

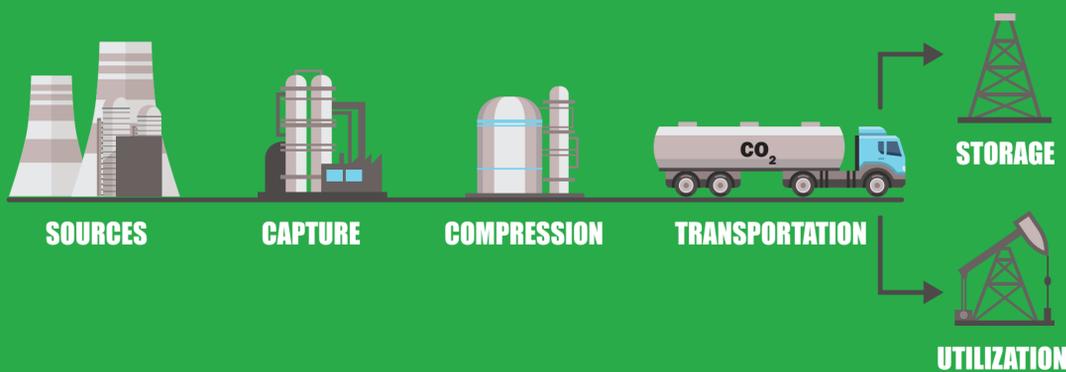
Carbon Capture, Utilization, and Storage

Overview

Carbon capture, utilization, and storage (CCUS) is an important emissions reduction process that can be applied in a wide range of settings. It is key to helping the world mitigate carbon dioxide (CO₂) emissions.

Process

CCUS captures CO₂ emissions from sources such as coal- and natural-gas-fired power plants and industrial facilities before they enter the atmosphere. It can even be used to capture CO₂ directly from ambient air, using a process referred to as direct air capture. The captured CO₂ is either stored deep underground or reused for commercial purposes.



Research and Development

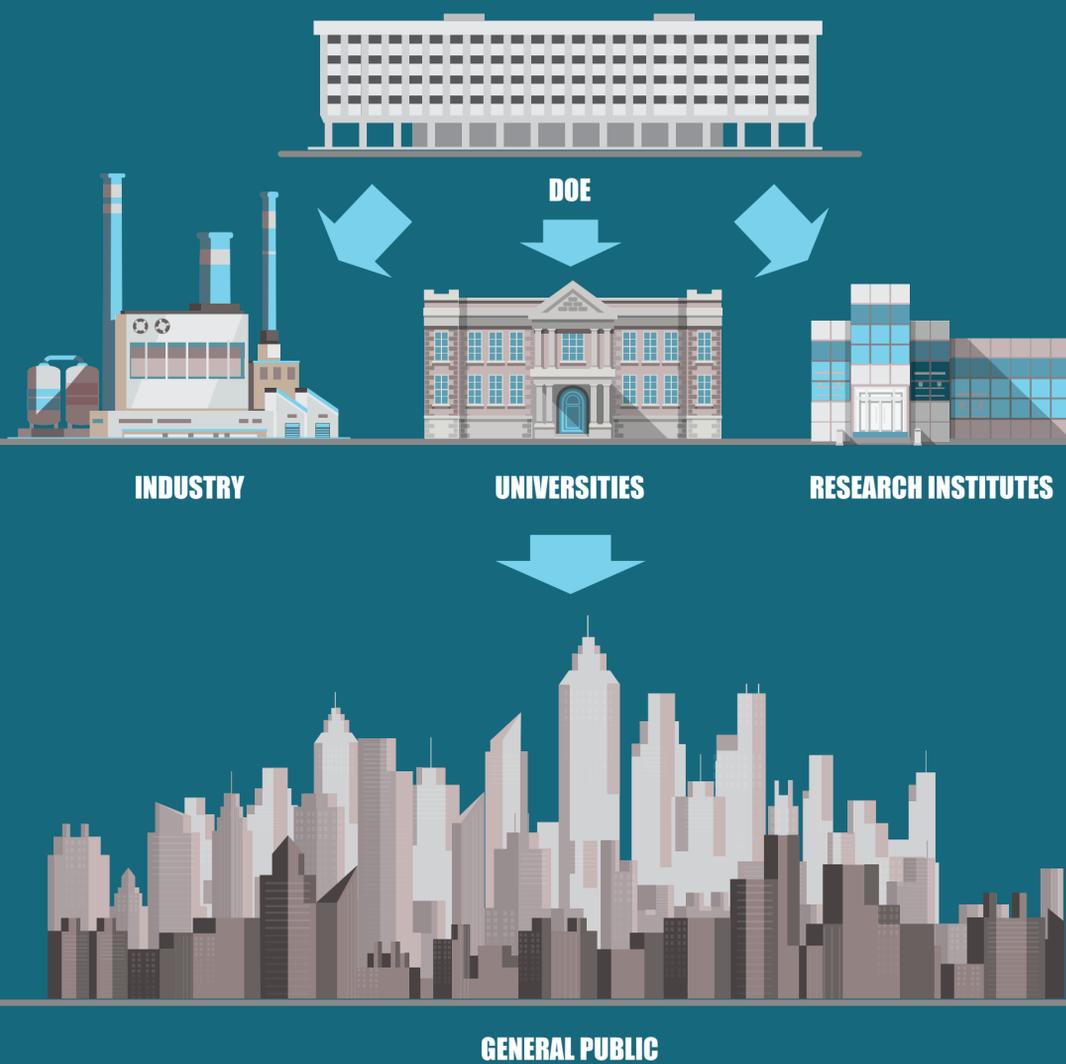
The U.S. Department of Energy has a robust CCUS research and development (R&D) program. This program, managed by the Office of Fossil Energy, has been in operation for over two decades. It focuses on the following areas:

