Office of Clean Energy Demonstrations

THE OFFICE OF

CLEAN ENERGY DEMONSTRATIONS

Regional Direct Air Capture (DAC) Hubs Program
Notice of Intent Informational Webinar

Office of Clean Energy Demonstrations

U.S. Department of Energy

October 10, 2024

Webinar Logistics

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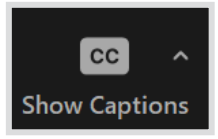

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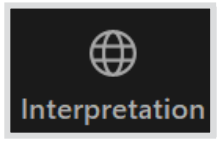

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Is this webinar being recorded?

Yes, this webinar is being recorded in English and Spanish and will be available on the DOE YouTube channel and the OCED website within the next week.

Will the slides be shared?

Yes, a copy of the presentation slides will be shared via email with registrants and on the OCED website within the next week.

How are you addressing questions?

Please **use the chat function to submit questions** – we will compile questions and post a Q&A to make available any answers we are able to provide, based on information that is public at this time.

Disclaimer

Only publicly available information provided in the OCED Notice of Intent (NOI) is discussed in this webinar.

Attending the webinar and watching the recording is completely voluntary and will not impact an applicant's selection.

This webinar is not a rule or regulation. If there are any inconsistencies between the NOI and the statements in this webinar, the NOI is the controlling document.

Today's Webinar Will Cover

- Direct Air Capture at DOE
- Request for Information Outcomes
- Notice of Intent Details
- Next Steps & Resources

DOE’s Direct Air Capture (DAC) Work

The Bipartisan Infrastructure Law provides up to $3.5 billion for a Regional DAC Hub Program in the United States

Regional DAC Hubs must:

- Represent “a network of direct air capture projects, potential carbon dioxide utilization off-takers, connective carbon dioxide transport infrastructure, subsurface resources, and sequestration infrastructure."

- Ultimately demonstrate **capture, processing, and storage or conversion** of at least 1,000,000 metric tons of CO_2 from the atmosphere per year at four Hub locations.

- To the extent practicable, be sited in **economically distressed areas** with (a) current or retired carbon-intensive fuel production or industrial capacity; (b) **high potential for carbon sequestration** or utilization; (c) high scalability potential; and (d) high employment potential.

Regional DAC Hubs Progress

In August 2023, 21 DAC Hub project selections over three topic areas were announced to support initial industry-wide efforts to advance toward the goals of the DAC Hubs program.

Topic Area 1: Feasibility Studies and Site Selection

Conceptual and pre-FEED studies followed by site and technology selection

24 months and ≤$3 million DOE funding per project

14 selections by FECM/NETL
13 have been awarded to date
~$40 million total DOE share

Topic Area 2: FEED Studies and Project Development

FEED studies and other activities to support project development

24 months and ≤$12.5 million DOE funding per project

5 selections by FECM/NETL
3 have been awarded to date
~$57 million total DOE share

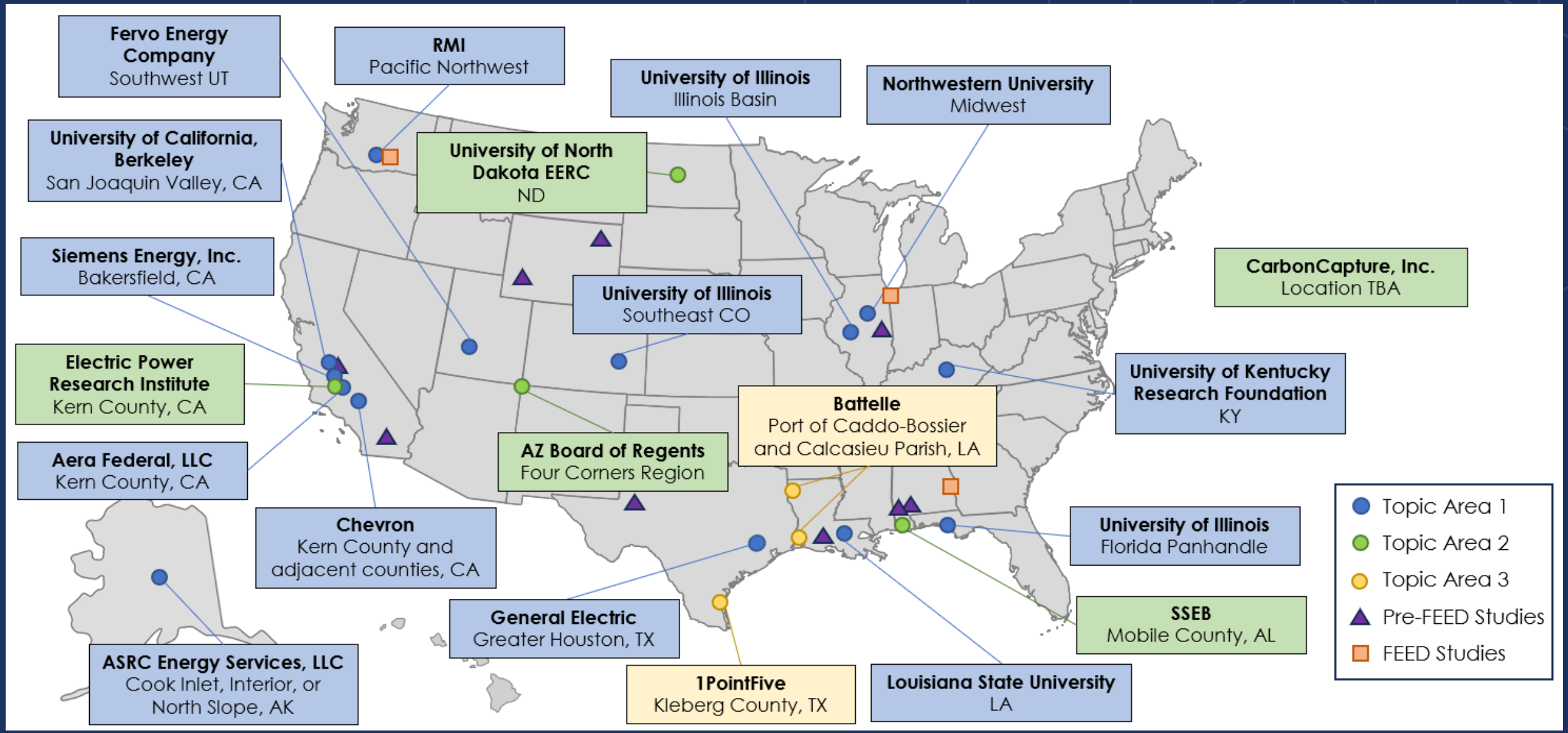
Topic Area 3: Permitting and Construction

