

Office of Clean Energy Demonstrations



Pilot-scale Rapid Operational Validation of key Energy Infrastructure Technologies (PROVE IT) - Small Business Innovation Research (SBIR)

Solicitation # 89243625QCD000019

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Before you begin

If you believe you are a good candidate for this solicitation, you will need to register in several systems. Registration can take up to several weeks – you should start working on those as soon as possible. If you are already registered, make sure your registration is active and current. All registrations are free.

SAM.gov registration (this can take several weeks)

SAM, maintained by the GSA's Federal Acquisition Service, is the primary repository for contractor information required to conduct business with OCED. To be registered in SAM, all mandatory information, including the Unique Entity Identifier (UEI) and a Commercial and Government Entity (CAGE) code, must be validated in SAM. You may obtain information on SAM registration and annual confirmation requirements at [SAM.gov](https://sam.gov).

SAM.gov contains required certifications that you may access at [Acquisition.gov](https://acquisition.gov) as part of your registration (see FAR 4.1102). You must complete these certifications to be eligible for a contract. You must provide representations and certifications electronically via the website and update the representations and certifications as necessary and at least annually to keep them current, accurate, and complete. OCED will not enter any contract if you do not comply with these requirements.

Small Business Administration (SBA) Company Registry (this can take a few days)

You must register with SBA's Company Registry, confirm that the NAICS code 541715 - Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)¹ applies to your company, update your commercialization status, and confirm your eligibility as small business. See [SBIR Registration](#) for additional information.

You must provide your unique Small Business Concern (SBC) Control ID (assigned by SBA upon completion of the Company Registry registration) and upload a PDF copy of the SBA Company Registry registration as part of your submission.

OCED eXCHANGE (this can take a few days)

You must register with [OCED eXCHANGE](#) to submit a proposal. Doing so requires a [Login.gov](#) or [ID.me](#) registration. For additional information on how to login and how to submit a proposal, consult the [OCED eXCHANGE User Guides](#).

Important deadlines

Step 1 submission package is due on April 7, 2025 - 5 p.m. Eastern Time.

Step 2 submission package is due approximately on June 2, 2025 - 5 p.m. Eastern Time.

¹ [SBA Table of Small Business Size Standards](#)

Executive summary

The Office of Clean Energy Demonstrations (OCED) is issuing a solicitation titled “Pilot-scale Rapid Operational Validation of key Energy Infrastructure Technologies (PROVE IT)” under the OCED Small Business Innovation Research (SBIR) program.

This solicitation supports the validation of existing pilot projects or subsystems in a relevant industrial environment to:

- 1) increase their technology readiness to the point of being able to be integrated in a large clean energy infrastructure project, and
- 2) increase their adoption readiness level² to medium/high.

OCED will prioritize technologies and application use cases that exhibit technological diversity when compared to the existing OCED portfolio of demonstration projects³ or that have not already been demonstrated at a scale larger than the proposed project.

The PROVE IT solicitation will be issued as a Federal Acquisition Regulation (FAR)-based request for proposals. OCED will award milestone-based, firm-fixed priced contracts under this solicitation.

Program scope and characteristics	
Scope	Integrating, operating, and testing existing pilot systems under industrial-relevant conditions
Total available OCED funding	Approximately \$31 million across all topic areas
Anticipated maximum per contract funding	\$4.3 million
Period of Performance	Up to 33 months
Contract Type	Firm-fixed price with milestone-based payments
Eligible offerors	Small, independent U.S. businesses ⁴
Cost share requirement	No cost share required

² [Adoption Readiness Level Framework](#)

³ Information on the current OCED portfolio can be found here: [OCED portfolio](#)

⁴ The program is being executed pursuant 13 C.F.R. Part 121 which includes restrictions about (1) the type of firm, (2) its ownership and control structure, and (3) small business concern in terms of the firm’s size in terms of the number of employees. Submitters must be domestic entities organized, chartered, or incorporated (or otherwise formed) under the laws of a particular state or territory of the United States or under the laws of the United States; have majority domestic ownership and control; and have a physical place of business in the United States. See additional eligibility details below in this solicitation.

Topic Areas		
Topic Area (TA)	TA1: Point Source Carbon Capture	TA2: Long-Duration Energy Storage
Available OCED funding per TA	Approximately \$22 million	Approximately \$9 million
Anticipated number of contracts	Up to 5 contracts	Up to 2 contracts
Key objectives	<ul style="list-style-type: none"> • Collect and validate operational performance data of pilot-scale-ready innovative solvents, sorbents, membranes, cryogenic, molten salt, oxy-fuel combustion, chemical looping, hybrid, or other technologies for point source carbon capture at power plant or industrial process facilities at a sufficient scale over a representative operating time • Pilot process should reflect all key unit operations, such as capture, generation, and purification (if applicable) • Validate technologies under varying CO₂ compositions to the extent possible within the use case to provide performance confidence to next stage adopters that the technology can work at target sites • Define engineering improvements to increase uptime, performance, and durability of technology • Reduce margin of error for predicted unit economics for the next stage of investors 	<ul style="list-style-type: none"> • Collect and validate operational performance data at sufficient scale, cycles, power shift time, and over a representative operating period of pilot-scale-ready non-lithium electrochemical long-duration energy storage technologies with <100MW of capacity deployed • Validate technologies at test center, industrial or commercial sites, or microgrid site locations to provide performance confidence to next stage site adopters • Define engineering improvements to increase uptime, performance, and durability of technology • Reduce margin of error for predicted unit economics for the next stage of investors

Statutory authority

- Section 9 of the Small Business Act (15 U.S.C. § 638)
- Section 646 of Public Law 95-91, U.S. Department of Energy Organization Act
- Public Law 117-58, Infrastructure Investment and Jobs Act, also known as the Bipartisan Infrastructure Law (BIL)

Background

OCED was established in December 2021 as part of the Infrastructure Investment and Jobs Act, commonly known as the Bipartisan Infrastructure Law (BIL), to build on DOE's expertise in energy research and development and expand DOE's scope to fill a critical gap in the commercial demonstration of technologies.

