

FINANCIAL ASSISTANCE FUNDING OPPORTUNITY ANNOUNCEMENT



Department of Energy (DOE) Office of Fossil Energy and Carbon Management (FECM)

Bipartisan Infrastructure Law - Storage Validation and Testing (Section 40305): Carbon Storage Assurance Facility Enterprise (CarbonSAFE): Phases II, III, III.5, and IV

Funding Opportunity Announcement (FOA) Number: DE-FOA-0002711

FOA Type: Modification 000006

Assistance Listing Number: 81.089, Fossil Energy Research and Development

Initial FOA Issue Date:	9/21/2022
First Submission Deadline for Full Applications:	11/30/2022 5:00pm ET
Second FOA Release Issue Date:	5/16/2023
Second Submission Deadline for Full Applications:	7/20/2023 5:00pm ET
Third FOA Release Issue Date:	12/18/2023 5:00pm ET
Third Submission Deadline for Full Applications:	03/20/2024 5:00pm ET
Expected Date for DOE Third Selection Notifications:	August 2024
Expected Timeframe for Award Negotiations:	December 2024
Amendment Issue Date:	02/15/2024

- To apply to this FOA, applicants must register with and submit application materials through Grants.gov at <https://www.grants.gov/>.
- Applicants must designate primary and backup points-of-contact with whom DOE will communicate to conduct award negotiations. If an application is selected for award

negotiations, it is not a commitment to issue an award. It is imperative that the applicant/selectee be responsive during award negotiations and meet negotiation deadlines. Failure to do so may result in cancelation of further award negotiations and rescission of the selection.

Registration Requirements

There are several one-time actions that must be completed before submitting an application in response to this Funding Opportunity Announcement (FOA) (e.g., register with the System for Award Management (SAM), obtain a Unique Entity Identifier (UEI) number, register with Grants.gov, and register with FedConnect.net to submit questions). It is vital that applicants address these items as soon as possible. Some may take several weeks, and failure to complete them could interfere with an applicant's ability to apply to this FOA.

- **SAM** – Applicants must register with SAM at <https://www.sam.gov/> prior to submitting an application in response to this FOA. Designating an Electronic Business Point of Contact (EBiz POC) and obtaining a special password called an MPIN are important steps in SAM registration. Failure to register with SAM will prevent your organization from applying through Grants.gov. The applicant must maintain an active SAM registration with current information at all times during which it has an active Federal award or application under consideration. More information about SAM registration for applicants is found at: https://www.fsd.gov/gsafsd_sp?id=gsafsd_kb_articles&sys_id=650d493e1bab7c105465eaccac4bcbcb.

NOTE: If clicking the SAM links do not work, please copy and paste the link into your browser.

Due to the high demand of SAM registrations and UEI requests, entity legal business name and address validations are taking longer than expected to process. Entities should start the SAM and UEI registration process as soon as possible. If entities have technical difficulties with the SAM registration or UEI validation process they should utilize the HELP feature on SAM.gov. SAM.gov will work entity service tickets in the order in which they are received and asks that entities not create multiple service tickets for the same request or technical issue. Additional entity validation resources can be found here: [GSAFSD Tier 0 Knowledge Base - Validating your Entity](#).

- **UEI** – Applicants must obtain an UEI from the SAM to uniquely identify the entity. The UEI is available in the SAM entity registration record.

NOTE: Subawardees/subrecipients at all tiers must also obtain an UEI from the SAM and provide the UEI to the Prime Recipient before the subaward can be issued. Full registration in SAM is not required to obtain an UEI for subaward reporting.

- **Grants.gov** – Applicants must register with Grants.gov and set up your WorkSpace. You cannot submit an application through Grants.gov unless you are registered. Please read the registration requirements carefully and start the process immediately.

- 1) The Authorized Organizational Representative (AOR) must register at:
<https://apply07.grants.gov/apply/OrcRegister>.
- 2) An email is sent to the E-Business (E-Biz) POC listed in SAM. The E-Biz POC must approve the AOR registration using their MPIN from their SAM registration.

More information about the registration steps for Grants.gov is provided at:
<https://www.grants.gov/web/grants/applicants/registration.html>.

In addition:

- Add a Profile to a Grants.gov Account: A profile in Grants.gov corresponds to a single applicant organization the user represents (i.e., an applicant) or an individual applicant. If you work for or consult with multiple organizations and have a profile for each, you may log in to one Grants.gov account to access all of your grant applications. To add an organizational profile to your Grants.gov account, enter the UEI for the organization in the UEI field while adding a profile. For more detailed instructions about creating a profile on Grants.gov, refer to:
<https://www.grants.gov/web/grants/applicants/registration/add-profile.html>.
- *EBiz POC Authorized Profile Roles*: After you register with Grants.gov and create an Organization Applicant Profile, the organization applicant's request for Grants.gov roles and access is sent to the EBiz POC. The EBiz POC will then log in to Grants.gov and authorize the appropriate roles, which may include the AOR role, thereby giving you permission to complete and submit applications on behalf of the organization. You will be able to submit your application online any time after you have been assigned the AOR role.

NOTE: When applications are submitted through Grants.gov, the name of the organization applicant with the AOR role that submitted the application is inserted into the signature line of the application, serving as the electronic signature. The EBiz POC **must** authorize people who are able to make legally binding commitments on behalf of the organization as a user with the AOR role; **this step is often missed and it is crucial for valid and timely submissions.**

For more detailed instructions about creating a profile on Grants.gov, refer to:
<https://www.grants.gov/web/grants/applicants/registration/authorize-roles.html>.

To track your role request, refer to:
<https://www.grants.gov/web/grants/applicants/registration/track-role-status.html>.

Questions relating to the **registration process, system requirements, or how an application form works** must be directed to Grants.gov at 1-800-518-4726 or support@grants.gov.

- **FedConnect.net** – Applicants must register with FedConnect to submit questions. FedConnect website: <https://www.fedconnect.net/>

See Section IV for Application and Submission Information (including how to create a Workspace).

Modifications

Mod. No.	Date	Description of Modification
000005	12/12/2023	Modification 000005 changes to the FOA are HIGHLIGHTED in the body of the FOA. The purpose of this amendment is to revise the following: • The previous release of the FOA has been incorporated into an updated, BIL-specific FOA template. Application requirements from the previous release of the FOA remain largely unchanged (edits are HIGHLIGHTED); however, several sections and subsections of the FOA have been moved within the document and the order of appendices has changed. • Section I.A.ii. Clarification of CarbonSAFE Phase I – Integrated CCUS Pre-Feasibility. • Community Benefits Plan subplans have been deleted throughout the FOA as they are no longer required to be submitted as separate plans/plan development proposals (Quality Jobs Plan; DEIA Plan; J40 Plan; and Community, Labor and Stakeholder Engagement Plan) • Section I.B.i. specifies that “All work for projects selected under this FOA must be performed in the United States.” • All references to NEPA as the National Environmental Protection Act have been corrected. • Section I.B.ii., AOI – 1, Objective 6 specifies, “The DOE share of the Pipeline FEED Study shall not exceed \$5 million.” • Section I.B.ii., AOI – 1, Objective 7 has been updated to clarify the requirements of the Community Benefits Plan. • Section I.B.ii, AOI – 1, Objective 8 has been updated to better explain the expectations and requirements of the Facility Type and High-Level Budget Justification. • Section I.B.ii., AOI – 2, Objective 4 specifies, “The DOE share of the Pipeline FEED Study shall not exceed \$5 million.” • Section I.B.ii, AOI – 3, Objective 8 includes updates to the Community Benefits Plan requirements. • Section I.B.ii, AOI – 3, Objective 8 has been updated to better explain the expectations and requirements of the Facility Type and High-Level Budget Justification. • Section I.B.ii, AOI – 4, Objective 5 includes updates to the Community Benefits Plan requirements.

Mod. No.	Date	Description of Modification
		• Section I.C, Applications Specifically Not of Interest has been updated. • Section IV.B., Application Forms, has replaced the subsection titled “Full Applications” from the previous release of the FOA. • Section IV.C.i., Full Application Content Requirements, now includes a “Pre-Award Factsheet.” Information concerning the “Pre-Award Factsheet” can be found in Section IV.C.xxii and in Appendix P. • Section IV.C.i., Full Application Content Requirements, now requires the applicant provide “Locations of Work.” Information concerning the requirement can be found in Section IV.C.xix. • Section V.A.i. Technical Review Criteria for ALL AOIs have been updated. • Section V.C.i., Program Policy Factors, has been updated. • Section VI.B.ix., Statement of Substantial Involvement, has been updated. • Section VI.B.xiv, Go/No-Go Review, has been added. • Appendix B, Waiver Requests, has been updated. • Appendix E, Statement of Project Objective Templates, has been updated. • Appendix G, CarbonSAFE Phase II Project Readiness, has been updated (Scenario Analysis and Technical Sub-Basinal Evaluation). • Appendix H, CarbonSAFE Phase III Project Readiness, has been updated (Scenario Analysis, Technical Sub-Basinal Evaluation, Regional Considerations Analysis/Site-Selection Process, CO₂ Technical Analysis, and Phase III Financing Plan). • Appendix I, CarbonSAFE Phase III.5 Project Readiness, has been updated (Scenario Analysis, Technical Sub-Basinal Evaluation, Regional Considerations Analysis/Site-Selection Process, and CO₂ Technical Analysis). • Appendix J, CarbonSAFE Phase IV Project Readiness, has been updated (Scenario Analysis, NEPA Compliance, Storage Field Development Plan, and CO₂ Source(s) Feasibility Study). • Appendix K, Storage Field Development Plan, has been updated to include clarifying information on expectations and requirements. • Appendix N, Project Management Plan, no longer includes references to the Community Benefits Plan subplans (DEIA,

Mod. No.	Date	Description of Modification
		J40, and Community Engagement Plan) and their associated milestones. Appendix P, Pre-Award Factsheet, has been added.
000006	2/15/2024	Modification 000006 changes to the FOA are HIGHLIGHTED in the body of the FOA. The purpose of this amendment is to revise the following: - The submission deadline for full applications, the expected date for selection notifications, and the expected timeframe for award negotiations. - The CO₂ Pipeline FEED Study has been replaced with the CO₂ Transport FEED Study. The change is reflected throughout the FOA. - Language has been added throughout the FOA to clarify the difference between: (a) the transport system from the sources to the storage field; and (b) distribution lines within the storage field. - Language has been included to clarify that the transport system FEED study will be used to help achieve NEPA compliance. - Inform Applicants that construction for CO₂ Transport system associated with CarbonSAFE Phase IV will be capped at \$15M of DOE funding. - Inform Applicants that financial assistance for the construction of CO₂ transport systems is available through the Carbon Dioxide Transportation Infrastructure Finance and Innovation (CIFIA) program. - Management of Induced Seismicity Risk – All Areas of Interest now require Applicants to follow the best practices in DOE’s “Recommended Practices for Managing Induced Seismicity Risk Associated with

Mod. No.	Date	Description of Modification
		Geologic Carbon Storage (Templeton et al., 2021). Specifically: ○ AOI 4 (Phase II) projects must assign their site to a specific risk category. ○ AOI 1 (Phase III) projects must update the overall induced seismicity risk of the planned operation in accordance with data collected during the course of the Phase III project (including, if necessary, collection of local data via a microseismic monitoring system), develop a plan for managing the risk, and incorporate this plan into the Storage Field Development Plan. ○ AOI 3, Objective 6 – Baseline Data was clarified to emphasize the need to characterize baseline microseismic activity. ○ Appendices H (Phase III project readiness) and I (Phase III.5 project Readiness) were modified to require Applicants to indicate whether the overall preliminary seismic risk of the proposed storage complex is categorized as Very Low (Category I), Low (Category II), Medium (Category III), or High (Category IV) in accordance with DOE’s “Recommended Practices for Managing Induced Seismicity Risk Associated with Geologic Carbon Storage (Templeton et al., 2021), and to describe the work done to justify this categorization. ○ Appendix I was further modified to require Applicants to provide the plan for managing the risk of induced seismicity. ○ Appendix K, Storage Field Development Plan, was modified to require Applicants to include Baseline Seismicity and plan for managing the risk of induced seismicity consistent with the risk category of the proposed project site that was determined by the Templeton et. al methodology • Language for Phase IV, Objective 3. Engineer, Procure, Construct was updated for clarity. • Delete language in Merit Review Criterion 5 for AOI 1 (Phase III) requiring the inclusion of a Phase III Project Financing Plan in the Application. • Delete language in Merit Review Criterion 1 for AOI 4 requiring the inclusion of a Stakeholder Analysis.

Mod. No.	Date	Description of Modification
		• Appendix J (Phase IV Project Readiness) was modified to clarify that revenue from the sale of hydrocarbons (oil or natural gas) recovered via operation of the proposed storage facility can not be considered as part of the financial/business analysis. • The link in the term, Current and Pending Support, has been revised (Section IV.C.xviii) • Removed Locations of Work Term (Section IV)

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I. Funding Opportunity Description

A. Background and Context

The Office of Fossil Energy and Carbon Management (FECM) and National Energy Technology Laboratory (NETL) is issuing this Funding Opportunity Announcement (FOA). Awards made under this FOA will be funded, in whole or in part, with funds appropriated by the Infrastructure Investment and Jobs Act¹, more commonly known as the Bipartisan Infrastructure Law (BIL).

The BIL is a once-in-a-generation investment in modernizing and upgrading American infrastructure to enhance United States competitiveness, drive the creation of good-paying union jobs, tackle the climate crisis, and ensure stronger access to economic and environmental benefits for disadvantaged communities². BIL appropriates more than \$62 billion to the Department of Energy (DOE)³ to invest in American manufacturing and workers; expand access to energy efficiency and clean energy; deliver reliable, clean and affordable power to more Americans; and demonstrate and deploy the technologies of tomorrow through clean energy demonstrations.

DOE's BIL investments will support efforts to build a clean and equitable energy economy that achieves a zero-carbon electricity system by 2035, and to put the United States on a path to achieve net-zero emissions economy-wide by no later than 2050⁴ to benefit all Americans.

BIL will invest a total of \$2.5 billion for the five-year period encompassing fiscal years (FYs) 2022 through 2026 for Carbon Storage Validation and Testing (Section 40305) via the development of new or expanded commercial large-scale carbon storage projects and associated carbon dioxide (CO₂) transport infrastructure. This includes funding for the feasibility, site characterization, permitting, and construction stages of project

¹ Infrastructure Investment and Jobs Act, Public Law 117-58 (November 15, 2021). <https://www.congress.gov/bill/117th-congress/house-bill/3684>. This FOA uses the more common name Bipartisan Infrastructure Law.

² Pursuant to E.O. 14008, "Tackling the Climate Crisis at Home and Abroad," January 27, 2021, and the Office of Management and Budget's Interim Justice40 Implementation Guidance M-21-28, DOE recognizes disadvantaged communities as defined and identified by the White House Council of Environmental Quality's Climate and Economic Justice Screening Tool (CEJST), located at <https://screeningtool.geoplatform.gov/>. DOE's Justice40 Implementation Guidance is located at <https://www.energy.gov/sites/default/files/2022-07/Final%20DOE%20Justice40%20General%20Guidance%20072522.pdf>.

³ U.S. Department of Energy. November 2021. "DOE Fact Sheet: The Bipartisan Infrastructure Deal Will Deliver For American Workers, Families and Usher in the Clean Energy Future." <https://www.energy.gov/articles/doe-fact-sheet-bipartisan-infrastructure-deal-will-deliver-american-workers-families-and-0>

⁴ [Executive Order \(EO\) 14008](#), "Tackling the Climate Crisis at Home and Abroad," January 27, 2021.

development. This funding opportunity announcement (FOA) will build on the existing CarbonSAFE Initiative to meet the requirements for Section 40305. The CarbonSAFE Initiative began in 2016 and includes four phases that begin with pre-feasibility projects all the way through permitting and construction of the secure geologic storage complex. Previous funding allowed for funding of the first three phases: pre-feasibility, storage complex feasibility, and site characterization and permitting projects. This FOA will focus funding on the last three phases: storage complex feasibility, site characterization, and permitting and construction of the storage complex.

i. Program Purpose

To support the availability of carbon capture, utilization, and storage (CCUS) and carbon dioxide removal (CDR) to reach climate goals, it is now imperative that existing research be built upon to test, mature, and validate CCUS technologies at commercial scale. One aspect is the need to improve practices regarding how to efficiently and cost-effectively characterize and permit commercial carbon storage project site(s), ensuring that secure geologic carbon storage is available in diverse regions and settings that will support longer-term carbon management goals across the United States, particularly as nascent CDR activities expand in the future.

In order to meet the Biden administration's decarbonization goals in an equitable fashion, this FOA incorporates practices and evaluation criteria associated with: (1) environmental justice; (2) community, labor, and stakeholder engagement, and (3) equity and workforce development. This ensures that development of the commercial-scale secure geologic storage infrastructure supported through this FOA addresses issues uniquely related to the nation's energy and decarbonization transition and past development activities.

Community engagement will be central to the successful implementation of all phases of the CarbonSAFE Initiative. Engagement is continuous throughout the life cycle of a project, but the types of engagement will change with each project phase. In addition to the stakeholder engagement required during the project design/development phases of the CarbonSAFE Initiative, all projects funded by the CarbonSAFE Initiative will complete National Environmental Policy Act (NEPA) review prior to commencement of construction.

In keeping with the administration's goals, and as an agency whose mission includes strengthening the country's security and prosperity by addressing its energy challenges, DOE intends to use this program to support the creation of good-paying jobs with the free and fair choice to join a union, the incorporation of strong labor standards, and workforce development (especially registered apprenticeship and quality pre-apprenticeship). This program will also support the Justice40 Initiative (J40) and Diversity, Equity, Inclusion, and Accessibility (DEIA) efforts.

Commercial large-scale carbon storage projects infrastructure being developed could be used by CO₂ captured and transported through other BIL provisions. These projects could be integrated and therefore, work performed under this FOA may also be supportive of activities under other sections of the BIL:

- Section 41004a—\$937 million for large-scale CCUS pilots. See FOA DE-FOA-0002738 [here](#).
- Section 41004b—\$2.5 billion for demonstration-scale carbon capture projects. See FOA DE-FOA-0002806 [here](#).
- Section 40308—\$3.5 billion for regional direct air capture (DAC) hubs. See FOA DE-FOA-0002735 [here](#).
- Section 40303—\$100 million for front-end engineering design (FEED) studies for CO₂ transport systems. See FOA DE-FOA-0002730 [here](#).
- Section 40304—\$2.1 billion available in loan guarantees for CO₂ transport infrastructure. See CIFIA Program Guide [here](#).
- Section 40314—\$8 billion for hydrogen (H₂) hubs, including fossil-based H₂ with carbon management. See FOA DE-FOA-0002779 [here](#).

Applicants are encouraged to review and determine if there are complementary or synergistic opportunities around linking multiple provisions throughout the CCUS value chain. However, it is important to note that federal dollars provided from one of the BIL provisions above cannot be used as cost share for another provision.

As part of the whole-of-government approach to advance equity and encourage worker organizing and collective bargaining,^{5, 6, 7} and in alignment with the applicable BIL sections, this FOA and any related activities will seek to encourage meaningful engagement and participation of workforce organizations, including labor unions, as well as underserved communities and underrepresented groups, including Indian Tribes⁸. Consistent with Executive Order 14008,⁹ this FOA is designed to help meet the goal that 40% of the benefits of the Administration's investments in clean energy and climate solutions be delivered to disadvantaged communities, as defined by the Department pursuant to the Executive Order, and to drive creation of accessible, good-paying jobs with the free and fair chance for workers to join a union.

⁵ [EO 13985](#), "Advancing Racial Equity and Support for Underserved Communities Through the Federal Government" January 20, 2021.

⁶ [EO 14025](#), "Worker Organizing and Empowerment," April 26, 2021.

⁷ [EO 14052](#), "Implementation of the Infrastructure Investment and Jobs Act," November 18, 2021.

⁸ [EO 13175](#), November 6, 2000 "Consultation and Coordination With Indian Tribal Governments", charges all executive departments and agencies with engaging in regular, meaningful, and robust consultation with Tribal officials in the development of Federal policies that have Tribal implications.

⁹ [EO 14008](#), "Tackling the Climate Crisis at Home and Abroad," January 27, 2021.

ii. Technology Space and Strategic Goals

The overall objective of this FOA is to accelerate the development of new or expanded commercial-scale geologic carbon storage projects and associated CO₂ transport infrastructure, through a focus on detailed site characterization, permitting, and construction stages of project development. This FOA is expected to remain open for five years to facilitate expeditious development of secure geologic carbon storage facilities. As required by the BIL, the selection process will give priority to projects with substantial CO₂ storage capacity and projects that will store CO₂ from multiple carbon capture facilities.

This FOA is for CarbonSAFE Phase II: Storage Complex Feasibility, CarbonSAFE Phase III: Site Characterization and Permitting, and CarbonSAFE Phase IV: Construction with the following Areas of Interest (AOIs):

- AOI 1—CarbonSAFE Phase III: Site Characterization and Permitting
- AOI 2—CarbonSAFE Phase III.5: NEPA, FEED Studies, and Storage Field Development Plan Only*
- AOI 3—CarbonSAFE Phase IV: Construction
- AOI 4—CarbonSAFE Phase II: Storage Complex Feasibility

* Note that Phase III.5 is intended for projects that only need to complete activities (like NEPA) prior to entering Phase 4 (in cases where an applicant has completed a Phase III project, they would not apply for Phase III.5).

Successful implementation of the CarbonSAFE Initiative will encourage the rapid growth of a vibrant, geographically widespread industry for secure geologic carbon storage by reducing risks and costs for future projects and bringing more storage resources into commercial classifications, thereby supporting business and financial decisions of potential developers. As such, DOE seeks proposals for projects that will transition into commercial storage complexes, resulting in key requirements such as Class VI permits, final investment decisions, site construction, and CO₂ offtake agreements.

The CarbonSAFE Initiative includes the following phases: Phase I—Integrated CCUS Pre-Feasibility, Phase II—Storage Complex Feasibility, Phase III—Site Characterization, and Phase IV—Permitting and Site Construction. [DE-FOA-0001584](#) (Phase I) and [DE-FOA-0001450](#) (Phase II) were released in 2016 and 2017, resulting in the award of 13 Phase I projects and six Phase II projects, respectively. [DE-FOA-0001999](#) (Phase III) was released in 2019, resulting in the award of five Phase III projects. [DE-FOA-0002610](#) (Phase II) was released in 2022, resulting in selection of eleven Phase II projects.

The structure of the CarbonSAFE Initiative (traditionally funded using annual appropriations) has been modified to more effectively use the CarbonSAFE Initiative phases for both the FECM Carbon Transport and Storage Program and BIL provision 40305. This will ultimately accelerate projects through commercial development to final construction. Applicants are not required to have a CarbonSAFE award to apply to the next phase. Applicants can apply for any phase that they are ready for and can

demonstrate that they have completed a previous phase effort on their own. As modified, the CarbonSAFE Initiative:

- **Phase I—Integrated CCUS Pre-Feasibility** (funded by regular annual appropriations) will continue to be supported through the base Carbon Transport and Storage Program. **Phase I projects are not included in this FOA** because the efforts required to establish pre-feasibility of CCUS in many regions of the U.S. are anticipated to be undertaken as the result of other FOAs under the base program such as Area of Interest 2 of DE-FOA-0002799, in which State Geologic Surveys (or their equivalent) will assemble the data sets needed to identify specific areas where large-scale geologic CO₂ storage projects may be feasible within their State(s). In many other locations of the U.S., the equivalent of Phase I work has already been performed for projects sponsored by commercial entities.
- **Phase II: Storage Complex Feasibility (FOA 2711 Area of Interest 4 funded by BIL)** seeks to perform feasibility assessments for onshore projects within the U.S. and offshore projects within state waters or the U.S. jurisdictional area of the Outer Continental Shelf (Atlantic, Gulf of Mexico, Pacific and Alaska) (proposed injection wells must be located in the United States), particularly for sites having commercial-scale CO₂ geological storage complexes in geographic areas/geologic settings lacking previously supported geologic carbon storage projects. Projects under this phase will perform a technical and economic feasibility study on a storage complex capable of storing a minimum of 50+ million metric tons of anthropogenically-sourced CO₂. Typical activities under Phase II projects include drilling, geophysical logging, and hydraulic (water injection) testing of stratigraphic test wells; passive and active seismic or other geophysical surveying; sampling and chemical analysis of formation fluids and groundwater; and modeling of CO₂ injection into targeted geologic storage reservoirs. Phase II projects were previously funded via annual appropriations (e.g., DE-FOA-0002610) but will henceforth be funded via BIL under this FOA (Area of Interest 4).
- **Phase III—Site Characterization and Permitting (FOA 2711 funded by BIL)** will focus primarily on detailed characterization required for preparing and submitting all federal, state, and local permit requirements, such as application(s) for a U.S. Environmental Protection Agency (EPA) Underground Injection Control (UIC) Class VI permit to construct and/or Department of Interior (DoI) Outer Continental Shelf (OCS) permit(s) to construct. However, Phase III also includes completion (if not previously completed) of a CO₂ Source(s) Feasibility study, **CO₂ Transport FEED Study**, completion of the DOE NEPA process resulting in a Finding of No Significant Impact (FONSI) on an Environmental Assessment (EA), or a Record of Decision (ROD) on an Environmental Impact Statement (EIS). Phase III has been modified slightly to now include a Storage Field Development Plan, a Risk Assessment and Mitigation Plan, a Community Benefits Plan, and a Business Plan. Depending on the location of a storage facility, the project could require additional environmental reviews

from multiple agencies and the project developer will need to coordinate across the agencies to complete the documentation necessary to meet leasing, regulatory, and NEPA requirements. DOE will support the project developer with cross-agency coordination on permitting and NEPA, where appropriate.

- **Phase III.5—NEPA, FEED Studies, and Storage Field Development Plan Only¹⁰ (FOA 2711 Area of Interest 2 funded by BIL)** is a new phase intended for applicants who have already completed most Phase III activities independent of DOE funding and have submitted all required federal, state, and local permit applications, such as Class VI or DoI OCS permit(s) to construct, but haven't gone through the NEPA compliance process and Community Benefits Plan development. The NEPA process requires developing an Environmental Information Volume (EIV) and then completing either an EA with a FONSI or an EIS with a ROD. A Community Benefits Plan should be completed and is required to apply to Phase IV. Additional activities for Phase III.5 could include the completion of one or more of the following: a CO₂ Source(s) Feasibility Study, a **CO₂ Transport FEED Study**, a Storage Field Development Plan, a Risk Assessment and Mitigation Plan, or a Business Plan. Depending on the location of a storage facility, the project could require additional environmental reviews from multiple agencies and the project developer will need to coordinate across the agencies to complete the documentation to meet leasing, regulatory, and NEPA requirements.
- **Phase IV—Construction (FOA 2711 Area of Interest 3 funded by BIL)** requires that Applicants have completed all federal, state, and local permits, such as the UIC Class VI or DoI OCS "Authorization to Construct"; a FONSI on an EA or a ROD on an EIS on the proposed project; a CO₂ Carbon Source(s) Feasibility Study for likely CO₂ capture facilities that would connect with the proposed storage facilities; a **CO₂ Transport FEED Study** or equivalent; a Storage Field Development Plan or equivalent; a Risk Assessment and Mitigation Plan or equivalent; Community Benefits Plan; and a Business Plan or equivalent.

The phases of the CarbonSAFE Initiative as modified are summarized in Figure 1.

* Note that Phase III.5 is intended for projects that need to complete activities (like NEPA) prior to entering Phase IV (in cases where an applicant has completed a Phase III project, they would not apply for Phase III.5).

¹⁰ Note that Phase III.5 is intended for projects that need to complete activities (like NEPA) prior to entering Phase IV (in cases where an applicant has completed a Phase III project, they would not apply for Phase III.5).

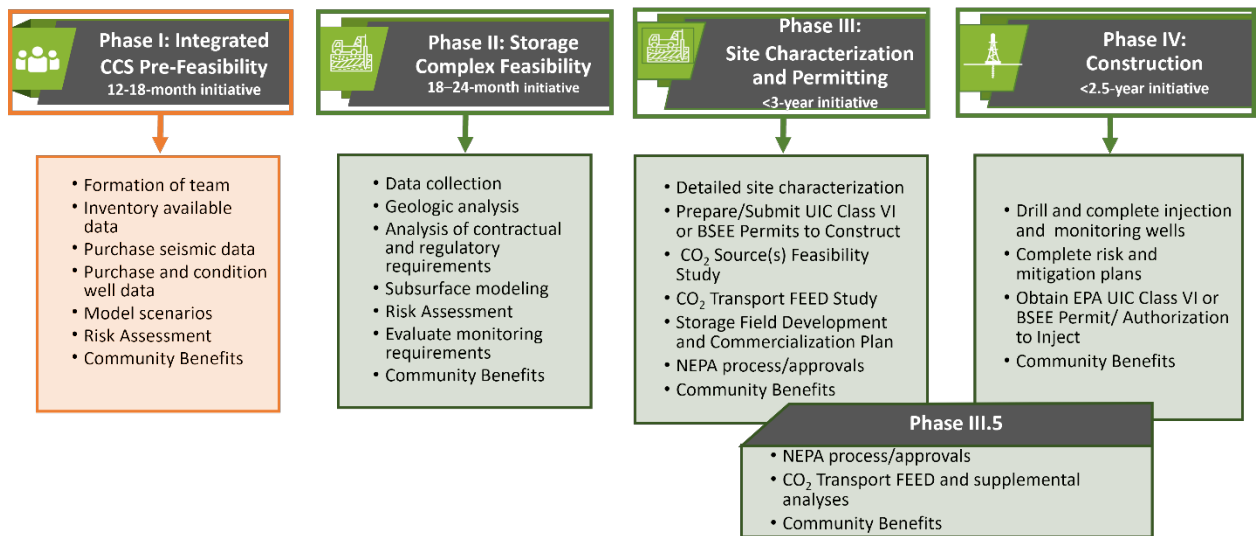


Figure 1. Graphical Representation of the CarbonSAFE Initiative

New and expanded carbon storage projects will be needed to provide future access to billions of metric tons of commercially available secure geologic storage capacity and enable injection of up to 100 million metric tons per year by 2030. It is anticipated that these projects will be located in different regions of the country with promising geologic characteristics to store at least 50 million metric tons of CO₂ per site, providing new jobs in communities throughout the United States. Projects will be required to follow a consistent approach to estimate storage quantities, moving carbon storage capacity from prospective through contingent storage resources to capacity, as classified under the CO₂ Storage Resources Management System (SRMS, see <https://www.spe.org/industry/docs/SRMS.pdf>).

This FOA aims to advance the nation's prospective resources to contingent status and contingent storage resources to capacity status as projects advance along the pathway toward commerciality (see SRMS classification in Figure 2).

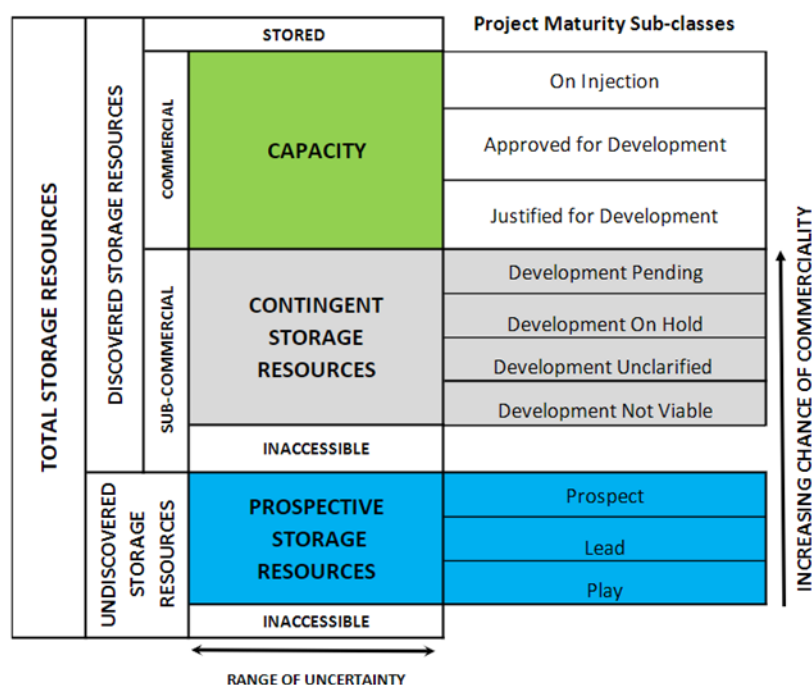


Figure 2. Society of Petroleum Engineers "Storage Resources Management System (SRMS)"

As the carbon management industry emerges, consistency in terminology will enable regulators, financial institutions, geologists, engineers, and communities to develop a common understanding. Requiring the projects to follow the SRMS structure will allow effective communication on a project's development stage and level of characterization completed for the resource or capacity estimation.

For the CarbonSAFE Initiative, storage complexes will be characterized to demonstrate they have both sufficient capacity and injectivity to support secure dedicated large-scale geologic storage for CCUS and CDR with no migration of the CO₂ as defined by EPA Class VI or DoI equivalent permits. Large-scale is defined as having sufficient future capacity to store a minimum of 50 million metric tons of CO₂.

For the purposes of this FOA, a storage complex consists of: (1) one or more storage reservoirs, with permeability and porosity that allow sufficient injection and storage of CO₂; and (2) one or more low-permeability seals, which overlay the reservoir(s) and serve as barriers to upward migration of CO₂. Projects may have yearly single injection well volumes as low as 100,000 metric tons of CO₂ per year, but the project should be planned for future additional sources of CO₂ to reach injection rates that achieve the storage of at least 50 million metric tons within 30 years, or faster.

Priority will be given to projects with substantial CO₂ storage capacity and/or projects that will store CO₂ from multiple point-source carbon capture and/or CDR facilities,

including DAC¹¹ and biomass carbon removal and storage (BiCRS)¹² sources.. The planned project site must extend over the entire volume of subsurface impacted by the planned injection to allow monitoring of injected CO₂ as required under the Class VI or DoI equivalent permit(s) for the storage facility. Project site(s) will require monitoring for several decades throughout the project's injection and post-injection operations; however, the DOE CarbonSAFE Initiative Phase IV project performance period will end once construction has been completed and the authorization to inject has been received from the appropriate authorized entities, including relevant federal, state, and local authorities.

NOTE: The CarbonSAFE Initiative will continue to limit eligibility to storage projects that will operate under Class VI or the offshore equivalent of Class VI permits.

Dedicated storage in depleted oil and gas fields or in naturally occurring CO₂ reservoirs or geologic “domes” will be permitted provided all production of hydrocarbons and/or naturally occurring CO₂ cease during storage operations and post-injection site care (PISC).

Within the business case, production of critical minerals (CM) to support electrification (electric vehicles, energy storage, etc.) is permitted. Brine extraction and potential production of CM (e.g., lithium) is also permitted. However, CM extraction from brines may not be included as an activity in the CarbonSAFE Initiative project scope, and therefore CarbonSAFE Initiative funding may not be used for this activity.¹³ Other DOE programs in FECM and the Advanced Manufacturing Office in DOE are supporting research, development, demonstration, and deployment (RDD&D) programs for CM extraction and applicants should consider these funding programs if interested in recovering CMs from produced brines.

The intent of this FOA is to award diverse projects throughout the United States; therefore, the FOA may be modified over time based on programmatic priorities such as regional diversity, geologic formations, and capture sources. Eligibility to apply for this FOA is not limited to projects previously funded under any or all CarbonSAFE Initiative Phases. However, all applicants must provide evidence that prerequisites for the

¹¹ DAC is a CDR approach that extracts CO₂ emissions from the atmosphere. The CDR Program is aiming to advance DAC technologies through further discovery and optimization of new and novel materials that promote rapid CO₂ uptake with high dynamic CO₂ capacity; structured material systems and component designs; and integrated processes that leverage the functional material's unique characteristics to maximize volumetric CO₂ capture productivity, while reducing pressure drop, heat and power requirements, and capital and operating costs. R&D is focused on processes and materials that will increase the amount of CO₂ removed by DAC, decrease the cost of materials, and improve the energy efficiency of carbon-removal operations.

¹² BiCRS is a CDR approach involving the use of biomass (e.g., algae, municipal waste, agricultural and wood residues) to remove CO₂ from the atmosphere and store it underground or in long-lived products, without affecting food security, rural livelihoods, biodiversity conservation, and other important values¹³. Carbon dioxide is produced from the combustion, gasification, pyrolysis, or other conversion of biomass to generate electricity or produce hydrogen, and the resulting CO₂ emissions are captured and then stored in a manner that prevents entry into the atmosphere.

¹³ To be clear, brine extraction and disposal may be part of the CarbonSAFE project scope if the extraction is a necessary component of injection operations, such as for managing pressure. Applicants may use the brine for other purposes, but the use of brine beyond enhancing storage performance must be funded by other sources. See FECM's Office of Resource Sustainability for information on funding opportunities related to mineral extraction.

appropriate phase are adequately met. Specifically: Applicants to this FOA must provide evidence that the identified secure geologic storage complex has a high potential for commercial-scale geologic storage. Additionally, applicants must demonstrate the proposed project's level of readiness by providing information as outlined in:

- **Appendix H:** *CarbonSAFE Phase III Project Readiness* for AOI 1 applications;
- **Appendix I:** *CarbonSAFE Phase III.5 Project Readiness* for AOI 2 applications;
- **Appendix J:** *CarbonSAFE Phase IV Project Readiness* for AOI 3 applications; and
- **Appendix G:** *CarbonSAFE Phase II Project Readiness* for AOI 4 applications.

NOTE: Items referred to as “project readiness” will be evaluated as part of the Merit Review Criteria, while items referred to as “entry requirements” are required to prevent the application from being considered nonresponsive.

B. Areas of Interest

i. General Information for All Areas of Interest

All work for projects selected under this FOA must be performed in the United States. See Section IV.I.iii. and Appendix B.

The CarbonSAFE Initiative addresses the overarching goal of DOE's Carbon Transport and Storage Program to enable and support the availability of CCUS and CDR to reach climate goals and help address the nation's decarbonization goals. Additionally, the CarbonSAFE Initiative also addresses the overarching Program goal of assessing secure geologic carbon storage resources along the classification pathway from contingent storage resources to capacity, as classified under the SRMS (see Section I.A.ii). In support of this goal, projects will be required to report the movement through Prospective, Contingent, and Capacity based on the SRMS guidelines discussed in the [Society of Petroleum Engineers \(SPE\) CO₂ Storage SRMS](#). The SRMS has been recognized by the United Nations Economic Commission for Europe (UNECE) such that the UNECE Injection Projects Working Group is developing a bridging document that maps UNECE to SRMS. This type of bridging document was also developed for the Petroleum Resources Management System (PRMS).

More specifically, this FOA seeks research and demonstration in the form of CarbonSAFE Initiative Phase II, III, III.5, and IV for:

Onshore Dedicated Storage and Onshore Hub Storage Facility(ies) to be developed in regions of the United States with promising geology for carbon storage. Projects are sought to meet regional needs for secure geologic storage of carbon captured from point sources in the power sector and hard to decarbonize industrial sectors and from CDR processes. Storage facilities could serve various types of CO₂ sources throughout

the project's 30- to 50-year time frame as defined by the project. Some projects funded under this FOA may be considered a carbon storage hub.

Onshore facilities field development design could vary throughout the U.S. and project developers are encouraged to propose a facility that provides a regional or interregional solution for decarbonization. The facility design of the proposed hub should be based on the unique regional or interregional aspects such as subsurface geology, geographic distribution and types of capture sources, and existing and planned transport infrastructure. Each regional or interregional facility will be unique and can be proposed as long as (1) the buildout of infrastructure (i.e., capture facilities, wells, and associated transport from sources) within the regional or interregional facility can eventually reach the commercial threshold of 50 MMT over a 30-year period, and (2) the facility would accept CO₂ from multiple sources. Below are some examples of dedicated storage or hub facilities.

- Example 1- a regional or interregional facility could be proposed that has multiple non-contiguous storage reservoir(s) with lower single well permeability/injectivity and smaller injection volumes. To meet the commercial threshold of 50 MMT over a 30-year period, this type of facility might require many reservoirs and wells with associated transport dispersed over a larger areal extent.
- Example 2- a regional or interregional facility could be proposed that includes multiple types of storage. For example, a storage facility could include saline storage, CO₂ conversion, and mineralization in reactive environments to meet the commercial threshold of 50MMT over a 30-year period.
- Example 3- a regional or interregional facility could be proposed that has storage reservoirs with very high single well permeability/injectivity in some wells, and other wells with lower single well permeability/injectivity and smaller injection volumes. The facility **as a whole must** meet the commercial threshold of 50MMT **over a 30-year period.**

Facility(ies) being developed can provide a storage solution for capture sources in all basins across the U.S. Applicants proposing Hub Storage Facilities should describe, as clearly as possible with information available at the time of application, the specific sources that will contribute CO₂ to the facility and the individual storage reservoirs that must be characterized. This information should be provided in the 'Scenario Analysis' section of the Project Readiness document for the CarbonSAFE Phase to which the application is directed (**Appendix H for Phase III, Appendix I for Phase III.5, Appendix J for Phase IV, and Appendix G for Phase II**). Storage site characterization activities performed under such projects should be designed to verify that all individual storage reservoirs and seals within the Hub Facility are capable of safely storing quantities of CO₂ that, when summed across the Hub Facility with CO₂ conversion and mineralization sites, will achieve the commercial threshold of 50MMT over a 30-year period.

Offshore Facility(ies) within state waters or the U.S. jurisdictional area of the Outer Continental Shelf (Atlantic, Gulf of Mexico, Pacific and Alaska) are also sought under this FOA. Such offshore facilities would test promising secure geologic storage formations, including depleted (non-producing) oil and natural gas fields, or other suitable sub-seafloor formations. Currently, the regulatory framework is being developed for the OCS through the U.S. Department of Interior. Following with current offshore trends in the international community, consensus-based standards may be utilized that are consistent with international best practices and standards when applicable. Therefore, applicants are encouraged to review the [London Protocol](#), International Standard Organization (ISO) 27914:2017 “Carbon dioxide capture, transportation and geological storage — Geological storage,” and Det Norske Veritas (DNV) RP-J203 2021 Geologic Storage of Carbon Dioxide. Separate AOIs are not designated for the different facility types, but there is a desire to encourage projects for dedicated storage in onshore carbon storage sites, onshore carbon storage hubs, and offshore carbon storage facilities that are located in regionally diverse areas with promising geology for carbon storage.

Carbon reduction technologies such as DAC and BiCRS are acceptable CO₂ sources in addition to anthropogenic CO₂ sources. Related to CO₂ sources, applicants are requested to include a 30-year CO₂ supply curve in their application, which will show the possible anthropogenic, DAC, and BiCRS CO₂ sources for the project site over time.

DOE recognizes the costs of developing secure geologic carbon storage projects in the offshore environment is expected to be greater than that for a similar size project located onshore. Similarly, it is recognized that hub storage facilities, generally, may have higher costs than single-source storage facilities. It is requested that applicants sufficiently justify the need for proposed costs as discussed in the Evaluation Criteria.

This FOA gives preference (in the Program Policy Factors) for sites having commercial-scale secure geological carbon storage complexes in geographic areas/geologic settings lacking previously supported geologic carbon storage projects (see links below).

Information regarding locations of prior and currently active projects and the status of CO₂ storage resource assessment can be found at:

- [Carbon Storage Program | netl.doe.gov](https://www.netl.doe.gov/carbon-storage-program)
- <https://pubs.usgs.gov/circ/1386/pdf/circular1386.pdf>

ii. Technical Requirements for Each Area of Interest

This FOA is for CarbonSAFE Phase III: Site Characterization and Permitting and CarbonSAFE Phase IV: Construction with the following AOIs:

- AOI 1—CarbonSAFE Phase III: Site Characterization and Permitting

- AOI 2—CarbonSAFE Phase III.5: NEPA, FEED Studies, and Storage Field Development Plan Only¹⁴
- AOI 3—CarbonSAFE Phase IV: Construction
- AOI 4—CarbonSAFE Phase II: Storage Complex Feasibility

Area of Interest 1—CarbonSAFE Phase III: Site Characterization and Permitting

Site Characterization Effort

The overall purpose of AOI 1 is to conduct detailed site characterization and permitting for a commercial-scale secure geological CO₂ storage complex. If not already completed, applicants are expected to conduct a CO₂ Source(s) Feasibility; a **Transport FEED study**; a Storage Field Development Plan; and a risk assessment and mitigation plan, which would be actively updated throughout the project life cycle. Recipients under this AOI will complete a detailed investigation of the relevant subsurface conditions and the potentially affected surface environment. Recipients will then complete and submit an application for a UIC Class VI or DoI OCS permit(s) to construct CO₂ injection wells and facilities and then go through the permitting process. For development of commercial infrastructure, it is desired for applicants to apply for more than one injection well per field site to ensure that there is a second injection well to avoid having a single point of failure.

Applicants are advised that data acquisition via active seismic surveying or vibratory coring in aquatic (offshore) environments is NOT eligible for a Categorical Exclusion (CX) from NEPA requirements. If such activities are proposed as part of the site characterization effort under this FOA, a clear plan for meeting NEPA requirements for these activities must also be included in the application. The effort, time, and cost associated with NEPA compliance for such activities must be included in the project scope, schedule, and budget.

Additionally, the Recipient will provide information and assistance to DOE for completing the NEPA process by the end of the period of project performance. At the end of the period of performance, ideally the Recipient should have the necessary NEPA approval (FONSI or ROD) and Class VI or DoI equivalent authorization(s) to construct and should be prepared, in terms of information, to decide whether to proceed to procurement and construction. Under AOI 1, Phase III CarbonSAFE Initiative projects will be considered for Onshore: Dedicated Storage and Hub Storage Facility(ies) within the United States and Offshore Facility(ies) within state waters or the U.S. jurisdictional area of the Outer Continental Shelf (OCS). Applicants should identify which facility type is applicable to their site and to explain how that contributes to their business case and storage field development.

¹⁴ Note that Phase III.5 is intended for projects that only need to complete activities (like NEPA) prior to entering Phase IV (in cases where an applicant has completed a Phase III project, they would not apply for Phase III.5).

Projects selected under AOI 1 are not restricted to projects previously funded under CarbonSAFE Initiative Phase I and/or CarbonSAFE Initiative Phase II awards.

Awards under AOI 1 can provide funding for the following activities or deliverables:

- Detailed site and subsurface characterization including storage resource/capacity assessment.
- Activities required to obtain a UIC Class VI or DoI OCS permit(s) to construct, including developing applications and subsequent permitting process steps.
- CO₂ Source(s) Feasibility Study.
- 30-year CO₂ Supply Curve.
- CO₂ Transport FEED Study.
- Storage Field Development Plan supported by Authorization for Expenditures (AFEs).
- Legal considerations and rights: pore/surface rights; rights of way and easements; and liability relief.
- NEPA compliance process: development of an EIV and receive either a FONSI or a ROD based on either an EA or EIS, respectively.
- Business and Financial Plans and Arrangements.
- Engineering, Procurement, and Construction (EPC) Analysis and Plans.
- Risk Assessment and Mitigation Plan.
- Community Benefits Plan.

Objective 1—Detailed Site Characterization of a Commercial-Scale CO₂ Storage Site

Recipients will complete a detailed characterization of a storage complex at a specific secure geologic storage site that has the potential to securely store a minimum of 50 million metric tons of captured CO₂. This characterization effort should build upon already completed field activities documented in the Applicant's response to **Appendix H: CarbonSAFE Phase III Project Readiness**.

The storage complex should have appropriate subsurface characteristics to meet CarbonSAFE Initiative objectives, such as accessible pore space in laterally extensive storage reservoirs overlain by regionally extensive seals to protect against adverse environmental impacts. While regulations are in development for the offshore federal waters of the United States, the permitting process will be designed to promote safety, protect the environment, and conserve resources as determined by BOEM and BSEE for the OCS environment. For a scenario that includes stacked storage within a storage complex, adequate storage resource must be identified and characterized among the multiple storage reservoirs.

Recipients under this AOI will perform detailed characterization of a proposed commercial-scale storage site(s) and develop comprehensive datasets of reservoir characteristics (such as stratigraphy, structure and dip, porosity, permeability,

injectivity, mineralogy, fluid composition and saturations, in situ stress state, geochemical conditions, fault zone presence and characteristics if present, etc.), caprock characteristics (such as stratigraphy, lateral extent and continuity, rock type and mineralogy, natural fractures and fracture-filling minerals, fluid compositions and saturations, CO₂ capillary entry pressures in the caprock matrix measured in, and fractures, etc.), and basement rock faults and fractures. Information and data collection will also be required to define the relevant geologic structures and risks (e.g., faults and potential for induced seismicity or leakage as well as the natural seismicity) and land surface features that would affect the placement or operations of facilities and monitoring. This site-specific data will be used in the preparation of the application(s) for the Class VI or DoI OCS “Authorization to Construct” and the approval process.

Recipients should identify, obtain, and evaluate existing data that are either publicly available or available for purchase from vendors or operators. While the use of existing data is encouraged, the data may require reprocessing to further evaluate the storage complex. In addition, new data may be required to adequately characterize the storage complex, including storage reservoirs and regional seal(s) and the land surface as needed. Recipients should collect sufficient baseline data to establish a basis for comparison during future injection. These new datasets could come from lab and field activities that include but are not limited to:

- Acquisition of surface and downhole seismic surveys.
- Acquisition of passive microseismic data to inform project-related decisions about potential subsurface flow pathways and risks of induced seismicity as well as natural seismicity.
- Drilling of stratigraphic test wells to acquire new data from characterization methods such as, but not limited to, well logs and cores, fluid samples, injection/production tests, in situ stress measurements, and fluid pressure and temperature measurements.
- Analyses of rock core, well tests, and well logs from stratigraphic wells/borings.
- Additional field data acquisition as needed to meet requirements for a Class VI or DoI OCS permit(s) to construct injection wells and facilities.

Note that while it is allowable to complete wells to Class VI standards to prevent inefficiencies of needing to recomplete wells, etc., there must be a clear need for the well as a characterization well in Phase III for the well to be drilled.

As appropriate, data will be incorporated into models that predict the behavior of CO₂ injected into the reservoir, the impact of injection on caprock competence, and the potential for injection-induced seismicity during the proposed injection project and post-injection monitoring period. Recipients should use geologic and computational models to define the UIC Class VI or DoI OCS area of review (AoR) and to predict the extent of injectate plume migration and subsurface pressure propagation for a proposed storage project. These models should incorporate specific conditions at the site, and proposed injection well(s) and brine production well(s) (if applicable), including

injection/extraction fluid volume, injection/extraction rate(s), target formation depth, pressures, and duration of injection.

The applicant must obtain the required federal, state, and local regulatory permits for the anticipated characterization activities. Timelines and data needs for completing the permitting processes should be assessed. It is anticipated that data acquired and analyzed during Phase III would be used for UIC permitting.

As part of the risk assessment, Recipients are encouraged to work with DOE's National Risk Assessment Partnership (NRAP), which may assist in applying the suite of NRAP tools designed to evaluate and manage the risks associated with saline storage. DOE desires to test and verify NRAP's tools' utility and performance in commercial-project applications. The use of NRAP tools in place of established industry standard models and risk assessment tools is not a requirement. However, collaboration with NRAP tool developers could include validation of one or more NRAP tools through: (1) sharing of relevant datasets, information, and technical insights from field efforts; and (2) comparisons with results from other modeling and simulation tools or methods. Collaboration arrangements will be discussed with DOE during award negotiation. Detailed description of the NRAP tools is available on <https://edx.netl.doe.gov/nrap/>. Voluntary collaboration with NRAP does not factor into DOE's selection of projects for funding.

To further support the risk assessment with respect to induced seismicity, the site characterization activities should follow the best management practices described in DOE's "Recommended Practices for Managing Induced Seismicity Risk Associated with Geologic Carbon Storage (Templeton et al., 2021)"¹⁵. Recipients of Phase III awards should develop a plan for managing the risk of induced seismicity consistent with the Risk Category of the proposed project site. In addition, Phase III Recipients must continue to update the overall induced seismicity risk of the planned operation in accordance with data collected during the course of the Phase III project. This data collection may include the installation and operation of a system to detect and record microseismic events in the project area. The updated induced seismicity risk assessment and the plan for implementing a passive seismic monitoring system (if necessary) must be included in the Storage Field Development Plan.

Please Note: Phase III funds may be used to collect data for the purpose of developing a monitoring plan for managing the risk of induced seismicity over the expected CO₂ injection operation. Phase III funds may not be used to install or operate a long-term network that would serve as a microseismic monitoring system for injection operations. Such a microseismic monitoring system is viewed by DOE as part of the storage facility

¹⁵ Note that, prior to application to Phase III, the Applicant should have categorized the overall preliminary seismic risk of the proposed storage complex as Very Low (Category I), Low (Category II), Medium (Category III), or High (Category IV) as described in Table 1 of this publication. See Appendix H, CarbonSAFE Phase III Project Readiness

construction; therefore, costs of such a system would be allowable under Phase IV projects but not under Phase III projects.

