceed into Phase 2 will be, in part, contingent upon OCED evaluation and acceptance of Recipient's demonstration of expected progress and performance. Continuation decisions for subsequent phases will be based on progress and performance goals to be further defined during award negotiations.

Site Development Plan: Provide comprehensive plan for developing IAP, including all component parts and access (electrical grid-tie, pipeline connections, etc.) and detailed plot plan. Including:

- **Clean Energy Plan:** Discuss plans to source clean or low-carbon electricity and/or heat for multiple for multiple DAC providers. For clean or low-carbon electricity sourcing, provide draft details/options that apply to the project's proposed plans to secure/procure any Power Purchase Agreements (PPAs), Virtual Power Purchase Agreements (vPPAs), Energy Attribute Credits (EACs) from electricity generators, or to directly source electricity from clean or low carbon assets. Describe the process by which the DAC facilities would be integrated with this energy infrastructure.
- **Storage Field Development Plan (if applicable).** Provide Storage Field Development Plan for the selected carbon storage site(s). Plan should: (1) explain the strategy for developing the storage field to maximize its potential utility, status of infrastructure development, and engineering considerations with respect to accepting CO_2 from multiple small plants; (2) describe all elements of the proposed storage field facilities including how site would be connected to transport and/or storage network, and establishing logical order and timing for the development of all anticipated facilities, accounting for changing needs for monitoring and use of pore space and changing CO_2 delivery rates over time; (3) describe ownership of pore space; and (4) present a cost plan over the proposed life of the project. Detailed site characterization of the selected carbon storage site is required to be completed. Carbon storage facilities should have sufficient capacity to store carbon for at least 12 years of operation.

- **UIC Class VI and/or other Permit Application Materials or Offtake Agreement (if applicable).** Provide documentation of the status of Underground Injection Control (UIC) Class VI permit to construct and/or other Federal and state CO_2 storage permits required to construct for the selected CO_2 storage site to the appropriate regulatory agency. All Federal and State CO_2 storage permits must be submitted during Phase 1. If the permit is not granted at the time of beginning Phase 2, the Recipient must provide details on the timing when the permit is expected to be granted. Alternatively, the Recipient must provide details and the status of the offtake agreement.
- **Updated Permitting Workflow Overview.** Provide permitting workflow overview that identifies the relevant and applicable Federal, state, and local codes, regulations, and permitting requirements anticipated to site, construct, implement, and operate the IAP. Overview should be organized by site location and should identify the Authority Having Jurisdiction (AHJ) and relevant regulatory bodies that may have approval authority during the course of the project. DOE recognizes that the material in this overview document will likely change during the award and, as such, will require that it be revised and updated during project execution. DOE encourages Recipients to conduct outreach to AHJs and submit any written confirmation from AHJs regarding the project, if received. Frequent communication with AHJs through the life of the project is encouraged as a means of mitigating permitting delays.
- **Conversion/Utilization Plan (if applicable):** Explain what technologies will convert or utilize the captured CO2. Describe TRLs of these technologies (as defined by DOE G 413.3-4A Technology Readiness Assessment Guide, 2011). Describe the largest demonstration(s) to date and results of demonstration(s). If captured CO_2 will be sold to a third party that is not a project partner, please indicate that and describe the market(s), buyer(s), and end use(s).
- **CO_2 Conditioning Plan (if applicable):** Describe plan for shared balance-of-plant infrastructure at the site (e.g., dehydration, compression, oxygen removal). Describe how the IAP will leverage economies of scale with such equipment across DAC technology providers. Describe how the equipment will be adapted to different flows, timing, and types of CO_2. Describe how produced CO_2 will be compatible with the intended offtake infrastructure.
- **Capacity Evaluation:** Describe the minimally acceptable and maximum DAC capacity that the proposed site could support. Describe potential of the proposed site to expand beyond initial expected capacity.
- Any other elements for developing the IAP.

Business Plan: Describe the commercial feasibility of the project, including intended tenant structure, service models, and other relevant monetization including tax credits. Provide updated projections of expected occupancy, tenant revenues, and operating costs over project lifetime, sources and uses of capital including the Award, ability to service debt, if applicable, and substantiation of ability to provide a reasonable return to equity partners or investors.

Financial Plan: Present a plan to obtain funding for the entire non-DOE share of the total project cost that identifies all sources and uses of project funds. The plan should include a discussion of the overall approach and anticipated schedule to raise required funds for project completion beyond DOE funding.

Recipients should provide a breakdown of all capital sources (e.g., investors and lenders) contemplated, a description of the indicative terms, as available, and a discussion of debt service considerations and credit risks (e.g. interest rate, repayment).

Community Benefits (CB) Plan: Implement meaningful two-way engagement with host communities, Tribes, and workforce, and incorporate feedback into project and future engagement plans. Mechanisms for accountability (e.g., negotiated agreements) should be in development, and partnerships needed to ensure successful community benefits implementation should be in place. Assessments and baselining activities so that project impacts can be measured should be complete. The plan should discuss later phases to ensure benefits are delivered to communities and workers.

Proof of DAC Interest: The project will submit letters of intent from at least one DAC provider expressing interest in working with this site with confirmation that expected climatic, energy, and offtake options would be accessible for their technology and their own business plan.

National Environmental Policy Act (NEPA) Compliance: Provide a complete Environmental Information Volume (EIV). An EIV describes the proposed project, alternatives to the proposed project, the existing environment at the project location(s), and the potential environmental impacts from the project. Follow OCED guidance for preparation of an EIV. Additional information about the EIV, DOE's NEPA requirements, and the role of the applicant in the NEPA process are described in Other Information section of this NOFO.

Environmental Health and Safety (EH&S) Risk Analysis: Provide an EH&S analysis of the proposed site, equipment, utilities integration, and any potential issues with integrating multiple DAC providers on the site. Analysis must include preliminary identification (and estimated quantities) of all potential air and water emissions and solid wastes produced from the site. Include any recommendations from an initial Process Hazard Analysis (PHA) performed.

TA-2 (Mid-Scale Commercial DAC) and TA-3 (Large-Scale Commercial DAC):

At a minimum, by the conclusion of Phase 1, TA-2 and TA-3 Recipients should have completed the activities described below. The continuation decision for Project to proceed into Phase 2 will be, in part, contingent upon OCED evaluation and acceptance of Recipient's demonstration of expected progress and performance.

DAC Technology Description(s): Provide a thorough description and data supporting the efficiency of each DAC technology. The DAC technology and DAC Technology Description, and all associated parameters, should include all processes and requirements to achieve the required carbon dioxide concentration and purity for the proposed downstream transport and storage, or utilization. Provide the current TRL (as defined by DOE G 413.3-4A Technology Readiness Assessment Guide, 2011), Adoption Readiness Level, and manufacturing readiness level and discuss plans for scale-up. Describe key parameters of each DAC technology.

The description of the technology should include, but is not limited to, the following: (1) overall process flow diagrams (including all major flows, any continuous or intermittently fed make-up chemicals or materials, any blowdown and waste flows, and their respective downstream treatment or destination, any water and waste-water treatment, any significant balance-of-plant processes such as air separation units, cooling (evaporative, air, or otherwise), heat pumps and/or other thermal processes); (2) mass and energy balances including, but not limited to, all material and energy flows crossing the DAC technology battery limits, specific energy consumption, DAC technology product composition (including carbon dioxide concentration, water concentration, concentration of other species), mass and energy balances to include design case, expected climatic variation, and expected range of process performance (e.g., membrane permeability or sorbent degradation between replacement); (3) resource requirements (i.e., power (including, but not limited to: type (thermal, electrical, etc.), specifications (temperature, latent/sensible heat, AC or DC, voltage, etc.), source(s), amount, load profile, power requirement for proposed project, and power requirement previously demonstrated for the proposed DAC technology), land, water); (4) discussion of the absorption/desorption chemistry and operating cycle for solvent and sorbent systems including sorbent degradation mechanism and impact on the process (as applicable); (5) description of relevant membrane chemistry, including transport mechanism (as applicable); and (6) description of process for DAC technologies that are not sorbent or membrane systems (as applicable).

CO_2 Conversion Technology Description(s) (if applicable): Provide a thorough description and data supporting the efficiency of the CO_2 conversion technology(ies), including the estimated quantity of CO_2 converted to valuable products and results of the LCA of the proposed system done in accordance to the latest NETL CO2U LCA Guidance. Provide the current TRL (as defined by DOE G 413.3-4A Technology Readiness Assessment Guide, 2011), Adoption Readiness Level, and manufacturing readiness levels and discuss plans for scale-up. The description of the technology should include, but is not limited to, the following: (1) overall process flow diagrams; (2) mass and energy balances; (3) resource requirements (e.g., feedstocks, energy, land, water); and (4) discussion of the conversion chemistry and operating cycle (as applicable).

Updated Technology Data Tables: Provide updated data tables for each DAC technology and selected CO_2 conversion (if applicable) technology. Prepare the data tables based on the experimental data obtained at the largest scale the technology has been validated. Note: The template Technology Data Tables are included in the Other Information section of this NOFO.

Life Cycle Analysis (LCA): Provide an updated LCA for the DAC facility that aligns with the most up-to-date project design utilizing data and best practices from NETL's CO2U LCA Guidance Toolkit. The LCA will follow technology-specific guidance (described in Section 4 -Technical Volume, Technical Approach for TA-2 and TA-3). Given the stage of the project, it is expected that there will be significant uncertainty in some portions of the LCA. Uncertainty in the LCA will be bounded through evaluation of multiple scenarios to characterize project sensitivities. To accompany LCA model files, the Recipient will include an LCA narrative summarizing LCA methodology, uncertainties, missing or unknown information, and results.

Techno-Economic Assessment (TEA): Provide a TEA for the proposed DAC Facility. The TEA will be used to validate the assessment of the levelized cost of capture. Recipients must describe their assumptions, rationale, and specific system design boundaries as part of their TEA.

Clean Energy Plan: Discuss plans to source clean or low-carbon electricity and/or heat for multiple for multiple DAC providers. For clean or low-carbon electricity sourcing, provide draft details/options that apply to the project's proposed plans to secure/procure any Power Purchase Agreements (PPAs), Virtual Power Purchase Agreements (vPPAs), Energy Attribute Credits (EACs) from electricity generators, or to directly source electricity from clean or low carbon assets. Describe the process by which the DAC facilities would be integrated with this energy infrastructure.

Project FEED Study: Complete a front-end engineering design (FEED) study for the proposed project. The study boundary includes the DAC system itself, CO_2 conditioning, any supporting equipment (sometimes referred to as "balance-of-plant," offsite, or outside battery limits equipment), and connections to offtake infrastructure, all inclusive of piping, instrumentation, and other customary and relevant aspects of plant design. The FEED should be prepared in accordance with the format provided in Project FEED Requirements located in the Other Information section of this NOFO. Results shall include an AACE International 18R-97 Class 3 capital cost estimate that represents completion of at least 30% of project definition deliverables and expected accuracy of the estimated total project cost (TPC) aligned with AACE Class 3 accuracy range.

Storage Field Development Plan (if applicable): Provide Storage Field Development Plan for the selected carbon storage site(s). Plan should: (1) explain the strategy for developing the storage field to maximize its potential utility, status of infrastructure development, and engineering considerations; (2) describe all elements of the proposed storage field facilities including how site would be connected to transport and/or storage network, and establishing logical order and timing for the development of all anticipated facilities, accounting for changing needs for monitoring and use of pore space and changing CO_2 delivery rates over time; (3) describe ownership of pore space; and (4) present a cost plan over the proposed life of the project. Detailed site characterization of the selected carbon storage site is required to be completed. Carbon storage facilities should have sufficient capacity to store carbon for at least 12 years of operation.

UIC Class VI and/or other Permit Application Materials or Offtake Agreement (if applicable): Provide documentation of the status of Underground Injection Control (UIC) Class VI permit to construct and/or other Federal and state CO_2 storage permits required to construct for the selected CO_2 storage site to the appropriate regulatory agency. All Federal and State CO_2 storage permits must be submitted during Phase 1. If the permit is not granted at the time of beginning Phase 2, the Recipient must provide details on the timing when the permit is expected to be granted. Alternatively, the Recipient must provide details and the status of the offtake agreement.

Environmental Health and Safety (EH&S) Risk Analysis: Provide an EH&S analysis of the proposed DAC technology(ies) integrated with required supporting equipment. Identification (and estimated quantities) of all potential air and water emissions and solid wastes produced from the proposed technology(ies) will form the basis of the EH&S risk analysis. Include any recommendations from an initial Process Hazard Analysis (PHA) performed.

