

# 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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## Statement by Secretary Granholm on President Biden's Nomination of Brad Crabtree

U.S. Secretary of Energy Jennifer M. Granholm issued the following statement on President Biden's intent to nominate Brad Crabtree for Assistant Secretary for Fossil Energy and Carbon Management (FECM) at the U.S. Department of Energy (DOE): "I am grateful to President Biden for nominating Brad Crabtree to serve as DOE's Assistant Secretary for Fossil Energy and Carbon Management. This office's work to slash carbon emissions in our electricity and industrial sectors is critical to helping us confront the climate crisis. As one of the nation's top practitioners on carbon capture and storage and carbon utilization, Brad's expertise will help us meet this urgent challenge and make huge progress toward our net-zero goals, while creating good paying jobs and supporting energy communities in transition. I am grateful that he's willing to serve the American people and I look forward to his confirmation."

# Interagency News and Updates

## NETL Researcher Receives Prestigious Hispanic Engineer National Achievement Award

The National Energy Technology Laboratory's (NETL) José Figueroa, Carbon Capture Team supervisor, has received the Great Minds in STEM™ (GMiS) Hispanic Engineer National Achievement Award for advancing projects critical to the success of U.S. decarbonization efforts while serving as an exemplary professional helping to ensure a talented and diverse pipeline of researchers for the future. Figueroa will be recognized as a Luminary Honoree by the GMiS Hispanic Engineer National Achievement Awards Corporation at the 33rd annual GMiS Conference, which will be held virtually Oct. 11–22, 2021.



## Engineered Strategies for Net-Negative Emissions Pathways via Enhanced Terrestrial Ecosystems

Advanced Research Projects Agency–Energy (ARPA-E) has issued a Request for information (RFI): DE-FOA-0002577, “Engineered Strategies for Net-Negative Emissions Pathways via Enhanced Terrestrial Ecosystems.” ARPA-E is seeking insight into both parallel and exclusive approaches to terrestrial carbon removal and storage, including, but not limited to, approaches that employ recent advancements in biological, geochemical, or hybrid technologies. Additionally, ARPA-E is requesting information on how agriculture systems and feedstock crops may be engineered and bred to better feed into economically viable BECCS pathways for large-scale, near-term carbon removal opportunities. Responses to this RFI should be submitted in PDF to [ARPA-E-RFI@hq.doe.gov](mailto:ARPA-E-RFI@hq.doe.gov) by 5:00 PM Eastern Oct. 22, 2021.

## Making Methane from CO<sub>2</sub>: Carbon Capture Grows More Affordable

Researchers at DOE's Pacific Northwest National Laboratory (PNNL) have developed a method to convert captured carbon dioxide (CO<sub>2</sub>) into methane. By streamlining a longstanding process in which CO<sub>2</sub> is converted to methane, the researchers' **new method** reduces the materials needed to run the reaction; the energy needed to fuel it; and, ultimately, the selling price of the gas. A key chemical player known as EEMPA makes the process possible. (EEMPA is a PNNL-developed solvent that pulls CO<sub>2</sub> from power plant flue gas, binding the greenhouse gas [GHG] so it can be converted into useful chemicals.)



*Jotheeswari Kothandaraman, PNNL chemist and author of the new study, holds a sample of methanol, which has an even greater number of applications than methane.*

(Photo by Andrea Starr | Pacific Northwest National Laboratory)



# Interagency News and Updates (continued)

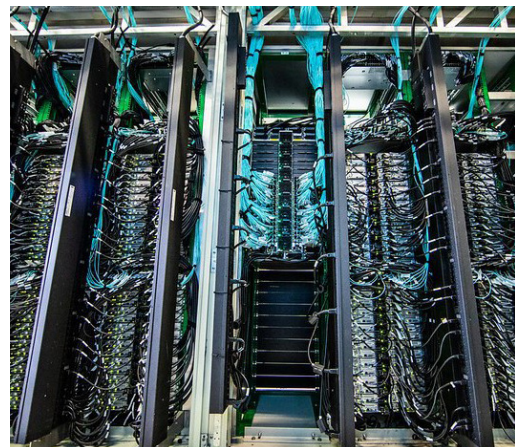
## NETL's Leadership and Innovations Displayed During 45th Clearwater Clean Energy Conference

The contributions of the National Energy Technology Laboratory (NETL) and its partner organizations toward realizing a clean, decarbonized power sector were detailed throughout the 45th Clearwater Clean Energy Conference, in which NETL associate laboratory director for Research and Innovation Bryan Morreale delivered the keynote address. The lab took an active role in the conference, with NETL Thermal Science Team supervisor Ronald Breault serving as Clearwater Clean Energy Conference Committee Co-Chair, in addition to delivering opening remarks for the event. He was also presented with the Percy Nichols Award for 2020 for notable scientific or industrial achievement in the field of solid fuels.