It is noted that DOE is investing in the Regional Initiatives to Accelerate CCUS Deployment projects (Figure 3) to provide technical assistance to stakeholders interested in developing CCUS projects. As the successors of the Regional Carbon Sequestration Partnerships, the existing Regional Initiative projects (the Plains CO₂ Reduction [PCOR] Partnership, the Midwest Regional Carbon Initiative [MRCI], the Carbon Utilization and Storage Partnership [CUSP], the Southeast Regional CO₂ Utilization and Storage Acceleration Partnership [SECARB-USA]) have amassed a wealth of knowledge and experience on geologic storage of CO₂, including monitoring technologies and strategies, permitting, and stakeholder engagement. DOE will be seeking additional regional initiative projects that will closely align with the BIL programs and support the deployment of large-scale storage projects and storage hubs. DOE has also invested in projects to characterize CO₂ storage resources offshore in state waters or U.S. jurisdictional area of the Outer Continental Shelf. These project teams have been compiling data and convening expertise, academic research institutions, government entities, and industry affiliates to address knowledge gaps, regulatory issues, infrastructure requirements, and geologic and engineering technical challenges of storing CO₂ offshore (the Gulf of Mexico Partnership for Offshore Carbon Storage [GoMCarb] and SECARB-Offshore). Applicants selected for negotiations leading to award under this FOA are encouraged to engage with these projects as a resource of information and technical expertise on all phases of the CCUS value chain. Additional information on these projects is available at the links below:

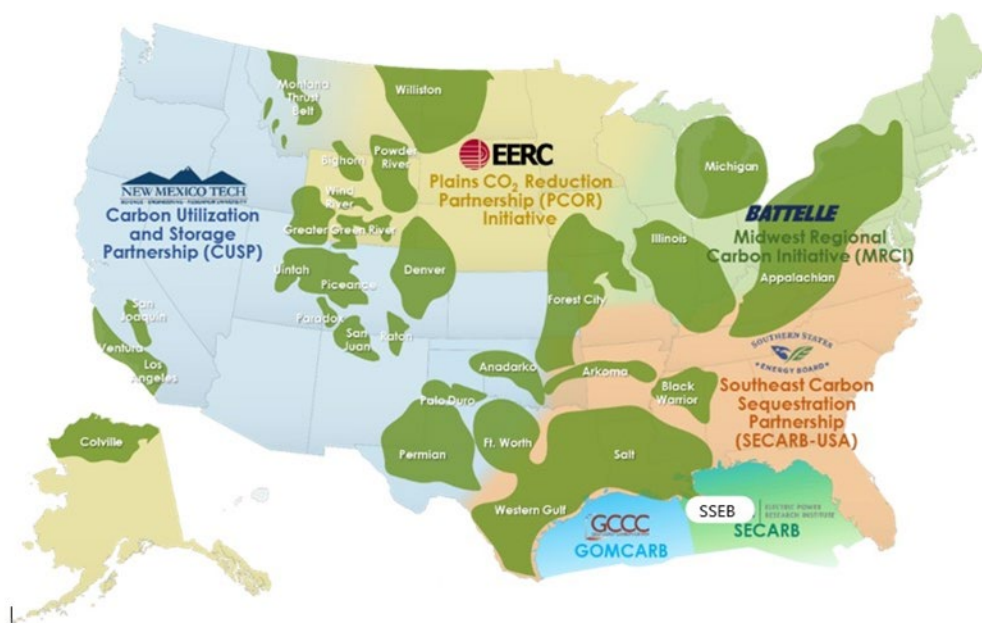


Figure 3. Basin Map with Regional Initiatives and Offshore Projects

- <https://netl.doe.gov/coal/carbon-storage/regional-initiative-to-accelerate-ccus-deployment>
- <https://www.beg.utexas.edu/gccc/research/gomcarb>
- <https://www.sseb.org/programs/offshore/>

Additionally, DOE encourages Recipients to participate in DOE’s new machine learning initiative, the [Science-informed Machine Learning for Accelerating Real-Time Decisions in Subsurface Applications \(SMART-CS\) Initiative](#). Participation in SMART-CS could include: (1) being a provider of relevant datasets, as available, for developing, testing, and validating SMART-CS tools/methods; (2) serving as a test user of the software and methods during the operational phase of the storage project; and perhaps (3) during the UIC or OCS permit application process. Note that participation in SMART-CS is not required of Recipients and their project—it is voluntary. Recipients will have an opportunity to further negotiate for their participation in SMART-CS at the time of award. Applicants do not need to contact SMART-CS team members before their project is selected. Voluntary involvement in SMART-CS does not factor into DOE’s selection of projects for funding.

Objective 2—UIC Class VI or OCS “Authorization to Construct”

Recipients shall submit a complete permit application(s) for a UIC Class VI or OCS “Authorization to Construct” an injection well and participate in good faith in the permitting process. UIC Class VI or OCS permits to construct will specify that the applicant is authorized to construct the injection wells or convert existing wells.

EPA’s guidance documents and the regulatory requirements for submission of the application for UIC Class VI or OCS permits to construct will help guide successful applicants’ activities under this FOA. Currently, the regulatory framework is being developed for the OCS through U.S. Department of Interior (BOEM, and BSEE). Following with current offshore trends in the international community, consensus-based standards may be utilized that are consistent with international best practices and standards when applicable. Therefore, applicants are encouraged to review the London Protocol, ISO 27914:2017 “Carbon dioxide capture, transportation and geological storage — Geological storage” and DNV RP-J203 2021 Geologic Storage of Carbon Dioxide.

For a complete listing of the requirements for permit applications, see the EPA website at: <https://www.epa.gov/uic/class-vi-wells-used-geologic-sequestration-co2>. The activities for preparing an application for a Class VI “Authorization to Construct” include, at a minimum:

- Site Characterization
- Determination of AoR and Corrective Action
- Injection Well Construction Plan

- Plans for Pre-Operational Testing
- Proposed Injection Well Operations
- Proposed Monitoring Plan
- Proposed Mechanical Integrity Testing
- Proposed Injection Well Plugging
- Proposed PISC and Site Closure Plan
- Emergency and Remedial Response Plan
- Demonstration of Volume Containment
- Demonstration of Financial Responsibility
- Public Participation
- CO₂ Source(s) and Chemical Makeup of CO₂ Stream(s)

Objective 3—Storage Field Development Plan

The Storage Field Development Plan should: (1) explain the strategy for developing the storage field to maximize its storage potential utility; (2) describe all elements of the proposed storage field facilities and establish a logical order and timing for the development of all anticipated facilities, accounting for changing needs for monitoring and use of pore space and changing CO₂ delivery rates over time; and (3) present a cost plan over the proposed life of the project. It is expected that the facilities description within the Storage Field Development Plan would be based on information associated with the relevant permits (e.g., UIC or OCS permit application and associated permit terms and conditions, National Pollutant Discharge Elimination System [NPDES] permit, monitoring well permits, site access road permit), along with regulatory rules and guidance. The plan should include, if relevant, the assessment and repurposing or plugging of legacy wells and other existing infrastructure. It is understood that this plan will be only a draft or preliminary until after relevant permits are received, financing is arranged, and other considerations are settled.

There are several major cost categories related to the development of a CarbonSAFE site, including wells, infrastructure, and monitoring deployment. Each of these will bring their own cost uncertainty due to outside influences such as oilfield contractor demand, steel price, supply chain disruptions, and inflation. To set the correct expectations, each plan is required to include a project cost breakdown with a P-10, P-50, and P-90 project cost analysis. Project risks and their effect on cost should be clearly explained. In addition, each proposed well should have a full AFE with cost uncertainty ranges defined for each line item.

The Storage Field Development Plan should additionally report the progression of the storage resource status from Prospective to Contingent and Contingent to Capacity based on the SRMS guidelines described at [SPE CO₂ Storage Resource Management System \(SRMS\)](#). Projects will be required to follow a consistent approach to estimate storage quantities, moving carbon storage resources from prospective through contingent storage resources to capacity, as classified under the CO₂ SRMS. The

estimated classification of the resource(s) and capacity(ies) will be used by DOE to demonstrate how BIL-funded projects are increasing secure geologic storage capabilities in the United States.

Additionally, it is important to understand the plan for commercialization and how the storage field would be built and evolve over time (at least 30 years). This is particularly significant for hub facilities where CO₂ is provided from multiple sources. A description and diagram of the fully developed field (which may include elements outside the scope of the CarbonSAFE Initiative project[s] funded here), with clear delineation as to the immediate portion that makes up the current project, should be used in the Storage Field Development Plan and in the business plan description (see Objective 8).

Note – The Storage Field Development Plan must address all components of infrastructure for which funding will be requested under a CarbonSAFE Phase IV award. Funding for construction under CarbonSAFE Phase IV shall only be used for infrastructure described in the Storage Field Development Plan.

Suggested contents of the Storage Field Development Plan are described in **Appendix K—Storage Field Development Plan**.

Objective 4—CO₂ Source(s) Feasibility Study

Recipients are expected to provide a plan for the initial supply of CO₂ that would be available for the first five years of injection, with a plan for the CO₂ supply curve over the next 25 years that shows CO₂ sources (e.g., anthropogenic, DAC, and BiCRS). It should show how the CO₂ sources change over the time frame of interest, including when the source(s) would come online (or go offline), CO₂ quantity, flue gas composition, and CO₂ source. For those sources expected to be used during the initial five years of operations, recipients shall include letters of interest and level of commitment from the current CO₂ source providers and discuss the specific business case associated with each source—this should also include new sources such as DAC and BiCRS if applicable.

At a minimum, the CO₂ Source Feasibility Study or equivalent must demonstrate due diligence by the Recipient and include all necessary information to support the application for a Class VI permit including, but not limited to, definition of source(s), physical and chemical characteristics (e.g., concentration of each gas constituent, including contaminants) of the captured CO₂ stream, flow rates, incoming pressure, and any requirements from the CO₂ **transport system** operators.

The CO₂ Source Feasibility Study should discuss the type of capture system and pre-/post-capture processing that a specific raw gas stream might need, percent capture, dehydration, and/or compression requirements. If a proposed source is already concentrated and does not require a capture technology, information should be included regarding quantity and purity of CO₂ and any requirements for dehydration and/or compression.

Objective 5—NEPA Compliance

Recipients will be requested to submit for use in the NEPA process a wide array of information about the proposed storage project, options under consideration for the proposed project, reasonable alternatives to the proposed project for achieving similar objectives, a description of the affected environment (to include both the natural environment and the human environment), the socio-economic setting of the proposed project and affected area surrounding the site, trends regarding changes in the surrounding environment (natural, socio-economic, human) and the potential impacts (both positive and negative) for the proposed project, its options, its reasonable alternatives, and all connected actions¹⁶. Recipients will complete an EIV which comprises not only the specific activities to be performed under the Phase III project, but also the entire construction, operation, closure, and post-closure phases of proposed transport and storage facilities, including all effects of these activities and connected actions, such as carbon capture facilities, on the surface and subsurface environment. The recipient will also be expected to cooperate fully with DOE personnel and DOE-approved contractors who may prepare the NEPA compliance documents and implement the NEPA compliance process.

Based on DOE's review of the Environmental Questionnaires (submitted with the application) and EIV, and the sensitivity of the proposed work area, an EA/FONSI or an EIS/ROD may need to be prepared and issued by DOE. The goal is for DOE to issue a FONSI or ROD prior to completion of Phase III work.

Projects will need to take into consideration time and cost for the entire NEPA compliance process, including (if applicable) the time and cost associated with gaining NEPA approval for active seismic surveying or vibratory coring in aquatic (offshore) environments, which are not eligible for a Categorical Exclusion. Subsequent to DOE's determination that an EA or EIS is the appropriate level of NEPA review, a third-party NEPA contractor may be engaged for preparation of the EA or EIS. DOE may choose to pay the third-party contractor directly or to have the recipient pay the third-party contractor (typical approach); in either case, DOE will direct document preparation and ensure that the EA or EIS satisfies all NEPA requirements. DOE also may request that the recipient prepare any portion of the EA or EIS, and, if it does so, DOE will independently evaluate that information and ensure that it satisfies all NEPA requirements.

The NEPA review will be structured such that a single EA/EIS will be developed and a single FONSI/ROD will be issued for the entire proposed project. If a project comprises multiple transport systems and/or storage facilities, the NEPA process will not be considered "complete" for any individual transport system/storage facility until a FONSI

¹⁶ Actions are connected if they: (i) Automatically trigger other actions which may require NEPA determinations; (ii) Cannot or will not proceed unless other actions are taken previously or simultaneously; (iii) Are interdependent parts of a larger action and depend on the larger action for their justification.

or ROD is issued for all transport systems/storage facilities covered by the EA or EIS for the overall project.

Objective 6—CO₂ Transport FEED Study

Recipients will conduct a Front End Engineering Design (FEED) Study of the new transport infrastructure¹⁷ needed to connect CO₂ source(s) to the injection wells. The FEED study will provide key information required to achieve Objective 5 of Phase III (NEPA Compliance). In many cases, the environmental impacts of the CO₂ transport system may be viewed as indirect impacts of the CO₂ storage facility; in such cases, the environmental impacts of the transport system must be fully analyzed as part of the EA or EIS associated with the storage facility. It is expected that the transport system FEED study will provide the level of detail needed to prepare the EA or EIS. A description of the items to be included are presented in Appendix L—CO₂ Transport FEED Study.

Note – The primary focus of the CarbonSAFE Initiative is the storage facility, not the transport system. **Therefore, the DOE share of the Transport FEED Study shall not exceed \$5 million.** DOE provides other opportunities such as [DE-FOA-0002730](https://www.doe.gov/foia/0002730) that can provide financial assistance for FEED studies of CO₂ transport systems.

Objective 7—Community Benefits Plan

Recipients are expected to engage with community and labor organizations and develop, update, and implement the plan through the life of the project. This involves understanding and addressing potential energy and environmental justice issues during the planning and design of their storage project and seeking opportunities for economic revitalization and creation of quality jobs at prevailing wages in the communities near the proposed project. Communities that could be affected negatively or positively should be identified and engaged in the process such that they have meaningful input throughout the project's life cycle. As part of assessing environmental justice, applicants should also examine physical climate risk and impacts to the site during the development, operations, and post-closure of the facility.

Recipients will explain how societal benefits and impacts will be addressed through preparing a Community Benefits Plan.

The Community Benefits Plan is required at the time of application. The Community Benefits Plan will be evaluated as part of the technical review process. If the project is selected, DOE will incorporate the Community Benefits Plan into the award and the recipient will be required to meet the Community Benefits Plan it proposed. During the life of the DOE award, DOE will evaluate the recipient's progress.

Important information about the Community Benefits Plan:

¹⁷ Note that the entire CO₂ transport system from source(s) to the storage field may include existing as well as new transport infrastructure; the FEED study would cover only new transport infrastructure

- Applicants are requested to include work relevant to each plan within the Statement of Project Objectives (SOP).
- The applicant should allocate staff time and budget for at least one team member to present in person on the Community Benefit plan at a public meeting convened with support of DOE.
- A public End-of-Project Progress Report is required, which covers final plans, accomplishments, and findings. It will be included in the project's overall final report.

Objective 8—Business and Financial Plans and Arrangements

Recipient will initiate the plans and documents needed for the final investment decision or for the financial closing on loans and investments, along with those needed for the EPC contracts. It is expected that many, if not all, of these plans and documents (or equivalents) will be finalized during CarbonSAFE Initiative Phase IV. Actual plans and documents may have different names than those stated below but should be functionally equivalent. Not all plans and documents listed below may be needed for a specific project; if not needed, an explanation of the lack of need for the plan or document should be submitted to DOE in the Application package. Generally, the needed plans and documents include those identified as entry requirements for CarbonSAFE Initiative Phase IV and those listed below:

- **Business Plan (preliminary or draft)**, including details on the project being proposed; the problem(s) to be solved by the project along with a brief description of how the project would solve these problems; how the project is expected to be developed; business structure(s) to be formed; resources that will be needed; and the expected results if the plan is followed in terms of risk sharing/shifting, income streams, and how the project intends to pay off loans and pay return to investors.
- **Project Financing Plan (preliminary or draft)**, including projections of tax credit allocations (e.g., 45Q) and other governmental incentives, any tax equity to be incorporated into the project financing, and loan types/structures. Also, this plan should address refinancing of the construction loan, if applicable.
- **Financial Model (preliminary or draft)** is an Excel-based mathematical model that describes the future project in numbers and specifically in terms of cash flows. This model will be updated during the course of the project as assumed values become facts, such that financial impacts can be communicated accurately.
- **Contracts (preliminary or drafts)**, if appropriate, for owner's engineer, project/construction management, detailed design, procurements, and construction, including a description of long-lead-time procurements and significant engineering, purchasing, and construction risks.
- **Site Ownership and Control Documentation (preliminary set)** for injection wells, monitoring wells, CO₂ transport infrastructure, monitoring sites or geophysical survey routes, mineral rights, and pore space.

- **Agreement(s) with Stakeholders and Affected Communities**, as appropriate, to include job-opportunity commitments, labor agreements, compliance with Davis-Bacon Act, job training and internship commitments or opportunities, community investment commitments, community small investor opportunities, information-sharing protocols, community input protocols, community emergency response training and protocols, etc.
- **Permits** Class VI permits or DoI equivalent should be Administratively Complete and plans to secure necessary permits that remain to be obtained.
- **Schedule (preliminary or draft)** for the project development and construction, including financial milestones.

Technical Elements to be Included in Applications (AOI 1)

- Applicants are asked to provide a one- to four-page writeup, titled “Facility Type and High-Level Budget Justification.” In this writeup, applicants should discuss the proposed facility type (onshore dedicated storage facility, onshore hub storage facility, or offshore storage facility) and justify their definition of facility type. Applicants should also address the elements that impact total CarbonSAFE Initiative Phase III project cost and where their proposal falls in the range of “Anticipated Individual Award Sizes” (Section II.A.i). Site specifics such as geology, local rig availability, number of wells needed in this phase, etc. that have significant impact on total project cost should be justified. The purpose of the of the “Facility Type and High-Level Budget Justification” is to provide DOE with sufficient information to assess the appropriateness of proposed project costs, which will be dependent upon facility type and site-specific elements. The inclusion of tables and/or figures may or may not be appropriate to justify project costs. The “Facility Type and High-Level Budget Justification” file should provide enough information to adequately explain and justify the detailed budget provided in the budget justification.
- Items listed in **Appendix H: CarbonSAFE Phase III Project Readiness**.
- Map of the proposed storage complex and stratigraphic column with proposed location of injection well(s) and any other relevant information. Applications should include a map of the proposed storage site(s) within the storage complex and descriptions of the owner(s) of the land surface, subsurface pore space, and mineral rights. If obtainable, the application should include commitment letters from landowners for site access and provide full disclosure of known land-use concerns (such as cultural, wildlife, or natural resources).

Success Metrics

Work performed under AOI 1 should build a foundation upon which a successful application could be subsequently submitted for CarbonSAFE Initiative Phase IV. Success will be measured in specific areas of emphasis:

- Individual projects should contribute to the programmatic goal of at least 2 billion metric tons of storage capacity (see SRMS classification) and injection of more than 65 million metric tons per year by 2030.
- Public engagement with potentially affected stakeholders, property owners, disadvantaged communities, and environmental justice communities with overall support across these groups and minimal opposition to the proposed project.
- Attainment of UIC Class VI or DoI OCS Permit(s) to Construct.
- NEPA Clearance (FONSI or ROD) to move into Phase IV of CarbonSAFE Initiative.
- Storage Field Development Plan.
- CO₂ Source(s) Feasibility Study.
- **CO₂ Transport FEED Study.**
- Status of the project at the end of the period of performance meets or exceeds the qualifications for selection to start a CarbonSAFE Initiative Phase IV project.

Area of Interest 2—CarbonSAFE Phase III.5: NEPA, FEED Studies, and Storage Field Development Plan Only

Characterization Effort Sought

The overall purpose of AOI 2 is to provide an opportunity for projects that were not previously funded by the federal government through the CarbonSAFE Initiative but are mostly prepared to enter CarbonSAFE Initiative Phase IV. Proposed projects should have previously completed detailed site characterization, submitted their Class VI permit application (or equivalent), and had it determined to be “Administratively Complete” by the appropriate regulatory authority. For projects that have conducted the detailed site characterization and received or plan to receive UIC Class VI or OCS permits, this AOI offers an opportunity to accomplish NEPA activities for the proposed project, which is a prerequisite for CarbonSAFE Initiative Phase IV funding as well as certain federally issued or guaranteed loans. If needed, additional activities for Phase III.5 could include completion of a CO₂ Source(s) Feasibility Study, CO₂ Supply Curves, **CO₂ Transport FEED Study**, and a Storage Field Development Plan. Any of these activities that have already been completed are not required to be duplicated. Under AOI 2, Phase III.5 CarbonSAFE Initiative projects will be considered for Onshore: Dedicated Storage and Hub Storage Facility(ies) within the United States and Offshore Facility(ies) within state waters or the U.S. OCS. Applicants should identify which facility type is applicable to their site and explain how it would support their business case.

Applicants are advised that data acquisition via active seismic surveying or vibratory coring in aquatic (offshore) environments is NOT eligible for a CX from NEPA requirements. If such activities are proposed as part of the site characterization effort under this FOA, a clear plan for meeting NEPA requirements for these activities must also be included in the application. The effort, time, and cost associated with NEPA

compliance for such activities must be included in the project scope, schedule, and budget.

Projects selected under AOI 2 are not restricted to projects previously funded under CarbonSAFE Initiative Phase I, Phase II, and/or CarbonSAFE Initiative Phase III awards.

Awards under AOI 2 will provide funding for the following activities or deliverables as applicable:

- NEPA compliance process: develop an EIV and receive either a FONSI or an ROD based on either an EA or EIS, respectively.
- CO₂ Source(s) Feasibility Study.
- 30-year CO₂ Supply Curve.
- **CO₂ Transport FEED Study.**
- Storage Field Development Plan supported by AFEs and includes Storage Resource/Capacity Assessment and Risk and Mitigation Plan.
- Legal considerations and rights: pore/surface rights; rights of way and easements; liability relief; federal, state, and local permits.
- Business and Financial Plans and Arrangements.
- EPC Analysis and Plans.
- Community Benefit Plan requirements (which includes Public Engagement and Training).

Objective 1—Storage Field Development Plan

If needed (optional because it may already be completed), the Storage Field Development Plan should: (1) explain the strategy for developing the storage field to maximize its potential utility; (2) describe all elements of the proposed storage field facilities and establish a logical order and timing for the development of all anticipated facilities, accounting for changing needs for monitoring and use of pore space and changing CO₂ delivery rates over time; and (3) present a cost plan over the proposed life of the project. It is expected that the facilities description within the Storage Field Development Plan would be based on information associated with the relevant permits (e.g., UIC or OCS permit application and associated permit terms and conditions, NPDES permit, monitoring well permits, site access road permit), along with regulatory rules and guidance. The Plan should include, if relevant, the assessment and repurposing or plugging of legacy wells and other existing infrastructure. It is understood that this Plan will be only a draft or preliminary until after relevant permits are received, financing is arranged, and other considerations are settled.

There are several major cost categories related to the development of a CarbonSAFE Initiative site, including wells, infrastructure, and monitoring deployment. Each of these will bring their own cost uncertainty due to outside influences such as oilfield contractor demand, steel price, supply chain disruptions, and inflation. To set the correct expectations, each Plan is required to include a project cost breakdown with a P-10, P-

50, and P-90 project cost analysis. Project risks and their effect on cost should be clearly explained. In addition, each proposed well should have a full AFE with cost uncertainty ranges defined for each line item.

The Storage Field Development Plan should additionally report the progression of the storage resource status through Prospective, Contingent, and Capacity based on the SRMS guidelines described at [SPE CO₂ SRMS](#). Projects will be required to estimate storage quantities, moving carbon storage resources from prospective through contingent storage resources to capacity, as classified under the CO₂ SRMS. These estimates will be used by DOE to demonstrate how BIL-funded projects are increasing secure geologic storage capabilities in the United States.

Additionally, it is important to understand the plan for commercialization and how the storage field would be built and evolve over time (at least 30 years). This is particularly significant for hub facilities. A description and diagram of the fully developed field (which may include elements outside the scope of the CarbonSAFE Initiative project(s) funded here), with clear delineation as to the immediate portion that makes up the current project, should be used in the Storage Field Development Plan and in business plan description.

Note – The Storage Field Development Plan must address all components of infrastructure for which funding will be requested under a CarbonSAFE Phase IV award. Funding for construction under CarbonSAFE Phase IV shall only be used for infrastructure described in the Storage Field Development Plan.

Suggested contents of the Storage Field Development Plan are listed in [Appendix K—Storage Field Development Plan](#).

Objective 2—CO₂ Source(s) Feasibility Study

If needed (optional because it may already be completed), recipients are expected to provide a plan for the initial supply of CO₂ that would be available for the first five years of injection, with a plan for the CO₂ supply curve over the next 25 years that shows CO₂ sources (e.g., anthropogenic, DAC and BiCRS). It should show how the CO₂ sources change over the time frame of interest, including when the source(s) would come online (or go offline), CO₂ quantity, flue gas composition, and CO₂ source. For those sources expected to be used during the initial five years of operations, recipients shall include letters of interest and level of commitment from the current CO₂ source providers and discuss the specific business case associated with each source—this should also include new sources such as DAC and BiCRS if applicable.

At a minimum, the CO₂ Source Feasibility Study or equivalent must demonstrate due diligence by the Recipient and include all necessary information to support the application for a Class VI permit including, but not limited to, definition of source(s), physical and chemical characteristics (e.g., concentration of each gas constituent,

including contaminants) of the captured CO₂ stream, flow rates, incoming pressure, and any requirements from the CO₂ **transport system** operators.

The CO₂ Source Feasibility Study should discuss the type of capture system and pre-/post-capture processing that a specific raw gas stream might need, percent capture, dehydration, and/or compression requirements. If a proposed source is already concentrated and does not require a capture technology, information should be included regarding quantity and purity of CO₂ and any requirements for dehydration and/or compression.

Objective 3—NEPA Compliance

Recipients will be requested to submit to the NEPA process a wide array of information about the proposed storage project, options under consideration for the proposed project, reasonable alternatives to the proposed project for achieving similar objectives, a description of the affected environment (to include both the natural environment and the human environment), the socio-economic setting of the proposed project and affected area surrounding the site, trends regarding changes in the surrounding environment (natural, socio-economic, human) and the potential impacts (both positive and negative) for the proposed project, its options, its reasonable alternatives, and all connected actions¹⁸. Recipients will complete an EIV which comprises not only the specific activities to be performed under the Phase III project, but also the entire construction, operation, closure, and post-closure phases of proposed transport and storage facilities, including all effects of these activities and connected actions, such as carbon capture facilities, on the surface and subsurface environment. The Recipient will also be expected to cooperate fully with DOE personnel and DOE-approved contractors who may prepare the NEPA compliance documents and implement the NEPA compliance process.

Based on DOE's review of the Environmental Questionnaires (submitted with the application) and EIV, and the sensitivity of the proposed work area, an EA/FONSI or an EIS/ROD may need to be prepared and issued by DOE. The goal is for DOE to issue a FONSI or ROD prior to completion of Phase III work.

Projects will need to take into consideration time and cost for the entire NEPA compliance process, including (if applicable) the time and cost associated with gaining NEPA approval for active seismic surveying or vibratory coring in aquatic (offshore) environments, which are not eligible for a Categorical Exclusion. Subsequent to DOE's determination of the appropriate level of NEPA review requiring either an EA or EIS, typically a third-party NEPA contractor is used for preparation of the EA or EIS. DOE may

¹⁸ Actions are connected if they: (i) Automatically trigger other actions which may require NEPA determinations; (ii) Cannot or will not proceed unless other actions are taken previously or simultaneously; (iii) Are interdependent parts of a larger action and depend on the larger action for their justification.

choose to pay the third-party directly or to have the recipient pay the third party (typical approach), in which case DOE would still direct document preparation.

The NEPA review will be structured such that a single EA/EIS will be developed, and a single FONSI/ROD will be issued for the entire proposed project. If a project comprises multiple transport systems and/or storage facilities, the NEPA process will not be considered “complete” for any individual transport system/storage facility until a FONSI or ROD is issued for all transport systems/storage facilities covered by the EA or EIS for the overall project.

Objective 4—CO₂ Transport FEED Study

Recipients will conduct a Front End Engineering Design (FEED) Study of the new transport infrastructure¹⁹ needed to connect CO₂ source(s) to the injection wells. The FEED study will provide key information required to achieve Objective 3 of Phase III.5 (NEPA Compliance). In many cases, the environmental impacts of the CO₂ transport system may be viewed as indirect impacts of the CO₂ storage facility; in such cases, the environmental impacts of the transport system must be fully analyzed as part of the EA or EIS associated with the storage facility. It is expected that the transport system FEED study will provide the level of detail needed to prepare the EA or EIS. A description of the items to be included are presented in Appendix L—CO₂ Transport FEED Study.

Note – The primary focus of the CarbonSAFE Initiative is the storage facility, not the transport system. **Therefore, the DOE share of the Transport FEED Study shall not exceed \$5 million.**

Objective 5—Community Benefit Plan

Recipients are expected to conduct Community Benefits related work through the life of the project. This involves understanding and addressing potential energy and environmental justice issues during the planning and design of their storage project, and seeking opportunities for economic revitalization and creation of quality jobs at prevailing wages in the communities near the proposed project. Communities that could be affected negatively or positively should be identified and engaged in the process such that they have meaningful input throughout the project’s life cycle. As part of assessing environmental justice, applicants should also examine physical climate risk and impacts to the site during the development, operations, and post-closure of the facility.

Recipients will explain how Community Benefits related work will be completed through preparing a Community Benefits Plan. The Community Benefits Plan will be evaluated as part of the technical review process. If the project is selected, DOE will incorporate the Community Benefits Plan into the award and the recipient will be required to meet the

¹⁹ Note that the entire CO₂ transport system from source(s) to the storage field may include existing as well as new transport infrastructure; the FEED study would cover only new transport infrastructure

Community Benefits Plan it proposed. During the life of the DOE award, DOE will evaluate the recipient's progress.

Important information about the Community Benefit Plans:

- Applicants are requested to include work relevant to each plan within the SOPO.
- The applicant should allocate staff time and budget for at least one team member to present in person on the Community Benefits plan at a public meeting convened with support of DOE.
- A public End-of-Project Progress Report is required, which covers final plans, accomplishments, and findings. It will be included in the project's overall final report.

Objective 6—Business and Financial Plans and Arrangements

If needed (optional because it may already be completed), recipient will initiate the plans and documents needed for the final investment decision or for the financial closing on loans and investments, along with those needed for the EPC contracts. It is expected that many if not all of these plans and documents (or equivalents) will be finalized during CarbonSAFE Initiative Phase IV. Actual plans and documents may have different names than those stated below but should be functionally equivalent. Not all plans and documents listed below may be needed for a specific project; if not needed, an explanation of the lack of need for the plan or document should be submitted to DOE in the application package. Generally, the needed plans and documents include those identified as entry requirements for CarbonSAFE Initiative Phase IV and those listed below:

- **Business Plan (preliminary or draft)**, including details on the project being proposed; the problem(s) to be solved by the project along with a brief description of how the project would solve these problems; how the project is expected to be developed; business structure(s) to be formed; resources that will be needed; and the expected results if the plan is followed in terms of risk sharing/shifting, income streams, and how the project intends to pay off loans and pay return to investors.
- **Project Financing Plan (preliminary or draft)**, including projections of tax (e.g., 45Q) credit allocations and other governmental incentives, any tax equity to be incorporated into the project financing, and loan types/structures. Also, this plan should address refinancing of the construction loan, if applicable.
- **Financial Model (preliminary or draft)** is an Excel-based mathematical model that describes the future project in numbers and specifically in terms of cash flows. This model will be updated during the course of the project as assumed values become facts, such that financial impacts can be communicated accurately.
- **Contracts (preliminary or drafts)**, if appropriate, for owner's engineer, project/construction management, detailed design, procurements, and

construction, including a description of long-lead-time procurements and significant engineering, purchasing, and construction risks.

- **Site Ownership and Control documentation (preliminary set)** for injection wells, monitoring wells, CO₂ transport systems, monitoring sites or geophysical survey routes, mineral rights, and pore space.
- **Agreement(s) with Stakeholders and Affected Communities**, as appropriate, to include job-opportunity commitments, labor agreements, compliance with Davis-Bacon Act, job training and internship commitments or opportunities, community investment commitments, community small investor opportunities, information-sharing protocols, community input protocols, community emergency response training and protocols, etc.
- **Permits** in hand and plans to secure necessary permits that remain to be obtained.
- **Schedule (preliminary or draft)** for the project development and construction, including financial milestones.

Technical Elements to be Included in Applications (AOI 2)

- Items listed in **Appendix I: CarbonSAFE Phase III.5 Project Readiness**, which includes evidence that the Class VI permit application (or equivalent) has been submitted and determined to be “Administratively Complete” by the appropriate regulatory authority.
- Map of the proposed storage complex and stratigraphic column with proposed location of injection well(s) and any other relevant information. Applications should include a map of the proposed storage site(s) within the storage complex and descriptions of the owner(s) of the land surface, subsurface pore space, and mineral rights. If obtainable, the application should include commitment letters from landowners for site access and provide full disclosure of known land-use concerns (such as cultural, wildlife, or natural resources).

Success Metrics

Work performed under AOI 2 should build a foundation upon which a successful application could be subsequently submitted for CarbonSAFE Initiative Phase IV. Success will be measured in specific areas of emphasis:

- Individual projects should contribute to the programmatic goal of access to at least 2 billion metric tons of storage capacity (see SRMS Classification) and injection of more than 65 million metric tons per year by 2030.
- Public engagement with stakeholders, potentially affected property owners, nearby disadvantaged communities, and environmental justice communities with overall support across these groups and minimal opposition to the proposed project.
- NEPA Clearance (FONSI or ROD) to move into Phase IV of CarbonSAFE Initiative.
- Storage Field Development Plan.
- CO₂ Carbon Source(s) Feasibility Study.

- **CO₂ Transport FEED Study.**
- Status of the project at the end of the period of performance meets or exceeds the qualifications for selection to start a CarbonSAFE Initiative Phase IV project.

Area of Interest 3—CarbonSAFE Phase IV: Construction

Carbon Storage Infrastructure Development Sought

The overall purpose of AOI 3 is to construct the commercial-scale secure geologic storage facility and prepare it for CO₂ injection. This includes drilling and completion of injection and monitoring wells; completion of risk and mitigation plans; completing all the baseline and any additional monitoring data; completing all other facility infrastructure (e.g., **CO₂ transport system infrastructure to deliver CO₂ to the storage field, CO₂ distribution lines within the storage field,** compressor stations); and obtaining Class VI Authorization to Inject or OCS equivalent. For development of commercial infrastructure, it is desired for applicants to apply for more than one injection well per field site to ensure that there is a second injection well to avoid having a single point of failure. Recipients are encouraged to collect sufficient baseline data to be prepared for future needs. Under AOI 3, Phase IV CarbonSAFE Initiative projects will be considered for Onshore: Dedicated Storage and Hub Storage Facility(ies) within the United States and Offshore Facility(ies) within state waters or the U.S. OCS. Applicants should identify which facility type is applicable to their site and to explain how that contributes to their business case.

Note the prerequisite requirement to submit an application to AOI 3 (Phase IV) is to provide evidence of Class VI (or equivalent) “Administratively Complete” by the appropriate regulatory authority and evidence of NEPA EA or EIS that is in process to receive a FONSI or ROD. However, the following two items will be required prior to final award of selected projects: 1) Evidence that the U.S. Environmental Protection Agency (EPA) Class VI or Department of Interior (DOI) Outer Continental Shelf (OCS) “Authorization to Construct” has been received from the appropriate regulatory authority; 2) Evidence that a Finding of No Significant Impact (FONSI) on an Environmental Assessment (EA), or a Record of Decision (ROD) on an Environmental Impact Statement (EIS) has been received.

Projects selected under AOI 3 are not restricted to projects previously funded under CarbonSAFE Initiative Phase I, II, III, and/or CarbonSAFE Initiative Phase III.5 awards.

Awards under AOI 3 will provide funding for the following activities and deliverables:

- **ACTIVITIES (partial listing):**
 - Final contractual agreement with CO₂ source, access agreements from landowners, agreements with pore space owners, and other agreements necessary for injection operations and post-injection regulatory and contract requirements.

- Drilling and completing injection well(s) or repurposing existing well(s) and infrastructure for injection of CO₂. Well construction will be completed to the approved Class VI or OCS equivalent specifications in “Authorization to Construct”; well repurposing will be in accordance with the applicable regulations or issued variances. Well installation should include wireline logging and coring to confirm characterization and contribute to establishing baseline data. Completed or repurposed wells may require pump testing and other well development efforts to confirm proposed injection parameters. Approved leak detection and downhole monitoring equipment will be installed within the wells as specified in the UIC permit or OCS equivalent. Completion of all activities needed to meet specifications for authorization to inject will be conducted. If existing wells will be repurposed, the modifications of the wells and the permit modifications must be described in the application.
- Drilling and completing monitoring and brine extraction wells or repurposing wells for monitoring or extraction, if appropriate. Well installation/repurposing will include data collection to confirm well integrity and subsurface characterization and to obtain baseline monitoring data.
- Constructing or installing monitoring systems as required by permits or for prudent operations, and establishing baseline data for all monitoring activities as defined in the EPA Monitoring Reporting and Verification (MRV) plan. This includes: (1) sub-surface, (2) surface and shallow subsurface or ground-water monitoring, (3) well and/or wellhead monitoring, and (4) any other required or prudent monitoring. Recipients are required to collect data to meet UIC Class VI or DoI OCS regulations, and are encouraged to collect research and development (R&D) baseline data above and beyond regulatorily required baseline data that could be useful for supporting future monitoring R&D, or as would be prudent to mitigate risk.
- Performing any needed **plugging, abandonment**, mitigation, or repurposing of legacy wells.
- **Constructing CO₂ transport infrastructure and ancillary infrastructure within the storage field as required to safely operate this infrastructure. The area constituting the storage field must be defined clearly in the Storage Field Development Plan.**
- **Construction of CO₂ transport infrastructure to deliver CO₂ to the storage field may also be allowed; however, the primary focus of the CarbonSAFE Initiative is the storage facility, not the transport system. Therefore, the DOE share of the cost of construction of the CO₂ transport system infrastructure to deliver CO₂ to the storage field shall not exceed \$15 million. DOE provides other opportunities such as the [Carbon Dioxide Transportation Infrastructure Finance and Innovation \(CIFIA\)](#) program that can provide financial assistance for construction of CO₂ transport systems.**
- Constructing and installing other infrastructure as needed to manage injection operations and to collect and manage monitoring data.

- Updating geologic models and injection strategies based on data from new wells and monitoring systems.
- Updating risk and mitigation plans to reflect characterization data obtained during construction and monitoring baseline development.
- Shakedown or testing of system as applicable.
- Community Benefits Plan requirements (which includes Public Engagement and Training).
- **DELIVERABLES:**
 - At time of Financial Assistance Award by DOE:
 - Updated Storage Facility Development Plan.
 - Evidence that the U.S. Environmental Protection Agency (EPA) Class VI or Department of Interior (DOI) Outer Continental Shelf (OCS) “Authorization to Construct” has been received from the appropriate regulatory authority.
 - Evidence that a Finding of No Significant Impact (FONSI) on an Environmental Assessment (EA), or a Record of Decision (ROD) on an Environmental Impact Statement (EIS) has been received.
 - As available prior to Financial Closing, copies of:
 - Final loan agreements (unexecuted).
 - Agreements with equity investors (executed or unexecuted).
 - Other supporting financing agreements (e.g., pledge agreements, promissory notes, guarantees, letters of credit, etc.).
 - Project Financial Model with significant updates.
 - As obtained, copies of draft and final contract(s) for:
 - Detailed design.
 - Owner’s engineer, if applicable.
 - Project/construction management, if applicable.
 - Large-cost or long-lead procurements, if applicable.
 - Repurposing or refurbishment of existing infrastructure (onshore and/or offshore).
 - Materials/components/systems procurement, construction, or installation.
 - Operations and maintenance services.
 - Other significant contracts.
 - Design drawings and specification sheets for facilities to be constructed, including lists of machinery and equipment, materials and supplies, and vendors and sub-contractors.
 - At time of Financial Closing, copies of:
 - Signature pages for all financing agreements not previously executed.
 - Current version of the Business Plan for the project.
 - Current version of the project Financial Model.
 - Insurance policies.
 - Evidence of receipt of all required permits, including a completed NEPA report.

- Financial Responsibility documents, which exist at the time of Financial Closing (e.g., bonds and financial assurance instruments).
- Agreement(s) with affected communities, if applicable.
- Notice to Proceed issued to the EPC contractor, or equivalent.
- Petition for Authorization to Inject.
- Post-Construction financial updates:
 - Tax equity partnership activity, if applicable.
 - Revised Insurance Policies.
 - Current Business Plan.
 - Updated Financial Model.
 - Construction loan refinancing, if applicable.
- **FINAL DELIVERABLES:**
 - List of Permits received.
 - As-Built Drawings and specifications.
 - Equipment List.
 - Operations and Maintenance Plans and Guides.
 - Updated pre-injection subsurface characterization and baseline data, to be collected before the end of the period of performance as per the Financial Assistance Agreement.
 - Updated Risk Assessment(s) or Risk Matrix and Mitigation Plans.
 - Final Monitoring Plans.
 - Final Emergency Response Plans and notification protocols.
 - Authorization to Inject (when received).
 - Personnel/Staffing Plan.
 - Complete public Engagement Plans for the operational phase of the project.
 - Final Community Benefits Plan (which includes Public Engagement and Training).

Objective 1—Fulfill Pre-Financial Closure Requirements

Recipient will complete the plans and documents needed for the final investment decision or for the financial closing on loans and investments, along with those needed for the EPC contracts. It is expected that many, if not all, of these plans and documents (or equivalents) would have been initiated before entry into Phase IV of CarbonSAFE Initiative, but perhaps not finalized. Actual plans and documents may have different names than those stated below, but should be functionally equivalent. Not all plans and documents listed below may be needed for a specific project; if not needed, an explanation of the lack of need for the plan or document should be submitted to DOE in the application package. If the Applicant has already completed financial close, they can simply submit the evidence or copies of relevant agreements. Generally, the needed plans and documents include those identified as entry requirements for CarbonSAFE Initiative Phase IV and those listed below:

- **Business Plan**, including details on the project being proposed; the problem(s) to be solved by the project along with a brief description of how the project would solve these problems; how the project is expected to be developed; business

structure(s) to be formed; resources that will be needed; and the expected results if the plan is followed in terms of risk sharing/shifting, income streams, and how the project intends to pay off loans and pay return to investors.

- **Project Financing Plan**, including projections of tax (e.g., 45Q) credit allocations and other governmental incentives, any tax equity to be incorporated into the project financing, and loan types/structures. Also, this plan should address refinancing of the construction loan, if applicable.
- **Financial Model** is an Excel-based mathematical model that describes the future project in numbers and specifically in terms of cash flows. This model will be updated during the course of the project as assumed values become facts, such that financial impacts can be communicated accurately.
- **Insurance Agreement(s)**: Procurement of insurance (other than financial responsibility requirements of UIC permits) to cover liabilities and casualties, such as general liability insurance, worker's compensation protections, and any insurance specific to well drilling and storage field operations.
- **Financial Responsibility documents** for an EPA Class VI well drilling permit(s) or equivalent offshore permit(s), which may need to be perfected before any CO₂ injection may occur.
- **Contracts** for owner's engineer, project/construction management, detailed design, procurements, and construction. This will include a description of long-lead-time procurements and significant engineering, purchasing, and construction risks.
- **Site Ownership and Control documentation** for injection wells, monitoring wells, CO₂ transport systems, monitoring sites or geophysical survey routes, mineral rights, and pore space.
- **Financial Closing Plan** should identify all needed transactions prior to, or coincident with, the signing of the loan and/or investment instruments and project contracts needed before construction and major procurements can begin. It may identify who will be involved in the closing process, specify the order of signings, and describe the methods of recording the transactions. Copies of documents required by lenders and investors should be attached to the plan, including contracts conditioned upon the financial closing. Some of the included or attached documents are listed below:
 - Project company structure and legal form.
 - Loan terms and agreements.
 - Investment terms and agreements, including tax equity, if applicable.
 - Updated Financial Model.
 - Insurance policies.
 - Financial Responsibility requirements and instruments chosen.
 - Other documents, as appropriate.

NOTE: DOE funding will be contingent on the non-DOE cost share being received or evidenced in the form of legally binding commitments. This must be achieved within the

first nine months of the project. (In cases where significant changes outside of the control of the recipient occur, appropriate time frame for a revised Financial Closing Plan will be determined in consultation with NETL.)

- **Agreement(s) with Stakeholders and Affected Communities**, as appropriate, and as referenced in the Community Benefits Plan, to include job-opportunity commitments, labor agreements, compliance with Davis-Bacon Act, job training and internship commitments or opportunities, community investment commitments, community small investor opportunities, information-sharing protocols, community input protocols, community emergency response training and protocols, etc.
- **Permits** or evidence of or plans to secure necessary permits that remain to be obtained.
- **Schedule** for the project development and construction, including financial milestones.

Objective 2—Achieve Financial Close

The recipient will (1) make the final investment decision or execute the binding financial arrangements for financing all of the proposed scope of work and purchases (e.g., construction and installation of project facilities) throughout the proposed period of project performance, and (2) release the initial proceeds from such financing for payment to the performers, vendors, and contractors necessary to accomplish the proposed scope of work and purchases. More generally, “financial close” means:

- **Coordinate** the completion and execution of all the necessary legal documents to secure the funds needed for the construction effort and purchases.
- **Finalize** the scope, schedule, and budget for the project.
- **Receive funds** (or firm fund commitments) and issue Notice to Proceed to the relevant (e.g., construction) contractor(s).

Objective 3—Engineer, Procure, Construct

The central objective of CarbonSAFE Initiative Phase IV is the final engineering, design, procurement, and installation or construction of facilities in accordance with the proposed scope of the project. The scope of the project must include all the facilities necessary to achieve storage of the quantity of CO₂ described in the Class VI or equivalent permits for construction of the storage facility. Such facilities may include **the CO₂ transport system** infrastructure to deliver CO₂ to the storage field, access roads, well pads, platforms, injection wells, monitoring wells and other monitoring hardware/software, CO₂ distribution lines within the storage field, pumps/compressors, produced water handling facilities, buildings, control systems, physical security, safety systems, emergency services, etc. as would reasonably be expected per the scope of the proposed project. Costs for new or repurposed facilities that would not be constructed until after 2029 are not allowable under this FOA.

Objective 3 is likely to include most or all of the following:

- Final detailed design of all infrastructure.
- Major equipment specifications.
- List of utility tie-ins needed.
- List of high-cost equipment with long-lead times.
- Plans for repurposing or refurbishment of existing infrastructure (onshore and/or offshore).
- Intended arrangements for procurement, construction, and installation services, including acceptance criteria and pre-commissioning testing/validation procedures.
- Plans for testing and verification of monitoring systems, supervisory control and data acquisition (SCADA), site security, safety/emergency service, and operational controls for the storage facilities.
- Status of all permits required to construct.
- Plans for interconnection with CO₂ supply line(s) and CO₂ testing.
- Contracts:
 - Signed and executed Engineering, Procurement and Construction (or similar) contract(s) including all approved terms and conditions and exhibits for construction of the entire plant, the cost of which shall be highlighted, if the contract is firm, fixed price.
 - Owner's engineer, if applicable.
 - Project/construction management, if applicable.
 - Equity and Debt provider agreements.
 - Sequestration MVA plan compliance monitor.
 - Operations and maintenance services.
 - Other significant contracts.

Objective 4—Petition for Authorization to Inject

Recipient will petition the regulatory authority with jurisdiction for authorization to inject CO₂ when the relevant facilities become eligible. Copies of the petition documents shall be submitted to DOE.

Objective 5—As-Built Drawings, Specification Sheets, and Final Plans

Before conclusion of the Phase IV Project, Recipient will prepare updated or final documents based on the construction and additional data collected during the course of project performance. Under this Objective, Recipient will deliver to DOE copies of updated or final plans, contracts, documents, data, etc. Generally, this Objective encompasses anything a new owner or operator would need in the situation of a default of the current owner or failure of the storage facilities to progress into and through the proposed operational phase of the storage project, as proposed, unless the final versions of such plans, contracts, documents, and data have been previously delivered to DOE. The following is not an exhaustive list of the items to be delivered to DOE; however, submittals may include:

- As-built drawings: wells and wellheads, CO₂ transport infrastructure, monitoring networks, control systems, buildings, physical security, compressor stations, pump stations, produced water handling facilities, offshore platform, etc.
- Operational plans and guides; maintenance plans and guides—all documents necessary for operating and maintaining the storage site facilities and CO₂ transport infrastructure constructed as part of the project.
- Final monitoring plans for reservoir(s), monitoring zone above main seal layer or caprock, underground sources of drinking water, well heads, and air emissions, as appropriate.
- Final emergency response plans and protocols, including notification procedures for neighboring populations or offshore platform personnel, and annual hazard and safety training for first responders and for the local, potentially affected populations.
- Final personnel/staffing plan for operations and maintenance during the period of active injection, including any internships or training opportunities during this time period.

Objective 6—Baseline Data

After the installation and activation of monitoring systems and sensors, data should be collected as would be prudent to establish baseline conditions. Collected data shall be submitted to DOE in accordance with an agreed upon Data Management Plan (DMP), and may include:

- Data collected to fully define baseline conditions for: (1) the subsurface, including microseismic activity; (2) land surface; (3) well(s); and (4) ambient air for which future monitoring results would be compared, especially for liability defense, permit compliance, or in accordance with other agreements (including the DOE ROD or mitigated FONSI).
- Inspection records for facilities and components of facilities.

Objective 7—Updated Risk Assessment(s) and Mitigation Plans

The project risk assessment and/or risk matrix, uncertainty analysis, and the associated mitigation plans will be updated and revised to be ready for the operational phase of the storage facilities. This will be done after the facilities are constructed and will use data collected throughout the Phase IV CarbonSAFE Initiative project. As appropriate, information from the risk assessment or matrix and from the mitigation plans will be included in information packages and training provided to local first responders (e.g., fire department, police department, hospitals, etc.) and to the local, potentially affected populations.

Objective 8—Community Benefit Plans

Recipients are expected to engage with community and labor organizations and develop, update, and implement the plan through the life of the project. This involves understanding and addressing potential energy and environmental justice issues during the planning and design of their storage project and seeking opportunities for economic

revitalization and creation of quality jobs at prevailing wages in the communities near the proposed project. Communities that could be affected negatively or positively should be identified and engaged in the process such that they have meaningful input throughout the project's life cycle. As part of assessing environmental justice, applicants should also examine physical climate risk and impacts to the site during the development, operations, and post-closure of the facility.

Recipients will explain how societal benefits and impacts will be addressed through preparing a Community Benefits Plan.

The Community Benefits Plan is required at the time of application. The Community Benefits Plan will be evaluated as part of the technical review process. If the project is selected, DOE will incorporate the Community Benefits Plan into the award and the recipient will be required to meet the Community Benefits Plan it proposed. During the life of the DOE award, DOE will evaluate the recipient's progress.

Important information about the Community Benefits Plan:

- Applicants are requested to include work relevant to each actionable section of the Community Benefits Plan within the Statement of Project Objectives (SOPO).
- The applicant should allocate staff time and budget for at least one team member to present in person on the Community Benefit plan at a public meeting convened with support of DOE.
- A public End-of-Project Progress Report is required, which covers final plans, accomplishments, and findings. It will be included in the project's overall final report.

Technical Elements to be Included in Applications (AOI 3)

- Applicants are required to provide a one- to four-page description, entitled, "Facility Type and High-Level Budget Justification." In this document, Applicants should describe the proposed facility type (onshore dedicated storage facility, onshore hub storage facility, or offshore storage facility) and justify their choice of facility type label. Applicants should also describe the project elements that significantly impact total project cost and where their proposal falls in the range of "Anticipated Individual Award Sizes" (Section II.A.i). Site specifics such as geology, local rig availability, number of wells needed in this phase, etc. that have significant impact on total project cost should be noted and the associated cost adjustments should be justified. The purpose of the of the "Facility Type and High-Level Budget Justification" is to provide DOE with sufficient information to assess the appropriateness of proposed project costs, which will be dependent upon facility type and site-specific elements. The inclusion of tables and/or figures may or may not be appropriate to justify project costs. The "Facility Type and High-Level Budget Justification" file should provide enough information to

adequately explain and justify the detailed budget provided in the budget justification.

- **Financial Responsibility documents** for an EPA Class VI well drilling permit(s) or equivalent offshore permit(s), which may need to be perfected before any CO₂ injection may occur.
- Items listed in **Appendix J: CarbonSAFE Phase IV Project Readiness**.
- Map of the proposed storage complex and stratigraphic column with proposed location of injection well(s) and any other relevant information. Applications should include a map of the proposed storage site(s) within the storage complex and descriptions of the owner(s) of the land surface, subsurface pore space, and mineral rights. If obtainable, the application should include commitment letters from landowners for site access and provide full disclosure of known land-use concerns (such as cultural, wildlife, or natural resources).

Success Metrics

Work performed under AOI 3 should build facilities that could subsequently perform commercial-scale CO₂ storage operations. Success will be measured in specific areas of emphasis:

- Individual projects should contribute to access for at least 2 billion metric tons of storage capacity and enable the injection of more than 65 million metric tons per year by 2030.
- Public engagement with potentially affected stakeholders, property owners, disadvantaged communities, and environmental justice communities with overall support across these groups and minimal opposition to the proposed project.
- Project has obtained UIC Class VI authorization to inject.
- Status of the project at the end of the period of performance is ready to start commercial operations.

