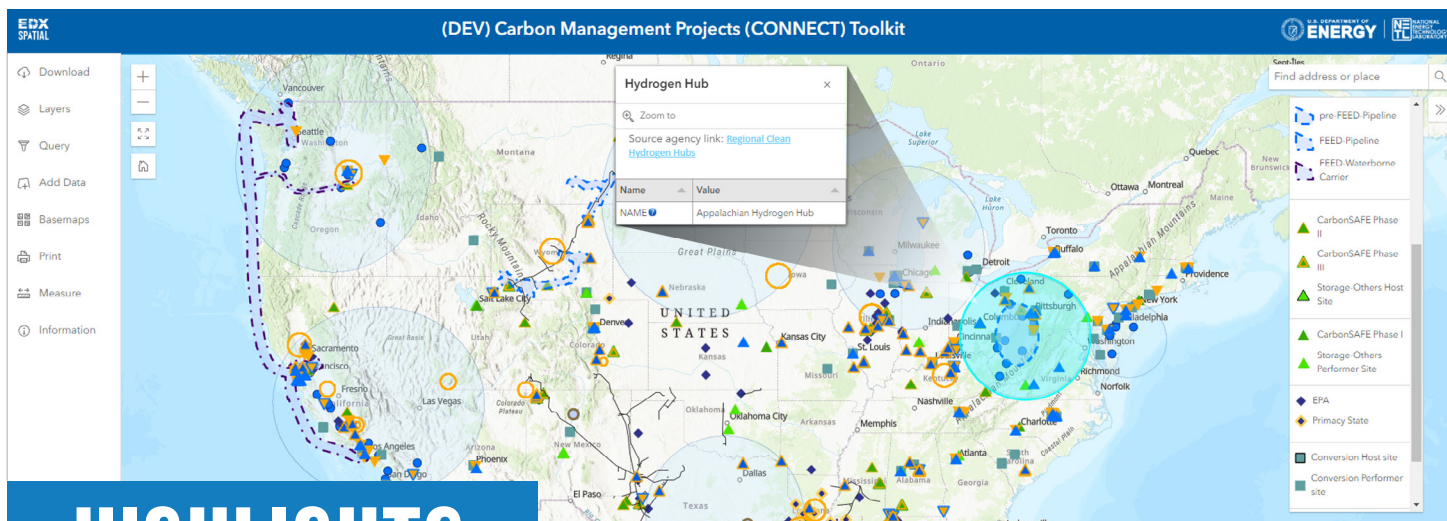


CARBON CAPTURE NEWSLETTER



HIGHLIGHTS

The newsletter is compiled by the National Energy Technology Laboratory to provide information on recent activities and publications related to carbon capture.

To subscribe, [click here](#).

Learn How the Federal Government is Investing in Carbon Management

As a part of broader efforts to support the United States in achieving a net-zero future, the U.S. Department of Energy's (DOE) Office of Fossil Energy and Carbon Management (FECM), in collaboration with other federal agencies, is developing new tools and resources to provide transparency about carbon management funding and improve the public's understanding of carbon management. In July 2024, FECM launched the [Carbon Management Projects \(CONNECT\) Toolkit](#), an online mapping tool and database that provides details about carbon management projects. This serves as a single source of authoritative information to the public on key federally funded carbon management projects. The CONNECT Toolkit also offers relevant information on other federal initiatives, regulatory permits, natural resource potential, existing infrastructure, point-source emissions, socio-demographic indicators, and protected lands. FECM also released the [Carbon Management Resource Portal](#)—a user-friendly platform to provide stakeholders with a place to learn about the rapidly evolving field of carbon management.

Interagency News and Updates



DOE Announces Funding for Test Centers to Advance Carbon Capture and Conversion Technologies

DOE's FECM announced up to \$127.5 million in federal funding to support the development of carbon dioxide (CO₂) capture, removal and conversion test centers for cement manufacturing facilities and power plants. This funding opportunity announcement (FOA) will support three areas of focus: Carbon Capture, Removal, and Conversion Test Center at an Electric Generating Unit will focus on providing post-combustion flue gas testing capabilities representative of domestic coal and/or natural gas-based power systems; Enabling Capital Improvements at Existing Carbon Capture Test Facilities will focus on providing enhanced capabilities and infrastructure improvements at existing flue gas testing centers representative of domestic fossil-based power systems; and Carbon Capture, Removal, and Conversion Technology Test Center at a Cement Manufacturing Facility will focus on providing flue gas testing representative of domestic cement manufacturing facilities.

