



LCFS Guidance

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Low Carbon Fuel Standard (LCFS) Guidance 20-06 (Revised)

Crude Oil Innovative Method Application-Solar or Wind Generated Electricity

INTRODUCTION

The California Air Resources Board's (CARB) Low Carbon Fuel Standard (LCFS) 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 has prepared this guidance document to describe the regulatory requirements in a user-friendly format. 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.

BACKGROUND

This guidance document is intended to assist the project operator (referred to as "applicant" in this document) to apply for the solar or wind generated electricity innovative method under LCFS section **§ 95489(c)**.

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1) Overview

The following are the steps required or recommended (in the case of the pre-application step) to obtain approval for a solar or wind electricity project.

1. Pre-application: Contact CARB to discuss the potential project and address any questions or concerns about project eligibility and the application process.
2. Register: The applicant must register in the LCFS Reporting Tool and Credit Bank & Transfer System (LRT-CBTS) as an opt-in project operator.
3. Submit Application: The project operator initiates review of the opt-in project using the innovative method by submitting a written application and supporting documents following the requirements outlined in LCFS Regulation Section 95489(c)(2) to CARB via the LRT-CBTS.
4. Review for Completeness: CARB staff reviews the application for completeness and notifies the applicant whether the application is complete or if additional information is required. A list of operating conditions through a pre-validation letter, specifying specific monitoring, reporting, and verification requirements may be imposed to ensure ongoing compliance and accurate credit generation.
5. Validation Process: Once the application has been determined to be complete, the applicant will be notified through the LRT-CBTS. The application must then be validated by a [CARB accredited verification body](#). A positive or qualified positive validation statement is required for CARB to proceed with the next step. If validation is not completed, or if an adverse statement is received, or if six months pass without completion, the application will be denied without prejudice.
6. Public Comment: After receiving a positive or qualified positive validation, the application will be posted for public comments for 14 days. In response to comments concerning factual or methodological errors the applicant, within 30 days, shall either submit revisions to its application, or detailed responses to the Executive Officer explaining why no revisions are necessary.
7. CARB Approval:
As part of any action approving an application, the Executive Officer may prescribe conditions of the approval that contain special limitations, recordkeeping and reporting requirements, and operational conditions that the Executive Officer determines should apply to the innovative method. If the Executive Officer determines the application will not be

approved, the applicant will be notified in writing, and the basis for the disapproval shall be identified.

2) Pre-Application

CARB staff recommends that after reading through this guidance document, the LCFS regulation,¹ and previously approved applications,² a prospective applicant contact CARB to discuss the potential project and any questions or concerns that the applicant may have about project eligibility, the application submittal and approval process, registration requirements, and post-approval recordkeeping and credit generation procedures.

The following are general requirements for a solar or wind electricity project:

1. The project must become operational no earlier than January 1, 2015.
2. The solar or wind electricity must be produced and consumed onsite or be provided directly to the crude oil production or transport facility from a third-party generator and not through a utility owned transmission or distribution network (i.e. the solar or wind electricity must be supplied “behind the meter”).³
3. The project must achieve an emission reduction of at least 1,000 metric tons carbon dioxide equivalent (CO₂e) per year. Calculations to determine if the project meets the threshold criterion are described in Appendix A of this document.
4. If the innovative method involves more than one crude producer or transporter, or electricity produced at a single third-party facility, the threshold criteria listed above may apply to the aggregated project total.

3) LRT-CBTS Registration Requirements

A crude oil producer or transporter or designated third-party joint applicant must register under section 95483.1 of the LCFS regulation as an opt-in project

¹ Non-official version of the LCFS regulation text can be found at:
https://ww2.arb.ca.gov/sites/default/files/2025-07/2025_lcfs_fro_oal-approved_unofficial_07012025.pdf

² The LCFS Innovative Crude Oil Applications page:
<https://ww2.arb.ca.gov/resources/documents/approved-innovative-crude-oil-applications-under-lcfs>

³ LCFS credit will not be awarded to any solar or wind electricity supplied to the grid. There must be systems installed to prevent reverse flow of electricity to the grid or there must be separate metering systems in place to track both the solar or wind electricity that is consumed by the crude production facility and the solar or wind electricity supplied to the grid.

operator to submit an application for a solar or wind generated electricity project and receive credits for an approved innovative method. The crude oil producer or transporter, through a written agreement, may elect to transfer the right to opt in for credit generation to the joint applicant. Opting into the LCFS program becomes effective when the crude oil producer or transporter, or third-party joint applicant establishes an account in the LRT-CBTS, pursuant to section 95483.2.⁴