Area of Interest 4—CarbonSAFE Phase II: Storage Complex Feasibility

Awards under this AOI will provide funding for the second stage of development of commercial-scale geological storage facilities for CO₂ and will include the following activities or deliverables:

- Storage complex characterization and assessment report.
- Geologic and computational models for the UIC Class VI or DoI OCS area of review (AoR), extent of injectate plume migration and extent of subsurface pressure propagation.
- Preliminary risk assessment with mitigation plans for the entire CO₂ transport and storage project.
- Preliminary CO₂ management & monitoring plan, including coverage for transport of CO₂.
- Detailed plan for a subsequent complete site characterization effort to support UIC Class VI or DoI OCS permitting process (i.e., a Phase III project).

- Technical and economic feasibility evaluation of a proposed CO₂ storage project, including various project options.
- Community Benefits Plan requirements (which includes Public Engagement and Training).

Objective 1 - Site Specific Characterization & Assessment of the CO₂ Storage Complex

Selected projects under this AOI will perform site-specific characterization of the storage complex and develop comprehensive datasets of formation characteristics (such as porosity, permeability, injectivity, mineralogy, fluid composition and saturations, geochemical conditions, stratigraphy, cap rock type and integrity, etc.) to determine the suitability of the potential geologic storage site(s). As part of this feasibility phase, the recipient should identify, obtain, and evaluate existing data that are either publicly available or available for purchase from vendors or operators. While the focus is on using existing data, the data may require reprocessing to further evaluate the storage complex. In addition, new data may be obtained to adequately characterize the storage complex, including storage reservoirs and regional seal(s). Data sets may include, for example, surface and downhole seismic surveys, analysis of core and well tests from stratigraphic wells/borings, and well logs.

Proposed work may include the drilling and testing of a stratigraphic well to validate existing data and acquire new data, including well logs and cores, fluid samples, bulk formation permeability test results, and fluid pressure and temperature measurements to determine subsurface parameters for the proposed storage site(s). Note that while it is allowable to complete wells to Class VI standards to prevent inefficiencies of needing to recomple wells, etc., there must be a clear need for the well as a characterization well in Phase II for the well to be drilled.

These site-specific data will be used in storage complex models and improved simulations of storage processes and risks.

Selected projects must obtain the required federal, state, and local regulatory permits for the anticipated characterization activities. Timelines and data needs for completing the permitting processes should be assessed. It is anticipated that data acquired and analyzed during this phase would be used for future or DoI OCS permitting. Applicants are advised that data acquisition via active seismic surveying or vibratory coring in aquatic (offshore) environments is NOT eligible for a Categorical Exclusion (CX) from NEPA requirements. If such activities are proposed as part of the site characterization effort under this AOI, a clear plan for meeting NEPA requirements for these activities must also be included in the application. The effort, time, and cost associated with NEPA compliance for such activities must be included in the project scope, schedule and budget.

Selected projects should use geologic and computational models to define the UIC Class VI or DoI OCS area of review (AoR) and to estimate the extent of injectate plume

migration and subsurface pressure propagation for a proposed storage project. These models should incorporate specific conditions at the site, as well as the proposed injection project, including injection fluid volume, injection rate, target formation depth, pressures, and duration of injection.

Selected projects will be required to provide data acquired during their project into the National Carbon Sequestration Database and Geographical Information System (NATCARB). Data curation and management requirements will be discussed with DOE during award negotiation.

It is noted that DOE is investing in the Regional Initiative projects to provide technical assistance to stakeholders interested in developing CCUS projects. As the successors of the Regional Carbon Sequestration Partnerships, the Regional Initiative projects have amassed a wealth of knowledge and experience on CCUS project development, monitoring technologies and strategies, permitting, and stakeholder engagement. Projects selected for negotiations leading to award under this AOI are encouraged to engage with the Regional Initiative project in their region as a source of information and technical expertise on all phases of the CCUS value chain. Additional information on the Regional Initiative projects is available at the link below.

<https://netl.doe.gov/coal/carbon-storage/regional-initiative-to-Accelerate-CCUS-deployment>

Objective 2 - Preliminary Project Risk Assessment with Mitigation & Management Plans

To aid in the planning, siting, and design of facilities and in the selection of specific reservoirs for commercial storage within the storage complex, Recipients will (a) conduct a risk assessment to identify potential constraints, technical and non-technical, that would prevent commercial-scale use of the proposed site(s) and candidate storage reservoirs within the storage complex, and (b) provide a mitigation plan for these potential risks.

Non-technical challenges such as likely financing and lending agreements, likely financial performance, landowner agreements for surface access and pore space use, public opposition, site ownership, and long-term liability shall also be addressed.

DOE recommends the identification of an alternate storage site within the storage complex, that can be used as a substitute if serious challenges arise with the primary site. DOE financial resources may support full characterization at only one site.

To reduce project risk and aid in the selection of specific storage reservoirs for commercial storage, a risk assessment will be conducted to identify potential constraints that would prevent usage of the candidate reservoirs. The risk assessment should include transport options, injection options and subsurface storage options. A monitoring and mitigation plan should be prepared based on the risk assessment

results. Monitoring strategies should be developed for wells, reservoirs, and permeable zones above the main caprock or seal layer, along with strategies for any aquifer, soil or atmospheric monitoring that may be required or prudent.

As part of the risk assessment, selected projects have the option of working with DOE's National Risk Assessment Partnership (NRAP), which may assist in applying the suite of NRAP tools designed to evaluate and manage the risks associated with saline storage. These tools could assist in evaluating several parts of the carbon storage subsurface containment system (e.g., reservoirs, seals, wells, and aquifers), as they relate to two major types of environmental risks: leakage and induced seismicity. NRAP tools may be most helpful when used in conjunction with industry standard models and risk assessment tools as a means to fill gaps, quantify risks and validate results from non-NRAP tools and methods. Furthermore, DOE desires to test and verify NRAP's tools' utility and performance in commercial-project applications. It is not a requirement to use NRAP tools in place of established industry standard models and risk assessment tools. Collaboration with NRAP tool developers could include validation of one or more NRAP tools through: (1) sharing of relevant datasets, information, and technical insights from field efforts; and (2) comparisons with results from other modeling and simulation tools or methods. Collaboration arrangements will be discussed with DOE during award negotiation. Detailed description of the NRAP tools is available on <https://edx.netl.doe.gov/nrap/>.

To further support the risk assessment with respect to induced seismicity, recipients of Phase II awards will perform a preliminary seismic risk screening analysis in accordance with DOE's "Recommended Practices for Managing Induced Seismicity Risk Associated with Geologic Carbon Storage" (Templeton et al., 2021). Specifically, Phase II activities should provide information that will enable the Preliminary Classification of Site-Specific Seismic Risk to be categorized as Very Low (Category I), Low (Category II), Medium (Category III), or High (Category IV) as described in Table 1 of Templeton et al., 2021.

Selected projects will develop a plan to manage the CO₂ and a strategy to ensure the reliability of a CO₂ source and CO₂ transport. The plan will address the handling of CO₂ and the monitoring of CO₂ in transport systems that are under the ownership or control of the project. The plan will describe the anticipated CO₂ source(s), likely contractual requirements, chemical composition(s) of the gas (including hazardous constituents), pressure(s) and temperature(s), rate(s) of delivery, reliability, etc. This plan will also describe and evaluate the transport options for delivery of the CO₂ to the injection site(s) and the options for injection well designs.

Objective 3 - Plan for Subsequent Detailed Site Characterization & UIC Class VI or DoI OCS Permitting

Results of Phase II projects should include a detailed plan for a subsequent, complete site characterization effort (i.e., first part of a CarbonSAFE Phase III project) that would

be needed to gather the information for a complete UIC Class VI or DoI OCS permit application and the permitting process.

Objective 4 - Project Technical & Economic Feasibility Assessment, including Conceptual-Level Design Study for CO₂ Transport

Selected projects will complete a technical and economic feasibility evaluation of their entire proposed CO₂ storage project (including various options that need to be considered to address potential challenges or hurdles that the project may need to overcome) in the identified potential storage complex at a specific storage site(s). The feasibility report should include a summary of the geology and risks associated with the potential storage site(s). It should address the regulatory, legislative, technical, public policy, commercial, financial, etc. challenges specific to the commercial-scale deployment of the proposed CO₂ storage project; and it should include a strategy that would enable an integrated capture and storage project to be economically feasible and publicly acceptable.

Selected projects will also complete a conceptual-level design study for the preferred CO₂ transport option. Unless transport costs are to be paid by third parties (e.g., by those who earn 45Q tax credits for capture of CO₂), the technical and economic feasibility of CO₂ transport will be included in the storage project's technical and economic feasibility evaluation.

Objective 5 – Community Benefits Plan

Recipients are expected to engage with community and labor organizations and develop, update, and implement the plan through the life of the project. This involves understanding and addressing potential energy and environmental justice issues during the planning and design of their storage project and seeking opportunities for economic revitalization and creation of quality jobs at prevailing wages in the communities near the proposed project. Communities that could be affected negatively or positively should be identified and engaged in the process such that they have meaningful input throughout the project's life cycle. As part of assessing environmental justice, applicants should also examine physical climate risk and impacts to the site during the development, operations, and post-closure of the facility.

Recipients will explain how societal benefits and impacts will be addressed through preparing a Community Benefits Plan.

The Community Benefits Plan is required at the time of application. The Community Benefits Plan will be evaluated as part of the technical review process. If the project is selected, DOE will incorporate the Community Benefits Plan into the award and the recipient will be required to meet the Community Benefits Plan it proposed. During the life of the DOE award, DOE will evaluate the recipient's progress.

Important information about the Community Benefits Plan:

- Applicants are requested to include work relevant to each actionable section of the Community Benefits Plan within the Statement of Project Objectives (SOPO).
- The applicant should allocate staff time and budget for at least one team member to present in person on the Community Benefit plan at a public meeting convened with support of DOE.
- A public End-of-Project Progress Report is required, which covers final plans, accomplishments, and findings. It will be included in the project's overall final report.

Technical Elements to be Included in Applications (AOI 4)

- Items listed in **Appendix G: CarbonSAFE Phase II Project Readiness**.
- Map of the proposed storage complex and stratigraphic column with proposed location of injection well(s) and any other relevant information.
- Photographs showing the physical conditions of any existing offshore platform proposed for use if applicable.

Success Metrics

Work performed under AOI 4 should build a foundation upon which a successful application could be subsequently submitted for CarbonSAFE Phase III based upon guidance in **Appendix H: CarbonSAFE Phase III Project Readiness**. Success will be measured in specific areas of emphasis:

- Comprehensive preliminary project risk assessment with mitigation & management plans.
- Viable plan for subsequent detailed site characterization and UIC Class VI permitting.
- Technical and Economic Feasibility Assessment detailing the cost and likely performance of the proposed geologic storage system that would have a capacity to store 50 million metric tons of CO₂ or more and could receive and store that amount in 30 years or less.
- A plan for public engagement with stakeholders, potentially affected property owners, nearby disadvantaged communities, and environmental justice communities with overall support across these groups and minimal opposition to the proposed project.
- Status of the project at the end of the period of performance meets or exceeds the qualifications in **Appendix H: CarbonSAFE Phase III Project Readiness** for selection to start a CarbonSAFE Phase III project.

iii. Carbon Matchmaker

Applicants have access to Carbon Matchmaker, which may be utilized to facilitate the formation of new project teams for this FOA. Carbon Matchmaker is an online information resource to connect users across the CCUS and CDR supply chains. Carbon matchmaker will:

- Increase awareness and facilitate development of regional carbon management hubs, including alongside hydrogen hub development where relevant.
- Provide domestic and international community, industry, and technology development stakeholders with CO₂ supply and demand maps for current and planned projects.
- Highlight past and currently funded DOE carbon management projects in a geospatial map.

Carbon Matchmaker is intended to help facilitate regional carbon management team formation by allowing carbon management producers, end-users, and other stakeholders to self-identify and align potential needs in specific geographic areas within the United States. Carbon Matchmaker allows organizations that may wish to participate on an application to express their interest to other applicants and to explore potential partnerships.

Participation by underrepresented partners and suppliers and labor unions is encouraged. Teams that include representation from diverse entities such as, but not limited to Minority Serving Institutions (MSIs), including Historically Black Colleges and Universities (HBCUs)/Other Minority Institutions (OMIs),²⁰ or through linkages with Opportunity Zones,²¹ are encouraged.

Interested applicants can follow the submission instructions on the Carbon Matchmaker website at: <https://www.energy.gov/fecm/carbon-matchmaker>. Please indicate if DOE's Carbon Matchmaker enabled or connected partnerships of participants in the application. If so, please describe. This is merely to evaluate the effectiveness and to continually improve the matchmaker tool.

NOTE: Participation in the Carbon Matchmaker online resource is voluntary. Participation, or lack thereof, will not have any impact on an organization being selected for award. All provided data is self-reported by interested stakeholders and is not furnished by DOE. DOE does not recommend, endorse, or otherwise evaluate the qualifications or validity of any entities or data that were self-reported on this platform.

²⁰ MSIs, including HBCUs/OMIs as educational entities recognized by the Office of Civil Rights (OCR), U.S. Department of Education, and identified on the OCR's Department of Education U.S. accredited postsecondary minorities' institution list. See <https://www2.ed.gov/about/offices/list/ocr/edlite-minorityinst.html>.

²¹ Opportunity Zones were added to the Internal Revenue Code by section 13823 of the Tax Cuts and Jobs Act of 2017, codified at 26 U.S.C. 1400Z-1. The list of designated Qualified Opportunity Zones can be found in IRS Notices 2018-48 (PDF) and 2019-42 (PDF). Further, a visual map of the census tracts designated as Qualified Opportunity Zones may also be found at Opportunity Zones Resources. Also see, frequently asked questions about Qualified Opportunity Zones.

DOE will not fund the provision of any information, nor will it compensate any applicants or requesting organizations for the development of such information.

C. Applications Specifically Not of Interest

The following types of applications will be deemed nonresponsive and will not be reviewed or considered (See Section III.D. of the FOA):

- Applications that fall outside the technical parameters specified in Sections I.A. and I.B. of the FOA.
- Applications for proposed technologies that are not based on sound scientific principles (e.g., violates the laws of thermodynamics).
- Applications whose field activities would not be focused on operation under Class VI or the offshore equivalent of Class VI permits. Note that the boundary of the DOE-funded project shall not include production of hydrocarbons unless they are reinjected. Dedicated storage in depleted oil and gas fields, or in naturally occurring CO₂ reservoirs or geologic “domes,” are permitted provided all production of hydrocarbons and/or naturally occurring CO₂ cease during storage operations and PISC. The repurposing of these assets is of interest.
- **AOI 1 Only**—Applications for projects that would not build a foundation upon which an application could be subsequently submitted for CarbonSAFE Initiative Phase IV (would not be expected to result in an EPA Class VI permit or DoI OCS “Authorization to Construct”; NEPA FONSI or ROD; and completed Storage Field Development Plan, CO₂ **Transport FEED**, and CO₂ Source[s] Feasibility).
- **AOI 2 Only**—Applications for projects that would not build a foundation upon which an application could be subsequently submitted for CarbonSAFE Initiative Phase IV (would not be expected to result in NEPA FONSI or ROD; and completed Storage Field Development Plan, CO₂ **Transport FEED**, and CO₂ Sources Feasibility Study).
- **AOI 4 Only**—Applications for projects that would not build a foundation upon which an application could be subsequently submitted for CarbonSAFE Phase III based upon guidance in **Appendix H: CarbonSAFE Phase III Project Readiness**
- **AOI 2 Only**—Applications that do not meet the pre-requisite requirements by providing evidence that the Class VI permit (or equivalent) has been submitted and determined to be administratively complete by the appropriate regulatory authority.
- **AOI 3 Only**—Applications that do not meet the pre-requisite requirements by providing evidence of Class VI (or equivalent) “Administratively Complete” by the appropriate regulatory authority and evidence of NEPA EA or EIS that is in process to receive a FONSI or ROD.
- Applications which use CO₂ as a fracturing fluid or a working fluid for oil and natural gas production. Please note, funding allocated to the project cannot be used for purposes other than carbon storage.

- Applications focused solely on theoretical, laboratory-based, modeling, and monitoring technologies.
- Applications with storage sites that include proposed injection wells not located in the United States.
- Submissions that exceed the maximum DOE share as outlined in Section II Award Information.
- **AOI 3 Only** – Applications that propose infrastructure construction not included in the Storage Field Development Plan.
- **AOI 3 Only** – Applications that include costs for CO₂ capture technology construction.
- **AOI 3 Only** – Applications that do not clearly distinguish the budget/costs for the proposed CarbonSAFE Phase IV project and the costs of a future, full commercial-scale integrated carbon capture, transport, and storage facility.

D. Community Benefits Plan: Job Quality and Equity

To support the goal of building a clean and equitable energy economy, the BIL-funded projects are expected to (1) support meaningful community and labor engagement; (2) invest in America’s workforce; (3) advance diversity, equity, inclusion, and accessibility (DEIA); and (4) contribute to the President’s goal that 40% of the overall benefits of certain federal investments flow to disadvantaged communities (the Justice40 Initiative).²² To ensure these goals are met, applications must include a Community Benefits Plan that describes how the proposed project would incorporate the four objectives stated above.

Applicants are encouraged to submit Community and Labor Partnership Documentation from established labor and community-based organizations that demonstrate the applicant’s ability to achieve the above goals as outlined in the Community Benefits Plan. Within the Community Benefits Plan, the applicant is encouraged to provide details on how to ensure the delivery of measurable community and jobs benefits, ideally using negotiated agreements between the applicant and the community, and/or the applicant and labor unions referred to collectively here as “Workforce and Community Agreements.” These include good neighbor agreements, community benefits agreements, community workforce agreements, project labor agreements, and other collective bargaining agreements. See Section IV.C.xvi. for the Community Benefits Plan content requirements.

E. Authorizing Statutes

²² The Justice40 initiative, established by E.O. 14008, sets a goal that 40% of the overall benefits of certain federal investments flow to disadvantaged communities. The Justice40 Interim Guidance provides a broad definition of disadvantaged communities (page 2): <https://www.whitehouse.gov/wp-content/uploads/2021/07/M-21-28.pdf>.

The programmatic authorizing statutes are:

- DOE Organization Act, 42 U.S.C. CHAPTER 84 - DEPARTMENT OF ENERGY § 7101., et seq. (Public Law 95-91), as amended.
- Energy Policy Act of 2005, (42 U.S.C. 16292(b)(2)(C)) (Public Law 109-58) as amended, TITLE IX, Subtitle F, Sec. 962(b)(2)(C).
- [PL 117-58, Infrastructure Investment and Jobs Act \(IIJA\) SEC. 41004\(b\)](#).

Awards made under this announcement will fall under the purview of 2 Code of Federal Regulation (CFR) Part 200 as amended by 2 CFR Part 910.

F. Notice of Bipartisan Infrastructure Law-Specific Requirements

Be advised that special terms and conditions apply to projects funded by the BIL relating to:

- Reporting, tracking and segregation of incurred costs;
- Reporting on job creation and preservation;
- Publication of information on the Internet;
- Access to records by Inspectors General and the Government Accountability Office;
- Requiring all of the iron, steel, manufactured goods, and construction materials used in the infrastructure activities of applicable projects are produced in the United States;
- Ensuring laborers and mechanics employed by contractors or subcontractors on BIL-funded projects are paid wages equivalent to prevailing wages on similar projects in the area;
- Protecting whistleblowers and requiring prompt referral of evidence of a false claim to an appropriate inspector general; and
- Certification and Registration.

Recipients of funding appropriated by the BIL must comply with requirements of all applicable Federal, State, and local laws, regulations, DOE policy and guidance, and instructions in this FOA. Recipients must flow down the requirements to subrecipients to ensure the recipient's compliance with the requirements.

II. Award Information

A. Award Overview

This FOA is being run with an initial closing as reflected on the cover page of this FOA. It is anticipated that multiple closings will follow through quarter 4 (Q4) of FY 2026 with the frequency based upon the number of applications received and the availability of funding. This FOA will be amended a minimum of four weeks in advance of subsequent closings to provide applicants notice of the next closing date. Applicants may submit more than one application to a single closing of this FOA; however, each application must describe a unique project. The same project cannot be submitted in an application to more than one AOI per closing. An applicant can only re-apply a maximum of three times per specific field site²³ per phase to this FOA.

i. Estimated Funding

DOE expects to make a total of approximately \$2,250,000,000 of federal funding available for new awards under this FOA across all closings through Q4 FY 2026, subject to the availability of BIL funds. DOE anticipates making approximately 15 to 40 AOI 1 awards, approximately zero to 10 AOI 2 awards, approximately 5 to 20 AOI 3 awards, and approximately 20 to 40 AOI 4 awards under this FOA across all closings through Q4 FY 2026. DOE may issue one, multiple, or no awards. Individual awards may vary between values as reflected in the table below.

DOE may issue awards in one, multiple, or none of the following topic areas:

AOI Number	AOI Title	Anticipated Number of Awards	Anticipated Minimum Award Size for Any One Individual Award (Fed Share)	Anticipated Maximum Award Size for Any One Individual Award (Fed Share)	Required Cost Share Minimum	Anticipated Period of Performance (months)
1	CarbonSAFE Phase III: Site Characterization and Permitting	15–40	\$15,000,000	\$110,500,000	20%	36
2	CarbonSAFE Phase III.5: NEPA, FEED Studies, and Storage Field Development Plan Only	0–10	\$100,000	\$4,550,000	20%	24

²³ Each proposed CarbonSAFE project field site can only be proposed a maximum of three times per phase.

AOI Number	AOI Title	Anticipated Number of Awards	Anticipated Minimum Award Size for Any One Individual Award (Fed Share)	Anticipated Maximum Award Size for Any One Individual Award (Fed Share)	Required Cost Share Minimum	Anticipated Period of Performance (months)
3	CarbonSAFE Phase IV: Construction	5–20	\$30,000,000	\$195,000,000	50%	30
4	CarbonSAFE Phase II: Storage Complex Feasibility	20–40	n/a	\$9,000,000	20%	24

*The DOE share listed under the anticipated individual award size is the maximum amount of DOE funding that can be proposed for each AOI. **Applications that propose a DOE share in excess of the maximum limits will not be evaluated and will be considered noncompliant to the FOA.** Note that applicants to AOIs 1 and 3 are expected to justify their total project cost in the required “Facility Type and High-Level Budget Justification” document described in Section IV.C.

DOE may establish more than one budget period for each award and fund only the initial budget period(s). Funding for all budget periods, including the initial budget period, is not guaranteed.

ii. Period of Performance

DOE anticipates making awards with the following periods of performance:

- AOI 1 (CarbonSAFE Phase III)—no more than 36 months.
- AOI 2 (CarbonSAFE Phase III.5)—no more than 24 months.
- AOI 3 (CarbonSAFE Phase IV)—no more than 30 months.
- AOI 4 (CarbonSAFE Phase II) —no more than 24 months.

CarbonSAFE Phase III and III.5 projects should be structured into budget periods of approximately 12 to 18 months with respect to major phases or decision points. CarbonSAFE Phase II and IV projects should be structured as a single budget period. Applicants are asked to apply for the minimum amount of time expected to be needed to complete the project and not necessarily apply using the maximum number of months available.

For CarbonSAFE Phase III, applicants will be required to submit their permit application(s) to the appropriate regulatory authorities with the appropriate jurisdiction prior to receiving funding/authorization for Budget Period 2 activities, along with successful completion of Budget Period 1. Applicants are expected to target receipt of “Authorization to Construct” at the completion of Phase III projects.

- For onshore or state waters, EPA or state with primacy will issue UIC Class VI permits, which will include an “Authorization to Construct.”

- For offshore OCS, BOEM/BSEE will provide an “Authorization to Construct” or use injection wells for injection into seafloor sediments or rock strata outside the jurisdiction of EPA and the states.

Project continuation will be contingent upon several elements. For a complete list see Section VI.B.xii.

iii. New Applications Only

DOE will accept only new applications under this FOA. DOE will not consider applications for renewals of existing DOE-funded awards through this FOA.

B. DOE Funding Agreements

Through cooperative agreements and other similar agreements, DOE provides financial and other support to projects that have the potential to realize the FOA objectives. DOE does not use such agreements to acquire property or services for the direct benefit or use of the United States government.

i. Cooperative Agreements

DOE generally uses cooperative agreements to provide financial and other support to prime recipients.

Through cooperative agreements, DOE provides financial or other support to accomplish a public purpose of support or stimulation authorized by federal statute. Under cooperative agreements, the government and prime recipients share responsibility for the direction of projects.

DOE has substantial involvement in all projects funded via cooperative agreement. See Section VI.B.ix. of the FOA for more information on what substantial involvement may involve.

III. Eligibility Information

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

A. Eligible Applicants

i. Individuals

U.S. citizens and lawful permanent residents are eligible to apply for funding as a prime recipient or subrecipient.

ii. Domestic Entities

The proposed prime recipient and subrecipient(s) must be domestic entities. The following types of domestic entities are eligible to participate as a prime recipient or subrecipient of this FOA:

1. Institutions of higher education;
2. For-profit entities;
3. Non-profit entities; and
4. State and local governmental entities, and Indian Tribes.

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.

DOE/NNSA FFRDCs are eligible to apply for funding as a subrecipient, but are not eligible to apply as a prime recipient. **NETL is not eligible for award under this announcement and may not be proposed as a subrecipient on another entity's application. An application that includes NETL as a prime recipient or subrecipient will be considered non-responsive.**

Non-DOE/NNSA FFRDCs are eligible to participate as a subrecipient, but are not eligible to apply as a prime recipient.

Federal agencies and instrumentalities (other than DOE) are eligible to participate as a subrecipient, but are not eligible to apply as a prime recipient.

Entities banned from doing business with the United States government, such as entities debarred, suspended, or otherwise excluded from or ineligible for participating in Federal programs, are not eligible.

Nonprofit organizations described in section 501(c)(4) of the Internal Revenue Code of 1986 that engaged in lobbying activities after December 31, 1995 are **not** eligible to apply for funding.

iii. Foreign Entities

In limited circumstances, DOE may approve a waiver to allow a foreign entity to participate as a prime recipient or subrecipient. A foreign entity may submit a Full Application to this FOA, but the Full Application must be accompanied by an explicit written waiver request. Likewise, if the applicant seeks to include a foreign entity as a subrecipient, the applicant must submit a separate explicit written waiver request in the Full Application for each proposed foreign subrecipient.

Appendix B lists the information that must be included in a foreign entity waiver request. The applicant does not have the right to appeal DOE's decision concerning a waiver request.

B. Cost Sharing

Applicants are bound by the cost share proposed in their Full Applications if selected for award negotiations.

The cost share must be at least 20% of the total project costs²⁴ for R&D projects (AOIs 1, 2, and 4).²⁵ The cost share must be at least 50% of the total project costs²⁶ for demonstration projects (AOI 3).²⁷ The cost share must come from non-federal sources unless otherwise allowed by law.

DOE understands that projects selected under this FOA may require the use of existing data. For purposes of this FOA, DOE will consider data that is commercially available at an established market price to be an allowable cost under the project (either as DOE share or non-federal cost share), but DOE will not consider in-kind data (e.g., data, owned by an entity, that is not routinely sold commercially but is instead donated to the project and assigned a value) to be an allowable cost under the project, including as Recipient cost share. Estimation methods used by the Recipient to assign a value to in-kind data cannot be objectively verified by DOE and therefore will not be accepted by DOE as an allowable cost under any project selected from this FOA. Consequently, DOE will not recognize in-kind data costs in any resulting approved DOE budget.

²⁴ Total project costs is the sum of the government share, including FFRDC costs if applicable, and the recipient share of project costs.

²⁵ Energy Policy Act of 2005, Pub.L. 109-58, sec. 988. Also see 2 CFR 200.306 and 2 CFR 910.130 for additional cost-sharing requirements.

²⁶ Total project costs is the sum of the government share, including FFRDC costs if applicable, and the recipient share of project costs.

²⁷ Energy Policy Act of 2005, Pub.L. 109-58, sec. 988. Also see 2 CFR 200.306 and 2 CFR 910.130 for additional cost-sharing requirements.

To help applicants calculate proper cost share amounts, DOE has included a cost share information sheet as **Appendix A** to this FOA.

i. Legal Responsibility

Although the cost share requirement applies to the project as a whole, including work performed by members of the project team other than the prime recipient, the prime recipient is legally responsible for paying the entire cost share. If the funding agreement is terminated prior to the end of the project period, the prime recipient is required to contribute at least the cost share percentage of total expenditures incurred through the date of termination.

The prime recipient is solely responsible for managing cost share contributions by the project team and enforcing cost share obligation assumed by project team members in subawards or related agreements.

ii. Cost Share Allocation

Each project team is free to determine how best to allocate the cost share requirement among the team members. The amount contributed by individual project team members may vary, as long as the cost share requirement for the project as a whole is met.

iii. Cost Share Types and Allowability

Every cost share contribution must be allowable under the applicable federal cost principles, as described in Section IV.I.i. of the FOA. In addition, cost share must be verifiable upon submission of the Full Application. Cost share may be provided in the form of cash or cash equivalents, or in-kind contributions. Cost share must come from non-federal sources (unless otherwise allowed by law), such as project participants, state or local governments, or other third-party financing. DOE Loan Guarantee, cannot be leveraged by applicants to provide the required cost share or otherwise support the same scope that is proposed under a project.

Cost share may be provided by the prime recipient, subrecipients, or third parties (entities that do not have a role in performing the scope of work). Vendors/contractors may not provide cost share. Any partial donation of goods or services is considered a discount and is not allowable.

Cash contributions include, but are not limited to: personnel costs, fringe costs, supply and equipment costs, indirect costs and other direct costs.

In-kind contributions are those where a value of the contribution can be readily determined, verified and justified but where no actual cash is transacted in securing the good or service comprising the contribution. Allowable in-kind contributions include,

but are not limited to: the donation of volunteer time or the donation of space or use of equipment.

Project teams may use funding or property received from state or local governments to meet the cost share requirement, so long as the federal government did not provide the funding to the state or local government.

The recipient may not use the following sources to meet its cost share obligations:

- Revenues or royalties from the prospective operation of an activity beyond the project period;
- Proceeds from the prospective sale of an asset of an activity;
- Federal funding or property (e.g., federal grants, equipment owned by the federal government); or
- Expenditures that were reimbursed under a separate federal program.

Project teams may not use the same cash or in-kind contributions to meet cost share requirements for more than one project or program.

Cost share contributions must be specified in the project budget, verifiable from the prime recipient's records, and necessary and reasonable for proper and efficient accomplishment of the project. As all sources of cost share are considered part of total project cost, the cost share dollars will be scrutinized under the same federal regulations as federal dollars to the project. Every cost share contribution must be reviewed and approved in advance by the Contracting Officer and incorporated into the project budget before the expenditures are incurred.

Applicants are encouraged to refer to 2 CFR 200.306 and 2 CFR 910.130 for additional cost sharing requirements.

iv. Cost Share Contributions by FFRDCs

Because FFRDCs are funded by the federal government, costs incurred by FFRDCs generally may not be used to meet the cost share requirement. FFRDCs may contribute cost share only if the contributions are paid directly from the contractor's Management Fee or another non-federal source.

v. Cost Share Verification

Applicants are required to provide written assurance of their proposed cost share contributions in their Full Applications.

Upon selection for award negotiations, applicants are required to provide additional information and documentation regarding their cost share contributions. Please refer to **Appendix A** of the FOA.

vi. Cost-Share Payment

DOE requires prime recipients to contribute the cost-share amount incrementally over the life of the award. Specifically, the prime recipient's cost share for each billing period must always reflect the overall cost-share ratio negotiated by the parties (i.e., the total amount of cost sharing on each invoice when considered cumulatively with previous invoices must reflect, at a minimum, the cost-sharing percentage negotiated). Prime recipients will be required to provide project cost share at a percentage commensurate with the total costs on a budget period basis.

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

C. Compliance Criteria

Full Applications must meet all compliance criteria listed below or they will be considered noncompliant. DOE will not review or consider noncompliant submissions that were submitted through other means other than specifically stated in the FOA, submitted after the applicable deadline, and/or submitted incomplete. DOE will not extend the submission deadline for applicants that fail to submit required information by the applicable deadline due to server/connection congestion.

A review of all submitted documents and information is performed to determine if the submissions are in compliance with the FOA requirements. **All submitted information and documents must meet all Compliance Criteria listed below to be eligible for review or the submission will be considered noncompliant. DOE will NOT review or consider noncompliant submissions.**

All applicant submissions must:

- comply with the maximum DOE share of the individual award size in Section II.A of the FOA.
- comply with the applicable content and form requirements listed in Section IV. of the FOA;
- include all required documents;
- be successfully uploaded in Grants.gov at <https://www.grants.gov/>, including clicking the "Submit" button; and

- be submitted by the deadline stated in the FOA.

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

Applicants are strongly encouraged to submit their Full Applications at least 48 hours in advance of the submission deadline. Under normal conditions (i.e., at least 48 hours in advance of the submission deadline), applicants should allow at least 1 hour to submit a Full Application. Once the Full Application is submitted by means specified in the FOA, applicants may revise or update that submission until the expiration of the applicable deadline. If changes are made to any of these documents, the applicant must resubmit the Full Application before the applicable deadline. DOE will not extend the submission deadline for applicants that fail to submit required information by the applicable deadline due to server/connection congestion.

D. Responsiveness Criteria

All “Applications Specifically Not of Interest,” as described in Section I.C. of the FOA, are deemed nonresponsive and are not reviewed or considered.

E. Other Eligibility Requirements

i. Requirements for DOE/NNSA and non-DOE/NNSA FFRDCs Included as a Subrecipient

DOE/NNSA and non-DOE/NNSA FFRDCs may be proposed as a subrecipient on another entity’s application subject to the following guidelines:

i. Authorization 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 a FFRDC must be consistent with its authority under its award.

ii. Authorization 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 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.

iii. *Funding, Cost Share, and Subaward with FFRDCs*

DOE will NOT fund DOE/NNSA FFRDCs participating as a subrecipient through the DOE field work authorization process. DOE will NOT fund non-DOE/NNSA FFRDCs through an interagency agreement with the sponsoring agency. Therefore, the prime recipient and FFRDC are responsible for entering into an appropriate subaward that will govern, among other things, the funding of the FFRDC portion of the work from the prime recipient under its DOE award. Such an agreement must be entered into before any project work begins.

The applicant should prepare the budgets using rates appropriate for funding the FFRDCs through subawards. The applicant's cost share requirement will be based on the total cost of the project, including the applicant's, the subrecipient's, and the FFRDC's portions of the project.

iv. *Responsibility*

The prime recipient will be the responsible authority regarding the settlement and satisfaction of all contractual and administrative issues, including, but not limited to disputes and claims arising out of any agreement between the prime recipient and the FFRDC.

v. *Limit on FFRDC Effort*

The FFRDC effort, in aggregate, shall not exceed 25% of the total estimated cost of the project, including the applicant's and the FFRDC's portions of the effort.

NETL is not eligible for award under this announcement and may not be proposed as a subrecipient on another entity's application. An application that includes NETL as a prime recipient or subrecipient will be considered nonresponsive.

F. Limitation on Number of Full Applications Eligible for Review

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

G. Questions Regarding Eligibility

DOE will not make eligibility determinations for potential applicants prior to the date on which applications to this FOA must be submitted. The decision whether to submit an application in response to this FOA lies solely with the applicant.

IV. Application and Submission Information

A. Application Process

All submissions must conform to the following form and content requirements, including maximum page limits (described below), and must be submitted as specifically stated. **Applications which do not meet ALL of the form and content requirements listed below will be considered noncompliant (see Section III Compliance Criteria). DOE will NOT review or consider noncompliant applications.** DOE will not review or consider submissions submitted through means other than specifically stated in the FOA, submissions submitted after the applicable deadline, and/or incomplete submissions. DOE will not extend deadlines for applicants who fail to submit required information and documents due to server/connection congestion.

All submissions must conform to the form and content requirements described below, including maximum page lengths.

- Each must be submitted in Adobe PDF format unless stated otherwise;
- Each must be written in English;
- All pages must be formatted to fit on 8.5 x 11 inch paper with margins not less than one inch on every side. Use Calibri typeface, a black font color, and a font size of 12 point or larger (except in figures or tables, which may be 10 point font). A symbol font may be used to insert Greek letters or special characters, but the font size requirement still applies. References must be included as footnotes or endnotes in a font size of 10 or larger. Footnotes and endnotes are counted toward the maximum page requirement;
- Page numbers must be included in the footer of every page; and
- Each submission must not exceed the specified maximum page limit, including cover page, charts, graphs, maps, and photographs when printed using the formatting requirements set forth above and single spaced. If applicants exceed the maximum page lengths indicated below, DOE will review only the authorized number of pages and disregard any additional pages.

DOE urges applicants to carefully review their Full Applications and to allow sufficient time for the submission of required information and documents. All Full Applications that pass the initial eligibility review will undergo comprehensive technical merit review according to the criteria identified in Section V.A. of the FOA.

B. Application Forms

The application forms and instructions are available on Grants.gov at <https://www.grants.gov/>.

Note: The maximum file size that can be uploaded to the Grants.gov website is 10MB. Files in excess of 10MB cannot be uploaded, and hence cannot be submitted for review. If a file exceeds 10MB but is still within the maximum page limit specified in the FOA, it must be broken into parts and denoted to that effect. For example:

TechnicalVolume_Part_1

TechnicalVolume_Part_2

DOE will not accept late submissions that resulted from technical difficulties due to uploading files that exceed 10MB.

C. Content and Form of the Full Application

Applicants must complete the following application forms found on the Grants.gov website at <https://www.grants.gov/>.

i. Full Application Content Requirements

Each Full Application must be limited to a **single** AOI. Concepts or technologies unrelated to the specific AOI should not be consolidated into a single Full Application.

Full Applications must conform to the following requirements and must not exceed the stated page limits.

Submission	Component	File Format	File Name
Full Application (PDF, unless stated otherwise)	SF-424	Form	N/A
	Project/Performance Site Location(s)	Form	N/A
	Technical Volume (20 page limitation, see chart below for further instruction)	PDF	TechnicalVolume.pdf
	Summary/Abstract for Public Release (1 page limit)	PDF	Summary.pdf
	Pre-Award Factsheet (1 page limit)	PDF	Factsheet.pdf
	Summary Slide	PPT	LeadOrganization_Slide.ppt
	Project Management Plan (10 page limit for AOI 1, 2, and 4; 15 page limit for AOI 3, see PMP appendix for further instruction)	PDF	PMP.pdf
	Resumes	PDF	Resumes.pdf
	SF424a Budget Information – Non-Construction Programs File (Phase II, III and III.V)	Microsoft Excel	SF424A.xls or .xlsx
	Budget Justification – SEE DETAILED INSTRUCTIONS BELOW	Microsoft Excel	Recipient Budget Justification.xls or .xlsx

Submission	Component	File Format	File Name
	Subrecipient Budget Justification, if applicable – SEE DETAILED INSTRUCTIONS BELOW	Microsoft Excel	Subrecipient_name BudgetJustification.xls or.xlsx
	Budget for DOE/NNSA FFRDC/NL or non-DOE/NNSA FFRDC/NL, if applicable	PDF	Use up to 10 letters of the FFRDC/NL name plus “Budget” as the file name (e.g., FFRDC/NL_nameBudget.xls or.xlsx), and click on “Add Optional Other Attachment” to attach.
	Authorization from cognizant Contracting Officer for DOE/NNSA FFRDC/NL or non-DOE FFRDC/NL, if applicable	PDF	Use up to 10 letters of the FFRDC/NL name plus FFRDC as the file name (e.g. anIFFRDC or lincolnFFRDC.pdf)
	Environmental Questionnaire	PDF	Env.pdf
	Cost-Share Commitment Letters, if applicable	PDF	CSCL.pdf
	SF-LLL Disclosure of Lobbying Activities, if applicable	Form	N/A
	Foreign Entity Waiver Request and Foreign Work Waiver Requests, if applicable	PDF	FN_Waiver.pdf
	Data Management Plan	PDF	DMP.pdf
	AOI 1 Only – CarbonSAFE Phase III Project Readiness (20 page limit)	PDF	PRPhase3.pdf
	AOI 2 Only – CarbonSAFE Phase III.5 Project Readiness (20 page limit – appendix does not count toward page limit)	PDF	PRPhase35.pdf
	AOI 3 Only – CarbonSAFE Phase IV Project Readiness (20 page limit – appendix does not count toward page limit)	PDF	PRPhase4.pdf
	AOI 4 Only – CarbonSAFE Phase II Project Readiness (20 page limit)	PDF	PRPhase2.pdf
	AOI 1 and 3 Only – Facility Type and High-Level Budget Justification (4 page limit)	PDF	HighLevelBudget.pdf
	Map of Storage Complex and Strat Column. Note, 11 x 17 paper allowed.	PDF	Map.pdf
	AOI 3 Only – Financial Responsibility Documents	PDF	FinancialResponsibility.pdf
	Field Site Access Commitment Letter(s)	PDF	CLField.pdf
	CO ₂ Source Commitment Letter(s)	PDF	CLSource.pdf
	Other Commitment Letter(s)	PDF	CLOthers.pdf

Submission	Component	File Format	File Name
	Community Benefits Plan: Job Quality and Equity (12 page limit)	PDF	CBenefits.pdf
	Community Benefits Plan Budget Justification	MS Excel	CBP_Budget_Justification.xls or.xlsx
	Community Partnership Documentation (10 page limit)	PDF	CommunityPartnership.pdf
	Current and Pending Support	PDF	Current_and_Pending_Support.pdf
	Potentially Duplicative Funding Notice (if applicable)	PDF	PDFN.pdf
	Transparency of Foreign Connections	PDF	TFC.pdf
	Locations of Work	PDF	LOW.xls or.xlsx

Note: The maximum file size that can be uploaded to the Grants.gov website is 10MB.

DOE provides detailed guidance on the content and form of each component below.

ii. **SF-424: Application for Federal Assistance**

Complete the SF 424 form first to populate data in other forms. Complete all required fields in accordance with the instructions on the form. The list of certifications and assurances in Field 21 can be found at <https://www.energy.gov/management/financial-assistance-forms-and-information-applicants-and-recipients>, under Certifications and Assurances. Note: The dates and dollar amounts on the SF-424 are for the complete project period of performance and not just the first project year, first phase or other subset of the project period of performance.

iii. **Project/Performance Site Location(s)**

Indicate the primary site where the work will be performed by the prime recipient or subrecipient(s). If a portion of the project will be performed at any other site(s), identify the site location(s) in the blocks provided.

Note that the Project/Performance Site Congressional District is entered in the format of the 2-digit state code followed by a dash and a 3 digit Congressional district code, for example VA-001. Hover over this field for additional instructions.

Use the Next Site button to expand the form to add additional Project/Performance Site Locations.

iv. **Technical Volume**

The Technical Volume must conform to the following content and form requirements. This volume must address the technical review criteria as discussed in Section V. of the FOA. Save the Technical Volume in a single PDF file using the following convention for the title "TechnicalVolume.pdf" and click on "Add Mandatory Other Attachment" to attach.

Applicants must provide sufficient citations and references to the primary research literature to justify the claims and approaches made in the Technical Volume. However, DOE and reviewers are under no obligation to review cited sources.

The technical volume must be submitted in Adobe PDF format. The technical volume must not exceed 20 pages—including cover page, table of contents, footnotes/endnotes, charts, graphs, maps, photographs, and other pictorial presentations—when printed using standard 8.5-by-11-inch paper with one-inch margins (top, bottom, left, and right), single spaced. The font must not be smaller than 11 point. The **Identification of Potential Conflicts of Interest or Bias in Selection of Reviewers and Bibliography sections are NOT included in the Project Narrative page limitation**. Do not include any Internet addresses (URLs) that provide information necessary to review the application. See Section VIII for instructions on how to mark proprietary application information.

If applicants exceed the maximum page lengths indicated below, DOE will review only the authorized number of pages and disregard any additional pages.

The technical volume (20-page limitation) must include:

Technical Volume Content Requirements		
SECTION	MAXIMUM PAGE LIMIT* (if applicable)	DESCRIPTION
Cover Page	Included in the page limitation (1-page maximum)	The cover page should include the project title, the specific FOA AOI being addressed, the Applicant's name, and the names of all team member organizations. In addition, provide the Applicant's technical and business points of contact along with email addresses and telephone numbers, names of all team member organizations, names of project manager, senior/key personnel and their organizations. The cover page should also include the federal and non-federal share of costs associated with each team member's proposed effort. Applicants should ensure the cost information is consistent with the submitted budget justification(s). The cover page should also include the project location(s). A sample Technical Volume Cover Page has been embedded below. Technical Volume Cover Page.docx
Table of Contents	Included in the page limitation	Applicant to capture, at a minimum, all of the required sections identified in this table.

Technical Volume Content Requirements		
SECTION	MAXIMUM PAGE LIMIT* (if applicable)	DESCRIPTION
Project Objectives	Included in the page limitation	This section should provide a clear, concise statement of the specific objectives/aims of the proposed project. Buy America Requirements for Infrastructure Projects: Within the first two (2) pages of the Narrative, include a short statement on whether the project will involve the construction, alteration, and/or repair of infrastructure in the United States. See the “Required Use of American Iron, Steel, Manufactured Products, and Construction Materials – Buy America Requirements for Infrastructure Projects” Appendix for applicable definitions to inform this statement.
Merit Review Criterion Discussion	Included in the page limitation	The section should be formatted to address each of the merit review criterion and subcriterion listed in Section V.A. Provide sufficient information so that reviewers will be able to evaluate the application in accordance with these Merit Review Criteria. The Project Narrative should only address Merit Review Criteria when those criteria are not addressed in other required documents (i.e., plans that are required to be submitted under unique file names and have stated page limits). For example, information included in the Project Readiness files do not need to be duplicated/repeated in the technical volume.
Statement of Project Objectives	Included in the page limitation	The Project Narrative must contain a single, detailed SOPO that addresses how the project objectives will be met. The SOPO must contain a clear, concise description of all activities to be completed during project performance. It is therefore required that it shall not contain proprietary or confidential business information. The SOPO is generally less than eight pages in total for the proposed work. Applicants shall prepare the SOPO in the format provided in an Appendix of the FOA.
Relevance and Outcomes/Impacts	Included in the page limitation	This section should explain the relevance of the effort to the objectives in the program announcement and the expected outcomes and/or impacts. The justification for the proposed project should include a clear statement of the importance of the project in terms of the utility of the outcomes and the target community of beneficiaries.
Multiple Principal Investigators	Included in the page limitation	The applicant, whether a single organization or team/partnership/consortium, must indicate if the project will include multiple principal investigators (PIs). This decision is solely the responsibility of the applicant. If multiple PIs will be designated, the application must identify the Contact PI/Project Coordinator and provide a “Coordination and Management Plan” that describes

Technical Volume Content Requirements		
SECTION	MAXIMUM PAGE LIMIT* (if applicable)	DESCRIPTION
		the organization structure of the project as it pertains to the designation of multiple PIs. This plan should, at a minimum, include: • Process for making decisions on scientific/technical direction. • Publications. • IP issues. • Communication plans. • Procedures for resolving conflicts. PIs' roles and administrative, technical, and scientific responsibilities for the project.
Facilities and Other Resources	Included in the page limitation	Identify the facilities (e.g., office, laboratory, computer, etc.) to be used at each performance site listed and, if appropriate, indicate their capacities, pertinent capabilities, relative proximity, and extent of availability to the project. Describe only those resources that are directly applicable to the proposed work. Provide any information describing the other resources available to the project, such as machine and electronics shops.
Equipment	Included in the page limitation	List important items of equipment already available for this project and, if appropriate, note the location and pertinent capabilities of each. If you are proposing to acquire equipment, describe comparable equipment, if any, already at your organization and explain why it cannot be used.
Identification of Potential Conflicts of Interest or Bias in Selection of Reviewers	<u>Not</u> included in the page limitation	Provide the following information in this section: Collaborators and Co-Editors: List in alphabetical order all persons, including their current organizational affiliation, who are, or who have been, collaborators or co-authors with you on a research project, book or book article, report, abstract, or paper during the 48 months preceding the submission of this application. Also, list any individuals who are currently, or have been, co-editors with you on a special issue of a journal, compendium, or conference proceedings during the 24 months preceding the submission of this application. If there are no collaborators or co-editors to report, state "None." Graduate and Postdoctoral Advisors and Advisees: List the names and current organizational affiliations of your graduate advisor(s) and principal postdoctoral sponsor(s) during the last five years. Also, list the names and current organizational affiliations of your graduate students and postdoctoral associates.

Technical Volume Content Requirements		
SECTION	MAXIMUM PAGE LIMIT* (if applicable)	DESCRIPTION
Bibliography	<u>Not included in the page limitation</u>	If applicable: Provide a bibliography for any references cited in the Project Narrative section. This section must include only bibliographic citations.

v. Resumes

A resume provides information that can be used by reviewers to evaluate the individual's skills, experience, and potential for leadership within the scientific community. Applicants must submit a resume (limited to two pages) for each Principal Investigator and Senior/Key Personnel that include the following:

1. Contact Information;
2. Education and training: Provide institution, major/area, degree, and year for undergraduate, graduate, and postdoctoral training;
3. Research and Professional Experience: Beginning with the current position, list professional/academic positions in chronological order with a brief description. List all current academic, professional, or institutional appointments, foreign or domestic, at the applicant institution or elsewhere, whether or not remuneration is received, and, whether full-time, part-time, or voluntary;
4. Awards and honors;
5. A list of up to 10 publications most closely related to the proposed project. For each publication, identify the names of all authors (in the same sequence in which they appear in the publication), the article title, book or journal title, volume number, page numbers, year of publication, and website address if available electronically. Patents, copyrights, and software systems developed may be provided in addition to or substituted for publications. An abbreviated style such as the Physical Review Letters (PRL) convention for citations (list only the first author) may be used for publications with more than 10 authors;
6. Synergistic Activities: List up to five professional and scholarly activities related to the proposed effort; and
7. There should be no lapses in time over the past ten years or since age 18, which ever time period is shorter.

As an alternative to a resume, it is acceptable to use the biographical sketch format approved by the National Science Foundation (NSF). The biographical sketch format may be generated by the Science Experts Network Curriculum Vita (SciENcv), a cooperative venture maintained at <https://www.ncbi.nlm.nih.gov/sciencv/>, and is also available at <https://nsf.gov/bfa/dias/policy/nsfapprovedformats/biosketch.pdf>. The use of a format

required by another agency is intended to reduce the administrative burden to researchers by promoting the use of common formats.

Save the resumes in a single PDF file using the following naming convention for the title "Resumes.pdf" and click on "Add Optional Other Attachment" to attach. The biographical information for each resume must not exceed two pages when printed on 8.5-by-11-inch paper with one-inch margins (top, bottom, left, and right), single spaced with font no smaller than 11 point.

vi. Community Partnership Documentation

In support of the Community Benefits Plan, applicants may submit documentation to demonstrate existing or planned partnerships with community entities, such as organizations that work with local stakeholders most vulnerable to or affected by the project. Examples of such as entities include organizations that carry out workforce development programs, labor unions, Tribal organizations, and community-based organizations that work with disadvantaged communities. The Partnership Documentation can be a letter on the partner's letterhead outlining the planned partnership signed by an officer of the entity, a Memorandum of Understanding, or other similar agreement. Such letters must state the specific nature of the partnership and must not be general letters of support. If the applicant intends to enter into Workforce and Community Agreements as part of the Community Benefits Plan, they should include letters from proposed partners. Each letter must not exceed 1 page. In total, the partnership documentation must not exceed 10 pages.

Save the Community Partnership Documentation in a single PDF file using the following naming convention for the title "PartnershipDoc.pdf" and click on "Add Optional Other Attachment" to attach.

vii. Budget Justification Workbook

Applicants are required to provide a detailed budget justification for the project as a whole, including all work to be performed by the Applicant and its Subrecipients and Contractors, and provide all requested documentation (e.g., a Federally approved rate agreement, vendor quotes). Applicants should include costs associated with implementing the various BIL-specific requirements (e.g., Buy America Requirements for Infrastructure projects, Davis Bacon, Community Benefits Plan, reporting oversight) required annual audits and incurred cost proposals in their proposed budget documents. Such costs may be reimbursed as a direct or indirect cost.

A Budget Justification Workbook is included as an attachment to this announcement for use and to describe the level of detail required in the budget justification. Although the data requested is mandatory, the use of the budget justification workbook is not.

The “Instructions and Summary” included with the Budget Justification Workbook will auto-populate as the applicant enters information into the workbook. Applicants must carefully read the “Instructions and Summary” tab provided within the Budget Justification Workbook. In addition, Applicants must carefully read and note each “Instructions” Summary contained within each individual tab of the Budget Justification Workbook. **As stipulated within the Budget Justification Workbook, all direct costs must be identified by specific Task. All cost should include the basis of cost and justification of need, as applicable. Of specific note is the necessity to identify personnel costs for each individual proposed for all Tasks to which they are assigned.** Note EXAMPLES provided within each tab for further clarification.

DOE understands that projects selected under this FOA may require the use of existing data. For purposes of this FOA, DOE will consider data that is commercially available at an established price to be an allowable cost under the project (either as DOE share or non-federal cost share), but DOE will not consider in-kind data (e.g., data, owned by an entity, that is not routinely sold commercially but is instead donated to the project and assigned a value) to be an allowable cost under the project, including as Recipient cost share. Estimation methods used by the Recipient to assign a value to in-kind data cannot be objectively verified by DOE and therefore will not be accepted by DOE as an allowable cost under any project selected from this FOA. Consequently, DOE will not recognize in-kind data costs in any resulting approved DOE budget.

