



Achieving American Leadership in the Carbon Capture, Transport, and Storage Supply Chain

Summary

The Carbon Capture, Transport, and Storage Supply Chain Deep Dive Assessment finds that developing carbon capture and storage (CCS)—a suite of interconnected technologies that can be used to achieve deep decarbonization—poses no significant supply chain risk and can support the U.S. government in achieving its net-zero goals.

CCS delivers deep emissions reductions in hard-to-decarbonize industrial sectors, such as steel, fertilizer, and cement; can decarbonize existing infrastructure and assets in power and industrial sectors; and helps the most carbon- and heat-intensive industries operate with little to no greenhouse gas emissions.

The assessment lays out the key opportunities and long-term use applications of CCS technologies that could help produce between 390,000 and 1.8 million good-paying union jobs. “The America’s Strategy to Secure the Supply Chain for a Robust

Clean Energy Transition” report also includes policy recommendations that will incentivize the advancement of the CCS industry to ensure the successful infrastructure is in place to support the nation’s clean energy and decarbonization transition.

CCS At-A-Glance

CCS is a suite of interconnected technologies used to reduce carbon dioxide (CO₂) emissions produced by carbon-emitting sources and help achieve deep decarbonization. During CCS, CO₂ is separated and captured from other gases, compressed and transported to storage sites, and safely and permanently stored, for example in deep geological formations underground.

[Download the CCS infographic](#) and [watch this CCS explainer video](#) to learn more.

Key Findings & Opportunities

CCS provides a near-term pathway to **rapidly reduce the impacts of existing, difficult-to-decarbonize, emissions-intensive infrastructure and processes**, while zero-carbon alternative solutions mature.

CCS also **poses a low supply chain risk**, due to the required infrastructure relying on large amounts of common and readily available raw materials (such as steel, cement, and ammonia).

Opportunities

CCS presents considerable opportunities in the following areas:

- **Growth in the American Economy and Workforce:** The growth of the CCS market could help produce between 390,000 and 1.8 million good-paying union jobs in various industries, including in fossil energy communities affected by the transition to a net-zero economy. These employment opportunities will include the fields of raw materials (steel and cement, among others); engineering and design (the design of carbon capture, pipelines, injection sites, and supervisory control and data acquisition), construction (retrofitting, pipeline development, injection sites, and trucking), and operation and maintenance (O&M). The report states that these employment opportunities will follow the value chain of CCS, largely in the Midwest, Appalachian, and Southern states for the construction and subsequent O&M of capture sites, pipeline sites, and storage sites.
- **Development of Diverse Supply Chains:** The United States remains a leader in CCS development and deployment, and CCS infrastructure can be supplied in large part by American-made components. There are also opportunities to develop diversified supply chains

with U.S. allies and partners that play to the strengths of each country.

- **Technological Innovations for CO₂ Use and Capture Technologies:** There are several opportunities for research and innovation in the CCS space, such as leveraging captured CO₂ for use in applications like chemicals, plastics, and novel materials. This would add new revenue streams to the carbon capture industry alongside existing 45Q tax credit incentives and restoring depleted oil and gas reservoirs for reuse.

Long-Term Use

Decarbonization efforts are rapidly evolving, potentially putting large capital investments into CCS infrastructure at risk of stranding or under-utilization. However, there are multiple long-term use cases, particularly for investment into transportation and storage:

- **Continued CCS:** There may be future conditions where zero-carbon alternatives are technically impossible or impractical. A built-out CCS network would allow infrastructure and processes to continue while addressing emissions.
- **Direct Air Capture and Storage (DACs):** CCS infrastructure also enables a long-term solution for continuing to remove CO₂ from the atmosphere by enabling the CO₂ transport and storage infrastructure needed for DACs. DACs will be easier to implement regionally if the CCS infrastructure is available for use.
- **Other Pipeline Uses:** Researchers are investigating opportunities to leverage CO₂ pipelines to transport other fluids, including hydrogen. Additional research is required in the areas of hydrogen compression technology and large-scale pipeline conversion, especially when converting pipelines originally intended to transport CO₂.

Policy Next Steps

To advance the growth and development of the CCS industry, policy recommendations and next steps are included in the report, “America’s Strategy to Secure the Supply Chain for a Robust Clean Energy Transition”. A high-level summary is included below.

- **Accelerate early development of CCS infrastructure.** Provide research, development, and demonstration to address technical challenges and costs of carbon capture, storage, and transport.
- **Enable CCS market growth.** Incentivize CO2 infrastructure projects (pipelines and storage), including providing investment and permitting support.
- **Incentivize domestic manufacturing of materials and equipment for the midstream** by prioritizing and/or requiring materials to be produced domestically. ■

Download the full document and the corresponding other documents that are part of the DOE response to the supply chain executive order at:
www.energy.gov/policy/supplychains