DOE Modifies FOA: Support Procurement of Commercial and Industrial Products Derived from Anthropogenic Carbon Oxides

DOE announced it has modified a funding opportunity to award \$100 million to support states, local governments and public utilities in purchasing products derived from converted carbon emissions. This amendment will increase the maximum federal share up to \$5 million dollars per award. The goal is to speed up adoption of advanced carbon management technologies, creating a market for environmentally sustainable alternatives in fuels, chemicals and building products sourced from captured emissions from industrial and power generation facilities. The current modification increases the potential award size, updates procurement and use definitions, updates terms and conditions, and changes community benefits reporting requirements.

DOE Announces Funding to Expand Portfolio of Carbon Management Technologies to Reduce Carbon Emissions

DOE's FECM announced up to \$54.4 million in additional funding available to advance diverse carbon management approaches that reduce CO₂ emissions. The funding will support the development of technologies that capture CO₂ from industrial and power generation sources or directly from the atmosphere and transport it either for geologic storage or conversion into valuable products such as fuels and chemicals. The FOA will support the following areas of interest: Reactive Carbon Capture Approaches for Point Source Capture or Atmospheric Capture with Integrated Conversion to Useful Products, Engineering-Scale Testing of Transformational Carbon Capture Technologies for Natural Gas Combined Cycle (NGCC) Power Plants, Engineering-Scale Testing of Transformational Carbon Capture Technologies in Portable Systems at Industrial Plants, Preliminary Front-End Engineering Design (Pre-FEED) Studies for Carbon Capture Systems at Existing (Retrofit) Domestic NGCC Power Plants, Pre-FEED Studies for Carbon Capture Systems at Hydrogen Production Facilities Using Coal, Mixed Coal/Biomass, or Natural Gas Feedstock, Enhancing CO₂ Transport Infrastructure: Pre-FEED Studies for Multimodal CO₂ Transfer Facilities.



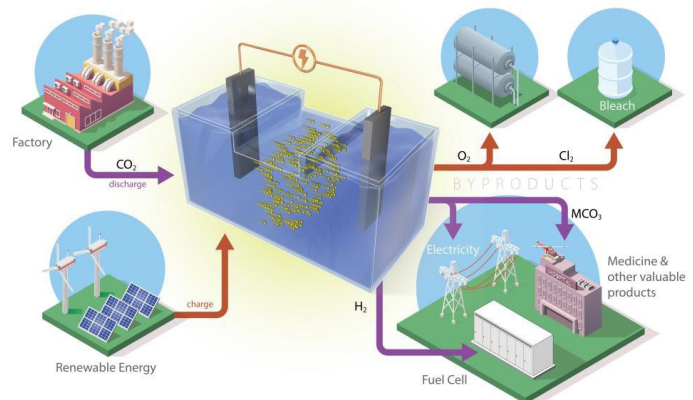
DOE Announces Funding to Catalyze Commercial CDR Technology

DOE's FECM announced funding of up to \$52.5 million, made available through President Biden's Investing in America agenda, to advance carbon dioxide removal (CDR) technologies that reduce legacy CO₂ by removing it directly from the atmosphere to counter-balance emissions from hard-to-abate sectors. The American-Made Commercial Direct Air Capture (DAC) Pilot Prize, funded by the Bipartisan Infrastructure Law (BIL), will support the development and deployment of DAC pilot projects that have demonstrated commercial readiness. Phase 1 of the Commercial Direct Air Capture Pilot Prize is [currently accepting applications](#) through February 7, 2025.

Interagency News and Updates (continued)

Carbon Capture Batteries Developed to Store Renewable Energy, Help Climate

Researchers at DOE's Oak Ridge National Laboratory (ORNL) are developing battery technologies that use renewable energy and capture airborne CO₂. This type of battery stores the renewable energy generated by solar panels or wind turbines. Utilizing this energy when wind and sunlight are unavailable requires an electrochemical reaction that, in ORNL's new battery formulation, captures CO₂ from industrial emissions and converts it to value-added products. ORNL researchers recently created and tested two different formulations for batteries that convert CO₂ into a solid form that has the potential to be used in other products.