Save the Budget Justification Workbook in a single file named “RecipientBudgetJustification.xls or.xlsx” and click on “Add Optional Other Attachment” to attach.

viii. Summary for Public Release

Applicants must submit a one-page summary of their project that is suitable for dissemination to the public. It should be a self-contained document that identifies the name of the applicant, the lead project manager/project director/principal investigator(s), the project title, the objectives of the project, a description of the project, including methods to be employed, the potential impact of the project (e.g., benefits, outcomes), major participants (for collaborative projects), and the project’s commitments and goals described in the Community Benefits Plan. This document must not include any proprietary or sensitive business information as DOE may make it available to the public after selections are made. The summary must not exceed 1 page when printed using standard 8.5 x 11 paper with 1” margins (top, bottom, left, and right) with font not smaller than 12 point. Save the Summary for Public Release in a single PDF file using the following naming convention for the title “Summary.pdf” and click on “Add Optional Other Attachment” to attach.

ix. Summary Slide

Applicants must provide a single slide summarizing the proposed project.

The Summary Slide template must include the following information:

- A technology summary;
- A description of the technology's impact;
- Proposed project goals;
- Any key graphics (illustrations, charts and/or tables);
- The project's key idea/takeaway;
- Topline community benefits;
- Project title, prime recipient, Principal Investigator, and senior/key personnel information; and
- Requested DOE funds and proposed applicant cost share.

Save the Summary Slide in a single Microsoft PowerPoint file using the following naming convention for the title "LeadOrganization_Slide.ppt or pptx" and click on "Add Optional Other Attachment" to attach.

x. Subrecipient Budget Justification (if applicable)

Applicants must provide a separate budget justification for each subrecipient that is expected to perform work estimated to be more than \$100,000 or 50 percent of the total work effort (whichever is less). The budget justification must include the same justification information described in the "Budget Justification Workbook" section above. Save each subrecipient budget justification in a Microsoft Excel file using the following naming convention for the title "Subawardee_name BudgetJustification.xls or.xlsx" and click on "Add Optional Other Attachment" to attach.

INCLUDING THE LANGUAGE FROM THE PREVIOUS RELEASE OF THE FOA BELOW FOR CONSIDERATION:

Applicants must provide a separate detailed budget justification for each subrecipient that is expected to perform work estimated to be more than \$100,000 or 50% of the total work effort (whichever is less). A Budget Justification Workbook is included as an attachment to this announcement. Although the data requested is mandatory, the use of the Budget Justification Workbook is not. The level of detail to be included in the subaward budget justification (if applicable) must be commensurate with that provided by the Prime Recipient. Save the information in a single file named "Subawardee_name BudgetJustification.xls or.xlsx" and click on "Add Optional Other Attachment" to attach.

xi. Budget for DOE/NNSA FFRDC (if applicable)

If proposed, FFRDC/NLs will be treated as subawards for applicants. Therefore, prepare the budgets utilizing rates appropriate for such an arrangement. You must provide a separate detailed budget justification for each FFRDC/NL proposed that is expected to perform work estimated to be more than \$100,000 or 50% of the total work effort (whichever is less). A Budget Justification Workbook is included as an attachment to this

announcement. Although the data requested is mandatory, the use of the Budget Justification Workbook is not. The level of detail to be included in the FFRDC/NL budget justification (if applicable) must be commensurate with that provided by the Prime Recipient. Use up to 10 letters of the FFRDC/NL name plus "Budget" as the file name (e.g., FFRDC/NL_nameBudget.xls or.xlsx), and click on "Add Optional Other Attachment" to attach.

xii. Authorization for non-DOE/NNSA or DOE/NNSA FFRDCs (if applicable)

The federal agency sponsoring the FFRDC must authorize in writing the use of the FFRDC on the proposed project and this authorization must be submitted with the application. The use of a FFRDC must be consistent with the contractor's authority under its award. Save the Authorization in a single PDF file using the following naming convention for the title "FFRDCAuth.pdf" and click on "Add Optional Other Attachment" to attach.

xiii. SF-LLL: Disclosure of Lobbying Activities (required)

Recipients and subrecipients may not use any federal funds to influence or attempt to influence, directly or indirectly, congressional action on any legislative or appropriation matters.

Recipients and subrecipients are required to complete and submit SF-LLL, "Disclosure of Lobbying Activities" to ensure that non-federal funds have not been paid and will not be paid to any person for influencing or attempting to influence any of the following in connection with the application:

- An officer or employee of any federal agency;
- A member of Congress;
- An officer or employee of Congress; or
- An employee of a member of Congress.

xiv. Waiver Requests (if applicable)

i. Foreign Entity Participation

For projects selected under this FOA, as set forth in Section III., all recipients and subrecipients must qualify as domestic entities. See Section III. To request a waiver of this requirement, the applicant must submit an explicit waiver request in the Full Application. Appendix B lists the information that must be included in a waiver request.

ii. Foreign Work Waiver Request

As set forth in Section IV.I.iii., all work for projects selected under this FOA must be performed in the United States. To request a waiver of this requirement, the applicant must submit an explicit waiver request in the Full Application. Appendix B lists the information that must be included in a foreign work waiver request.

Save the Waivers in a single PDF file using the following naming convention for the title “FN_Waiver.pdf” and click on “Add Optional Other Attachment” to attach.

xv. Data Management Plan

Applicants are required to submit a Data Management Plan as part of their Full Application. The Data Management Plan is a document that outlines the proposed plan for data sharing or preservation. Submission of this plan is required with the full application, and failure to submit the plan may result in rejection of the application without further consideration. Applicants shall prepare the DMP in the format provided in **Appendix F** of this FOA. Save the Data Management Plan in a single PDF file using the following naming convention for the title “DMP.pdf” and click on “Add Optional Other Attachment” to attach.”

xvi. Community Benefits Plan: Job Quality and Equity

The Community Benefits Plan: Job Quality and Equity (Community Benefits Plan or Plan) must set forth the applicant’s approach to ensuring that federal investments advance four goals: 1) community and labor engagement; 2) investing in job quality and workforce continuity; 3) advancing diversity, equity, inclusion, and accessibility (DEIA); and 4) contributing to the Justice40 Initiative. The below sections include the requirements for each goal. The Community Benefits Plan should indicate the applicant’s intention to engage meaningfully with labor and community stakeholders on these goals, including the potential of entering into formal Workforce and Community Agreements. Given project complexity and sensitivities, applicants should consider pursuing multiple agreements.

For your convenience, a Community Benefits Plan template is available at: [About Community Benefits Plans](#). Applicants are strongly encouraged to use the template to complete their specific Plan. If the template is not used, the Plan must address all of the elements described below, and as outlined in the template.

The applicant’s Community Benefits Plan must include at least one Specific, Measurable, Assignable, Realistic and Timely (SMART) milestone per budget period to measure progress on the proposed actions. The Plan will be evaluated as part of the technical review process. If DOE selects a project, DOE will incorporate the Community Benefits Plan into the award, and the recipient must implement its Community Benefits Plan when carrying out its project. Public transparency around the plan and SMART commitments ensure accountability. In addition, DOE will evaluate the recipient’s progress during the award period of performance, including as part of the Go/No-Go review process.

The Community Benefits Plan must not exceed 12 pages. It must be submitted in PDF format. This Plan must address the technical review criterion titled, “Community Benefits Plan: Job Quality & Equity.” See Section V. of the FOA.

For additional information, see [About Community Benefits Plans](#).

Save the Community Benefits Plan in a single PDF file using the following naming convention for the title “CBenefits.pdf” and click on “Add Optional Other Attachment” to attach.

The Community Benefits Plan must address the following:

1. Community and Labor Engagement: The Community Benefits Plan must describe the applicant’s actions to date and plans to engage with community partners, such as local and/or Tribal governments, labor unions, and community-based organizations that support or work with underserved communities, including Disadvantaged Communities as defined for purposes of the Justice40 Initiative. By facilitating community input, social buy-in, and accountability, such engagement can substantially reduce or eliminate stalls or slowdowns, litigation, and other risks associated with project implementation. Community and labor engagement should lay the groundwork for the negotiation of Workforce and Community Agreements, which could take the form of one or more kinds of negotiated agreements with communities, labor unions, or, ideally, both. Registered apprenticeship programs, labor-management training partnerships, quality pre-apprenticeship programs, a card check provision, and local and targeted hiring goals are all examples of provisions that Workforce and Community Agreements could cover that would increase the success of a DOE-funded project.

Applicants should also provide Community and Labor Partnership Documentation from representative organizations reflecting substantive engagement and feedback on applicant’s approach to community benefits including job quality and workforce continuity; diversity, equity, inclusion, and accessibility; and the Justice40 Initiative detailed below.

2. Investing in Job Quality and Workforce Continuity: A well-qualified, skilled, and trained workforce is necessary to ensure project stability, continuity, and success, and to meet program goals. High-quality jobs are critical to attracting and retaining the qualified workforce required.

The Plan must 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.

As the 1935 National Labor Relations Act states, employees’ ability to organize, bargain collectively, and participate, through labor organizations of their choosing, in decisions

that affect them contributes to the effective conduct of business and facilitates amicable settlements of any potential disputes between employees and employers, providing assurances of project efficiency, continuity, and multiple public benefits.

The Plan must include:

- a. A summary of the applicant's plan to attract, train, and retain a skilled and well qualified workforce for both construction and ongoing operations/production activities. A collective bargaining agreement, labor-management partnership, or other similar agreement would provide evidence of such a plan. Alternatively, applicants may describe:
 - i) wages, benefits, and other worker supports to be provided benchmarking against prevailing wages for construction and local median wages for other occupations;
 - ii) commitments to invest in workforce education and training, including measures to reduce attrition, increase productivity from a committed and engaged workforce, and support the development of resilient, skilled, and stable workforce for the project; and
 - iii) efforts to engage employees in the design and execution of workplace safety and health plans.
- b. It is the policy of the United States to eliminate the causes of certain substantial obstructions to the free flow of commerce by encouraging the practice and procedure of collective bargaining and by protecting the exercise by workers of full freedom of association. Applicant should provide a description of how and if they plan to affirmatively support worker organizing and collective bargaining. This might include a commitment to negotiate pre-hire project labor agreements for construction activity, a pledge to remain neutral during any union organizing campaigns, intention or willingness to permit union recognition through card check (as opposed to requiring union elections), intention or willingness to enter into binding arbitration to settle first contracts, a pledge to allow union organizers access to appropriate onsite non-work places (e.g., lunch rooms), a pledge to refrain from holding captive audience meetings, and other supportive commitments or pledges.

3. DEIA: The Community Benefits Plan must include a section describing how diversity, equity, inclusion, and accessibility (DEIA) objectives will be incorporated into the project. The section should detail how the applicant will partner with underrepresented businesses, educational institutions, and training organizations that serve workers who face barriers to accessing quality jobs, and/or other project partners to help address DEIA.

The following is a list of potential DEIA actions that could be included in a Plan. This list is offered to provide guidance to applicants and is not intended to be comprehensive.

- a. Commit to partner with Minority Business Enterprises, Minority Owned Businesses, Woman Owned Businesses, and Veteran Owned Businesses for contractor support needs;
- b. To fill open positions for the DOE-funded project, partner with workforce training organizations serving under-represented communities and those facing systemic barriers to quality employment such as those with disabilities, women, returning citizens, opportunity youth, and veterans
- c. Provide workers with comprehensive support services, such as childcare and transportation, to increase representation and access in project's construction and operations jobs.

4. Justice40 Initiative: Applicants must provide an overview of benefits to disadvantaged communities that the project can deliver, supported by measurable milestones.

Specifically, the Justice40 Initiative section must include:

- 1. Identification of applicable disadvantaged communities to which the anticipated project benefits will flow.
- 2. Identification of Applicable Benefits that are quantifiable, measurable, and trackable, including, at a minimum, a discussion of the relevance of each of the eight DOE Justice40 Initiative benefits outlined below. Benefits include (but are not limited to) measurable direct or indirect investments or positive project outcomes that achieve or contribute to the following in disadvantaged communities: (1) a decrease in energy burden; (2) a decrease in environmental exposure and burdens; (3) an increase in access to low-cost capital; (4) an increase in high-quality job creation, the clean energy job pipeline, and job training for individuals; (5) increases in clean energy enterprise creation and contracting (e.g., minority-owned or disadvantaged business enterprises); (6) increases in energy democracy, including community ownership; (7) increased parity in clean energy technology access and adoption; and (8) an increase in energy resilience. Applicants should also discuss how the project will maximize all of the benefits listed in #4 above.
- 3. A description of how and when anticipated benefits are expected to flow to disadvantaged communities. For example, will the benefits be provided directly within the disadvantaged communities identified in the Justice40 Initiative section, or another way; whether the benefits will flow during project development or after project completion, and how will applicant will track benefits delivered.
- 4. A discussion of anticipated negative and cumulative environmental impacts on disadvantaged communities. Applicants should discuss any anticipated negative or positive environmental impacts associated with the project, and how they will mitigate any negative impacts. Within the context of cumulative impacts created by the project, applicants should use Environmental Protection Agency EJSscreen

tool to quantitatively discuss existing environmental impacts in the project area.
See [EJScreen: Environmental Justice Screening and Mapping Tool | US EPA](#)

For projects funded under this FOA, DOE will provide specific reporting guidance for the benefits described above.

xvii. Community Benefits Plan Budget Justification

Applicants must provide a separate budget justification identifying the Community Benefit Plan costs included in the “Budget Justification Workbook.” This Community Benefits Plan Budget Justification must include the same justification information described in the “Budget Justification Workbook” section above but should only include Community Benefits Plan costs.

Save the Community Benefits Plan in a Microsoft Excel file using the following naming convention for the title “CBP_Budget_Justification.xlsx” and click on “Add Optional Other Attachment” to attach.”

xviii. 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. As part of the application, the principal investigator or lead project manager and all senior/key personnel at the applicant 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 connections with foreign government-sponsored talent recruitment programs must be identified in current and pending support.

For every 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 being 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.

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.

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

I, [Full Name and Title], 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 project period of performance of the award should circumstances change which impact the responses provided above.

The information may be provided in the format approved by the National Science Foundation (NSF), which may be generated by the Science Experts Network Curriculum Vita (SciENCv), a cooperative venture maintained at <https://www.ncbi.nlm.nih.gov/sciencv/>, and is also available at <https://www.nsf.gov/bfa/dias/policy/researchprotection/cps.pdf>. The use of a format required by another agency is intended to reduce the administrative burden to researchers by promoting the use of common formats. If the NSF format is used, the individual must still include a signature, date, and a certification statement using the language included in the paragraph above.

Save the Current and Pending Support in a single PDF file using the following naming convention for the title "CPS.pdf" and click on "Add Optional Other Attachment" to attach.

Definitions:

Current and pending support – (a) All resources made available, or expected to be made available, to an individual in support of the individual's RD&D efforts, regardless

of (i) whether the source is foreign or domestic; (ii) whether the resource is made available through the entity applying for an award or directly to the individual; or (iii) whether the resource has monetary value; and (b) includes in-kind contributions requiring a commitment of time and directly supporting the individual's RD&D efforts, such as the provision of office or laboratory space, equipment, supplies, employees, or students. This term has the same meaning as the term Other Support as applied to researchers in 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.

Foreign Government-Sponsored Talent Recruitment Program – An effort directly or indirectly organized, managed, or funded by a foreign government, or a foreign government instrumentality or entity, to recruit science and technology professionals or students (regardless of citizenship or national origin, or whether having a full-time or part-time position). Some foreign government-sponsored talent recruitment programs operate with the intent to import or otherwise acquire from abroad, sometimes through illicit means, proprietary technology or software, unpublished data and methods, and intellectual property to further the military modernization goals and/or economic goals of a foreign government. Many, but not all, programs aim to incentivize the targeted individual to relocate physically to the foreign state for the above purpose. Some programs allow for or encourage continued employment at United States research facilities or receipt of federal research funds while concurrently working at and/or receiving compensation from a foreign institution, and some direct participants not to disclose their participation to United States entities. Compensation could take many forms including cash, research funding, complimentary foreign travel, honorific titles, career advancement opportunities, promised future compensation, or other types of remuneration or consideration, including in-kind compensation.

Senior/key personnel – an individual who contributes in a substantive, meaningful way to the scientific development or execution of a research, development and demonstration (RD&D) project proposed to be carried out with DOE award.²⁸

²⁸ Typically, these individuals have doctoral or other professional degrees, although individuals at the masters or baccalaureate level may be considered senior/key personnel if their involvement meets this definition. Consultants, graduate students, and those with a postdoctoral role also may be considered senior/key personnel if they meet this definition.

xix. Transparency of Foreign Connections

Applicants must provide the following as it relates to the proposed recipient and subrecipients. Include a separate disclosure for the applicant and each proposed subrecipient. U.S. National Laboratories, domestic government entities, and institutions of higher education are only required to respond to items 1, 2 and 9, and if applying as to serve as the prime recipient, must provide complete responses for project team members that are not U.S. National Laboratories, domestic government entities, or institutions of higher education.

1. Entity name, website address, and mailing address;
2. The identity of all owners, principal investigators, project managers, and senior/key personnel who are a party to any *Foreign Government-Sponsored Talent Recruitment Program* of a foreign country of risk (i.e., China, Iran, North Korea, and Russia);
3. 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;
4. 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;
5. Percentage, if any, that the proposed recipient or subrecipient has foreign ownership or control;
6. Percentage, if any, that the proposed recipient or subrecipient is wholly or partially owned by an entity in a foreign country of risk;
7. 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;
8. Any technology licensing or intellectual property sales to a foreign country of risk, during the 5-year period preceding submission of the proposal;
9. Any foreign business entity, offshore entity, or entity outside the United States related to the proposed recipient or subrecipient;
10. 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;
11. 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%;
12. 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; and

13. 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.
14. DOE reserves the right to request additional or clarifying information based on the information submitted.

Save the Transparency of Foreign Connections information in a single PDF file using the following convention for the title “TFC.pdf”.

xx. Potentially Duplicate Funding Notice

If the applicant or project team member has other active awards of federal funds, the applicant must determine whether the activities of those awards potentially overlap with the activities set forth in its application to this FOA. If there is a potential 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 FOA, if a recipient or project team member receives any other award of federal funds for activities that potentially overlap with the activities funded 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 Contracting Officer in writing of the potential duplication and eliminate any inappropriate duplication of funding.

Save the Potentially Duplicative Funding Notice in a single PDF file using the following naming convention for the title “PDFN.pdf” and click on “Add Optional Other Attachment” to attach.

xxi. Pre-Award Factsheet

A project Pre-Award Factsheet is required with the application and must not include any proprietary or business sensitive information. The intent is to publish information provided in the Pre-Award Factsheet if the project is selected for award. The required contents of the Pre-Award Factsheet are listed in Appendix P.

The Pre-Award Factsheet must not exceed one page when printed using standard 8.5-by-11-inch paper with one-inch margins (top, bottom, left, and right), single spaced with font no smaller than 11 point. Save this information in a file named “Factsheet.pdf” and click on “Add Optional Other Attachment” to attach.

xxii. Project Management Plan

The Project Management Plan (PMP) must not exceed 10 pages for AOI 1, 2, and 4 or 15 pages for AOI 3—including cover page, table of contents, footnotes/endnotes, charts, graphs, maps, photographs, and other pictorial presentations—when printed using standard 8.5-by-11-inch paper with one-inch margins (top, bottom, left, and right), single spaced with font no smaller than 11 point. Note, however, that the Gantt chart does NOT count toward the page limit. Applicants shall prepare the PMP in the format provided in **Appendix N** of the FOA. Save this information in a file named “PMP.pdf” and click on “Add Optional Other Attachment” to attach.

xxiii. SF-424A Budget Information—Non-Construction Programs (SF-424) File

You must provide a separate budget for each year of support requested and a cumulative budget for the total project period. Use the SF-424 A Excel “Budget Information – Non Construction Programs” form on the DOE Financial Assistance Forms Page at <https://www.energy.gov/management/financial-assistance-forms-and-information-applicants-and-recipients> under DOE budget forms.

You may request funds under any of the Object Class Categories as long as the item and amount are necessary to perform the proposed work, meet all the criteria for allowability under the applicable federal cost principles, and are not prohibited by the funding restrictions in this announcement (see Section IV.I Funding Restrictions). Save the information in a single file named “SF424A.xls or xlsx” and click on “Add Optional Other Attachment” to attach.

xxiv. Environmental Questionnaire

The Applicant must submit an Environmental Questionnaire providing for the work of the entire project. The Applicant is also responsible for submitting a separate Environmental Questionnaire for each proposed subrecipient performing at a different location. The Environmental Questionnaire is available at:

http://www.netl.doe.gov/File%20Library/Business/forms/451_1-1-3.pdf. Save the questionnaire in a single file named “Env.pdf” (or “Env-FILL IN TEAM MEMBER.pdf” if more than questionnaire is submitted) and click on “Add Optional Other Attachment” to attach.

NOTE: If selected for award and if a subrecipient’s location is not known at the time of application, a subsequent Environmental Questionnaire will be needed prior to them beginning work at an alternate location.

NOTE: Applicants are advised that data acquisition via active seismic surveying or vibratory coring in aquatic (offshore) environments is NOT eligible for a CX from NEPA requirements. If such activities are proposed as part of the site characterization effort under this FOA, a clear plan for meeting NEPA requirements for these activities must also be included in the application in addition to the Environmental Questionnaire(s).

xxv. Cost Share Commitment Letters

Cost-share commitment letters are required from any party (other than the organization submitting the application) proposing to provide all or part of the required cost share (including subrecipients). The letter should state the party is committed to providing a specific minimum dollar amount of cost share, identify the type of proposed cost share (e.g., cash, services, and/or property) to be contributed, and be signed by the person authorized to commit the expenditure of funds by the entity. Note that the applicant can attach any relevant audited financial statements to the end of this file. The applicant should submit the letter(s) in PDF format. Save this information in a single file named “CSCL.pdf” and click on “Add Optional Other Attachment” to attach.

xxvi. CarbonSAFE Phase III Project Readiness—AOI 1 Only

Provide information as outlined in the Appendix of the FOA such that DOE can determine the proposed project’s level of readiness for Phase III: Site Characterization and Permitting. The section should be formatted to address Merit Review Criterion 1 listed in Section V.A. Submission of this document is required with the Full Application, and failure to submit the plan will result in rejection of the applicant’s application without further consideration. The Phase III Project Readiness must not exceed 20 pages when printed using standard 8.5-by-11-inch paper with one-inch margins (top, bottom, left, and right), single spaced with font no smaller than 11 point (except in figures, tables, or footnotes, which may be 10-point font). Save this information in a file named “PRPhase3.pdf” and click on “Add Optional Other Attachment” to attach.

xxvii. CarbonSAFE Phase III.5 Project Readiness—AOI 2 Only

Provide information as outlined in the Appendix of the FOA such that DOE can determine the proposed project’s level of readiness for Phase III.5: NEPA, FEED Studies, and Storage Field Development Plan Only. The section should be formatted to address Merit Review Criterion 1 listed in Section V.A. Submission of this document is required with the Full Application, and failure to submit the plan will result in rejection of the applicant’s application without further consideration. The body of the Phase III.5 Project Readiness must not exceed 20 pages when printed using standard 8.5-by-11-inch paper with one-inch margins (top, bottom, left, and right), single spaced with font no smaller than 11 point (except in figures, tables, or footnotes, which may be 10-point font). The appendix of documentation related to “Authorization to Construct” does not apply to the page limit. Save this information in a file named “PRPhase35.pdf” and click on “Add Optional Other Attachment” to attach.

xxviii. CarbonSAFE Phase IV Project Readiness – AOI 3 Only

Provide information as outlined in the Appendix of the FOA such that DOE can determine the proposed project’s level of readiness for Phase IV: Construction. The section should be formatted to address Merit Review Criterion 1 listed in Section V.A. Submission of this document is required with the Full Application, and failure to submit the plan will result in rejection of the applicant’s application without further consideration. The Phase IV

Project Readiness must not exceed 15 pages when printed using standard 8.5-by-11-inch paper with one-inch margins (top, bottom, left, and right), single spaced with font no smaller than 11 point (except in figures, tables, or footnotes, which may be 10-point font). The Appendices do NOT apply to the page limit. Save this information in a file named “PRPhase4.pdf” and click on “Add Optional Other Attachment” to attach.

xxix. CarbonSAFE Phase II Project Readiness – AOI 4 Only

Provide information as outlined in the Appendix of the FOA such that DOE can determine the proposed project’s level of readiness for Phase II: Storage Complex Feasibility. The section should be formatted to address merit review criterion 1 listed in Section V.A. Submission of this document is required with the full application, and failure to submit the plan will result in rejection of the applicant’s application without further consideration. The Phase II Project Readiness must not exceed 20 pages when printed using standard 8.5" by 11" paper with 1" margins (top, bottom, left and right) single spaced with font no smaller than 11 point (except in figures, tables, or footnotes, which may be 10 point font). Save this information in a file named “PRPhase2.pdf” and click on “Add Optional Other Attachment” to attach.

xxx. Facility Type and High-Level Budget Justification—AOI 1 and 3 Only

In this writeup, applicants should discuss the proposed facility type (onshore dedicated storage facility, onshore hub storage facility, or offshore storage facility) and justify their definition of facility type. Applicants should also address the elements that impact total CarbonSAFE Initiative Phase III or Phase IV project cost and where their proposal falls in the range of “Anticipated Individual Award Sizes” (Section II.A.i). Site specifics such as geology, local rig availability, number of wells needed in this phase, etc. that have significant impact on total project cost should be justified.

xxxi. Map of Storage Complex and Strat Column

Map of the proposed storage complex and stratigraphic column with proposed location of injection well(s) and any other relevant information. Applications should include a map of the proposed storage site(s) within the storage complex and descriptions of the owner(s) of the land surface, subsurface pore space, and mineral rights. Note that 11 x 17 paper is allowed.

xxxii. Financial Responsibility Documents—AOI 3 Only

Financial Responsibility Documents for an EPA Class VI well drilling permit(s) or equivalent offshore permit(s), which may need to be perfected before any CO₂ injection may occur.

xxxiii. Field Site Access Commitment Letter(s)

Letter(s) from field site owner(s) and/or field site operator(s) indicating commitment to allow access to the applicant to perform work described in the application should the project be selected. Where appropriate, the commitment letters should provide full disclosure of known land-use concerns (such as cultural, wildlife, or natural resources).

Save this information in a single file named “CLField.pdf” and click on “Add Optional Other Attachment” to attach.

xxxiv. CO₂ Source Commitment Letters

Letter(s) from CO₂ sources that intend to provide a combined minimum of 50 million metric tons of CO₂ within a 30-year period. The applicant should identify and show level of commitment of CO₂ source(s). For this FOA, a letter of support from CO₂ sources is sufficient to satisfy the requirement of showing their level of commitment. Save this information in a single file named “CLSource.pdf” and click on “Add Optional Other Attachment” to attach.

xxxv. Other Commitment Letter(s)

Letter(s) from other relevant parties not submitted under Sections III.C.xxvi, xxxiv, or xxxv, such as additional team members and parties that may provide data to be used on the project. Save this information in a single file named “CLOthers.pdf” and click on “Add Optional Other Attachment” to attach.

D. Post Selection Information Requests

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. The following is a non-exhaustive list of examples information that may be required:

- Personnel proposed to work on the project and collaborating organizations (See Section VI.B.xix. Participants and Collaborating Organizations);
- Current and Pending Support (See Sections IV.C.xviii. and VI.B.xx. Current and Pending Support);
- A Data Management Plan describing how all research data displayed in publications resulting from the proposed work will be digitally accessible at the time of publications, in accordance with **Appendix F**;
- Indirect cost information;
- Other budget information;
- Letters of Commitment from third parties contributing to cost share, if applicable;
- Name and phone number of the Designated Responsible Employee for complying with national policies prohibiting discrimination (See 10 CFR 1040.5);
- Information for the DOE Office of Civil Rights to process assurance reviews under 10 CFR 1040;
- Representation of Limited Rights Data and Restricted Software, if applicable;
- Information related to Davis-Bacon Act Requirements;
- Information related to any proposed Workforce and Community Agreement, as defined above in “Community Benefits Plan: Job Quality and Equity,” that applicants may have made with the relevant community;

- Any proposed or required Project Labor Agreements.

E. Unique Entity Identifier (UEI) and System for Award Management (SAM)

Each applicant (unless the applicant is an individual or federal awarding agency that is excepted from those requirements under 2 CFR 25.110(b) or (c), or has an exception approved by the federal awarding agency under 2 CFR 25.110(d)) is required to: (1) Be registered in the SAM at <https://www.sam.gov> before submitting its application; (2) provide a valid UEI number in its application; and (3) continue to maintain an active SAM registration with current information at all times during which it has an active federal award or an application or plan under consideration by a federal awarding agency. DOE may not make a federal award to an applicant until the applicant has complied with all applicable UEI and SAM requirements and, if an applicant has not fully complied with the requirements by the time DOE is ready to make a federal award, the DOE will determine that the applicant is not qualified to receive a federal award and use that determination as a basis for making a federal award to another applicant.

NOTE: Due to the high demand of UEI requests and SAM registrations, entity legal business name and address validations are taking longer than expected to process. Entities should start the UEI and SAM registration process as soon as possible. If entities have technical difficulties with the UEI validation or SAM registration process they should utilize the **HELP** feature on **SAM.gov**. SAM.gov will work entity service tickets in the order in which they are received and asks that entities not create multiple service tickets for the same request or technical issue. Additional entity validation resources can be found here: [GSAFSD Tier 0 Knowledge Base - Validating your Entity](#).

F. Submission Dates and Times

All required submissions must be submitted as specifically stated in the announcement no later than 5 p.m. ET on the dates provided on the cover page of this FOA.

G. Intergovernmental Review

This FOA is not subject to Executive Order 12372 – Intergovernmental Review of Federal Programs.

H. Funding Restrictions

i. Allowable 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 entities. The cost principles contained in 2 CFR Part 200, Subpart E apply to all entities other than for-profits.

ii. Pre-Award Costs

Applicants selected for award negotiations (selectee) must request prior written approval to charge pre-award costs. Pre-award costs are those incurred prior to the effective date of the federal award directly pursuant to the negotiation and in anticipation of the federal award where such costs are necessary for efficient and timely performance of the scope of work. Such costs are allowable only to the extent that they would have been allowable if incurred after the date of the federal award and **only** with the written approval of the federal awarding agency, through the DOE Contracting Officer.

Pre-award costs cannot be incurred prior to the Selection Official signing the Selection Statement and Analysis.

Pre-award expenditures are made at the selectee's risk. DOE is not obligated to reimburse costs: (1) in the absence of appropriations; (2) if an award is not made; or (3) if an award is made for a lesser amount than the selectee anticipated.

1. National Environmental Policy Act (NEPA) Requirements Related to Pre-Award Costs

DOE's decision whether and how to distribute federal funds under this FOA is subject to NEPA. Applicants should carefully consider and should seek legal counsel or other expert advice before taking any action related to the proposed project that would have an adverse effect on the environment or limit the choice of reasonable alternatives prior to DOE completing the NEPA review process.

DOE does not guarantee or assume any obligation to reimburse pre-award costs incurred prior to receiving written authorization from the Contracting Officer. If the applicant elects to undertake activities that DOE determines may have an adverse effect on the environment or limit the choice of reasonable alternatives prior to receiving such written authorization from the Contracting Officer, the applicant is doing so at risk of not receiving federal funding for their project and such costs may not be recognized as allowable cost share. Nothing contained in the pre-award cost reimbursement regulations or any pre-award costs approval letter from the Contracting Officer override the requirement to obtain the written authorization from the Contracting Officer prior to taking any action that may have an adverse effect on the environment or limit the choice of reasonable alternatives. Likewise, if an application is selected for negotiation

of award, and the prime recipient elects to undertake activities that are not authorized for federal funding by the Contracting Officer in advance of DOE completing a NEPA review, the prime recipient is doing so at risk of not receiving federal funding and such costs may not be recognized as allowable cost share.

iii. Performance of Work in the United States (Foreign Work Waiver)

1. Requirement

All work performed under DOE awards issued under this FOA must be performed in the United States. The prime recipient must flow down this requirement to its subrecipients.

2. Failure to Comply

If the prime 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 prime 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 prime recipient, subrecipients, contractors or other project partners.

3. Waiver

To seek a foreign work waiver, the applicant must submit a written waiver request to DOE. Appendix B lists the information that must be included in a request for a foreign work waiver.

Save the waiver request(s) in a single PDF file. The applicant does not have the right to appeal DOE's decision concerning a waiver request.

iv. Construction

Recipients are required to obtain written authorization from the Contracting Officer before incurring any major construction costs.

DOE strongly encourages the use of project labor agreements (PLAs) in connection with construction projects. A PLA is a pre-hire agreement between a private entity (or entities) and a labor organization (or organizations) representing individuals who will be working on the construction project. Applicants that commit to using best-practice project labor agreements will generally be likely to produce a construction workforce plan that meets the criteria in this FOA. By contrast, applicants that do not commit to using a PLA will be required to submit workforce continuity plans and show that they have taken other measures to reduce the risk of delays in project delivery.

For large construction projects, DOE may require a PLA. Assessment of applicability will be conducted on a case-by-case basis.

v. 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 Contracting Officer assigned to the award.

vi. Equipment and Supplies

Property disposition may be required at the end of a project if the current fair market value of property exceeds \$5,000. For-profit entity disposition requirements are set forth at 2 CFR 910.360. Property disposition requirements for other non-federal entities are set forth in 2 CFR 200.310 – 200.316.

vii. Buy America Requirements for Infrastructure Projects

Pursuant to the Build America Buy America Act, subtitle IX of BIL (Buy America, or “BABA”), Federally assisted projects that involve infrastructure work, undertaken by applicable recipient types, require that:

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

Whether a given project must apply this requirement is project-specific and dependent on several factors, such as the recipient’s entity type, whether the work involves “infrastructure,” as that term is defined in Section 70914 of the Bipartisan Infrastructure Law, and whether the infrastructure in question is publicly owned or serves a public function.

Applicants are strongly encouraged to consult **Appendix C** of this FOA to determine whether their project may have to apply this requirement, both to make an early determination as to the need of a waiver, as well as to determine what impact, if any, this requirement may have on the proposed project’s budget.

Please note that, based on the implementation guidance from the Office of Management and Budget (OMB) issued on April 18, 2022, the Buy America requirements of the BIL do not apply to DOE projects in which the prime recipient is a for-profit entity; the requirements only apply to projects whose

prime recipient is a “non-Federal entity,” e.g., a State, local government, Indian tribe, Institution of Higher Education, or nonprofit organization. Subawards should conform to the terms of the prime award from which they flow; in other words, for-profit prime recipients are not required to flow down these Buy America requirements to subrecipients, even if those subrecipients are non-Federal entities as defined above. Conversely, prime recipients which are non-Federal entities must flow the Buy America requirements down to all subrecipients, even if those subrecipients are for-profit entities. Finally, for all applicants—both non-Federal entities and for-profit entities—DOE is including a Program Policy Factor that the Selection Official may consider in determining which Full Applications to select for award negotiations that considers whether the applicant has made a commitment to procure U.S. iron, steel, manufactured products, and construction materials in its project.

The DOE financial assistance agreement will require each recipient: (1) to fulfill the commitments made in its application regarding the procurement of U.S.-produced products and (2) to fulfill the commitments made in its application regarding the procurement of other key component metals and manufactured products domestically that are deemed available in sufficient and reasonably available quantities or of a satisfactory quality at the time of award negotiation. Applicants may seek waivers of these requirements in very limited circumstances and for good cause shown. Further details on requesting a waiver can be found in [Appendix C](#) and the terms and conditions of an award.

Applicants are strongly encouraged to consult [Appendix C for more information](#).

viii. Davis-Bacon Act Requirements

Projects awarded under this FOA will be funded under Division D of the Bipartisan Infrastructure Law. Accordingly, per section 41101 of that law, all laborers and mechanics employed by the recipient, subrecipients, contractors or subcontractors in the performance of construction, alteration, or repair work funded in whole or in part under this FOA shall be paid wages at rates not less than those prevailing on similar projects in the locality, as determined by the Secretary of Labor in accordance with subchapter IV of chapter 31 of title 40, United States Code commonly referred to as the “Davis-Bacon Act” (DBA).

Applicants shall provide written assurance acknowledging the DBA requirements above, and confirming that the laborers and mechanics performing construction, alteration, or repair work on projects funded in whole or in part by awards made as a result of this FOA are paid or will be paid wages at rates not less than those prevailing on projects of a character similar in the locality as determined by subchapter IV of Chapter 31 of Title 40, United States Code (Davis-Bacon Act).

Applicants acknowledge that they will comply with all of the Davis-Bacon Act requirements, including but not limited to:

- (1) ensuring that the wage determination(s) and appropriate Davis-Bacon clauses and requirements are flowed down to and incorporated into any applicable subcontracts or subrecipient awards.
- (2) ensuring that if wage determination(s) and appropriate Davis-Bacon clauses and requirements are improperly omitted from contracts and subrecipient awards, the applicable wage determination(s) and clauses are retroactively incorporated to the start of performance.
- (3) being responsible for compliance by any subcontractor or subrecipient with the Davis-Bacon labor standards.
- (4) receiving and reviewing certified weekly payrolls submitted by all subcontractors and subrecipients for accuracy and to identify potential compliance issues.
- (5) maintaining original certified weekly payrolls for 3 years after the completion of the project and must make those payrolls available to the DOE or the United States Department of Labor (DOL) upon request, as required by 29 CFR 5.6(a)(2).
- (6) conducting payroll and job-site reviews for construction work, including interviews with employees, with such frequency as may be necessary to assure compliance by its subcontractors and subrecipients and as requested or directed by the DOE.
- (7) cooperating with any authorized representative of the Department of Labor in their inspection of records, interviews with employees, and other actions undertaken as part of a DOL investigation.
- (8) posting in a prominent and accessible place the wage determination(s) and DOL Publication: WH-1321, Notice to Employees Working on Federal or Federally Assisted Construction Projects.
- (9) notifying the Contracting Officer of all labor standards issues, including all complaints regarding incorrect payment of prevailing wages and/or fringe benefits, received from the recipient, subrecipient, contractor, or subcontractor employees; significant labor standards violations, as defined in 29 CFR 5.7; disputes concerning labor standards pursuant to 29 CFR parts 4, 6, and 8 and as defined in FAR 52.222-14; disputed labor standards determinations; DOL investigations; or legal or judicial proceedings related to the labor standards under this Contract, a subcontract, or subrecipient award.
- (10) preparing and submitting to the Contracting Officer, the Office of Management and Budget Control Number 1910-5165, Davis Bacon Semi-Annual Labor Compliance Report, by April 21 and October 21 of each year. Form submittal will be administered through the iBenefits system (<https://doeibenefits2.energy.gov>), its successor system, or other manner of compliance as directed by the Contracting Officer.

Recipients of funding under this FOA will also be required to undergo Davis-Bacon Act compliance training and to maintain competency in Davis-Bacon Act compliance. The Contracting Officer will notify the recipient of any DOE sponsored Davis-Bacon Act compliance trainings. The DOL offers free Prevailing Wage Seminars several times a year that meet this requirement, at <https://www.dol.gov/agencies/whd/government-contracts/construction/seminars/events>.

For additional guidance on how to comply with the Davis-Bacon provisions and clauses, see <https://www.dol.gov/agencies/whd/government-contracts/construction> and <https://www.dol.gov/agencies/whd/government-contracts/protections-for-workers-in-construction>.

DOE anticipates contracting with a third party for a Davis-Bacon Act electronic payroll compliance software application. Recipients of funding under this FOA must ensure the timely electronic submission of weekly certified payrolls through this software as part of its compliance with the Davis-Bacon Act unless a waiver is granted to a particular contractor or subcontractor because it is unable or limited in its ability to use or access. Applicants should indicate if they will seek a waiver.

ix. Lobbying

Recipients and subrecipients may not use any federal funds to influence or attempt to influence, directly or indirectly, congressional action on any legislative or appropriation matters.

Recipients and subrecipients are required to complete and submit SF-LLL, "Disclosure of Lobbying Activities" (<https://www.grants.gov/web/grants/forms/sf-424-individual-family.html>) to ensure that non-federal funds have not been paid and will not be paid to any person for influencing or attempting to influence any of the following in connection with the application:

- An officer or employee of any federal agency;
- A Member of Congress;
- An officer or employee of Congress; or
- An employee of a Member of Congress.

x. Risk Assessment

Pursuant to 2 CFR 200.206, DOE will conduct an additional review of the risk posed by applications submitted under this FOA. Such risk assessment will consider:

1. Financial stability;
2. Quality of management systems and ability to meet the management standards prescribed in 2 CFR 200 as amended and adopted by 2 CFR 910;
3. History of performance;

4. Audit reports and findings; and
5. The applicant's ability to effectively implement statutory, regulatory, or other requirements imposed on non-federal entities.

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 guidelines on government-wide suspension and debarment in 2 CFR Part 180, and must require non-federal entities to comply with these provisions. These provisions restrict federal awards, subawards and contracts with certain parties that are debarred, suspended or otherwise excluded from or ineligible for participation in federal programs or activities.

Further, as DOE invests in critical infrastructure and funds critical and emerging technology areas, DOE also 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.

xi. Invoice Review and Approval

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

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

xii. Prohibition related to Foreign Government-Sponsored Talent Recruitment Programs

a. Prohibition

Persons participating in a *Foreign Government-Sponsored Talent Recruitment Program of a Foreign Country of Risk* are prohibited from participating in projects selected for federal funding under this FOA. Should an award result from this FOA, the recipient must exercise ongoing due diligence to reasonably ensure that no individuals participating on the DOE-funded project are participating in a *Foreign Government-Sponsored Talent Recruitment Program of a Foreign Country of Risk*. 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.

b. Definitions

- 1. Foreign Government-Sponsored Talent Recruitment Program.** An effort directly or indirectly organized, managed, or funded by a foreign government, or a foreign government instrumentality or entity, to recruit science and technology professionals or students (regardless of citizenship or national origin, or whether having a full-time or part-time position). Some foreign government-sponsored talent recruitment programs operate with the intent to import or otherwise acquire from abroad, sometimes through illicit means, proprietary technology or software, unpublished data and methods, and intellectual property to further the military modernization goals and/or economic goals of a foreign government. Many, but not all, programs aim to incentivize the targeted individual to relocate physically to the foreign state for the above purpose. Some programs allow for or encourage continued employment at United States research facilities or receipt of Federal research funds while concurrently working at and/or receiving compensation from a foreign institution, and some direct participants not to disclose their participation to U.S. entities. Compensation could take many forms including cash, research funding, complimentary foreign travel, honorific titles, career advancement opportunities, promised future compensation, or other types of remuneration or consideration, including in-kind compensation.
- 2. Foreign Country of Risk.** DOE has designated the following countries as foreign countries of risk: Iran, North Korea, Russia, and China. This list is subject to change.

xiii. Affirmative Action and Pay Transparency Requirements

All applicants must comply with all applicable federal labor and employment laws, including but not limited to Title VII of the Civil Rights Act of 1964, the Fair Labor Standards Act, the Occupational Safety and Health Act, and the National Labor Relations Act, which protects employees' right to bargain collectively and engage in concerted activities for the purpose of workers' mutual aid or protection.

All federally assisted construction contracts exceeding \$10,000 annually will be subject to the requirements of Executive Order 11246:

- (1) Recipients, subrecipients, contractors, and subcontractors are prohibited from discriminating in employment decisions on the basis of race, color, religion, sex, sexual orientation, gender identity or national origin.
- (2) Recipients and contractors are required to take affirmative action to ensure that equal opportunity is provided in all aspects of their employment. This includes flowing down the appropriate language to all subrecipients contractors, and subcontractors.
- (3) Recipients, subrecipients, contractors, and subcontractors are prohibited from taking adverse employment actions against applicants and employees for asking about, discussing, or sharing information about their pay or, under certain circumstances, the pay of their co-workers.

The Department of Labor's (DOL) Office of Federal Contractor Compliance Programs (OFCCP) uses a neutral process to schedule compliance evaluations. Consult OFCCP's Technical Assistance Guide²⁹ to gain an understanding of the requirements and possible required actions the recipients, subrecipients, contractors, and subcontractors must take. Additional guidance may also be found in the National Policy Assurances, produced by DOE.

Additionally, for construction projects valued at \$35 million or more and lasting more than one year, the recipients, subrecipients, contractors, and subcontractors may be selected by the OFCCP to participate in the *Mega Construction Project Program*. DOE, under relevant legal authorities including Sections 205 and 303(a) of Executive Order 11246, will require participation as a condition of the award. This program offers extensive compliance assistance with EO 11246. For more information regarding this program, see <https://www.dol.gov/agencies/ofccp/construction/mega-program>.

xiv. Foreign Collaboration Considerations

- a. Consideration of new collaborations with foreign entities and governments. The recipient will be required to provide DOE with advanced written notification of any potential collaboration with foreign entities or governments in connection with its DOE-funded award scope. The recipient will then be required to await further guidance from DOE prior to contacting the proposed foreign entity or government regarding the potential collaboration or negotiating the terms of any potential agreement.

²⁹ See OFCCP's Technical Assistance Guide at: <https://www.dol.gov/sites/dolgov/files/ofccp/Construction/files/ConstructionTAG.pdf?msclkid=9e397d68c4b111ec9d8e6fecb6c710ec> Also see the National Policy Assurances <http://www.nsf.gov/awards/managing/rtc.jsp>

- b. Existing collaborations with foreign entities and governments. The recipient will be required to provide DOE with a written list of all existing foreign collaborations in which has entered in connection with its DOE-funded award scope.
- c. Description of collaborations that should be reported. In general, a collaboration will involve some provision of a thing of value to, or from, the recipient. A thing of value includes but may not be limited to all resources made available to, or from, the recipient in support of and/or related to the DOE award, regardless of whether or not they have monetary value. Things of value also may include in-kind contributions (such as office/laboratory space, data, equipment, supplies, employees, students). In-kind contributions not intended for direct use on the DOE award but resulting in provision of a thing of value from or to the DOE award must also be reported. Collaborations do not include routine workshops, conferences, use of the recipient's services and facilities by foreign investigators resulting from its standard published process for evaluating requests for access, or the routine use of foreign facilities by awardee staff in accordance with the recipient's standard policies and procedures.

V. Application Review Information

A. Technical Review Criteria

i. Full Applications

Applications will be evaluated against the technical review criteria shown below. All sub-criteria are of equal weight. Evaluation criteria are outlined and listed by AOI. The criteria apply to each AOI independently.

AOI 1—Phase III: Site Characterization and Permitting

Technical Merit Review Criterion 1: CarbonSAFE Phase III Project Readiness (35%)

- a. Degree to which the application sufficiently describes how the effort to date has justified that the project (1) is economically attractive and has a sound business case with acceptable internal rate of return for investors; and (2) meets the criteria listed in the “Scenario Analysis” portion of *Appendix H: CarbonSAFE Phase III Project Readiness* and evidence of interest from relevant parties (i.e., site landowner, pore space owners), including commitment letters.
- b. Degree to which the application sufficiently defines and confirms the adequacy of the storage complex geology of the proposed site for injection of a minimum of 50 million metric tons of CO₂ within a 30-year period. The criteria are listed in the “Technical Subsurface Data Evaluation” section of *Appendix H: CarbonSAFE Phase III Project Readiness*.
- c. Degree to which the application sufficiently summarizes the process used in selecting the proposed site, including the criteria listed in the “Regional Analysis” section of *Appendix H: CarbonSAFE Phase III Project Readiness*.
- d. Degree to which the application sufficiently addresses the CO₂ source, transport mechanism, and constituent breakdown of CO₂ stream as summarized in the “CO₂ Technical Analysis” section of *Appendix H: CarbonSAFE Phase III Project Readiness* and evidence of interest from CO₂ sources, including commitment letters.

Technical Merit Review Criterion 2: Community Benefits Plan (20%)

This criterion involves consideration of the following factors:

Community Labor and Engagement

- a. Extent to which the applicant demonstrates community and labor engagement to date that results in support for the proposed project;
- b. Extent to which the applicant has a clear and appropriately robust plan to engage – ideally through a clear commitment to negotiate an enforceable Workforce and Community Agreements with labor unions, Tribal entities, and community-based organizations that support or work with disadvantaged communities and other affected stakeholders;

- c. Extent to which the applicant has considered accountability to affected workers and community stakeholders, including those most vulnerable to project activities with a plan to publicly share SMART community benefits plan commitments; and
- d. Extent to which the applicant demonstrates that community and labor engagement will lead to the delivery of high-quality jobs, minimal environmental impact, and allocation of project benefits to disadvantaged communities.

Job Quality and Workforce Continuity

- a. Quality and manner in which the proposed project will create and/or retain high quality, good-paying jobs with employer-sponsored benefits for all classifications and phases of work;
- b. Extent to which the project provides employees with the ability to organize, bargain collectively, and participate, through labor organizations of their choosing, in decisions that affect them and that contribute to the effective conduct of business and facilitates amicable settlements of any potential disputes between employees and employers, providing assurances of project efficiency, continuity, and multiple public benefits; and
- c. Extent to which applicant demonstrates that they are a responsible employer, with ready access to a sufficient supply of appropriately skilled labor, and an effective plan to minimize the risk of labor disputes or disruptions.

Diversity, Equity, Inclusion, and Accessibility

- a. Extent to which the Community Benefits Plan includes specific and high-quality actions to meet DEIA goals, which may include DEIA recruitment procedures; supplier diversity plans, and other DEIA initiatives; and
- b. 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.

Justice40 Initiative

- a. Extent to which the Community Benefits Plan identifies: specific, measurable benefits for disadvantaged communities, how the benefits will flow to disadvantaged communities, and how negative environmental impacts affecting disadvantaged communities would be mitigated; and
- b. Extent to which the project would contribute to meeting the objective that 40% of the benefits of climate and clean energy investments will flow to disadvantaged communities.

Technical Merit Review Criterion 3: Technical Approach and Understanding (20%)

- a. Feasibility, appropriateness, rationale, and completeness of the proposed SOPO, such that there is a logical progression of work.
- b. The adequacy and completeness of the PMP in establishing baselines (technical scope, budget, schedule) and in managing project performance relative to those baselines; defining the actions that will be taken when these baselines must be revised; and identification of project risks and strategies for mitigation.
- c. The degree to which the “Facility Type and High-Level Budget Justification” file, in consultation with other project budget files, justifies the facility type and reasonableness of project budget total.

Technical Merit Review Criterion 4: Technical and Management Capabilities, Facilities, and Resources (15%)

- a. The adequacy (quality, availability, and appropriateness) of the facilities (excluding the proposed storage complex field site), and equipment to perform project Tasks.
- b. Degree to which the application provides clear, convincing evidence that the organizations and individuals included in the proposed team are organized in an effective manner and possess the credentials, experience, and capabilities necessary to successfully meet the objectives of the project, have **availability to complete work in specified time frame, and provide interest/commitment letters.**
- c. The degree, if any, that pre-existing data is provided to perform project Tasks. The degree to which the application demonstrates access to any required data (e.g., commitment letters) or suitable plans to acquire the data.
- d. Depth and clarity of the discussion of previous or current CCUS projects involving one or more of the proposed partners to demonstrate the experience of the partners, including evidence of past cooperation among various partners to make CCUS a viable carbon management practice.

Merit Review Criterion 5: Financial (10%):

The application should include an analysis of cost-shared funds for Phase III, including:

- a. The appropriateness of the Applicant’s financial commitment to the project.
- b. The appropriateness of commitment from other parties providing non-federal cost share for Phase III.
 - i. For non-federal cost-share commitments that are in the form of cash, each provider must present audited financial statements for the prior year and all unaudited interim financial statements for the current year. If audited financial statements are not available, the financial statements presented must be certified by the Chief Financial Officer of the organization that the statements were prepared on the basis of U.S. Generally Accepted Accounting Principles (US GAAP). Each provider must describe how the financial statements evidence the capacity of the provider to supply their committed cost share.

- ii. For non-federal cost-share commitments that are not in cash, provide a full description of the commitment and justification for the qualification of such commitment as non-federal cost share. Provide supporting evidence regarding the value of the non-cash commitment.
- iii. Applicants must certify in writing that all non-federal cost share will come from qualified sources.

AOI 2—Phase III.5: NEPA, FEED Studies, and Storage Field Development Plan Only

Technical Merit Review Criterion 1: CarbonSAFE Phase III.5 Project Readiness (45%)

- a. Degree to which the application sufficiently describes how the effort to date has justified that the project (1) is economically attractive and has a sound business case with acceptable internal rate of return for investors; and (2) meets the criteria listed in the “Scenario Analysis” portion of **Appendix I: CarbonSAFE Phase III.5 Project Readiness** and evidence of interest from relevant parties (i.e., site landowner, pore space owners), including commitment letters.
- b. Degree to which the application sufficiently defines and confirms the adequacy of the storage complex geology of the proposed site for injection of a minimum of 50 million metric tons of CO₂ within a 30-year period. The criteria are listed in the “Technical Subsurface Data Evaluation” section of **Appendix I: CarbonSAFE Phase III.5 Project Readiness**.
- c. Degree to which the application sufficiently summarizes the process used in selecting the proposed site, including the criteria listed in the “Regional Analysis” section of **Appendix I: CarbonSAFE Phase III.5 Project Readiness**.
- d. Degree to which the application sufficiently addresses the CO₂ source, transport mechanism, and constituent breakdown of CO₂ stream as summarized in the “CO₂ Technical Analysis” section of **Appendix I: CarbonSAFE Phase III.5 Project Readiness** and evidence of interest from CO₂ sources, including commitment letters.