OCED is a multi-technology office with funding for commercial demonstrations that include advanced nuclear, clean hydrogen, carbon management, long-duration energy storage, industrial decarbonization, and more. With a clear role in commercializing critical clean energy technologies, OCED fills the gap between the research, development, and early-stage demonstration projects, including those within DOE technology offices, and initial deployments supported by the private sector and/or other DOE programs. OCED places a specific focus on both technical and adoption risks that may prevent the commercialization and deployment of new technologies such as delivered cost, functional performance, ease of use, market size and market openness, downstream value chain, ability to be integrated in a large infrastructure project, material sourcing, community adoption, and environmental and safety elements.

In June 2023, OCED issued a Request for Information⁵ (RFI) asking for input on the need and opportunity of a program targeting pilot-scale operational validation of technologies. OCED received responses from small businesses, investors, incubators and accelerators, and others.⁶ OCED applied learnings from the responses to this solicitation to best meet the needs of participating small businesses.

The SBIR program was authorized in 1982 to stimulate technological innovation; use small businesses to meet federal Research and Development (R&D) needs; foster and encourage participation in technological innovation by the socially and economically disadvantaged small businesses and those that are 51 percent owned and controlled by women; and increase private sector commercialization of innovations derived from federal R&D, thereby increasing competition, productivity, and economic growth. Currently, OCED contributes to the SBIR program through two specific provisions:

- Long-Duration Energy Storage Pilot Program⁷
- Carbon Capture Large-Scale Pilot Projects Program⁸

The OCED SBIR program is subject to all applicable statutory language, regulations, and policies issued by the Small Business Administration (SBA).⁹ OCED does not intend to issue a Small Business Technology Transfer Research (STTR) solicitation and will not accept applications under the STTR program.

⁵ DE-FOA-0003123 - <https://oced-exchange.energy.gov/#Foald6130961d-63fe-44ff-887b-0d52d11c2799>

⁶ https://www.energy.gov/sites/default/files/2024-02/OCED%20PROVE%20IT%20RFI%20Summary_022324-508.pdf

⁷ Section 41001 of the Bipartisan Infrastructure Law of 2021, Public Law 117-58, codified at 42 U.S.C. § 17232(c).

⁸ Section 41004(b) of the Bipartisan Infrastructure Law of 2021, Public Law 116-260, codified at 42 U.S.C. § 16292(b).

⁹ <https://www.sbir.gov/>

Program objectives and structure

The PROVE IT solicitation will support small businesses conducting research and development efforts aimed at operational validation in relevant operational environments of a pilot-scale unit before it can be deemed ready for a large-scale demonstration project or its commercialization.

A successful offer for this solicitation will focus on a technology having the following characteristics:

- It has been fully vetted in a laboratory environment, but a component or subsystem still needs testing as part of a fully integrated system in an industrial-relevant environment.
- It presents significant adoption challenges across one or more core risk areas of the DOE adoption readiness level.¹⁰
- It has shown to have significant potential impact in the industry of reference.

The program is designed to de-risk both technology and adoption challenges hindering the commercial liftoff of the given technology. A successful OCED PROVE IT contractor will be able to leverage the outcomes of the operational validation effort funded by OCED to catalyze the additional financing or other partnerships needed to move to the next stage of demonstration by the end of the contract. To accomplish these goals, a successful proposal will show:

- The entity's ability to operate an already existing pilot project, or a pilot project needing minimal upgrades or modifications, in an industrial or commercially relevant environment.
- The entity's ability to accomplish all relevant tasks to successfully execute the project including but not limited to:
 - access to an industrial facility or a relevant industrial test bed facility,
 - a robust design of experiment to validate the technology and analyze all possible failure modes,
 - the ability to ensure continuous operations of the pilot line and data collection,
 - the ability to identify adverse environmental impacts of the materials or process and devise mitigation strategies for environmental barriers to adoption.
- The entity's ability to identify all other supporting parties (i.e., regulatory partners, financiers, certification bodies, design and engineering firms, community organizations) needed to minimize adoption risks and ensure fast technology liftoff.

At the end of a successful PROVE IT contract, the team will be able to show a fully tested pilot system, verification of the technology performance at that scale, evidence of ability to operate, and proof of the team's ability to execute – all to provide confidence to investors in their next step to commercial scale-up.

Consistent with the SBIR statutory objectives,¹¹ OCED will encourage participation by women-owned and socially and economically disadvantaged small businesses and will strive to improve the return on investment for economic and social benefits to the communities potentially impacted by these technologies and the nation. OCED anticipates contractors to commit to certain community benefits uniquely related to the specific technology and aimed at maximizing benefits for all impacted communities and consider labor, diversity, equity, inclusion, and accessibility while minimizing or mitigating any potential or perceived negative impact of the technology.

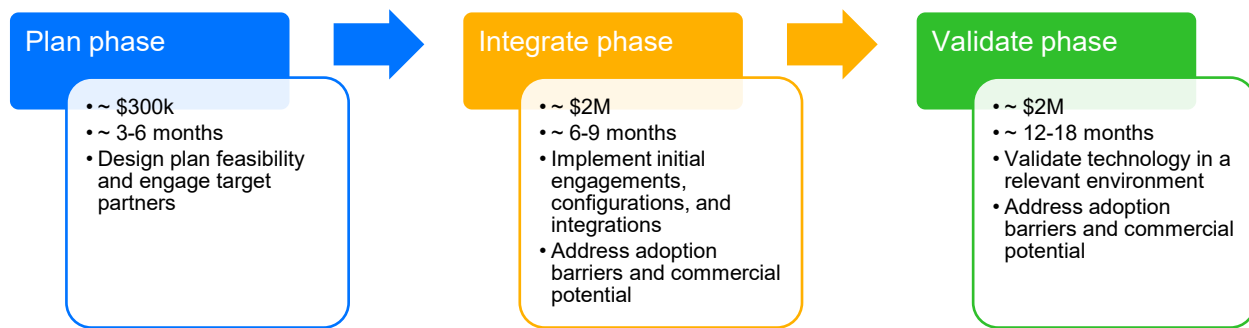
The projects are expected to be structured into three phases. In the initial submission, offerors will submit a single proposal covering work related to all phases. OCED will assess the proposal in its entirety. At the end of each phase, teams will submit deliverables showing they are ready to move to the next phase of the contract and that it is in the best interest of OCED to continue supporting the project. Based on these deliverables and other considerations, OCED will determine whether the project execution is satisfactory according to the pre-specified criteria and whether to approve funding and authorize work for the subsequent phase.