Updated Permitting Workflow Overview: Provide permitting workflow overview that identifies the relevant and applicable Federal, state, and local codes, regulations, and permitting requirements anticipated to site, construct, implement, and operate the DAC facility. Overview should be organized by site location and should identify the Authority Having Jurisdiction (AHJ) and relevant regulatory bodies that may have approval authority during the course of the project. DOE recognizes that the material in this overview document will likely change during the award and, as such, will require that it be revised and updated during project execution.

DOE encourages Recipients to conduct outreach to AHJs and submit any written confirmation from AHJs regarding the project, if received. Frequent communication with AHJs through the life of the project is encouraged as a means of mitigating permitting delays.

Security Framework: Submit and maintain a Security Framework which will identify a Security Coordinator for the project and will further serve to document the Recipient's approach to ensuring compliance with the Award's Security Requirements.

Updated Cybersecurity Plan: Submit updated Cybersecurity plan. For more information, review the Cybersecurity Plan Guidance available on the OCED Award Negotiations webpage. Recipients will be further required to maintain and improve the plan throughout the life of the project and submit updated iterations of the Cybersecurity Plan at each phase of the project.

Technology Maturation Plan(s) (TMP): Prepare a TMP(s) that relates the proposed project work to maturation of the proposed technology, describes plan to reach the required TRL at the end of the project, and describes any known post-project research and development necessary to further mature the technology.

Measurement, Reporting, and Verification (MRV) Plan (if applicable): For Recipients intending to generate carbon dioxide removal or emissions reduction credits, also known as carbon offsets in some contexts, develop a robust MRV plan as part of their Phase 1 activities. The plan must provide specific descriptions of how the Recipient intends to approach relevant equipment (e.g., flow meters, sensors), regulatory requirements (e.g., for Class VI wells), MRV protocol/methodology selection, verifier selection, reporting, associated digital infrastructure, governance, and MRV costs.

No MRV-related equipment procurement or partnership establishment is required in Phase 1, although any existing partnerships and MRV implementation strategies currently utilized by the Recipient can be referenced. In the case of carbon dioxide removal credit generation, the plan must discuss the expected duration of any stored CO_2, long-term monitoring, and associated technical, financial, and legal mechanisms intended to be used to mitigate and manage the risk of reversals. If applicable, the plan must ensure that any intended underground geologic storage of CO_2 would be compliant with Underground Injection Control (UIC) Class VI permitting requirements or regulatory requirements for an equivalent storage mechanism. In the case of emissions reduction credit generation (e.g., associated with the production and sale of CO_2-based sustainable aviation fuel via an expected book-and-claim system), current and dynamic baseline emissions from the conventional product system must be evaluated.

In either case, MRV protocol/methodology selection plans must focus on evaluating options based on their scientific rigor, reliance on physical measurements, compliance with broader legal and regulatory regimes, utilization of third-party verification, and consideration of additionality, permanence, double counting, and market leakage. DOE reserves the right to require complete revision of MRV plans deemed by DOE as insufficient or illegitimate.

Business Plan: Business Plan must demonstrate the commercial feasibility of the proposed technology and related infrastructure.

Recipients should provide updated market analyses including plans to ensure sufficient contracted or merchant demand for the CO_2 conversion products including expected selling price and volume expectations. Recipient should provide an overview of changes to key project parameters including site selection and control considerations, timeline for securing adequate feedstock, and utilities.

Financial Plan: Recipients must present a plan to obtain funding for the entire non-DOE share of the total project cost that identifies all sources and uses of project funds. The plan should include a discussion of the overall approach and anticipated schedule to raise required funds for project completion beyond DOE funding. Recipients should provide a breakdown of all capital sources (e.g., investors and lenders) contemplated, a description of the indicative terms, as available, and a discussion of debt service considerations and credit risks (e.g. interest rate, repayment).

National Environmental Policy Act (NEPA) Compliance: Provide a complete Environmental Information Volume (EIV). An EIV describes the proposed project, alternatives to the proposed project, the existing environment at the project location(s), and the potential environmental impacts from the project. Follow OCED guidance for preparation of an EIV. Additional information about the EIV, DOE's NEPA requirements, and the role of the applicant in the NEPA process are described in Other Information section of this NOFO.

Community Benefits Plan: Implement meaningful two-way engagement with host communities, Tribes, and the workforce, and incorporate feedback into project and future engagement plans. Mechanisms for accountability (e.g., negotiated agreements) should be in development and partnerships needed to ensure successful CB implementation should be in place. Assessments and baselining activities so that project impacts can be measured should be complete. Develop plans for later phases to ensure benefits are delivered to communities and workers.

Integrated Project Schedule. Provide an Integrated Project Schedule (IPS). Should include a Level 3 IPS for Phase 2 and a Level 2 IPS for Phases 3-4 for the proposed DAC facility.

Project Examples

Topic Area 1 – Infrastructure Access Platform: This illustrative project is a hydrogen production facility that is adding carbon capture to its existing steam methane reforming operations and expanding to electrolytic hydrogen production. It has already negotiated a clean electricity power purchase agreement and is beginning construction of a pipeline to a regional carbon dioxide transportation network.

With DOE co-funding, they would develop an unused, adjacent lot as a platform for early commercial direct air capture demonstration. They expect to have capacity to host 2-3 small-scale or mid-scale facilities and 2-3 large pilots simultaneously. They would charge those DAC developers an annual tenant fee based on the square footage required for a tenant facility. The project would also collect revenue from DAC tenants by offering access, at a reasonable mark-up, to the clean electricity and carbon offtake resources it has already procured in larger volumes for its hydrogen production. Other balance-of-plant operations like carbon dioxide dehydration and compression may also be added or provided to be shared across tenants. They have letters of intent from several DAC developers interested in using the site for a variety of Federally-funded and privately-funded projects.

The interested DAC developers include technology partners from FOA-1 projects and some who are not, with some also applying for funding as a TA-2 MSC facility.

Topic Area 2 – Mid-Scale Commercial Facility: This illustrative project is a partnership between a DAC developer, a concrete producer, and a large soft drink bottling plant. The DAC developer proposes a 5,000 TPA facility as the next step following a successful catch-and-release 250 TPA pilot plant. The beverage company is interested in test-marketing a carbon-neutral version of their most popular drink and have agreed to let the DAC company build its MSC facility at its plant complex outside a large midwestern city. The beverage company has also offered the DAC company a share of the additional renewable energy it intends to use to bolster its product's carbon-neutral claims, and they plan to explore integration of waste heat from beverage production into the DAC process.

The DAC developer also plans to truck a small percentage of its captured CO_2 to a nearby low-carbon concrete producer. Since the company ultimately plans to focus on the carbon removal market, injecting into concrete may allow it to sell carbon removal credits and establish relationships and experience in preparation for larger-scale deployments. If the MSC facility were a success, the developer plans to build several 60,000 TPA facilities in the Gulf Coast area, expanding the capacity of one of the existing regional DAC hubs. The developer hopes to apply for TA-3 funding in a future program opening to support that expansion.

Topic Area 3 – Large-Scale Commercial Facility: This illustrative project is led by a DAC developer who has been operating a smaller 2,500 TPA commercial facility in western Europe and wants to develop a larger facility in the US with a capacity of 50,000 TPA. If that facility is successful, they expect to use private capital to add three more facilities at the site for a total future site capacity of 200,000 TPA, and eventually replicate that model at future sites. Their mid-scale commercial facility was successful from a technical perspective, so they plan to use the same design with only minor improvements. Based on the learnings from that facility, as well as cheaper access to storage and additional renewable energy in the US, they are expecting a 30-40% cost decrease which would make both fundraising and credit sales easier at large commercial scale. Several US and EU-based airlines purchased the credits from the smaller demonstration in western Europe and would likely buy the credits from this new facility as well.

They have proposed siting the facility in the western U.S. If selected, this project could be the first facility constructed in a new DAC Hub, complementing various FOA-1 projects that are also planning facilities in the region. They have identified a site near an existing privately-operated CO_2 pipeline to a Class VI well recently permitted and injecting CO_2 from various industries. A commercial solar and battery storage developer is on board to create new renewable capacity to power operations via a power purchase agreement and will begin development once the DAC project reaches final investment decision (FID).

Applications Specifically NOT of Interest

The following list applies to all TAs, unless otherwise indicated:

- Projects that propose venting or "catch-and-release" of CO_2 captured in lieu of storage or utilization
- Projects that do not result in net carbon dioxide removal (CDR) from the atmosphere or do not result in a lowering of the emissions intensity of a product or process
- (TA-2 and TA-3 only) Projects proposing to demonstrate a DAC technology that has already been demonstrated or deployed commercially at similar or larger scale to the proposed facility, unless there are sufficiently novel aspects to this demonstration of value to future deployments (e.g., new ambient conditions, integration of new energy sources, new storage or utilization offtake)
- Applications proposing non-DAC CDR approaches, such as biochar, bioenergy with carbon capture and storage, biomass burial or sinking, enhanced mineralization without paired DAC, direct ocean capture[5], ocean alkalinity enhancement, soil carbon sequestration, or afforestation/reforestation
- Point-source capture
- Early-stage R&D on DAC or other areas such as point-source capture and storage
- Applications not based on sound scientific and engineering principles
- Bench-scale/engineering testing
- Exclusively subsurface characterization or development of subsurface storage or CO_2 transportation resources
- Carbon conversion exclusively
- Projects not located in the United States

Expected Award and Project Management Structure

Awards selected under TA-1 of this NOFO may, at the discretion of OCED, be funded through Other Transaction (OT) agreements and may be eligible for a customized award and project management structure. For TA-1, OT agreements may be preferrable to accommodate custom project phasing and potential milestone payments, scope changes during negotiations, potential program income, and the likelihood that subrecipients (e.g., DAC tenants) may change during the project, among other reasons. Any TA-1 award deemed better suited for a grant or cooperative agreement may be funded through the four-phased management structure described below.

Awards selected under TA-2 and TA-3 of 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.

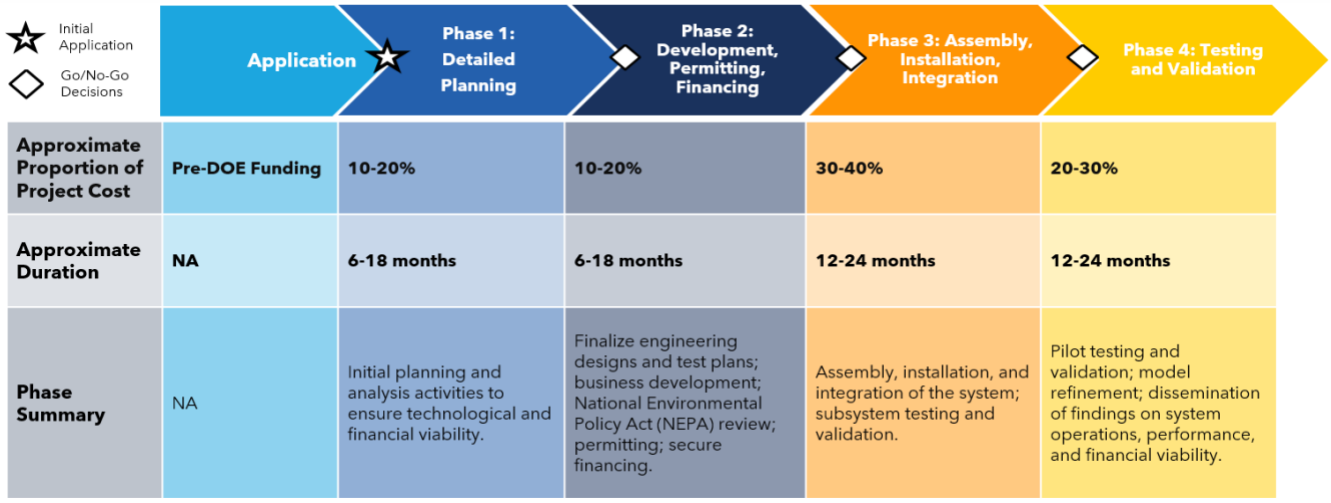
[5] Direct ocean capture (DOC) may be distinguished from DAC by indicating that DOC includes methods that rely on air-sea gas exchange to effect atmospheric carbon dioxide removal, whereas DAC methods do not, even if they use water as a capture medium.

Figure 3 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. Recipients will be expected to execute all four phases of their project.

Applicants will be evaluated, in part, based on their readiness for Phases 1 through 4. All TA-2 and TA-3 applicants will apply initially to OCED's Phase 1 (Detailed Project Planning). If selected for negotiation of a Phase 1 award, applicants must demonstrate completeness of all Award requirements to qualify them to advance to a later phase.

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.

While Figure 3 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."[6]



	Application	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 3. Summary of the anticipated phase structure of the projects awarded under this NOFO.

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 Tribes, and local and community stakeholders.

DOE expects recipients will complete preliminary engineering, construction, and commercial-scale designs during this phase. This will include finalization of a FEED Study, Project Management Plan, Risk Management Plan, the initial Safety Plan, an initial Financial Plan for the entire 4-phase effort, and final site selection and procurement plan for the various components to be included in the award.