The battery developed at ORNL, consisting of two electrodes in a saltwater solution, pulls atmospheric CO₂ into its electrochemical reaction and releases only valuable byproducts. Credit: Andy Sproles/ORNL, DOE

Baytown CCS Project

DOE's Office of Clean Energy Demonstration awarded the Baytown Carbon Capture and Storage (CCS) Project \$12.5 million to begin activities in Phase 1. Calpine plans to build a carbon capture demonstration facility that would capture CO₂ from the Baytown Energy Center, an NGCC power plant in Baytown, Texas. The project would be the first full-scale implementation of CCS technology at an NGCC plant in the United States. During Phase 1, which is expected to last 9–12 months, Calpine will complete an integrated FEED study to determine the specifications for CO₂ capture, transport, and storage components.



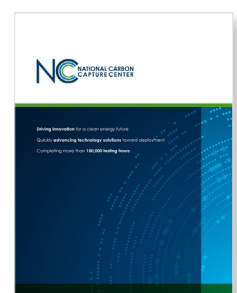
DOE Announces Funding to Accelerate America's CDR Industry

DOE announced 24 CDR Purchase Pilot Prize semifinalists to receive a total of \$1.2 million to scale up their CDR technologies. Funded by the BIL, the CDR Purchase Pilot Prize allows companies to compete for the opportunity to deliver CDR credits directly to DOE. The 24 semifinalists will receive \$50,000 each to help scale diverse CDR approaches across four pathways: DAC with storage, biomass with CDR and storage, enhanced rock weathering and mineralization, and planned or managed carbon sinks. Modification 4 of the official prize rules—including revisions to Section 1 and 2, Phase 2 official rules, Phase 3 official rules, and updated appendices—are available [here](#).



NCCC Launches a New Digital Brochure

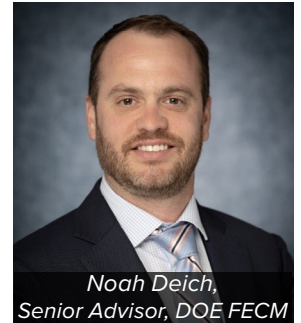
Funded by DOE and industry-leading sponsors, the National Carbon Capture Center (NCCC) plays a pivotal role in accelerating commercial development of cost-effective carbon management technologies. NCCC's overall scope of carbon management technology development includes point-source carbon capture for fossil-based power plants and various industrial processes, CO₂ conversion and CDR. NCCC's new digital brochure highlights include success stories and benefits for sponsors and technology developers.



Interagency News and Updates (continued)

Carbonsations Podcast with FECM's Noah Deich

The Carbonsations podcast focuses on the leading figures of the emerging carbon industry who are helping pave the way to net zero and beyond. This episode features Noah Deich, Senior Advisor at FECM. He shares his journey from co-founding the climate non-governmental organization Carbon180 to his current role at DOE and delves into the FECM's initiatives to support CDR, including the Carbon Negative Shot and the Voluntary CDR Purchase Challenge.



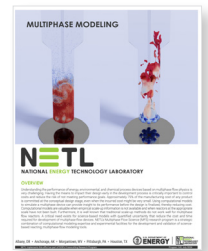
DOE to Fund Carbon Management Projects, Meet Climate Change Challenges

FECM announced its intent to issue funding in support of research and development projects in cooperation with industry and academia to solve climate change challenges. The notice was made in anticipation of a sixth funding round for DE-FOA-0002614. The FOA will be both a multi-programmatic and multi-year FOA, potentially soliciting work in any, or all, of the following topic areas: carbon conversion, CDR, point-source capture and carbon transport and storage.



Multiphase Modeling Fact Sheet: Carbon Capture Applications

The DOE National Energy Technology Laboratory (NETL) Multiphase Flow Science (MFS) research program is a strategic combination of computational modeling expertise and experimental facilities for the development and validation of science-based reacting, multiphase-flow modeling tools. The Multiphase Modeling fact sheet emphasizes the MFS research program's work in energy and environmental applications including biomass and waste plastic gasification, carbon capture using solid sorbents or liquid solvents and chemical-looping combustion of gaseous and solid fuels.