The expected structure for each project is depicted in Figure 1 and described below.

¹⁰ [Adoption Readiness Level Framework](#)

¹¹ [SBA policies](#)

Figure 1 Project phases



Plan phase

In the Plan phase, teams will finalize the plans to validate the technology under operational conditions and address adoption challenges that might hinder technology commercialization. The plan will include defining the pilot system integration engineering designs, size specifications, parts needed and availability, and activity dependency. Teams will engage and secure all necessary partnerships to lock in host-site commitments, supplier quotes, testing services, and other subcontractor support as needed.

Final deliverables may include planning documents of engineering design, comprehensive design of experiment, risk register, and proof of partner commitments. At the end of the Plan phase, teams will be able to start on physical integration activities.

For the Plan phase, the maximum cost is \$300,000 and the maximum period of performance is approximately 6 months.

Integrate phase

In the Integrate phase, teams will set up their pilot system and equipment configuration and will integrate it in the industrial facility or industry-relevant test bed facility. This work typically includes hiring any workers or contractors, buying needed parts, and performing integrations. Teams will need to coordinate between the host-site, suppliers, and other partners.

Deliverables may include certifications from any partners, proof of work completed, data collection and verification plans, and evidence of commissioning and operations within a commercial environment. During or at the end of the Integrate phase, teams will be able to start operating and validating the pilot system.

For the Integrate phase, the maximum cost is \$2,000,000 and the maximum period of performance is approximately 9 months.

Validate phase

In the Validate phase, teams will operate and validate the pilot system. This work typically includes running the pilot system, collecting operational data, tracking specified metrics, noting and making improvements or upgrades, comparing operating scenarios via comparison tests, and troubleshooting operations and technology. Teams will need to work with the host-site, coordinate with third-party testers, and keep the pilot system staffed appropriately.

Deliverables may include performance reports, failure and root-cause-analysis reports, improvement recommendations, comparison test outcomes, next-step-project pro forma financial model, next-step-project investment memo, and summary conclusions. At the end of the Validate phase, teams will have validated sustained operations at the given size and be ready to deploy the technology at the next scale or in a first-of-a-kind commercial demonstration project.

For the Validate phase, the maximum cost is \$2,000,000 and the maximum period of performance is approximately 18 months.

Topic areas

Topic Area 1: Point source carbon capture

Topic area requirements

The PROVE IT Topic Area 1 - Carbon Capture Point Source supports operational validation of already built pilot-scale systems of solvents, sorbents, membranes, cryogenic, molten salt, oxy-fuel combustion, chemical looping, hybrid, or other technologies for point source carbon capture, at power plant or industrial process facilities. Pilot process should reflect all key unit operations, such as capture, purification, and regeneration (if applicable). OCED will not consider proposals focused on materials or technologies widely represented in the current OCED's Carbon Capture Demonstrations and Carbon Capture Large-Scale Pilot Projects portfolios (i.e., monoethanolamines).

Offerors must include in the application package proof of having an already built system with a capacity of 1-5 TPD (metric tons CO₂ per day). The desired CO₂ concentration in the exhaust gas is between 3% and 20%. A capture efficiency of at least 80% must be met at the end of the pilot system validation phase. For a successful offer, teams must include proof of having concluded at least 100 hours of (either continuous or intermittent) testing at the laboratory / bench scale. The application must also include available performance data of the technology including, but not limited to capture efficiency, CO₂ purity, and degradation rate of capture medium (e.g., solvent, sorbent), if applicable.

Offerors are to define a target power plant or industrial process use case, such as refineries, steel, cement, manufacturing, or electricity generation facilities to describe the typical operating conditions, uptime, and parameters of that specific use case. In particular, the pilot testing and validation exhaust gas composition should match the typical target use case exhaust gas (with respect to CO₂ and O₂ concentrations, as well as presence and levels of any other contaminants). These parameters will then form the basis of the proposed test and validation design of experiment. Testing should minimally achieve capture efficiency greater than 80% of input CO₂ and obtain CO₂ purity greater than 90%. Furthermore, the use case will define the specific adoption challenges that need to be addressed or minimized to have a credible path to the technology's commercial scale up after the end of the OCED contract. Offerors are also expected during the project to validate the cost of carbon capture enabled by the technology using the data acquired from the testing campaign. The contract scope of work can include engineering improvements needed to increase uptime and performance as a result of the operational validation campaign.

Offerors must identify a commercial or industrial site (such as an industrial processing facility or a small power plant) where the technology validation will be conducted and show commitment for site access for the project period of performance. OCED may consider testing happening at an industrial test center if the testing conditions are the same of an actual industrial site.

Topic area expected outcomes

By the end of the contract, sustained and validated operational testing will show potential customers – such as an industrial partner – that the technology can work under their specific site conditions for a sufficient length of time to prove the projected economics of the system and financing requirements for a large-scale pilot or commercial demonstration. This proof point requires performance data at sufficient scale over a long enough operating time to be valuable. Validation under real-world operating conditions will ensure that any impact of corrosion, degradation, or performance is analyzed and controlled. Additionally, testing over varying CO₂ compositions can show robustness to unpredictable conditions and applicability to multiple use cases.