[6] https://www.ecfr.gov/current/title-2/part-200#p-200.1(Budget%20period)

The requirements of the FEED study are located in the Other Information section of this NOFO. As specified by DOE, the recipient will prepare an environmental information volume (EIV) or an updated environmental considerations summary (ECS) to support DOE's National Environmental Policy Act (NEPA) evaluation of construction and operating impacts.

Phase 1 should also include a continuation of analysis activities to refine and update Techno-Economic Analysis (TEA) data and initial Life Cycle Analysis (LCA) provided in the Application for the specific project. Community and workforce 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. Recipients 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 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, engineering and operational designs should be sufficiently mature to support completion and execution of relevant fabrication, procurement, or construction contracts and overall commencement of major project execution tasks. Plans for operational, validation, or other testing should be refined.

Long-lead procurement activities may be started in Phase 2 with prior DOE approval. Third-party financing agreements should be completed and any relevant credit purchase or offtake agreements in place.

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 workforce engagement should have progressed, and relevant Workforce and Community Agreements finalized. Updated comprehensive community benefits commitments should reflect community and workforce 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 implementation. 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 prior to 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 workforce 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 the negotiation phase. 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, and integrated.

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.

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 stakeholders for the purpose of informing future private sector investment decisions.

Recipients are also 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 this NOFO will be eligible to complete all four phases pending successful execution of milestones. 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 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 Go/No-Go reviews 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/or 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 is Protected Data, it will only be shared publicly in an aggregated and anonymized form in accordance with OCED protocols.

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 located on the Funding Opportunities section of the Apply for Funding page 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.

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 support; or 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 and/or decommissioning plans as part of future decision points. DOE also may request proposed sources of funding/revenue and the business model which 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.
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 prior to the Selection Official signing 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 located 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 *Foreign Entity Participation and Performance of Foreign Work in the United States Guidance* located on the What other Information may be Requested? Page and in the Waiver Requests section of this NOFO. 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:

1. All iron, steel, and manufactured products used in the infrastructure project are produced in the United States; and
2. 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* located on the Funding Opportunities 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 and/or schedule.

Davis-Bacon Act Requirements

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

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/or review 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 969D of the Energy Policy Act of 2005, as amended by Section 40308 of the Infrastructure Investment and Jobs Act of 2021, Public Law 117-58, codified at 42 U.S.C. § 16298d(j).

Cooperative Agreements under this announcement will be issued consistent with the OMB Guidance for Federal Financial Assistance in title 2 of the Code of Federal Regulations (CFR) and DOE regulations at 2 CFR Part 910. Other Transaction Awards are authorized by 42 U.S.C. 7256.

STEP 2:
GET READY TO APPLY

IN THIS STEP

Application Contents and Format

Application Contents and Format

Component and Subcomponent	File Naming Convention	Page Limit	Format
Pre-Application Submission (TA-1 only)	ControlNumber_LeadOrganization_PreApp.pdf	10	PDF
Concept Paper (TA-2 and TA-3 only)	ControlNumber_LeadOrganization_ConceptPaper.pdf	10	PDF
Application			
Application For Federal Assistance	Standard Form SF-424 ControlNumber_LeadOrganization_App424.pdf	N/A	PDF
Technical Volume	ControlNumber_LeadOrganization_TechVol.pdf	50	PDF
Reference Facility Data	ControlNumber_LeadOrganization_RefFacilityData.pdf	N/A	PDF
Technology Data Tables	ControlNumber_LeadOrganization_TechDataTables.pdf	N/A	PDF
Preliminary Life Cycle Analysis (narrative)	ControlNumber_LeadOrganization_PrelimLCANarrative.pdf	3	PDF
Preliminary Life Cycle Analysis	ControlNumber_LeadOrganization_PrelimLCA.xlsx	N/A	Excel
Financial Model	ControlNumber_LeadOrganization_FinModel.xlsx	N/A	Excel
Project Pre-FEED	ControlNumber_LeadOrganization_PreFEED.pdf	20	PDF
Community Partnership Documentation	ControlNumber_LeadOrganization_Partner_Doc.pdf	3	PDF
Community Benefits Plan	ControlNumber_LeadOrganization_CBP.pdf	15	PDF
Impacting Indian Tribe Documentation	ControlNumber_LeadOrganization_IMT_Doc.pdf	3	PDF
Environmental Considerations Summary	ControlNumber_LeadOrganization_EnviroSummary.pdf	12	PDF
Resumes	ControlNumber_LeadOrganization_Resumes.pdf	3 pages each	PDF
Letters of Commitment	ControlNumber_LeadOrganization_LOCs.pdf	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	PDF Excel Excel
Transparency of Foreign Connections	ControlNumber_LeadOrganization_TransparencyFC.pdf	N/A	PDF
Foreign Entity Participation and Work Waiver Request	ControlNumber_LeadOrganization_Waiver.pdf	N/A	PDF
Current and Pending Support	ControlNumber_LeadOrganization_CPS.pdf	N/A	PDF
Potentially Duplicative Funding Notice	ControlNumber_LeadOrganization_PDFN.pdf	2	PDF
Certification and Disclosure of Lobbying Activities	ControlNumber_LeadOrganization_SFLLL.pdf ControlNumber_LeadOrganization_LDSC.pdf	N/A	PDF

Application Package

This application process includes two phases: Pre-Application or Concept Paper, and Application. The Application documents and supplemental information you submit through electronic systems used by the DOE, including OCED eXCHANGE and FedConnect.net, constitutes 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 (e.g., commercial or financial information that is privileged or confidential), trade secrets, proprietary, or otherwise confidential information prior to 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 as 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 8.5X11-inch paper with margins no less than one inch on all sides.
7. Use **Calibri** typeface, **black** font color, font size of **12-point** or larger, and no less than single line spacing. Figures and tables may use 10-point font.
8. References must be included as footnotes or endnotes in a **10-point font** or larger. Footnotes, endnotes, and any appendices 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.

1. Pre-Application (TA-1 only)

Pre-Application Content

- Cover Page
- Team, Technical Solution and Business Case
- Community Benefits Plan

Total Pre-Application Maximum Page Limit: 10 pages

TA-1 applicants must submit a Pre-Application by the specified due date and time to be eligible to submit an Application. Applicants that do not submit a Pre-Application cannot submit an Application. The Pre-Application must conform to the requirements listed below, including the stated page limits. Each Pre-Application must be submitted as a single file in OCED eXCHANGE.

The Pre-Application must address all the requirements described in this subsection. DOE will review only the authorized number of pages. Please note that all statements of expertise provided will need to be substantiated in the Application submission. DOE makes an independent assessment of each Pre-Application based on the criterion in Technical Review Criteria. Based on its independent assessment, DOE will designate only a subset of pre-applicants as eligible to submit Applications. Any Applications that do not have Pre-Applications designated by DOE as eligible will not be considered. Applications that do not strictly adhere to what was proposed in the Pre-Application will not be considered. DOE intends to publish a list of Pre-Application finalists so that TA-2 applicants and other independent projects may pair with the proposed IAP before Application.

The following are the Pre-Application components and their requirements. Each potential applicant must provide the following information as part of the Pre-Application.

Cover Page

The cover page must include all of the following:

- The project title and Topic Area.
- The project team, including recipient name, entity type, and an explanation of eligibility as described in Step 1, both the technical and business points of contact, and names of all team member organizations.
- The proposed project location(s).
- The proposed Federal funding level, cost share, and period of performance.
- Any statements regarding confidentiality as described in Step 3.
- Applicants are encouraged to use the cover page format shown at the end of the Step 2 section.

Team, Technical Solution and Business Case

Applicants are required to describe:

- High-level description of team, partners, and location.
- Business model and financing plan overview.
- Narrative overview of commercial progress including procurement of energy inputs, CO2 transportation, storage and/or utilization.
- Preliminary development plan and timeline, including key risks.
- Participation in any current or past DOE awards (including terminated awards), any other links to FOA-1 TA-1/2/3 selectees, or other non-DOE-funded facilities that are advancing.

Community Benefits Plan

Applicants are required to explain how their proposed project will address these four core elements:

- Supporting meaningful community and workforce engagement.
    - Applicants must include a brief explanation of how, or if, choice of proposed location included community input and any existing community-based partnerships informing project planning.
- Preparing a skilled workforce and supporting quality jobs.
- Advancing diversity, equity, inclusion, and accessibility.
- Contributing to the goal of providing the greatest positive benefits to communities while minimizing negative impacts.

For additional information, see Community Benefits Plan.

2. Concept Paper (TA-2 and TA-3 only)

Concept Paper Content

- Cover Page
- Technical Solution and Business Case
- Project Plan and Team
- Community Benefits Plan
- Management and Organization

Total Concept Paper Maximum Page Limit: 10 pages

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 concept. The Concept Paper must conform to the requirements listed below, including the stated page limits. Applicants that submit Concept Papers that do not meet the requirements listed below cannot submit an Application. 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. DOE will review only the authorized number of pages. Please note that all statements of expertise provided will need to be substantiated in the Application. DOE makes an assessment of each Concept Paper based on the criterion in Technical Review Criteria. DOE will encourage a subset of applicants to submit Applications, and other applicants will be discouraged from submitting an Application, see Awards Notice. DOE may elect to provide feedback to some or all applicants that receive "encourage" notifications. An applicant who receives a "discourage" notification may still submit an Application. DOE will review all eligible Applications. However, by discouraging the submission of an Application, DOE intends to convey its lack of programmatic interest in the proposed project in an effort 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.

Cover Page

The cover page must include all of the following:

- The project title and Topic Area.
- The project team, recipient name, entity type, an explanation of eligibility as described in Step 1, both the technical and business points of contact, and names of all team member organizations.
- The proposed project location(s).
- The proposed Federal funding level, cost share, and period of performance.
- Any statements regarding confidentiality as described in Step 3.
- Applicants are encouraged to use the cover page format shown at the end of the Step 2 section.

Technical Solution and Business Case

Applicants are required to describe or provide:

- Proposed facility nameplate capture capacity and any planned steps to reach that capacity.
- Technology solution description including self-assessment of TRL (as defined by DOE G 413.3-4A Technology Readiness Assessment Guide, 2011) and readiness with respect to operational data from Reference Facility required at Application.
- Description of the role of this facility in broader expansion/deployment plans.
- Preliminary Techno-Economic Analysis (TEA) results including levelized cost of capture.
- Screening level GHG emissions assessment: Submit a screening level GHG emissions assessment using relevant data sources from NETL's CO2U Guidance Toolkit. The screening level assessment should focus on quantifying on-site emissions from the facility and upstream emissions from electricity generation. Results should include the carbon intensity of the proposed facility (i.e., mass CO_2-eq/mass CO_2 stored, or product produced) and annual CO_2 captured and permanently stored or utilized by the proposed system. The screening level GHG emissions assessment should be discussed as a narrative (i.e., less than 1 page not including any relevant figures/tables).
- Energy input and CO_2 transportation, storage, and/or utilization overview.

Project Plan and Team

Applicants are required to describe or provide:

- Preliminary development plan and timeline, including key risks.
- High-level description of team, partners, proposed site location, and rationale for site selection (TA-2 Only: Site uncertainty is acceptable if the applicant intends to partner with TA-1 IAP upon TA-1 Application eligibility designation).
- Participation in any current or past DOE awards (including terminated awards), any other links to FOA-1 TA-1/2/3 selectees, or other non-DOE-funded facilities that are advancing.

Community Benefits Plan

Applicants are required to explain how their proposed project will address these four core elements:

- Supporting meaningful community and workforce engagement.
    - Must include a brief explanation of if and how the choice of proposed location included community input and any existing community-based partnerships informing project planning.
- Preparing a skilled workforce and supporting quality jobs.
- Advancing diversity, equity, inclusion, and accessibility.
- Contributing to the goal of providing the greatest positive benefits to communities while minimizing negative impacts. For additional information, see Community Benefits Plan.

3. Application

Technical Volume Content

- Cover Page
- Project Overview
- Technical Approach
- Financial and Market Viability
- Management and Organization
- Workplan
- Risk Analysis and Mitigation

Total Technical Volume Maximum Page Limit: 50 pages

Only applicants with Pre-Applications that have been deemed eligible may apply to TA-1. Applicants that met Concept Paper requirements may apply to TA-2 and TA-3, and applicants whose Concept Papers received an "encourage" notification are encouraged to apply. Unless otherwise specified, the requirements below apply to all Topic Areas.

Applicants will have approximately 90 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 Concept Paper Notifications, or eligibility 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; all citations, charts, graphs, maps, photos, or other graphics; and must include all the components listed below.

