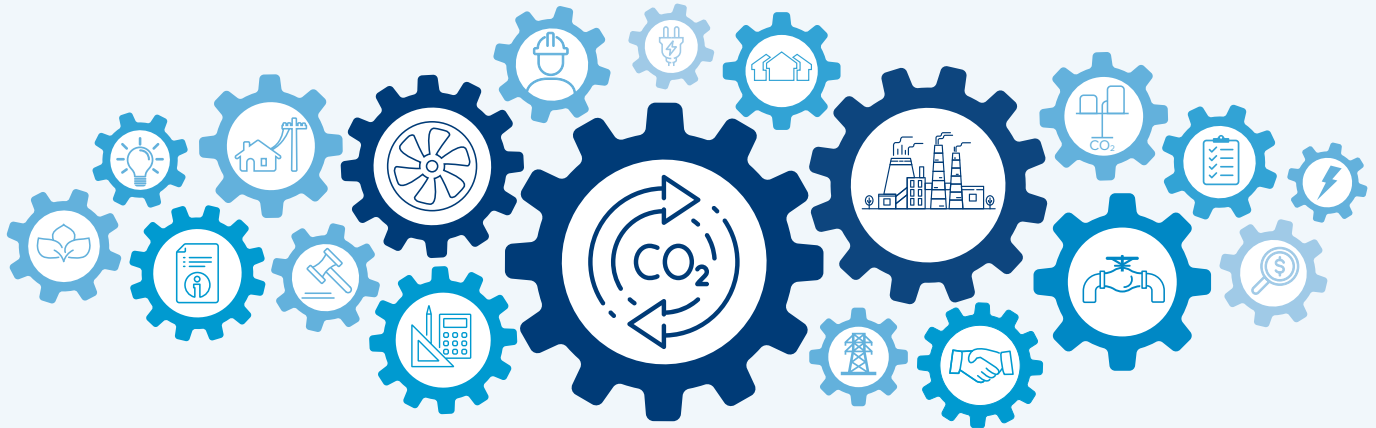


CARBON CAPTURE NEWSLETTER

U.S. DEPARTMENT OF ENERGY | OFFICE OF FOSSIL ENERGY AND CARBON MANAGEMENT | NATIONAL ENERGY TECHNOLOGY LABORATORY



HIGHLIGHTS

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

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DOE Announces Funding to Deploy Infrastructure Necessary to Manage and Store Carbon Emissions

The U.S. Department of Energy (DOE) released three funding opportunity announcements (FOAs) to bolster investments in the carbon management industry and to significantly reduce carbon dioxide (CO₂) emissions released into the atmosphere through power generation and industrial operations. The funding from President Biden's Bipartisan Infrastructure Law (BIL) will support three programs to help drive the demonstration and deployment of carbon capture systems, along with carbon transport and storage infrastructure. **Carbon Storage Validation and Testing** supports the Carbon Storage Assurance Facility Enterprise (CarbonSAFE) Initiative and provides up to \$2.25 billion to support the development of new and expanded large-scale, commercial carbon storage projects with capacities to store 50 or more million metric tons of CO₂, along with associated CO₂ transport infrastructure. The **Carbon Capture Demonstration Projects Program** provides up to \$2.54 billion to develop six integrated carbon capture, transport, and storage demonstration projects that can be readily replicated and deployed at fossil energy power plants and major industrial sources of CO₂. **Carbon Dioxide Transport Engineering and Design** provides up to \$100 million to design regional CO₂ pipeline networks to safely transport captured CO₂ from key sources to centralized locations.

Interagency News and Updates

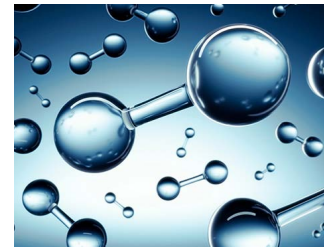
DOE Announces Funding to Capture and Convert CO₂ into Valuable Products

DOE's Office of Fossil Energy and Carbon Management (FECM) announced up to \$30 million in funding for research and development (R&D) projects to advance carbon dioxide removal (CDR) approaches that will reduce CO₂ emissions by capturing it directly from both the atmosphere and oceans and converting it into valuable products such as fuels and chemicals. The full funding opportunity announcement (FOA-0002614) is [available online](#).