Detailed design and NEPA followed by construction and operation

≤10 years and ≤$650 million DOE funding per project

2 selections by OCED and both have been awarded for $50 million Phase 2
Up to $1.4 billion total DOE share

DAC Pre-FEED, FEED, and Hubs FOA-1 Project Map



Outcomes from Request for Information (RFI): Mid Scale Funding

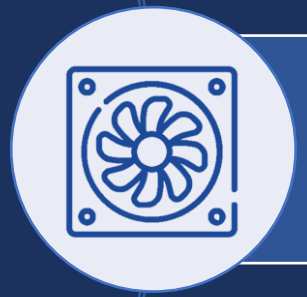
Mid-Scale RFI Respondents and Themes

47 Responses

- **21** DAC Developers
- **4** Industry Groups
- **2** CDR Developers
- **11** Non-profits, labor groups and think tanks
- **1** Carbon Utilizer
- **8** All Others

DAC industry agrees **DOE should fund mid-scale facilities**

Derisk larger Hub-scale deployments, unique need for public funding, important part of many tech company development plans



DOE should **still support larger Hub** projects

Don't delay or radically reduce funding for larger Hub projects

Flexibility is critical to overcome obstacles at mid-scale

Siting flexibility, access to energy and carbon management infrastructure, size and cost flexibility, recurring openings for funding

Notice of Intent (NOI) Details

This NOI announces funding for three Topic Areas (TAs)

	TA-1 *Infrastructure Scaling Platforms (ISPs)*	**TA-2** *Mid-Scale Commercial DAC Facilities (MSC)*	**TA-3** *Large-Scale Commercial DAC Facilities (LSC)*
Funding by TA	$100 – 300 million	$100 – 300 million	$1 – 1.4 billion
Project Funding	Up to $250M Federal share 50% minimum non-Federal cost share	Up to $50M Federal share 50% minimum non-Federal cost share	Up to $600M Federal share 50% minimum non-Federal cost share
Estimated Project Count	1 – 3 projects	4 – 8 projects	2 – 6 projects
Key Objectives	• Design, build and operate ISPs/host sites • Allow early commercial DAC technologies to overcome challenges in accessing clean energy inputs and carbon management infrastructure	• Design, build and operate MSC DAC facilities • Demonstrate the first commercial deployment of a DAC technology at this scale • Contribute to the combined capacity of a new or existing regional DAC hub	• Design, build and operate LSC DAC facilities • Demonstrate the scale-up of a DAC technology already deployed commercially at smaller scale • Contribute to the combined capacity of a new or existing regional DAC hub

TA-3: Large-Scale Commercial (LSC) DAC Facility

Objective: Provide funding to LSC DAC facilities as primary contributors to the creation and expansion of four megaton regional DAC hubs

Key Attributes

- Target nominal gross capture capacity of at least **25,000 TPA**, with option to build bigger in stages
- Propose plan for subsequent deployments of this technology of at least 10x the proposed facility capacity
- Demonstrate scale up of technology already deployed commercially at smaller scale
- Robust **life cycle assessment** (LCA) and **measurement, reporting and verification** (MRV)

