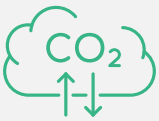
Capturing value from CO_2

Reduce your carbon footprint while increasing profits.

Background

Carbon capture and sequestration (CCS), also known simply as carbon capture, offers the opportunity to boost profitability while reducing greenhouse gas (GHG) emissions. Industrial facilities like ethanol, cement and chemical production plants that emit carbon dioxide can significantly benefit from this process.



Depending on when your facility began service and its level of GHG emissions, CCS solutions can be cost-effective for sites that emit as little as 25,000 metric tons of CO_2 per year.

Monetizing carbon capture

A growing means to incentivize CCS technology implementation is a U.S. federal tax credit for the geological sequestration, or the process of injecting carbon oxides like

CO_2 into underground geological formations, where they are either permanently trapped or transformed. The tax credit for this process is typically referred to by its IRC section, 45Q, and is based on the number of metric tons of qualified carbon oxides that are captured and sequestered. The Section 45Q credit has taken on additional focus since its revisions in 2018.

The amounts of the credit and other features depend on when the qualifying capture equipment was placed into service. Currently, the credits range from up to $50 per metric ton.

Factors that make these benefits likely to increase over time include rising CO_2 emission prices, scaled increases to some section 45Q credits scheduled through 2026 and annual adjustments for inflation. Future federal tax credit expansions are also possible. Section 45Q credits can also in certain situations be utilized with other federal or state tax incentives such as the Federal Renewable Fuel Standard Program and the California Low Carbon Fuel Standard Program. Future Section 45Q application expansion has also been discussed at the federal level.

Some producers have also found ways to profit from the sale of a portion of their captured CO_2. Although the secondary market is still in its infancy, high-purity CO_2 can be sold for processes such as soft drink carbonation, concrete curing, and the manufacturing of fuels and building materials. Ongoing research focuses on uptake through algae and bioproducts, catalytic conversion of fuels and chemicals, mineralization into inorganic materials and possible working fluids. If you are an ethanol producer, dairy digester or wastewater treatment facility, capturing carbon could reduce your California carbon intensity score, which can increase your California Low Carbon Fuel Standard credit.

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Technical considerations

CO_2 will essentially be at atmospheric pressure when it's first recovered from your site's processes. This pressure must be increased to approximately 1,500 to 2,200 psi if you intend to store it in the ground or transport it via a pipeline. Reliable compression equipment is critical because CO_2 must be maintained within strict pressure and temperature ranges.

Dehydration equipment is necessary to ensure that the moisture does not cause any freezing problems during pressure changes and prevents any damage to components due to carbonic acid forming.

One source for a complete CCS solution

Copeland's Industrial business can help your operation to implement a complete CCS solution, backed by the entire Copeland portfolio. You'll get a full balance of plant (BOP) that includes front end engineering and design and equipment for compression and dehydration.

Contact Copeland today to learn more about how to select the best process optimization solutions, resolve your carbon capture challenges, and reach new levels of profitability. Please visit our website:

www.copeland.com/en-us/brands/vilter

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To learn more, visit **copeland.com/Vilter**

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