DOE Opens BIL Funding Opportunity for Regional Clean Hydrogen Hubs and Releases Draft of DOE National Clean Hydrogen Strategy and Roadmap

DOE opened applications for a \$7 billion program to create regional clean hydrogen hubs (H₂Hubs) across the country, which will form a critical arm of America's future clean energy economy. As part of a larger \$8 billion hydrogen hub program funded through the BIL, the H₂Hubs will be a central driver in helping communities across the country benefit from clean energy investments, good-paying jobs, and improved energy security.



NETL Research, Accomplishments Take Center Stage in FY 2022 Q4

In August, National Energy Technology Laboratory (NETL) talent and solutions were on display as NETL hosted researchers from DOE national laboratories, U.S. research universities, industry, and professional associations at the 2022 Carbon Management Project Review Meeting in Pittsburgh, PA. Additionally, NETL Thermal Science Team Supervisor Ronald Breault, Ph.D., and NETL Director Brian Anderson, Ph.D., highlighted NETL's contributions in building hydrogen-based energy infrastructures and power systems of the future during a keynote address to the 2022 Clearwater Clean Energy Conference. NETL also welcomed members of the RAPID DEPLOY Workshop who convened in Morgantown, WV, and visited NETL in August to learn more about the lab's electrified reactors, microwave reactors, non-thermal plasma reactors, and ultrasound reactors that make up its Reaction Analysis and Chemical Transformation Laboratory (ReACT) facility.



Chair's Summary: Global Clean Energy Action Forum 2022

Representatives from 34 countries, anchored by the Ministers and Heads of Delegations from the Clean Energy Ministerial (CEM) and Mission Innovation (MI), along with participants from the clean energy community of companies, civil society, investors, youth, labor, innovators, and academics, met in Pittsburgh, Pennsylvania, in August to convene the first Global Clean Energy Action Forum (GCEAF). Ministers of the CEM and MI welcomed the first joint meeting under the GCEAF and committed to turn ambition into action. They highlighted that to enable action-oriented cooperation on clean energy, both institutions need resources for their secretariats to realize the agreed-upon mandates embraced by the members of CEM and MI, as well as for the individual initiatives under each platform. They encouraged focused attention on important priorities including hydrogen, industrial decarbonization, cities, and the just transition.

Interagency News and Updates (continued)

NETL-Pittsburgh Hosts Whitehouse Energy Representatives

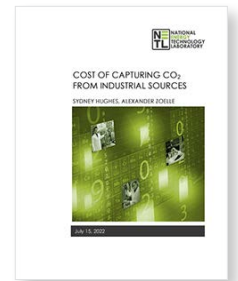
NETL Director Brian Anderson hosted representatives from the White House Office of Science and Technology Policy (OSTP) Energy Team at NETL-Pittsburgh in September, where they discussed how NETL energy analysis expertise can help support the nation's transition to a clean energy future. The group also toured several NETL facilities focused on developing decarbonization technologies. The group joined other members of NETL leadership and researchers focused on the development of multi-scale approaches to modeling and analysis of energy technology, processes, and markets.



(left to right) David C. Miller, Ph.D., Brian J. Anderson, Ph.D., Sally M. Benson, Ph.D., Costa T. Samaras, Ph.D., Rachael L. Reolfi.

NETL Explores CO₂ Capture Retrofit Costs for Industrial Sources

NETL published “Cost of Capturing CO₂ From Industrial Sources,” an update to an original 2014 study that examines the costs of retrofitting a variety of industrial processes with state-of-the-art CO₂ capture systems. The report is accompanied by NETL’s Industrial Sources Carbon Capture Retrofit Database (CCRD), which allows users to estimate the cost of capture for a given industrial plant or an entire industrial sector, using either study assumptions or user inputs. These analyses and tools are of considerable importance given major initiatives to decarbonize the economy by 2050.