The applicant should consider the weighting of each of the Technical Review Criterion 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

The cover page must include all of the following:

- The project title and Topic Area.
- The project team, including Recipient name, subrecipient name(s), senior/key personnel and their organizations, entity types, and an explanation of eligibility as described in Step 1, both the technical and business points of contact, and names of all team member organizations.
- The proposed project location(s).
- The proposed Federal funding level, cost share, and period of performance.
- Any statements regarding confidentiality as described in Step 3.
- Applicants are encouraged to use the cover page format shown at the end of the Step 2 section.

Project Overview

This section must include a description of:

- The technology solution(s) to be demonstrated (TA-2 and TA-3 only).
- The team's rationale for pursuing this project.
- The high-level objectives and performance targets for the project.
- The demonstration location and why it was chosen, including site access status.
- The impact of DOE funding and how the DOE funding, relative to prior, current, or anticipated funding from other public and private sources, is necessary to achieve the project objectives.
- How the project will enable further replication and/or extension of the project and approach, and the ways in which the proposed project location and related infrastructure, skilled workforce, community engagement, and others will contribute to the overall project viability and long-term success.

TA-1 Applications should describe the overall long-term vision and strategy for the IAP, detailed plans for Phase 1 activities, and higher-level plans for Phase 2 through 4 activities along with existing and planned partnerships, potential DAC tenants, and financing strategies/commitments. Applicants should thoroughly describe the rationale for the site location(s), system designs, market potential (if applicable), and commercial viability.

TA-2 and TA-3 Applications should describe the overall long-term vision and strategy for the DAC facility, detailed plans for Phase 1 activities, and higher-level plans for Phase 2 through 4 activities along with existing and planned partnerships and financing strategies/commitments. Applicants should thoroughly describe the rationale for the DAC facility site locations, system designs, market potential (if applicable), and commercial viability.

Technical Approach

Applicants are expected to include the following in their Phase 1 Applications (all Topic Areas, unless noted):

Concept. Describe the selected geographic region in the United States and discuss the carbon intensity of the local industry, fossil energy production history (if applicable), availability of clean and low carbon energy production, land and water resources, existing infrastructure, and CO_2 storage and/or conversion potential, and include information on economically distressed communities impacted (if applicable). Applicants must discuss the fit of the site(s) from a social and environmental justice standpoint (including social characterization of nearby communities, community support for the project, and workforce availability), with reference to the CBP, as appropriate. Applicants must define their Concept, including selection and siting of DAC and CO_2 conversion (if applicable) technology(ies) with a discussion of ongoing NEPA and permitting activities. Applicants should fully describe any links between TA projects (e.g., TA-1<>TA-2), links with FOA-1 DAC Hubs projects, and links with any other DOE projects outside of FOA-1.

Site Description. Describe the proposed site location. Provide a rough plot plan. Describe climatic conditions at the site. Explain anticipated impact of climatic conditions on DAC technologies, highlighting if favorable or unfavorable.

(TA-2 and TA-3) DAC Technology Description(s). Provide a thorough description and data supporting the efficiency of the DAC technology(ies). Applicants must provide the current TRL (as defined by DOE G 413.3-4A Technology Readiness Assessment Guide, 2011) and discuss plans for scale-up. Applicants must describe key parameters of the DAC technology(ies). The description of the technology should include, but is not limited to, the following: (1) overall process flow diagrams; (2) mass and energy balances; (3) resource requirements (e.g., energy, land, water); (4) discussion of the absorption/desorption chemistry and operating cycle for solvent and sorbent systems (as applicable); and (5) description of relevant membrane chemistry, including transport mechanism (as applicable).

(TA-2) Reference Facility Data. Submit, for each facility proposed, the following Reference Facility data: 1) at least 1,000 hours of testing data from the Reference Facility, 2) validation that all core processes are not less than TRL 6 (as defined by DOE G 413.3-4A Technology Readiness Assessment Guide, 2011), 3) documentation of not less than 1/25th the nominal gross capture capacity of the proposed MSC facility (e.g., a minimum of 80 TPA Reference Facility for a proposed MSC facility of 2,000 TPA).

Applicants who do not yet have complete Reference Facility data but can demonstrate their Reference Facility is operational and generating the required data will be considered. The Reference Facility Data may be submitted as separate documents to the Technical Volume.

(TA-3) Reference Facility Data. Submit, for each proposed facility, the following Reference Facility data: 1) at least six months of operational data including at least 1,000 hours of continuous operations from a smaller commercial facility, 2) validation that all key processes are not less than TRL 7 (as defined by DOE G 413.3-4A Technology Readiness Assessment Guide, 2011), 3) documentation of not less than 1/25th the nominal gross capture capacity of the proposed LSC facility (e.g., a minimum of 1,000 TPA for a proposed 25,000 TPA facility). The Reference Facility Data may be submitted as separate documents to the Technical Volume.

CO_2 Conversion Technology Description(s) (if applicable). Provide a thorough description and data supporting the efficiency of the CO_2 conversion technology(ies), including the estimated quantity of CO_2 converted to valuable products and results of the LCA of the proposed system done in accordance to the latest NETL CO2U LCA Guidance.

Applicants must provide the current TRL and discuss plans for scale-up. The description of the technology should include, but is not limited to, the following: (1) overall process flow diagrams; (2) mass and energy balances; (3) resource requirements (i.e., feedstocks, energy, land, water, etc.); and (4) discussion of the conversion chemistry and operating cycle (as applicable).

(TA-2 and TA-3) Technology Data Tables. Provide data tables for each DAC technology and selected CO_2 conversion (if applicable) technology. Applicants must prepare the data tables based on the experimental data obtained at the largest scale the technology has been validated. Applicants must submit the data tables in a separate document to the Technical Volume. Note: The Technology Data Tables are required to be completed in accordance with the description below and the Technology Data Tables template in the Other Information section of this NOFO. Applicants that do not submit the required Technology Data Tables or submit incomplete table(s) will be considered non-compliant and DOE will not review or consider non-compliant submissions.

Disclosed data should most closely represent current achieved or expected performance rather than projections. Short narratives can be provided in addition to the data table to provide more insight on disclosed data or the provision of multiple data points or ranges. Specific data should be linked to narratives through the use of superscript numbering or lettering.

There are different modules to be filled out depending on the nature of the specific project. Modules are to be filled out only if they are applicable to a given project. Data that is to be described qualitatively contains "Description" as the unit.

(TA-2 and TA-3) Preliminary Life Cycle Analysis (LCA). Provide a preliminary LCA is that includes the following:

- A 3-page narrative (not including figures) that describes the methods, results, and completeness of the LCA;
- An excel spreadsheet that details the LCA calculations, assumptions, and data sources;
- System diagrams for the proposed system (and a comparison system, where relevant for CO_2 utilization projects) that clearly illustrate the emission sources, material and energy inputs, and reference flows; and,
- A contribution analysis showing emissions from each major operation/input.

LCA Technical Requirements: If the CO2 captured from the modeled DAC technology will be sent to permanent geologic storage, conduct the LCA based on the DAC facility boundaries and normalize results to 1 kg of pipeline-ready CO2.

- If the CO_2 captured from the modeled DAC technology will be utilized to make a product, the LCA should include a comparison to a conventionally produced product system following the guidelines set forth in the NETL's CO2U toolkit.

- For electricity inputs, conduct a sensitivity assessment using different grid carbon intensities - capturing key grid technology scenarios that include the following (at a minimum): (1) sourcing 100% of electricity from the current U.S. grid mix (CI = 546 kg CO_2e/MWh); (2) sourcing 100% of electricity from the EIA's modeled 2050 U.S. grid mix (CI = 434 kg CO_2e/MWh); and (3) sourcing 100% of electricity from a 50% wind and 50% solar grid (CI = 23 kg CO_2e/MWh).
- Results should be reported using 100-year Global Warming Potential (GWP) characterization factors from the Sixth Assessment Report (AR6). Data are available here: US EPA IPCC data tracker.

Resources: The following is a non-exhaustive list of recommended resources that can be used to complete the LCA and/or source life cycle inventory data (e.g., for energy and material inputs):

- NETL carbon capture and CO_2 utilization LCA guidance - CO2U LCA Guidance Document
- NETL Life Cycle Inventory (LCI) Data – NETL CO2U openLCA LCI Database
- Electricity Consumption LCI Data – NETL Grid Mix Explorer
- General LCA[7] best practices for DAC: Best Practices for Life Cycle Assessment of Direct Air Capture with Storage (DACS) | Department of Energy

The preliminary LCA material may be submitted as separate documents to the Technical Volume. If quantitative data are not available, the applicants should include a qualitative discussion in the LCA narrative report that highlights any major uncertainties and missing information.

(TA-2 and TA-3) Preliminary Techno-Economic Assessment (TEA). Provide a preliminary TEA for the proposed DAC Facility. The TEA will be used to validate the assessment of the levelized cost of capture. Applicants must describe their assumptions, rationale, and specific system design boundaries as part of their preliminary TEA. Applicant should ensure that the boundaries for the TEA and LCA are aligned and consistent. The quality and scientific depth of the provided information will be an important element of the technical evaluation of the Application.

Applicants should conduct their TEA using the latest total project cost (TPC) that is consistent with the Business Plan and with material and energy balances that are consistent with the DAC Technology Description.

Applicants should articulate expected values of key parameters that influence financial viability, including all capital and operational expenditures, tax credits, revenue streams, and asset life.

Storage Field Development Plan Status (if applicable). Demonstrate that the project has secured CO_2 storage site(s) or demonstrate advanced progress towards securing storage site with an identified storage partner. Carbon storage facilities should have sufficient capacity to store carbon for at least 12 years of operation. Applicants must discuss the current status of the Storage Field Development Plan for the selected carbon storage site(s) supported by Authorization for Expenditures (AFEs), including development, characterization, and permitting activities conducted to date. Applicants must discuss the current status of, and plans for submitting, the UIC Class VI permit to construct and/or other Federal and State permits required for CO_2 Storage.

[7] "Life Cycle Assessment" and "Life Cycle Analysis" have the same meaning.

Applicants must discuss preliminary plans for CO_2 monitoring, reporting, and verification (MRV) during CO_2 injection and conversion (if applicable). Alternatively, applicants must discuss the status of the offtake agreement.

If the applicant has already conducted or is currently conducting activities meeting the Phase 1 requirements under a different DOE award or at private expense, the status of such activities should be clearly described in the Application, and only complementary (but not redundant) additional activities should be proposed under this NOFO.

(TA-2 and TA-3) Preliminary Environmental Health and Safety (EH&S) Risk Analysis. Applicants must complete a preliminary EH&S analysis of the integrated DAC system as a separate document to the Technical Volume. Identification (and estimated quantities) of all potential air and water emissions and solid wastes produced from the proposed technology(ies) will form the basis of the EH&S risk analysis.

Financial and Market Viability

This section must include:

- **Business Plan.** Demonstrate the commercial feasibility of the proposed technology and related infrastructure. Applicants should provide a high-level market analysis including plans to ensure sufficient contracted or merchant demand for the CO_2 conversion products. Applicant should provide an overview of key project inputs including site selection and control considerations, timeline for securing adequate feedstock, and utilities. TA-1 applicants should include a discussion and projections of any DAC tenant revenue models or partnership structures envisioned.
    - Commercial assessment: Describe the commercial feasibility of the proposed technologies and related infrastructure and how the applicant intends to deploy the technologies at scale.
    - Revenue estimates: Provide an initial estimate of the sales volumes and weighted average selling prices of all the revenue generating products to be commercialized for every year of expected operations. Volumes and prices must be based on realistic assumptions. The applicant must explain and justify any assumption underpinning the above revenue estimates. Applicants must provide evidence of commercial discussions with potential offtakers or buyers of the respective products including MOUs, LOIs, purchase and sales agreements, to help validate the revenue projections.
    - Tax credits and subsidies: Include an estimate of any tax credits, subsidies, or sources of concessionary capital expected for every year of the project, including volumes and unit values.
    - Key contracts, permits, and agreements: Provide a top-level description, schedule, and status, of all contracts and agreements in place or being negotiated, as relevant to the IAP or DAC facility. These must include NEPA, design, engineering, technology licensing, financing, construction, startup, commissioning, shakedown, operation, and maintenance of the IAP or DAC facility.
    - Preliminary site selection: Describe the rationale for selection of the proposed site(s) and contain evidence of control over the site(s) or the plan to establish control over the site(s). Identify site owner(s). Describe zoning considerations.

- Procurement of key inputs and supplies: Describe procurement strategy for key inputs including power, energy, water, raw materials, and other key supplies needed for successful operation of the facility. Applicants must provide any available letters of commitment or term sheets for key inputs as available. The letters of commitment should be submitted in a separate attachment. Applicants must provide a realistic estimate of power consumption volumes and prices expected for every year of operations. A similar annual estimate of input costs must be provided for other major inputs, including volumes and unit prices, along with a justification of the assumptions behind those estimates.
- (TA-1 only) Provide a list of prospective DAC tenants, status of commercial negotiations, and anticipated timing of final agreements along with revenue estimates from such commercial agreements. Any assumptions underpinning the above estimates must be explained and justified.

