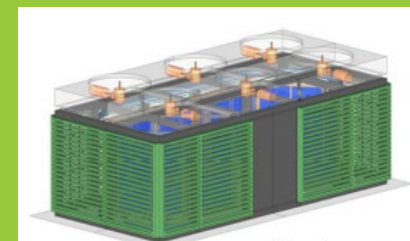
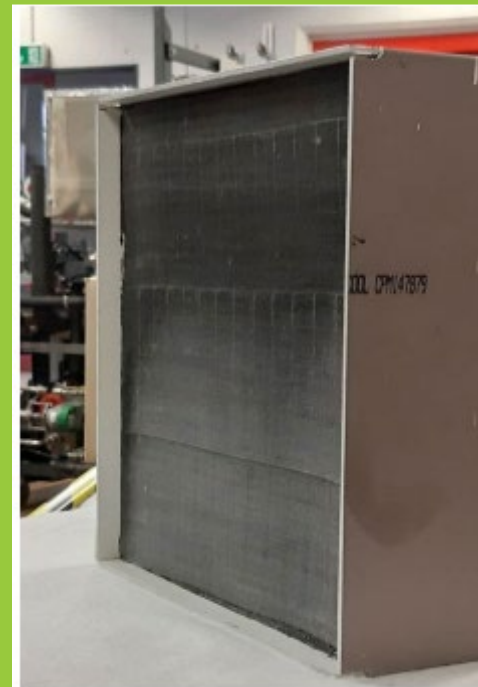
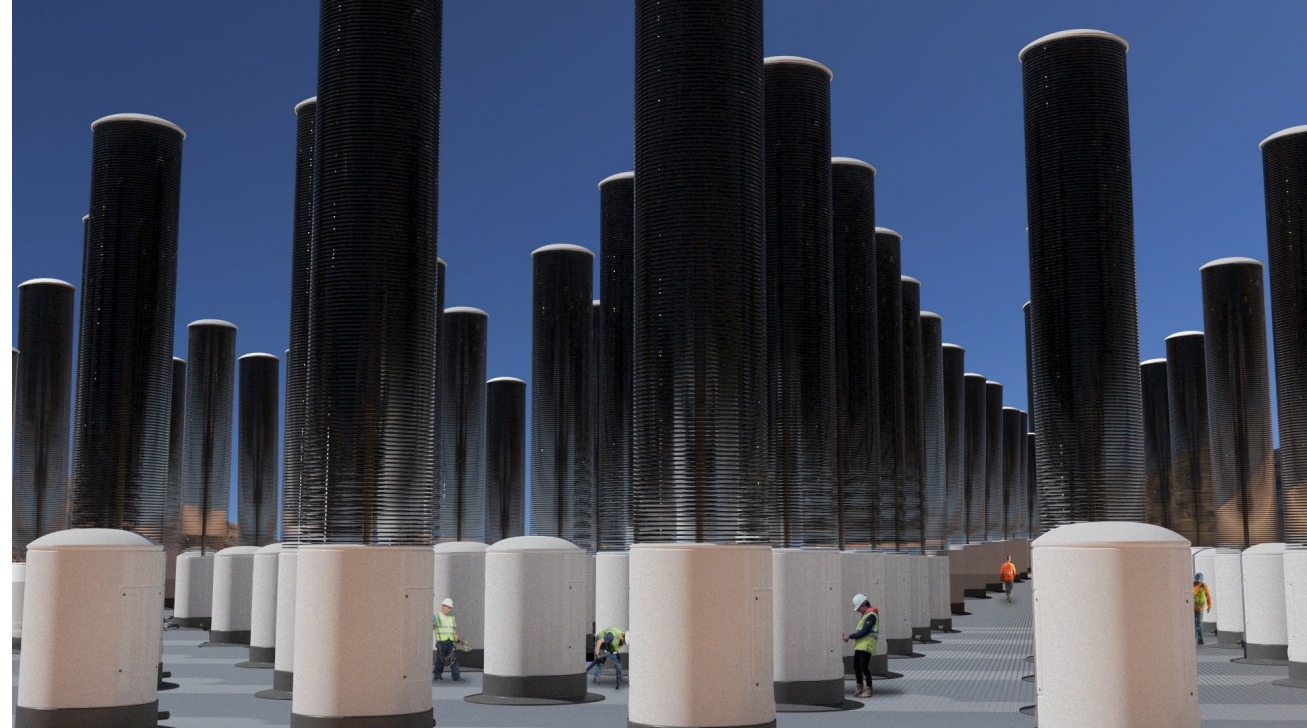