PROVE IT funding should result in the following outcomes:

- Validate operational performance data at the 1-5 TPD scale through the collection of at least 1,000 hours of steady-state data. Continuous data acquisition should be no less than 500 hours.
- Validate technologies under varying CO₂ compositions to the extent able to provide performance confidence to next stage adopters so that the technology can work at target sites.
- Define engineering improvements to increase uptime, performance, and durability of technology.
- Reduce margin of error for predicted unit economics for the next stage of investors.

Topic Area 2: Long-duration energy storage

Topic area requirements

The PROVE IT Topic Area 2 – Long-duration energy storage supports operational validation for already built long-duration energy storage pilot-scale systems using technologies already proven to operate as a laboratory prototype. OCED requires that the proposed project focuses on sustained operational testing in similar conditions as potential customer's target site conditions.

OCED expects offerors to have access at the time of application to a completed system sized between approximately 100 and 250 kWdc that can discharge for a minimum of 10 hours. OCED will consider systems that operate on a shorter timeframe (i.e., 8 hours) if the offeror shows a clear path to 10+ hours.

Appropriate scaling pace is important to innovation progression. Upon proposal submission, offerors must have an existing, already built system that has been tested for 50-100 hours in a lab environment. Existing operating data at the lab/bench scale include having completed 25+ charge/discharge cycles (not necessarily all at the minimum 8-hour duration). Appropriate sites of interest include test centers, industrial or commercial sites, or microgrid operations. Pilot hosts are expected to allow site access for the project period of performance for full ability to test. Residential sites and laboratory environments will not be considered acceptable operational hosts sites.

Any other test parameters should match as close as possible to the target use case the offeror would see as the most viable end-use for the technology. Offerors will be asked to define a target use case application and describe that application's conditions and parameters that will then form the basis of the proposed test conditions.

OCED will consider electrochemical technologies that are not lithium-ion chemistries, vanadium-based, or zinc bromide chemistries due to being already demonstrated at larger scale by the private sector or widely represented in the current OCED portfolio of demonstration projects. Within this Topic Area, OCED will only consider proposals that:

- Do not use lithium-based energy storage technologies or other technologies that are currently widely deployed at >100MW capacity.
- Do not use vanadium-based or zinc bromide chemistries that are widely represented in the current OCED portfolio of demonstration projects.
- Do not intend to produce a bulk chemical as a storage medium, such as hydrogen or ammonia.
- Have the potential to achieve a 10-hour continuous discharge duration or longer.

Topic area expected outcomes

By the end of the contract, the testing outcome should convince potential customers and regulators that the technology can work at their specific site conditions for a sufficient length of time to prove the projected economics of the system. This proof point requires performance data at appropriate power capacity scales, enough operating cycles, and sufficient power shifting periods over a long enough operating period. Additionally, testing over varying conditions can show robustness to unpredictable conditions and such a program could support making engineering improvements to increase uptime and performance.

PROVE IT funding should result in the following outcomes:

- Validate operational performance data through the collection of at least 1,000 hours of steady-state data.
- Validate technologies under the necessary conditions and performance requirements to provide confidence to the next stage adopters.
- Define engineering improvements to increase uptime, performance, and durability of technology.
- Reduce margin of error for unit economics estimates for the next stage of investors.

Instructions to Offerors

Proposal process

OCED is structuring the application process into two steps, requesting documents and information only when needed (just-in-time approach):

- Step 1: Proof of technology readiness
- Step 2: Project plan, commercialization plan, milestone table, and resource availability

OCED will send an advisory down-select notice to interested parties after completing the review of Step 1. This notice will include OCED's advisory recommendation to proceed or not to proceed with Step 2. Firms who receive a high confidence rating for Step 1 will be advised to proceed to Step 2 of the solicitation process. Firms who do not receive a high confidence rating will be advised that they are unlikely to be viable competitors, along with the general basis for the OCED's advisory recommendation. As this is an advisory notice only, all firms who participated in Step 1 may choose to proceed to Step 2. The intent is to decrease the burden on potential offerors and encourage only the most promising offerors to move forward in the process. OCED does not intend to provide additional details nor debriefings after the completion of the advisory down-select notifications.

Offerors who do not receive the highest confidence ratings and are advised that they are unlikely to be viable competitors but still choose to proceed shall email the Contracting Officer no later than 48 hours after receiving the advisory notification. Offerors shall be disqualified from the competition unless they email a written notice to the Contracting Officer no later than 48 hours of receipt of the advisory notice in their email system of an intent to move forward to the next step.

Failure to participate in Step 1 of the procurement precludes a small business from participating in Step 2.

OCED will not accept more than one proposal package from any one small business.

Questions about the solicitation

OCED will respond to questions or requests for clarification submitted in writing by an offeror regarding this solicitation. All questions or requests for clarification must be submitted by 5:00 p.m. EST on February 17, 2025 by email to OCED.PROVEIT@hq.doe.gov. OCED will post all answers in [OCED eXCHANGE](#) using the Question-and-Answer spreadsheet. In addition, all answers to any question received will be also posted as an Amendment to this solicitation on the SAM.gov website.

Where to apply

Submissions will be accepted on [OCED eXCHANGE - CD0000019](#) – Announcement title: PROVE IT.

When to apply

Deadline for step 1

OCED must receive your proposal package for Step 1 in OCED eXCHANGE no later than 5:00 p.m. ET on April 7, 2025.

Firms are responsible for ensuring that all files constituting the proposal package are uploaded prior to the deadline. If a proposal package is not submitted by the deadline, OCED will determine the proposal package to be incomplete and will not evaluate it. Start the submission process early to allow sufficient time to upload the complete proposal package.