- **Financial Plan.** Present a plan to obtain funding for the entire non-DOE share of the total project cost that identifies all sources and uses of project funds. The plan should include a discussion of the overall approach and anticipated schedule to raise required funds for project completion beyond DOE funding. Applicants should provide a breakdown of all capital sources (e.g., investors and lenders) contemplated, a description of the indicative terms, as available, and a discussion of debt service considerations and credit risks (e.g. interest rate, repayment). Include strategy for securing revenue-generating contracts prior to Final Investment Decision.

- **Financial/Cash Flow Model.** Include a narrative discussion of the key assumptions and projected project along with a financial model. As a separate excel attachment, applicants should provide a financial model that includes a breakdown of all cashflows from the project for every year of development, construction, and operations. The model will break down all key capital costs, revenues, operating costs, taxes, and financing costs. The model must include a base case scenario indicating the most likely performance scenario based on projected technical parameters that are consistent with submitted Application (e.g., TPC estimate, Pre-FEED, Preliminary LCA). The financial model provides an expected return (e.g., internal rate of return) over the project lifespan and a levelized cost of capture that aligns with the preliminary TEA.

- **(TA-2 and TA-3) Measurement, Reporting, and Verification (MRV) Plan Description (if applicable).** Applicants must submit a description of their MRV plans for the proposed project, if applicable. These plans are only relevant for proposed projects that intend to generate carbon credits as part of their business plan. This applies to projects intending to sell carbon dioxide removal credits or emissions reduction credits. The type of credit will depend on the ultimate disposition of the captured CO_2, the system boundaries in the life Cycle Analysis, and the treatment in the utilized protocol. If included, the plan must include high-level descriptions of how the applicant intends to approach relevant equipment (e.g., flow meters, sensors), regulatory requirements (e.g., for Class VI wells), MRV protocol/methodology selection, verifier selection, reporting, and associated digital infrastructure. Existing partnerships and MRV implementation strategies on the part of the applicant can also be discussed.

Management and Organization

This section must include:

- Applicant History: Provide a thorough description of applicant's primary responsibilities. Provide a thorough description of applicant's experience in carbon management, if any.
- Plan, including key organizational members and structure, project partners roles and responsibilities, and relevant prior experience. This plan must address any changes to the personnel, approach and/or responsibilities as the project moves from planning to implementation and demonstration.
- Description of the skills and expertise that the Lead Project Manager (LPM) and Project Team have to successfully design, develop, and operate the proposed plan.
- 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.
- Detailed description of safety management system, including a five-year construction/operations safety performance history that can include Occupational Health and Safety Administration (OSHA) 300A forms or Experience Modification Rating of the entities and management involved in the IAP or DAC facility. For those teams who may not have an extensive history, applicants should include a detailed description of their intended safety management system.
- Time commitment of key roles and personnel: A table showing time commitment (hours per week) of key organizational roles for all project phases and key personnel to fill each role for, at minimum, Phase 1 and Phase 2.
- A summary organization chart of the team must be provided. The chart must include identification of any subrecipients or contractors.

Workplan

The Workplan must include:

- A Project Management Plan (PMP) that establishes baseline (technical scope, budget, schedule, and performance metrics) to be assessed during the proposed project and used to manage project performance relative to those baselines; defines the actions that will be taken when these baselines must be revised; and identifies project risks and strategies for mitigation. The PMP shall include:
    - Integrated Project Schedule (IPS) showing critical path for the entire project, and including task and subtask durations, milestones, Community Benefits Plan, NEPA, and Go/No-Go reviews. TA-2 and TA-3 applicants should include a Level 2 IPS for Phase 1 and a Level 1 IPS for Phases 2-4 for the proposed DAC facility;
    - A Baseline Cost Plan establishing the baseline cost for the project and incorporating costs for all tasks necessary for performing the proposed project;
    - A system for project management to enable monitoring and controlling project scope, cost, and schedule;

  - A Project Communication Protocol that ensures effective communication between the Recipient, Subrecipients, and DOE; and
  - An Environmental Management Plan that assesses, monitors, and reports potential environmental impacts to air, land and water resources, and potential impacts of waste production.

- **(TA-2 and TA-3)** Technical Scope Summary (all Topic Areas), divided by budget periods in alignment with the four Project Phases.
- **(TA-2 and TA-3)** Proposed Go/No-Go Review points for each project phase.
- Work Breakdown Structure (WBS) proposal, in accordance the Workplan proposed and incorporating elements below:
  - Applicants must complete a preliminary permitting workflow overview that identifies the relevant and applicable Federal, state, and local codes, regulations, and permitting requirements anticipated to site, construct, implement, and operate the DAC facility. Overview should be organized by site location and should identify the Authority Having Jurisdiction (AHJ) and relevant regulatory bodies that may have approval authority during the course of the project. DOE recognizes that the material in this overview document will likely change during the award and, as such, will require that it be revised and updated during project execution. DOE encourages applicants to conduct outreach to AHJs and submit any written confirmation from AHJs regarding the project, if received. Frequent communication with AHJs through the life of the project is encouraged as a means of mitigating permitting delays.
  - 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 also should include identification of the anticipated tasks required to be conducted to meet Federal, state, and local codes, regulations, and permitting requirements applicable to siting, construction, and operation of the proposed project) described in the Permitting Workflow Overview.
  - A summary of the End of Project Goal(s).

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 and/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.

Risk Analysis and Mitigation

This section must include an initial Risk Management Plan (RMP) that quantitatively and qualitatively assesses, identifies, tracks, and manages project risk; identifies potential risk elements and potential impacts; provides an approach to assessing and managing risk; and is in conformance with industry standards for risk management and risk mitigation. The RMP must include:

- Identification of technical risks, including technology, systems integration, infrastructure, engineering, scale-up, and similar elements.
- Identification of security risks, including cybersecurity, physical security, internal and external threat identification and response, and similar elements. Applicants must also discuss both physical security and cybersecurity considerations for the proposed IAP or DAC facility.
- Identification of financial risks including project finance, market and regulatory structures, commercial business models, and similar elements.
- Identification of organizational risks, including project team, project management structure, and similar elements.
- Identification of execution risks, including engineering, procurement, construction, permitting, safety, testing, and similar elements.
- Assessment of the probability of occurrence of each risk and potential impacts.
- Identification of proposed mitigations for identified risks.

Project Pre-FEED Study Summary

TA-2 and TA-3 applicants must submit a maximum 20-page document in addition to the Technical Volume that summarizes the results of a pre-FEED study for the proposed project. The pre-FEED study must represent the planned nameplate gross capture capacity following construction.

All listed requirements apply to all facilities in multi-facility Applications, although one comprehensive pre-FEED may be sufficient to cover multiple, interconnected DAC systems.

The scope of the pre-FEED study includes the DAC system itself, any supporting equipment (sometimes referred to as “balance-of-plant,” offsite, or outside battery limits equipment), and connections to offtake infrastructure, all inclusive of equipment piping, instrumentation, and other customary and relevant aspects of plant design. Supporting equipment for the project may include, but is not limited to, unit operations such as condensation, dehydration, oxygen removal, and compression and utilities such as cooling water, compressed air, nitrogen, steam, electricity, water treatment, and waste treatment.

The study summary must include (a) a process flow diagram with clearly labeled equipment and flows; (b) a corresponding heat and mass balance based on process modeling; (c) a preliminary process and utility equipment list; (d) a preliminary utility flow diagram; (e) a rough plot plan; (f) a draft project execution plan; and (g) a draft preliminary Process Hazard Analysis (PHA). Other engineering deliverables can be provided at the applicant’s discretion.

If available, equipment descriptions should be provided that discuss how equipment would be used dynamically within the system.

The applicant should describe how the system design will address relevant needs for storage of or buffering for any intermediary, input, or waste products. Needs for and plans to balance variable supply and demand signals, as well as resilience aspects necessary to handle maintenance outages and external system shocks should also be described at a high level.

Required processing for and connections to CO_2 transport, storage, and/or conversion infrastructure must be explicitly discussed. For energy provision, the pre-FEED summary should discuss whether and how the facility intends to leverage behind-the-meter energy or connect to an electrical grid. Corresponding impacts to capacity factors, energy storage, dynamic energy mixes, expected LCA results, and MRV strategies must be described.

The pre-FEED summary must include an AACE International 18R-97 Class 4 capital cost estimate that involves completion of at least 5% of project definition deliverables and expected accuracy of the estimated total plant cost (TPC) aligned with AACE Class 4 accuracy range. The cost estimate's boundaries should seek to be as consistent as possible with other information disclosed within the pre-FEED summary including equipment lists. All cost estimates must meet conventional industry standards for the corresponding size and complexity of proposed projects. Installation, contingency, and design and engineering (i.e., engineering, procurement, and construction contractor service) cost estimates should also be included to the extent possible.

Applicants are required to discuss major sources of uncertainty in the cost estimate and mitigation plans during the course of subsequent design and engineering efforts. While specific escalation assumptions or factorial methods are not being prescribed, the summary should explain what assumptions were used and why they were deemed appropriate. DOE may require the use of alternative cost estimating assumptions in future phases.

Community Benefits Plan

The Community Benefits Plan must not exceed 15 pages total.

Applications must include a Community Benefits Plan (CBP, or Plan) setting forth the applicant's approach to ensuring that Federal investments advance four goals: 1) support meaningful community and workforce engagement; 2) invest in quality jobs; 3) advance diversity, equity, inclusion, and accessibility; and 4) provide the greatest positive benefits to local communities while minimizing 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".[1] Such agreements facilitate community and workforce 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 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 Commitments (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 workforce 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 allowable, allocable, and reasonable in accordance with the applicable Federal cost principles.
2. **Community and Workforce 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.

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

   Community and workforce 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, workforce-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 Workforce 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, DOE, with assistance from the recipients, will 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 will seek to acknowledge Tribes' consultation policies, traditions, and expectations when appropriate and adheres to DOE Order 144.1A[8] on tribal consultation.

At minimum, the **Community and Workforce 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 DAC. Applicants are encouraged to reference any prior work with DOE or other programs that include community benefit activities.
- **Engagement Objectives, Methods, and Timeline:** Describe the project engagement strategy, including objectives, methods, and timelines for engaging and collaborating with community stakeholders, Tribes, and workforce organizations including labor unions. Specify if engagement plans include collaboration with existing local or regional community initiatives (e.g., the Regional Energy Democracy Initiative (REDI) | Department of Energy).
- **Incorporation of Feedback:** Describe how the project will incorporate community and workforce 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.
- **Workforce and Community Agreements:** Describe plans to negotiate a Community Benefits Agreement, Tribal Agreement, Project Labor Agreement, Community Workforce Agreement, and/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 workforce organization. Describe any existing agreements that will cover the proposed project, along with any examples of current or previous agreements with any community or workforce 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.

[8] See DOE Order 144.1A: DOE Requirements for Consultation and Engagement with Federally Recognized Indian Tribes and Alaska Native Claims Settlement Act Corporations Pursuant to DOE P 144.1 for details: : https://www.directives.doe.gov/directives-documents/100-series/0144.1a-border/@@images/file

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

- **Background and Experience.** Summarize the project team's previous or ongoing efforts to invest in the local workforce and create quality jobs, invest in workforce development, and protect worker rights.
- **Quality Jobs.** Provide the anticipated number of jobs and timeline for job creation and duration. 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, workforce-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; and
  - 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., workforce-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).

4. **Diversity, Equity, Inclusion, and Accessibility (DEIA):** Describe the project's DEIA goals and methods, including partnerships with businesses majority owned or controlled by underrepresented[9] persons or groups of underrepresented persons ("underrepresented businesses"), residents of disadvantaged communities, educational institutions, and training or workforce development organizations that serve workers facing barriers to quality jobs, and/or other partners to help support DEIA. At minimum, the DEIA section should include the following elements:

   - **Background and Experience.** A description of prior and ongoing efforts by the project team relevant to DEIA.
   - **Strategies, Milestones, and Timelines.** A description of targeted DEIA outcomes and implementation strategies, including milestones and timelines. For example, applicants can discuss any wealth-sharing, shared ownership, or commitments to partner with underrepresented businesses for partnership and contractor support needs.

[9] 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.

- **Partnership Plans.** Plans to partner with workforce training organizations serving underrepresented communities and those facing systemic barriers to quality employment such as those with disabilities, returning citizens, opportunity youth, and veterans; plans for using hiring preferences or goals for members of local communities, and residents of disadvantaged communities and recruitment goals for underrepresented persons; and/or plans to provide comprehensive support services to address barriers in accessing in projects' construction and operations jobs, such as childcare and transportation.