Technical Merit Review Criterion 2: Community Benefits (20%)

This criterion involves consideration of the following factors:

Community Labor and Engagement

- a. Extent to which the applicant demonstrates community and labor engagement to date that results in support for the proposed project;
- b. Extent to which the applicant has a clear and appropriately robust plan to engage – ideally through a clear commitment to negotiate an enforceable Workforce and Community Agreements with labor unions, Tribal entities, and community-based organizations that support or work with disadvantaged communities and other affected stakeholders;

- c. Extent to which the applicant has considered accountability to affected workers and community stakeholders, including those most vulnerable to project activities with a plan to publicly share SMART community benefits plan commitments; and
- d. Extent to which the applicant demonstrates that community and labor engagement will lead to the delivery of high-quality jobs, minimal environmental impact, and allocation of project benefits to disadvantaged communities.

Job Quality and Workforce Continuity

- a. Quality and manner in which the proposed project will create and/or retain high quality, good-paying jobs with employer-sponsored benefits for all classifications and phases of work;
- b. Extent to which the project provides employees with the ability to organize, bargain collectively, and participate, through labor organizations of their choosing, in decisions that affect them and that contribute to the effective conduct of business and facilitates amicable settlements of any potential disputes between employees and employers, providing assurances of project efficiency, continuity, and multiple public benefits; and
- c. Extent to which applicant demonstrates that they are a responsible employer, with ready access to a sufficient supply of appropriately skilled labor, and an effective plan to minimize the risk of labor disputes or disruptions.

Diversity, Equity, Inclusion, and Accessibility

- a. Extent to which the Community Benefits Plan includes specific and high-quality actions to meet DEIA goals, which may include DEIA recruitment procedures; supplier diversity plans, and other DEIA initiatives; and
- b. 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.

Justice40 Initiative

- a. Extent to which the Community Benefits Plan identifies: specific, measurable benefits for disadvantaged communities, how the benefits will flow to disadvantaged communities, and how negative environmental impacts affecting disadvantaged communities would be mitigated; and
- b. Extent to which the project would contribute to meeting the objective that 40% of the benefits of climate and clean energy investments will flow to disadvantaged communities.

Technical Merit Review Criterion 3: Technical Approach and Understanding (20%)

- a. Feasibility, appropriateness, rationale, and completeness of the proposed SOPO, such that there is a logical progression of work.
- b. The adequacy and completeness of the PMP in establishing baselines (technical scope, budget, schedule) and in managing project performance relative to those baselines; defining the actions that will be taken when these baselines must be revised; and identification of project risks and strategies for mitigation.

Technical Merit Review Criterion 4: Technical and Management Capabilities, Facilities, and Resources (15%)

- a. The adequacy (quality, availability, and appropriateness) of the facilities (excluding the proposed storage complex field site), and equipment to perform project Tasks.
- b. Degree to which the application provides clear, convincing evidence that the organizations and individuals included in the proposed team are organized in an effective manner and possess the credentials, experience, and capabilities necessary to successfully meet the objectives of the project, have availability to complete work in specified time frame, and provide interest/commitment letters.
- c. The degree, if any, that pre-existing data is provided to perform project Tasks. The degree to which the application demonstrates access to any required data (e.g., commitment letters) or suitable plans to acquire the data.
- d. Depth and clarity of the discussion of previous or current CCUS projects involving one or more of the proposed partners to demonstrate the experience of the partners, including evidence of past cooperation among various partners to make CCUS a viable carbon management practice.

AOI 3—Phase IV: Construction

Technical Merit Review Criterion 1: CarbonSAFE Phase IV Entry Requirements (25%)

- a. Degree to which the application sufficiently describes how the effort to date has justified that the project (1) is economically attractive; has a sound business case with acceptable internal rate of return for investors; and publicly acceptable, and (2) meets the criteria listed in the “Scenario Analysis” portion of Appendix J: *CarbonSAFE Phase IV Project Readiness* and evidence of interest from relevant parties (i.e., site landowner, pore space owners), including commitment letters.
- b. Degree to which the application sufficiently describes the plan for development of the storage site, including the appropriateness of the chosen site and including the criteria listed in the “Storage Field Development Plan” portion of Appendix J: *CarbonSAFE Phase IV Project Readiness*. This includes the appropriateness of the P-10, P-50, and P-90 project cost analysis and the risk discussion.
- c. Degree to which the application sufficiently addresses the 30-year CO₂ Supply Curve, availability of CO₂ sources expected in the first five years of operations, and other criteria as listed in the “CO₂ Source(s) Feasibility Study” section of Appendix J: *CarbonSAFE Phase IV Project Readiness*.
- d. Degree to which the application sufficiently addresses CO₂ transport, including the

criteria listed in the “CO₂ Transport FEED Study” section of **Appendix J: CarbonSAFE Phase IV Project Readiness**.

- e. Degree to which the application sufficiently addresses the “Engineer, Procure & Construct Effort” section of **Appendix J: CarbonSAFE Phase IV Project Readiness**.
- f. Degree to which the application sufficiently addresses and adequately justifies the contents of “Additional Required Documents” requested in **Appendix J: CarbonSAFE Phase IV Project Readiness**.

Technical Merit Review Criterion 2: Community Benefits (15%)

This criterion involves consideration of the following factors:

Community Labor and Engagement

- a. Extent to which the applicant demonstrates community and labor engagement to date that results in support for the proposed project;
- b. Extent to which the applicant has a clear and appropriately robust plan to engage – ideally through a clear commitment to negotiate an enforceable Workforce and Community Agreements with labor unions, Tribal entities, and community-based organizations that support or work with disadvantaged communities and other affected stakeholders;
- c. Extent to which the applicant has considered accountability to affected workers and community stakeholders, including those most vulnerable to project activities with a plan to publicly share SMART community benefits plan commitments; and
- d. Extent to which the applicant demonstrates that community and labor engagement will lead to the delivery of high-quality jobs, minimal environmental impact, and allocation of project benefits to disadvantaged communities.

Job Quality and Workforce Continuity

- a. Quality and manner in which the proposed project will create and/or retain high quality, good-paying jobs with employer-sponsored benefits for all classifications and phases of work;
- b. Extent to which the project provides employees with the ability to organize, bargain collectively, and participate, through labor organizations of their choosing, in decisions that affect them and that contribute to the effective conduct of business and facilitates amicable settlements of any potential disputes between employees and employers, providing assurances of project efficiency, continuity, and multiple public benefits; and
- c. Extent to which applicant demonstrates that they are a responsible employer, with ready access to a sufficient supply of appropriately skilled labor, and an effective plan to minimize the risk of labor disputes or disruptions.

Diversity, Equity, Inclusion, and Accessibility

- a. Extent to which the Community Benefits Plan includes specific and high-quality actions to meet DEIA goals, which may include DEIA recruitment procedures; supplier diversity plans, and other DEIA initiatives; and
- b. 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.

Justice40 Initiative

- a. Extent to which the Community Benefits Plan identifies: specific, measurable benefits for disadvantaged communities, how the benefits will flow to disadvantaged communities, and how negative environmental impacts affecting disadvantaged communities would be mitigated; and
- b. Extent to which the project would contribute to meeting the objective that 40% of the benefits of climate and clean energy investments will flow to disadvantaged communities.

Technical Merit Review Criterion 3: Technical Approach and Understanding (10%)

- a. Feasibility, appropriateness, rationale, and completeness of the proposed SOPO, such that there is a logical progression of work.
- b. The adequacy and completeness of the PMP in establishing baselines (technical scope, budget, schedule) and in managing project performance relative to those baselines; defining the actions that will be taken when these baselines must be revised; and identification of project risks and strategies for mitigation.
- c. The degree to which the "Facility Type and High-Level Budget Justification" file, in consultation with other project budget files, justifies the facility type and reasonableness of project budget total.

Technical Merit Review Criterion 4: Technical and Management Capabilities, Facilities, and Resources (10%)

- a. The adequacy (quality, availability, and appropriateness) of the facilities (excluding the proposed storage complex field site), and equipment to perform project Tasks.
- b. Degree to which the application provides clear, convincing evidence that the organizations and individuals included in the proposed team are organized in an effective manner and possess the credentials, experience, and capabilities necessary to successfully meet the objectives of the project, have availability to complete work in specified time frame, and provide interest/commitment letters.
- c. The degree, if any, that pre-existing data is provided to perform project Tasks. The degree to which the application demonstrates access to any required data (e.g., commitment letters) or suitable plans to acquire the data.
- d. Depth and clarity of the discussion of previous or current CCUS projects involving

one or more of the proposed partners to demonstrate the experience of the partners, including evidence of past cooperation among various partners to make CCUS a viable carbon management practice.

Merit Review Criterion 5: Financial (40%)

A description of the requested content of the “Business and Financial Plans and Arrangements” is included in **Appendix J: CarbonSAFE Phase IV Entry Requirements**. Note that the applicant should be clear regarding the distinction between financing for the proposed CarbonSAFE Phase IV project and the larger envisioned future commercial project, and is asked to specifically refer to “CarbonSAFE Phase IV” and “commercial project” throughout for clarity.

- a. The adequacy, completeness, and viability of the proposed “Business and Financial Plans and Arrangements.”
- b. Financial condition and capacity of proposed funding sources to provide their portion of project costs, including development costs.
- c. Reasonableness and completeness of “Business and Financial Plans and Arrangements” in demonstrating the potential for the applicant to successfully implement the project.
- d. Viability of financial projections and Financial Model.
- e. Degree of financial commitment to the project evidenced by applicant and other project parties.

AOI 4—Phase II: Storage Complex Feasibility

Technical Merit Review Criterion 1: Project Readiness (35%)

- a. Degree to which the application sufficiently describes how the effort to date has justified that the project is economically attractive and publicly acceptable, including the criteria listed in the “Scenario Analysis” portion of **Appendix G: CarbonSAFE Phase II Project Readiness**.
- b. Degree to which the application sufficiently defines and confirms the adequacy of the storage complex geology of the proposed site for injection of a minimum of 50 million metric tons of CO₂ within a 30-year period. The criteria are listed in the “Technical Sub-Basinal Evaluation” section of **Appendix G: CarbonSAFE Phase II Project Readiness**.
- c. Degree to which the application sufficiently summarizes the process used in selecting the proposed site, including the criteria listed in the “Regional Analysis” section of **Appendix G: CarbonSAFE Phase II Project Readiness**.
- d. Degree to which the application sufficiently addresses the CO₂ source, transport mechanism, and constituent breakdown of the CO₂ stream as summarized in the “CO₂ Technical Analysis” section of **Appendix G: CarbonSAFE Phase II Project Readiness**.
- e. Degree to which the application describes the CO₂ transport opportunities.

Technical Merit Review Criterion 2: Community Benefits Plan (20%)

This criterion involves consideration of the following factors:

Community Labor and Engagement

- a.** Extent to which the applicant demonstrates community and labor engagement to date that results in support for the proposed project;
- b.** Extent to which the applicant has a clear and appropriately robust plan to engage – ideally through a clear commitment to negotiate an enforceable Workforce and Community Agreements with labor unions, Tribal entities, and community-based organizations that support or work with disadvantaged communities and other affected stakeholders;
- c.** Extent to which the applicant has considered accountability to affected workers and community stakeholders, including those most vulnerable to project activities with a plan to publicly share SMART community benefits plan commitments; and
- d.** Extent to which the applicant demonstrates that community and labor engagement will lead to the delivery of high-quality jobs, minimal environmental impact, and allocation of project benefits to disadvantaged communities.

Job Quality and Workforce Continuity

- a.** Quality and manner in which the proposed project will create and/or retain high quality, good-paying jobs with employer-sponsored benefits for all classifications and phases of work;
- b.** Extent to which the project provides employees with the ability to organize, bargain collectively, and participate, through labor organizations of their choosing, in decisions that affect them and that contribute to the effective conduct of business and facilitates amicable settlements of any potential disputes between employees and employers, providing assurances of project efficiency, continuity, and multiple public benefits; and
- c.** Extent to which applicant demonstrates that they are a responsible employer, with ready access to a sufficient supply of appropriately skilled labor, and an effective plan to minimize the risk of labor disputes or disruptions.

Diversity, Equity, Inclusion, and Accessibility

- a.** Extent to which the Community Benefits Plan includes specific and high-quality actions to meet DEIA goals, which may include DEIA recruitment procedures; supplier diversity plans, and other DEIA initiatives; and
- b.** 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.

Justice40 Initiative

- a. Extent to which the Community Benefits Plan identifies: specific, measurable benefits for disadvantaged communities, how the benefits will flow to disadvantaged communities, and how negative environmental impacts affecting disadvantaged communities would be mitigated; and
- b. Extent to which the project would contribute to meeting the objective that 40% of the benefits of climate and clean energy investments will flow to disadvantaged communities.

Technical Merit Review Criterion 3: Technical Approach and Understanding (20%)

- a. Adequacy and feasibility of the Applicant's approach to achieving the objectives of the FOA and applicable AOI.
- b. Feasibility, appropriateness, rationale, and completeness of the proposed Statement of Project Objectives, such that there is a logical progression of work.
- c. The adequacy and completeness of the Project Management Plan (PMP) in establishing baselines (technical scope, budget, schedule) and in managing project performance relative to those baselines; defining the actions that will be taken when these baselines must be revised; and identification of project risks and strategies for mitigation.

Technical Merit Review Criterion 4: Technical and Management Capabilities, Facilities and Resources (15%):

- a. The adequacy (quality, availability and appropriateness) of any pre-existing wells and equipment or facilities that would be used/repurposed for the storage project or used to perform project tasks.
- b. The degree, if any, that pre-existing data is provided to perform project tasks. The degree to which the application demonstrates access to any required data (e.g., commitment letters) or suitable plans to acquire the data.
- c. Degree to which the application provides evidence that the organizations and individuals included in the proposed team are organized in an effective manner and possess the credentials, experience and capabilities necessary to successfully meet the objectives of the project, and have availability to complete work in specified time frame, and provide interest/commitment letters.
- d. Depth and clarity of the discussion of previous or current CCUS projects involving one or more of the proposed partners to demonstrate the experience of the partners, including evidence of past cooperation among various partners to make CCUS a viable carbon management practice.

Merit Review Criterion 5: Financial (10%):

- a. The appropriateness of the Applicant's financial commitment to the project.
- b. The appropriateness of commitment from other parties providing non-federal cost share for Phase II.

- i. For non-federal cost-share commitments that are in the form of cash, each provider must present audited financial statements for the prior year and all unaudited interim financial statements for the current year. If audited financial statements are not available, the financial statements presented must be certified by the Chief Financial Officer of the organization that the statements were prepared on the basis of U.S. Generally Accepted Accounting Principles (US GAAP). Each provider must describe how the financial statements evidence the capacity of the provider to supply their committed cost share.
- ii. For non-federal cost-share commitments that are not in cash, provide a full description of the commitment and justification for the qualification of such commitment as non-federal cost share. Provide supporting evidence regarding the value of the non-cash commitment.
- iii. Applicants must certify in writing that all non-federal cost share will come from qualified sources.

Environmental Evaluation Criteria

The environmental evaluation, which is not point scored, will be conducted as follows. The Environmental Questionnaire(s) will be evaluated to: (1) determine the adequacy and completeness of information submitted; (2) assess the applicant's awareness of project-related requirements, including requirements for mitigating any project-related environmental risks and impacts; (3) assess the applicant's ability to meet compliance requirements and the applicant's approach to identification and resolution of issues; and (4) assess the potential impacts of the proposed work and the potential liability to DOE. The Questionnaire will be used to assist DOE in partially fulfilling requirements for compliance with NEPA and for making a preliminary assessment regarding the level of analysis necessary to comply with NEPA.

The Selection Official may consider the results of this evaluation when making selections.

B. Standards for Application Evaluation

Applications that are determined to be eligible will be evaluated in accordance with this FOA and the guidance provided in the "DOE Merit Review Guide for Financial Assistance," effective September 2020, which is available at: <https://energy.gov/management/downloads/merit-review-guide-financial-assistance-and-unsolicited-proposals-current>.

C. Other Selection Factors

i. Program Policy Factors

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

- The degree to which the proposed project exhibits technological diversity when compared to the existing DOE project portfolio and other projects selected from the subject FOA;
- The degree to which the proposed project, including proposed cost share, optimizes the use of available DOE funding to achieve programmatic objectives;
- The level of industry involvement and demonstrated ability to accelerate demonstration and commercialization and overcome key market barriers;
- The degree to which the proposed project is likely to lead to increased high-quality employment and manufacturing in the United States;
- The degree to which the proposed project will accelerate transformational technological advances in areas that industry by itself is not likely to undertake because of technical and financial uncertainty;
- The degree to which the proposed project, or group of projects, represent a desired geographic distribution (considering past awards and current applications);
- The degree to which the proposed project incorporates applicant or team members from Minority Serving Institutions (e.g., Historically Black Colleges and Universities (HBCUs) and Other Minority Serving Institutions such as Tribal Colleges and Universities); and partnerships with Minority Business Enterprises, Minority Owned Businesses, Woman Owned Businesses, Veteran Owned Businesses, or Indian Tribes Nations;
- The degree to which the proposed project, when compared to the existing DOE project portfolio and other projects to be selected from the subject FOA, contributes to the total portfolio meeting the goals reflected in the Community Benefits Plan criteria; and
- It may be desirable to select for award a project, or group of projects, that represent a diversity of technical approaches, storage types, depositional environments, facility types, and methods (i.e., a variety of carbon capture methods and types of industrial sources) under this FOA or the overall program.
- It may be desirable to select for award a project, or a group of projects, that represents a diversity of storage capacities (50 million metric tons to at least 1 billion metric tons) and a diversity of injection rates among DOE's portfolio of funded projects for geologic carbon storage.
- It may be desirable to select projects with substantial CO₂ storage capacity or projects that will store CO₂ from multiple carbon capture facilities.
- It may be desirable to support complementary (e.g., mitigation and removal projects) and/or similar projects which, when taken together, will best achieve the program's research goals and objectives.
- To best achieve the program's goals and objectives, it may be desirable to select a project or group of projects with a geographic or basinal/sub-basin

distribution that balances carbon management opportunities across the nation.

- It may be desirable to select a project, or group of projects, if such a selection will optimize use of available funds.
- It may be desirable to select a project, or group of projects, if such a selection presents lesser schedule risk, lesser budget risk, lesser technical risk, lesser environmental risks. Environmental risk includes, but is not limited to, an adverse impact to air, soil, or water, or an increase in overall cradle-to-grave GHG footprint (carbon dioxide equivalent, CO₂e).
- It may be desirable to select an entity located in an urban and economically distressed area including a Qualified Opportunity Zone (QOZ), or to select a project, or group of projects, if the proposed project(s) will occur in a QOZ or otherwise advance the goals of a QOZ, including spurring economic development and job creation in distressed communities throughout the United States. QOZ is an economically distressed community where new investments, under certain conditions, may be eligible for preferential tax treatment. Localities qualify as QOZs if they have been nominated for that designation by a state, the District of Columbia, or a U.S. territory, and that nomination has been certified by the Secretary of the U.S. Treasury via his delegation of authority to the Internal Revenue Service (IRS). More information is available at: <https://www.irs.gov/credits-deductions/opportunity-zones-frequently-asked-questions#:~:text=What%20is%20a%20Qualified%20Opportunity%20Zone%20%28QOZ%29%3F%20A1.,conditions%2C%20may%20be%20eligible%20for%20preferential%20tax%20treatment>.
- It may be desirable to select projects for award that have higher levels of participation and teaming arrangements from partnerships among industrial, academic, and government entities.
- It may be desirable to select a project, or group of projects, that will procure U.S. iron, steel, manufactured projects, and construction materials.

D. Evaluation and Selection Process

i. 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 FOA. Ultimately, the Selection Official considers the recommendations of the reviewers, along with other considerations such as program policy factors, in determining which applications to select.

ii. Recipient Responsibility and Qualifications

DOE, prior to making a federal award with a total amount of federal share greater than the simplified acquisition threshold, is required to review and consider any responsibility and qualification information about the applicant that is in the entity information domain in [SAM.gov](https://sam.gov) (see 41 U.S.C. § 2313).

The applicant, at its option, may review information in the entity information domain in [SAM.gov](https://sam.gov) and comment on any information about itself that a federal awarding agency previously entered and is currently in the entity information domain in [SAM.gov](https://sam.gov).

DOE will consider any written comments by the applicant, in addition to the other information in the entity information domain in [SAM.gov](https://sam.gov), in making a judgment about the applicant's integrity, business ethics, and record of performance under federal awards when completing the review of risk posed by applicants as described in 2 CFR 200.206.

iii. Selection

The Selection Official may consider the technical merit, the Federal Consensus Board's recommendations, program policy factors, and the amount of funds available in arriving at selections for this FOA.

E. Anticipated Notice of Selection and Award Negotiation Dates

DOE anticipates notifying applicants selected for negotiation of award and negotiating awards by the dates provided on the cover page of this FOA.

VI. Award Administration Information

A. Award Notices

i. Ineligible Submissions

Ineligible Full Applications will not be further reviewed or considered for award. The Contracting Officer will send a notification letter by email to the technical and administrative points of contact designated by the applicant. The notification letter will state the basis upon which the Full Application is ineligible and not considered for further review.

ii. Full 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 Grants.gov. The notification letter will inform the applicant whether or not its Full Application was selected for award negotiations. Alternatively, DOE may notify one or more applicants that a final selection determination on particular Full Applications will be made at a later date, subject to the availability of funds or other factors.

iii. Successful Applicants

Receipt of a notification letter selecting a Full Application for award negotiations does not authorize the applicant to commence performance of the project. If an application is selected for award negotiations, it is not a commitment by DOE to issue an award. Applicants do not receive an award until award negotiations are complete and the Contracting Officer executes the funding agreement, accessible by the prime recipient in FedConnect.

The award negotiation process will take approximately 120 days. Applicants must designate a primary and a backup point-of-contact in Grants.gov with whom DOE will communicate to conduct award negotiations. The applicant must be responsive during award negotiations (i.e., provide requested 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.

Please refer to Section IV.I.ii. of the FOA for guidance on pre-award costs.

NOTE: Applicants may have an opportunity during award negotiations, if selected, to amend certain aspects of their application if there are changes in the applicable regulations or regulatory processes or laws that would affect their applications if the date of the change (in applicable regulations or regulatory processes or laws) rendered the applicant unable to account for the changes in their original application.

submittal. This opportunity to amend certain aspects of the application, if selected, could be applied to the issuance of new laws or changes in regulations by BSEE, BOEM, EPA, other federal agencies, state governments and agencies, and local governments.

iv. 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 Full Application for federal funding in the future. A notification letter stating the Full 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 Full Application for award negotiations.

v. Unsuccessful Applicants

DOE shall 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.

B. Administrative and National Policy Requirements

i. Registration Requirements

There are several one-time actions before submitting an application in response to this FOA, and it is vital that applicants address these items as soon as possible. Some may take several weeks, and failure to complete them could interfere with an applicant's ability to apply to this FOA, or to meet the negotiation deadlines and receive an award if the application is selected. These requirements are as follows:

1. System for Award Management

Register with the SAM at <https://www.sam.gov>. Designating an Electronic Business Point of Contact (EBiz POC) and obtaining a special password called a Marketing Partner ID Number (MPIN) are important steps in SAM registration. Please update your SAM registration annually.

2. FedConnect

Register in FedConnect at <https://www.fedconnect.net>. To create an organization account, your organization's SAM MPIN is required. For more information about the SAM MPIN or other registration requirements, review the FedConnect Ready, Set, Go! Guide at https://www.fedconnect.net/FedConnect/Marketing/Documents/FedConnect_Ready_Set_Go.pdf.

3. Grants.gov

Register in Grants.gov (<https://www.grants.gov/>) to receive automatic updates when Amendments to this FOA are posted.

4. Electronic Authorization of Applications and Award Documents

Submission of an application and supplemental information under this FOA through electronic systems used by the DOE, including Grants.gov and FedConnect.net, constitutes the authorized representative's approval and electronic signature.

ii. Award Administrative Requirements

The administrative requirements for DOE grants and cooperative agreements are contained in 2 CFR Part 200 as amended by 2 CFR Part 910.

iii. Foreign National Participation (April 2023)

All applicants selected for an award under this FOA and project participants (including subrecipients and contractors) who anticipate involving foreign nationals in the performance of an award, will be required to provide DOE with specific information about each foreign national to satisfy requirements for foreign national participation and access approvals. The volume and type of information collected may depend on various factors associated with the award. DOE concurrence may be required before a foreign national can participate in the performance of any work under an award.

Approval for foreign nationals in Principal Investigator/Co-Investigator roles, from countries of risk (i.e., China, Iran, North Korea, and Russia), or from countries identified on the U.S. Department of State's list of State Sponsors of Terrorism (<https://www.state.gov/state-sponsors-of-terrorism/>) may require written authorization from DOE before they can participate in the performance of any work under an award.

A "foreign national" is defined as any person who is not a United States citizen by birth or naturalization. DOE may elect to deny foreign national's participation in the award. Likewise, DOE may elect to deny a foreign national's access to a DOE sites, information, technologies, equipment, programs, or personnel.

Applicants selected for award negotiations must include this requirement in subawards.

iv. Subaward and Executive Reporting

Additional administrative requirements necessary for DOE grants and cooperative agreements to comply with the Federal Funding and Transparency Act of 2006 (FFATA) are contained in 2 CFR Part 170. Prime recipients must register with the new FFATA Subaward Reporting System database and report the required data on their first tier subrecipients. Prime recipients must report the executive compensation for their own executives as part of their registration profile in SAM.

v. National Policy Requirements

The National Policy Assurances that are incorporated as a term and condition of award are located at: <http://www.nsf.gov/awards/managing/rtc.jsp>.

vi. Environmental Review in Accordance with National Environmental Policy Act (NEPA)

DOE's decision whether and how to distribute federal funds under this FOA is subject to NEPA (42 U.S.C. § 4321, *et seq.*). NEPA 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 NEPA website, at <https://www.energy.gov/nepa>.

While NEPA compliance is a federal agency responsibility and the ultimate decisions remain with the federal agency, all recipients selected for an award will be required to assist in the timely and effective completion of the NEPA process in the manner most pertinent to their proposed project. If DOE determines certain records must be prepared to complete the NEPA review process (e.g., biological evaluations or environmental assessments), the recipient may be required to prepare the records and the costs to prepare the necessary records may be included as part of the project costs.

vii. Applicant Representations and Certifications

1. Lobbying Restrictions

By accepting funds under this award, the prime recipient agrees that none of the funds obligated on the award shall be expended, directly or indirectly, to influence Congressional action on any legislation or appropriation matters pending before Congress, other than to communicate to Members of Congress as described in 18 U.S.C. § 1913. This restriction is in addition to those prescribed elsewhere in statute and regulation.

2. Corporate Felony Conviction and Federal Tax Liability Representations

In submitting an application in response to this FOA, the applicant represents that:

- a.** It is **not** a corporation that has been convicted of a felony criminal violation under any federal law within the preceding 24 months; and
- b.** It is **not** a corporation that has any unpaid federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

For purposes of these representations the following definitions apply:

A Corporation includes any entity that has filed articles of incorporation in any of the 50 states, the District of Columbia, or the various territories of the United States [but not foreign corporations]. It includes both for-profit and non-profit organizations.

3. Nondisclosure and Confidentiality Agreements Representations

In submitting an application in response to this FOA the applicant represents that:

- a. It **does not and will not** require its employees or contractors to sign internal nondisclosure or confidentiality agreements or statements prohibiting or otherwise restricting its employees or contractors from lawfully reporting waste, fraud, or abuse to a designated investigative or law enforcement representative of a federal department or agency authorized to receive such information.
- b. It **does not and will not** use any federal funds to implement or enforce any nondisclosure and/or confidentiality policy, form, or agreement it uses unless it contains the following provisions:
 - (1) *“These provisions are consistent with and do not supersede, conflict with, or otherwise alter the employee obligations, rights, or liabilities created by existing statute or Executive Order relating to (1) classified information, (2) communications to Congress, (3) the reporting to an Inspector General of a violation of any law, rule, or regulation, or mismanagement, a gross waste of funds, an abuse of authority, or a substantial and specific danger to public health or safety, or (4) any other whistleblower protection. The definitions, requirements, obligations, rights, sanctions, and liabilities created by controlling Executive Orders and statutory provisions are incorporated into this agreement and are controlling.”*
 - (2) The limitation above shall not contravene requirements applicable to Standard Form 312 Classified Information Nondisclosure Agreement (<https://fas.org/sgp/othergov/sf312.pdf>), Form 4414 Sensitive Compartmented Information Disclosure Agreement (<https://fas.org/sgp/othergov/intel/sf4414.pdf>), or any other form issued by a federal department or agency governing the nondisclosure of classified information.
 - (3) Notwithstanding the provision listed in paragraph (a), a nondisclosure or confidentiality policy form or agreement that is to be executed by a person connected with the conduct of an intelligence or intelligence-related activity, other than an employee or officer of the United States government, may contain provisions appropriate to the particular activity for which such document is to be used. Such form or agreement shall, at a minimum, require that the person will not disclose any classified information received in the course of such activity unless specifically authorized to do so by the United States government. Such nondisclosure or confidentiality forms shall also make it clear that they do not bar disclosures to Congress, or to an authorized official of an executive agency or the Department of Justice, that are essential to reporting a substantial violation of law.

viii. Statement of Federal Stewardship

DOE will exercise normal federal stewardship in overseeing the project activities performed under DOE awards. Stewardship Activities include, but are not limited to, conducting site visits; reviewing performance and financial reports; providing assistance and/or temporary intervention in unusual circumstances to correct deficiencies that develop during the project; assuring compliance with terms and conditions; and reviewing technical performance after project completion to ensure that the project objectives have been accomplished.

ix. Statement of Substantial Involvement

DOE has substantial involvement in work performed under awards made as a result of this FOA. DOE does not limit its involvement to the administrative requirements of the award. Instead, DOE has substantial involvement in the direction and redirection of the technical aspects of the project as a whole. Substantial involvement includes, but is not limited to, the following:

Recipient's Responsibilities. The Recipient is responsible for:

1. Performing the activities supported by this award in accordance with the PMP, including providing the required personnel, facilities, equipment, supplies, and services.
2. Managing and controlling project activities in accordance with established processes and procedures to ensure Tasks and Subtasks are completed within schedule and budget constraints defined by the current PMP.
3. Implementing an approach to identify, analyze, and respond to project risks that is commensurate with the complexity of the project.
4. Defining and revising approaches and plans, submitting the plans to DOE for review, and incorporating DOE comments.
5. Coordinating related project activities with subrecipients and external suppliers, including contractors, to ensure effective integration of all work elements.
6. Attending annual project review meetings and reporting project status.
7. Participating in peer review evaluations of the project, or peer review evaluations of the program that their project supports.
8. Submitting technical reports and publicly releasable documents that incorporate DOE comments.
9. Presenting the project results at appropriate technical conferences or meetings as directed by the DOE Project Officer.
10. Submitting data generated as a result of this project to NETL for inclusion in the NETL Energy Data eXchange (EDX) at: <https://edx.netl.doe.gov/>.

DOE Responsibilities. DOE has the right to intervene in the conduct or performance of project activities for programmatic reasons. Intervention includes the interruption or

modification of the conduct or performance of project activities. Suspension or termination of the cooperative agreement under 2 CFR part 200, as amended by 2 CFR part 910 (DOE Financial Assistance Regulations), does not constitute intervention in the conduct or performance of project activities.

DOE is responsible for:

1. Reviewing in a timely manner project plans, including project management, testing and technology transfer plans, and recommending alternate approaches if the plans do not address critical programmatic issues.
2. Participating in project management planning activities, including risk analysis, to ensure DOE's program requirements or limitations are considered in performance of the work elements.
3. Conducting annual project review meetings to ensure adequate progress and that the work accomplishes the program and project objectives. Recommending alternate approaches or shifting work emphasis, if needed.
4. Providing substantial involvement to ensure that project results address critical system and programmatic goals established by DOE/FECM, in coordination with DOE's Carbon Transport and Storage Program.
5. Promoting and facilitating technology transfer activities, including disseminating program results through presentations and publications.
6. Serving as scientific/technical liaison between awardees and other program or industry staff.
7. Reviewing and concurring with ongoing technical performance to ensure that adequate progress has been obtained within the current Budget Period authorized by DOE before work can commence on subsequent Budget Periods.

x. Subject Invention Utilization Reporting

To ensure that prime recipients and subrecipients holding title to subject inventions are taking the appropriate steps to commercialize subject inventions, DOE may require that each prime recipient holding title to a subject invention submit annual reports for ten (10) years from the date the subject invention was disclosed to DOE on the utilization of the subject invention and efforts made by prime recipient or their licensees or assignees to stimulate such utilization. The reports must include information regarding the status of development, date of first commercial sale or use, gross royalties received by the prime recipient, and such other data and information as DOE may specify.

xi. Intellectual Property Provisions

The standard DOE financial assistance intellectual property provisions applicable to the various types of recipients are located at <http://energy.gov/gc/standard-intellectual-property-ip-provisions-financial-assistance-awards>.

xii. Energy Data eXchange (EDX) Requirements

The DOE is required to improve access to federally funded research results, proper archiving of digital data, and expanded discovery and reuse of research datasets per DOE and Executive Orders. The Energy Data eXchange (EDX) is a data laboratory developed and maintained by NETL to find, connect, curate, use, and re-use data to advance fossil energy and environmental research and development (R&D).

Data products generated under the resulting award will be required to be submitted in the EDX at <https://edx.netl.doe.gov/>. Data products include but are not limited to software code, tools, applications, webpages, portfolios, images, videos, and datasets.

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

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

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

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

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

The Recipient or subrecipient should coordinate with the Project Manager on an annual basis to assess if there is data that should be submitted to EDX and identify the proper

file formats prior to submission. All final data products shall be submitted to EDX by the Recipient prior to the completion of the project.

xiii. Reporting

Reporting requirements are identified on the Federal Assistance Reporting Checklist and Instructions, DOE F 4600.2, attached to the award agreement.

Additional reporting requirements apply to projects funded by BIL. DOE may require specific data collection to track progress toward key departmental goals: ensuring justice and equity, investing in the American workforce, 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 labor disputes and disruptions
 - Contributions to ratio of apprentice-to-journey level workers employed
- Number of trainings completed, trainees placed in full-time employment, or number of trainings with workforce partnerships involving employers, community-based organizations, or labor unions.
- Justice and Equity data, including:
 - Minority Business Enterprises, Minority Owned Businesses, Woman Owned Businesses and Veteran Owned Businesses acting as vendors and sub-contractors for bids on supplies, services and equipment.
 - Value, number, and type of partnerships with MSIs
 - Stakeholder engagement events, consent-based siting activities
 - Other relevant indicators from the Community Benefits Plan
- Number and type of energy efficient and clean energy equipment installed
- Funding leveraged, follow-on-funding, Intellectual Property (IP) Generation and IP Utilization

xiv. Conference Spending

The recipient shall not expend any funds on a conference not directly and programmatically related to the purpose for which the grant or cooperative agreement was awarded that would defray the cost to the United States government of a conference held by any Executive branch department, agency, board, commission, or office for which the cost to the United States government would otherwise exceed \$20,000, thereby circumventing the required notification by the head of any such Executive Branch department, agency, board, commission, or office to the Inspector General (or senior ethics official for any entity without an Inspector General), of the date, location, and number of employees attending such conference.

xv. Indemnity

Awards resulting from this FOA will contain the following provision reminding Recipient's of DOE's right of indemnification.

The Recipient shall indemnify the Government and its officers, agents, or employees for any and all liability, including litigation expenses and attorney's fees, arising from suits, actions, or claims of any character for death, bodily injury, or loss of damage to property or to the environment, resulting from the project, except to the extent that such liability results from the direct fault or negligence of Government officers, agents or employees, or to the extent such liability may not be covered by applicable allowable costs provisions.

xvi. Uniform Commercial Code (UCC) Financing Statements

Per 2 CFR 910.360 (Real Property and Equipment) when a piece of equipment is purchased by a for-profit recipient or subrecipient with federal funds, and when the federal share of the financial assistance agreement is more than \$1,000,000, the recipient or subrecipient must:

Properly record, and consent to the Department's ability to properly record if the recipient fails to do so, UCC financing statement(s) for all equipment in excess of \$5,000 purchased with project funds. These financing statement(s) must be approved in writing by the Contracting Officer prior to the recording, and they shall provide notice that the recipient's title to all equipment (not real property) purchased with federal funds under the financial assistance agreement is conditional pursuant to the terms of this section, and that the government retains an undivided reversionary interest in the equipment. The UCC financing statement(s) must be filed before the Contracting Officer may reimburse the recipient for the federal share of the equipment unless otherwise provided for in the relevant financial assistance agreement. The recipient shall further make any amendments to the financing statements or additional recordings, including appropriate continuation statements, as necessary or as the Contracting Officer may direct.

xvii. Implementation of Executive Order 13798, Promoting Free Speech and Religious Liberty

States, local governments, or other public entities may not condition sub-awards in a manner that would discriminate, or disadvantage sub-recipients based on their religious character.

xviii. Participants and Collaborating Organizations

If selected for award negotiations, the selected applicant must submit a list of personnel who are proposed to work on the project, both at the recipient and subrecipient level and a list of proposed collaborating organizations prior to award. Recipients will have an

ongoing responsibility to notify DOE of changes to the personnel and collaborating organizations, and submit updated information during the life of the award.

xix. Current and Pending Support

If selected for award negotiations, within 30 days of the selection notice, the selectee must submit 1) current and pending support disclosures and resumes for any new PIs or 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 PI and senior/key personnel, and 2) updated disclosures if there are changes to the current and pending support previously submitted to DOE. Also See Section IV.C.xviii.

xx. U.S. Manufacturing Commitments

A primary objective of DOE's multi-billion-dollar research, development, and demonstration investments is to cultivate new research and development ecosystems, manufacturing capabilities, and supply chains for and by United States industry and labor. Therefore, in exchange for receiving taxpayer dollars to support an applicant's project, the applicant must agree to a U.S. Competitiveness provision requiring that any products embodying any subject invention or produced through the use of any subject invention will be manufactured substantially in the United States unless the Recipient can show to the satisfaction of DOE that it is not commercially feasible. Award terms, including the specific U.S. Competitiveness Provision applicable to the various types of Recipients and projects, are available at <https://www.energy.gov/gc/standard-intellectual-property-ip-provisions-financial-assistance-awards>.

Please note that a subject invention is any invention conceived or first actually reduced to practice in performance of work under an award. An invention is any invention or discovery which is or may be patentable. The recipient includes any awardee, recipient, sub-awardee, or sub-recipient.

As noted in the U.S. Competitiveness Provision, if an entity cannot meet the requirements of the U.S. Competitiveness Provision, the entity may request a modification or waiver of the U.S. Competitiveness Provision. For example, the entity may propose modifying the language of the U.S. Competitiveness Provision in order to change the scope of the requirements or to provide more specifics on the application of the requirements for a particular technology. As another example, the entity may request that the U.S. Competitiveness Provision be waived in lieu of a net benefits statement or United States manufacturing plan. The statement or plan would contain specific and enforceable commitments that would be beneficial to the United States economy and competitiveness. Examples of such commitments could include manufacturing specific products in the United States, making a specific investment in a new or existing United States manufacturing facility, keeping certain activities based in

the United States or supporting a certain number of jobs in the United States related to the technology. DOE may, in its sole discretion, determine that the proposed modification or waiver promotes commercialization and provides substantial United States economic benefits, and grant the request. If granted, DOE will modify the award terms and conditions for the requesting entity accordingly.

More information and guidance on the waiver and modification request process can be found in the DOE Financial Assistance Letter on this topic, available at <https://www.energy.gov/management/pf-2022-09-fal-2022-01-implementation-doe-determination-exceptional-circumstances-under>. Additional information on DOE's Commitment to Domestic Manufacturing for DOE-funded R&D is available at <https://www.energy.gov/gc/us-manufacturing>.

The U.S. Competitiveness Provision is implemented by DOE pursuant to a Determination of Exceptional Circumstances (DEC) under the Bayh-Dole Act and DOE Patent Waivers. See Section VIII.J. Title to Subject Inventions of this FOA for more information on the DEC and DOE Patent Waivers.

xxi. Interim Conflict of Interest Policy for Financial Assistance

The DOE interim Conflict of Interest Policy for Financial Assistance (COI Policy)³⁰ is applicable to all non-Federal entities applying for, or that receive, DOE funding by means of a financial assistance award (e.g., a grant, cooperative agreement, or technology investment agreement) and, through the implementation of this policy by the entity, to each Investigator who is planning to participate in, or is participating in, the project funded wholly or in part under the DOE financial assistance award. The term "Investigator" means the PI and any other person, regardless of title or position, who is responsible for the purpose, design, conduct, or reporting of a project funded by DOE or proposed for funding by DOE. Recipients must flow down the requirements of the interim COI Policy to any subrecipient non-Federal entities. Further, for DOE funded projects, the recipient must include all financial conflicts of interest (FCOI) (i.e., managed and unmanaged/unmanageable) in their initial and ongoing FCOI reports.

It is understood that non-Federal entities and individuals receiving DOE financial assistance awards will need sufficient time to come into full compliance with DOE's interim COI Policy. To provide some flexibility, DOE allows for a staggered implementation. **Specifically, prior to award, applicants selected for award negotiations must: ensure all Investigators complete their significant financial disclosures; review the disclosures; determine whether a FCOI exists; develop and implement a management plan for FCOIs; and provide DOE with an initial FCOI report that includes all FCOIs (i.e., managed and unmanaged/unmanageable).** Recipients will have 180 days from the date of the award to come into full compliance with the other

³⁰ DOE's interim COI Policy can be found at [PF 2022-17 FAL 2022-02 Department of Energy Interim Conflict of Interest Policy Requirements for Financial Assistance](#).

requirements set forth in DOE's interim COI Policy. **Prior to award, the applicant must certify that it is, or will be within 180 days of the award, compliant with all requirements in the COI Policy.**

xxii. Fraud, Waste and Abuse

The mission of the DOE Office of Inspector General (OIG) is to strengthen the integrity, economy and efficiency of the Department's programs and operations including deterring and detecting fraud, waste, abuse and mismanagement. The OIG accomplishes this mission primarily through investigations, audits, and inspections of DOE activities to include grants, cooperative agreements, loans, and contracts.

The OIG maintains a Hotline for reporting allegations of fraud, waste, abuse, or mismanagement. To report such allegations, please visit <https://www.energy.gov/ig/ig-hotline>.

Additionally, recipients of DOE awards must be cognizant of the requirements of [2 CFR 200.113 Mandatory disclosures](#), which states:

The non-Federal entity or applicant for a Federal award must disclose, in a timely manner, in writing to the Federal awarding agency or pass-through entity all violations of Federal criminal law involving fraud, bribery, or gratuity violations potentially affecting the Federal award. Non-Federal entities that have received a Federal award including the term and condition outlined in appendix XII of 2 CFR Part 200 are required to report certain civil, criminal, or administrative proceedings to SAM. Failure to make required disclosures can result in any of the remedies described in [2 CFR 200.339](#). (See also [2 CFR part 180](#), [31 U.S.C. § 3321](#), and [41 U.S.C. § 2313](#).) [[85 FR 49539](#), Aug. 13, 2020]

Applicants and subrecipients (if applicable) are encouraged to allocate sufficient costs in the project budget to cover the costs associated for personnel and data infrastructure needs to support performance management and program evaluation needs including but not limited to independent program and project audits to mitigate risks for fraud, waste, and abuse.

xxiii. Human Subjects Research

Research involving human subjects, biospecimens, or identifiable private information conducted with DOE funding is subject to the requirements of DOE Order 443.1C, Protection of Human Research Subjects, 45 CFR Part 46, Protection of Human Subjects (subpart A which is referred to as the "Common Rule"), and 10 CFR Part 745, Protection of Human Subjects.

Additional information on the DOE Human Subjects Research Program can be found at: [HUMAN SUBJECTS Human Subjects Pr... | U.S. DOE Office of Science \(SC\) \(osti.gov\)](#).

xxiv. Cybersecurity Plan (if applicable)

In accordance with BIL Section 40126, applicants selected for award negotiations must submit an acceptable cybersecurity plan to DOE prior to receiving funding.³¹ These plans are intended to foster a cybersecurity-by-design approach for BIL efforts. The Department will also use these plans to ensure effective integration and coordination across its research, development, and demonstration programs. **A cybersecurity plan is NOT required as part of the application submission for this FOA, but all projects selected under this FOA will be required to submit a cybersecurity plan during the award negotiation phase.**

The Department recommends using open guidance and standards such as the National Institute of Standards and Technology's (NIST) Cybersecurity Framework (CSF) and the DOE Cybersecurity Capability Maturity Model (C2M2).³² The cybersecurity plan created pursuant to BIL Section 40126 should document any deviation from open standards, as well as the utilization of proprietary standards where the awardee determines that such deviation is necessary.

- Cybersecurity plans should be commensurate to the threats and vulnerabilities associated with the proposed efforts and demonstrate the cybersecurity maturity of the project.
- Cybersecurity plans may cover a range of topics relevant to the proposed project, e.g., software development lifecycle, third-party risks, and incident reporting.
- At a minimum, cybersecurity plans should address questions noted in BIL section 40126 (b) 'Contents of Cybersecurity Plan'.³³

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

³¹ 42 U.S.C. § 18725

³² NERC critical infrastructure protection (CIP) standards for entities responsible for the availability and reliability of the bulk electric system. NIST IR 7628: 2 Smart grid cyber security strategy and requirements. NIST SP800-53, Recommended Security Controls for Federal Information Systems and Organizations: Catalog of security controls in 18 categories, along with profiles for low-, moderate-, and high-impact systems. NIST SP800-82, Guide to Industrial Control Systems (ICS) Security. NIST SP800-39, Integrated Enterprise-Wide Risk Management: Organization, mission, and information system view. AMI System Security Requirements: Security requirements for advanced metering infrastructure. ISO (International Organization for Standardization) 27001, Information Security Management Systems: Guidance on establishing governance and control over security activities (this document must be purchased). IEEE (Institute of Electrical and Electronics Engineers) 1686-2007, Standard for Substation Intelligent Electronic Devices (IEDs) Cyber Security Capabilities (this document must be purchased). DOE Cybersecurity Capability Maturity Model (C2M2).

³³ 42 U.S.C. § 18725

xxv. Real Property and Equipment

Real property and equipment purchased with project funds (federal share and recipient cost share) are subject to the requirements at 2 CFR 200.310, 200.311, 200.313, and 200.316 (non-Federal entities, except for-profit entities) and 2 CFR 910.360 (for-profit entities). For projects selected for award under this FOA, the recipient may (1) take disposition action on the real property and equipment; or (2) continue to use the real property and equipment after the conclusion of the award period of performance, with Contracting Officer approval.

The recipient's written Request for Continued Use must identify the property and include: a summary of how the property will be used (must align with the authorized project purposes); a proposed use period, (e.g., perpetuity, until fully depreciated, or a calendar date where the recipient expects to submit disposition instructions); acknowledgement that the recipient shall not sell or encumber the property or permit any encumbrance without prior written DOE approval; current fair market value of the property; and an Estimated Useful Life or depreciation schedule for equipment.

When the property is no longer needed for authorized project purposes, the recipient must request disposition instructions from DOE. For-profit entity disposition requirements are set forth at 2 CFR 910.360. Property disposition requirements for other non-federal entities are set forth in 2 CFR 200.310-200.316.

VII. Questions/Agency Contacts

Upon the issuance of a FOA, DOE personnel are prohibited from communicating (in writing or otherwise) with applicants regarding the FOA except through the established question and answer process as described below. Specifically, questions regarding this FOA must be submitted through the FedConnect portal. You must register with FedConnect to respond as an interested party to submit questions, and to view responses to questions. It is recommended that you register as soon after release of the FOA as possible to have the benefit of all responses. Applicants are encouraged to review previously issued Questions and Answers prior to the submission of questions.

Questions and comments concerning this FOA shall be submitted not later than 3 business days prior to the application due date. Please note, feedback on individual concepts will not be provided through Q&A.

NOTE: Please be as clear and concise when asking a question under the FOA and be as specific as possible to which AOI you are asking the question. If it is not clear DOE will be required to ask for additional information and clarity on the question to provide an accurate response which will take additional time

All questions and answers related to this FOA will be posted on the FedConnect portal at: <https://www.FedConnect.net>. DOE will attempt to respond to a question within 3 business days, unless a similar question and answer has already been posted on the website.

Questions relating to the registration process, system requirements, how an application form works, or the submittal process must be directed to Grants.gov at 1-800-518-4726 or support@grants.gov. DOE/NNSA cannot answer these questions.

VIII. Other Information

A. FOA Modifications

Amendments to this FOA will be posted on the Grants.gov system and the FedConnect portal. However, you will only receive an email when an amendment or a FOA is posted on these sites by registering with FedConnect as an interested party for this FOA. DOE recommends that you register as soon after the release of the FOA as possible to ensure you receive timely notice of any amendments or other FOAs.

B. Government Right to Reject or Negotiate

DOE reserves the right, without qualification, to reject any or all applications received in response to this FOA and to select any application, in whole or in part, as a basis for negotiation and/or award.

C. Commitment of Public Funds

The Contracting Officer is the only individual who can make awards or commit the government to the expenditure of public funds. A commitment by anyone other than the Contracting Officer, either express or implied, is invalid.

D. Treatment of Application Information

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

If an application includes trade secrets or business sensitive, proprietary, or otherwise confidential information, it is furnished to the Federal Government in confidence with the understanding that the information shall be used or disclosed only for evaluation 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.

The 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 Full Application, and other applicant submission must be marked as follows and identify the specific pages 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 or in accordance with a financial assistance between the submitter and the Government. The Government may use or disclose any information that is not appropriately marked or otherwise restricted, regardless of source. [End of Notice]

In addition, (1) the header and footer of every page that contains business sensitive, trade secrets, 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.

E. Evaluation and Administration by Non-Federal Personnel

In conducting the merit review evaluation, the Go/No-Go Reviews and Peer 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 (COI) and non-disclosure acknowledgements (NDA) prior to reviewing an application. Non-federal personnel conducting administrative activities must sign an NDA.

F. Notice Regarding Eligible/Ineligible Activities

Eligible activities under this FOA include those which describe and promote the understanding of scientific and technical aspects of specific energy technologies, but not those which encourage or support political activities such as the collection and dissemination of information related to potential, planned or pending legislation.

G. Notice of Right to Conduct a Review of Financial Capability

DOE reserves the right to conduct an independent third party review of financial capability for applicants that are selected for negotiation of award (including personal credit information of principal(s) of a small business if there is insufficient information to determine financial capability of the organization).

H. Requirement for Full and Complete Disclosure

Applicants are required to make a full and complete disclosure of all information requested. Any failure to make a full and complete disclosure of the requested information may result in:

- The termination of award negotiations;
- The modification, suspension, and/or termination of a funding agreement;
- The initiation of debarment proceedings, debarment, and/or a declaration of ineligibility for receipt of federal contracts, subcontracts, and financial assistance and benefits; and
- Civil and/or criminal penalties.

I. Retention of Submissions

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

J. Title to Subject Inventions

Ownership of subject inventions is governed pursuant to the authorities listed below:

- Domestic Small Businesses, Educational Institutions, and Nonprofits: Under the Bayh-Dole Act (35 U.S.C. § 200 et seq.), domestic small businesses, educational institutions, and nonprofits may elect to retain title to their subject inventions;
- All other parties: The federal Non-Nuclear Energy Act of 1974, 42. U.S.C. § 5908, provides that the government obtains title to new inventions unless a waiver is granted (see below);
- Class Patent Waiver:

DOE has issued a class waiver that applies to this FOA. Under this class waiver, domestic large businesses may elect title to their subject inventions similar to the right provided to the domestic small businesses, educational institutions, and nonprofits by law. In order to avail itself of the class waiver, a domestic large business must agree that any products embodying or produced through the use of a subject invention first created or reduced to practice under this program will be substantially manufactured in the United States.

- **Advance and Identified Waivers:** For an applicant not covered by a Class Patent Waiver or the Bayh-Dole Act, the applicant may request a patent waiver that will cover subject inventions that may be invented under the award, in advance of or within 30 days after the effective date of the award. Even if an advance waiver is not requested or the request is denied, the recipient will have a continuing right under the award to request a waiver for identified inventions, i.e., individual subject inventions that are disclosed to DOE within the timeframes set forth in the award's intellectual property data terms and conditions. Any patent waiver that may be granted is subject to certain terms and conditions in 10 CFR 784.
- **DEC:** On June 07, 2021, DOE approved a DETERMINATION OF EXCEPTIONAL CIRCUMSTANCES (DEC) UNDER THE BAYH-DOLE ACT TO FURTHER PROMOTE DOMESTIC MANUFACTURE OF DOE SCIENCE AND ENERGY TECHNOLOGIES. In accordance with this DEC, all awards, including sub-awards, under this FOA shall include the U.S. Competitiveness Provision in accordance with Section VI.B.xviii. U.S. Manufacturing Commitments of this FOA. A copy of the DEC can be found at <https://www.energy.gov/gc/determination-exceptional-circumstances-decs>. Pursuant to 37 CFR 401.4, any nonprofit organization or small business firm as defined by 35 U.S.C. § 201 affected by any DEC has the right to appeal it by providing written notice to DOE within 30 working days from the time it receives a copy of the determination.
- DOE may issue and publish on the website above further DEC's prior to the issuance of awards under this FOA. DOE may require additional submissions or requirements as authorized by any applicable DEC.

