Independent Statistics and Analysis
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Annual Energy Outlook 2025 Fact Sheet: Carbon Capture, Allocation, Transportation, and Sequestration Module

We introduced the Carbon Capture, Allocation, Transportation, and Sequestration (CCATS) Module in our modeling system (National Energy Modeling System [NEMS]) for the *Annual Energy Outlook 2025* (AEO2025) to better reflect the emerging market for captured carbon dioxide (CO_2). We designed CCATS to be flexible to incorporate future policies and to more accurately project long-term trends in U.S. energy markets.

At its core, CCATS is an optimization module that minimizes various operation and investment costs for capturing, transporting, and sequestering or utilizing CO_2. After applying policy incentives, the module determines the most cost-effective network flow of CO_2 from supply sources to demand locations and projects the development of CO_2 infrastructure for both transportation and saline storage until 2050.

CO_2 supply representation

CCATS receives quantities of captured CO_2 from other modules in NEMS. In NEMS, CO_2 supply comes from a variety of sources, including hydrogen production facilities, natural gas processing facilities, ethanol plants, cement kilns, and fossil fuel-fired power plants. Given limited data and resources, CCATS did not represent direct air capture (DAC) for AEO2025.

CO_2 demand representation

For AEO2025, CO_2 demand in CCATS comes from either CO_2 enhanced oil recovery (EOR) or geologic storage in saline formations. Today, the overwhelming majority of captured CO_2 is directed toward CO_2 EOR, a process in which CO_2 is injected into oil and natural gas wells to extract additional hydrocarbon resources.[1] Demand from other sources of CO_2 utilization such as the food and beverage industry and electrofuels, or e-fuels, were not included as sources of CO_2 demand for AEO2025.

Policy and legislation representation

In representing existing policy and legislation for AEO2025, CCATS focused on the expansion and enhancement of 45Q tax credits in the Inflation Reduction Act.[2] In particular, the module represents tax credits of $85 per metric ton of CO_2 permanently stored and $60 per metric ton of CO_2 used for EOR. Eligible projects must meet minimum quantity thresholds and begin construction by 2033 to qualify for the tax credits, which last for 12 years after the carbon capture equipment associated with the project is placed into service.

1 U.S. Environmental Protection Agency, GHGRP, https://www.epa.gov/ghgreporting/supply-underground-injection-and-geologic-sequestration-carbon-dioxide.
[2] H.R.5376 Inflation Reduction Act of 2022, Pub. L. No. 117-169 (2022), https://www.congress.gov/bill/117th-congress/house-bill/5376/text.

Geographic representation

Today, carbon capture and sequestration operations are active in three main geographical areas, which are represented in CCATS: the Gulf Coast, the Permian Basin, and the Rocky Mountains/Great Plains. Each of these markets is local, and no existing pipelines move CO_2 between these regions. CCATS was designed to build on this local transportation infrastructure to support additional volumes.

CO_2 Capture and Sequestration in AEO2025 Publication Tables

Projections of CO_2 capture and sequestration can be found in Table 72, *Capacity with Carbon Capture and Carbon Flows*. This table summarizes CO_2 capture and sequestration in units of million metric tons.