



Carbon Capture Jobs and Project Development Status

CARBON CAPTURE PROJECT DEVELOPMENT AT RISK DUE TO COVID-19

Absent Congress enacting recommendations by the Carbon Capture Coalition, the emerging domestic carbon capture industry is at significant risk from the immediate market crisis and long-term economic uncertainty created by the coronavirus (COVID-19). The International Energy Agency (IEA) reports that due to the COVID-19 crisis, global investments in energy technologies are [set to fall a staggering 20 percent in 2020](#).

Carbon capture projects are at risk of delay or cancellation as project developers face profound near-term financial challenges and as tax equity markets shrink and can no longer provide project investment on favorable terms, if at all. Ensuring that current projects proceed on pace, as well as increasing the number of carbon capture projects in the near-term development pipeline, will reduce carbon emissions cost-effectively, spur economic activity, create and preserve jobs, and support domestic energy and industrial production and supply chains. At the same time, there is tremendous potential to dramatically increase the pace of carbon capture project deployment, if market certainty can be provided.

INTRODUCTION

Fostering carbon capture deployment at levels needed to meet mid-century climate goals [will result in dramatic growth in employment provided by the carbon capture industry, including both project jobs \(primarily construction\) and operational jobs featuring a mix of skill levels](#). If commercially deployed globally to address emissions as part of a broad suite of zero- and low-carbon technologies, the carbon capture industry would employ between 70,000 and 100,000 construction workers and 30,000 to 40,000 facility operators in 2050, with additional employees to [build and maintain a CO₂ transport and storage network](#). Additionally, carbon capture retrofits will decarbonize existing facilities, preventing their retirement and loss of associated high-wage jobs.

Globally, [21 large-scale facilities](#) currently capture approximately [42 millions of CO₂ per year](#). The U.S. has 13 commercial-scale carbon capture facilities operating today, with the capacity to capture on the order of 25 million tons of CO₂ annually. The IEA estimates that the global carbon capture industry will need to scale-up to over 2,000 facilities capturing 2.8 gigatons of CO₂ per year to limit warming to 2°C. [To meet the more ambitious 1.5°C scenario, the IPCC estimates that 10 gigatons of CO₂ per year must be captured](#).

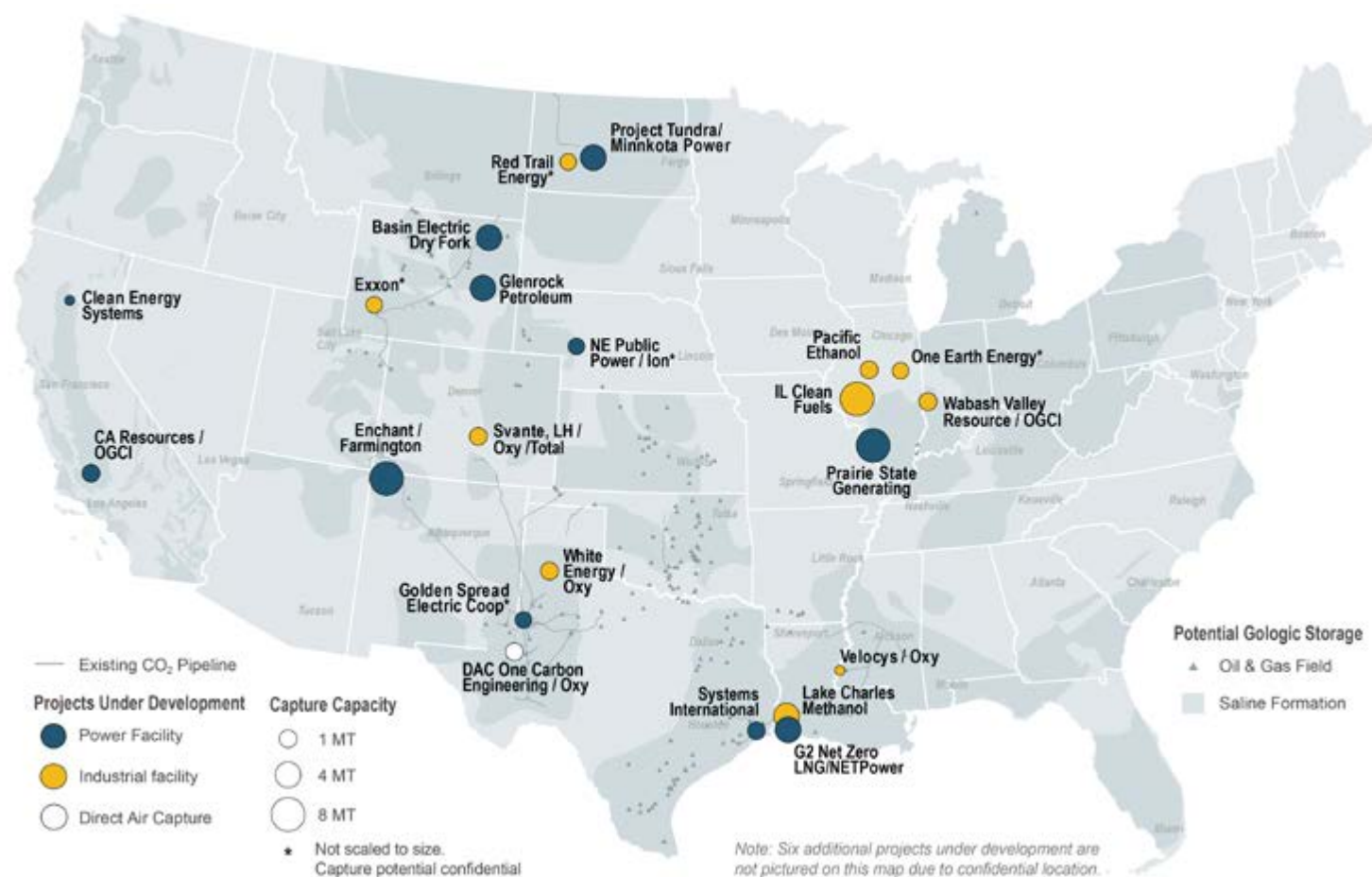
Reaching this scale of CO₂ capture and storage will require an accelerated, economywide build-out of capture projects across sectors, including heavy industry (e.g. cement, steel, chemicals and other vital industrial processes); ethanol, fertilizer and hydrogen production; refining and natural gas processing; power generation and direct air capture from ambient air.