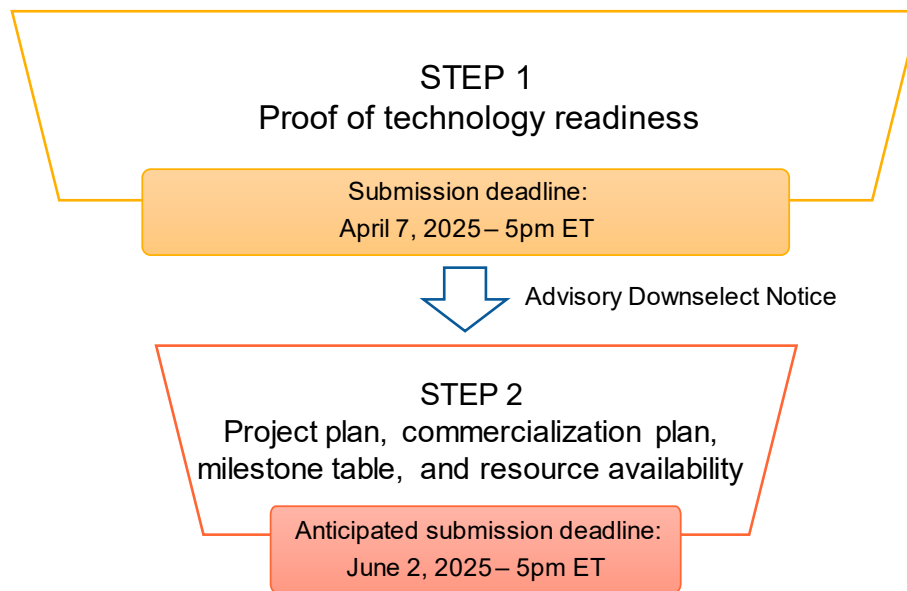
OCED will issue the advisory down-select notices approximately 4 weeks after the step 1 submission deadline.

Anticipated deadline for step 2

OCED will provide notification of the step 2 due date within the advisory down-select notice. OCED anticipates that the deadline for step 2 submission will be approximately 4 weeks after the receipt of the advisory notice, around June 2, 2025.

Firms are responsible for ensuring that all files constituting the proposal package are submitted prior to the deadline. If a proposal package is not received by the deadline, OCED will determine the proposal package to be incomplete and will not evaluate it.

Figure 22 Representation of the proposal process



Exchanges with best-suited offerors

Approximately 4 weeks after the step 2 submission deadline and after the evaluation of the proposals, OCED will select a certain number of best-suited parties to negotiate a contract based on the totality of information available. OCED reserves the right to communicate with only those selected parties to finalize contract(s). During the negotiation phase, OCED will request additional administrative documents to confirm eligibility for a federal contract and to conduct an administrative due diligence of the contractor. In addition, OCED will negotiate the details of the milestone table, the dollar value to complete each milestone, and the expected deliverables at the end of each phase to ensure success of the contract and define requirements to issue a subsequent option corresponding to a subsequent phase of the project. If the parties cannot successfully address any remaining issues, at OCED’s sole discretion, OCED reserves the right to limit exchanges with only the next best rated parties.

What to submit

The proposals must include the information requested at each step and follow the prescribed format in the sections below. Failure to follow procedures or to provide any of the requested documents or information may be considered a material omission and may adversely affect an offeror’s evaluation or result in elimination of the offeror from the competition.

OCED will not accept documents with any page(s) over the required page limits. Pages in excess of the page limits identified for each required document will not be evaluated. Attempts to circumvent page count restrictions through excessive use of headers/footers, spreadsheets, charts, tables, diagrams, design drawings, graphs, and/or tables may result in rejection of the quotation or truncation of the document.

Except for headers/footers, spreadsheets, charts, tables, diagrams, design drawings, graphs, and tables, the vendor's quotation shall use 11-point (or larger) Arial font. At a minimum, all pages shall have 0.5-inch margins on all sides and be single-spaced (at least equivalent to Microsoft® Word's "Single" line-spacing option). Up to two columns of text per page is acceptable.

Classified information shall not be included. OCED will reject any proposal package that contains classified information.

For assistance in completing your proposal package, use the following checklist at each step to ensure your submission is complete.

Step 1: Proof of technology readiness

The first step will focus on backward looking information with the focus on assessing whether the interested party meets the technical entry criteria for the specific Topic Area of interest. OCED requires that offerors submit the following documents:

- Project information (a single PDF with no more than 1 page in total):
 - Selected Topic Area.
 - Project title. The title must be concise and descriptive of the proposed effort.
 - Contact information of the offeror.
 - Proposal Summary.
- Company pitch deck, meant to mimic what might be presented to an investor detailing items such as the technology differentiation, intellectual property status, market fit and size, team, and next steps (a single PDF file with no more than 20 slides in total).
- Testing data campaign report, including a thoughtful summary of experimental data in the form of graphs, charts, tables, and narrative, meant to demonstrate the technical readiness in the strongest format and detail able (a single PDF file with no more than 20 pages).
- Concept paper outlining the approach to the future validation testing, the intended testing campaign, the expected outcomes and proof (or credible plan) to be able to operate a pilot-scale version of the proposed technology capable of operating under industrially relevant conditions, including evidence that this pilot-scale is representative of a potential full-scale project with a similar use case (a single PDF file with no more than 10 pages).

In addition, OCED requires offerors to submit the following documents: Note: these documents will not be evaluated but are necessary to be considered for a contract:

- Copy of the SBA Company Registry registration
- Prior Awards Addendum (for firms with more than 21 Phase I awards in the past 5 fiscal years). Refer to [Performance Benchmark Requirements](#) for additional information.
- Commercialization Metrics Survey (CMS) available in "My Dashboard" section of your company's sbir.gov profile.
- Disclosures of Foreign Affiliations or Relationships to Foreign Countries, as defined in the Appendix.