DOE Announces New Biden-Harris Administration Appointees and Promotions

DOE announced new Biden-Harris Administration appointees who will work alongside U.S. Secretary of Energy Jennifer M. Granholm to ensure Americans have access to affordable clean energy and pursue President Biden's goals of a 100% clean electricity by 2035 and a net-zero economy by 2050. New appointees include David Berrios, White House Liaison, Office of the Secretary; David Crane, Director, Office of Clean Energy Demonstrations; and Jeff Marootian, Senior Advisor for Energy Efficiency and Renewable Energy, Office of the Secretary. Current appointees taking on new roles are Miles Fernandez, Chief of Staff, Office of Electricity, and Caroline Grey, Chief of Staff, Office of Clean Energy Demonstrations. The full list of DOE Biden-Harris Administration appointees is [available online](#).

Industrial Efficiency and Decarbonization FOA

DOE's \$104 million Industrial Efficiency and Decarbonization funding opportunity announcement (FOA) will advance decarbonization technologies that will reduce the carbon footprint of the industrial sector. Projects funded under FOA-0002804 will drive the transformational technology and innovation necessary to reduce industrial greenhouse gas (GHG). The full FOA is [available online](#).

Interagency News and Updates (continued)

Better Plants Partners Save \$10.6 Billion in Energy Costs

DOE released the 2022 Better Plants Progress Update, highlighting the leadership of more than 270 manufacturers and water utilities who partner with DOE to increase energy and water efficiency. As part of the Better Buildings Initiative, Better Plants works with industrial partners to develop, implement, and share technologies and best practices to increase energy and water efficiency and reduce GHG emissions in manufacturing plants and other industrial facilities.



DOE Releases Notice of Intent to Issue a Funding Opportunity from DOE's HPC4EI Initiative

DOE's High-Performance Computing for Energy Innovation (HPC4EI) Initiative will issue a fall 2022 solicitation in November 2022. HPC4EI programs provide access to national laboratory supercomputing resources, including expertise for high-performance computing projects, to reduce carbon emissions, improve manufacturing processes, address products' life cycle energy consumption, and increase the efficiency of energy conversion and storage technologies. The fall solicitation will include the High-Performance Computing for Manufacturing Program and the High-Performance Computing for Materials Program.



Subscribe to NETL's Carbon Transport and Storage Newsletter

NETL's Carbon Storage Newsletter has been renamed the Carbon Transport and Storage Newsletter. The newsletter provides information on recent activities and publications related to carbon transport and storage. It covers domestic, international, public sector, and private sector news. Subscription information is [available online](#).



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](#).

Interagency News and Updates (continued)

Bipartisan Infrastructure Law Hub

The BIL represents the most dramatic changes to DOE since its founding in 1977. For the next five years, the BIL will stand up 60 new DOE programs, including 16 demonstration and 32 deployment programs, and expand funding for 12 existing research, development, demonstration, and deployment (RDD&D) 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

National Carbon Capture Conference & Expo

The National Carbon Capture Conference & Expo, to be held Nov. 8–9, 2022, in Des Moines, IA, is a two-day event designed



specifically for companies and organizations advancing technologies and policy that support the CDR from all sources, including fossil fuel-based power plants, ethanol production plants, and industrial processes, as well as directly from the atmosphere. The program will focus on research, data, trends, and information on all aspects of carbon capture, utilization, and storage (CCUS), aiming to help companies build knowledge, connect with others, and better understand the market and carbon utilization.

COP27

The Conference of Parties (COP) is the decision-making body responsible for monitoring and reviewing the implementation of the United Nations Framework Convention on Climate Change. It brings together the 197 nations and territories—called Parties—that have signed on to the Framework Convention. The COP has met annually since 1995. The 27th Session of the COP (COP27), to be held in Sharm El-Sheikh, Egypt, Nov. 7–8, 2022, will include discussion of the finance



behind climate action implementation and review landmark science reports from the Intergovernmental Panel on Climate Change (IPCC), United Nations Environment Programme (UNEP), and other institutions.