5. **Ensuring Project Benefits:** This section should include an assessment of project impacts and where they flow, the extent to which they flow to disadvantaged communities, and strategies to maximize benefits, minimize 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.
- **Project benefits.** Applicants should describe in detail all anticipated project benefits and the extent to which they may flow to 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 revenue streams such as pore space or tolling agreements in which revenues directly flow to local community members. The description should clearly enumerate:
  - Anticipated project benefits (type and magnitude) and metrics that could be used to track each benefit;
  - Where/to whom benefits are expected to flow, and the extent to which impacts will flow to Disadvantaged communities; and
  - How well the anticipated benefits align with the surrounding community's/communities' priorities ascertained through community engagement and/or Community Needs Assessment(s).
- **Project negative impacts.** Applicants should describe all anticipated project negative impacts and the extent to which they may flow to disadvantaged communities. 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. Consider direct impacts, indirect impacts, and cumulative impacts. This description should clearly enumerate:
  - Specific project negative impacts (type and magnitude) and metrics that will be used to track each impact;
  - Where/to whom impacts are expected to flow, and the extent to which impacts will flow to disadvantaged communities;
  - How additional project negative impacts could interact with existing cumulative burdens.

- **Implementation Plan, Milestones, and Timelines.** 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.

Community Partnership Documentation

In support of the Community Benefits Plan, applicants may submit letters, Memoranda of Understanding, or other similar agreements from partnering Tribes, labor unions, and/or 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 prior to award. Potential impacts determined after Application will also require additional documentation. See Community and Workforce Engagements discussion on consultation.

Documentation from Potentially Impacted Indian Tribes

Applicants are required to submit documentation demonstrating that an authorized representative[10] 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)[11] or intersecting with tribal subsurface rights, applicants are required to submit documentation demonstrating support from the relevant Indian Tribes at the time of Application.

[10] 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.

[11] 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.

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.
- 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 tribal 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.[12]

[12] 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.

Environmental Considerations Summary

This is a summary of environmental information known about the proposed project and the proposed project location for the full scope of the project (Phases 1-4). To provide this information you can use the Environmental Considerations Summary (ECS) template. DOE acknowledges that not all the information in the ECS may be available at the proposal stage; applicants should provide as many details as possible. DOE recommends consulting with experts or advisors in your organization to assist with your responses. More information on this requirement is in the Environmental Information Guidance.

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 of the personnel. 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 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. For any subaward listed in the Application, a separate Budget Justification Workbook must be provided for each subaward listed in the Application. See the Required Applications 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 which 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 to not use the Budget Justification Workbook template, they must provide all data elements and justifications which 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, Community Benefits Plan, reporting, oversight,) 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 the following information as it relates 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.

Disclosure Information	
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.
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%.

Disclosure Information	
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.

Waiver Requests (if applicable)

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 "Requirements" 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 "Requirements" 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.

To identify overlap, duplication of effort, or synergistic efforts, append a description of the other award or activity to the current and pending support statement.

Details of any obligations, contractual or otherwise, to any program, entity, or organization sponsored by a foreign government must be provided on request to either the applicant institution or DOE. Supporting documents of any identified source of support must be provided to DOE on request, including certified translations of any document.

Each senior/key personnel must provide a separate certification statement listing the required information above regarding current and pending support. The individual must sign and date their respective certification statement:

> I, [Full Name and Title], understand that I have been designated as senior/key personnel by DOE.
>
> I certify to the best of my knowledge and belief that the information contained in this Current and Pending Support Disclosure Statement is true, complete, and accurate. I understand that any false, fictitious, or fraudulent information, misrepresentations, half-truths, or omissions of any material fact, may subject me to criminal, civil, or administrative penalties for fraud, false statements, false claims, or otherwise. (18 U.S.C. §§ 1001 and 287, and 31 U.S.C. §§ 3729-3733 and 3801-3812). I further understand and agree that (1) the statements and representations made herein are material to DOE's funding decision, and (2) I have a responsibility to update the disclosures during the period of performance of the award should circumstances change which impact the responses provided above.
>
> I also certify that, at the time of submission, I am not a party in a malign foreign talent recruitment program**.**

The information may be provided in the approved common disclosure format available at: https://www.nsf.gov/bfa/dias/policy/researchprotection/commonform_cps.pdf. Regardless of the format used, the individual must include a signature, date, and a certification statement using the language included in the paragraph above.

Definitions:

Current and pending support – (a) All resources made available, or expected to be made available, to an individual in support of the individual's research, development, and demonstration (RD&D) efforts, regardless of (i) whether the source is foreign or domestic; (ii) whether the resource is made available through the entity applying for an award or directly to the individual; or (iii) whether the resource has monetary value; and (b) includes in-kind contributions requiring a commitment of time and directly supporting the individual's RD&D efforts, such as the provision of office or laboratory space, equipment, supplies, employees, or students.

This term has the same meaning as the term Other Support as applied to researchers in National Security Presidential Memorandum-33 (NSPM-33). For researchers, Other Support includes all resources made available to a researcher in support of and/or related to all of their professional RD&D efforts, including resources provided directly to the individual or through the organization, and regardless of whether or not they have monetary value (e.g., even if the support received is only in-kind, such as office/laboratory space, equipment, supplies, or employees). This includes resource and/or financial support from all foreign and domestic entities, including but not limited to gifts provided with terms or conditions, financial support for laboratory personnel, and participation of student and visiting researchers supported by other sources of funding.

Malign Foreign Talent Recruitment Programs - More information can be found at https://www.whitehouse.gov/wp-content/uploads/2024/02/OSTP-Foreign-Talent-Recruitment-Program-Guidelines.pdf#page=3

Senior/key personnel -- means an individual who (a) contributes in a substantive, meaningful way to the development or execution of the scope of work of a project proposed for funding by DOE, and (b) is designated as a covered individual by DOE.

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

The applicant is responsible for assessing whether each person listed on the Application is a senior/key personnel as described in (a) of the definition. Further, the applicant is responsible for identifying any such individual to DOE for designation as a senior/key personnel, if not already designated by DOE as described above.

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

DOE may further designate senior/key personnel during award negotiations or the award period of performance.

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 are potentially duplicative 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 are potentially duplicative 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 relationship with national lab(s) that is prior to this NOFO's Application and that is or may be relevant to the NOFO Application.

Cybersecurity Plan

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

Example Cover Page for Concept Papers, Pre-Applications, and Applications

Project Title & Topic Area:	**OCED eXCHANGE Control Number:**
Applicant Name:	
Applicant Entity Type and Explanation of Eligibility:	
Project Location by City, State, and Zip Code +4:	
Proposed Technology:	
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 and 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 (yrs):	

STEP 3:
SUBMIT YOUR APPLICATION

IN THIS STEP

Submission Requirements and Deadlines

Submission Requirements and Deadlines

Request Application Package

All Application, 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 (enter Notice of Funding Opportunity Number).

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; and
- 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, the DOE will determine that the applicant is not qualified to receive a Federal award and use that determination as a basis for making a Federal award to another applicant.

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

Pre-Application (TA-1 only)

You must submit your Pre-Application by January 31, 2025, 11:59 pm.

Concept Paper (TA-2 and TA-3 only)

You must submit your Concept Paper by January 31, 2025, 11:59 pm.

Application

You must submit your Application by July 31, 2025, 11:59 pm.

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 Board'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) prior to 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 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 be used 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 prior to the award that the applicant is submitting as part of the Application. This section discusses data that will be part of or arises out of 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 DOE awards may be protected from public disclosure for up to ten years after the data is first produced. Protected Data is technical data or commercial or financial data first produced in the performance of the award which, if it 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 is 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 which 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 which 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/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 and/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 who 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 *DAC-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

The following Concept Papers, Pre-Applications, and Applications will be deemed nonresponsive and will not be reviewed or considered:

- Concept Papers, Pre-Applications, and Applications not based on established scientific principles
- Concept Papers, Pre-Applications, and Applications proposing approaches identified specifically as NOT of interest.

Review Criteria

Compliance Criteria

All applicant submissions for Concept Papers, Pre-Applications, and Applications must:

- Comply with the applicable content and form requirements listed in Technical Review Criteria and Applications sections 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

Concept Papers and Pre-Applications

Concept Papers and Pre-Applications are evaluated based on consideration of the following factors.

Concept Paper and Pre-Application Criterion: Overall NOFO Responsiveness and Viability of the Project (Weight: 100%)

This criterion involves consideration of the following factors:

- Applicant clearly and compellingly addresses each of the Concept Paper and Pre-Application components and requirements in Section 2.
- Applicant clearly and compellingly describes the proposed scope of the project including the key technologies and systems, demonstration site and test plan, and commercialization approach.
- Applicant clearly and compellingly identifies how the proposed approach could be replicated and/or extended to DAC hubs and supporting infrastructure.

- Where appropriate, the applicant demonstrates how it plans to leverage other Federal and/or state funding and/or incentive programs (including rebates and tax credits) and partnerships.
- Applicant has identified a preliminary project development plan and timeline that shows a clear and compelling path to execution of the proposed project, including a finance plan, any key risks, challenges, and possible mitigation strategies, and has shown the impact that DOE funding and the proposed project would have on supporting decarbonization goals.
- Applicant and proposed team have the qualifications, experience, capabilities, and other resources necessary to design, develop, build, and operate the proposed project.
- Likelihood of applicant and proposed team to satisfy full eligibility requirements by time of Application.
- Description of strategies to ensure meaningful community and workforce engagement, quality jobs and workforce development, DEIA, benefits to disadvantaged communities, and methods to ensure accountability for all strategies.
- Proposed work, if successfully accomplished, would meet the objectives as stated in the NOFO, including achieving market liftoff and attracting follow-on investments from the private sector.

Applications

Criterion 1: Technical Approach and Impact (TA-1: 15%, TA-2: 25%, TA-3: 20%)

This criterion involves consideration of the following factors:

Project Technical Approach and Impact:

- **(TA-2 and TA-3 only):** Validation of readiness based on 1) operational data from Reference Facility and 2) assessment of proposed changes to the components, design, materials, integration, or scale of the individual unit operations responsible for core capture, regeneration, and energy integration steps. TA-2 projects are expected to propose some changes to those elements. TA-3 projects are expected to propose few or no changes without independent validation.
- **(TA-2 and TA-3 only):** Scientific and engineering soundness of the proposed DAC technology(ies).
- **(TA-2 and TA-3 only):** Demonstrated progress of Reference Facility, projected cost and efficiency, and credibility of proposed future upgrades (Nth-of-a-kind) for cost and efficiency improvements.
- **(TA-2 and TA-3 only):** Comprehensiveness of plans for measuring and managing any non- CO_2 emissions or pollution from the facility.
- Technical details of storage site, if applicable.
- Technical details of CO_2 Conversion Technology, if applicable.
- **(TA-2 and TA-3 only):** Potential to maximize net CO_2 emissions reductions by incorporating energy and CO_2 storage/utilization options associated with the greatest net climate benefit, via net carbon removal or a reduction in carbon intensity of a product or process.
- **(TA-2 and TA-3 only):** Adequacy and clarity of the preliminary LCA.

- **(TA-2 and TA-3 only):** Larger facilities (i.e., ability to capture greater volumes of CO_2).
- **(TA-2 and TA-3 only):** Degree to which the proposed project approach will advance the technical maturity and commercial readiness of the proposed technology.
- Ability to access existing or planned clean energy and carbon offtake resources to reduce the need to develop them using project funds.
- Extent to which the Application specifically and reasonably demonstrates how the proposed project will be capable of meeting the technical objectives and system requirements outlined in the NOFO.
- Degree to which the proposed project can substantiate an ability to quickly achieve its technical objectives.
- Degree to which the proposed technology, site, testing plan, and commercialization activities are clearly described in the Application.
- 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.
- Adequacy of the details provided in the initial LCA and other Application materials to assess relative environmental value of the technology proposed versus existing technologies and the environmental viability of the technology if widely commercialized.
- Where appropriate, the extent to which the applicant demonstrates how it plans to leverage other Federal and/or state programs and partnerships.
- 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.
- Applicant provides a reasonable understanding of the security risks to the project and demonstrates a commitment to security risk management considerations; including: cybersecurity, physical security, and internal threat identification, and response planning.