Step 2: Project plan, commercialization plan, milestone table, and resource availability

The second step will focus on forward looking information with the focus on assessing whether the interested party has developed a robust project plan and has the resources necessary to successfully execute a contract. OCED requires offerors to submit the following documents:

- Project plan detailing the activities to be performed during the project and by whom as well as detail what will not be in scope (a single PDF file with no more than 20 pages). The plan should include, at minimum:
 - project management plan;
 - initial design of experiment;
 - initial risk register;
 - integrated schedule; and
 - governance structure.
- Commercialization plan including a full adoption readiness level assessment¹² and showing market landscape analysis and product-market fit in the strongest format and detail able (a single PDF file with no more than 10 pages).
- Techno-Economic Analysis detailing the economic performance of the technology and its unit cost at the pilot and full scale (a single PDF file with no more than 5 pages and accompanying Excel file with no more than 5 tabs).
- Resumes of the key personnel (a single PDF file with no more than 20 pages).
- Letters of commitment from subcontractors/consultants (a single PDF file with no more than 10 pages).
- Proof of control of a pilot-scale version of the technology capable of operating under industrially relevant conditions (a single PDF file with no more than 10 pages).
- Milestone table, to include deliverables to show how milestones will be met and progress will be made in the operational validation of the technology, and associated milestone costs.

In addition, OCED requires offerors to submit the following document. Note: this document will not be evaluated but is necessary to be considered for a contract:

- Cybersecurity-Self Assessment-Worksheet.

As part of step 2, OCED may request an in-person or virtual meetings with each team competing in this step to verify claims and gauge the team's preparedness. If requested, the interview will consist of a discussion of materials submitted and demonstration of the existing system to the extent possible. OCED will notify all interested parties whether the interviews are being requested as part of the step 2 advisory down-select notice.

¹² [Adoption Readiness Assessment](#)

Evaluation Factors for Award

OCED will evaluate proposal packages that comply with the stated administrative requirements and are technically responsive to the topic areas of this solicitation. OCED will assign confidence ratings for each step described in the Instructions to Offerors. At the end of the proposal submission process, OCED will assign final confidence ratings in each topic area considering the entire proposal package including the responses during the interview session (if requested).

The outcome of the review and selection process will result in the highest rated offerors selected for issuance of a milestone-based firm fixed priced contract award.

Evaluation criteria

OCED will employ a best value tradeoff evaluation methodology. The evaluation factors for award are listed in the order of importance:

- Technology readiness – OCED will evaluate the maturity and readiness of the technology and its ability to meet the functionality required by the market at a price point that customers are willing to pay and meet market demand consistently with the topic area requirements outlined above.
- Market opportunity, commercialization pathway, and economic viability – OCED will assess the commercialization pathway for the technology, its target market(s) demand and the risks associated with the market landscape, including competitors, customers, other value chain players, and intellectual property competitiveness.
- Project management and execution – OCED will assess the details of the project plan, including the feasibility of the schedule, potential to manage risks, and strength of planning for cooperation within the firm and its proposed partners.
- Team qualifications and resource availability – OCED will assess the capabilities, expertise, and availability of the resources of the offeror and its partners to carry out the project as proposed. OCED will assess the offeror's control of a pilot scale system and any resource-related risks that can hinder the project success.
- Milestone table and price – OCED will assess the reasonableness of the proposed milestones, deliverables, and price of the project.

Eligibility information

SBIR program eligibility requirements are in place to ensure that the funds go only to small, independent United States (U.S.) businesses. The regulations (13 C.F.R. § 121) include restrictions about (1) the type of firm, (2) its ownership structure, and (3) the small business' size in terms of the number of employees.¹³ These and other requirements can be found in more detail at SBA's program eligibility guide.¹⁴

Type of firm

A SBIR small business contractor must be a business concern – it must be organized as a for-profit concern and meet all the other requirements for a “business concern” in 13 C.F.R. § 121.105. Non-profit entities are not eligible for the SBIR Program.

If a contractor is a joint venture, each party to the joint venture must be a concern that satisfies all program eligibility requirements regarding type, size, ownership, and control. The only exception is for an SBA approved Mentor-Protégé small business joint venture formed in accordance with 13 C.F.R. § 125.9.

Business concerns, other than investment companies licensed, or state development companies qualifying under the Small Business Investment Act of 1958, 15 U.S.C. § 661, et seq., are affiliates of one another when either directly or indirectly, (a) one concern controls or has the power to control the other; or (b) a third-party/parties controls or has the power to control both. Control can be exercised through common ownership, common management, and contractual relationships. The term “affiliates” is defined in greater detail in 13 C.F.R. § 121. The term “number of employees” is defined in 13 C.F.R. § 121.

Ownership structure

A majority (more than 50%) of your firm's equity (e.g., stock) must be directly owned and controlled by one of the following:

- One or more individuals who are citizens or permanent resident aliens of the U.S. The term “individual” refers only to actual people – it does not refer to companies or other legal entities of any sort. “Permanent resident alien” refers to an alien admitted to the U.S. as a lawful permanent resident by the U.S. Citizenship and Immigration Services;
- Other for-profit small business concerns. Each concern must be more than 50% directly owned and controlled by individuals who are U.S. citizens or permanent resident aliens of the U.S.); or
- A combination of (1) and (2) above.

Small business' size

The NAICS code for this solicitation is 541715. The size standard to qualify as a small business for this solicitation is 1,000 or fewer employees as determined by the SBA standards for the determined applicable NAICS code of 541715 - Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology). To be eligible for award, your business must qualify as a small business under that NAICS code. NAICS codes can be appended to SAM.gov registrations.

For the SBIR program, an employee includes all individuals employed on a full-time, part-time, or other basis. This includes employees obtained from a temporary employee agency, professional employee organizations or leasing concern. SBA will consider the totality of the circumstances, including criteria used by the IRS for Federal income tax purposes, in determining whether individuals are employees of a concern. Volunteers (i.e., individuals who receive no compensation, including no in-kind compensation, for work performed) are not considered employees.¹⁵

¹³ The purpose of the requirement regarding type of firm is to target the contracts to firms with an economic interest in developing the technology into a commercial application. The purpose of the ownership requirement is to limit the program to independent firms controlled by U.S. citizens or permanent resident aliens as a way of maximizing the likelihood that the funding will stimulate innovative activity within the U.S. economy. The purpose of the size restriction (number of employees of the firm and its affiliates) is to limit program funding to small business concerns with a unique capacity for innovation, which are more likely to be constrained by lack of access to such funding.

