

Notice of Intent No.: DE-FOA-0003489
Issue Date: 10/31/2024

DISCLAIMER: This “Notice of Intent to Issue” is for informational purposes only; the Department of Energy is not seeking comments on the information in this notice, and applications are not being accepted at this time. Any information contained in this notice is subject to change.

This is a Notice of Intent to Issue
Notice of Funding Opportunity No. DE-FOA-0003490
Title: Carbon Capture Research and Development and Front-End Engineering
Design Studies for Power Generation and Industrial Point Sources

The Department of Energy (DOE) National Energy Technology Laboratory (NETL) intends to issue Notice of Funding Opportunity (NOFO) No. DE-FOA-0003490 on behalf of the Office of Fossil Energy and Carbon Management (FECM) in the 2024 calendar year.

TECHNICAL OBJECTIVES

A component of Executive Order 14008 (dated January 27, 2021), “[Tackling the Climate Crisis at Home and Abroad.](#)” is to “... ensure America and the world can meet the urgent demands of the climate crisis, while empowering American workers and businesses to lead a clean energy revolution that achieves a carbon pollution-free power sector by 2035 and puts the United States on an irreversible path to a net-zero economy by 2050.”¹ Carbon capture and storage (CCS) is one of many approaches critical to significantly reducing domestic and global carbon dioxide (CO₂) emissions. However, the energy and capital cost associated with state-of-the-art carbon capture systems represent a barrier to meaningful deployment. Development, testing, and analysis are required to generate expansive data sets that can be used to minimize cost, validate performance, and minimize environmental risks while scaling up carbon capture processes to commercially relevant scales. Efforts sought under this NOFO will build upon and expand research and development that DOE has invested in since 2009 to support achievement of emissions reduction targets.

If released, this NOFO is anticipated to focus on five Areas of Interest (AOIs). A minimum of 20% non-Federal cost sharing will be required for all AOIs. This advanced notice of the non-Federal cost sharing requirement is intended to give prospective applicants ample time to obtain the required non-Federal resources and adequately address such in any potential application(s) submitted in response to the intended NOFO. The DOE encourages team-oriented approaches in response to this announcement. It is considered critical that support services and analyses to be

¹ <https://www.energy.gov/sites/default/files/2021/02/f83/eo-14008-tackling-climate-crisis-home-abroad.pdf>

provided related to environmental performance, safety, and technical assistance be performed by individuals or organizations with professional capabilities in these areas.

ANTICIPATED AREAS OF INTEREST

AOI-1. Engineering-Scale Testing of Transformational Carbon Capture Technologies at Natural Gas Power Generation and Industrial Facilities.

AOI-1 will include three subtopics:

AOI-1A. Purpose-Built Engineering-Scale Testing of Transformational Carbon Capture Technologies at Industrial Facilities

AOI-1B. Purpose-Built Engineering-Scale Testing of Flexible Carbon Capture Technologies at Natural Gas Electric Generation Facilities

AOI-1C. Engineering-Scale Testing of Transformational Carbon Capture Technologies at an Existing Test Facility

AOI-1A and AOI-1B will include the design and construction of purpose-built engineering-scale systems at industrial (minimum 3,000 lb/hr flue gas) and electric generation (minimum 5,000 lb/hr flue gas) facilities, respectively. AOI-1C will involve engineering-scale testing at an existing test facility providing a minimum of 80,000 lb/hr of flue gas.

Testing of carbon capture technologies that targets high capture efficiency and flexible operating conditions is of particular interest. The industrial sectors of interest for AOI-1A include but are not limited to (i) hydrocarbon processing (e.g., petrochemicals, catalytic cracker, hydrocracking), (ii) mineral production (e.g., cement and lime), (iii) pulp and paper production, (iv) iron and steel production, (v) glass production, and (vi) waste-to-energy (includes municipal solid waste, biogas/water treatment wastes/sludge).

AOI-2. Enabling Technologies for Carbon Capture Systems.