CETPartnership Joint Call 2024

The CETPartnership Joint Call 2024 (the Call) is the third annual joint call under the CETPartnership. The Call consists of call modules, addressing different energy technology and system challenges. Call modules focusing on enabling technologies typically address approaches with reference to the Technology Readiness Level 6 or Commercial Readiness Index 7. Some distinguish between research-oriented approaches and innovation-oriented approaches. Call modules focusing on system integration typically address holistic, integrated and transdisciplinary approaches with three dimensions: technologies and infrastructures, organization of energy systems and transition of energy systems.



New Categories Created in the CCS-EJ-SJ Database

The CCS-EJ-SJ database v2.0 integrates datasets from various federal agencies and authoritative sources to alert stakeholders and decision makers of the social and environmental factors that might impact the viability of CCS and energy-related project implementation. There are seven categories in the CCS-EJ-SJ v2 database: environmental justice (EJ), energy justice, economic justice, social justice (SJ), ecosystem assets, clean energy and infrastructure. Most of the layers within each category have been updated in this version. As compared to the old database, there are three new categories in the v2 database: ecosystem assets, clean energy, and infrastructure.

Interagency News and Updates (continued)

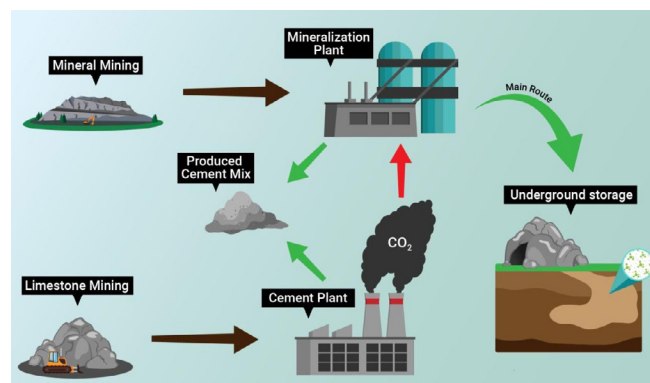
DOE Workshop on Transforming Industry: Strategies for Decarbonization Text Version

On May 14–15, 2024, DOE hosted a workshop to solicit input from stakeholders across the industrial sector to inform a new DOE vision study, *Pathways for U.S. Industrial Transformations: Unlocking American Innovation*. This vision study builds upon the 2022 Industrial Decarbonization Roadmap, the *Pathway to Commercial Liftoff: Industrial Decarbonization Report*, and other DOE analyses to present the critical technologies to pursue in parallel to decarbonize the industrial sector. This effort will consider the technical, economic, workforce and supply-chain challenges associated with the scale and pace of an industrial transformation, and present informed strategies for overcoming these barriers. DOE presented the framing, approach and initial results and provided stakeholders across industry, academia and government with an opportunity to provide feedback and help shape the study.



NETL Carbon Mineralization Article Highlights Achievements in Research Field

NETL's work in developing carbon mineralization technologies, which presents an alternative pathway toward a decarbonized power sector and economy, is gaining widespread recognition from the greater research community. NETL's established role as a key technical contributor in the field is evidenced by an article co-authored by NETL experts published in the journal *ChemBioEng Reviews*. Recently, Wiley, publisher of *ChemBioEng Reviews*, notified NETL that its review article, "[Mineralization of Carbon Dioxide: Literature Review](#)," is among the most read articles (top 40 most read, both recently and all-time) and the most cited articles (top 30 most recently and all-time) from that journal.



Carbon mineralization presents a new approach to carbon management in which captured CO₂ is reacted with metal cations to form carbonate minerals.

DOE Announces Plans to Create Low-Carbon Cement and Concrete Center of Excellence to Reduce Industrial Emissions

DOE's Industrial Efficiency and Decarbonization Office announced its plan to create a Cement and Concrete Center of Excellence to accelerate the development and adoption of novel low-carbon cement and concrete technologies. U.S. national laboratories can receive up to \$9 million through an upcoming competitive lab call to develop and lead the center. The center will support collaboration across academia, national labs, government agencies, and corporations to develop and validate low-carbon cement and concrete technologies, increase the industry's economic competitiveness, and help the U.S. reach net-zero carbon emissions by 2050.