K. Government Rights in Subject Inventions

Where prime recipients and subrecipients retain title to subject inventions, the United States government retains certain rights.

Government Use License

The United States government retains a nonexclusive, nontransferable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States any subject invention throughout the world. This license extends to contractors doing work on behalf of the government.

March-In Rights

The United States government retains march-in rights with respect to all subject inventions. Through "march-in rights," the government may require a prime recipient or subrecipient who has elected to retain title to a subject invention (or their assignees or exclusive licensees), to grant a license for use of the invention

to a third party. In addition, the government may grant licenses for use of the subject invention when a prime recipient, subrecipient, or their assignees and exclusive licensees refuse to do so.

DOE may exercise its march-in rights only if it determines that such action is necessary under any of the four following conditions:

- The owner or licensee has not taken or is not expected to take effective steps to achieve practical application of the invention within a reasonable time;
- The owner or licensee has not taken action to alleviate health or safety needs in a reasonably satisfied manner;
- The owner has not met public use requirements specified by federal statutes in a reasonably satisfied manner; or
- The United States manufacturing requirement has not been met.

Any determination that march-in rights are warranted must follow a fact-finding process in which the recipient has certain rights to present evidence and witnesses, confront witnesses and appear with counsel and appeal any adverse decision. To date, DOE has never exercised its march-in rights to any subject inventions.

L. Rights in Technical Data

Data rights differ based on whether data is first produced under an award or instead was developed at private expense outside the award.

“Limited Rights Data”: The United States government will not normally require delivery of confidential or trade secret-type technical data developed solely at private expense prior to issuance of an award, except as necessary to monitor technical progress and evaluate the potential of proposed technologies to reach specific technical and cost metrics.

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

M. Copyright

The prime recipient and subrecipients may assert copyright in copyrightable works, such as software, first produced under the award without DOE approval. When copyright is asserted, the government retains a paid-up nonexclusive, irrevocable worldwide license to reproduce, prepare derivative works, distribute copies to the public, and to perform publicly and display publicly the copyrighted work. This license extends to contractors and others doing work on behalf of the government.

N. Export Control Responsibilities (April 2023)

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 selected applicant must immediately report to DOE any export control violations related to the projected funding under the DOE award, at the prime or subrecipient level, and provide the corrective action(s) to prevent future violations.

O. Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment

As set forth in 2 CFR 200.216, recipients and subrecipients are prohibited from obligating or expending project funds (federal funds and recipient cost share) to procure or obtain; extend or renew a contract to procure or obtain; or Enter into a contract (or extend or renew a contract) to procure or obtain equipment, services, or systems that uses *covered telecommunications equipment or services* as a substantial or essential component of any system, or as critical technology as part of any system. As described in section 889 of Public Law 115-232, *covered telecommunications equipment* is telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).

See Public Law 115-232, section 889, 2 CFR 200.216, and 2 CFR 200.471 for additional information.

P. Personally Identifiable Information (PII)

All information provided by the applicant must to the greatest extent possible exclude PII. The term “PII” refers to 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, mother’s maiden name. See OMB Memorandum M-07-16 dated May 22, 2007, found at: <https://www.whitehouse.gov/sites/whitehouse.gov/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 the 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).

Q. Annual Independent Audits

If a for-profit entity is a prime recipient and has expended \$750,000 or more of DOE awards during the entity's fiscal year, an annual compliance audit performed by an independent auditor is required. For additional information, please refer to 2 CFR 910.501 and Subpart F.

If an educational institution, non-profit organization, or state/local government is a prime recipient or subrecipient and has expended \$750,000 or more of federal awards during the non-federal entity's fiscal year, then a Single or Program-Specific Audit is required. For additional information, please refer to 2 CFR 200.501 and Subpart F.

Applicants and subrecipients (if applicable) should propose sufficient costs in the project budget to cover the costs associated with the audit. DOE will share in the cost of the audit at its applicable cost share ratio.

APPENDIX A – COST SHARE INFORMATION

Cost Sharing or Cost Matching

The terms “cost sharing” and “cost matching” are often used synonymously. Even the DOE Financial Assistance Regulations, 2 CFR 200.306, use both of the terms in the titles specific to regulations applicable to cost sharing. DOE almost always uses the term “cost sharing,” as it conveys the concept that non-federal share is calculated as a percentage of the Total Project Cost. An exception is the State Energy Program Regulation, 10 CFR 420.12, State Matching Contribution. Here “cost matching” for the non-federal share is calculated as a percentage of the federal funds only, rather than the Total Project Cost.

How Cost Sharing Is Calculated

As stated above, cost sharing is calculated as a percentage of the Total Project Cost. FFRDC costs must be included in Total Project Costs. The following is an example of how to calculate cost sharing amounts for a project with \$1,000,000 in federal funds with a minimum 20% non-federal cost sharing requirement:

- Formula: Federal share (\$) divided by federal share (%) = Total Project Cost
Example: \$1,000,000 divided by 80% = \$1,250,000
- Formula: Total Project Cost (\$) minus federal share (\$) = Non-federal share (\$)
Example: \$1,250,000 minus \$1,000,000 = \$250,000
- Formula: Non-federal share (\$) divided by Total Project Cost (\$) = Non-federal share (%)
Example: \$250,000 divided by \$1,250,000 = 20%

What Qualifies For Cost Sharing

While it is not possible to explain what specifically qualifies for cost sharing in one or even a couple of sentences, in general, if a cost is allowable under the cost principles applicable to the organization incurring the cost and is eligible for reimbursement under a DOE grant or cooperative agreement, then it is allowable as cost share. Conversely, if the cost is not allowable under the cost principles and not eligible for reimbursement, then it is not allowable as cost share. In addition, costs may not be counted as cost share if they are paid by the federal government under another award unless authorized by federal statute to be used for cost sharing.

The rules associated with what is allowable as cost share are specific to the type of organization that is receiving funds under the grant or cooperative agreement, though are generally the same for all types of entities. The specific rules applicable to:

- FAR Part 31 for For-Profit entities, (48 CFR Part 31); and
- 2 CFR Part 200 Subpart E - Cost Principles for all other non-federal entities.

In addition to the regulations referenced above, other factors may also come into play such as timing of donations and length of the project period. For example, the value of ten years of donated maintenance on a project that has a project period of five years would not be fully allowable as cost share. Only the value for the five years of donated maintenance that corresponds to the project period is allowable and may be counted as cost share.

Additionally, DOE generally does not allow pre-award costs for either cost share or reimbursement when these costs precede the signing of the appropriation bill that funds the award. In the case of a competitive award, DOE generally does not allow pre-award costs prior to the signing of the Selection Statement by the DOE Selection Official.

General Cost Sharing Rules on a DOE Award

1. Cash Cost Share – encompasses all contributions to the project made by the recipient or subrecipient(s), for costs incurred and paid for during the project. This includes when an organization pays for personnel, supplies, equipment for their own company with organizational resources. If the item or service is reimbursed for, it is cash cost share. All cost share items must be necessary to the performance of the project.
2. In-Kind Cost Share – encompasses all contributions to the project made by the recipient or subrecipient(s) that do not involve a payment or reimbursement and represent donated items or services. In-Kind cost share items include volunteer personnel hours, donated existing equipment, donated existing supplies. The cash value and calculations thereof for all In-Kind cost share items must be justified and explained in the Cost Share section of the project Budget Justification. All cost share items must be necessary to the performance of the project. If questions exist, consult your DOE contact before filling out the In-Kind cost share section of the Budget Justification.
3. Funds from other federal sources MAY NOT be counted as cost share. This prohibition includes FFRDC subrecipients. Non-federal sources include any source not originally derived from federal funds. Cost sharing commitment letters from subrecipients must be provided with the original application.
4. Fee or profit, including foregone fee or profit, are not allowable as project costs (including cost share) under any resulting award. The project may only incur those costs that are allowable and allocable to the project (including cost share) as determined in accordance with the applicable cost principles prescribed in FAR Part 31 for For-Profit entities and 2 CFR Part 200 Subpart E - Cost Principles for all other non-federal entities.

DOE Financial Assistance Rules 2 CFR Part 200 as amended by 2 CFR Part 910

As stated above, the rules associated with what is allowable cost share are generally the same for all types of organizations. Following are the rules found to be common, but again, the specifics are contained in the regulations and cost principles specific to the type of entity:

- (A) Acceptable contributions. All contributions, including cash contributions and third party in-kind contributions, must be accepted as part of the prime recipient's cost sharing if such contributions meet all of the following criteria:

- (1) They are verifiable from the recipient's records.
 - (2) They are not included as contributions for any other federally-assisted project or program.
 - (3) They are necessary and reasonable for the proper and efficient accomplishment of project or program objectives.
 - (4) They are allowable under the cost principles applicable to the type of entity incurring the cost as follows:
 - a. For-profit organizations. Allowability of costs incurred by for-profit organizations and those nonprofit organizations listed in Attachment C to OMB Circular A-122 is determined in accordance with the for-profit cost principles in 48 CFR Part 31 in the FAR, except that patent prosecution costs are not allowable unless specifically authorized in the award document. (v) Commercial Organizations. FAR Subpart 31.2—Contracts with Commercial Organizations; and
 - b. Other types of organizations. For all other non-federal entities, allowability of costs is determined in accordance with 2 CFR Part 200 Subpart E.
 - (5) They are not paid by the federal government under another award unless authorized by federal statute to be used for cost sharing or matching.
 - (6) They are provided for in the approved budget.
- (B) Valuing and documenting contributions
 - (1) Valuing recipient's property or services of recipient's employees. Values are established in accordance with the applicable cost principles, which mean that amounts chargeable to the project are determined on the basis of costs incurred. For real property or equipment used on the project, the cost principles authorize depreciation or use charges. The full value of the item may be applied when the item will be consumed in the performance of the award or fully depreciated by the end of the award. In cases where the full value of a donated capital asset is to be applied as cost sharing or matching, that full value must be the lesser or the following:
 - a. The certified value of the remaining life of the property recorded in the recipient's accounting records at the time of donation; or
 - b. The current fair market value. If there is sufficient justification, the Contracting Officer may approve the use of the current fair market value of the donated property, even if it exceeds the certified value at the time of donation to the project. The Contracting Officer may accept the use of any reasonable basis for determining the fair market value of the property.
 - (2) Valuing services of others' employees. If an employer other than the recipient furnishes the services of an employee, those services are valued at the employee's regular rate of pay, provided these services are for the same skill level for which the employee is normally paid.
 - (3) Valuing volunteer services. Volunteer services furnished by professional and technical personnel, consultants, and other skilled and unskilled labor may be

counted as cost sharing or matching if the service is an integral and necessary part of an approved project or program. Rates for volunteer services must be consistent with those paid for similar work in the recipient's organization. In those markets in which the required skills are not found in the recipient organization, rates must be consistent with those paid for similar work in the labor market in which the recipient competes for the kind of services involved. In either case, paid fringe benefits that are reasonable, allowable, and allocable may be included in the valuation.

(4) Valuing property donated by third parties.

- a.** Donated supplies may include such items as office supplies or laboratory supplies. Value assessed to donated supplies included in the cost sharing or matching share must be reasonable and must not exceed the fair market value of the property at the time of the donation.
- b.** Normally only depreciation or use charges for equipment and buildings may be applied. However, the fair rental charges for land and the full value of equipment or other capital assets may be allowed, when they will be consumed in the performance of the award or fully depreciated by the end of the award, provided that the Contracting Officer has approved the charges. When use charges are applied, values must be determined in accordance with the usual accounting policies of the recipient, with the following qualifications:
 - i.** The value of donated space must not exceed the fair rental value of comparable space as established by an independent appraisal of comparable space and facilities in a privately-owned building in the same locality.
 - ii.** The value of loaned equipment must not exceed its fair rental value.

(5) Documentation. The following requirements pertain to the recipient's supporting records for in-kind contributions from third parties:

- a.** Volunteer services must be documented and, to the extent feasible, supported by the same methods used by the recipient for its own employees.
- b.** The basis for determining the valuation for personal services and property must be documented.

APPENDIX B – 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 economy security.³⁴ For projects selected under this FOA, 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 an explicit waiver request in the Full Application.

Waiver Criteria

Foreign entities seeking to participate in a project funded under this FOA 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 the entity acknowledges and demonstrates that it has the intent and ability to comply with the U.S. Competitiveness Provision (see Section VI.B.xix.); 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, 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;
- c. The rationale for proposing a foreign entity participate (must address criteria above);

³⁴ See [Critical and Emerging Technologies List Update \(whitehouse.gov\)](https://www.whitehouse.gov/critical-emerging-technologies/).

- 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.

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

As set forth in **Section IV.K.iii.**, all work under funding under this FOA 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 an explicit waiver request in the Full 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 FOA 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 United States 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 Intellectual Property (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.

APPENDIX C – REQUIRED USE OF AMERICAN IRON, STEEL, MANUFACTURED PRODUCTS, AND CONSTRUCTION MATERIALS BUY AMERICA REQUIREMENT FOR INFRASTRUCTURE PROJECTS

A. Definitions

For purposes of the Buy America Requirement, based both on the statute and OMB Guidance Document dated April 18, 2022, the following definitions apply:

Construction materials includes an article, material, or supply—other than an item of primarily iron or steel; a manufactured product; cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives³⁵—that is or consists primarily of:

- non-ferrous metals;
- plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables);
- glass (including optic glass);
- lumber; or
- drywall.

Infrastructure includes, at a minimum, the structures, facilities, and equipment for, in the United States, Roads, highways, and bridges; public transportation; Dams, ports, harbors, and other maritime facilities; Intercity passenger and freight railroads; Freight and intermodal facilities; airports; Water systems, including drinking water and wastewater systems; Electrical transmission facilities and systems; utilities; broadband infrastructure; and buildings and real property. Infrastructure includes facilities that generate, transport, and distribute energy.

Moreover, according to the OMB guidance document:

When determining if a program has infrastructure expenditures, Federal agencies should interpret the term “infrastructure” broadly and consider the definition provided above as illustrative and not exhaustive. When determining if a particular construction project of a type not listed in the definition above constitutes “infrastructure,” agencies should consider whether the project will serve a public function, including whether the project is publicly owned and operated, privately operated on behalf of the public, or is a place of public accommodation, as opposed to a project that is privately owned and not open to the public. Projects with the former qualities have greater indicia of infrastructure, while projects with the latter quality have fewer. Projects consisting solely of the purchase, construction, or improvement of a private home for personal use, for example, would not constitute an infrastructure project.

³⁵ BIL, § 70917(c)(1).

The Agency, not the applicant, will have the final say as to whether a given project includes infrastructure, as defined herein. Accordingly, in cases where the “public” nature of the infrastructure is unclear, but the other relevant criteria are met, DOE strongly recommends that applicants complete their full application with the assumption that Buy America requirements will apply to the proposed project.

Project means the construction, alteration, maintenance, or repair of infrastructure in the United States.

B. Buy America Requirement for Infrastructure Projects (“Buy America” Requirements)

In accordance with section 70914 of the BIL, none of the project funds (includes federal share and Recipient cost share) may be used for a project for infrastructure unless:

- (1) all iron and steel used in the project are produced in the United States--This means all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States;
- (2) all manufactured products used in the project are produced in the United States—this means the manufactured product was manufactured in the United States; and the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55 percent of the total cost of all components of the manufactured product, unless another standard for determining the minimum amount of domestic content of the manufactured product has been established under applicable law or regulation; and
- (3) all construction materials³⁶ are produced in the United States—this means that all manufacturing processes for the construction material occurred in the United States.

The Buy America Requirement only apply to articles, materials, and supplies that are consumed in, incorporated into, or affixed to an infrastructure project. As such, it does not apply to tools, equipment, and supplies, such as temporary scaffolding, brought to the construction site and removed at or before the completion of the infrastructure project. Nor does the Buy America Requirement apply to equipment and furnishings, such as movable chairs, desks, and portable computer equipment, that are used at or within the finished infrastructure project, but are not an integral part of the structure or permanently affixed to the infrastructure project.

These requirements must flow down to all sub-awards, all contracts, subcontracts and purchase orders for work performed under the proposed project, except where the prime recipient is a for-profit entity. Based on guidance from the Office of Management and Budget (OMB), the Buy America requirements of the BIL do not apply to DOE projects in which the prime recipient is a for-profit entity; the requirements only apply to projects whose prime recipient is a State, local government, Indian tribe, Institute of Higher Education, or nonprofit organization.

³⁶ Excludes cement and cementitious materials, aggregates such as stone, sand, or gravel, or aggregate binding agents or additives.

For additional information related to the application and implementation of these Buy America requirements, please see OMB Memorandum M-22-11, issued April 18, 2022:

<https://www.whitehouse.gov/wp-content/uploads/2022/04/M-22-11.pdf>

Note that for all applicants – both non-Federal entities and for-profit entities – DOE is including a Program Policy Factor that the Selection Official may consider in determining which Full Applications to select for award negotiations that considers whether the applicant has made a commitment to procure U.S. iron, steel, manufactured products, and construction materials in its project.

C. Waivers

The DOE financial assistance agreement will require each recipient: (1) to fulfill the commitments made in its application regarding the procurement of U.S.-produced products and (2) to fulfill the commitments made in its application regarding the procurement of other key component metals and manufactured products domestically that are deemed available in sufficient and reasonable available quantities or of a satisfactory quality at the time of award negotiation.

In limited circumstances, DOE may waive the application of the Buy America Requirement where DOE determines that:

- (1) applying the Buy America requirements would be inconsistent with the public interest;
- (2) the types of iron, steel, manufactured products, or construction materials are not produced in the United States in sufficient and reasonably available quantities or of a satisfactory quality; or
- (3) the inclusion of iron, steel, manufactured products, or construction materials produced in the United States will increase the cost of the overall project by more than 25 percent.

If an applicant or recipient is seeking a waiver of the Buy America requirements, it may submit a waiver request after it has been notified of its selection for award negotiations. A waiver request must include:

- A detailed justification for the use of “non-domestic” iron, steel, manufactured products, or construction materials to include an explanation as to how the non-domestic item(s) is essential to the project;
- A certification that the applicant or recipient made a good faith effort to solicit bids for domestic products supported by terms included in requests for proposals, contracts, and nonproprietary communications with potential suppliers;
- Applicant /Recipient name and Unique Entity Identifier (UEI)
- Total estimated project cost, DOE and cost-share amounts
- Project description and location (to the extent known)
- List and description of iron or steel item(s), manufactured goods, and construction material(s) the applicant or recipient seeks to waive from Domestic Content

- Procurement Preference requirement, including name, cost, country(ies) of origin (if known), and relevant Product Service Codes (PSC) and North American Industry Classification System (NAICS) code for each
- Waiver justification including due diligence performed (e.g., market research, industry outreach) by the applicant or recipient
 - Anticipated impact if no waiver is issued.

DOE may require additional information before considering the waiver request.

Waiver requests are subject to public comment periods of no less than 15 days and must be reviewed by the Made in America Office. There may be instances where an award qualifies, in whole or in part, for an existing waiver described at [DOE Buy America Requirement Waiver Requests](#)

DOE's decision concerning a waiver request is not appealable.

APPENDIX D— LIST OF ACRONYMS

45Q	U.S. Internal Revenue Code Section 45Q
AACE	Association for the Advancement of Cost Engineering
AAPG	American Association of Petroleum Geologists
Acq	Acquisition
AD	Associate Director
AOI	Area of Interest
ASFE	Assistant Secretary for Fossil Energy
ASME	American Society of Mechanical Engineers
BiCRS	Biomass Carbon Removal and Storage
BIL	Bipartisan Infrastructure Law
BSEE	Bureau for Safety and Environmental Enforcement
CarbonSAFE	Carbon Storage Assurance Facility Enterprise
CCUS	Carbon Capture, Utilization, and Storage
CDR	Carbon Dioxide Removal
CETs	Critical and Emerging Technologies
CEJST	Climate and Economic Justice Screening Tool
CFO	NETL Chief Financial Officer
CFR	Code of Federal Regulations
CO	Contracting Officer
CO ₂	Carbon Dioxide
CO _{2e}	Carbon Dioxide Equivalent
COI	Conflict of Interest
Comms	Communications
CRADA	Cooperative Research and Development Agreement
CRO	NETL Chief Research Officer
CS	Contract Specialist
CTO	NETL Chief Technology Officer
CURC	Carbon Utilization Research Council
CX	Categorical Exclusion
DAC	Direct Air Capture
DAS	Deputy Assistant Secretary
DEC	Determination of Exceptional Circumstances
DEIA	Diversity, Equity, Inclusion, and Accessibility
Deputy Dir	Deputy Director
Dir	Director
DMP	Data Management Plan
DOE	Department of Energy
DoI	Department of Interior
DOI	Digital Object Identifier
DOL	Department of Labor

EA	Environmental Assessment
EDX	Energy Data eXchange
EGR	Enhanced Gas Recovery
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
EPAct	Energy Policy Act
ERP	Emergency Response Plan
Exec Dir	Executive Director
FAC	NETL Finance and Acquisition Center
FAC Fin Adv	NETL Finance and Acquisition Center Financial Advisor
FAR	Federal Acquisition Regulation
FCOI	Financial Conflicts of Interest
FE or FECM	DOE Office of Fossil Energy and Carbon Management
Fed. Reg.	Federal Regulation
FEED	Front-End Engineering Design
FFRDC	Federally Funded Research and Development Center
FFATA	Federal Funding and Transparency Act of 2006
FGCAA	Federal Grant and Cooperative Agreement Act
FID	Federal Identifier
FOA	Funding Opportunity Announcement
FOIA	Freedom of Information Act
FONSI	Finding of No Significant Impact
FPD	FOA Planning Document
FY	Fiscal Year
GAAP	Generally Accepted Accounting Principles
GO	Grants Officer
H ₂	Hydrogen
HAZOP	Hazardous Operations
HBCUs	Historically Black Colleges and Universities
HQ	DOE Headquarters
IEA	International Energy Agency
IEAGHG	International Energy Agency Greenhouse Gas Research and Development Programme
IIJA	Infrastructure Investment and Jobs Act
INVESTOR	Investing in Vital Emerging Strategic Technologies and Objective Research Tool
IP	Intellectual Property
IPMP	Intellectual Property Management Plan
IRB	Institutional Review Board
IRC	Internal Revenue Code
IRS	Internal Revenue Service
J40	Executive Order 14008 Justice40 Initiative
M&O	Management and Operating
MA	DOE HQ Office of Management
MBE	Minority Business Enterprise

MFA	Multi-Factor Authentication
MOP	Maximum Operating Pressure
MPIN	Marketing Partner ID Number
MRPC	Merit Review Panel Chairperson
MSI	Minority-Serving institution
MYPP	Multi-Year Program Plan
NDA	Non-Disclosure Acknowledgement
NEPA	National Environmental Policy Act
NETL	National Energy Technology Laboratory
NNSA	National Nuclear Security Agency
NOI	Notice of Intent
NSF	National Science Foundation
OCS	Outer Continental Shelf
OFCCP	Office of Federal Contractor Compliance Program
OMB	Office of Management and Budget
OSS	Open-Source Software
OSTI	Office of Scientific and Technical Information
OTA	Other Transactions Authority
OTS	Organizational Tracking System
P-10	Monte Carlo Simulation Percentile 10
P-50	Monte Carlo Simulation Percentile 50
P-90	Monte Carlo Simulation Percentile 90
P&ID	Process and Instrumentation Diagram
PDAS	Principal Deputy Assistant Secretary
PFD	Process Flow Diagram
PII	Personal Identifiable Information
PMRD&D	HQ Program Manager Research, Development, and Demonstration
PMP	Project Management Plan
QER	Quadrennial Energy Review
QOZ	Qualified Opportunity Zone
QTR	Quadrennial Technology Review
RD&D	Research, Development, and Demonstration
RIC	NETL Research and Innovation Center
RCSP	Regional Carbon Sequestration Partnership
RFI	Request for Information
ROD	Record of Decision
ROW	Right-of-Way
RTIC	DOE Research and Technology Investment Committee
S&T	NETL Science and Technology Strategic Plans and Programs
S4	DOE Under Secretary
SAM	System for Award Management
SciENCv	Science Experts Network Curriculum Vita

SMART	Specific, Measurable, Achievable, Relevant, and Timely
SOPO	Statement of Project Objectives
SPOC	Single Point of Contact
SRMS	Storage Resource Management System
SO	Selection Official
SOPO	Statement of Project Objectives
SPE	Society of Petroleum Engineers
SSAE	Strategic Systems Analysis and Engineering Directorate
STEM	Science, Technology, Engineering, and Mathematics
TAA	Technical Assistance Agreement
TDC	NETL Technology Development Center
TIA	Technology Investment Agreement
TM	NETL Technology Manager
TMP	Technology Maturation Plan
TPL	Technical Project Lead
TRL	Technology Readiness Level
UCC	Uniform Commercial Code
UEI	Unique Entity Identifier
U.S.	United States
U.S.C.	United States Code
UIC	Underground Injection Control
USMP	U.S. Manufacturing Plan
WBS	Work Breakdown Structure
WP	Work Proposal
WRP	Workforce Readiness Plan

APPENDIX E – STATEMENT OF PROJECT OBJECTIVES TEMPLATES

STATEMENT OF PROJECT OBJECTIVES TEMPLATE **FOR PHASE II**

STATEMENT OF PROJECT OBJECTIVES

BIL-Title of Project

(Insert the title of the work to be performed. Be concise and descriptive.)

This should be a standalone document that states the work to be conducted and should not include any proprietary/confidential information. Note also that publicly available information can be added to the [Carbon Matchmaker](#) as appropriate.

A. OBJECTIVES

Include one paragraph on the overall objective(s) of the work. Note: DOE anticipates making awards with one budget period.

B. SCOPE OF WORK

This section should not exceed one-half page and should summarize the effort and approach to achieve the objective(s) of the work for each BP. Note: DOE anticipates making awards with one budget period.

C. TASKS TO BE PERFORMED

This section provides a brief summary of the planned approach to this project. Tasks/Subtasks, concisely written, should be provided in a logical sequence and should be divided into the BPs of the project, as appropriate. In writing the Statement of Project Objectives (SOPO), avoid (1) the use of proper nouns to minimize SOPO modifications in the event of changes to the project team, facilities, etc.; (2) figures and equations; (3) references to other documents and publications; and (4) details about past work and discussion of technical background (which should be covered elsewhere in the application narrative). If the project is structured in BPs, clearly delineate which Tasks/Subtasks are in each BP.

Note that all Community Benefits Plan-related work should be conducted in the Community Benefits Plan Task below (including project management).

Task 1.0—Project Management and Planning (REQUIRED; APPLICANT INSERT THE LANGUAGE PROVIDED BELOW IN QUOTES)

“The Recipient shall manage and direct the project in accordance with a Project Management Plan to meet all technical, schedule and budget objectives and requirements. The Recipient will coordinate activities in order to effectively accomplish

the work. The Recipient will ensure that project plans, results, and decisions are appropriately documented and project reporting and briefing requirements are satisfied.

The Recipient shall update the Project Management Plan 30 days after award and as necessary throughout the project to accurately reflect the current status of the project. Examples of when it may be appropriate to update the Project Management Plan include: (a) project management policy and procedural changes; (b) changes to the technical, cost, and/or schedule baseline for the project; (c) significant changes in scope, methods, or approaches; or (d) as otherwise required to ensure that the plan is the appropriate governing document for the work required to accomplish the project objectives.

Management of project risks will occur in accordance with the risk management methodology delineated in the Project Management Plan in order to identify, assess, monitor and mitigate technical uncertainties as well as schedule, budgetary and environmental risks associated with all aspects of the project. The results and status of the risk management process will be presented during project reviews and in quarterly progress reports with emphasis placed on the medium- and high-risk items.

Within 90 days after award, the Recipient will consult with representatives from NETL's Research and Innovation Center (RIC) to discuss the sharing of various types of data collected by the project with RIC, how the sharing of data will be of value to the carbon transport and storage industry, and how the shared data would be protected and managed by RIC.

The Recipient shall participate in cross-project working groups once the working groups are established by NETL."

Task 2.0—Site Specific Characterization & Assessment of the CO₂ Storage Complex. (APPLICANT provide appropriate descriptive text and Subtasks [with descriptive text] for the specific proposed project following the guidance in the first paragraph of Section C of this SOPO template. Additional information related to intended scope for this Task is located in Objective 1 of Area of Interest [AOI] 4 of the Funding Opportunity Announcement [FOA]).

Task 3.0—Preliminary Project Risk assessment with Mitigation & Management Plans (APPLICANT provide appropriate descriptive text and Subtasks [with descriptive text] for the specific proposed project. Additional information related to intended scope for this Task located in Objective 2 of AOI 4 of theFOA.)

Task 4.0—Plan for Subsequent Detailed Site Characterization & UIC Class VI or Department of Interior (Dol) OCS Permitting. (APPLICANT provide appropriate descriptive text and

Subtasks [with descriptive text] for the proposed project. Additional information related to intended scope for this Task located in Objective 3 of AOI 4 of the FOA.)

Task 5.0—Project Technical & Economic Feasibility Assessment, Including Conceptual-Level Design Study for CO₂ Transport. (APPLICANT provide appropriate descriptive text and Subtasks [with descriptive text]. Additional information located in Objective 4 of AOI 4 of the FOA.)

Task 6.0—Community Benefits Plan. (APPLICANT include required text below in quotes, then provide additional descriptive text and Subtasks [with descriptive text]. Additional information located in Objective 5 of AOI 4 of the FOA.)

“The Recipient is required to implement the project in accordance with the Community Benefits Plan which is incorporated as an attachment to this award. The Community Benefits Plan contains four actionable sections: Community and Labor Engagement; Investing in Job Quality and a Skilled Workforce; Diversity, Equity, Inclusion, and Accessibility; and Justice40 Initiative. Funding spent on each section will be reported in the quarterly reports. In addition, the Recipient will undergo an Assistance & Validation process after selection, at an interim review, and toward the end of the project. Assistance & Validation is a cooperative effort between the Recipient and the DOE team administering the award. Each A&V effort will require the Recipient Team and the DOE the discuss the activities, performance metrics, baseline, and targets of the Community Benefits Plan and assess progress. Discussion will include opportunities for improvement. At the conclusion of each A&V effort, a report will be prepared with findings and recommendations and a summary of the report will be made public.”

APPLICANT add additional Tasks/Subtasks if appropriate and as needed.

D. DELIVERABLES (REQUIRED; APPLICANT INSERT THE LANGUAGE PROVIDED BELOW IN QUOTES AND CONTINUE TO COMPLETE.)

“The periodic and final reports shall be submitted in accordance with the “Federal Assistance Reporting Checklist” and the instructions accompanying the checklist. In addition to the reports specified in the “Federal Assistance Reporting Checklist”, the Recipient must provide the following to the NETL Project Manager (identified in Block 15 of the Assistance Agreement as the Program Manager).”

“A catalog of geologic materials/samples collected under the project must be developed and maintained throughout the project. Throughout the life of the project, the Recipient must provide DOE to physical access to available materials/samples upon request ensuring this request does not impede ongoing or planned investigations. If the Recipient does not wish to retain the materials/samples, then the Recipient must offer DOE the opportunity to obtain possession of available materials/samples before the materials/samples are disposed.”

“The following guidance applies to all Tasks performed under this FOA:

- In accordance with Executive and DOE Orders, any data products generated as a result of federally funded research and development shall be provided to NETL for inclusion in the Energy Data eXchange (EDX), <https://edx.netl.doe.gov/>. The data owner should work with its NETL/FECM Federal Project Manager annually to assess if there is data that should be submitted to EDX and identify the proper file formats prior to submission.
- Data products resulting from federally funded research and development include but are not limited to software code, tools, applications, webpages, portfolios, images, videos, and datasets.
- All final data products shall be submitted to EDX by the project Principal Investigator (PI)/performer one (1) month prior to the end date of the project. Note, EDX offers the contributor the option to request a delay in release to the public for any given contribution. Thus, if there are compelling reasons to delay release (e.g., patent application pending, publication pending, etc.), such requests can be easily accommodated but all agreed to data products still should be submitted by the Project PI/performer to EDX and that contribution process used to request the delay.
- EDX supports a wide variety of file types and formats including: 1) data, 2) metadata, 3) software/tools, and 4) articles (provided that there is an accompanying Government use license). A partial list of file formats accepted by EDX is provided below, however, EDX is designed for flexibility and accepts all types of file formats. Please contact EDXsupport@netl.doe.gov for any questions regarding file types and formats.
- EDX uses federation and web services to elevate visibility for publicly approved assets in the system, including connections with DOE’s OSTI systems, Data.gov and Re3Data. This ensures compliance with federal requirements, while raising visibility for researcher’s published data products to promote discoverability and reuse.
- It is strongly encouraged that all published research products obtain an OSTI Digital Object Identifier (DOI) to ensure more visibility in other search repositories (i.e., osti.gov, data.gov, Google Scholar, etc.). EDX has a custom-built API within the standard contribution workflow that allows contributors the option for obtaining an OSTI DOI by completing just a few additional fields.
- If there are questions about contributions to EDX, Project PIs should work with their Federal Project Manager. EDX help information is also available at <https://edx.netl.doe.gov/about> or edxsupport@netl.doe.gov.

Common Data Product Submission Formats: ASC, AmiraMesh, AVI, CAD, CSV, DAT, DBF, DOC, DSV, DWG, GIF, HDF, HTML, JPEG2000, JPG, MOV, MPEG4, MSH/CAS/DAT, NetCDF, PDF, PNG, PostScript, PPT, RTF, Surface, TAB, TIFF, TIFF Stacks, TXT, XLS, XML,

Xradio, ZIP, and others.

Geographic Formats: APR, DBF, DEM, DLG, DRG, DXF, E00, ECW, GDB, GeoPDF, GeoTIFF, GML, GPX, GRID, IMG, KML, KMZ, MDB, MrSID, SHP, and others.”

Task/ Subtask Number	Deliverable Title	Due Date
1.0	Project Management Plan	Update due 30 days after award. Revisions to the PMP shall be submitted as requested by the NETL Project Manager.
1.x	BIL Metrics Reporting	TBD but likely quarterly.

APPLICANT continue to identify deliverables (other than those identified on the “Federal Assistance Reporting Checklist”) that will be delivered using the format provided in the table above. Ensure the delivery date to the National Energy Technology Laboratory (NETL) is also identified. For example, delivery to NETL X months after completion of Task/Subtask X.x.

NOTE: If the application is selected for award, the U.S. Department of Energy (DOE) may require the recipient to include additional deliverables, provided that such deliverables are consistent with the budget, schedule, and scope of the project. (Note that it is anticipated that there will be Bipartisan Infrastructure Law [BIL]-specific reporting requirements. Details of what will be required are not available at the time of issuance of the FOA, but should be available during negotiation of selected projects. If selected, applications will be required to incorporate BIL-specific reporting.)

E. BRIEFINGS/TECHNICAL PRESENTATIONS (REQUIRED; APPLICANT INSERT THE LANGUAGE PROVIDED BELOW IN QUOTES AND CONTINUE TO COMPLETE.)

“ The Recipient shall prepare detailed briefings for presentation to the NETL Project Manager at their facility located in Pittsburgh, PA, Morgantown, WV, Albany, OR, or via WebEx. The Recipient shall make a presentation to the NETL Project Manager at a project kick-off meeting held within ninety (90) days of the project start date. At a minimum, annual briefings shall be given by the Recipient to explain the plans, progress, and results of the technical effort and a final project briefing at the close of the project shall also be given. In addition, the Recipient will participate in separate peer review meetings as required by DOE.”

At the applicant’s discretion, other briefings/presentations may be added to Section E of the SOPO.

NOTE: If the application is selected for award, DOE may require the recipient to include additional briefings/presentations, provided that such briefings/presentations are consistent with the budget, schedule, and scope of the project.

STATEMENT OF PROJECT OBJECTIVES TEMPLATE FOR PHASE III

STATEMENT OF PROJECT OBJECTIVES

BIL-Title of Project

(Insert the title of the work to be performed. Be concise and descriptive.)

This should be a standalone document that states the work to be conducted and should not include any proprietary/confidential information. Note also that publicly available information can be added to the [Carbon Matchmaker](#) as appropriate.

A. OBJECTIVES

Include one paragraph on the overall objective(s) of the work. Also include objective(s) for each budget period (BP) of work.

B. SCOPE OF WORK

This section should not exceed one-half page and should summarize the effort and approach to achieve the objective(s) of the work for each BP. Note that Phase III projects will be required to submit their permit application(s) to the appropriate regulatory authorities with the appropriate jurisdiction prior to receiving funding/authorization for BP 2 activities (along with successful completion of BP 1). Applicants are expected to target receipt of “Authorization to Construct” at the completion of Phase III projects.

For onshore or state waters, the U.S. Environmental Protection Agency (EPA) or state with primacy will issue Underground Injection Control (UIC) Class VI permits, which will include an “Authorization to Construct.”

For offshore outer continental shelf (OCS), the Department of Interior’s Bureau of Ocean Energy Management (BOEM)/Bureau of Safety and Environmental Enforcement (BSEE) will provide an “Authorization to Construct” or use injection wells for injection into seafloor sediments or rock strata outside the jurisdiction of EPA and the states.

C. TASKS TO BE PERFORMED

This section provides a brief summary of the planned approach to this project. Tasks/Subtasks, concisely written, should be provided in a logical sequence and should be divided into the BPs of the project, as appropriate. In writing the Statement of Project Objectives (SOPO), avoid (1) the use of proper nouns to minimize SOPO modifications in the event of changes to the project team, facilities, etc.; (2) figures and equations; (3) references to other documents and publications; and (4) details about past work and discussion of technical background (which should be covered elsewhere in the application narrative). If the project is structured in BPs, clearly delineate which Tasks/Subtasks are in each BP.

Note that all Community Benefits Plan-related work should be conducted in the Community Benefits Plan Task below (including project management).

Task 1.0—Project Management and Planning (REQUIRED; APPLICANT INSERT THE LANGUAGE PROVIDED BELOW IN QUOTES)

“The Recipient shall manage and direct the project in accordance with a Project Management Plan to meet all technical, schedule and budget objectives and requirements. The Recipient will coordinate activities in order to effectively accomplish the work. The Recipient will ensure that project plans, results, and decisions are appropriately documented and project reporting and briefing requirements are satisfied.

The Recipient shall update the Project Management Plan 30 days after award and as necessary throughout the project to accurately reflect the current status of the project. Examples of when it may be appropriate to update the Project Management Plan include: (a) project management policy and procedural changes; (b) changes to the technical, cost, and/or schedule baseline for the project; (c) significant changes in scope, methods, or approaches; or (d) as otherwise required to ensure that the plan is the appropriate governing document for the work required to accomplish the project objectives.

Management of project risks will occur in accordance with the risk management methodology delineated in the Project Management Plan in order to identify, assess, monitor and mitigate technical uncertainties as well as schedule, budgetary and environmental risks associated with all aspects of the project. The results and status of the risk management process will be presented during project reviews and in quarterly progress reports with emphasis placed on the medium- and high-risk items.

Within 90 days after award, the Recipient will consult with representatives from NETL’s Research and Innovation Center (RIC) to discuss the sharing of various types of data collected by the project with RIC, how the sharing of data will be of value to the carbon transport and storage industry, and how the shared data would be protected and managed by RIC.

The Recipient shall participate in cross-project working groups once the working groups are established by NETL.”

Task 2.0—National Environmental Policy Act (NEPA) (REQUIRED; APPLICANT INSERT THE LANGUAGE PROVIDED BELOW IN QUOTES). Note that NEPA activities performed in subtask 2.1 should be budgeted for by the applicant and/or subrecipients. Note that activities performed in subtask 2.2 are focused on supporting the NEPA Division in reaching a NEPA

determination by responding to questions, etc. and should be budgeted as such. DOE anticipates separately funding contractors for preparation of Environmental Assessments or Environmental Impact Statements.

“The recipient will perform all work elements required to obtain a NEPA determination for the potential future Phase IV CarbonSAFE projects at the proposed site(s) and support the required NEPA review process.”

“Subtask 2.1 - Preparation and Submission of an Environmental Information Volume (EIV)

The recipient will complete an EIV to assess any NEPA-related issues at the chosen site(s) for the potential future Phase IV CarbonSAFE project, including connected actions. The purpose of the EIV, http://netl.doe.gov/File%20Library/Business/forms/451_1-1-6.pdf, is to initiate analysis of the chosen capture, transportation and storage site(s) from a NEPA perspective. The completed EIV will provide all initial environmental data and details about the proposed actions to take place through the post injection site care period.”

“Subtask 2.2 - Preparation and Submission of NEPA Documentation

Following the NEPA Division’s review of the EIV, the recipient will work on the documentation required for the probable NEPA class of action (Categorical Exclusions, Environmental Assessment or Environmental Impact Statement). The recommended documentation will be submitted to the NEPA Division.”

Task 3.0—UIC Class VI “Authorization to Construct” or OCS “Authorization to Construct.” (APPLICANT select appropriate title. Provide appropriate descriptive text and Subtasks [with descriptive text] for the specific proposed project following the guidance in the first paragraph of Section C of this SOPO template. Additional information related to intended scope for this Task located in Objective 2 of Area of Interest [AOI 1] of the Funding Opportunity Announcement [FOA].)

Task 4.0—Detailed Site Characterization of a Commercial-Scale Carbon Dioxide (CO₂) Storage Site. (APPLICANT provide appropriate descriptive text and Subtasks [with descriptive text] for the proposed project. Additional information related to intended scope for this Task located in Objective 1 of AOI 1 of the FOA.)

Task 5.0—Storage Field Development Plan. (APPLICANT provide appropriate descriptive text and Subtasks [with descriptive text]. Additional information located in Objective 3 of AOI 1 of the FOA and Appendix 7 of the FOA.)

Task 6.0—CO₂ Source(s) Feasibility Study. (APPLICANT provide appropriate descriptive text and Subtasks [with descriptive text]. Additional information located in Objective 4 of AOI 1 of the FOA and Appendix 9 of the FOA.)

Task 7.0—CO₂ Transport Front-End Engineering Design (FEED) Study. (APPLICANT provide appropriate descriptive text and Subtasks [with descriptive text]. Additional information located in Objective 6 of AOI 1 of the FOA and Appendix 8 of the FOA.)

Task 8.0—Business and Financial Plans and Arrangements. (APPLICANT provide appropriate descriptive text and Subtasks [with descriptive text]. Additional information located in Objective 8 of AOI 1 of the FOA.)

Task 9.0—Community Benefits Plan. (APPLICANT include required text below in quotes, then provide additional descriptive text and Subtasks [with descriptive text]. Additional information located in Objective 7 of AOI 1 of the FOA.)

“The Recipient is required to implement the project in accordance with the Community Benefits Plan which is incorporated as an attachment to this award. The Community Benefits Plan contains four actionable sections: Community and Labor Engagement; Investing in Job Quality and a Skilled Workforce; Diversity, Equity, Inclusion, and Accessibility; and Justice40 Initiative. Funding spent on each section will be reported in the quarterly reports. In addition, the Recipient will undergo an Assistance & Validation process after selection, at an interim review, and toward the end of the project. Assistance & Validation is a cooperative effort between the Recipient and the DOE team administering the award. Each A&V effort will require the Recipient Team and the DOE the discuss the activities, performance metrics, baseline, and targets of the Community Benefits Plan and assess progress. Discussion will include opportunities for improvement. At the conclusion of each A&V effort, a report will be prepared with findings and recommendations and a summary of the report will be made public.”

APPLICANT add additional Tasks/Subtasks if appropriate and as needed.

D. DELIVERABLES (REQUIRED; APPLICANT INSERT THE LANGUAGE PROVIDED BELOW IN QUOTES AND CONTINUE TO COMPLETE.)

“The periodic and final reports shall be submitted in accordance with the “Federal Assistance Reporting Checklist” and the instructions accompanying the checklist. In addition to the reports specified in the “Federal Assistance Reporting Checklist”, the Recipient must provide the following to the NETL Project Manager (identified in Block 15 of the Assistance Agreement as the Program Manager).”

“A catalog of geologic materials/samples collected under the project must be developed and maintained throughout the project. Throughout the life of the project, the Recipient must provide DOE to physical access to available materials/samples upon request

ensuring this request does not impede ongoing or planned investigations. If the Recipient does not wish to retain the materials/samples, then the Recipient must offer DOE the opportunity to obtain possession of available materials/samples before the materials/samples are disposed.”

“The following guidance applies to all Tasks performed under this FOA:

- In accordance with Executive and DOE Orders, any data products generated as a result of federally funded research and development shall be provided to NETL for inclusion in the Energy Data eXchange (EDX), <https://edx.netl.doe.gov/>. The data owner should work with its NETL/FECM Federal Project Manager annually to assess if there is data that should be submitted to EDX and identify the proper file formats prior to submission.
- Data products resulting from federally funded research and development include but are not limited to software code, tools, applications, webpages, portfolios, images, videos, and datasets.
- All final data products shall be submitted to EDX by the project Principal Investigator (PI)/performer one (1) month prior to the end date of the project. Note, EDX offers the contributor the option to request a delay in release to the public for any given contribution. Thus, if there are compelling reasons to delay release (e.g., patent application pending, publication pending, etc.), such requests can be easily accommodated but all agreed to data products still should be submitted by the Project PI/performer to EDX and that contribution process used to request the delay.
- EDX supports a wide variety of file types and formats including: 1) data, 2) metadata, 3) software/tools, and 4) articles (provided that there is an accompanying Government use license). A partial list of file formats accepted by EDX is provided below, however, EDX is designed for flexibility and accepts all types of file formats. Please contact EDXsupport@netl.doe.gov for any questions regarding file types and formats.
- EDX uses federation and web services to elevate visibility for publicly approved assets in the system, including connections with DOE’s OSTI systems, Data.gov and Re3Data. This ensures compliance with federal requirements, while raising visibility for researcher’s published data products to promote discoverability and reuse.
- It is strongly encouraged that all published research products obtain an OSTI Digital Object Identifier (DOI) to ensure more visibility in other search repositories (i.e., [osti.gov](https://www.osti.gov/), data.gov, Google Scholar, etc.). EDX has a custom-built API within the standard contribution workflow that allows contributors the option for obtaining an OSTI DOI by completing just a few additional fields.
- If there are questions about contributions to EDX, Project PIs should work with their Federal Project Manager. EDX help information is also available at <https://edx.netl.doe.gov/about> or edxsupport@netl.doe.gov.

Common Data Product Submission Formats: ASC, AmiraMesh, AVI, CAD, CSV, DAT, DBF, DOC, DSV, DWG, GIF, HDF, HTML, JPEG2000, JPG, MOV, MPEG4, MSH/CAS/DAT, NetCDF, PDF, PNG, PostScript, PPT, RTF, Surface, TAB, TIFF, TIFF Stacks, TXT, XLS, XML, Xradio, ZIP, and others.

Geographic Formats: APR, DBF, DEM, DLG, DRG, DXF, E00, ECW, GDB, GeoPDF, GeoTIFF, GML, GPX, GRID, IMG, KML, KMZ, MDB, MrSID, SHP, and others.”

Task/ Subtask Number	Deliverable Title	Due Date
1.0	Project Management Plan	Update due 30 days after award. Revisions to the PMP shall be submitted as requested by the NETL Project Manager.
1.x	BIL Metrics Reporting	TBD but likely quarterly.
2.1	Environmental Information Volume	At the end of Budget Period 1.
2.2	NEPA Documentation (EA or EIS)	Due at project completion.
3.x	Application for Underground Injection Control Class VI Permit to Construct	At the end of Budget Period 1.
4.x	Risk Assessment and Mitigation Plan	APPLICANT provide appropriate due dates for specific project (multiple versions expected).
4.x	Geologic Catalog of Materials	At the end of each project year.
5.x	Storage Field Development Plan supported by AFEs	APPLICANT provide appropriate due date for specific project.
6.x	CO ₂ Source(s) Feasibility Study	APPLICANT provide appropriate due date for specific project.
7.x	CO ₂ Transport FEED Study	APPLICANT provide appropriate due date for specific project.
8.x	Initial (Preliminary or Draft) Version of Business and Financial Plans as Appropriate (APPLICANT replace this	APPLICANT provide appropriate due date for specific project.

	text with specific plans that will be submitted)	
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APPLICANT continue to identify deliverables (other than those identified on the “Federal Assistance Reporting Checklist”) that will be delivered using the format provided in the table above. Ensure the delivery date to the National Energy Technology Laboratory (NETL) is also identified. For example, delivery to NETL X months after completion of Task/Subtask X.x.

NOTE: If the application is selected for award, the U.S. Department of Energy (DOE) may require the recipient to include additional deliverables, provided that such deliverables are consistent with the budget, schedule, and scope of the project. (Note that it is anticipated that there will be Bipartisan Infrastructure Law [BIL]-specific reporting requirements. Details of what will be required are not available at the time of issuance of the FOA, but should be available during negotiation of selected projects. If selected, applications will be required to incorporate BIL-specific reporting.)

E. BRIEFINGS/TECHNICAL PRESENTATIONS (REQUIRED; APPLICANT INSERT THE LANGUAGE PROVIDED BELOW IN QUOTES AND CONTINUE TO COMPLETE.)

“The Recipient shall prepare detailed briefings for presentation to the NETL Project Manager at their facility located in Pittsburgh, PA, Morgantown, WV, Albany, OR, or via WebEx. The Recipient shall make a presentation to the NETL Project Manager at a project kick-off meeting held within ninety (90) days of the project start date. At a minimum, annual briefings shall be given by the Recipient to explain the plans, progress, and results of the technical effort and a final project briefing at the close of the project shall also be given. In addition, the Recipient will participate in separate peer review meetings as required by DOE.”

At the applicant’s discretion, other briefings/presentations may be added to Section E of the SOPO.

NOTE: If the application is selected for award, DOE may require the recipient to include additional briefings/presentations, provided that such briefings/presentations are consistent with the budget, schedule, and scope of the project.

Statement of Project Objectives Template **for Phase III.5**

STATEMENT OF PROJECT OBJECTIVES

BIL-Title of Project

(Insert the title of the work to be performed. Be concise and descriptive)

This should be a standalone document that states the work to be conducted and should not include any proprietary/confidential information. Note also that publicly available information can be added to the [Carbon Matchmaker](#) as appropriate.

A. OBJECTIVES

Include one paragraph on the overall objective(s) of the work. Also include objective(s) for each budget period (BP) of work.

B. SCOPE OF WORK

This section should not exceed one-half page and should summarize the effort and approach to achieve the objective(s) of the work for each BP.

C. TASKS TO BE PERFORMED

This section provides a brief summary of the planned approach to this project. Tasks/Subtasks, concisely written, should be provided in a logical sequence and should be divided into the BPs of the project, as appropriate. In writing the Statement of Project Objectives (SOPO), avoid (1) the use of proper nouns to minimize SOPO modifications in the event of changes to the project team, facilities, etc.; (2) figures and equations; (3) references to other documents and publications; and (4) details about past work and discussion of technical background (which should be covered elsewhere in the application narrative). If the project is structured in BPs, clearly delineate which Tasks/Subtasks are in each BP.

Note that all work related to the Community Benefits Plan should be conducted in the relevant Task below (including project management).

Task 1.0—Project Management and Planning. (REQUIRED; APPLICANT INSERT THE LANGUAGE PROVIDED BELOW IN QUOTES)

“The Recipient shall manage and direct the project in accordance with a Project Management Plan to meet all technical, schedule and budget objectives and requirements. The Recipient will coordinate activities in order to effectively accomplish the work. The Recipient will ensure that project plans, results, and decisions are

appropriately documented and project reporting and briefing requirements are satisfied.

The Recipient shall update the Project Management Plan 30 days after award and as necessary throughout the project to accurately reflect the current status of the project. Examples of when it may be appropriate to update the Project Management Plan include: (a) project management policy and procedural changes; (b) changes to the technical, cost, and/or schedule baseline for the project; (c) significant changes in scope, methods, or approaches; or (d) as otherwise required to ensure that the plan is the appropriate governing document for the work required to accomplish the project objectives.

Management of project risks will occur in accordance with the risk management methodology delineated in the Project Management Plan in order to identify, assess, monitor and mitigate technical uncertainties as well as schedule, budgetary and environmental risks associated with all aspects of the project. The results and status of the risk management process will be presented during project reviews and in quarterly progress reports with emphasis placed on the medium- and high-risk items.

Within 90 days after award, the Recipient will consult with representatives from NETL's Research and Innovation Center (RIC) to discuss the sharing of various types of data collected by the project with RIC, how the sharing of data will be of value to the carbon transport and storage industry, and how the shared data would be protected and managed by RIC.

The Recipient shall participate in cross-project working groups once the working groups are established by NETL."

Task 2.0—National Environmental Policy Act (NEPA). (REQUIRED; APPLICANT INSERT THE LANGUAGE PROVIDED BELOW IN QUOTES). Note that NEPA activities performed in subtask 2.1 should be budgeted for by the applicant and/or subrecipients. Note that activities performed in subtask 2.2 are focused on supporting the NEPA Division in reaching a NEPA determination by responding to questions, etc. and should be budgeted as such. DOE anticipates separately funding contractors for preparation of Environmental Assessments or Environmental Impact Statements.

