GLOBAL CCS INSTITUTE

PRESS RELEASE

Carbon capture and storage pipeline grows by 10 large-scale facilities globally

Global CCS Institute updates CO_2RE database, showing continued growth of carbon capture and storage capacity

8 June 2020, Washington, DC - The Global CCS Institute, an international think tank, has added 10 carbon capture and storage (CCS) facilities to its global database, bringing the total number of CCS facilities in various stages of development to 59 with a capture capacity of more than 127 million tonnes per annum (mtpa). There are now 21 facilities in operation, three under construction, and 35 in various stages of development.

“Our recent CO2RE Database update shows that despite the current CV-19 crisis we are observing a significant increase in CCS facilities in the pipeline which demonstrates continued progress towards meeting climate targets, and will also result in significant job creation and economic growth”, said Global CCS Institute CEO Brad Page.

In a recent flagship report on the value of CCS, the Global CCS Institute found that CCS deployment in line with the Paris Agreement and energy-related Sustainable Development Goals could create some 100,000 jobs in the industry by 2050.

The facilities added continue trends in CCS deployment that include innovative applications such as natural gas power, negative emissions and cement, as well as stacked and offshore geologic storage. Fuelled by targeted incentives and sustained government support the US adds nine facilities, while the UK adds one facility.

“We are thrilled to see the diversity of CCS applications. The average capture capacity of the new facilities is 2.6 mtpa, as opposed to 2 mtpa for those already in the pipeline, indicating that new facilities are aiming for economies of scale, and strengthening CCS’ role in large-scale emissions abatement. Nonetheless, with 21 facilities operating today, we still need at least a 100-fold scale-up to reach climate goals”, adds Brad Page.

In the UK, the Drax bioenergy with CCS project aims to capture 4 mtpa from one of the existing biomass-fired power units by 2027, before converting all of its remaining biomass units to bioenergy with carbon capture and storage (BECCS) by 2035. The carbon dioxide (CO2) will be transported by pipeline and stored in the southern North Sea via dedicated geological storage. The project will be an anchor for the wider Zero Carbon Humber Cluster.

The US continues to add a large number of facilities mainly as the result of the 45Q tax credit, and the California Low Carbon Fuel Standard CCS Protocol. For example, the combined incentives contribute to the economic viability of both California

Resources Corporation's (CRC) CalCapture Project, and Velocys' and Oxy Low Carbon Ventures' Bayou Fuels Negative Emission Project. Multiple projects were also awarded US Department of Energy (DOE) front-end-engineering-design (FEED) study grants, or part of CarbonSAFE, seeking to establish large-scale storage of 50 mtpa and more. The Zeros Project in Texas, in an important development for the CCS facilities pipeline, has also completed its FEED and entered pre-construction.

"This is an important time for CCS in the US," says Assistant Secretary for Fossil Energy Steven Winberg. "Policy incentives and research from DOE projects are working together to help industry move forward towards the goal of net-zero carbon emissions."

While the US does not currently have any natural gas plants equipped with CCS, the database update includes three gas plant projects: Mustang Station in Texas, Plant Daniel in Mississippi and CRC's CalCapture facility in California. This brings the total natural gas-fuelled power plants with CCS under development globally in the database to six.

"The CalCapture project offers multiple benefits including substantial emissions reductions, prolific positive economic impacts across the California economy, and development of a key technology needed worldwide to meet future energy transition targets. The FEED for the Cal Capture project is expected to be completed by the end of 2020, which would position the project for permitting, construction and commissioning by mid-decade", said Shawn Kerns, CRC Executive Vice President of Operations and Engineering.

Moreover, two projects, the San Juan Generating Station and CRC's CalCapture facility, are also evaluating plans for stacked storage, using both geologic storage with enhanced oil recovery, as well as dedicated storage in saline formations.

Oxy Low Carbon Ventures (LCV) has teamed up with LaFarge Holcim and Total to evaluate the capture of CO_2 from a cement plant in Colorado, and Oxy LCV also intends to store CO_2 from Velocys' biofuel production, delivering negative emissions.

The facilities update comes on the heels of continued momentum for CCS, including the Alberta Carbon Trunk Line becoming fully operational, a positive investment decision by Equinor, Shell, and Total for the Northern Lights project, supportive policy momentum in Australia, and a $131 million funding announcement by the US Department of Energy.