Interagency News and Updates (continued)

IRS Issues Guidance for Procedures to Claim a Credit for Carbon Oxide Utilization

The Internal Revenue Service (IRS) issued [Notice 2024-60](#) to provide initial guidance on the credit for the sequestration of carbon oxide. This credit was amended significantly by the Inflation Reduction Act of 2022 (IRA). The notice provided describes information that must be included in a written report known as the lifecycle analysis (LCA) report and provides the procedures a taxpayer must follow to submit the report along with required supporting information to the IRS and DOE for review. Before any credit is determined, the IRS must approve the LCA of greenhouse gas (GHG) emissions documented in the LCA report with respect to carbon capture property placed in service on or after Feb. 18, 2018. Accordingly, the IRS must approve the taxpayer's LCA before the taxpayer may claim the utilization of carbon oxide credits.

DOE STEM Portal

DOE is building pathways for a diverse workforce to pursue careers in science, technology, engineering and mathematics (STEM). DOE seeks to engage learners at all levels to promote STEM and energy literacy and to attract, inspire and develop a STEM identity and a sense of belonging in STEM. DOE is committed to promoting and supporting people from all backgrounds and perspectives, including individuals and communities that have been historically underrepresented in STEM fields and activities at DOE.

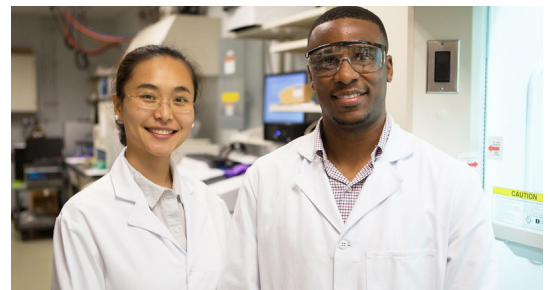


Explore Career Opportunities with FECM

FECM is looking for enthusiastic, driven professionals to join the team and help define the future of energy. Learn more about FECM's [Workforce Programs](#) and sign up for FECM career alerts to receive the newest vacancies. Text FECM CAREERS to 468311 to receive text message alerts or subscribe [here](#).

Explore Career Opportunities at NETL

At the core of NETL's success is its commitment to hiring the right people for the right positions. DOE's only government-owned and government-operated national laboratory offers exciting federal careers in research and engineering, technical project management, procurement, finance and budget, legal, and administrative support. Learn more at [NETL Careers](#).



Bipartisan Infrastructure Law Hub

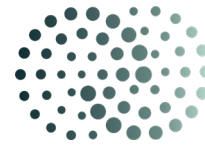
The BIL represents the most dramatic changes to DOE since its founding in 1977. The BIL is standing up 60 new DOE programs, including 16 demonstration and 32 deployment programs, and is expanding funding for 12 existing research, development, demonstration and deployment programs. NETL's [BIL Hub](#) provides information on the BIL, including links to the Guidebook, DOE's Clean Energy Corps, DOE's Applicant Portal and DOE's Grid Resilience Program, as well as information on solicitations and funding opportunities.



U.S. and International Events

Conference: Carbon Capture Global Summit

The Carbon Capture Global Summit 2024, to be held Sept. 3–4, 2024, in London, England, brings together policymakers, industry leaders and public and private sector investors to enable in-depth discussions on global carbon capture, utilization, and storage (CCUS) strategy, the latest policy frameworks, financial incentives, supply chain development, innovation, technology and international cooperation.



**Carbon Capture
Global Summit**

Conference: Climate Week NYC

Climate Week NYC, to be held Sept. 22–29, 2024, in New York, New York, is one of the key summits on the international calendar and has been driving climate action forward since it was first launched by Climate Group in 2009. Climate Week NYC brings together international leaders from business, government and civil society to showcase the unstoppable momentum of global climate action.



Conference: Carbon Capture Summit USA

The Carbon Capture Summit USA, to be held Oct. 15–16, 2024, in Houston, Texas, will explore next-generation carbon capture, utilization, storage, and transportation that meets net-zero emissions targets. The conference will spotlight cutting-edge CCUS technologies that transform carbon emissions into valuable resources, promoting a sustainable circular carbon economy.