¹⁴ [Guide to SBIR/STTR Program Eligibility](#)

¹⁵ See 13 C.F.R. § 121.106(a) for additional information.

Other eligibility requirements

All funded activities must be performed in the U.S., except under exceptional circumstances, for which an explanation must be submitted to OCED and an approval, if made, has been conveyed in writing by OCED. “U.S.” means the 50 states, the territories, and possessions of the U.S., the Commonwealth of Puerto Rico, the Republic of the Marshall Islands, the Federated States of Micronesia, the Republic of Palau, and the District of Columbia. Non-U.S. citizens are eligible to perform work on SBIR contracts provided they are legally empowered to work in the U.S. at the time that a contract is made and throughout the duration of the project. That is, a foreign national working on an SBIR contract must NOT be an immigrant without legal status and must be an immigrant alien or a foreign national visiting the U.S. on an approved visa.

In exceptional circumstances, where expertise or facilities do not exist in the U.S. to perform the proposed activities, offerors may propose to perform part of the work under the contract outside the U.S. In these situations, the offeror must clearly justify the need for foreign work including details of domestic experts and facilities that were contacted to make this determination. No pre-approval of foreign work will be granted in advance of the application. OCED will decide on whether performance of work outside the U.S. is justified as part of the application review process. Insufficient justification may result in declining the application.

Additional Solicitation Provisions

The following provisions will also be applicable to this solicitation:

- [FAR 52.233-2](#) Service of protest
- [DEAR 952.209-8](#) Organizational conflicts of interest – disclosure
- [DEAR 952.233-2](#) Service of protest
- [DEAR 952.233-4](#) Notice of protest file availability
- [DEAR 952.233-5](#) Agency protest review
- DOE-L-2030 System for award management continuous registration requirement
The Offeror must be registered in the [SAM.gov](#), in full compliance with the requirements of the provision at [FAR 52.204-7](#), System for Award Management, when submitting an offer or quotation, and shall continue to be registered until time of award

Other requirements

Conflicts of interest

Contractors must be aware of potential conflicts of interest in the event their SBIR contract includes a subcontract to a research institution (e.g., National Laboratory, University) and the contractor's employee(s)/ownership is (are) also an employee(s) of the research institution. The subcontracted work might either be a Strategic Partnership Project (SPP) or a Cooperative Research and Development Agreement (CRADA). Any conflict of interest related to a subcontracted effort with DOE, or its contractors shall be addressed prior to award by providing to DOE a statement from the DOE Contracting Officer at the Laboratory Site Office confirming that the National Laboratory Contractor is aware of the ownership (or dual employment) and that the National Laboratory Contractor has conducted a conflict review in accordance with its approved conflict procedures. A similar statement should be obtained from the Sponsored Program Office or similar business office in the event the subcontract is with a university or other research institution.

In addition, the contractor shall provide to OCED prior to issuance of a contract a document detailing how it will exercise both financial and managerial control over the project and how the awardee will isolate the Research Institution employee(s) from influencing control of the contract.

Payment Schedule

The exact payment terms will be included in the contract. Invoices are submitted electronically through the DOE Office of Finance and Accounting's Vendor Invoicing Portal and Electronic Reporting System (VIPERS). Instructions concerning contractor enrollment and use of VIPERS can be found at <https://vipers.doe.gov>.

Rights in Data Developed Under SBIR Funding Agreements

The SBIR program provides specific right protections for data developed under SBIR awards. Please review the full text at the following FAR 52.227-20 Rights in Data-SBIR Program.¹⁶

Copyrights

The contractor may copyright and publish (consistent with appropriate national security considerations, if any) material developed with OCED support. OCED receives a royalty-free license for the Federal Government and requires that each publication contain an appropriate acknowledgment and disclaimer statement.

Export Control

The contractor shall comply with all U.S. export control laws including Export Administration Regulations (EAR) and International Traffic in Arms Regulations (ITAR). Offerors are responsible for ensuring that all employees who will work on this contract are eligible under export control laws, EAR, and ITAR. Any employee who is not a U.S. citizen or a permanent resident may be restricted from working on this contract if the technology is restricted under export control laws, ITAR, or EAR unless the prior approval of the Department of State or the Department of Commerce is obtained via a technical assistance agreement or an export license. Violations of these regulations can result in criminal or civil penalties. For additional information on ITAR, please visit the [Code of Federal Regulations](#).

Essentially Equivalent Awards and Prior Work

The contractor must certify with every invoice that they have not previously been paid nor are currently being paid for essentially equivalent work by any agency of the Federal Government. Failure to report essentially equivalent or duplicate efforts can lead to the termination of contracts and/or civil or criminal penalties.

Evidence of Contractor Responsibility

OCED may request the offeror to submit certain organizational, management, personnel, and financial information to establish responsibility of the offeror. Contractor responsibility includes all resources required for contractor performance (e.g., financial capability, workforce, and facilities).

¹⁶ [Rights in Data - SBIR Program](#)

Contractor Responsibilities for Costs

In accordance with FAR Part 45, OCED will not provide services, equipment, or facilities (resources – capital equipment, tooling, test, and computer facilities, etc.) for the performance of work under SBIR contracts. Generally, any contractor will furnish its own resources to perform the proposed work on the contract.

Agency Recovery Authority and Ongoing Reporting

In accordance with section 5 of the SBIR and STTR Extension Act of 2022, OCED will:

- require contractors to repay all amounts received by OCED under the contract if:
 - the small business concern makes a material misstatement that OCED determines poses a risk to national security; or
 - there is a change in ownership, change to entity structure, or other substantial change in circumstances of the small business concern that OCED determines poses a risk to national security; and
- require contractors to regularly report to OCED and the SBA throughout the duration of the contract on:
 - any change to a disclosure required pertaining to Disclosures of Foreign Affiliation or Relationships to Foreign Countries;
 - any material misstatement made under paragraph above; and
 - any change described in paragraph above.