U.S. and International Events (continued)

2022 Appalachian Hydrogen & Carbon Capture Conference

The Appalachian Hydrogen & Carbon Capture Conference, to be held Nov. 10, 2022, in Pittsburgh, PA, explores issues surrounding hydrogen use and carbon capture and storage (CCS) in the unique context of the Appalachian region.



2022 AIChE Annual Meeting

The American Institute of Chemical Engineers (AIChE) Annual Meeting, to be held Nov. 13–18, 2022, in Phoenix, AZ, is an educational forum for chemical engineers interested in innovation and professional growth. Academic and industry experts will cover a wide range of topics relevant to innovative research, new technologies, and emerging growth areas in chemical engineering.



The Energy Transition—The Role for Sustainable Carbon

The Energy Transition—The Role for Sustainable Carbon workshop will be held Nov. 16–18, 2022, in Sardinia, Italy. The workshop will cover options and opportunities for progressing a comprehensive energy transition that makes full use of the energy choices available, including sustainable carbon options. The workshop will include a mix of policy-relevant sessions and technology development considerations for limiting CO₂ and other emissions.



INTERNATIONAL CENTRE FOR
SUSTAINABLE CARBON

A&WMA Climate Change 2022

The virtual Air & Waste Management Association (A&WMA) conference, to be held Nov. 29–30, 2022, will address emerging policies and strategies for tackling climate change impacts, including mitigation, adaptation, and resiliency. The conference will emphasize the types of climate commitments made following the 26th COP meeting in Glasgow, Scotland; the efforts and plans to meet these commitments at all levels; and advances in policies since the global 2015 Paris Accord.

Climate Change 2022: Commitments to Actions
Virtual Conference • November 29-30, 2022



CCS4G Symposium 2022—Super Critical Connections

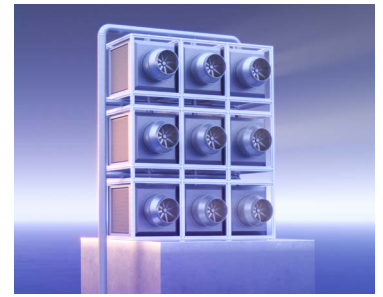
The one-day Carbon Capture and Storage for Geoscientists (CCS4G) Symposium, to be held Dec. 15, 2022, in London, England, will focus on the geoscience aspects of geological CO₂ storage. The conveners are soliciting oral presentations from industry experts to meet the goal of offering deep technical insights into topics pertinent to CCS.



Business and Industry News

NETL Deciding on Location for DAC Lab

NETL is deciding between Pittsburgh, PA, or Morgantown, WV, for the site of its new direct air capture (DAC) lab, which will research how to remove carbon emissions directly from the air. DAC to remove carbon from the air is currently estimated to cost \$400–1,000 per ton of CO₂ captured; DOE wants to bring this cost down to \$100. NETL expects to open its DAC facility in phases, with the first stages becoming available at the end of next year.



DOE Awards FEED Study of Industrial-Scale Carbon Capture Project

Dastur International Inc., along with affiliate company Dastur Energy Inc., and Air Liquide have been awarded a DOE-funded front-end engineering and design (FEED) study for the design and engineering of an industrial-scale carbon capture plant at Air Liquide's Steam Methane Reformer (SMR) on the U.S. Gulf Coast. The project aims to capture 0.9 metric tons per year of CO₂ with a net carbon capture efficiency of at least 95%, enabling the production of clean or blue hydrogen. The project intends to use Air Liquide's state-of-the-art cryogenic technology, which runs on grid electricity, and will have lower secondary emissions compared to conventional amine-based carbon capture technology.

New CCU Market Study and Key Findings Webinar

The Global CO₂ Initiative's recent research, "Implementing CO₂ capture and utilization at scale and speed: The path to achieving its potential," is now [available for download](#). This

research report helps clarify carbon capture and utilization (CCU) trends and development, and points to the most effective and efficient ways in which to grow the CCU industry.



UCI Chemists Receive DOE Funding

Teams led by University of California, Irvine (UCI) chemists have received a combined \$25 million from DOE under its Energy Frontier Research Centers Program and Clean Energy Manufacturing Initiative. The funding is part of \$540 million in awards for sustainable energy technology and low-carbon manufacturing research at 54 universities and 11 national laboratories around the United States.

