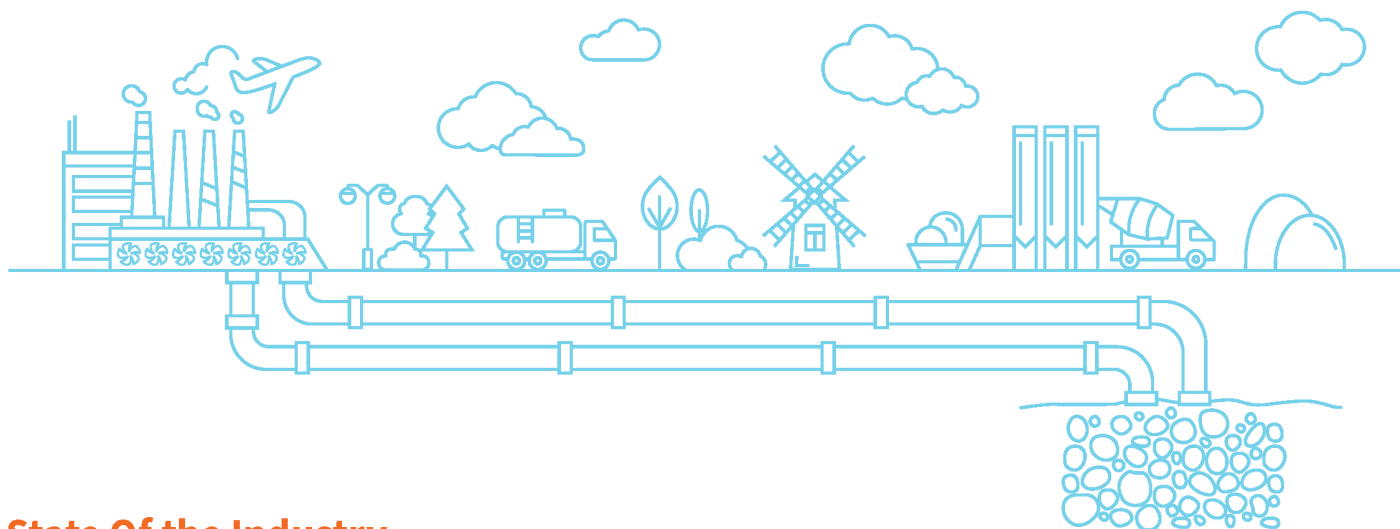


The State of the Carbon Management Industry

What is Carbon Mangement?

Carbon management is a portfolio of safe, effective, and increasingly cost-effective technologies used to manage, abate, and remove greenhouse gas emissions from the atmosphere. This suite of technologies includes the full carbon management value chain; carbon capture, removal, transport, reuse, and storage.

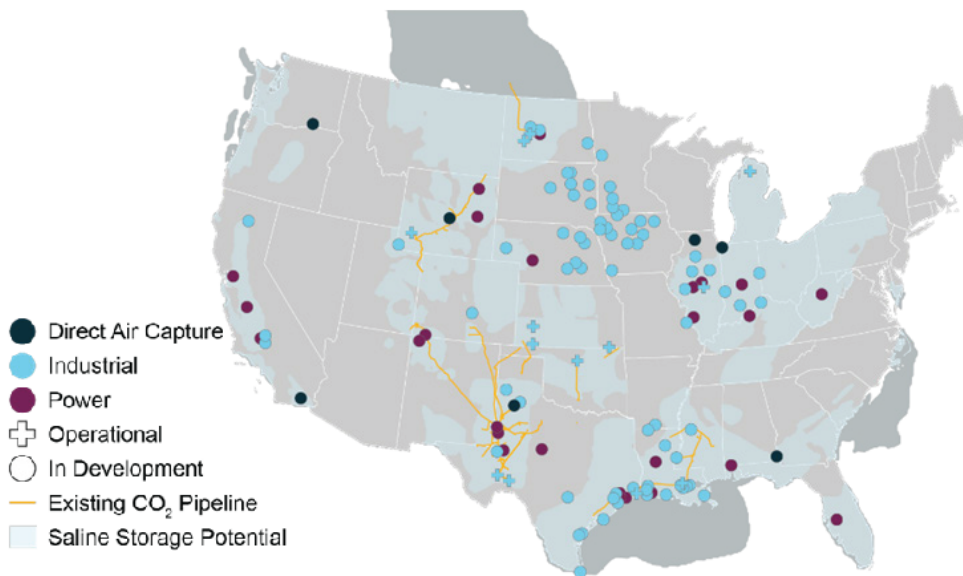
Carbon management involves the capture of carbon dioxide (CO₂) and its precursor, carbon monoxide (CO) from large point sources, including power generation and many industrial facilities, which would otherwise be released into the atmosphere. CO₂ can also be captured directly from the ambient air. This captured CO₂ is then either reused to make products or materials, or safely and permanently stored underground. In decarbonizing the industry and energy sectors, carbon management will play an important and complementary role to other emissions reduction strategies.



State Of the Industry

The passage of the 2018 FUTURE Act, which restructured and significantly expanded the 45Q tax credit, along with recently enacted legislation to further strengthen the potential of the credit, has driven significantly increased interest and investment in the carbon management sector. The pace and scope of project development has been steadily accelerating over the past two years and is evidenced by measurable factors including both the number and diversity of project announcements, and applications to the EPA or state primacy programs for Class VI permits, which are required to permanently store CO₂ in appropriate geologic formations

Figure 1: Publicly announced carbon management projects.



These projects span the development cycle from early stages of development to project construction.

Today, in the U.S. there are 14 commercial-scale facilities with the collective capacity to capture and store approximately 21.4 million metric tons of CO₂ per year, representing nearly half of the global deployment of the technology to-date. In direct reaction to the enactment of

recent federal policy support for carbon management technologies there have been more than 120 projects announced in the United States, with 34 announced in the last year alone.

Among announced projects, sectoral and geographic diversity is continuing to expand. The current catalog of projects in the development pipeline spans multiple industrial sectors, electric power, transportation fuels, and direct air capture technologies, as well as CO₂ transport and storage. Additionally, more than half of announced projects have expressed their intent to store captured CO₂ deep underground in dedicated geologic storage sites.

Preparing for Future Demand

As the U.S. continues to lead the world in supportive federal policy levers to enable economywide deployment of these technologies, globally, the momentum and support for carbon management deployment is making similar strides. Today, there are more than 150 facilities in various stages of development across the globe; with more than half of those projects in construction or advanced phases of development with a combined capture capacity estimated at nearly 200 million metric tons per year.



However, despite recent impressive advances in the sector, the current pace of technology deployment is not yet on track to meet economywide decarbonization targets. According to the [International Energy Agency](#), carbon management technologies must scale to capture and store 1.6 billion tons of CO₂ globally per year by 2030 and subsequently increasing to 7.6 billion tons per year by midcentury.

While the U.S. has now successfully enacted the most comprehensive federal policy support for carbon management technologies in the world, critical gaps remain. The levels of deployment needed to reach emissions reduction targets, preserve and expand high-wage jobs and bolster American energy, industrial and manufacturing production require additional support. A combination of policy, regulatory and legal frameworks at the federal and state level, as well as increased coordination between project proponents, local communities, government, and stakeholders is crucial to enable economywide deployment of these technologies.