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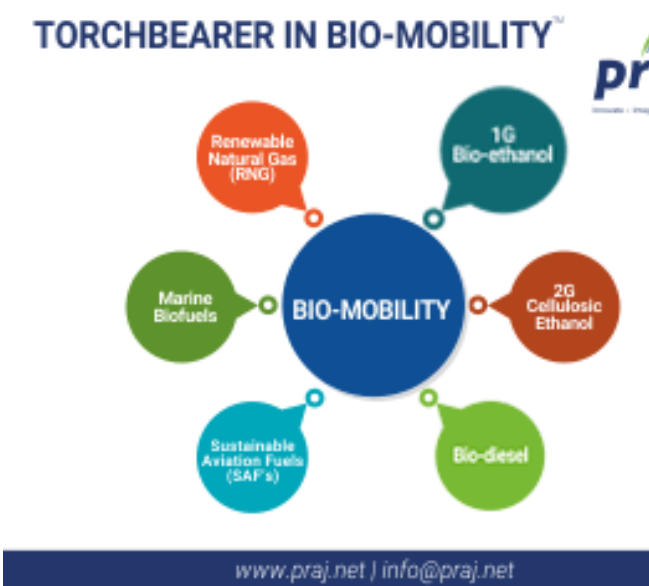
There's More than One Way to Save the Planet! Carbon capture and sequestration (CCS) another new market for Bioenergy

March 17, 2020 | Jim Lane

By Mike Newman. COO of Parhelion Underwriting

Special to The Digest

Carbon capture and sequestration (CCS) is an important strategy to reduce greenhouse gas (GHG) emissions and mitigate climate change. CCS is a process by which large amounts of carbon dioxide (CO₂) are captured, compressed, transported, and sequestered. The sequestration component of CCS includes CO₂ injection into geologic formations (such as depleted oil and gas reservoirs, un-mineable coal beds, and saline formations) as well as use in industrial materials (e.g. concrete). CCS is distinct from biological sequestration, which is typically accomplished through natural and working lands management and conservation practices that enhance the storage of carbon or reduce CO₂ emissions.



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The original use envisaged for carbon capture and storage (ccs) technology was to take CO₂ out of the chimneys of coal-fired power plants and pump it deep underground; do it right and the power station will be close to carbon-neutral. Apply the same technology to a biomass-burning plant and the CO₂ you pump into the depths is not from ancient fossils, but from recently living plants—and, before them, the atmosphere. Hey presto: negative emissions.



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The problem from a negative-emissions point of view is that the CO₂ rapidly gets back into the atmosphere. But there is one notable exception. For half a century oil companies have been squirting CO₂ down some of their wells in order to chase recalcitrant oil out of the nooks and crannies in the rock—a process known as enhanced oil recovery, or EOR. And though the oil comes out, a lot of the CO₂ stays underground.



The fact that oilfields in Texas regularly use EOR has made the state a popular site for companies trying out new approaches to carbon capture. A startup called net Power has built a new sort of gas-fired power plant on the outskirts of Houston. Most such plants burn natural gas in air to heat water to make steam to drive a turbine. The net Power plant burns natural gas in pure oxygen to create a stream of hot CO₂ which drives the turbine directly—and which, being pure, needs no further filtering in order to be used for EOR. And oil recovered through EOR that uses atmospheric CO₂ can earn handsome credits under California’s Low-Carbon Fuel Standards cap and trade program.

Studies by the [Intergovernmental Panel on Climate Change](#) (IPCC) and the [California Council on Science and Technology](#) (CCST) have shown that CCS has the potential to reduce carbon emissions by millions of metric tons, and may be an integral part of meeting California’s long term climate goals.

California’s Air Resources Board (CARB) has adopted a [CCS protocol under the Low Carbon Fuel Standard \(LCFS\)](#), describing the requirements that CCS projects must meet in order to generate LCFS credits. CARB staff has prepared this document to address frequently asked questions (FAQ) about the CCS Protocol. These requirements are primarily addressed in LCFS Regulation section 95490(a) and the CCS Protocol subsection A.1.

1. Do CCS projects have to be located within California to earn LCFS credits?

No. Projects may be located anywhere, but the innovative crude oil or transportation fuel produced associated with the CCS project must be consumed in California. LCFS credits will only be issued for the fuel consumed in California.

The only exceptions to being issued credits based on fuel consumed in California are direct air capture (DAC) projects, which store captured carbon dioxide (CO₂) underground. DAC projects may apply for CCS Permanence Certification regardless of location, and do not need to have a



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fuel component to be issued credits.

2. Does the CO₂ need to be captured and sequestered by the same entity?

No. CO₂ may be captured by one entity and transferred to another entity for sequestration. When applying for CCS Permanence Certification and for crediting under the LCFS, both the capture entity and the sequestering entity must apply as joint applicants.

3. Do LCFS credits go to the entity that captures or sequesters the CO₂?

Once the CCS project application receives Permanence Certification, and after the reported amounts of sequestered CO₂ are verified, the entity that captures the CO₂ can claim the LCFS credits.

4. What types of CCS projects are eligible under the LCFS?

The following table is intended to be a complete list of the types of CCS projects that are eligible for crediting under the LCFS regulation; CARB staff acknowledges that there may be other CCS project types that could become eligible for LCFS crediting in the future.

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5. What types of sequestration sites are eligible for CCS projects?

The sites that are eligible for CO₂ sequestration under the LCFS are:

- ▶ Saline reservoirs
- ▶ Depleted oil and gas reservoirs
- ▶ Oil and gas reservoirs used for CO₂-enhanced oil recovery (CO₂-EOR)

As a reminder, the entities that run the sequestration sites are not the entities receiving the LCFS credits (unless that same entity is also the entity that captured the CO₂). In addition, all sequestration site types must be located onshore in order to be eligible for CCS Permanence Certification.

6. Is the oil produced from CO₂-EOR, using CO₂ captured from eligible project types, eligible to generate credits?

No. CO₂-EOR fields are sequestration sites under the CCS Protocol, not project types. The capture facility is the entity that generates the LCFS credits, not the CO₂ sequestering facility.

The Global CCS Institute says that there is a steady increase in projects to capture and store, or use, CO₂. But the trend needs to be treated with caution. First, global carbon capture is still measured in the tens of millions of tonnes, not the billions of tonnes that matter to the climate. Second, the public support the sector has received in the past has often proved fickle or poorly designed.

But there are still some reasons for optimism. In 2008 the U.S. enacted a tax credit, 45q, that was to reward the first 75m tonnes of CO₂ sequestered through CCS. Last year 45q was amended. Instead of a 75m tonne cap, there is now a time limit: all projects that are up and running before January 1st 2024 will be eligible. This has created a flurry of activity.

Mike Newman is the COO of Parhelion Underwriting, a Lloyds, London-backed risk finance

company specializing in risks impacting investment in environmental commodity and climate finance markets.

Risks often act as barriers to investment and trading in the climate finance market – the systems designed to reduce greenhouse gas emissions such as the Renewable Fuel Standard (RFS), California’s Cap & Trade and Low Carbon Fuel Standard (LCFS) – because Federal and State programs have created areas of uncertainty.

The risk of invalidation of credits and the political pressures that might repeal the legislation worry market participants – but the huge pool of capital in the global insurance and reinsurance industry has always taken risks that other forms of capital (debt and equity) can’t or won’t take and insurance risk capital is used successfully in several environmental commodity markets.

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