## NETL Director Delivers Keynote at Simulation-Based Engineering Workshop

NETL Director Brian Anderson, Ph.D., shared some of the lab's most innovative modeling and computational tools during a keynote address Sept. 8, at the Simulation-Based Engineering for Accelerating the Deployment of Decarbonization Technologies virtual workshop. The workshop was hosted by FECM and the United States Energy Association and convened academia, industry, and government leaders for panel discussions and interactive sessions designed to assess the current state and future potential of simulation-based engineering technologies in driving the deployment of decarbonization technologies. Anderson joined FECM Deputy Assistant Secretary Emily Grubert, Ph.D., who provided an additional keynote from the federal leadership perspective.



## Now Accepting Applications: RECS 2021

DOE/FECM invites graduate students and early career professionals who are interested in carbon capture, utilization, and storage (CCUS) to apply for the 2021 Research Experience in Carbon Sequestration (RECS) program. RECS 2021 will include interactive content on a range of CCUS topics, and will incorporate virtual CCUS site tours, live lectures, discussion, and group exercises. The nation's leading CCUS experts from DOE national laboratories, energy industry, and academia will join the program. RECS encourages those with backgrounds in geology, chemistry, hydrology, physics, engineering, natural sciences, and related fields to apply. Enrollment is limited to 25 participants and is tuition free. The deadline to apply is Oct. 15, 2021. Visit the RECS website to learn more about the application process.

# U.S. and International Events

## University Coalition for Fossil Energy Research (UCFER) 2021 Annual Review Meeting

The University Coalition for Fossil Energy Research (UCFER) will have its 2021 [Annual Review Meeting](#) held virtually on Tuesday, Oct. 5, 2021, from 11:00 a.m.–5:00 p.m. and Wednesday, Oct. 6, 2021, from 11:00 a.m.–4:00 p.m. The meeting will include remarks from NETL management and principal investigators from active UCFER subawards including Carbon Capture.

## IEAGHG 6th Post-Combustion Capture Conference

The International Energy Agency Greenhouse Gas R&D Programme's (IEAGHG) 6th Annual Post-Combustion Capture Conference will be held in the United Kingdom (UK) Oct. 19–21, 2021. The event will gather post-combustion capture experts to share their knowledge, findings, and expertise. The agenda is now [available](#).



## Carbon Capture Technology Conference and Expo

The Carbon Capture Technology Conference and Expo is a two-day event to be held Oct. 20–21, 2021, in Stuttgart Messe, Germany. Experts from around the world will discuss the latest advances in new technology for carbon capture, storage, and transport, as well as unique ways of utilizing CO<sub>2</sub> to produce net-zero fuels and for other manufacturing processes.

## Gordon Research Conference: Permanently Removing CO<sub>2</sub> from Our Emissions and Atmosphere

The fourth installation of the CCUS Gordon Research Conference series, to be held Oct. 24–29, 2021, in Waterville Valley, New Hampshire, will examine the following questions: (1) Can the United States decarbonize safely and with a variety of approaches appropriate for the assortment of power and industrial challenges? and (2) Can the United States develop methods to clean up the atmosphere in time to keep within reasonable temperature limits? FECM PDAS Dr. Jennifer Wilcox will present “Integrating CCUS into Low Carbon Economies” and DOE FECM Carbon Capture Program Manager Lynn Brickett will present “Direct Air Capture: Where It’s Been, Where It’s Going.”

## 26<sup>th</sup> UN Climate Change Conference of the Parties

The UK will host COP26 in Glasgow, Scotland, Oct. 31–Nov. 12, 2021. COP26 will bring parties together to accelerate action toward the goals of the Paris Agreement and the United Nations (UN) Framework Convention on Climate Change.



# U.S. and International Events (continued)

## 2021 Appalachian Hydrogen & Carbon Capture Conference

The Appalachian Hydrogen & Carbon Capture Conference (co-sponsored by DOE), to be held Nov. 4, 2021, at Hilton Garden Inn Pittsburgh Southpointe, explores issues surrounding hydrogen use and carbon capture and storage (CCS) in the unique context of the Appalachian region.

