

Unlocking Value With Carbon Capture, Utilization, and Sequestration

Carbon capture, utilization, and sequestration (CCUS) is a multifaceted approach to combating climate change by reducing atmospheric carbon dioxide (CO₂). CCUS is recognized as a crucial element of global climate change mitigation strategies and is often included in international agreements such as the Paris Agreement and is expanding under various government programs and voluntary markets.

The first step in CCUS is the capture of CO₂ emissions from various industrial point sources such as ethanol, cement, steel, fertilizer, and power plants. There are several methods for capturing CO₂, including post-combustion capture, pre-combustion capture, and oxy-fuel combustion, with each suited to specific industries and processes. Alternatively, existing CO₂ can be removed from the atmosphere through direct air capture (DAC). Once the CO₂ is captured, it can either be permanently sequestered or utilized. Utilization includes transforming CO₂ into valuable products like fuels, chemicals, and materials, thereby reducing the overall emissions footprint.

In cases where CO₂ cannot be effectively utilized, safe and long-term storage is crucial to prevent its release into the atmosphere. CO₂ can be stored in geological formations such as depleted oil and gas reservoirs, deep saline aquifers, un-minable coal seams, and even through mineralization processes that convert CO₂ into stable carbonate minerals.

In the United States (U.S.), the additional value created by the Inflation Reduction Act of 2022 (IRA) - through the Section 45Q tax credit - has turned CO₂ into a valuable co-product that can be monetized when safely and permanently sequestered underground. For example, ethanol fermentation produces a pure stream of biogenic CO₂ that is inexpensive to capture because of its high purity and concentration. Ethanol facilities representing at least half the U.S. production and 25 million metric tons of CO₂ are actively investigating CCUS. However, tax credits alone are often not enough to make a CCUS project financially attractive.

Our Services:

- EcoUniversity CCUS Workshop
- Feasibility Studies
- Financial Pro Forma Analysis or Review
- Overall Project Due Diligence
- Risk Assessment and Financial Structuring
- CCUS Site Permanence Review
- Carbon Intensity (CI) Estimation
- Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation (GREET) Modeling
- Low Carbon Fuel Standard (LCFS) Validation, Verification, and Permitting
- Asset Development Consulting
- CCUS Site Certification (Initial and Quarterly Certificates)
- Third-Party Reviews
- Class II and Class VI Permitting Advisory and Consulting

Stacking additional credits earned on the voluntary carbon market (VCM) or other programs such as California's Low Carbon Fuel Standard (CA-LCFS) may be necessary to bridge that financial gap.

EcoEngineers, recently acquired by leading global assurance partner LRQA, has a team of licensed engineers and geologists with technical backgrounds and expertise in CCUS. We consult and advise clients in petroleum, biofuels, and other industries regarding permitting, third-party reviews, and VCM pathways. Whether it is conducting CCUS site permanence reviews and feasibility studies or performing a risk assessment and asset development consulting, EcoEngineers can guide CCUS project stakeholders through the regulatory process providing expert support from project concept to completion.

About EcoEngineers

EcoEngineers, an LRQA company, is a consulting, auditing, and advisory firm with an exclusive focus on the energy transition and decarbonization. From innovation to impact, EcoEngineers helps its clients navigate the disruption caused by carbon emissions and climate change. EcoEngineers helps organizations stay informed, measure emissions, make investment decisions, maintain compliance, and manage data through the lens of carbon accounting. Its team of engineers, scientists, auditors, consultants, and researchers live and work at the intersection of low-carbon fuel policy, innovative technologies, and the carbon marketplace. EcoEngineers was established in 2009 to steer low-carbon fuel producers through the complexities of emerging energy regulations in the United States. Today, EcoEngineers' global team is shaping the response to climate change by advising businesses across the energy transition. For more information, visit www.ecoengineers.us.

Navigating the Energy Transition



- Asset Development
- Life-Cycle Analysis
- Compliance
- Regulatory Engagement



- Validation & Verification
- Quality Assurance Programs
- Third-Party Engineering Reviews



- Interactive Workshops
- Market Outlooks
- Carbon Literacy

To learn more about our CCUS services and capabilities, contact us at clientservices@ecoengineers.us