AOI-2 will include two subtopics:

AOI-2A. Atmospheric Chemistry/Dispersion Modeling for Carbon Capture Systems

AOI-2B. Development and Testing of Processes and Approaches Supporting Carbon Capture Technologies

AOI-2 subtopics will focus on 1) the development and testing of atmospheric chemistry/dispersion models simulating fate and transport of atmospheric emissions from facilities that apply carbon capture technologies (AOI-2A) and 2) the development of enabling technologies (AOI-2B) that support the performance of carbon capture technologies in terms of

both environmental and cost impacts (e.g., reduce carbon capture media degradation; reclaim the degraded carbon capture media; reduce non-CO₂ emissions through engineering controls). Processes and approaches focused on CO₂ conditioning to meet pipeline transportation specifications are of particular interest.

AOI-3. Testing of Low-Cost, High Capture Efficiency, Flexible Capture Systems for Electricity Generation and Industrial Facilities. Subtopics for AOI-3 are focused on lab-scale testing of components (AOI-3A) and bench-scale testing of integrated processes (AOI-3B) for carbon capture approaches targeting high capture efficiency and capability for flexible operations while minimizing cost increases. Applications should propose innovative and transformational carbon capture approaches compared to state-of-the-art technologies.

AOI-4. Preliminary Front-End Engineering Design Studies (pre-FEED) for Flexible Carbon Management Systems. Pre-FEED studies conducted under AOI-4 will provide insight into design and placement considerations, risk identification and mitigation, and resource requirements of the entire CCS value chain (capture, transport and storage/use) for both electricity generation (AOI-4A) and industrial (AOI-4B) facilities under transient operation scenarios.

AOI-5. FEEDs for Oxygen-Driven (Chemical Looping/Oxy-Combustion) Hydrogen Production Pre-Commercial Pilot Scale Systems. Applications should propose FEED studies for pre-commercial pilot scale systems at facilities producing hydrogen using natural gas, coal, or biomass feedstocks that are capable of capturing at least 20,000 tonnes of CO₂ per year.

SUBMISSION AND REGISTRATION REQUIREMENTS

If a NOFO is released, it will be posted at Grants.gov (<http://www.grants.gov>) and at FedConnect (<http://www.fedconnect.net>). Entities interested in applying are strongly encouraged to register at these sites to receive notification of announcements regarding the NOFO. Applications can only be submitted through Grants.gov.

There are several one-time actions an applicant must complete to submit a Full Application in Grants.gov (e.g., register with the System for Award Management (SAM), obtain a Unique Entity Identifier (UEI), register with Grants.gov, and register in FedConnect.net to submit questions). Applicants who are not registered with SAM and Grants.gov, should allow at least 44 days to complete these requirements. It is suggested that the process be started as soon as possible.

- **SAM** - Applicants must register with SAM at <http://www.sam.gov/> prior to submitting a Full Application in response to a NOFO. NOTE: 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 an 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 an application under consideration. More information about SAM registration for applicants

is found at: <https://sam.gov/content/entity-registration>.

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 DUNS number has been replaced with the UEI. The UEI is already available in the SAM entity registration record.

NOTE: Subawardees/subrecipients at all tiers must also obtain an UEI and provide the UEI to the Prime Recipient before the subaward can be issued.

- **Grants.gov** - Applicants must register with Grants.gov and set up a Workspace. An applicant cannot submit a Full Application through Grants.gov unless it is registered. Please read the registration requirements carefully and start the process immediately.

1. The Authorized Organizational Representative (AOR) must register at: grants.gov/register.
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:

grants.gov/applicants/applicant-registration.

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 to a NOFO. FedConnect website: www.fedconnect.net.

DISCLAIMER

This is a Notice of Intent (NOI) only. DOE may issue a NOFO as described herein, may issue a NOFO that is significantly different than the NOFO described herein, or may not issue a NOFO at all.

This Notice is issued so that interested parties are aware of DOE's intention to issue this NOFO in the near term. All the information contained in this Notice is subject to change.

No Concept Papers or Full Applications are being accepted at this time.

DOE will **not** entertain questions at this time. Details on how to submit questions will be provided in the NOFO, if issued.