# Carbon Dioxide Removal Program

2024 FECM/NETL  
Carbon Management Research Project  
Review Meeting

Andrew Jones  
CDR Technology Manager  
August 5, 2024



# Carbon Dioxide Removal Program...Mission



## • Mission

- Research, develop, and demonstrate advanced cost-effective carbon dioxide removal (CDR) technologies to support just and sustainable decarbonization pathways
- Develop robust techno-economic and lifecycle analyses (TEA/LCA) and tailored measurement, monitoring, reporting, and verification (MMRV) methods



**Direct Air Capture (DAC)**



**Biomass Carbon Removal and Storage (BiCRS)**



**Enhanced Rock Weathering (ERW)**



**Marine CDR (mCDR)**

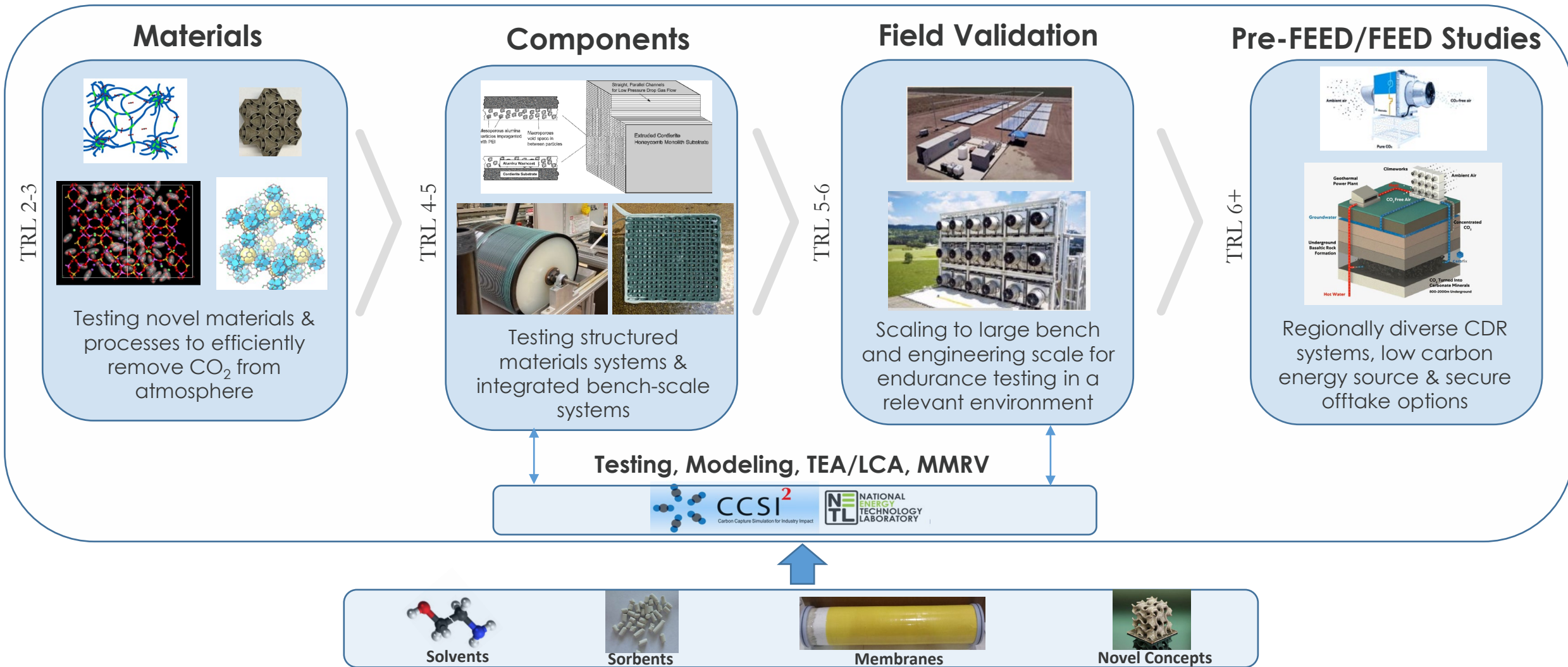
## • Drivers/Challenges

- Reduce capital & operating costs across a broad CDR technology portfolio (DAC, BiCRS, ERW/EM, mCDR)
- Accelerate demonstration of CDR technologies to aid in gigatonne-scale CO<sub>2</sub> removal by 2050