Liftoff Technical Approach and Impact:

- Degree to which the proposed project's approaches are replicable and extensible to commercial-scale technologies and systems.
- Degree to which the proposed project reasonably expects to enable, encourage, and accelerate broader industry-wide implementation.
- Sufficiency of technical detail provided in the Application addressing whether the proposed technologies and systems would be commercially viable at scale.
- 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 (TA-1: 35%, TA-2: 25%, TA-3: 30%)

This criterion involves consideration of the following factors:

- **(TA-2 only)** Vision for deploying the technology at a scale of at least 100,000 TPA following a successful mid-scale demonstration.
- **(TA-3 only)** Vision for subsequent deployments of the technology, at this location or elsewhere, of at least 10x the proposed facility capacity.
- **(TA-3 only)** Vision for how this facility can contribute to a new or existing regional DAC hub with a one million TPA capture capacity..
- **(TA-2 and TA-3 only)** Ability to secure agreements for future carbon credit sales or future revenue from other sources prior to the construction phase.
- **(TA-1 only)** Sustainable business model for operations beyond DOE support.
- **(TA-1 only)** Capacity for hosting and value proposition for early commercial DAC projects.
- Degree to which the applicant assesses and demonstrates potential market competitiveness and sustainability for the proposed project through project assessment using Adoption Readiness Level (ARL) framework.
- Adequacy of the details in the preliminary techno-economic analysis (TEA) to justify viability and feasibility of the project and the value proposition and timeline of the technology to be replicated.
- 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.
- 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.
- 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.
- 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.
- Adequacy of the business plan for developing key project agreements such as financing, acquisition strategies, supply chain, and other relevant project documents.
- **(TA-2 and TA-3 only)** Degree to which project proposes suitable measurement, reporting, and verification plan inclusive of protocols, partners, and strategies to enable impact quantification and carbon credit generation.
- Degree to which DOE funding is necessary to achieve the demonstration project objectives.
- Degree to which project mitigates or reduces barriers to broader market adoption identified in Adoption Readiness Level (ARL) assessment.
- 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.

- 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 and Organization (15%)

This criterion involves consideration of the following factors:

- Demonstrated experience of the applicant and partnering organizations in the technology areas addressed in the Application and in managing projects of similar size, scope, and complexity
- Thoroughness of the depth and clarity of the discussion of previous or current DAC projects involving one or more of the proposed partners to demonstrate the experience of the partners, including evidence of past cooperation among various partners and commitment to cost share
- Adequacy of the credentials, capabilities, and experience of key personnel and partnering organizations
- Clarity and likely effectiveness of the project organization, including subrecipients or partners, to successfully complete the project. Adequacy of plans to add new team members (if applicable).
- Adequacy and availability of proposed personnel, facilities, and equipment to perform project tasks, including EPC firms and/or project developers, when utilized.
- Demonstrated safety performance history of all team organizations.
- Level of participation by project participants as evidenced by letter(s) of commitment and how well they are integrated into the Workplan.
- Degree to which existing facilities and/or infrastructure provided by the applicant team are leveraged to support the project.
- Strength of the project management discussion in the project Workplan to give confidence in a high likelihood of project success.
- Degree to which the applicant has defined and described a project management structure that addresses interfaces with DOE and key team members.
- Clarity and appropriateness of the roles of the team members**.**
- 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**.**

Criterion 4: Workplan (15%)

This criterion involves consideration of the following factors:

- Feasibility, appropriateness, rationale, and completeness of the proposed plan, such that there is a logical progression of work, and necessary tasks and deliverables of the project were sufficiently identified and described.
- The adequacy and completeness of the Project Management Plan (PMP) in establishing baselines (technical scope, budget, schedule, and performance metrics) that will be assessed during the proposed project, and in managing project performance relative to those baselines; defining the actions that will be taken when these baselines must be revised; and identifying project risks and strategies for mitigation. The following aspects of the PMP shall be evaluated:
    a. Soundness and completeness of the Integrated Project Schedule that includes all tasks necessary for successful completion of the project; incorporates and shows inter-relationships among all technical, financial, NEPA, CBP, and permitting and other appropriate factors; includes a critical path schedule with milestones and decision points; and allocates sufficient and appropriate time to complete the project deliverables;
    b. Adequacy of the Baseline Cost Plan for establishing the baseline cost for the project and incorporating costs for all tasks necessary for performing the proposed project;
    c. Adequacy of the project management system to monitor and control project scope, cost, and schedule;
    d. Adequacy of the Project Communication Protocol for ensuring effective communication between the Recipient, Subrecipients, and DOE;
    e. Adequacy of the Risk Management Plan for quantitatively and qualitatively assessing, identifying, tracking, and managing project risk; completeness of the identification of potential risk elements with potential impacts; quality and adequacy of the approach to assessing and managing risks, conformance of risk management approach with industry standards; and adequacy of the approaches to risk mitigation; and
    f. Adequacy of the Environmental Management Plan for assessing, monitoring, and reporting the potential environmental impacts to air, land and water resources, and potential impacts of waste production.
- Ability to execute the project on a fast timeline.
- Degree to which the proposed Workplan and critical path have been clearly and thoroughly described and thoughtfully considered.
- 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.
- Strength and level of clarity in the definition of the project phases, metrics, Integrated Project Schedule, and Go/No-Go review criteria.

- 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 benefits milestones at appropriate project Go/No-Go review points to mitigate project risk and enable the successful design, procurement, construction, and operation of the proposed project.
- Extent to which CB are integrated into the project management schedule and provides mechanisms with measurable actions that enable impacts to project direction in a timely manner.
- 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.

Criteria 5: Community Benefits Plan (20%)

This criterion involves consideration of the following factors:

Overall Approach

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

Community and Workforce Engagement

- 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, labor unions, and/or Tribes, in a manner that can impact project decisions.
- Extent to which the project will incorporate accountability to and transparency with affected Tribes, workers and community stakeholders, including those most vulnerable to project activities, including any plans to negotiate enforceable Workforce and Community Agreements.
- Investing in Quality Jobs Extent to which the jobs supported by the proposed project will be quality jobs and the project provides a robust and credible plan to attract, train, and retain skilled local workers (e.g., through Workforce and Community Agreements, commitments to wages above prevailing wage requirements, benefits, or other worker support).
- Extent to which the project provides employees with the ability to organize, bargain collectively, and participate, through workforce organizations of their choosing, in decisions that affect them.

Diversity, Equity, Inclusion, and Accessibility (DEIA)

- Extent to which the Community Benefits Plan 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 businesses, partnerships with Minority-Serving Institutions[13] (MSIs), and other DEIA initiatives.

[13] Minority-Serving Institution is defined in 7 CFR 3430.302.

- 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.

Ensuring Project Benefits

- Extent to which the Community Benefits Plan identifies specific and measurable project benefits, how the benefits will flow, and describes a plan to maximize project benefits to disadvantaged and local communities.
- Extent to which the Community Benefits Plan identifies specific potential negative impacts, where they could flow, and describes a plan to eliminate, minimize, and mitigate negative impacts.

Other Selection Factors

In addition to the above criteria, the Selection Official may consider the following program policy factors in determining to select for negotiation of award, a project or group of projects of less or equal merit than other projects if that project or group of projects (statutory factors in **bold**):

- **Contribute to the development of hubs that are located in different regions of the United States.**
- **Help a new or existing regional DAC hub advance towards one million ton capture capacity.**
- **Are located in a region with (1) existing carbon-intensive fuel production or industrial capacity, or (2) carbon-intensive fuel production or industrial capacity that has retired or closed in the preceding 10 years.**
- **Contribute to the development of at least two hubs that are located in economically distressed communities in the regions of the United States with high levels of coal, oil, or natural gas resources.**
- Represent a diversity of technologies.
- Optimize use of available funds, including proposed cost share.
- Support U.S. supply chains and producers of steel and other construction materials.
- Have broad public support from the communities most directly impacted by or most vulnerable to impacts from the project.

Review and Selection Process

Overview

The evaluation process consists of multiple phases; each includes 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 parties 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. These pre-selection clarifications will solely be for the purposes of clarifying the Application. The 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 purposes, 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 and/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 located on the Funding Opportunities section of the Apply for Funding page. 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 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, and
- 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 an assessment of community opposition, potential labor disputes, availability of a skilled workforce, public and worker health and safety considerations and other factors. 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 workforce 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 and Pre-award Submission Notifications

DOE will notify applicants of its determination to allow an Application or 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 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.

DOE may stagger its selection determinations. As a result, some applicants may receive their notification letter in advance of other applicants.

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 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

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 anticipated award.

To reduce burden 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 prior to merit review or after merit review when the Application is under consideration for funding.

Applicants will be notified (primarily by e-mail) 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.

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 prior to 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 Disclosures; Bipartisan Infrastructure Law-Specific Requirements; Fraud, Waste and Abuse requirements; Safety, Security, and Regulatory requirements; and Environmental Review in Accordance with National Environmental Policy Act requirements.

These 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 for more information. Please review this document prior to 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 section of the Award Negotiations 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 the 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 justice and equity, investing in quality jobs, boosting domestic manufacturing, reducing greenhouse gas 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 workforce 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
- Justice and 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 events
  - Other relevant indicators from the Community Benefits Plan
- Number and type of energy efficient and clean energy equipment installed
- Funding leveraged and follow-on-funding
- Intellectual property generation and utilization

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 Officer assigned to the award.

Prohibition Related to Malign Foreign Talent Recruitment Programs

As required by law,[14] senior/key personnel participating in a Malign Foreign Talent Recruitment Program[15] 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.

[14] See sections 10631-10632 of P.L. 117-167 (42 USC 19231-19232); OSTP-Foreign-Talent-Recruitment-Program-Guidelines.pdf (whitehouse.gov).
[15] 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: 1. Foreign Entity Participation; and 2. Foreign Work

1. 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.[16] 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.

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

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;
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.
  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.

National Environmental Policy Act (NEPA) 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 updated Environmental Considerations Summary (ECS) for all proposed Phase 1 activities in detail 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 a complete Environmental Information Volume (EIV), to include 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 prior to entering into a Phase 3 financial assistance agreement (e.g., prior to commencing construction). At DOE's discretion, an ECS, to include all 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.

Other Information

Project FEED Requirements

As part of Phase 1 activities, TA-2 and TA-3 recipients must complete a front-end engineering design (FEED) study for their proposed project. The FEED study must represent the planned nameplate gross capture capacity following construction. All listed requirements apply to all facilities in multi-facility Applications, although one comprehensive FEED may be sufficient to cover multiple, interconnected DAC systems.

The scope of the FEED study includes the DAC system itself, any supporting equipment (sometimes referred to as "balance-of-plant," offsite, or outside battery limits equipment), and connections to offtake infrastructure, all inclusive of equipment piping, instrumentation, and other customary and relevant aspects of plant design. Supporting equipment for the project may include, but is not limited to, unit operations such as air feed pre-treatment, condensation, dehydration, oxygen removal, and compression and utilities such as cooling water, compressed air, nitrogen, steam, electricity, water treatment, and waste treatment.

The content included in a FEED study is tailored by the type of project and the needs of the project owner. Often Engineering, Procurement, and Construction (EPC) firms will have an in-house standard in the absence or lack of project owner definition. The goal of the FEED study is for the owner and EPC firm to collaboratively refine the project's scope, design, and cost estimate as much as possible to reduce risk and uncertainty prior to executing the project.

DOE expects that the following list of content is included in the FEED study. Often, items 1 through 3 in the list below are provided by the project owner to the EPC firm.

Recipients are encouraged to include additional materials outside this list that resulted from the uniqueness of their respective project or the needs of the owner. Recipients are also encouraged to integrate detailed design activities with CBP requirements and activities as appropriate for the project into an overall integrated project schedule. All sections of the FEED study should be checked to ensure that the values agree between sections of the report(s) as well as other project deliverables.