"The recipient will perform all work elements required to obtain a NEPA determination for the potential future Phase IV CarbonSAFE project at the proposed site(s) and support the required NEPA review process."

"Subtask 2.1 - Preparation and Submission of an Environmental Information Volume (EIV)

The recipient will complete an EIV to assess any NEPA-related issues at the chosen

site(s) for the potential future Phase IV CarbonSAFE project, including connected actions. The purpose of the EIV, http://netl.doe.gov/File%20Library/Business/forms/451_1-1-6.pdf, is to initiate analysis of the chosen capture, transportation and storage site(s) from a NEPA perspective. The completed EIV will provide all initial environmental data and details about the proposed actions to take place through the post injection site care period.”

“Subtask 2.2 - Preparation and Submission of NEPA Documentation
Following the NEPA Division’s review of the EIV, the recipient will work on the documentation required for the probable NEPA class of action (Categorical Exclusions, Environmental Assessment or Environmental Impact Statement). The recommended documentation will be submitted to the NEPA Division.”

Task 3.0—Storage Field Development Plan. (APPLICANT include this Task only if not already completed. Provide appropriate descriptive text and Subtasks [with descriptive text] for the specific proposed project following the guidance in the first paragraph of Section C of this SOPO Template. Additional information related to intended scope for this Task located in Objective 1 of Area of Interest [AOI] 2 of the Funding Opportunity Announcement [FOA].)

Task 4.0—Carbon Dioxide (CO₂) Source(s) Feasibility Study. (APPLICANT include this Task only if not already completed. Provide appropriate descriptive text and Subtasks [with descriptive text] for the proposed project. Additional information related to intended scope for this Task located in Objective 2 of AOI 2 of the FOA and Appendix 9 of the FOA.)

Task 5.0—CO₂ Transport Front-End Engineering Design (FEED) Study. (APPLICANT include this Task only if not already completed. Provide appropriate descriptive text and Subtasks [with descriptive text]. Additional information located in Objective 4 of AOI 2 of the FOA and Appendix 8 of the FOA.)

Task 6.0—Business and Financial Plans and Arrangements. (APPLICANT include this Task only if not already completed. Provide appropriate descriptive text and Subtasks [with descriptive text]. Additional information located in Objective 6 of AOI 2 of the FOA.)

Task 7.0—Community Benefit Plan. (APPLICANT include required text below in quotes, then provide additional descriptive text and Subtasks [with descriptive text]. Additional information located in Objective 5 of AOI 2 of the FOA.)

“The Recipient is required to implement the project in accordance with the Community Benefits Plan which is incorporated as an attachment to this award. The Community Benefits Plan contains four actionable sections: Community and Labor Engagement; Investing in Job Quality and a Skilled Workforce; Diversity, Equity, Inclusion, and Accessibility; and Justice40 Initiative. Funding spent on each section will be reported in

the quarterly reports. In addition, the Recipient will undergo an Assistance & Validation process after selection, at an interim review, and toward the end of the project. Assistance & Validation is a cooperative effort between the Recipient and the DOE team administering the award. Each A&V effort will require the Recipient Team and the DOE the discuss the activities, performance metrics, baseline, and targets of the Community Benefits Plan and assess progress. Discussion will include opportunities for improvement. At the conclusion of each A&V effort, a report will be prepared with findings and recommendations and a summary of the report will be made public.”

APPLICANT add additional Tasks/Subtasks if appropriate and as needed.

D. DELIVERABLES (REQUIRED; APPLICANT INSERT THE LANGUAGE PROVIDED BELOW IN QUOTES AND CONTINUE TO COMPLETE.)

“The periodic and final reports shall be submitted in accordance with the “Federal Assistance Reporting Checklist” and the instructions accompanying the checklist. In addition to the reports specified in the “Federal Assistance Reporting Checklist”, the Recipient must provide the following to the NETL Project Manager (identified in Block 15 of the Assistance Agreement as the Program Manager).”

“A catalog of geologic materials/samples collected under the project must be developed and maintained throughout the project. Throughout the life of the project, the Recipient must provide DOE to physical access to available materials/samples upon request ensuring this request does not impede ongoing or planned investigations. If the Recipient does not wish to retain the materials/samples, then the Recipient must offer DOE the opportunity to obtain possession of available materials/samples before the materials/samples are disposed.”

“The following guidance applies to all Tasks performed under this FOA:

- In accordance with Executive and DOE Orders, any data products generated as a result of federally funded research and development shall be provided to NETL for inclusion in the Energy Data eXchange (EDX), <https://edx.netl.doe.gov/>. The data owner should work with its NETL/FECM Federal Project Manager annually to assess if there is data that should be submitted to EDX and identify the proper file formats prior to submission.
- Data products resulting from federally funded research and development include but are not limited to software code, tools, applications, webpages, portfolios, images, videos, and datasets.
- All final data products shall be submitted to EDX by the project Principal Investigator (PI)/performer one (1) month prior to the end date of the project. Note, EDX offers the contributor the option to request a delay in release to the public for any given contribution. Thus, if there are compelling reasons to delay release (e.g., patent application pending, publication pending, etc.), such

requests can be easily accommodated but all agreed to data products still should be submitted by the Project PI/performer to EDX and that contribution process used to request the delay.

- EDX supports a wide variety of file types and formats including: 1) data, 2) metadata, 3) software/tools, and 4) articles (provided that there is an accompanying Government use license). A partial list of file formats accepted by EDX is provided below, however, EDX is designed for flexibility and accepts all types of file formats. Please contact EDXsupport@netl.doe.gov for any questions regarding file types and formats.
- EDX uses federation and web services to elevate visibility for publicly approved assets in the system, including connections with DOE's OSTI systems, Data.gov and Re3Data. This ensures compliance with federal requirements, while raising visibility for researcher's published data products to promote discoverability and reuse.
- It is strongly encouraged that all published research products obtain an OSTI Digital Object Identifier (DOI) to ensure more visibility in other search repositories (i.e., osti.gov, data.gov, Google Scholar, etc.). EDX has a custom-built API within the standard contribution workflow that allows contributors the option for obtaining an OSTI DOI by completing just a few additional fields.
- If there are questions about contributions to EDX, Project PIs should work with their Federal Project Manager. EDX help information is also available at <https://edx.netl.doe.gov/about> or edxsupport@netl.doe.gov.

Common Data Product Submission Formats: ASC, AmiraMesh, AVI, CAD, CSV, DAT, DBF, DOC, DSV, DWG, GIF, HDF, HTML, JPEG2000, JPG, MOV, MPEG4, MSH/CAS/DAT, NetCDF, PDF, PNG, PostScript, PPT, RTF, Surface, TAB, TIFF, TIFF Stacks, TXT, XLS, XML, Xradio, ZIP, and others.

Geographic Formats: APR, DBF, DEM, DLG, DRG, DXF, E00, ECW, GDB, GeoPDF, GeoTIFF, GML, GPX, GRID, IMG, KML, KMZ, MDB, MrSID, SHP, and others."

Task/ Subtask Number	Deliverable Title	Due Date
1.0	Project Management Plan	Update due 30 days after award. Revisions to the PMP shall be submitted as requested by the NETL Project Manager.
1.x	BIL Metrics Reporting	TBD but likely quarterly.
2.1	Environmental Information Volume	At the end of Budget Period 1.

2.2	NEPA Documentation (EA or EIS)	Due at project completion.
3.x	Risk Assessment and Mitigation Plan	APPLICANT provide appropriate due dates for specific project (multiple versions expected).
3.x	Storage Field Development Plan supported by AFEs	APPLICANT provide appropriate due date for specific project.
4.x	CO ₂ Source(s) Feasibility Study (Only include if performing this Task)	APPLICANT provide appropriate due date for specific project.
5.x	CO ₂ Transport FEED Study (Only include if performing this Task)	APPLICANT provide appropriate due date for specific project.
6.x	Initial (Preliminary or Draft) Version of Business and Financial Plans as Appropriate (APPLICANT replace this text with specific plans that will be submitted)	APPLICANT provide appropriate due date for specific project.

APPLICANT continue to identify deliverables (other than those identified on the “Federal Assistance Reporting Checklist”) that will be delivered using the format provided in the table above. Ensure the delivery date to the National Energy Technology Laboratory (NETL) is also identified. For example, delivery to NETL X months after completion of Task/Subtask X.x.

NOTE: If the application is selected for award, the U.S. Department of Energy (DOE) may require the recipient to include additional deliverables, provided that such deliverables are consistent with the budget, schedule, and scope of the project. (Note that it is anticipated that there will be Bipartisan Infrastructure Law [BIL]-specific reporting requirements. Details of what will be required are not available at the time of issuance of the FOA, but should be available during negotiation of selected projects. If selected, applications will be required to incorporate BIL-specific reporting.)

E. BRIEFINGS/TECHNICAL PRESENTATIONS (REQUIRED; APPLICANT INSERT THE LANGUAGE PROVIDED BELOW IN QUOTES AND CONTINUE TO COMPLETE.)

“The Recipient shall prepare detailed briefings for presentation to the NETL Project Manager at their facility located in Pittsburgh, PA, Morgantown, WV, Albany, OR, or via WebEx. The Recipient shall make a presentation to the NETL Project Manager at a

project kick-off meeting held within ninety (90) days of the project start date. At a minimum, annual briefings shall be given by the Recipient to explain the plans, progress, and results of the technical effort and a final project briefing at the close of the project shall also be given. In addition, the Recipient will participate in separate peer review meetings as required by DOE.”

At the applicant’s discretion, other briefings/presentations may be added to Section E of the SOPO.

NOTE: If the application is selected for award, DOE may require the recipient to include additional briefings/presentations, provided that such briefings/presentations are consistent with the budget, schedule, and scope of the project.

Statement of Project Objectives Template **for Phase IV**

STATEMENT OF PROJECT OBJECTIVES

BIL-Title of Project

(Insert the title of the work to be performed. Be concise and descriptive.)

This should be a standalone document that states the work to be conducted and should not include any proprietary/confidential information. Note also that publicly available information can be added to the [Carbon Matchmaker](#) as appropriate.

A. OBJECTIVES

Include one paragraph on the overall objective(s) of the work. Note: DOE anticipates making awards with one budget period.

B. SCOPE OF WORK

This section should not exceed one-half page and should summarize the effort and approach to achieve the objective(s) of the work for each BP. Note: DOE anticipates making awards with one budget period.

C. TASKS TO BE PERFORMED

This section provides a brief summary of the planned approach to this project. Tasks/Subtasks, concisely written, should be provided in a logical sequence and should be divided into the BPs of the project, as appropriate. In writing the Statement of Project Objectives (SOPO), avoid (1) the use of proper nouns to minimize SOPO modifications in the event of changes to the project team, facilities, etc.; (2) figures and equations; (3) references to other documents and publications; and (4) details about past work and discussion of technical background (which should be covered elsewhere in the application narrative). If the project is structured in BPs, clearly delineate which Tasks/Subtasks are in each BP.

Note that all work related to the Community Benefits Plan should be conducted in the relevant Task below (including project management).

Task 1.0—Project Management and Planning. (REQUIRED; APPLICANT INSERT THE LANGUAGE PROVIDED BELOW IN QUOTES)

“The Recipient shall manage and direct the project in accordance with a Project Management Plan to meet all technical, schedule and budget objectives and requirements. The Recipient will coordinate activities in order to effectively accomplish the work. The Recipient will ensure that project plans, results, and decisions are appropriately documented and project reporting and briefing requirements are satisfied.

The Recipient shall update the Project Management Plan 30 days after award and as necessary throughout the project to accurately reflect the current status of the project. Examples of when it may be appropriate to update the Project Management Plan include: (a) project management policy and procedural changes; (b) changes to the technical, cost, and/or schedule baseline for the project; (c) significant changes in scope, methods, or approaches; or (d) as otherwise required to ensure that the plan is the appropriate governing document for the work required to accomplish the project objectives.

Management of project risks will occur in accordance with the risk management methodology delineated in the Project Management Plan in order to identify, assess, monitor and mitigate technical uncertainties as well as schedule, budgetary and environmental risks associated with all aspects of the project. The results and status of the risk management process will be presented during project reviews and in quarterly progress reports with emphasis placed on the medium- and high-risk items.

Within 90 days after award, the Recipient will consult with representatives from NETL's Research and Innovation Center (RIC) to discuss the sharing of various types of data collected by the project with RIC, how the sharing of data will be of value to the carbon transport and storage industry, and how the shared data would be protected and managed by RIC.

The Recipient shall participate in cross-project working groups once the working groups are established by NETL."

Task 2.0—Fulfill Pre-Financial Closure Requirements. (APPLICANT provide appropriate descriptive text and Subtasks [with descriptive text] for the specific proposed project following the guidance in the first paragraph of Section C of this SOPO Template. Additional information related to intended scope for this Task located in Objective 1 of Area of Interest [AOI] 3 of the Funding Opportunity Announcement [FOA].)

Task 3.0—Achieve Financial Close. (APPLICANT provide appropriate descriptive text and Subtasks [with descriptive text] for the proposed project. Additional information related to intended scope for this Task located in Objective 2 of AOI 3 of the FOA.)

Task 4.0—Engineer, Procure, Construct. (APPLICANT provide appropriate descriptive text and Subtasks [with descriptive text]. Additional information located in Objective 3 of AOI 3 of the FOA.)

Task 5.0—Petition for Authorization to Inject. (APPLICANT provide appropriate descriptive text and Subtasks [with descriptive text]. Additional information located in Objective 4 of AOI 3 of the FOA.)

Task 6.0—As-Built Drawings, Specification Sheets, and Final Plans. (APPLICANT provide appropriate descriptive text and Subtasks [with descriptive text]. Additional information located in Objective 5 of AOI 3 of the FOA.)

Task 7.0—Baseline Data. (APPLICANT provide appropriate descriptive text and Subtasks [with descriptive text]. Additional information located in Objective 6 of AOI 3 of the FOA.)

Task 8.0—Updated Risk Assessment(s) and Mitigation Plans. (APPLICANT provide appropriate descriptive text and Subtasks [with descriptive text]. Additional information located in Objective 7 of AOI 3 of the FOA.)

Task 9.0— Community Benefits Plan. (APPLICANT include required text below in quotes, then provide additional descriptive text and Subtasks [with descriptive text]. Additional information located in Objective 8 of AOI 3 of the FOA.)

“The Recipient is required to implement the project in accordance with the Community Benefits Plan which is incorporated as an attachment to this award. The Community Benefits Plan contains four actionable sections: Community and Labor Engagement; Investing in Job Quality and a Skilled Workforce; Diversity, Equity, Inclusion, and Accessibility; and Justice40 Initiative. Funding spent on each section will be reported in the quarterly reports. In addition, the Recipient will undergo an Assistance & Validation process after selection, at an interim review, and toward the end of the project. Assistance & Validation is a cooperative effort between the Recipient and the DOE team administering the award. Each A&V effort will require the Recipient Team and the DOE the discuss the activities, performance metrics, baseline, and targets of the Community Benefits Plan and assess progress. Discussion will include opportunities for improvement. At the conclusion of each A&V effort, a report will be prepared with findings and recommendations and a summary of the report will be made public.”

APPLICANT add additional Tasks/Subtasks if appropriate and as needed. See **ACTIVITIES (partial listing)** from AOI 3 description in the FOA for additional items to be incorporated into Tasks above or as additional Tasks below.

D. DELIVERABLES (REQUIRED; APPLICANT INSERT THE LANGUAGE PROVIDED BELOW IN QUOTES AND CONTINUE TO COMPLETE.)

“The periodic and final reports shall be submitted in accordance with the “Federal Assistance Reporting Checklist” and the instructions accompanying the checklist. In addition to the reports specified in the “Federal Assistance Reporting Checklist”, the Recipient must provide the following to the NETL Project Manager (identified in Block 15 of the Assistance Agreement as the Program Manager).”

“A catalog of geologic materials/samples collected under the project must be developed and maintained throughout the project. Throughout the life of the project, the Recipient must provide DOE to physical access to available materials/samples upon request ensuring this request does not impede ongoing or planned investigations. If the Recipient does not wish to retain the materials/samples, then the Recipient must offer DOE the opportunity to obtain possession of available materials/samples before the materials/samples are disposed.”

“The following guidance applies to all Tasks performed under this FOA:

- In accordance with Executive and DOE Orders, any data products generated as a result of federally funded research and development shall be provided to NETL for inclusion in the Energy Data eXchange (EDX), <https://edx.netl.doe.gov/>. The data owner should work with its NETL/FECM Federal Project Manager annually to assess if there is data that should be submitted to EDX and identify the proper file formats prior to submission.
- Data products resulting from federally funded research and development include but are not limited to software code, tools, applications, webpages, portfolios, images, videos, and datasets.
- All final data products shall be submitted to EDX by the project Principal Investigator (PI)/performer one (1) month prior to the end date of the project. Note, EDX offers the contributor the option to request a delay in release to the public for any given contribution. Thus, if there are compelling reasons to delay release (e.g., patent application pending, publication pending, etc.), such requests can be easily accommodated but all agreed to data products still should be submitted by the Project PI/performer to EDX and that contribution process used to request the delay.
- EDX supports a wide variety of file types and formats including: 1) data, 2) metadata, 3) software/tools, and 4) articles (provided that there is an accompanying Government use license). A partial list of file formats accepted by EDX is provided below, however, EDX is designed for flexibility and accepts all types of file formats. Please contact EDXsupport@netl.doe.gov for any questions regarding file types and formats.
- EDX uses federation and web services to elevate visibility for publicly approved assets in the system, including connections with DOE’s OSTI systems, Data.gov and Re3Data. This ensures compliance with federal requirements, while raising visibility for researcher’s published data products to promote discoverability and reuse.
- It is strongly encouraged that all published research products obtain an OSTI Digital Object Identifier (DOI) to ensure more visibility in other search repositories (i.e., [osti.gov](https://www.osti.gov), data.gov, Google Scholar, etc.). EDX has a custom-built API within the standard contribution workflow that allows contributors the option for obtaining an OSTI DOI by completing just a few additional fields.
- If there are questions about contributions to EDX, Project PIs should work with their

Federal Project Manager. EDX help information is also available at <https://edx.netl.doe.gov/about> or edxsupport@netl.doe.gov.

Common Data Product Submission Formats: ASC, AmiraMesh, AVI, CAD, CSV, DAT, DBF, DOC, DSV, DWG, GIF, HDF, HTML, JPEG2000, JPG, MOV, MPEG4, MSH/CAS/DAT, NetCDF, PDF, PNG, PostScript, PPT, RTF, Surface, TAB, TIFF, TIFF Stacks, TXT, XLS, XML, Xradio, ZIP, and others.

Geographic Formats: APR, DBF, DEM, DLG, DRG, DXF, E00, ECW, GDB, GeoPDF, GeoTIFF, GML, GPX, GRID, IMG, KML, KMZ, MDB, MrSID, SHP, and others.”

Task/ Subtask Number	Deliverable Title	Due Date
1.0	Project Management Plan	Update due 30 days after award. Revisions to the PMP shall be submitted as requested by the NETL Project Manager.
1.x	BIL Metrics Reporting	TBD but likely quarterly.
X.x	Geologic Catalog of Materials (if applicable)	At the end of each project year.

APPLICANT continue to identify deliverables (other than those identified on the “Federal Assistance Reporting Checklist”) that will be delivered using the format provided in the table above. Ensure the delivery date to the National Energy Technology Laboratory (NETL) is also identified. For example, delivery to NETL X months after completion of Task/Subtask X.x. Specifically, APPLICANT should reference the **Deliverables** list from the AOI 3 description in the FOA and include relevant deliverables based on project specifics in the table above.

NOTE: If the application is selected for award, the U.S. Department of Energy (DOE) may require the recipient to include additional deliverables, provided that such deliverables are consistent with the budget, schedule, and scope of the project. (Note that it is anticipated that there will be Bipartisan Infrastructure Law [BIL]-specific reporting requirements. Details of what will be required are not available at the time of issuance of the FOA, but should be available during negotiation of selected projects. If selected, applications will be required to incorporate BIL-specific reporting.)

E. BRIEFINGS/TECHNICAL PRESENTATIONS (REQUIRED; APPLICANT INSERT THE LANGUAGE PROVIDED BELOW IN QUOTES AND CONTINUE TO COMPLETE.)

“ The Recipient shall prepare detailed briefings for presentation to the NETL Project Manager at their facility located in Pittsburgh, PA, Morgantown, WV, Albany, OR, or via WebEx. The Recipient shall make a presentation to the NETL Project Manager at a project kick-off meeting held within ninety (90) days of the project start date. At a minimum, annual briefings shall be given by the Recipient to explain the plans, progress, and results of the technical effort and a final project briefing at the close of the project shall also be given. In addition, the Recipient will participate in separate peer review meetings as required by DOE.”

At the applicant’s discretion, other briefings/presentations may be added to Section E of the SOPO.

NOTE: If the application is selected for award, DOE may require the recipient to include additional briefings/presentations, provided that such briefings/presentations are consistent with the budget, schedule, and scope of the project.

APPENDIX F – DATA MANAGEMENT PLAN

A Data Management Plan (“DMP”) explains how data generated in the course of the research or work performed under an assistance award will be shared and preserved or, when justified, explains why data sharing or preservation is not possible or scientifically appropriate.

DMP Requirements

In order for a DMP to be considered acceptable, the DMP must address the following:

At a minimum, the DMP must describe how data sharing and preservation will enable validation of the results from the proposed work, or how results could be validated if data are not shared or preserved.

The DMP must provide a plan for making all research data displayed in publications resulting from the proposed work digitally accessible at the time of publication. This includes data that are displayed in charts, figures, images, etc. In addition, the underlying digital research data used to generate the displayed data should be made as accessible as possible in accordance with the principles stated above. This requirement could be met by including the data as supplementary information to the published article, or through other means. The published article should indicate how these data can be accessed.

The DMP should consult and reference available information about data management resources to be used in the course of the proposed work. In particular, a DMP that explicitly or implicitly commits data management resources at a facility beyond what is conventionally made available to approved users should be accompanied by written approval from that facility. In determining the resources available for data management at DOE User Facilities, researchers should consult the published description of data management resources and practices at that facility and reference it in the DMP. Information about other DOE facilities can be found in the additional guidance from the sponsoring program.

The DMP must protect confidentiality, personal privacy, Personally Identifiable Information, and U.S. national, homeland, and economic security; recognize proprietary interests, business confidential information, and intellectual property rights; avoid significant negative impact on innovation, and U.S. competitiveness; and otherwise be consistent with all laws (i.e., export control laws), and DOE regulations, orders, and policies.

Data Determination for a DMP

The Principal Investigator should determine which data should be the subject of the DMP and, in the DMP, propose which data should be shared and/or preserved in accordance with the DMP Requirements noted above.

For data that will be generated through the course of the proposed work, the Principal Investigator should indicate what types of data should be protected from immediate public disclosure by DOE (referred to as “protected data”) and what types of data that DOE should be able to release immediately. Similarly, for data developed outside of the proposed work at private expense that will be used in the course of the proposed work, the Principal Investigator should indicate whether that type of data will be subject to public release or kept confidential (referred to as “limited rights data”). Any use of limited rights data or labeling of data as “protected data” must be consistent with the DMP Requirements noted above.

Suggested Elements for a DMP

The following list of elements for a DMP provides suggestions regarding the data management planning process and the structure of the DMP:

Data Types and Sources: A brief, high-level description of the data to be generated or used through the course of the proposed work and which of these are considered digital research data necessary to validate the research findings or results.

Content and Format: A statement of plans for data and metadata content and format including, where applicable, a description of documentation plans, annotation of relevant software, and the rationale for the selection of appropriate standards. Existing, accepted community standards should be used where possible. Where community standards are missing or inadequate, the DMP could propose alternate strategies for facilitating sharing, and should advise the sponsoring program of any need to develop or generalize standards.

Sharing and Preservation: A description of the plans for data sharing and preservation. This should include, when appropriate: the anticipated means for sharing and the rationale for any restrictions on who may access the data and under what conditions; a timeline for sharing and preservation that addresses both the minimum length of time the data will be available and any anticipated delay to data access after research findings are published; any special requirements for data sharing, for example, proprietary software needed to access or interpret data, applicable policies, provisions, and licenses for re-use and re-distribution, and for the production of derivatives, including guidance for how data and data products should be cited; any resources and capabilities (equipment, connections, systems, software, expertise, etc.) requested in the research proposal that are needed to meet the stated goals for sharing and preservation (this could reference the relevant section of the associated research proposal and budget request); and whether/where the data will be preserved after direct project funding ends and any plans for the transfer of responsibilities for sharing and preservation. A description of how the recipient intends to make the results of any resulting DOE-funded work available to the public, including the relevant technical community.

Protection: A statement of plans, where appropriate and necessary, to protect confidentiality, personal privacy, Personally Identifiable Information, and U.S. national, homeland, and economic security; recognize proprietary interests, business confidential information, and intellectual property rights; and avoid significant negative impact on innovation, and U.S. competitiveness.

Rationale: A discussion of the rationale or justification for the proposed data management plan including, for example, the potential impact of the data within the immediate field and in other fields, and any broader societal impact.

Additional Guidance

In determining which data should be shared and preserved, researchers must consider the data needed to validate research findings as described in the Requirements and are encouraged to consider the potential benefits of their data to their own fields of research, fields other than their own, and society at large.

DMPs should reflect relevant standards and community best practices and make use of community accepted repositories whenever practicable.

Costs associated with the scope of work and resources articulated in a DMP may be included in the proposed research budget as permitted by the applicable cost principles.

To improve the discoverability of and attribution for datasets created and used in the course of research, DOE encourages the citation of publicly available datasets within the reference section of publications, and the identification of datasets with persistent identifiers such as Digital Object Identifiers (DOIs). In most cases, DOE can provide DOIs free of charge for data resulting from DOE-funded research through its Office of Scientific and Technical Information (OSTI) DataID Service.

Definitions

Data Preservation: Data preservation means providing for the usability of data beyond the lifetime of the research activity that generated them.

Data Sharing: Data sharing means making data available to people other than those who have generated them. Examples of data sharing range from bilateral communications with colleagues, to providing free, unrestricted access to anyone through, for example, a web-based platform.

Digital Research Data: The term digital data encompasses a wide variety of information stored in digital form including: experimental, observational, and simulation data; codes, software

and algorithms; text; numeric information; images; video; audio; and associated metadata. It also encompasses information in a variety of different forms including raw, processed, and analyzed data, published and archived data.

Research Data: The recorded factual material commonly accepted in the scientific community as necessary to validate research findings, but not any of the following: preliminary analyses, drafts of scientific papers, plans for future research, peer reviews, or communications with colleagues. This 'recorded' material excludes physical objects (e.g., laboratory samples). Research data also do not include:

(A) Trade secrets, commercial information, materials necessary to be held confidential by a researcher until they are published, or similar information which is protected under law; and

(B) Personnel and medical information and similar information the disclosure of which would constitute a clearly unwarranted invasion of personal privacy, such as information that could be used to identify a particular person in a research study.”

Validate: In the context of DMPs, validate means to support, corroborate, verify, or otherwise determine the legitimacy of the research findings. Validation of research findings could be accomplished by reproducing the original experiment or analyses; comparing and contrasting the results against those of a new experiment or analyses; or by some other means.

APPENDIX G – CARBONSAFE PHASE II PROJECT READINESS

CARBONSAFE PHASE II PROJECT READINESS

To be considered responsive to the Funding Opportunity Announcement (FOA), information must be supplied with the application such that DOE can determine the project's level of readiness for CarbonSAFE Phase II: Storage Complex Feasibility

Scenario Analysis

A Scenario Analysis must show that (a) the proposed integrated capture and storage project can safely store a minimum of 50 million metric tons of CO₂ within a 30-year period; (b) the specific CO₂ sources described in the scenario are capable of providing the required volumes; (c) participation in the proposed integrated capture, transport, and storage project will serve the business interest of each individual participant (capture sources, transport providers, and storage complex operators) in the proposed scenario; and (d) the proposed capture/transport/storage scenario has some level of existing public support.

Note that this Scenario Analysis should include all aspects of the envisioned future, long-term commercial project and not be limited to the boundaries of the proposed Phase II CarbonSAFE Initiative project. Sufficient information must be provided such that a preliminary determination can be made of the commercial viability of the proposed scenario. DOE understands that there will be considerable uncertainty with respect to cost estimates and other aspects of the long-term capture/transport/storage scenario. However, the Scenario Analysis should provide evidence that the Applicant has thoroughly considered all aspects of the scenario and has gathered information to reduce the uncertainty as much as possible. Specific information in the Scenario Analysis should include but is not limited to:

- A map or maps showing the following:
 - CO₂ sources, pipelines or other transport routes, and storage site(s)
 - Geographic footprints of CO₂ plume(s) and pressure front(s) at all injection wells needed to achieve the required CO₂ volumes
 - Approximate locations of any stratigraphic test wells, or seismic surveys planned in the Phase II project
- A table showing approximate latitude and longitude coordinates³⁷ of:
 - All CO₂ sources described in the proposed scenario
 - All injection wells included in the scenario
 - All stratigraphic test wells included in the Phase II project
- Anticipated business contractual requirements necessary to fully address technical and financial project risks.

³⁷ Coordinates will be used solely by DOE as a means of determining approximate project location. This information will not be released. Coordinates provided in the table should be reasonably close (though not necessarily identical) to the actual locations provided in NEPA documentation for the CarbonSAFE Phase III project (Environmental Questionnaires and Environmental Information Volumes) and in subsequent applications for CarbonSAFE Phase IV funding and Class VI or DoI permits.

- Commitment level and anticipated level of investment for all participants.
- Estimate of anticipated capital (\$) and operating cost (\$/metric ton stored) of the proposed storage facility.
- Estimate of anticipated capital costs (\$) and operating cost (\$/metric ton transported) of the of the proposed transport infrastructure.
- Estimate of revenues generated via storage of CO₂ (e.g., 45Q tax credits) over the expected life of the storage operation.
- Potential sources of revenue (other than tax credits) that are likely to result directly from the overall project and can be expected contribute its economic viability, such as revenue from enhanced oil recovery as a component of stacked storage.
- Discussion of why participation in the proposed integrated capture, transport, and storage project will serve the business interest of each participant (capture sources, transport providers, and storage complex operators).
- Anticipated needs and strategy to secure financing and/or cost share from outside parties.
- Strategy for securing any necessary pore space rights (i.e. estimated cost and probability of securing rights).
- Role of state incentives/policies toward project economics (long-term liability, tax incentives, rate base recovery, etc.) and public acceptance (e.g., relation to State Implementation Plans).
- Plan for assumption of long-term liability for stored CO₂.

Technical Sub-Basinal Evaluation

A Subsurface Data Analysis must confirm the adequacy of the storage complex geology, described below, for any proposed site(s). Sufficient information must be provided such that a determination can be made of the adequacy to meet the expected injection rates and volumes to permanently and safely store the required amount of injected CO₂.

- Storage Reservoir(s) - identify and evaluate storage types and formation types.
 - Storage formations identified must have depth sufficient to contain the entire plume area of CO₂ in the supercritical state, and adequate thickness, porosity, permeability, areal extent, etc.
- Confining System – identify and evaluate confining zone(s) within the confining system between the injection interval(s) and underground sources of drinking water (USDWs) for the entire anticipated areal extent of the CO₂ plume:
 - Formation types, thicknesses and other analyses conducted (e.g., shale facies analysis for shale formations).
 - Information on wellbores if applicable (oil, natural gas, other permitted wells) that penetrate the confining system and identify which confining zone(s) is/are penetrated; wellbore information shall include but not be limited to: location, depth, formations penetrated, age of wellbore, UIC permit if applicable and usage of well.

- Structural elements that could impact confining zone(s) integrity within the confining system should be identified.
- USDW—provide the depth of the USDW at the proposed project site(s). Identify if project is located in or near a “sole source aquifer” and plan to protect sole source drinking water.
- Prospective Storage Resources – calculations based on information provided above should be used to demonstrate that the formation(s) identified can contain the estimated CO₂ for injection and displaced fluids. Volumetric calculations should be reported for low, medium, and high probabilities (i.e., P10, P50, & P90). All documentation supporting calculations and parameters used (such as porosity, thickness, net/gross, areal extent and efficiency factors) should be included to validate calculations.

Regional Considerations Analysis/Site Selection Process

A Regional Proximity Analysis must confirm the adequacy of the site data, described below, to determine if a potential site will be suitable to permanently and safely store CO₂. Sufficient information must be provided that identifies potential issues and describes how identified issues will be addressed.

- Project should be assessed for potential conflicts with any protected or environmentally sensitive areas or other surface sensitivities (floods, landslides, etc.) within the extent of the plume, or surface equipment placement.
- Identification of pore space owners and surface owners that may be impacted based on an initial model of the largest area used in Prospective Storage Resources calculations, potential seismic surveys, and infrastructure (pipelines, wells, compressors, etc.).
- Population centers in and around the plume extent should be analyzed and potential conflicts assessed; mitigation of any potential conflicts should be discussed and addressed with the engagement team, including recommendations for mitigation.
- Identify existing resource development in the anticipated plume region and assess any potential for conflicts between the injection project area and existing mineral leases (including pore space issues).
- Rights-of-way for CO₂ transport infrastructure should be assessed for potential conflict or synergies for the project site(s), making effort to avoid protected or environmentally sensitive areas.

CO₂ Technical Analysis

Applicants must demonstrate that the CO₂ sources described in the Scenario Analysis, in aggregate, are capable of meeting the integrated capture and storage project criteria of a minimum of 50 million metric tons of CO₂ within a 30-year period. At a minimum, the following supporting information must be provided:

- Volumes of CO₂ expected from each source.
- General description of the readiness of each source to provide CO₂ for storage, including the availability of technology for CO₂ capture and processing at the source.

- CO₂ source analysis of the gas following carbon capture: chemical composition of the gas (including expected trace contaminants), pressure, temperature, rate of delivery, reliability, etc. based on the expected capture technology to be employed. Include a discussion of how these parameters compare to requirements for delivery via pipelines or other transport modes.

APPENDIX H – CARBONSAFE PHASE III PROJECT READINESS

CARBONSAFE PHASE III PROJECT READINESS

To be considered responsive to the Funding Opportunity Announcement (FOA), information must be supplied with the application such that the U.S. Department of Energy (DOE) can determine the project's level of readiness for Carbon Storage Assurance Facility Enterprise (CarbonSAFE) Initiative Phase III: Site Characterization and Permitting.

Scenario Analysis

The Scenario Analysis must show that (a) the proposed storage complex can safely store a minimum of 50 million metric tons of CO₂ within a 30-year period; (b) the specific CO₂ sources described in the scenario fully intend to provide at least 100,000 metric tons of CO₂ per year to the storage complex during the first five years of its operation and can be reasonably expected to provide at least 50 million metric tons within a 30-year period; (c) participation in the proposed integrated capture, transport, and storage project will serve the business interest of each individual participant (capture sources, transport providers, and storage complex operators) in the proposed scenario; and (d) the proposed capture/transport/storage scenario has some level of existing public support.

Note that this Scenario Analysis should include all aspects of the envisioned future, long-term commercial project and not be limited to the boundaries of the proposed Phase III CarbonSAFE Initiative project. Sufficient information must be provided such that a preliminary determination can be made of the commercial viability of the proposed scenario. DOE understands that there will be considerable uncertainty with respect to cost estimates and other aspects of the long-term capture/transport/storage scenario. However, the Scenario Analysis should provide evidence that the Applicant has thoroughly considered all aspects of the scenario and has gathered information to reduce the uncertainty as much as possible. Specific information in the Scenario Analysis should include but is not limited to:

- A map or maps showing the following:
 - CO₂ sources, pipelines or other transport routes, and storage site(s).
 - Geographic footprints of CO₂ plume(s) and pressure front(s) at all injection wells needed to achieve the required CO₂ volumes.
 - Approximate locations of any stratigraphic test wells, or seismic surveys planned in the Phase III project.
 - Land-use over the proposed storage complex and transport routes.
 - Pore space ownership over the proposed storage complex.

- A table showing approximate latitude and longitude coordinates³⁸ of:
 - All CO₂ sources described in the proposed scenario.
 - All injection wells included in the scenario
 - Start and end points of all major pipeline segments required to deliver CO₂ from sources to storage sites
 - All stratigraphic test wells included in the Phase III project
- Provide a justification of all estimated costs, revenues, sources of revenues, etc. that justify that the project is economically attractive and has a sound business case with acceptable internal rate of return:
 - Estimate of anticipated capital costs for fully developing the storage complex, including injection wells, monitoring wells, CO₂ transport for pipelines or other transport modes required to deliver CO₂ from the specified sources to the proposed storage complex, acquisition of pore space, other on-site facilities, etc.
 - Estimate of anticipated capital costs required to achieve carbon capture at all sources that (1) are expected to provide at least 100,000 metric tons of CO₂ per year to the storage complex during the first five years of its operation, and (2) are expected contribute CO₂ to the proposed storage complex within a 30-year period.
 - Estimate of revenues generated via storage of CO₂ (e.g., 45Q tax credits) over the expected life of the storage operation.
 - Potential sources of revenue (other than tax credits) that are likely to result directly from the storage operation and can be expected contribute its economic viability, such as revenue from enhanced oil recovery as a component of stacked storage.
- Estimates, in \$/ton CO₂ stored, of operating costs for capture, transport, and storage over the expected life of the storage complex.
- Discussion of why participation in the proposed integrated capture, transport, and storage project will serve the business interest of each participant (capture sources, transport providers, and storage complex operators).
- Current level of commitment to the proposed scenario as evidenced by letters from CO₂ sources, transport providers, landowners, pore space owners, and other stakeholders whose cooperation is required.
- Status of any business contractual agreements necessary to fully address technical and financial project risks.
- Status of state incentives/policies toward project economics (long-term liability, tax incentives, rate base recovery, etc.).

³⁸ Coordinates will be used solely by DOE as a means of determining approximate project location. This information will not be released. Coordinates provided in the table should be reasonably close (though not necessarily identical) to the actual locations provided in NEPA documentation for the CarbonSAFE Phase III project (Environmental Questionnaires and Environmental Information Volumes) and in subsequent applications for CarbonSAFE Phase IV funding and Class VI or DoI permits.

- Plan for assumption of remedial and long-term liability for stored CO₂.
- Assessment of the status and physical condition of all existing infrastructure (e.g., pipelines, compressor stations, offshore platforms) that is expected to be utilized and/or re-purposed during the development and operation of the proposed storage complex based upon industry standards and codes. Include an estimate of the level of effort and cost required to make such infrastructure suitable for long-term CO₂ transport and storage.

Technical Subsurface Data Evaluation

A Technical Subsurface Data Evaluation must define and confirm the adequacy of the storage complex geology for the proposed project site(s). Sufficient information (including cross-section, seismic lines with interpretation, if available, plume model and resource assessments) must be provided such that a determination can be made of the adequacy of the project site(s) to meet the expected injection rates and volumes to securely store a minimum of 50 million metric tons of CO₂ within a 30-year period. Specific information for inclusion is:

- Depositional system and stratigraphic framework for the overall storage complex.
- Prospective/Contingent Storage Resources should be provided in a table that includes current resource estimates in million(s) metric tons for the project based on current information. Calculations based on information provided above should be used to demonstrate that the formation(s) identified can contain the estimated CO₂ for injection and displaced fluids. Volumetric calculations should be reported for low, medium, and high probabilities (i.e., P10, P50, & P90). All documentation supporting calculations and parameters used (such as porosity, thickness, net/gross, areal extent and efficiency factors) should be included to validate calculations.
- Storage reservoir(s)—summarize data sources and analyses performed; discuss results of initial characterization of the target reservoir(s). Storage formations identified must have depth sufficient to contain the entire plume area of CO₂ in the supercritical state, and adequate thickness, porosity, permeability, areal extent, etc. In addition, provide information on the water composition of the storage reservoir and evidence that the total dissolved solids are greater than 10,000 mg/L.
- Confining system—summarize data sources and analyses performed; discuss results of initial characterization of the confining zone(s) within the storage complex, as well as other confining formations between the injection interval(s) and underground sources of drinking water (USDWs) for the project site(s). This should include but not be limited to formation types, thicknesses and other analyses conducted (e.g., shale facies analysis for shale formations). Information on wellbores if applicable (oil, natural gas, other permitted wells) that penetrate the confining system and identify which confining zone(s) is/are penetrated; wellbore information shall include but not be limited to: location, depth, formations penetrated, age of wellbore, UIC permit if applicable and usage of well. Structural elements that could impact confining zone(s) integrity within the confining system should be identified.

- USDW—provide the depth of the USDW at the proposed project site(s). Identify if project is located in or near a “sole source aquifer” and plan to protect sole source drinking water.
- Legacy wellbores—summarize known information on legacy wellbores that penetrate the storage complex. Provide any assessments that have taken place on legacy wellbores and risk mitigation strategy
- Subsurface structural elements—identify and discuss properties of geologic structure (e.g., faults) or frequency, magnitude, and location of natural seismicity that could impact storage complex integrity.
- Preliminary Seismic Risk Screening Evaluation - Indicate whether the overall preliminary seismic risk of the proposed storage complex is categorized as Very Low (Category I), Low (Category II), Medium (Category III), or High (Category IV) in accordance with DOE’s “Recommended Practices for Managing Induced Seismicity Risk Associated with Geologic Carbon Storage (Templeton et al., 2021). Describe the work done to justify this categorization.
- Prediction of site performance—summarize results of modeling that has been done to predict hydrologic, geomechanical, or geochemical impacts from the injection of a minimum of 50 million metric tons of CO₂ within a 30-year period at the proposed project site(s)... Models should be based upon actual data obtained from initial site characterization and should include CO₂ plume movement and pressure changes over the life of the project. Models should be based upon actual data obtained from initial site characterization and parameters should be included in a table accompanying the legible model output (map). Additionally, a prediction of the changes in subsurface conditions that could result in natural or induced seismicity should be provided.

Regional Considerations Analysis/Site-Selection Process

Provide a brief summary (not to exceed one page) of the process of selecting the proposed project site(s) over other potential project sites, and consideration given to the below factors.

Provide a brief summary (not to exceed one page) of the process of selecting the proposed project site(s) over other potential project sites, and consideration given to the below factors.

- Land usage near the project sites and along the rights of way (ROWs) that could be impacted by the proposed project, including the Phase III site characterization activities and the construction and operation of the long-term CO₂ transport and storage infrastructure.
- Potential conflict with protected and sensitive areas.
- Pore space ownership, site access, and existing infrastructure issues.
- Proximity to population centers.
- Proximity to disadvantaged communities and/or potential to provide benefits or avoid negative impacts to disadvantaged communities (as defined per [Justice40 Initiative | Department of Energy](#)).

- Potential issues affecting the timeframe for regulatory approval and construction of the CO₂ transport and storage infrastructure.
- The extent to which principles for Consent-Based Project Siting were used (Appendix 4), and/or the extent to which community support and/or opposition were used to select this site.
- Conflicts with existing resource development, surface or subsurface.

CO₂ Technical Analysis

Applicants must demonstrate that the CO₂ sources described in the Scenario Analysis, in aggregate, are capable of meeting the integrated capture and storage project criteria of a minimum of 50 million metric tons of CO₂ within a 30-year period. At a minimum, the following supporting information must be provided:

- Volumes of CO₂ expected from each source shown on a cumulative graph over the 30 year period.
- General description of the readiness of each source to provide CO₂ for storage, including the availability of technology for CO₂ capture and processing at the source.
- Cumulative CO₂
- CO₂ source analysis of the gas following carbon capture: chemical composition of the gas (including expected trace contaminants), pressure, temperature, rate of delivery, reliability, etc. based on the expected capture technology to be employed. Include a discussion of how these parameters compare to requirements for delivery via pipelines or other transport modes.
- For scenarios in which more than one CO₂ source is proposed, a table summarizing the sources that are expected to contribute toward the required 50 million metric tons over 30 years, including, for each source:
 - Source Name.
 - Facility type (e.g., cement, ethanol, coal power, gas power, refinery, ammonia, etc.).
 - Capture technology employed (if known).
 - Approximate CO₂ quantity (metric tons/yr).
 - Approximate distance from storage complex.
 - Transport type(s).
 - Degree of commitment to the commercial project (e.g., letter of commitment, letter of support/interest, informal contact, etc.).

Phase III Project Financing Plan

The application must include a Phase III Project Financing Plan which applies **only to the Phase III project**, not to the long-term capture/transport/storage effort described in the Scenario

Analysis above. This Plan is intended only for the analysis of cost shared funds for Phase III and should consist of the following.

- A description of the capacity of the Applicant to provide the non-federal cost share estimated for Phase III. The Applicant's financial commitment to the project should be evidenced by a commitment letter for the Phase III non-federal cost share. A commitment letter should be included that states the amount and timing of the funds to be made available for the project, and should provide information on the source(s) of the funds along with the authority of the signor of the letter to commit such funds to the project. Any existing approval, such as minutes from a board of directors meeting, should be included in the application materials. Limitations, restrictions, contingencies, or the like on the commitment must be disclosed in the letter.
- If other parties are to provide non-federal cost share for Phase III, such parties must also provide commitment letters including the same information as above. In addition, other parties must disclose their relationship to the Applicant, or other interests in the project. Evidence of the capacity of each outside party to fulfill their financial commitment should also be included.

Note that in consideration of the fact that audited financial statements can have a significant number of pages, these can be attached at the end of the cost-share commitment letter file instead of in the Phase III Project Readiness file.

APPENDIX I – CARBONSAFE PHASE III.5 PROJECT READINESS

CARBONSAFE PHASE III.5 PROJECT READINESS

To be considered responsive to the Funding Opportunity Announcement (FOA), information must be supplied with the application such that the U.S. Department of Energy (DOE) can determine the project's level of readiness for Carbon Storage Assurance Facility Enterprise (CarbonSAFE) Initiative Phase III.5: National Environmental Policy Act (NEPA), Front-End Engineering Design (FEED) Studies, and Storage Field Development Plan Only.

Class VI "Authorization to Construct"

A section of the Project Readiness document must include evidence that the Class VI permit application (or equivalent) has been submitted and determined to be administratively complete by the appropriate regulatory authority. Associated documentation can be included as an appendix to the CarbonSAFE Initiative Phase III.5 Project Readiness document. Failure to include this information will result in the application being deemed nonresponsive to Area of Interest (AOI) 2.

Scenario Analysis

The Scenario Analysis must show that (a) the proposed site storage complex can safely store a minimum of 50 million metric tons of CO₂ within a 30-year period; (b) the specific CO₂ sources included in the scenario are capable of providing the required volumes; (c) and that the integrated capture and storage project, including transport of CO₂ from all sources to the storage complex, is economically sound; and (d) the proposed capture/transport/storage scenario has some level of existing public support.

The information provided in the Scenario Analysis must be consistent with the information provided in the Class VI (or equivalent) application for a Permit to Construct the proposed storage facility with respect to well locations, transport infrastructure locations, CO₂ sources, volumes, and quality, and all other logistical considerations. Note that this Scenario Analysis should include all aspects of the envisioned future, long-term commercial project and not be limited to the boundaries of the proposed Phase III CarbonSAFE Initiative project. Sufficient information must be provided such that a preliminary determination can be made of the commercial viability of the proposed scenario. DOE understands that there will be considerable uncertainty with respect to cost estimates and other aspects of the long-term capture/transport/storage scenario. However, the Scenario Analysis should provide evidence that the Applicant has thoroughly considered all aspects of the scenario and has gathered information to reduce the uncertainty as much as possible. Specific information includes but is not limited to:

- A map or maps showing the following:
 - CO₂ sources, pipelines or other transport routes, and storage site(s).

- Geographic footprints of CO₂ plume(s) and pressure front(s) at all injection wells needed to achieve the required CO₂ volumes.
- Approximate locations of any stratigraphic test wells, or seismic surveys planned in the Phase III project.
- Land-use over the proposed storage complex and transport routes.
- Pore space ownership over the proposed storage complex.
- A table showing approximate latitude and longitude coordinates³⁹ of:
 - All CO₂ sources described in the proposed scenario.
 - All injection wells included in the scenario.
 - Start and end points of all major pipeline segments required to deliver CO₂ from sources to storage sites.
 - All stratigraphic test wells included in the Phase III.5 project.
- Provide a justification of all estimated costs, revenues, sources of revenues, etc. that justify that the project is economically attractive and has a sound business case with acceptable internal rate of return:
 - Estimate of anticipated capital costs for fully developing the storage complex, including injection wells, monitoring wells, CO₂ transport for pipelines or other transport modes required to deliver CO₂ from the specified sources to the proposed storage complex, acquisition of pore space, other on-site facilities, etc.
 - Estimate of anticipated capital costs required to achieve carbon capture at all sources that (1) are expected to provide at least 100,000 metric tons of CO₂ per year to the storage complex during the first five years of its operation, and (2) are expected contribute CO₂ to the proposed storage complex within a 30-year period.
 - Estimate of revenues generated via storage of CO₂ (e.g., 45Q tax credits) over the expected life of the storage operation.
 - Potential sources of revenue (other than tax credits) that are likely to result directly from the storage operation and can be expected contribute its economic viability, such as revenue from enhanced oil recovery as a component of stacked storage.
- Estimates, in \$/ton CO₂ stored, of operating costs for capture, transport, and storage over the expected life of the storage complex.
- Discussion of why participation in the proposed integrated capture, transport, and storage project will serve the business interest of each participant (capture sources, transport providers, and storage complex operators).
- Current level of commitment to the proposed scenario as evidenced by letters from CO₂

³⁹ Coordinates will be used solely by DOE as a means of determining approximate project location. This information will not be released. Coordinates provided in the table should be reasonably close (though not necessarily identical) to the actual locations provided in NEPA documentation for the CarbonSAFE Phase III.5 project (Environmental Questionnaires and Environmental Information Volumes) and in subsequent applications for CarbonSAFE Phase IV funding and Class VI or DOI permits.

sources, transport providers, landowners, pore space owners, and other stakeholders whose cooperation is required.

- Status of any business contractual agreements necessary to fully address technical and financial project risks.
- Status of state incentives/policies toward project economics (long-term liability, tax incentives, rate base recovery, etc.).
- Plan for assumption of remedial and long-term liability for stored CO₂.
- Assessment of the status and physical condition of all existing infrastructure (e.g., pipelines, compressor stations, offshore platforms) that is expected to be utilized and/or re-purposed during the development and operation of the proposed storage complex based upon industry standards and codes. Include an estimate of the level of effort and cost required to make such infrastructure suitable for long-term CO₂ transport and storage.

Technical Subsurface Data Evaluation

A Technical Subsurface Data Evaluation must define and confirm the adequacy of the storage complex geology for the proposed project site(s). Sufficient information (including cross-section seismic lines with interpretation, if available, plume model and resource assessments) must be provided such that a determination can be made of the adequacy of the project site(s) to meet the expected injection rates and volumes to securely store a minimum of 50 million metric tons of CO₂ within a 30-year period. Specific information for inclusion is:

- Depositional system and stratigraphic framework for the overall storage complex.
- Prospective/Contingent Storage Resources should be provided in a table that includes current resource estimates in million(s) metric tons for the project based on current information. Calculations based on information provided above should be used to demonstrate that the formation(s) identified can contain the estimated CO₂ for injection and displaced fluids. Volumetric calculations should be reported for low, medium, and high probabilities (i.e., P10, P50, & P90). All documentation supporting calculations and parameters used (such as porosity, thickness, net/gross, areal extent and efficiency factors) should be included to validate calculations.
- Storage reservoir(s)—summarize data sources and analyses performed; discuss results of initial characterization of the target reservoir(s). Storage formations identified must have depth sufficient to contain the entire plume area of CO₂ in the supercritical state, and adequate thickness, porosity, permeability, areal extent, etc. In addition, provide information on the water composition of the storage reservoir and evidence that the total dissolved solids are greater than 10,000 mg/L.
Confining system—summarize data sources and analyses performed; discuss results of initial characterization of the confining zone(s) within the storage complex, as well as other confining formations between the injection interval(s) and underground sources of drinking water (USDWs) for the project site(s). This should include but not be limited to formation types, thicknesses and other analyses conducted (e.g., shale facies analysis for shale formations). Information on wellbores if applicable (oil, natural gas, other

permitted wells) that penetrate the confining system and identify which confining zone(s) is/are penetrated; wellbore information shall include but not be limited to: location, depth, formations penetrated, age of wellbore, UIC permit if applicable and usage of well. Structural elements that could impact confining zone(s) integrity within the confining system should be identified.

- USDW—provide the depth of the USDW at the proposed project site(s).). Identify if project is located in or near a “sole source aquifer” and plan to protect sole source drinking water.
- Legacy wellbores—summarize known information on legacy wellbores that penetrate the storage complex. Provide any assessments that have taken place on legacy wellbores and risk mitigation strategy.
- Subsurface structural elements—identify and discuss properties of geologic structure (e.g., faults) or frequency, magnitude, and location of natural seismicity that could impact storage complex integrity.
- Overall Seismic Risk Screening Evaluation - Indicate whether the overall preliminary seismic risk of the proposed storage complex is categorized as Very Low (Category I), Low (Category II), Medium (Category III), or High (Category IV) in accordance with DOE’s “Recommended Practices for Managing Induced Seismicity Risk Associated with Geologic Carbon Storage (Templeton et al., 2021). Describe the work done to justify this categorization. Applicants must also provide the plan for managing the risk of induced seismicity consistent with the Risk Category of the proposed project site.
- Prediction of site performance—summarize results of modeling that has been done to predict hydrologic, geomechanical, or geochemical impacts from the injection of a minimum of 50 million metric tons of CO₂ within a 30-year period at the proposed project site(s). Models should be based upon actual data obtained from initial site characterization and should include CO₂ plume movement and pressure changes over the life of the project. Models should be based upon actual data obtained from initial site characterization and parameters should be included in a table accompanying the legible model output (map). Additionally, a prediction of the changes in subsurface conditions that could result in natural or induced seismicity should be provided.