## • Goal & Metrics

- Support U.S. goal to achieve zero-carbon economy by 2050
- Support DOE's CNS target of secure and scalable CO<sub>2</sub> removal under \$100/net metric ton CO<sub>2</sub>e across the CDR portfolio by 2032, with costs including MMRV

# Carbon Dioxide Removal Program... Structure



# CDR.. Program Outreach



Carbon Capture Newsletter

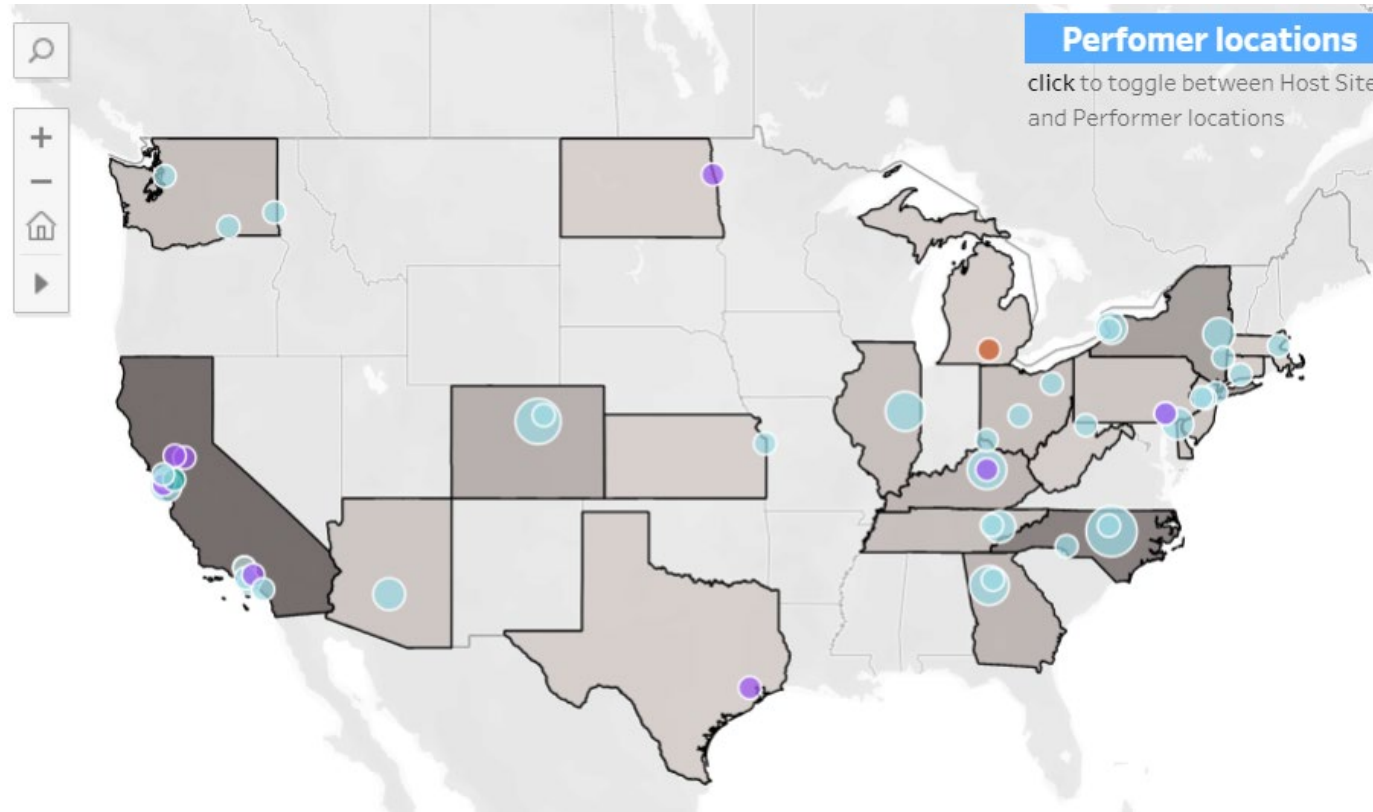
Carbon Capture Program R&D Compendium

Carbon Dioxide Removal Program Website

# NETL CDR Project Map

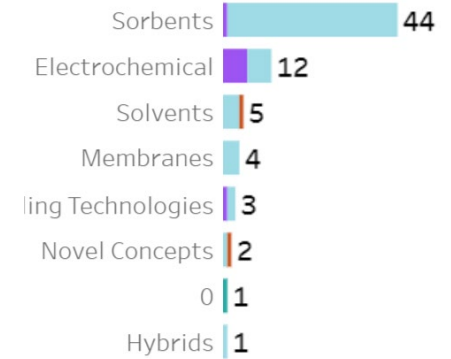


- Map of all active and inactive NETL-funded projects.