- **Carbon Capture**
Finding ways to reduce the cost of capture and associated energy penalty; developing post-combustion, pre-combustion, and direct air capture technologies.
- **Carbon Utilization**
Utilizing CO₂ for enhanced oil recovery to increase oil production. Developing technologies that can convert CO₂ into other valuable commodities.
- **Carbon Storage**
Developing protocols for the secure geologic storage of the captured CO₂. The CO₂ can be stored in deep saline formations, depleted oil and gas reservoirs, coal and shale seams, and basalts.

Projects

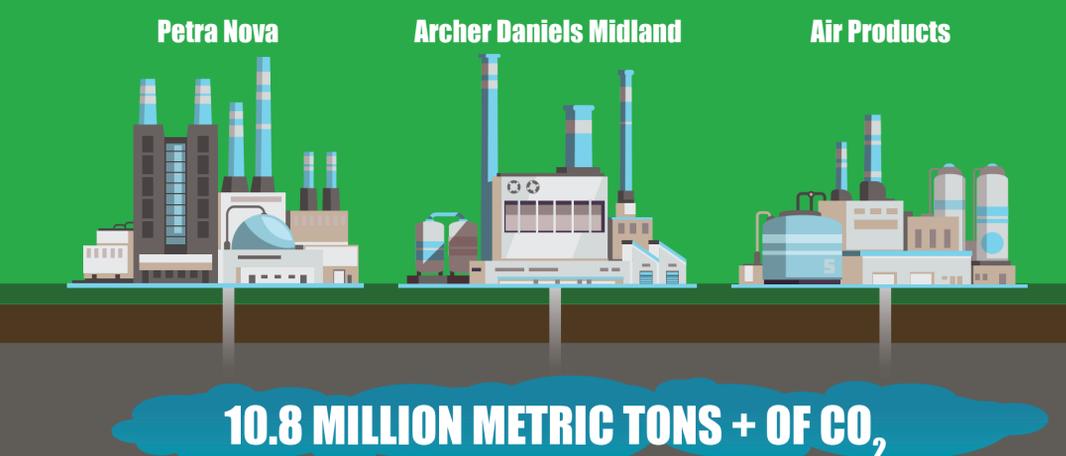
In collaboration with industry, leading universities, and research institutes, DOE is funding and supporting more than 100 R&D projects to advance CCUS technologies and bring them to the commercial market.

Many of the projects are focused on finding ways to reduce the cost of capturing CO₂ from power and industrial plants, or directly from the atmosphere. Other projects are focused on finding ways to turn CO₂ into valuable commodities, such as plastics, chemicals, concrete, and building materials.



Demonstration

As a result of DOE's R&D, a number of cutting-edge CCUS technologies have been deployed at major demonstration sites. Three of these projects—Petra Nova, Archer Daniels Midland, and Air Products—have captured and injected over 10.8 million metric tons of CO₂. Not only are these projects successful, but they show conclusively how well CCUS works!



LEARN MORE about the Office of Fossil Energy's CCUS R&D program and how these technologies can be deployed across the coal, oil and natural gas, and industrial sectors. Visit [fossil.energy.gov](https://www.fossil.energy.gov).



U.S. DEPARTMENT OF
ENERGY

Fossil
Energy

May 2020