**Hydrogen  
& Carbon  
CAPTURE  
Conference**

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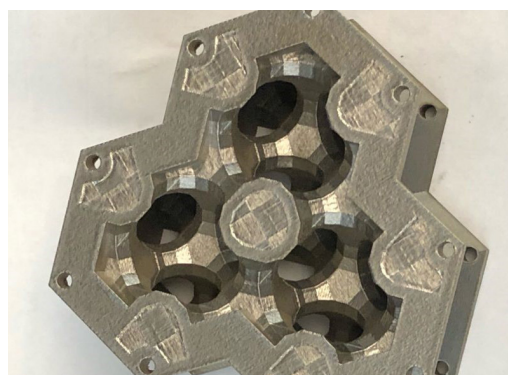
## Business and Industry News

### Northwestern Receives DOE Funding to Study Carbon Capture Systems

Northwestern will receive DOE funding to examine how the dynamic behavior of promising carbon capture systems impacts the systems' ability to capture and release CO<sub>2</sub>. Specifically, the Northwestern research team will study the chemical and structural changes that metal-organic frameworks (MOFs), (porous materials with uniform structures that are promising solid sorbents) undergo during CO<sub>2</sub> capture and release cycles. This knowledge is necessary for developing MOF sorbents for long-term DAC applications. The objective is to study these changes over a high number of capture-release cycles and find the reasons behind the reduction of the materials' CO<sub>2</sub> capture efficiency over time.

### DAC Technology to Be Enabled by 3D Printing with GE Research DOE Award

Along with chemists and engineers from the University of California, Berkeley and University of South Alabama, General Electric (GE) Research has been selected for DOE funding for a two-year project to develop a method for DAC. The project involves the use of a 3D-printed heat exchanger made with materials for absorbing CO<sub>2</sub> from the air. GE will 3D print heat exchangers meant for optimizing temperature management within the carbon extraction system to maximize the process.



# Publications

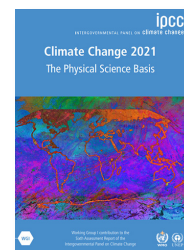
## Proceedings of the Carbon Management and Oil and Gas Research Project Review Meeting

- Integrated CCUS Projects and FEED Studies, AUGUST 2–3, 2021.
- Point Source Capture – Lab, Bench, and Pilot-Scale Research, AUGUST 12–13, 16–17, 2021.
- Carbon Dioxide Removal Research, AUGUST 18–19, 2021.



## Climate Change 2021: The Physical Science Basis

*CONTRIBUTION OF WORKING GROUP I TO THE SIXTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE: V. MASSON-DELMOTTE, P. ZHAI, A. PIRANI, S. L. CONNORS, C. PÉAN, S. BERGER, N. CAUD, Y. CHEN, L. GOLDFARB, M. I. GOMIS, M. HUANG, K. LEITZELL, E. LONNOY, J.B.R. MATTHEWS, T. K. MAYCOCK, T. WATERFIELD, O. YELEKÇI, R. YU, B. ZHOU (EDS.). CAMBRIDGE UNIVERSITY PRESS. IN PRESS.*

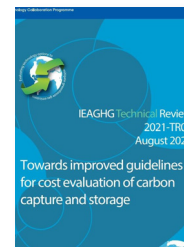


## Net Zero by 2050: A Roadmap for the Global Energy Sector

INTERNATIONAL ENERGY AGENCY, JULY 2021.

## Towards improved guidelines for cost evaluation of carbon capture and storage

IEA GREENHOUSE GAS R&D PROGRAMME, IEAGHG TECHNICAL REVIEW, 2021-TR05, AUGUST 2021.



## Modeling, Design, and Testing of a Novel Biphasic Solvent-Enabled Absorption System for Post-Combustion Carbon Capture

PAUL NIELSEN, HAFIZ SALIH, HONG LU, QING YE, KEVIN O'BRIEN, STEPHANIE BROWNSTEIN, MOHAMED ATTALLA, YONGQI LU, 15TH INTERNATIONAL CONFERENCE ON GREENHOUSE GAS CONTROL TECHNOLOGIES, GHGT-15, 2021.

## Renewable-integrated flexible carbon capture: a synergistic path forward to clean energy future

MANALI S. ZANTYE, AKHIL ARORA, M. M. FARUQUE HASAN, ENERGY & ENVIRONMENTAL SCIENCE, VOLUME 14, ISSUE 7, ISSN 1754-5692, JULY 14, 2021. (SUBSCRIPTION MAY BE REQUIRED.)



# About DOE's Carbon Capture Program

NETL's Carbon Capture Program is developing the next generation of advanced carbon dioxide (CO<sub>2</sub>) capture technologies. The U.S. Department of Energy's (DOE) Office of Fossil Energy and Carbon Management has adopted a comprehensive multi-pronged approach for the research and development of advanced CO<sub>2</sub> capture technologies that have the potential to provide step-change reductions in both cost and energy requirements as compared to currently available technologies.

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 Capture Infographics
- Compendium of Carbon Capture Technology
- Carbon Dioxide Capture Handbook
- CCSI<sup>2</sup>
- Systems Analysis
- Conference Proceedings
- Accomplishments Posters
- Fossil Energy Techlines

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**Pittsburgh, PA** 15236-0940  
412-386-4687

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

**CUSTOMER SERVICE:** 1-800-553-7681

[www.netl.doe.gov](http://www.netl.doe.gov)

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