- Hover over performer or host locations for additional project information
- Can be filtered by ending scale, key technology, and CDR pathway
- Easy to generate graphs of project counts

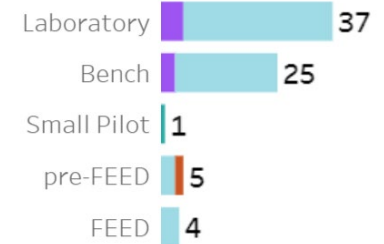


- Biomass Carbon Removal and Storage
- Direct Air Capture
- Enhanced Mineralization
- Marine CDR

## Key Technology



## Ending Scale



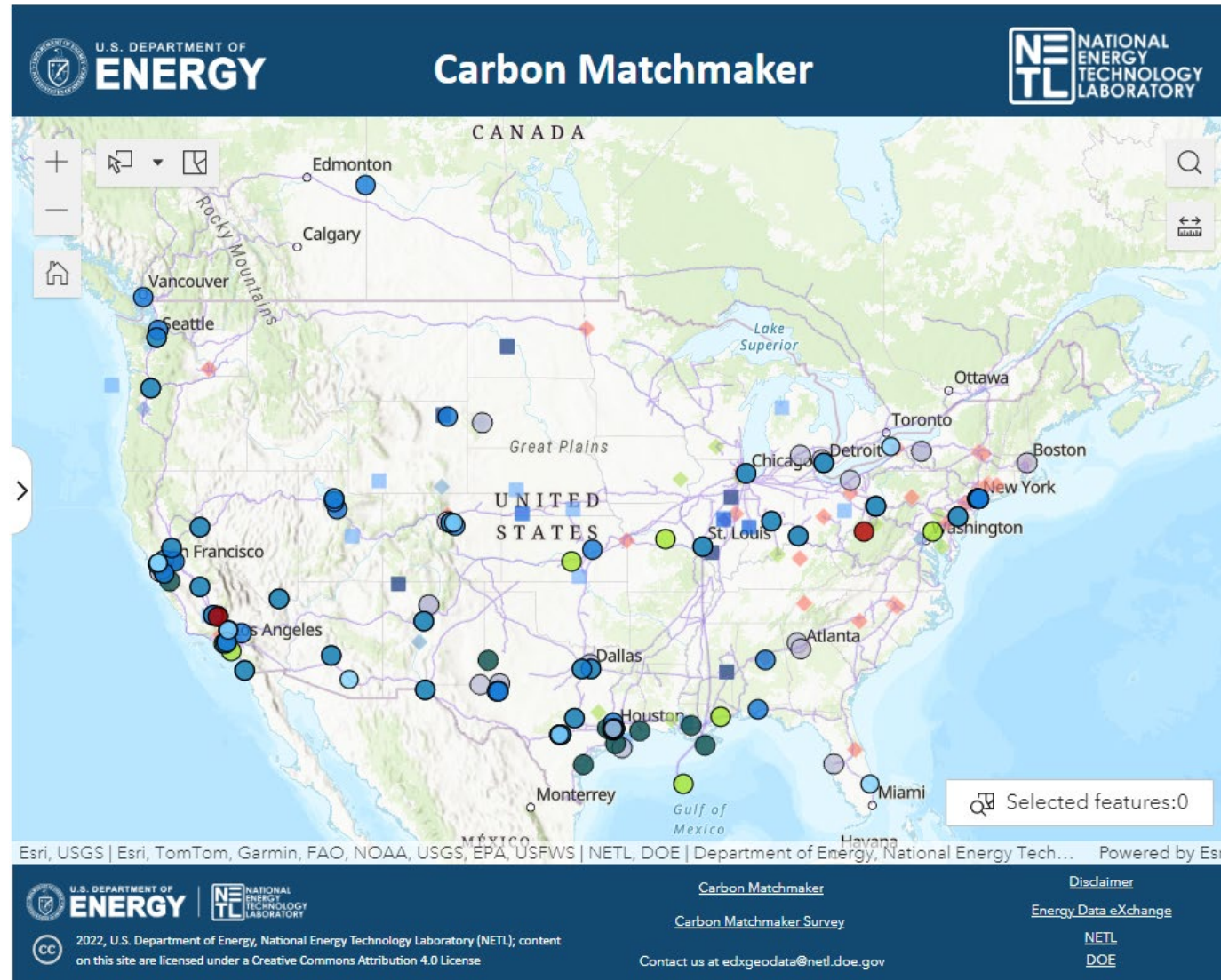
Project Status (All)	Technology Area Carbon Dioxide Removal	Point Source Capture Approach (All)
Ending Scale (All)	Key Technology (All)	Application Type (All)