View the Global CCS Institute database at co2re.co

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About the Global CCS Institute: The Global CCS Institute is an international think tank whose mission is to accelerate the deployment of carbon capture and storage (CCS), a vital technology to tackle climate change and provide energy security. For more information, visit www.globalccsinstitute.com

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New Projects added to CO2RE Database: Details

Title	Status	Country	Operational Date	Industry	Capture Rate	Facility Storage Type	Facility Short Description
The ZEROS Project	In Construction	United States	2020s	Power Generation	1.5	Enhanced oil recovery	The ZEROS project is a proposed two-plant project in Texas United States designed to gasify and combust waste fuels in an oxyfuel-based process. This ensures high CO2 concentrations in flue gas suitable for capture and storage.
Prairie State Generating Station Carbon Capture	Advanced Development	United States	Mid 2020s	Various	6	Enhanced oil recovery	This project seeks to establish a 50+ million tonne commercial geological storage hub in Illinois USA. Adjacent power plants such as Prairie State Generation (816 MWe coal-fired power plant 10 Mtpa CO_2) which has been awarded a full-scale FEED study and regional ethanol plants are potential CO_2 sources.
Mustang Station of Golden Spread Electric Cooperative Carbon Capture	Advanced Development	United States	Mid 2020s	Cement Production	1.5	In Evaluation	The University of Texas at Austin is conducting a Front-End Engineering and Design study for CO_2 capture at the Mustang Station using Piperazine Advanced Stripper (PZAS) process. The Mustang Station is a 450 MWe natural gas-fired combine cycle power plant
San Juan Generating Station Carbon Capture	Advanced Development	United States	2023	Power Generation	6	Enhanced oil recovery and potential dedicated geological storage	Enchant Energy proposes to capture up to 6 million metric tonnes per annum CO_2 from the SJGS Unit 1 (340 MW) and Unit 4 (507 MW). Captured CO_2 will be used for enhanced oil recovery in the Permian Basin. Additional CO2 sequestration optionality in an EPA-certified Class VI injection well is under examination funded through a $17.5 million DOE CarbonSAFE award. The SJGS retrofit project FEED study awarded by the US DOE is underway.
Plant Daniel Carbon Capture	Advanced Development	United States	Mid 2020s	Power Generation	1.8	Dedicated geological storage	A carbon capture plant retrofit Front-End Engineering and Design (FEED) study using the Southern Company subsidiary Mississippi Power's Plant Daniel existing natural gas-fired combined cycle power units as a basis is currently underway by Southern Company Services and Linde-BASF.
Gerald Gentleman Station Carbon Capture	Advanced Development	United States	Mid 2020s	Power Generation	3.8	In Evaluation	The project plans to capture up to 3.8 million tonnes per annum CO_2 from the 700 MWe Gerald Gentleman Station Unit 2. The project is currently in Front-End Engineering and Design (FEED) study awarded by the US DOE.
Cal Capture	Advanced Development	United States	2024	Power Generation	1.4	Enhanced Oil Recover	California Resources Corporations Carbon Capture project is planned to capture CO_2 from the 550 MWe natural gas combined cycle plant located in California United States with a total of 1.4 million tonnes per annum captured and stored. Electric Power Research Institute California Resources Corporation and Fluor are working together on a Front-End Engineering and Design (FEED) study based on Fluor's amine-based Econamine FG Plus process. The captured CO_2 will be either stored or used for enhanced oil recovery in the nearby Elk Hills Oil Field.
Drax BECCS Project	Early Development	United Kingdom	2027	Power Generation	4	In Evaluation	The Drax BECCS Project aims to capture 4 million tonnes per annum from one (660 MW) of the biomass-fired power lines at the UK's biggest power station by 2027. CO_2 will be transported by pipeline and stored in southern North Sea via dedicated geological storage. The Drax BECCS Project will be an anchor CCS project for the wider Zero Carbon Humber Cluster. Drax also plans to convert all four of its biomass units to BECCS by 2035 delivering 16 Mpta of negative emissions.
LafargeHolcim Cement Carbon capture	Early Development	United States	Mid 2020s	Cement Production	0.725	Enhanced oil recovery	Svante LafargeHolcim Oxy Low Carbon Ventures and Total is conducting a study to assess the financial viability and design requirements of 0.725 million tonnes per annum CO_2 capture facility at LafargeHolcim's cement plant in Colorado United States.
Velocys' Bayou Fuels Negativ Emission Project	Early Development	United States	2024	Chemical Production	0.5	Enhanced Oil Recovery	Oxy Low Carbon Ventures, LLC is planning to take, transport and store CO_2 captured from the Velocys Inc's proposed Bayou Fuels biomass-to-fuels facility. When in operation in 2024, the plant will capture 0.3 to 0.5 million tonnes CO_2 per annum while enabling the production of negative emission transportation fuels.