Conference: GHGT-17

The 17th Greenhouse Gas Control Technologies (GHGT) Conference, to be held Oct. 20–24, 2024, in Calgary, Alberta, Canada, is the principal international conference on GHG mitigation technologies. The GHGT conferences are held every two years in member countries, rotating between North America, Europe and Asia. Each conference is a forum for technical discussions related to the field of GHGT.



U.S. and International Events (continued)

Conference: Carbon Capture Technology Expo Europe

Carbon Capture Technology Expo Europe, to be held Oct. 23–24, 2024, in Messe Hamburg, Germany, is a solutions-driven forum that will discuss the development of new carbon capture technologies and propel carbon capture into the mainstream for stationary and mobile applications. The two-day event will explore how to rapidly accelerate the deployment and commercialization of CDR technologies as a key solution on the pathway to net-zero carbon emissions.



Appalachian Hydrogen & Carbon Capture Conference

The Appalachian Hydrogen & Carbon Capture Conference, to be held Nov. 7, 2024, in Pittsburgh, Pennsylvania, will report on the latest projects coming out of DOE and major corporations. The evening prior will feature a reception acknowledging Marcellus's 20th anniversary. View the agenda [here](#).



Meetings: Global CCS Institute 2024 Americas

The Global CCS Institute is an international think tank whose mission is to accelerate the deployment of CCS. The [Global CCS Institute 2024 Americas Finance Meeting](#) will be held Nov. 6, 2024, in Houston, Texas, followed by a reception. [Global CCS Institute 2024 Americas Member Meeting](#) will be held Nov. 7, 2024, in Houston, Texas, followed by a reception.

Conference: Deploy24

Hosted by DOE, Demonstrate Deploy Decarbonize 2024 (Deploy24) will be held Dec. 4–5, 2024, in Washington, D.C. Deploy24—the second annual gathering of decision-makers from across the private and public sectors—is focused on accelerating the deployment of critical energy and decarbonization technologies and supply chains in the United States. Deploy24 builds this private-public dialogue through a range of formats, all with a focus on the immediate opportunities and challenges to accelerating domestic energy transformation. Register [here](#).



Business and Industry News

PRI Announces Operation Phase of Carbon Capture Pilot

The Prairie Research Institute (PRI) and DOE marked a significant milestone with a ribbon-cutting ceremony for the upcoming large-scale pilot testing of the Linde-BASF advanced post-combustion CO₂ capture technology at City Water, Light and Power's Dallman 4 coal-fired power plant in Springfield, Illinois. The \$80 million project, funded by DOE, Linde/BASF and the state of Illinois, is a groundbreaking initiative to position Illinois as a leader in carbon capture research and development. The Phase III pilot, which retrofits Dallman 4, is the largest of its kind globally, promising substantial economic and environmental benefits.



With city, state, and federal officials, the ribbon-cutting was led by key project stakeholders, including Kevin O'Brien, director of the Illinois Sustainable Technology Center and the Net-Zero Center of Excellence at the PRI; Bob Flider, senior director of community and government relations at the University of Illinois Urbana-Champaign; PRI Executive Director Praveen Kumar; Springfield Mayor Misty Buscher; Ronald Munson, point source carbon capture technology manager, NETL, DOE; Doug Brown, chief utility engineer of City Water, Light and Power; Aaron Gurnsey, president of the Central Illinois Building and Construction Trades Council and business agent of Plumbers and Steamfitters Local 137; and representatives from project partner companies Linde and BASF.

Aera's DAC Hub Awarded DOE Funding to Bring DAC Technology to Kern County and California

Aera Federal LLC has been awarded a \$2.8 million cooperative agreement contract as part of the department's Regional DAC Hubs Initiatives, which aim to demonstrate the capture, processing, delivery, and storage or end-use of captured carbon. The award will help fund a feasibility study to establish the viability of DAC as a business and technology for large-scale California decarbonization and identify optimal pathways, technologies and partners to scale DAC. The Aera DAC Hub, located in the Kern County Belridge Oil Field, aims to be one of the first projects in development as part of California's full-scale DAC-plus-storage network of regional hubs. The Aera DAC Hub will be designed to capture carbon emissions from ambient air and transport and store them at Aera's storage site.