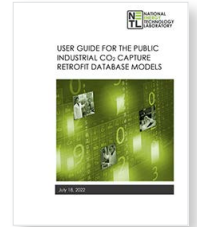
Publications

Industrial CO₂ Capture Retrofit Database (IND CCRD)

SYDNEY HUGHES, ALEX ZOELLE, MARK WOODS, SAMUEL HENRY, SALLY HOMSY, SANDEEP PIDAPARTI, NORMA KUEHN, HANNAH HOFFMAN, KATIE FORREST, TIMOTHY FOUT, WILLIAM SUMMERS, STEVE HERRON, ERIC GROL, NATIONAL ENERGY TECHNOLOGY LABORATORY, SEPT.2022.

User Guide for the Public Industrial CO₂ Capture Retrofit Database Models

SYDNEY HUGHES, ALEX ZOELLE, MARK WOODS, SAMUEL HENRY, SALLY HOMSY, SANDEEP PIDAPARTI, NORMA KUEHN, HANNAH HOFFMAN, KATIE FORREST, TIMOTHY FOUT, WILLIAM SUMMERS, STEVE HERRON, ERIC GROL, NATIONAL ENERGY TECHNOLOGY LABORATORY, SEPT. 2022.

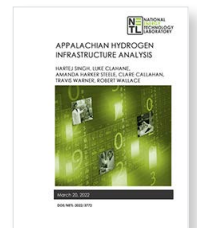


Lessons Learned for Rapid Decarbonization of Power Sectors – Collaborative Report from CEM

PRATEEK JOSHI, JEFF LOGAN, NATIONAL RENEWABLE ENERGY LABORATORY, ISSUE 7, SEPT. 13, 2022.

Appalachian Hydrogen Infrastructure Analysis

HARTEJ SINGH, LUKE CLAHANE, AMANDA HARKER-STEELE, CLARE CALLAHAN, NATIONAL ENERGY TECHNOLOGY LABORATORY, MAR. 20, 2022.

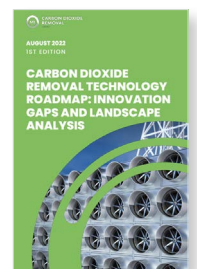


Analysis of alternative bioenergy with carbon capture strategies: present and future

CALEB H. GEISSLER, CHRISTOS T. MARAVELIAS, ENERGY & ENVIRONMENTAL SCIENCE, ISSUE 7, MAY 27, 2022. (SUBSCRIPTION MAY BE REQUIRED.)

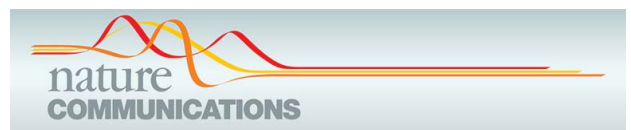
CO₂ Removal Technology Roadmap: Innovation Gaps and Landscape Analysis

MI CDR, AUG. 2022.



Environmental trade-offs of direct air capture technologies in climate change mitigation toward 2100

YANG QIU, PATRICK LAMERS, VASSILIS DAIIOGLOU, NOAH MCQUEEN, HARMEN-SYTZE DE BOER, MATHIJS HARMSSEN, JENNIFER WILCOX, ANDRÉ BARDOW, SANGWON SUH, NATURE COMMUNICATIONS, VOLUME 13, JUNE 25, 2022.



About DOE Carbon Capture:

DOE/NETL is developing the next generation of advanced CO₂ capture technologies through NETL's Point Source Carbon Capture Program and the Carbon Dioxide Removal Program.



The 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 single document.



Carbon Capture Reference Materials

- Carbon Capture Program Factsheet
- Carbon Dioxide Removal Program Fact Sheet
- Carbon Capture Infographics
- Compendium of Carbon Capture Technology
- Carbon Dioxide Capture Handbook
- CCSI²
- Systems Analysis
- Conference Proceedings
- Accomplishments Posters
- Fossil Energy Techlines

Contact Us

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412-386-4687

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

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