



CARBON CAPTURE AND SEQUESTRATION PROJECT ELIGIBILITY

October 2022

INTRODUCTION

The California Air Resources Board's (CARB) Low Carbon Fuel Standard regulation, which appears at sections 95480 to 95503 of title 17, California Code of Regulations, is designed to reduce greenhouse gas emissions associated with the life cycle of transportation fuels used in California. CARB staff prepared this document to address frequently asked questions (FAQ). These answers may be based in part on case-specific factual circumstances and are offered here only as guidance that does not supplant the requirements of the LCFS regulation. Unlike the regulation itself, this document does not have the force of law. It is not intended to and cannot establish new mandatory requirements beyond those that are already in the LCFS regulation, nor can it supplant, replace or amend any of the legal requirements of the regulation. Conversely, any omission or truncation of regulatory requirements does not relieve entities of their legal obligation to fully comply with all requirements of the regulation.

This document addresses common questions related to carbon capture and sequestration (CCS) project eligibilities for receiving LCFS credits. These requirements are primarily addressed in LCFS Regulation section 95490(a) and the CCS Protocol subsection A.1. If you have a question that you would like to be included in this FAQ, please contact LCFS staff (see contact below).

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 and associated with the CCS project must be sold in California markets (with the exception of direct air capture (DAC) projects). The credits generated will be pro-rated based on the volumes of fuel sent to California.

DAC projects that store the captured carbon dioxide (CO₂) underground may apply for CCS Permanence Certification regardless of location.

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. 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?

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Once the CCS project application receives Permanence Certification, and after the reported amounts of sequestered CO₂ are verified, LCFS credits may be claimed by the entity that captures the CO₂. The entities that operate the sequestration sites are not necessarily the entities eligible to receive LCFS credits (unless that same entity is also the entity that captured the CO₂).

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 to generate LCFS credits under the LCFS regulation. CARB staff acknowledge that there may be other CCS project types that could become eligible in the future.

Project Type (these entities receive the LCFS credits)	Examples (where the CO ₂ is captured from)
Direct air capture (credits generated by the capturer)	<ul style="list-style-type: none"> • Chemical separation (e.g. absorption, membrane separation) of CO₂ directly from ambient (atmospheric) air
Tier 2 pathway (credits generated by the alternative fuel producer)	<ul style="list-style-type: none"> • CO₂ from fermentation during ethanol production • CO₂ streams from production of renewable diesel, renewable gasoline, and alternative jet fuel • CO₂ produced as part of biogas from anaerobic digestion • CO₂ from power plants that produce low-CI electricity supplied for eligible transportation applications such as electric vehicle charging, etc. • CO₂ from hydrogen production using steam methane reforming • CO₂ from production of any other alternative transportation fuel listed in sections 95482(a) of the LCFS regulation
Refinery Investment (credits generated by the refinery)	<ul style="list-style-type: none"> • CO₂ from steam methane reforming at or supplying hydrogen to a refinery • CO₂ from steam generators and/or combined heat and power plants at a refinery
Innovative Crude (credits generated by the crude producer ¹)	<ul style="list-style-type: none"> • CO₂ from steam methane reforming at a bitumen upgrader • CO₂ from steam generators or combined heat and power plants that supply steam, heat, or power demand at an oil field

¹ The crude oil producer may elect to transfer the right to opt in for credit generation to the joint applicant through a written agreement.

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Project Type (these entities receive the LCFS credits)	Examples (where the CO ₂ is captured from)
	<ul style="list-style-type: none"> • CO₂ from processing of associated gas from crude oil production at an oil field. Associated gas must be consumed at the oil field as part of oil recovery operations.

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 crude oil generated as a result of CO₂-EOR using CO₂ captured from eligible projects is not eligible for generating LCFS credits under the Innovative Crude Provision.

7. Can CO₂ that is already being captured and used productively in industry (e.g., in carbonated beverages or dry ice production) generate LCFS credit if it is instead permanently sequestered?

Under these circumstances, the net reduction in CO₂ emissions to the atmosphere depends on the marginal new source of CO₂ that replaces the prior industrial use. If the marginal source of CO₂ is newly installed capture from anthropogenic sources, then the CCS project would result in net CO₂ emission reductions to the atmosphere and would be eligible for LCFS crediting. Conversely, if the marginal source of CO₂ is increased production from a natural CO₂ dome, then net CO₂ reduction from the CCS project would be zero and the project would not be eligible for LCFS crediting.

Section 95490(c)(2)(A) of the LCFS regulation requires that the applicant provide a complete description of the CCS project and how greenhouse gas emissions are

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reduced. In order to demonstrate that CCS projects for which CO₂ is already being captured and used productively do result in net GHG emission reductions, the applicant must provide an independent research analysis showing that the marginal source of CO₂ for that region is from newly installed capture from anthropogenic sources.

8. How are GHG emissions calculated for electricity used by the capture facility for direct air capture projects?

For electricity generated onsite (i.e., behind the meter), the GHG emissions must be calculated using the CA-GREET emission factors for the specific electricity supply.

Under section B.2.2(c) of the CCS Protocol, the GHG emissions for demonstrated new or expanded purchased low carbon intensity (low-CI) electricity must be calculated using the CA-GREET emission factors for the specific low-CI electricity supply. In order to demonstrate new or expanded supply of low-CI electricity, the project operator must be able to demonstrate renewable electricity attribute accounting over each monthly balancing period.

If new or expanded purchased low-CI electricity cannot be demonstrated, the GHG emissions must be calculated using the CA-GREET default grid-based average (e.g., eGRID U.S. subregion) emission factors.

CONTACT

If you have questions regarding the above information, please visit the LCFS Contacts webpage: <https://www.arb.ca.gov/fuels/lcfs/contact.htm>.