Key Application Requirements

- **Reference facility data**, including:
  - **Six months** operational data from the reference facility
  - Not less than **TRL 7** with validation of all core processes
  - Not less than **1/25th** the nominal gross capture capacity of the proposed MSC facility
- **Carbon offtake application** (including permanent geologic storage and utilization in short- or long-lived products)

TA-2: Mid-Scale Commercial (MSC) DAC Facility

Objective: Provide funding to MSC DAC facilities as supplemental contributors to the creation and expansion of four regional megaton DAC hubs

Key Attributes

- **First commercial application** of a DAC technology at this order of magnitude scale
- Target nominal gross capture capacity of between **2,000 – 25,000 TPA**, with build stages optional
- Convey **compelling vision** for deploying technology at a scale of **at least 100,000 TPA** following mid-scale demonstration
- Robust **life cycle assessment** (LCA) and **measurement, reporting and verification** (MRV)

Key Application Requirements

- **Reference facility data**, including:
  - **1,000 hours** of data from the reference facility
  - Not less than **TRL 6** with validation of all core processes
  - Not less than **1/25th** the nominal gross capture capacity of the proposed MSC facility
- **Carbon offtake application** (including permanent geologic storage and utilization in short- or long-lived products)

TA-1: Infrastructure Scaling Platforms (ISPs)

Objective: Provide funding to create a host site (or ISP) for DAC developers at early stages of commercialization (e.g., small-scale and mid-scale)

Key Attributes

- Give DAC developers place to **build and operate early commercial** facilities
- Provide **access** to critical elements:
  - **Clean energy**
  - **Carbon dioxide offtake** (geologic storage, integration into a carbon-based conversion process or utilization into a valuable product and/or pipeline)
- Create **shared post-regeneration CO_2 conditioning processes** (dehydration, oxygen removal, compression)

Key Application Requirements

- **Access to energy and carbon offtake** (i.e., storage, utilization) resources or services
- **Business Plan**
- Initial list of potential DAC tenants

FOA-1 vs. NOFO - Recurring Program

	FOA-1	NOFO – Recurring Program
Recurring Openings and Flexible Funding Ranges	✗	✓
Minimum Facility Size (Large-Scale/Hub)	50,000 tons/year	25,000 tons/year
Hub Composition	Unified projects	Unified projects Independent projects in a region
Readiness Requirements	10x maximum	25x maximum Qualitative readiness assessment
Mid-Scale DAC CAPEX	✗	✓
Infrastructure Access for Small/Mid-Scale DAC	✗	✓
Concept Papers or Pre-Applications	✗	✓

Next Steps and Resources

Anticipated Timeline

1	2	3	4
Winter ‘24-25	**Spring ‘25**	**Summer ‘25**	**Winter ‘25-26**
NOFO Release	Concept Paper Submission + Encourage/Discourage Notification (TA-2,3) Or Pre-Application Submission (TA-1)	**Application Submission Deadline (submitted through OCED-eXCHANGE)**	**Selection Announcements**

Carbon Management Industry Day

OCED invites all interested potential applicants* and team members to attend this event where DOE will present and answer questions on:

- Topic areas covered in the NOI
- Strategies on teaming
- Panels on financing, FEED studies and OCED project requirements

November 13, 2024

Washington, DC

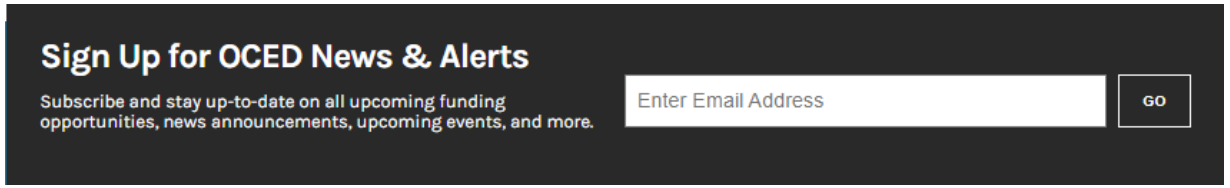
To request an invitation, please fill out **this form**

To learn more, visit the **DAC Engagement page**

**Due to anticipated demand, Industry Day participation will be limited to 3 individuals from any single organization*

Stay Connected

- For questions regarding DAC projects email DAC-OCED@hq.doe.gov
- Regional DAC Hubs Program: https://www.energy.gov/oced/DACHubs
- OCED Website & Newsletter Sign-up energy.gov/oced
  Scroll to bottom to sign up here:



- OCED Exchange DAC Hubs NOI: oced-exchange.energy.gov
- Follow us on LinkedIn linkedin.com/company/doe-oced/

Thank you!

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For more information, please visit: energy.gov/OCED