Regional Considerations Analysis/Site-Selection Process

Provide a brief summary (not to exceed one page) of the process of selecting the proposed project site(s) over other potential project sites, and consideration given to the below factors.

- Land usage near the project sites and along the rights of way (ROWS) that could be impacted by the proposed project, including the Phase III site characterization activities and the construction and operation of the long-term CO₂ transport and storage infrastructure .
- Potential conflict with protected and sensitive areas.
- Pore space ownership, site access, and existing infrastructure issues.
- Proximity to population centers.

- Proximity to disadvantaged communities and/or potential to provide benefits or avoid negative impacts to disadvantaged communities (as defined per [Justice40 Initiative | Department of Energy](#)).
- Potential issues affecting the timeframe for regulatory approval and construction of the CO₂ transport and storage infrastructure.
- The extent to which principles for Consent-Based Project Siting were used (Appendix 4), and/or the extent to which community support and/or opposition were used to select this site.
- Conflicts with existing resource development, surface or subsurface.

CO₂ Technical Analysis

Applicants must demonstrate that the CO₂ sources described in the Scenario Analysis, in aggregate, are capable of meeting the integrated capture and storage project criteria of a minimum of 50 million metric tons of CO₂ within a 30-year period. At a minimum, the following supporting information must be provided:

- Volumes of CO₂ expected from each source shown on a cumulative graph over the 30-year period.
- General description of the readiness of each source to provide CO₂ for storage, including the availability of technology for CO₂ capture and processing at the source.
- CO₂ source analysis of the gas following carbon capture: chemical composition of the gas (including expected trace contaminants), pressure, temperature, rate of delivery, reliability, etc. based on the expected capture technology to be employed. Include a discussion of how these parameters compare to requirements for delivery via pipelines or other transport modes.
- For scenarios in which more than one CO₂ source is proposed, a table summarizing the sources that are expected to contribute toward the required 50 million metric tons over 30 years, including, for each source:
 - Source Name.
 - Facility type (e.g., cement, ethanol, coal power, gas power, refinery, ammonia, etc.).
 - Capture technology employed (if known).
 - Approximate CO₂ quantity (metric tons/yr).
 - Approximate distance from storage complex.
 - Transport type(s).
 - Degree of commitment to the commercial project (e.g., letter of commitment, letter of support/interest, informal contact, etc.).

APPENDIX J – CARBONSAFE PHASE IV PROJECT READINESS

CARBONSAFE PHASE IV PROJECT READINESS

To be considered responsive to the Funding Opportunity Announcement (FOA), information must be supplied with the application such that the U.S. Department of Energy (DOE) can determine the project's level of readiness for Carbon Storage Assurance Facility Enterprise (CarbonSAFE) Initiative Phase IV: Construction.

Please note that there is a 20 page limit on the body of this document, which should provide a short narrative or summary of the appendices. Except for the Scenario Analysis, the sections discussed below should be attached as appendices to the CarbonSAFE Phase IV Project Readiness document.

Scenario Analysis

The Scenario Analysis must show that (a) the proposed storage complex can safely store a minimum of 50 million metric tons of CO₂ within a 30-year period; (b) the specific CO₂ sources included in the scenario are capable of providing the required volumes; (c) the integrated capture and storage project, including transport of CO₂ from all sources to the storage complex, is economically sound; and (d) the proposed capture/transport/storage scenario has some level of existing public support.

The information provided in the Scenario Analysis must be consistent with the information provided in both (a) the Class VI (or equivalent) application for a Permit to Construct the proposed storage facility and (b) the NEPA Environmental Assessment or Environmental impact Statement for the proposed Phase IV project with respect to well locations, transport infrastructure locations, CO₂ sources, volumes, and quality, and all other logistical considerations. Note that this Scenario Analysis should include all aspects of the envisioned future, long-term commercial project and not be limited to the boundaries of the proposed Phase IV CarbonSAFE Initiative project. Sufficient information must be provided such that a preliminary determination can be made of the commercial viability of the proposed scenario. DOE understands that there will be considerable uncertainty with respect to cost estimates and other aspects of the long-term capture/transport/storage scenario. However, the Scenario Analysis should provide evidence that the Applicant has thoroughly considered all aspects of the scenario and has gathered information to reduce the uncertainty as much as possible. Specific information includes but is not limited to:

- A map or maps showing the following:
 - CO₂ sources, pipelines or other transport routes, and storage site(s).
 - Geographic footprints of CO₂ plume(s) and pressure front(s) at all injection wells

- needed to achieve the required CO₂ volumes.
 - Approximate locations of any stratigraphic test wells, or seismic surveys planned in the Phase III project.
 - Land-use over the proposed storage complex and transport routes.
 - Pore space ownership over the proposed storage complex.
- A table showing approximate latitude and longitude coordinates⁴⁰ of:
 - All CO₂ sources described in the proposed scenario.
 - All injection wells included in the scenario.
 - Start and end points of all major pipeline segments required to deliver CO₂ from sources to storage sites.
 - All stratigraphic test wells included in the Phase IV project.
- Provide a justification of all estimated costs, revenues, sources of revenues, etc. that justify that the project is economically attractive and has a sound business case with acceptable internal rate of return:
 - Estimate of anticipated capital costs for fully developing the storage complex, including injection wells, monitoring wells, CO₂ transport for pipelines or other transport modes required to deliver CO₂ from the specified sources to the proposed storage complex, acquisition of pore space, other on-site facilities, etc.
 - Estimate of anticipated capital costs required to achieve carbon capture at all sources that (1) are expected to provide at least 100,000 metric tons of CO₂ per year to the storage complex during the first five years of its operation, and (2) are expected contribute CO₂ to the proposed storage complex within a 30-year period.
 - Estimate of revenues generated via storage of CO₂ (e.g., 45Q tax credits) over the expected life of the storage operation.
 - Potential sources of revenue (other than tax credits) that are likely to result directly from the storage operation and can be expected contribute its economic viability, such as revenue from enhanced oil recovery as a component of stacked storage.
- Estimates, in \$/ton CO₂ stored, of operating costs for capture, transport, and storage over the expected life of the storage complex.
- Discussion of why participation in the proposed integrated capture, transport, and storage project will serve the business interest of each participant (capture sources, transport providers, and storage complex operators).
- Current level of commitment to the proposed scenario as evidenced by letters from CO₂

⁴⁰ Coordinates will be used solely by DOE as a means of determining approximate project location. This information will not be released. Coordinates provided in the table should be reasonably close (though not necessarily identical) to the actual locations provided in NEPA documentation for the CarbonSAFE Phase IV project (Environmental Questionnaires and Environmental Information Volumes) and in subsequent applications for CarbonSAFE Phase IV funding and Class VI or DOI permits.

sources, transport providers, landowners, pore space owners, and other stakeholders whose cooperation is required.

- Status of any business contractual agreements necessary to fully address technical and financial project risks.
- Status of state incentives/policies toward project economics (long-term liability, tax incentives, rate base recovery, etc.).
- Plan for assumption of remedial and long-term liability for stored CO₂.
- Assessment of the status and physical condition of all existing infrastructure (e.g., pipelines, compressor stations, offshore platforms) that is expected to be utilized and/or re-purposed during the development and operation of the proposed storage complex based upon industry standards and codes. Include an estimate of the level of effort and cost required to make such infrastructure suitable for long-term CO₂ transport and storage.

Class VI or BSEE OCS “Authorization to Construct”

A section of the Project Readiness document must include evidence that an application(s) for a U.S. Environmental Protection Agency (EPA) Class VI or DoI Outer Continental Shelf (OCS) “Authorization to Construct” permit(s) have been submitted and have been determined by the cognizant regulatory authority to be “Administratively Complete” at the time of application for Phase IV. Documentation to verify the regulatory authority’s determination can be included as an appendix to the CarbonSAFE Initiative Phase IV Project Readiness document. Failure to include this information will result in the application being deemed nonresponsive to Area of Interest (AOI) 3. Furthermore, if the proposed project is subsequently selected for award, the applicant will be required to provide evidence that the U.S. Environmental Protection Agency (EPA) Class VI or DoI Outer Continental Shelf (OCS) “Authorization to Construct” has been received from the appropriate regulatory authority before work authorized under the permit(s) can begin under the DOE award.

Documentation provided to support this section should include but not be limited to:

- Copy of all parts of application package for Underground Injection Control (UIC) Class VI permit(s) to construct or equivalent offshore permit(s).
- Copy of UIC Class VI permit(s) to construct and conditions or equivalent offshore permit(s).

National Environmental Policy Act (NEPA) Compliance

A section of the Project Readiness document must include evidence that the applicant is actively collaborating with DOE to produce an Environmental Assessment (EA) or Environmental Impact Statement (EIS) as determined by DOE on the basis of the project’s Environmental Information Volume (EIV). In addition, the applicant must provide evidence of progress towards a Finding of No Significant Impact (FONSI) on an Environmental Assessment (EA), or a Record of

Decision (RoD) on an Environmental Impact Statement (EIS). The information provided in the EA/EIS must be consistent with the information provided in both (a) the Class VI (or equivalent) application for a Permit to Construct the proposed storage facility and (b) the Scenario Analysis for the proposed Phase IV project with respect to well locations, transport infrastructure locations, CO₂ sources, volumes, and quality, and all other logistical considerations. Associated documentation can be included as an appendix to the CarbonSAFE Initiative Phase IV Project Readiness document. Failure to include this information will result in the application being deemed nonresponsive to AOI 3. Furthermore, if the proposed project is subsequently selected for award, the applicant will be required to provide evidence that a Finding of No Significant Impact (FONSI) on an Environmental Assessment (EA), or a Record of Decision (RoD) on an Environmental Impact Statement (EIS) has been received before any work described under the FONSI or RoD can begin under the DOE award.

All components of a potential CarbonSAFE Phase IV project must have been analyzed during the Environmental Assessment (EA) or Environmental Impact Statement (EIS) process. Applications that propose project elements not included in the applicable NEPA analysis will result in the application being deemed nonresponsive to AOI 3.

Storage Field Development Plan (This plan specifically, or an equivalent similar plan will be accepted assuming similar information is included.)

The Storage Field Development Plan should explain all elements of the storage field site and confirm the adequacy of the geology for the proposed project site(s). It is expected that the contents of the Storage Field Development Plan would be similar to information provided for receipt of permission to construct under EPA Class VI rules or DoI OCS-equivalent rules.

The Storage Field Development Plan should include technical subsurface data evaluation used to justify the EPA Class VI or DoI OCS permits to construct. It should define and confirm the adequacy of the storage complex geology for the proposed project site(s). Sufficient information (including cross-section, seismic lines with interpretation, plume model and resources assessments) must be provided such that a determination can be made of the adequacy of the project site(s) to meet the expected injection rates and volumes to securely store a minimum of 50 million metric tons of CO₂ within a 30-year period. Specific information for inclusion is:

- Depositional system and stratigraphic framework for the overall storage complex.
- Prospective/Contingent Storage Resources should be provided in a table that includes current resource estimates in million(s) metric tons for the project based on current information. Volumetric calculations should be reported for low, medium, and high probabilities (i.e., P10, P50, & P90). All documentation supporting calculations and parameters used (such as porosity, thickness, net/gross, areal extent and efficiency factors) should be included to validate calculations.
- Storage reservoir(s)—summarize data sources and analyses performed; discuss results of initial characterization of the target reservoir(s). Storage formations identified must

have depth sufficient to contain the entire plume area of CO₂ in the supercritical state, and adequate thickness, porosity, permeability, areal extent, etc. In addition, provide information on the water composition of the storage reservoir and evidence that the total dissolved solids are greater than 10,000 mg/L.

- Confining system—summarize data sources and analyses performed; discuss results of initial characterization of the confining zone(s) within the storage complex, as well as other confining formations between the injection interval(s) and underground sources of drinking water (USDWs) for the project site(s). This should include but not be limited to formation types, thicknesses and other analyses conducted (e.g., shale facies analysis for shale formations). Information on wellbores if applicable (oil, natural gas, other permitted wells) that penetrate the confining system and identify which confining zone(s) is/are penetrated; wellbore information shall include but not be limited to: location, depth, formations penetrated, age of wellbore, UIC permit if applicable and usage of well. Structural elements that could impact confining zone(s) integrity within the confining system should be identified.
- USDW—provide the depth of the USDW at the proposed project site(s). Identify if project is located in or near a “sole source aquifer” and plan to protect sole source drinking water.
- Legacy wellbores—summarize known information on legacy wellbores that penetrate the storage complex. Provide any assessments that have taken place on legacy wellbores and risk mitigation strategy.
- Subsurface structural elements—identify and discuss properties of geologic structure (e.g., faults) or frequency, magnitude, and location of natural seismicity that could impact storage complex integrity.
- Prediction of site performance—summarize results of modeling that has been done to predict hydrologic, geomechanical, or geochemical impacts from the injection of a minimum of 50 million metric tons of CO₂ within a 30-year period at the proposed project site(s). Models should be based upon actual data obtained from initial site characterization and should include CO₂ plume movement and pressure changes over the life of the project. Models should be based upon actual data obtained from initial site characterization and parameters should be included in a table accompanying the legible model output (map). Additionally, a prediction of the changes in subsurface conditions that could result in natural or induced seismicity should be provided.

There are several major cost categories related to the development of a CarbonSAFE Initiative site including wells, infrastructure, and monitoring deployment. Each of these will bring their own cost uncertainty due to outside influences such as oilfield contractor demand, steel price, supply chain disruptions, and inflation. In order to set the correct expectations, each recipient is required to submit a full Field Development Plan with a P-10, P-50, and P-90 project cost analysis. Project risks and their effect on cost should be clearly explained. In addition, each

proposed well should have a full Authority for Expenditure (AFE) with cost uncertainty ranges defined for each line item.

The Storage Field Development plan will be required to report the movement through Prospective, Contingent, and Capacity based on the Society of Petroleum Engineers (SPE) Storage Resource Management System (SRMS) guidelines discussed at: [SPE Carbon Dioxide \(CO₂\) SRMS](#). Projects should follow the process to classify contingent storage resources and storage capacity. These estimated classification of resources and capacity will be used to demonstrate how Bipartisan Infrastructure Law (BIL)-funded projects are adding additional geologic storage infrastructure. Projects will be required to provide as part of their project an example of contingent resources and move through to capacity.

Additionally, it is important to understand the plan for commercialization and for how the storage field would build out and evolve over time (at least 30 years). This is particularly significant for hub facilities. A description and diagram of the fully developed field (which may include elements outside the scope of the CarbonSAFE Initiative project[s]) with clear delineation as to the immediate portion that makes up the current project should be used in the business plan description.

Suggested contents of the Field Development Plan are listed in Appendix 7—*Storage Field Development Plan*.

CO₂ Source(s) Feasibility Study (This study specifically, or an equivalent similar plan will be accepted assuming similar information is included.)

A section of the Project Readiness document must include a plan for the initial supply of CO₂ that would be available for the first five years of injection, with a plan for the CO₂ supply curves (both yearly and cumulative) over the next 25 years that shows CO₂ sources (anthropogenic, direct air capture [DAC], and biomass carbon removal and storage [BiCRS]). It should show how the CO₂ sources change over the time frame of interest, including when the source(s) would come online (or go offline), CO₂ quantity, flue gas composition, and CO₂ source. For those sources expected to be used during the initial five years of operations, recipients shall include letters of interest and level of commitment from the current CO₂ source providers and discuss the specific business case associated with each source—this should also include new sources, such as DAC and BiCRS, if applicable.

At a minimum, the CO₂ Source Feasibility Study or equivalent must demonstrate due diligence by the Recipient and include all necessary information to support the application for a Class VI permit including, but not limited to, definition of source(s), physical and chemical characteristics (e.g., concentration of each gas constituent, including contaminants) of the captured CO₂ stream, flow rates, incoming pressure, and any requirements from the CO₂ transport system operators.

The CO₂ Source Feasibility Study should discuss the type of capture system and pre-/post-capture processing that a specific raw gas stream might need, percent capture, dehydration, and/or compression requirements. If a proposed source is already concentrated and does not require a capture technology, information should be included regarding quantity and purity of CO₂ and any requirements for dehydration and/or compression.

CO₂ Transport Front-End Engineering Design (FEED) Study (This plan specifically, or an equivalent similar plan will be accepted assuming similar information is included.)

A section of the Project Readiness document must include the Front End Engineering Design (FEED) Study of the new transport infrastructure⁴¹ needed to connect CO₂ source(s) to the storage field. A description of the items to be included are presented in Appendix 8—CO₂ Transport FEED Study.

Business and Financial Plans and Arrangements

These plans should include the addressable market, development scenarios, proposed business model structure, risk allocation, basic commercial terms, a revenue model, government incentives, financing cost, financial assumptions, ways to achieve economy of scale if applicable, and sensitivity discussion. If the plan includes the use of current 45Q tax credits, the business case analysis shall include, at a minimum, details on the anticipated revenue and duration of the credits. No revenue from the sale of hydrocarbons (oil or natural gas) recovered via operation of the proposed storage facility will be considered as part of the financial/business analysis. Specifically, the economic viability of the proposed storage facility cannot depend on revenues from the sale of hydrocarbons produced as the result of the proposed storage facility operation.

Note that the applicant should be clear regarding the distinction between financing for the proposed CarbonSAFE Initiative Phase IV project and the larger envisioned future commercial project, and is asked to specifically refer to “CarbonSAFE Phase IV” and “commercial project” throughout for clarity.

Additionally, it is important to understand the plan for commercialization and for how the storage field would build out and evolve over time (at least 30 years). This is particularly significant for hub facilities. A description and diagram of the fully developed field (which may include elements outside the scope of the CarbonSAFE Initiative project[s]) with clear delineation as to the immediate portion that makes up the current project should be included for clarity.

⁴¹ Note that the entire CO₂ transport system from source(s) to the storage field may include existing as well as new transport infrastructure; the FEED study would cover only new transport infrastructure

Business Financial Plans and Arrangements should include:

- Current version of the relevant Business Plan for the project: operating costs, operating revenues, financing cash flows, EBITDA, tax credits/liabilities, and rate of investment (ROI) over the project lifespan. The Business Case Analysis should also include a list of key economic/financial assumptions.
- Current versions of the Project Financing Plan describing how the non-DOE cost share will be provided, sources of funding, steps to secure funding, and how the time span between construction completion and first CO₂ delivery will be managed, etc.
- Evidence of the financial conditions and financial capacities of each entity mentioned in the Project Financing Plan, such as audited financial statements and funding commitment authorities.
- Evidence that the project recipients have the financial assets (liquid or loan authorities) and commitment to cover contingencies if the project costs exceed the negotiated agreement, either as additional cost share or the entire amount of the cost overrun, up to the 25% of the original proposed project cost.
- Functional project Financial Model with assumptions explained in an attached narrative.
- Expected Insurance types, structure, coverage amounts.
- High-level future potential build-out scenarios of the storage facility that includes multiple capture sources coming online throughout the 30-year deployment period.
- Evidence that the Financial Responsibility requirements for an EPA Class VI well drilling permit are met, or provide an explanatory narrative that justifies why the requirements are not yet met.
- Copies of (if applicable and available at time of application):
 - A schedule for financial closing (if not a part of the Project Financing Plan).
 - Signed Agreement(s) or Preliminary Agreement(s) involving or affecting the project, including agreements with affected communities.

Engineer, Procure, and Construct Effort

Contract(s) for (if available at time of application):

- Detailed design.
- Owner's engineer, if applicable.
- Project/construction management, if applicable.
- Large-cost or long-lead procurements, if applicable.
- Materials/components/systems procurement, construction, or installation, including compliance with the Davis-Bacon Act regarding payment of prevailing wages and the Buy American provisions detailed in the FOA.
- Operations and maintenance services.
- Other significant contracts.
- The construction schedule at the lowest Work Breakdown Structure (WBS) available and resource-loaded, if applicable.

- Design drawings and specifications sheets for facilities to be constructed (if available at time of application).
- Draft Plans and Guides for operating and maintaining the storage site facilities and CO₂ **transport infrastructure** constructed as part of the project (if available at time of application).
- Draft Emergency Response Plans and notification protocols (if available at time of application).
- Draft Personnel/Staffing Plan (if available at time of application).

Additional Required Documents

The following additional documents should be included as attachments to the Phase IV Project Readiness Document:

- Initial potential benefits that could include, but not be limited to, metrics such as created jobs/internships/apprenticeships, domestic manufacturing, justice and equity, consent-based siting, revenue, emission reduction, etc.
- Initial Environmental Health and Safety (EH&S) Analysis. Applicants are required to submit an initial EH&S analysis. EH&S analysis should include discussion regarding air and water emissions, water utilization, solid waste streams, noise, and potential environmental impacts of the technology, including toxicological effects and hazards of emissions and waste streams.
- Copies of CO₂ Transportation and Storage Contract(s) or other evidence of the source(s) of CO₂ to be processed.
- Map of the proposed storage site(s) and storage complex that also shows property ownership (with descriptions) for the land surface, subsurface pore space, and mineral rights, including an indication of where easements and access rights have been obtained and including disclosure of known land-use concerns (such as cultural, wildlife, or natural resources).
- Copies of documents of rights of access, lease, or ownership, as appropriate for CO₂ **transport infrastructure** and electrical power facilities, wells, well pads platforms, access roads, land surface access, monitoring stations, pore space (including royalty arrangements), mineral rights, etc.
- Copies of documents providing independent certification that all existing infrastructure (e.g., pipelines, compressor stations, offshore platforms) intended for reuse or repurposing in the Phase IV project has been qualified for the intended purpose (i.e., fit-for-service or fit-for purpose), particularly with respect to the structural/mechanical integrity and environmental, safety, and health aspects of the existing infrastructure.
- Project Risk Assessment(s) and Mitigation Plans for proposed project.

APPENDIX K – STORAGE FIELD DEVELOPMENT PLAN

The Storage Field Development Plan should: (1) explain the strategy for developing the storage field to maximize its potential utility; (2) describe all elements of the proposed storage field facilities and establish a logical order and timing for the development of all anticipated facilities, accounting for changing needs for monitoring and use of pore space and changing carbon dioxide (CO₂) delivery rates over time; and (3) present a cost plan over the proposed life of the project. It is expected that the facilities description within the Storage Field Development Plan would be based on information associated with the relevant permits (e.g., Underground Injection Control [UIC] or Outer Continental Shelf [OCS] permit application and associated permit terms and conditions, National Pollutant Discharge Elimination System [NPDES] permit, monitoring well permits, site access road permit), along with regulatory rules and guidance. The plan should include, if relevant, the assessment and repurposing or plugging of legacy wells and repurposing of other existing infrastructure such as pipelines, compressor stations, or offshore platforms based upon industry standards and codes. It is understood that this plan will be only a draft or preliminary until after relevant permits are received, financing is arranged, and other considerations are settled.

There are several major cost categories related to the development of a Carbon Storage Assurance Facility Enterprise (CarbonSAFE) site, including wells, infrastructure, and monitoring deployment. Each of these will bring their own cost uncertainty due to outside influences such as oilfield contractor demand, steel price, supply chain disruptions, and inflation. To set the correct expectations, each Plan is required to include a project cost breakdown with a P-10, P-50, and P-90 project cost analysis. Project risks and their effect on cost should be clearly explained. In addition, each proposed well should have a full Authorization for Expenditure (AFE) with cost uncertainty ranges defined for each line item.

The Storage Field Development Plan should additionally report the progression of the storage resource status through Prospective, Contingent, and Capacity based on the Society of Petroleum Engineers (SPE) Storage Resource Management System (SRMS) guidelines described at [SPE CO₂ SRMS](#). Projects will be required to use the SRMS process to classify the status of the storage resource(s) from prospective through contingent to capacity. The estimated classification of the resource(s) and capacity(ies) will be used by the U.S. Department of Energy (DOE) to demonstrate how Bipartisan Infrastructure Law (BIL)-funded projects are increasing secure geologic storage capabilities in the United States.

Additionally, it is important to understand the plan for commercialization and how the storage field would be built and evolve over time (at least 30 years). This is particularly significant for hub facilities. A description and diagram of the fully developed field (which may include elements outside the scope of the CarbonSAFE Initiative project[s] funded

here), with clear delineation as to the immediate portion that makes up the current project, should be used in the Storage Field Development Plan and in business plan description.

Suggested contents of the Storage Field Development Plan are described below. Please note, however, that DOE will accept the Plan in whatever format is company standard for the Recipient, assuming that the Plan has all needed information to understand the build-out, operations, and costs for the planned storage of CO₂.

Suggested contents of the Field Development Plan:

1. Executive Summary
2. Storage Development Description and Rationale for Development Plan
 - Field Characterization Results
 - Seismic Interpretation and Structural Configuration
 - Baseline Seismicity and plan for managing the risk of induced seismicity consistent with the risk category of the proposed project site that was determined by the [Templeton et. al](#) methodology.
 - Geological Interpretation and Reservoir Description
 - Volumetrics
 - Reservoir Pressure and Reservoir Fluids
 - Reservoir Units and Modelling Approach
 - Injection Rate and Mass Over Time
 - Area of Review Calculation
 - Legacy Well Evaluation
3. Development and Management Plan
 - Development Plan
 - Well Construction and Legacy Well Mitigation Plans
 - Plans for Repurposing Existing Infrastructure for CO₂ Transport and Storage Based Upon Industry Standards and Codes
 - Injection Facilities
 - Monitoring Plan
 - Injection Operations
 - Decommissioning and Post-Injection Site Care (PISC) Plan
 - Costs
 - Pre-Project Costs (Seismic, Exploration Drilling, Appraisal Drilling, Studies)
 - Drilling and Completion of Wells
 - Assessment and Repurposing or Plugging of Legacy Wells, Pipelines and Other Existing Infrastructure
 - Facilities
 - Field OpEx, Excluding Tariffs
 - Decommissioning and PISC Costs
 - Project Risks and Mitigations
 - Storage Management Plan

Note – The Storage Field Development Plan must address all components of infrastructure for which funding will be requested under a CarbonSAFE Phase IV award. Funding for construction under CarbonSAFE Phase IV shall only be used for infrastructure described in the Storage Field Development Plan

APPENDIX L – CO₂ TRANSPORT FEED STUDY

(This plan specifically, or an equivalent similar plan, will be accepted assuming similar information is included.)

Note - The primary focus of the CarbonSAFE Initiative is the storage facility, not the transport system. **Therefore, the DOE share of the CO₂ Transport FEED Study shall not exceed \$5 million.**

FEED study deliverables shall include, but not necessarily be limited to:

1. **Project Scope and Summary** that includes business objectives and a summary of the proposed project. This document must describe whether the transport infrastructure will be an open access or common carrier and how the proposed system(s) can help accelerate CCUS/CDR development.
2. **Project Parameters** including, but not limited to:
 - a. Site characteristics and ambient conditions;
 - b. CO₂ fluid compositions including maximum and minimum limits;
 - c. Land use, right-of-way, utility corridors, property boundaries, and title research;
 - d. Project execution plan that details the timeline, critical items, decisions points, and significant milestones necessary to advance the project through the stages of detailed design, procurement, construction, commissioning, and start-up.
3. **Engineering Design Package** that covers all proposed modes of transport within the system, including interconnection between modes (if applicable). The engineering design package shall include, but not be limited to:
 - a. **General (applicable to all transport modes)**
 - i. A Route Report and Maps, complete with:
 1. A Geographic Information Systems (GIS) database to house all route and survey information;
 2. Route map incorporating aerial photography, right-of-way and workspace, environmental features (waterways, streams, rivers, canals, lakes, wetlands, etc.), existing transportation infrastructure (roads, tunnels, highways, railroads, terminals, locks, ports), topography, elevation profiles, hydrological data, foreign crossings, and others;

3. Crossing and right-of-way investigation or survey including elevation, crossing methods, constructability, proposed mitigation, land use, access, workspace configuration, and other relevant information at key locations;
 4. Geotechnical and hydrotechnical investigations (desktop or field) that consider extreme weather scenarios and other ground movement force considerations;
 5. Wetland and environmental survey or investigation information;
 6. Cultural and archeological survey or investigation information;
 7. Population density study along the transport route and a preliminary High Consequence Area (HCA) determination;
 8. Site selection for aboveground facilities and construction laydown yards;
 9. Locations of both existing and proposed CO₂ sources, transfer facilities, and storage/conversion facilities; and
 10. Landowner engagement and land acquisition plan along the proposed route.
- ii. A Design Basis document that covers:
1. Applicable codes, regulations, standards, and specifications that govern the civil, structural, mechanical, process, electrical, and automation/controls designs;
 2. If no codes, regulations, standards, or specifications exist, alternatives that demonstrate equivalency shall be identified;
 3. Transport distance, transport mode, transport capacity, CO₂ phase, and permissible composition of CO₂ transported between each receipt/delivery point;
 4. Route selection process, including alternatives considered;
 5. Basis for the selected mode of transport;

6. Crossing design including waterways, roads, interstate highways, and railroads including horizontal directional drilling requirements;
 7. Integrity management and inspection;
 8. Supervisory Control and Data Acquisition (SCADA) System and Leak Detection System;
 9. Overpressure protection, venting during routine operations, and emergency venting;
 10. Building monitoring designs and equipment to detect and notify personnel of unsafe conditions;
 11. Metering and custody transfer;
 12. Operating and control philosophy;
 13. Infrastructure and/or rights of way intended for re-use;
 14. Provisions for future expansion; and
 15. A staffing plan for operation of the transport system.
- iii. Key Design Calculations and Drawings that cover:
1. Pressure design and Maximum Operating Pressure (MOP) determination;
 2. Overpressure protection;
 3. Mass and energy balance, including justification for proposed equation of state (EOS);
 4. An estimate of annual CO₂ releases from normal and emergency operations;
 5. Transport system and equipment sizing;
 6. Process flow diagram (PFD) and Utility flow diagram (UFD);
 7. Preliminary process and instrumentation diagrams (P&ID);
 8. Power requirements, sources, costs, and timing;
 9. Preliminary material take-off;
 10. Tie-in list;
 11. Demolition/removal drawings; and
 12. Preliminary drawing list and estimated drawing count for the detailed engineering phase.
- iv. Technical Specifications and datasheets for major materials, equipment, and activities, including but not limited to: rotating or static equipment, measurement facilities, leak detection, SCADA, controls, communications,

- buildings, electrical substations, construction, surveying, and others.
- v. Risk management plan, complete with a risk register, a preliminary Hazard and Operability Analysis (HAZOP), and a preliminary cause and effect diagram.
 - vi. If converting assets to CO₂ service, a preliminary conversion-to-service plan that includes an integrity assessment plan to demonstrate fitness for service and/or applicable regulatory compliance.
 - vii. Additional critical safety and risk assessments:
 - 1. Conducting an Air Dispersion and Potential Impact Radius (PIR) study including terrain and overland flow considerations for determining the effect on any populated areas;
 - 2. Providing an Emergency Response Plan (ERP) including training and outreach for emergency responders and local communities, as appropriate;
 - 3. Consideration of additional safety critical equipment (e.g., emergency shutdown system, braking, maritime safety) and redundant safety design;
 - 4. Consideration of odorant additives for CO₂; and
 - 5. Consideration of additional distance for setback in populated areas.
 - viii. Constructability review and construction specifications to meet applicable codes, regulations, and standards.
 - ix. Environmental Specifications:
 - 1. Monitoring;
 - 2. Structures, such as for waterbody crossings, to minimize construction damage to the environment;
 - 3. Wetland, river, lake, major stream crossings and horizontal directional drills; and
 - 4. Soil erosion mitigation measures and structures and monitoring after construction for 1 year.
 - x. Commissioning plans.
 - xi. Procurement plan for long lead materials and equipment.
 - xii. Plan for selection of contractors/subcontractors.
 - xiii. Summary of lessons learned during FEED study execution.

b. Additional Deliverables for Pipelines

- i. A Route Report and Maps, complete with:

1. Geotechnical and hydrotechnical investigations (desktop or field) that consider extreme weather scenarios and other ground movement force considerations aligned with DOT PHMSA's Integrity Management Program and relevant advisory bulletins for all pipelines such as the June 2022 bulletin (Docket PHMSA-2022-0063) titled "Pipeline Safety: Potential for Damage to Pipeline Facilities Caused by Earth Movement and Other Geological Hazards;"⁴²
- ii. A Design Basis document that covers:
 1. Pipe specifications including fracture toughness criteria;
 2. Design criteria including metallurgical requirements to address ductile fracture propagation including length for fracture arrest based upon material;
 3. Material and pipe coating specifications including specifications for fracture arrest (maximum arrest distance) and selection;
 4. Cathodic protection including location of ground beds;
 5. Integrity management including inline inspection of the pipeline;
 6. Location of mainline valves for isolation including public safety, waterbody crossings and rupture isolation and detection;
 7. Supervisory Control and Data Acquisition (SCADA) System and Leak Detection System with pressure and flow monitoring including rupture mitigation valves (RMV) that will isolate pipeline segments within 30 minutes or less;
 8. Determination of Maximum Operating Pressure and Minimum Operating Pressure including placement of overpressure safety devices; and
 9. Pipeline "venting design" and location options at pump stations, mainline valves, and laterals for public safety.
- iii. Key Design Calculations and Drawings that cover:

⁴² [PHMSA Land Movement Advisory Bulletin.pdf \(dot.gov\)](https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/2022-05/PHMSA%20Land%20Movement%20Advisory%20Bulletin.pdf) - <https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/2022-05/PHMSA%20Land%20Movement%20Advisory%20Bulletin.pdf>

1. Experimentally verified thermo-hydraulic analysis (steady state and transient);
2. Preliminary alignment sheets; and
3. Pipeline facilities – Additional deliverables for transfer facilities apply (Section I.B.i.3.g).
- iv. Technical Specifications and datasheets for major materials and activities, including but not limited to: pumps, compressors, pigging facilities, pipe, and valves.
- v. If converting a pipeline to CO₂ service, a preliminary conversion-to-service plan for DOT PHMSA regulatory compliance that includes an integrity assessment plan to demonstrate fitness for service and/or applicable regulatory compliance for offshore pipelines.
- vi. Additional critical safety and risk assessments:
 1. Consideration of additional safety critical equipment and redundant safety design such as crack arrestors (or pipe toughness (Charpy Impact Value)) and enhanced shut off capabilities in the event of a catastrophic failure including mainline valve spacing and RMV locations.
- vii. Construction Specifications to meet 49 CFR Part 195:
 1. Right of way clearing, grading, and ditching;
 2. Depth of soil cover and minimum spacing from dwelling;
 3. Welding requirements;
 4. 100% Non-Destructive Testing of pipeline girth weld;
 5. Pressure testing per the requirements in 49 CFR 195.304;
 6. Coating;
 7. Backfill to protect the pipe and coating;
 8. Pipe Bending requirements; and
 9. Clean-up of the right of way.

c. Additional Deliverables for Rail

- i. A design basis document that covers:
 1. Number of trains, length of each train, number of rail cars per train, round trip journey time (including loading, travel, and unloading), and total round-trip journeys per year;
 2. A description of loading (filling), storage, and unloading (emptying) facilities and operations;

3. Blocking, bracing, and segregation of product;
4. A traffic study and reliability assessment;
5. Restrictions on weight, width, curfews, noise; and
6. Identification of High Threat Urban Areas (HTUA).
- ii. Technical Specifications and datasheets for major materials and activities, including but not limited to:
 1. Railways, railyards, switches and crossings;
 2. Rail cars; and
 3. Support systems such as: handling and transfer systems, gaging systems, temperature and pressure control systems, boil off management, and instrumentation.
- iii. Rail terminals – Additional deliverables for transfer facilities apply (Section I.B.i.3.g).

d. Additional Deliverables for Truck

- i. A design basis document that covers:
 1. Number of trucks, round trip journey time (including loading, travel, and unloading), and total round-trip journeys per year;
 2. A description of loading (filling), storage, and unloading (emptying) facilities and operations;
 3. Blocking, bracing, and segregation of product;
 4. A traffic study and reliability assessment; and
 5. Restrictions on weight, width, curfews, and noise.
- ii. Technical Specifications and datasheets for major materials and activities, including but not limited to:
 1. Trucks;
 2. Tanks or intermodal containers; and
 3. Support systems such as: handling and transfer systems, gaging systems, temperature and pressure control systems, boil off management, and instrumentation.
- iii. Trucking terminals – Additional deliverables for transfer facilities apply (Section I.B.i.3.g).

e. Additional Deliverables for Barge

- i. A Route Report and Maps, complete with a waterway navigation plan.
- ii. A design basis document that covers:

1. Number of barges, number of cargo tanks or intermodal containers per barge, roundtrip journey time, and total round-trip journeys per year;
 2. A description of loading (filling), storage, and unloading (emptying) facilities and operations; and
 3. Stowage and segregation of product;
 4. Port and waterway congestion; and
 5. Restrictions on length, width, height, and draft.
- iii. Technical Specifications and datasheets for major materials and activities, including but not limited to:
1. Hull structure and general arrangement;
 2. Subdivision and stability;
 3. Cargo tanks or intermodal containers; and
 4. Cargo support systems such as: containment systems, handling and transfer systems, piping and hoses, ventilation, pump and compressor rooms, venting systems, gauging systems, temperature and pressure control systems, boil off management, instrumentation, fire suppression and other life safety equipment.
- iv. Marine terminals and jetties – Additional deliverables for transfer facilities apply (Section I.B.i.3.g).

f. Additional Deliverables for Ship

- i. A Route Report and Maps, complete with a waterway navigation plan including any crossings between state, federal, and international waters.
- ii. A design basis document that covers:
 1. Number of ships, number of cargo tanks or intermodal containers per ship, roundtrip journey time, and total round-trip journeys per year;
 2. A description of loading (filling), storage, and unloading (emptying) facilities and operations; and
 3. Stowage and segregation of product;
 4. Port and waterway congestion; and
 5. Restrictions on length, width, height, and draft.
- iii. Technical Specifications and datasheets for major materials and activities, including but not limited to:
 1. Hull structure and general arrangement;
 2. Subdivision and stability;

3. Cargo tanks or intermodal containers;
 4. Cargo support systems such as: containment systems, handling and transfer systems, piping, ventilation, pump and compressor rooms, venting systems, gauging systems, temperature and pressure control systems, boil off management, fire suppression and other life safety equipment;
 5. Dynamic positioning system for offshore injection; and
 6. CO₂ injection pumps and heaters onboard the ship.
- iv. Marine terminals and jetties – Additional deliverables for transfer facilities apply (Section I.B.i.3.g).

g. Additional Deliverables for Transfer Facilities

- i. A Design Basis document that covers:
 1. A description of loading (filling), storage, and unloading (emptying) facilities and operations;
 2. A description of upgrades or modifications to existing facilities;
 3. A coordination study outlining how the facility will address intermittent operation of CO₂ sources and sinks due to events such as maintenance, flow interruption, emergency shutdowns, etc.; and
 4. Site physical security and cybersecurity.
- ii. Key Design Calculations and Drawings that cover:
 1. Mechanical, electrical, and civil/structural plot plan drawings depicting the quantity, location, and arrangement of mechanical/processing equipment and piping, buildings and electrical equipment, utility systems, and civil/structural infrastructure;
 2. Preliminary P&IDs;
 3. Preliminary line list;
 4. Experimentally verified thermo-hydraulic analysis (steady state and transient);
 5. Power system load study, electrical load list, one-line diagrams, and instrument list; and
 6. Hazardous area classification drawings.
- iii. Technical Specifications and datasheets for major materials and activities, including but not limited to:
 1. Major mechanical/processing equipment;

2. Major buildings and electrical equipment; and
 3. Civil/structural infrastructure.
4. **Project cost estimate.** Design of the transport system shall support an itemized capital (CAPEX) and operational (OPEX) cost estimate consistent with AACE (Association of the Advancement of Cost Engineering) Class 3 with an expected accuracy range of -10% to -20% on the low side and +10% to +30% on the high side. The cost estimate should include a basis of estimate for each item. Successful applicants should provide a benchmark study for the overall cost estimate, if available. Successful applicants will be required to submit a transport buildout plan with a P-10, P-50 and P-90 project cost analysis based on the acquisition and installation of CO₂ transport networks that fulfill the Build America, Buy America Act provisions in the Bipartisan Infrastructure Law (BIL).
 5. **Business case analysis.** Successful applicants will be required to prepare the business case analysis in the format provided in Appendix J and submit it within 90 days of project completion. This business case analysis should include the addressable market, development scenarios, proposed business model structure, risk allocation, basic commercial terms, a revenue model, government incentives, financing costs, financial assumptions, and sensitivity analysis discussion. If the plan includes the use of current 45Q tax credits, the business case analysis shall include, at a minimum, details on the anticipated revenue and duration of the credits. Successful applicants should provide a projected use for the transport infrastructure over the next 50 years including types of CO₂ sources and sinks in the present and future that will be available to utilize the transport infrastructure.
 6. **Environmental, Safety and Health (ES&H) analysis.** Successful applicants will be required to prepare an ES&H analysis of the proposed project and submit it within 90 days of project completion in accordance with the format provided in Appendix B. ES&H analysis should include a discussion regarding emissions to air and water, solid waste streams, water use, and potential environmental and health impacts of the project.
 7. **Regulatory Plan analysis.** Successful applicants will be required to prepare the Regulatory Plan analysis in the format provided in Appendix C and submit it within 90 days of project completion. The Regulatory Plan analysis shall set forth the applicant's plans and actions to engage with local, state, and federal regulators and receive the necessary permits and regulatory approvals for the proposed project. Successful applicants must

submit a Regulatory Plan that demonstrates how the deployment of the proposed CO₂ transport system will meet or exceed local, state, and federal permitting and other regulatory requirements associated with construction and operation of the proposed CO₂ transport system. Successful applicants will demonstrate the ability of a plan to exceed the minimum health, environment, and safety regulatory requirements. The Regulatory Plan shall identify if community and stakeholder support has been obtained or opposition has been received by the applicant. If awarded, applicants must implement, evaluate, and update this plan throughout the life of the project at the direction of DOE. In addition, recipients will be required to report on regulatory approval progress and outcomes throughout the project lifecycle and the final report, including the potential or actual use of eminent domain.

APPENDIX M – CO₂ SOURCE(S) FEASIBILITY STUDY

Recipients are expected to provide a plan for the initial supply of carbon dioxide (CO₂) that would be available for the first five years of injection, with a plan for the CO₂ supply curve over the next 25 years that shows CO₂ sources (anthropogenic, direct air capture [DAC], and biomass carbon removal and storage [BiCRS]). It should show how the CO₂ sources change over the time frame of interest, including when the source(s) would come online (or go offline), CO₂ quantity, flue gas composition, and CO₂ source. For those sources expected to be used during the initial five years of operations, recipients shall include letters of interest and level of commitment from the current CO₂ source providers and discuss the specific business case associated with each source—this should also include new sources such as DAC and BiCRS if applicable.

At a minimum, the CO₂ Source Feasibility Study or equivalent must demonstrate due diligence by the recipient and include all necessary information to support the application for a Class VI permit including, but not limited to, definition of source(s), physical and chemical characteristics (e.g., concentration of each gas constituent, including contaminants) of the captured CO₂ stream, flow rates, incoming pressure, and any requirements from the CO₂ pipeline operators.

The CO₂ Source Feasibility Study should discuss the type of capture system and pre-/post-capture processing that a specific raw gas stream might need, percent capture, dehydration, and/or compression requirements. If a proposed source is already concentrated and does not require a capture technology, information should be included regarding quantity and purity of CO₂ and any requirements for dehydration and/or compression.

APPENDIX N – PROJECT MANAGEMENT PLAN

The applicant's Project Management Plan (PMP) is an approved document that defines how the applicant will execute, monitor, and control the project to accomplish the objectives. The specific contents, level of detail, and inclusion of subsidiary planning documents are tailored according to the needs of the project. Consequently, every PMP will be different based on the risk, visibility, and/or complexity of the project and the recipient's established processes, procedures, and systems.

Title Page:

PROJECT MANAGEMENT PLAN

{Insert Project Title}

{Date Prepared}

SUBMITTED BY

{Organization Name}

{Organization Address}

{City, State, Zip Code}

PRINCIPAL INVESTIGATOR

{Name}

{Phone Number}

{Email}

SUBMITTED TO

U.S. Department of Energy

National Energy Technology Laboratory

This plan should be formatted to include the following sections with each section to include the information as described below:

A. Executive Summary: Provide a description of the project that includes the objective, project goals, and expected results. For purposes of the application, this information is included in the Project Narrative and should be simply copied to this document for completeness, so that the PMP is a stand-alone document.

B. Project Organization and Structure: Provide the following information in this section:

- Organizational Chart(s): Include a complete project organizational chart and sub-organization charts (if applicable), accompanied by a discussion of how the organizational structure will facilitate the performance of the Tasks and achievement of the objectives described in the Statement of Project Objectives (SOPO) within the time frame specified in the application.
- Roles and Responsibilities of Participants: Provide a discussion of key project team members, and the capacity in which each team member will assist in achieving the overall objective(s) of the proposed project. For multi-organizational or multi-investigator projects, describe the roles to be performed by each participant/investigator within the context of the Task/Subtask structure contained in the SOPO. Include descriptions of any business agreements or intellectual property (IP) issues between the applicant and other members of the project team, and how these agreements will be integrated and managed.
- Decision-Making and Communication Strategy: Provide a discussion of how communication and decision-making will occur within the context of the organizational structure, with particular emphasis on scientific/technical direction and mechanisms for controlling project scope, cost, and schedule. Include a discussion of how the project team will communicate with the U.S. Department of Energy (DOE) and external stakeholders during the performance of the project.
- Management Capabilities: Provide information relevant to the capabilities and experience of the principal investigator (PI) and key project team members in managing technical projects of similar nature and complexity. If applicable, include examples that demonstrate the ability to successfully meet research objectives within scope, budget, and schedule.

C. Risk Management Plan: Provide a summary description of the proposed approach to identify, analyze, and respond to perceived risks associated with the proposed project. Project risk events are uncertain future events that, if realized, impact the success of the project. Risk is inherent to all projects regardless of complexity, cost, or visibility. An effective Risk Management Plan will identify perceived risks and explain mitigation strategies for each risk. At a minimum, the Risk Management Plan shall include the initial identification of significant financial; cost/schedule; technical/scope; management; planning and oversight; environment, safety, and health (ES&H); external factors; and management issues that have the potential to impede project progress and strategies to minimize impacts from those issues. Note that Area of Interest (AOI) 3 applications are expected to have a more detailed risk discussion. The page limit for AOI 3 was increased by five pages to allow more detailed risk discussion. (AOI 1, 2, and 4 have a PMP page limit of 10 pages, while AOI 3 has a PMP page limit of 15 pages.)

The following table format is provided but is not required:

Perceived Risks and Mitigation Strategies

Perceived Risk	Risk Rating			Mitigation/Response Strategy
	Probability	Impact	Overall	
	(Low, Med, High)			
Financial Risks:				
Cost/Schedule Risks:				
Technical/Scope Risks:				
Management, Planning, and Oversight Risks:				
ES&H Risks:				
External Factor Risks:				

D. Milestone Log: Provide milestones for each budget period (BP) of the project. Each milestone should be linked to a specific Task or Subtask and include a title, planned completion date, and a description of the method/process/measure used to verify completion. Milestones should be quantitative and show progress toward BP and/or project goals. Conversely, periodic, mandatory progress reports are not considered to be milestones.

Milestones are presumed to lie on the critical path of the project (i.e., unless all milestones are achieved, the Objectives as defined in the SOPO cannot be met completely). Applicants must provide at least two milestones per year throughout the course of the project.

Milestone Format

Task/ Subtask	Milestone Title & Description	Planned Completion Date	Verification method

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(NOTE: During project performance, the recipient will report the Milestone Status as part of the required quarterly progress report as prescribed under the Federal Assistance Reporting Checklist. The Milestone Status will present actual performance in comparison with Planned Milestones, and include:

- (1) The actual status and progress of the project.
- (2) Specific progress made toward achieving the project's milestones.
- (3) Any proposed changes in the project's schedule required to complete milestones.)

E. Costing Profile: Provide a table (the Spend Plan) that projects the expenditures of government funds by fiscal year for each project team member. The applicant must ensure that these budgets are entirely consistent with the information provided in the separate budget files required with the application.

Spend Plan by Fiscal Year Format

	FY 20XX		FY 20XX		FY 20XX		FY 20XX		Total	
	DOE Funds	Cost Share	DOE Funds	Cost Share	DOE Funds	Cost Share	DOE Funds	Cost Share	DOE Funds	Cost Share
Applicant										
Sub-recipient A, if proposed										
Sub-recipient B, if proposed										
FFRDC/NL, if proposed										
Total (\$)										
Total Cost Share %										

Additionally, provide a table (the Spend Plan) that projects the expenditures of funds for each Task by fiscal year.

	FY 20XX		FY 20XX		FY 20XX		Total	
	DOE Funds	Cost Share	DOE Funds	Cost Share	DOE Funds	Cost Share	DOE Funds	Cost Share
Task 1.0 Project Management and Planning								
Task 2.0 (Title)								
Task 3.0 (Title)								

<i>Add additional Tasks as necessary</i>								
Total (\$)								
Total Cost Share %								

F. Project Timeline: The applicant should provide complete but concise summaries (via charts, tables, or other means) of the baseline project schedule, labor requirements, and cost. Information in these summaries must be entirely consistent with the information contained in the other required elements of the application package. Include the following information:

- **Baseline Schedule/Timeline:** A visual representation of the schedule of project activities (Gantt chart or equivalent), broken down by BP (if applicable) and by Task/Subtask as identified in the SOPO. The Gantt chart (or equivalent) shall be to the same level of detail as the Subtask structure in the SOPO. The schedule/timeline should indicate a start and an end date for each BP, Task, and Subtask. The schedule should show interdependencies between Tasks and include the milestones identified in the Project Milestones section of the PMP. It may be necessary to support the visual schedule with a brief narrative to explain key elements of the schedule and interrelationships among Tasks.
- **Baseline Labor Effort by Task:** A summary (tabular or other) of the estimated labor hours and labor categories (e.g., project manager, PI, engineer, technician, scientist, clerical, etc.) required for each major Task in the SOPO, including labor hours and categories for each major subrecipient or consultant. Also include a narrative that explains why these labor types and amounts are needed to perform the specified Task(s) and provides evidence that the time commitment of the PI and key personnel will be sufficient to achieve all technical objectives described in the SOPO.
- **Baseline Project Cost by Task:** A summary (tabular or other) of the expected cost of performing each major Task identified in the SOPO. Dollar values shown for each Task should represent the total cost of performing that Task, regardless of the source of funding (DOE or cost share). Baseline costs need not be broken down to the Subtask level.
- **Note that Gantt charts do NOT count toward the PMP page limit.**

G. Success Criteria: Success criteria are used by DOE to determine if specific goals and objectives were met at the end of BP(s), Go/No-Go decision points, and/or project completion. The success criteria should be objective and stated in terms of specific, measurable, and repeatable data. Usually, the success criteria pertain to desirable outcomes, results, and observations from the project.

(NOTE: As the first Task in the SOPO, successful applicants will revise the version of the PMP

that is submitted with their applications by including details from the negotiation process. This PMP will be updated by the recipient as the project progresses, and the recipient must use this plan to report scope, schedule, and budget variances.)

APPENDIX O – CYBERSECURITY PLAN

Cybersecurity Plan

Be advised that under section 40126 of the Bipartisan Infrastructure Law (BIL), the Secretary of Energy has determined that this Funding Opportunity Announcement (FOA) requires an applicant to submit a Cybersecurity Plan to the U.S. Department of Energy (DOE) prior to the issuance of an award.

Each applicant whose Full Application is selected for award negotiations will be required to submit a Cybersecurity Plan during the award negotiations phase. A Cybersecurity Plan explains how basic cybersecurity practices throughout the life of the proposed the project will be maintained.

APPENDIX P – PRE-AWARD FACTSHEET

A project Pre-Award Factsheet is required with the application and must not include any proprietary or business sensitive information. The intent is to publish information provided in the Pre-Award Factsheet if the project is selected for award.

The following should be included:

- High resolution logo.
- Project title.
- Project location - to include city, county, state, and facility name.
- Name of the lead/prime organization.
- List of project partners.
- Location of lead/prime organization's headquarters (city, state).
- A two to three paragraph description of the project's purpose. The description should include the project's goal(s), intended outcome, how the project will support decarbonization efforts, and any aspects of the project that make it new, unique, or different.
- A description of the project's CO₂ sources and the type(s) of industry that CO₂ will be captured from. Examples include power plants, cement plants, electric generation, hydrogen, direct air capture, etc.
- A description of the storage location and how the project will utilize/convert CO₂.
- How much CO₂ will be captured and stored per year.
- The lifetime capacity of the project storage location.
- A description of project impacts and benefits. Examples of potential benefits and impacts include:
 - Level of carbon dioxide emissions reduction (ex. 19% reduction in North Dakota's carbon dioxide emissions).
 - Number of jobs created.
 - How the community will be involved in project activities.
 - How the project will improve the health/wellbeing of the people living near this site(s).
 - Education opportunities.