Global Thermostat Wins as Technology Provider for Two of the Nine DAC Awards in Phase I of DOE's CDR Prize

Global Thermostat was acquired last month by fellow DAC company Zero Carbon Systems, bringing together its core technology with Zero Carbon Systems' engineering design. The combined company will enable additional resources to be dedicated to the next phases of DOE's [CDR Purchase Pilot Prize](#). Global Thermostat's partnerships with Fervo Energy and Carbon America were among nine DAC winners in the prize Phase 1. These proposals now advance to the final phases of the competition for a carbon credit purchase agreement with DOE worth up to \$3 million.

Publications

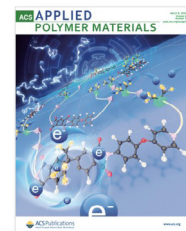
Impact of carbon dioxide removal technologies on deep decarbonization: EMF37 MARKAL–NETL modeling results

Nadejda Victor, Christopher Nichols, ENERGY AND CLIMATE CHANGE, VOLUME 5, DECEMBER 2024. (SUBSCRIPTION MAY BE REQUIRED.)



Polydiallylammonium-Polysulfone Multiblock Copolymers for Moisture-Swing Direct Air Capture of Carbon Dioxide

Alison R. Biery, Hoda Shokrollahzadeh Behbahani, Matthew D. Green, Daniel M. Knauss, ACS APPLIED POLYMER MATERIALS, VOLUME 6, ISSUE 5, FEB. 26, 2024. (SUBSCRIPTION MAY BE REQUIRED.)



Towards Energy-Efficient Direct Air Capture with Photochemically-Driven CO₂ Release and Solvent Regeneration

Uvinduni I. Premadasa, Benjamin Doughty, Radu Custelcean, Ying-Zhong Ma, CHEMPLUSCHEM, MARCH 8, 2024. (SUBSCRIPTION MAY BE REQUIRED.)

The performance of solvent-based direct air capture across geospatial and temporal climate regimes

Bjørn-Gustaf J. Brooks, Caleb H. Geissler, Keju An, Sean T. McCoy, Richard S. Middleton, Jonathan D. Ogland-Hand, FRONTIERS IN CLIMATE, VOLUME 6, APR. 24, 2024.

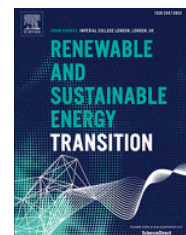


frontiers

Frontiers in **Climate**

Economic assessment of clean hydrogen production from fossil fuels in the intermountain-west region, USA

Fangxuan Chen, Bailian Chen, Zhiwei Ma, Mohamed Mehana, RENEWABLE AND SUSTAINABLE ENERGY TRANSITION, VOLUME 5, AUGUST 2024.



Maximizing Marine Carbon Removal by Coupling Electrochemical and Biological Methods

Charles F. Hibbeln, Paul Marsh, Christopher R. Myers, Peter J. Valdez, Scott J. Edmundson, Chinmayee V. Subban, ENVIRONMENTAL SCIENCE & TECHNOLOGY LETTERS, VOLUME 11, ISSUE 5, APRIL 10, 2024. (SUBSCRIPTION MAY BE REQUIRED.)



About DOE Carbon Capture:

DOE/NETL is developing the next generation of advanced CO₂ capture technologies through NETL's Point Source Carbon Capture Program (PSCC) and advancing a diverse set of CDR approaches to directly remove CO₂ emissions from the atmosphere through NETL's Carbon Dioxide Removal Program.



The Digital Compendium of Carbon Capture Technology provides a technical summary of the DOE/NETL's Carbon Capture Program, assembling carbon dioxide capture technology research and development (R&D) descriptions in a searchable database.



Carbon Capture Reference Materials

- Point Source Carbon Capture Program Fact Sheet
- Carbon Dioxide Removal Program Fact Sheet
- Carbon Capture Infographics
- Interactive Project Maps: PSCC and CDR
- Compendium of Carbon Capture Technology
- Carbon Dioxide Capture Handbook
- CCSI²
- Systems Analysis
- Conference Proceedings
- Accomplishments Posters: PSCC and CDR

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Program staff are also located in **Houston, Texas** and **Anchorage, Alaska**

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