# Carbon Matchmaker Tool



This tool will:

- Enable a **teaming mechanism** to support geographically diverse CCUS/CDR projects across the U.S.
- Increase awareness and facilitate development of regional carbon management hubs.
- Provide all stakeholders with **CO<sub>2</sub> supply and demand maps** for current and planned projects.
- Highlight past and currently funded **DOE carbon management projects** in a geospatial map.



Users can toggle through filters, including:

- CO<sub>2</sub> sources
- Utilization or conversion
- Capture
- CDR
- Storage (including CarbonSAFE projects)
- Transport and Infrastructure (including Class I railroads)
- Active DOE-funded CCUS activities

## Upgrading DAC Case Studies to Baseline Reports:

- ❖ Consistent basis for tech evaluation & comparison
- ❖ Guide R&D
- ❖ Support modeling, regulations & policy

### Ask:

- ❖ Cost & performance information for 1<sup>st</sup> commercial ~100,000 net tpa DAC offerings

### Assurance:

- ❖ Information will be held as confidential & used expressly for DAC Baseline Report development

### Contact:

- ❖ Sally Homsy ([sally.homsy@netl.doe.gov](mailto:sally.homsy@netl.doe.gov))



# NETL/FECM DIRECT AIR CAPTURE BASELINES

Help NETL/FECM define the basis for cost and net removal comparison for the next quarter of a century of Direct Air Capture (DAC) implementation!

## EFFORT

NETL is upgrading its existing DAC case studies for solvent and sorbent DAC to baseline reports. Baseline reports (1) provide a consistent basis for the evaluation and comparison of developing technologies, (2) are used for R&D guidance, (3) are increasingly used by various organizations for system modeling efforts (e.g., NEMS, ReEDS, NREL's ATB), and (4) provide reference data for regulators and policy makers.

### Solvent System



### Sorbent System



### Baseline Reports



## NEED

Cost and performance information for commercial DAC offerings from qualified technology providers. This information could take the form of detailed process designs or a "black box" process flow diagram with material and energy balance and high-level cost data. A detailed information request and design basis document is available upon request.

## DESIGN BASIS

Performance and cost should be for a first commercial offering at around the "net" 100,000 tonne/year scale, i.e., the first plant to be built based upon project operational experience to date. Options for cost reduction through R&D or implementation experience are welcome and encouraged; however, the estimate should stand alone without this information. A detailed information request and design basis document is available upon request.

## CONFIDENTIALITY

The information will be used expressly for the purpose of creating DAC baseline type reports. Vendors will not be identified as the source of this information in the report documents or subsequent studies unless they specifically request to be identified. Participating vendors will be given the opportunity to review the documents prior to publication.

## CONTACT

If your organization is interested in more information, please reach out to the NETL point of contact for these studies, Sally Homsy ([Sally.Homsy@netl.doe.gov](mailto:Sally.Homsy@netl.doe.gov)).

# Meeting Engagement

Please...

- ❖ Allow at least **3 minutes for Q&A**
- ❖ **Report accurate cost estimates** with key assumptions clearly stated. Reporting overly optimistic costs does a disservice to the industry
- ❖ Engage through questions and discussions during the refreshment breaks, **DAC Test Center Workshop** (Monday @ 4 p.m. in Rooms 411/412), and **CDR Enhanced Mineralization Special Session** (Thursday @ 10:30 a.m. in Rooms 411/412)



# Questions

<https://netl.doe.gov/carbon-dioxide-removal>

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