Additionally, a commercial-scale carbon capture industry will require the build-out of CO₂ transport infrastructure to move CO₂ from where it is captured to appropriate geologic storage sites. Not only would this constitute a significant investment in domestic energy, industry and manufacturing, it would preserve and expand a high-wage jobs base in many regions of the country, while decarbonizing economic sectors that are fundamental to modern life as we know it.



45Q ENABLING CARBON CAPTURE PROJECTS

Two years after the landmark bipartisan reform and expansion of the federal 45Q tax credit in 2018, there are [approximately 30 carbon capture projects](#) in various stages of project development in the U.S.¹ This includes one project securing financing, two companies that have completed front end engineering and design (FEED) studies for several projects, 15 projects that are conducting FEED studies, five projects in pre-FEED status and seven whose status is confidential. If these projects proceed to construction and, ultimately, commercial operation, it will represent roughly a tripling of commercial carbon capture projects in the U.S. and an essential early down payment on long-term deployment goals. According to the Global CCS Institute, meeting the Paris climate targets will require building between 70 and 100 carbon capture facilities a year for the next 30 years.



Note: Industrial Facility w/ CO₂ to Added Value refers to projects where captured CO₂ will be repurposed for use in manufacturing of other products.

¹ This number is based both on the Clean Air Task Force’s [carbon capture utilization and storage \(CCUS\)](#) tracker and from conversations with project developers in the Carbon Capture Coalition.

CARBON CAPTURE IS A HIGH-WAGE JOB CREATOR

Carbon capture retrofits of industrial facilities and power plants support high-wage jobs in particular; indeed, they provide among the most desirable green jobs since employment associated with heavy industry (refining, chemicals, cement, steel, etc.) and [electric power generation pays more than the average for states in which such facilities are located](#). In addition, new and innovative high-skill and high-wage industries will play a role in commercializing the carbon capture industry, including jobs associated with new negative emissions and carbon utilization technologies.

Drawing on Great Plains Institute modeling of economically feasible capture projects, the Rhodium Group has provided preliminary analysis of the jobs potential for a typical carbon capture facility across several industries. The range in jobs numbers reflect differences in project sizes in the Great Plains Institute project database.

		PROJECT JOBS	OPERATION JOBS
CARBON CAPTURE RETROFIT*	INDUSTRY		
	STEEL MILL	1,680 – 3,030	170 – 310
	REFINERY	440 – 760	40 – 70
	CEMENT PLANT	430 – 690	60 – 110
	HYDROGEN PLANT	175 – 300	20 – 30
	ETHANOL PLANT	30 – 50	5 – 10
POWER	COAL POWER PLANT	1,800 – 3,350	160 – 300
	NATURAL GAS COMBINED-CYCLE POWER PLANT	1,140 – 2,090	100 – 180
CO₂ TRANSPORT INFRASTRUCTURE	TRUNK LINE (20" DIAMETER PIPELINE, 200 MILES LONG)	1,250 – 2,190	8 – 20
	FEEDER LINE (12" DIAMETER PIPELINE, 50 MILES LONG)	250 – 370	2 – 5

*By facility type

CONCLUSION

Carbon capture is a crucial tool to meet mid-century climate goals, but the pace of development both globally and domestically needs to accelerate dramatically to meet the challenge. Unfortunately, without immediate action from Congress, the economic conditions created by COVID-19 create unprecedented risk for the deployment of carbon capture technology and the associated jobs, economic, and emissions benefits.