1. Project Background

a) Discuss high-level project need and business objective
b) Summarize major aims and conclusions of each of the subsequent chapters (e.g., Project Scope, Project Design Basis)

2. Project Scope

a) Provide a summary of the proposed project, the project objective, and how the proposed project will meet the project objective
b) Describe the roles and scope of work for different parties involved in the project
c) Provide the system boundaries/battery limits of the proposed project
d) Describe qualitatively whether the project is a greenfield or brownfield development and any expected integration with existing industrial sites or utilities

3. Project Design Basis

a) Describe site characteristics including location, topography, available land, transportation access, available utilities, access to water, and expected access to carbon dioxide transport and/or storage
b) Describe site ambient conditions including temperature ranges, precipitation, atmospheric pressure ranges, elevation, air concentration averages and extremes with a focus on CO_2 concentrations and pollutants, prevailing wind, airflow patterns, relative humidity, seismic data, sea spray, pollen, spores, and risk of natural disasters including being downwind of wildfires
c) Describe any expected fuel feedstocks including compositional analysis
d) Describe environmental requirements as dictated by Authorities Having Jurisdiction (AHJs), such as the Environmental Protection Agency, state departments of environmental protection/quality, etc., concerning:
    i. Air emissions permitting limitations and required measurement and control technologies
    ii. Water discharge permitting limitations and required measurement and control technologies
    iii. Waste disposal (e.g., spent sorbents and solvents) permitting limitations and required measurement and control technologies
    iv. Safety considerations including fire department rules and other public safety concerns
e) Describe site-specific design considerations including flood plain, soil conditions, building/enclosure permitting, noise regulations, and local community requirements for the proposed site
f) Describe any modularization design requirements

4. Basic Contracting, Purchasing, and Staffing Strategy

a) Provide a plan for tracking cost and schedule performance, such as cost performance indicators from an earned value management system
b) Provide details about staffing, operation, and training (including apprenticeships) plans for the DAC facility and any associated unit operations

5. Engineering Design Packages

a) Describe process engineering specifications including:
   i. Process area description and plot plan
   ii. Finalized block flow diagrams (BFDs), process flow diagrams (PFDs), and piping and instrumentation diagrams (P&IDs)
   iii. Process model simulation output and heat and material balances (H&MBs)
   iv. Minimum stream requirements (as applicable) such as gas effluent from the absorber/adsorber, CO_2 product from the regenerator, CO_2 product after compression (with detailed impurities), and CO_2 product before transfer to transport and storage
   v. Specific DAC technology design details (as applicable) including capture fraction, pressure drop across contactor, contactor spacing, working/adsorption capacity or solvent loading, step cycle times, selectivity, vacuum pressure, regeneration energy, steam requirements, electrical requirements, system auxiliary load, and sorbent/solvent initial fill and makeup rates
   vi. Description of expected maintenance requirements and consumable replacement
   vii. Initial study of system startup, shutdown, and response to dynamic environmental conditions
   viii. Equipment and instrumentation lists and vendor datasheets with sizing and key parameters used for equipment design and costing (e.g., height, diameter, heat duty, temperature, power, and materials of construction)
   ix. HAZOP and Process Hazard Analysis (PHA) documentation
   x. Cause-and-effect diagrams
   xi. Overpressure relief and flare studies
b) Describe civil and structural engineering elements including:
   i. Soil load analysis and soil resistivity assessment
   ii. Storm water runoff plan
   iii. Geologic assessment
   iv. Spill containment assessment
   v. Determination of type of foundation for various loads associated with all plant equipment including evaluation of abandoned tunnels, sinkholes, and other risks
   vi. Foundation design drawings (e.g., concrete slabs, helical pillars)
   vii. Structural and architectural drawings (e.g., process equipment/piping structural supports, access gangways/ladders, building enclosures, etc.)
   viii. Structural steel support and foundation
   ix. Material takeoffs
c) Describe mechanical engineering elements including:
   i. General site plan view(s)
   ii. 3D model and/or equipment elevation sections and plan drawings
   iii. Piping/tracing/insulation line list and material specification
   iv. Piping isometrics
   v. Piping layout/routing drawings

d) Describe electrical engineering elements including:
   i. Electrical load lists
   ii. One-line diagram(s)
   iii. Electrical equipment (e.g., substation, motor control centers, switchgear) specifications
   iv. Cable/cable tray drawings and specifications
   v. Lighting drawings
e) Describe instrumentation and controls engineering and system integration elements including:
   i. Control system architecture specification
   ii. Instrument/equipment lists and specifications
   iii. Loop drawings
   iv. Communications infrastructure (e.g., remote SCADA ability, telephone, internet) specifications
f) Describe safety and emergency access plans for facility including:
   i. Strategies to develop and use inherent safety principles , protocols, and training at the facility
   ii. Risk review of primary safety risks from facility with development of mitigants
   iii. Emergency access plans and routes
   iv. Evaluation of exit routes, dead ends, emergency lighting, escape times, and personal protective equipment needs
g) Describe fire protection engineering plan including fire protection system (e.g., sprinkler, foam, water cannons, and toxic firefighting water drainage) design specifications and drawings
h) Describe facilities engineering plans including:
   i. Building and security infrastructure plans including front office/administration, control rooms, canteens, maintenance/shop areas, and laboratories
   ii. Heating, ventilation, and air conditioning plans
i) Describe project security plans including physical site security and cybersecurity with associated information protection systems
j) Provide results of transportation and logistics study
k) Detail constructability plans including construction access, laydown areas, and sequencing of construction work
l) Conduct and discuss detailed project capital cost estimate including:
   i. Specified year dollar basis and nominal vs. real
   ii. Costs for primary equipment with details related to quantity, equipment specifications, material choices, and design margins
   iii. Costs for equipment transportation, equipment installation, piping, insulation, instrumentation, controls, electrical systems, civil/site preparation work, and buildings (all directly rather than factorially estimated to the extent possible)
   iv. Costs for “balance-of-plant"/offsite/outside battery limits equipment including but not limited to unit operations such as condensation, dehydration, oxygen removal, and compression and utilities such as cooling water, compressed air, nitrogen, steam, electricity, water treatment, and waste treatment
   v. Costs for connective infrastructure to CO_2 transport, storage, and/or conversion/utilization as applicable
   vi. EPC fees and process and project contingency costs

vii. Costs for land purchase or tenant fees
viii. High-level discussion of other expected relevant capital cost categories such as interest, pre-production/startup costs, construction insurance, working capital, inventory capital, etc.

m) Conduct and discussion detailed project operating cost estimate including:
i. Costs for raw materials including sorbent/solvent makeup
ii. Costs for waste disposal
iii. Costs for utilities including steam, electricity, nitrogen, cooling water, etc. if not covered in the capital cost estimate. Costs for additional low-carbon energy purchasing, such as through power purchase agreements, must also be discussed and included
iv. Costs for workforce at facility (aligned with separate FEED workforce estimates) inclusive of operating workforce and supervision including benefits, taxes, etc.
v. Costs for maintenance workforce and materials
vi. Costs for property taxes and insurance

n) Provide an integrated project schedule covering:
i. Identification of project critical path
ii. Detailed milestones for the aforementioned engineering tasks
iii. Strategy for tracking schedule performance such as schedule performance indicators

Technology Data Tables

The Technology Data Tables must be filled out as part of the Application and subsequently during each project phase, as applicable. Provided data should most closely represent previously demonstrated conditions at the Reference Facility rather than projections, although additional modeled, experimental, and operational results can be disclosed with explanations of differences. Other short narratives can be provided in addition to the data tables to provide more insight on disclosed data or the provision of multiple data points or ranges. Specific data should be linked to narratives through the use of superscript numbering or lettering. Data in addition to the data requested can be provided but will then be expected to be disclosed, if still relevant, in all subsequent phases as available.

There are different tables to be filled out depending on the nature of the specific project. DOE may provide additional tables for processes not completely covered by the listed tables, such as DAC systems making use of membranes or cryogenic separation, if such processes are selected. Tables are to be filled out only if they are applicable to a given project. Data that is to be described qualitatively contains “Description” as the unit. DOE reserves the right to request additional technical data regarding processes for continued evaluation as projects progress.

General Technology Table	Unit	Value at Application	Value at Phase 1 End
System TRL (as defined by DOE G 413.3-4A Technology Readiness Assessment Guide, 2011)	TRL		
Largest demonstrated capture capacity (assuming 100% capacity) of the specific proposed technology process flow diagram and mass and energy balance	t CO_2/year (gross)		
Total system energy requirement (captured)	GJ/t CO_2 captured		
Total system energy requirement (stored or utilized)	GJ/t CO_2 stored or utilized		
System electrical requirement (including to generate thermal) (captured)	GJ/t CO_2 captured		
System electrical requirement (including to generate thermal) (stored or utilized)	GJ/t CO_2 stored or utilized		
System thermal requirement (excluding thermal energy generated via electricity) (captured)	GJ/t CO_2 captured		
System thermal requirement (excluding thermal energy generated via electricity) (stored or utilized)	GJ/t CO_2 stored or utilized		
System thermal requirement (temperature) (excluding thermal energy generated via electricity) (captured)	°C		
System thermal requirement (temperature) (excluding thermal energy generated via electricity) (stored or utilized)	°C		
Required maximum system temperature	°C		
Required minimum system pressure	bar		
Volumetric productivity	mol CO_2/m3 capture media-time; kg CO_2/ha-year; etc.		
CO_2 capture fraction from feed air	%		
Pressure drop across contactor (if applicable)	Pa		
Approximate land requirement	m2/t CO_2-year		
Approximate water requirement	gal/t CO_2		
Required water quality	Description		
Cumulative total of captured CO_2 to date of the specific proposed technology process flow diagram and mass and energy balance	t CO_2		
Climatic conditions used in testing and operations to date	Description		

Solid Sorbent Table (If Applicable)	Unit	Value at Application	Value at Phase 1 End
Sorbent, substrate, and contactor material	Description		
Form factor (e.g., pellets, laminate sheets	Description		
Average sorbent dimensions	mm*mm*mm		
Thermal conductivity	W/(m-K)		
Adsorption pressure	bar		
Adsorption temperature range	°C–°C		
Equilibrium CO_2 loading during adsorption	mol CO_2/kg		
Equilibrium H_2O loading during adsorption	mol H_2O/kg		
Heat of CO_2 adsorption	kJ/mol CO_2		
Heat of H_2O adsorption	kJ/mol CO_2		
CO_2 adsorption kinetics	minute/cycle		
Desorption pressure	bar		
Desorption temperature range	°C–°C		
Equilibrium CO_2 loading during desorption	mol CO_2/kg		
Equilibrium H2O loading during desorption	mol H_2O/kg		
Heat of CO_2 desorption	kJ/mol CO_2		
Heat of H_2O desorption	kJ/mol CO_2		
CO_2 desorption kinetics	minute/cycle		
CO_2 product purity before conditioning	%		
Sorbent degradation rate (% cyclical capacity loss per cycle or equivalent)	Description		
Sorbent loss per cycle	Description		
Sorbent makeup rate	%/year		
Details on sorbent reactivation or replenishment	Description		

Liquid Solvent Table (If Applicable)	Unit	Value at Application	Value at Phase 1 End
Type of solvent (e.g., KOH in water)	Description		
Molecular weight	g/mol		
Density	kg/m3		
Boiling point at 1 atm	°C		
Freezing point at 1 atm	°C		
Vapor pressure at 25°C	bar		
Solvent molar concentration (e.g., KOH)	mol/L		
Specific heat capacity at 25°C and 1 atm	kJ/kg-K		
Viscosity at 25°C and 1 atm	cP		
Surface tension at 25°C and 1 atm	dyne/cm		
CO_2 mass transfer rate	m/s		
Thermal conductivity	W/m-K		
Absorption pressure	bar		
Absorption temperature	°C		
Equilibrium CO_2 loading during adsorption	mol CO_2/kg		
Heat of absorption	kJ/mol CO_2		
Absorbed solution viscosity	cP		
Intermediate steps after absorption (if applicable)	Description		
Desorption pressure	bar		
Desorption temperature	°C		
Equilibrium CO_2 loading during desorption	mol CO_2/kg		
Heat of desorption	kJ/mol CO_2		
CO_2 product purity before conditioning	%		
Solvent makeup rate	%/year		

Electrochemical Table (If Applicable)	Unit	Value at Application	Value at Phase 1 End
Balanced chemical equations	Description		
Standard enthalpy change of overall reaction(s) at relevant temperature and pressure	kJ/mol CO_2		
Standard Gibbs free energy of overall reaction(s) at relevant temperature and pressure	kJ/mol CO_2		
Electrolysis-related electrical use per unit of CO_2 captured	kWh/kg CO_2		
Nominal cell potential	V		
Nominal current density	mA/cm2		
Nominal power density	mW/cm2		
Nominal operating temperature	°C		
Change in temperature across cell	°C		
Operating pressure	atm		
Degradation rate	%/1,000 hour		
Electrolyte and solvent	Description		
Electrolyte concentration	mol/L		
Electrolyte loss rate	%/1,000 hour		
Faradaic efficiency/selectivity to different reaction products	%s		
Membrane material(s)	Description		
Membrane cost	$/m2		
Presence of PFAS in membrane supply chain	Yes/no		
Anode catalyst	Description		
Anode catalyst loading	g/cm2		
Anode catalyst cost	$/g		
Cathode catalyst	Description		
Cathode catalyst loading	g/cm2		
Cathode catalyst cost	$/g		
CO_2 product purity before conditioning	%		

STEP 6:
CONTACTS AND SUPPORT

IN THIS STEP

Agency Contacts

Helpful Websites

Agency Contacts

NOFO and Program Questions

Direct Air Capture Hubs

Project Management Division

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

Email: *DAC-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 (*DAC-OCED@hq.doe.gov*) at least three business days before the concept paper or Application due date and time. OCED intends to publish all questions and answers in OCED eXCHANGE website.

Regional Direct Air Capture (DAC) Hubs, Carbon Management Division
Office of Clean Energy Demonstrations, U.S. Department of Energy
Phone: 202-586-OCED
Email: OCED@hq.doe.gov

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
Apply for Funding Opportunities
Award Negotiations