Appendix

Background on Topic Area 1: Point source carbon capture

OCED's carbon management portfolio includes the \$937 million Carbon Capture Large-Scale Pilots program, the \$2.5 billion Carbon Capture Demonstration Projects Program, and the \$3.5 billion Regional Direct Air Capture Hubs program. In particular, the Carbon Capture Large-Scale Pilots program funds projects that further the development of transformational carbon capture technologies “not yet advanced to the point of being tested under real operational conditions at commercial scale.”¹⁷ The Carbon Capture Large-Scale Pilots program released one Notice of Funding Opportunity (NOFO) cooperative agreement in February 2023¹⁸ and announced over \$304 million to four eligible projects. Additionally, a second NOFO cooperative agreement for up to \$1.3 billion across 3 different topic areas was announced in December 2024.¹⁹ This new funding opportunity focuses on point source carbon capture large-scale pilots, commercial demonstrations, and networked demonstration planning and commercialization.

Other DOE offices and programs support early-stage design, engineering, and characterization work, including multiple funding opportunities issued by the Office of Fossil Energy and Carbon Management (FECM)²⁰ supporting different technology challenges within this space including geologic sequestration (CarbonSafe²¹), transport infrastructure planning and design, point source capture technology development, and small pilots and Front-End Engineering & Design (FEED) studies.²²

Background on Topic Area 2: Long-duration energy

Electricity demand is growing significantly from residential and commercial electrification, the rise in data centers, and a growing US manufacturing base, such as semiconductor manufacturing. Additionally, variable renewable solar and wind generation is expected to grow significantly in the coming years and comprise most new capacity additions.²³ Currently deployed 2-6 hour lithium-ion energy storage is already supporting resource adequacy, reliability, and flexibility needs of the grid.²⁴ Long-duration (greater than 10 hours) technologies that are non-lithium have not yet sufficiently demonstrated the functional performance and delivered cost needed for markets and regulators to integrate them into system planning, and investors lack demonstrated successes to support investing in them. This solicitation attempts to break this chicken-and-egg cycle to progress their deployment.

OCED intends to complement and build on prior and existing DOE programming to target remaining technical and commercial adoption challenges. DOE has a broad range of related programming, including the Duration Addition to electricity Storage (DAYS)²⁵ program through ARPA-E, the Critical Facility Energy Resilience (CiFER)²⁶ opportunity issued by the Office of Electricity, the Energy Storage Pilot Demonstrations opportunity²⁷ issued by OCED, the projects supporting thermal energy storage through the OCED Industrial Demonstrations program,²⁸ the Industrial Efficiency and Decarbonization Office (IEDO),²⁹ the Solar Energy Technologies Office (SETO),³⁰ and the Grid Resilience and Innovation Partnerships (GRIP) program³¹, among others.

Disclosures of Foreign Affiliations or Relationships to Foreign Countries

You must complete the “Disclosures of Foreign Affiliations or Relationships to Foreign Countries” form as part of your proposal submission. Even if you do not have any foreign relationships, you must complete this form to

¹⁷ 42 U.S.C. § 16292(a)(1)

¹⁸ DE-FOA-0002963 - <https://oced-exchange.energy.gov/#Foaldd3200aa3-9f64-4388-aa2c-c90dfd5f991f>

¹⁹ DE-FOA-0003473 - <https://oced-exchange.energy.gov/Default.aspx#Foald391fe1ec-4b51-4d1c-99cd-31533c9a440a>

²⁰ <https://www.energy.gov/fecm/office-fossil-energy-and-carbon-management>

²¹ <https://netl.doe.gov/carbon-management/carbon-storage/carbonsafe>

²² <https://www.energy.gov/fecm/point-source-carbon-capture>

²³ <https://www.eia.gov/todayinenergy/detail.php?id=61242>

²⁴ https://www.eia.gov/analysis/studies/electricity/batterystorage/pdf/battery_storage_2021.pdf

²⁵ <https://arpa-e.energy.gov/technologies/programs/days>

²⁶ DE-FOA-0003384 - <https://www.fedconnect.net/FedConnect/default.aspx?ReturnUrl=%2fFedConnect%2f%3fdoc%3dDE-FOA-0003384%26agency%3dDOE&doc=DE-FOA-0003384&agency=DOE>

²⁷ DE-FOA-0003399 - <https://oced-exchange.energy.gov/#Foald22c1262c-80dc-4361-9d06-4a2eda844221>

²⁸ <https://www.energy.gov/oced/industrial-demonstrations-program-0>

²⁹ <https://www.energy.gov/eere/iedo/industrial-efficiency-decarbonization-office>

³⁰ <https://www.energy.gov/eere/solar/solar-energy-technologies-office>

³¹ <https://www.energy.gov/qdo/grid-resilience-and-innovation-partnerships-grip-program>

represent that such relationships do not exist. If you do not submit this form, OCED will decline your proposal during the administrative screening process, and it will not be evaluated. Foreign involvement or investment does not independently disqualify you but failing to disclose such affiliations or relationships may result in denial of an award.

The disclosures require the following information:

- the identity of all owners and covered individuals of the small business concern who are a party to any foreign talent recruitment program of any foreign country of concern, including the People's Republic of China;
- the existence of any joint venture or subsidiary of the small business concern that is based in, funded by, or has a foreign affiliation with any foreign country of concern, including the People's Republic of China;
- 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;
- whether the small business concern is wholly owned in the People's Republic of China or another foreign country of concern;
- the 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 concern, including the People's Republic of China;
- any technology licensing or intellectual property sales to a foreign country of concern, including the People's Republic of China, during the five-year period preceding submission of the proposal; and
- any foreign entity, offshore entity, or entity outside the United States related to the small business concern.

After reviewing the above listed disclosures, and if determined appropriate, OCED may ask you to provide true copies of any 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 in effect during the five-year period before proposal submission.

During award, you must regularly report to OCED any changes to a required disclosure.