The project operator must initiate review of the opt-in project using the innovative method through a written application to CARB. If the innovative method involves steam, heat, RNG, biogas, or electricity produced by a third party and delivered to the crude oil producer or transporter, both the crude producer or transporter and the third party must apply as joint applicants for approval. If multiple crude producers or transporters receive steam, heat, RNG, biogas, or electricity from a single third-party facility, each must submit an independent application with the third party as a joint applicant. If the innovative method involves delivery of carbon captured by the crude oil producer or transporter to a third party for storage, both parties must apply and will be considered joint applicants for approval.

The project operator must initiate review of the opt-in project using the innovative method through a written application to CARB. If the innovative method involves steam, heat, RNG, biogas, or electricity produced by a third party and delivered to the crude oil producer or transporter, both the crude producer or transporter and the third party must apply as joint applicants for approval. If multiple crude producers or transporters receive steam, heat, RNG, biogas, or electricity from a single third-party facility, each must submit an independent application with the third party as a joint applicant. If the innovative method involves delivery of carbon captured by the crude oil producer or transporter to a third party for storage, both parties must apply and will be considered joint applicants for approval. If the crude oil producer or transporter, or third-party joint applicant using an approved innovative method does not register as an opt-in project operator, credits generated by the producer's use of the innovative method may be claimed by the California refinery (or refineries) that purchase the crude produced using the innovative method, if CARB receives all information it needs to ensure compliance with limitations and reporting requirements applied to the method.

⁴ For the LRT-CBTS instructions, refer to the LRT-CBTS User Guide, located at: https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/guidance/lrt_cbts_userguide.pdf

4) Application Submittal

The application is submitted through the LRT-CBTS. The application will be reviewed for completeness and applicants will be notified if any additional information or documentation is required. If the application is found to be complete and no other information is needed, staff will notify the applicant using the LRT-CBTS communication to indicate the application is complete.

An application must contain the following material:

1. A complete description of the innovative method and how emissions are reduced. This description must also clearly show that the project meets the threshold requirements described above and in Appendix A.
2. An engineering drawing(s) or process flow diagram(s) that illustrates the combined solar or wind electricity and crude oil production or transport facilities and clearly identifies the system boundaries, relevant process equipment, material flows, and energy flows necessary to calculate the innovative method credits. The diagrams must clearly show that the solar or wind electricity is being provided “behind the meter”. The applicant must also identify the type(s) and location(s) of meters to be used to measure and record the amount of solar or wind electricity being supplied for crude oil production or transport.
3. A map including global positioning system coordinates for solar generation facilities described in item “2” above.
4. A preliminary estimate of the potential innovative method credit, including descriptions and copies of production and operational data or other technical documentation utilized in support of the calculation. See Appendix A for calculation.
5. An attestation letter stating that the information sent by the applicant to CARB is accurate and represents the actual or intended long-term, steady-state operation of the solar or wind electricity innovative method.

If solar or wind electricity production is likely to exceed consumption of electricity for crude oil production or transport during periods of high solar or wind production, then the preliminary estimates of innovative method credit and the demonstration that the project meets the eligibility threshold must take this into consideration. Only the amount of solar or wind electricity supplied directly for crude production or transport will generate LCFS credit.

All documents that are claimed to contain confidential business information must prominently be labeled as “Contains Confidential Business Information” (CBI) and a separate redacted version of any such document must also be submitted.⁵

5) Application Approval Process

The application must be approved by CARB before credits may be generated for the innovative method. The applicant will be able to generate LCFS credits starting with the calendar quarter in which the project is approved.

Following receipt of an application designated by the applicant as ready for formal evaluation, CARB shall advise the applicant in writing that the application is complete, or the application is incomplete, in which case CARB will identify which requirements have not been met. If deemed incomplete, the applicant may submit additional information to correct deficiencies. If the applicant is unable to achieve a complete application within 180 days of CARB’s receipt of the original application, the application will be denied on that basis, and the applicant will be informed in writing.

Before CARB releases the application for validation, the applicant must obtain the services of a verification body (VB) accredited by the Executive Officer. The applicant must select an Executive Officer-accredited VB within the LRT-CBTS system. The VB must submit a Conflict of Interest (COI) disclosure and a Notice of Verification Services (NOVS) through LRT-CBTS. CARB must review and approve both the COI and NOVS before validation can begin. Once a VB has been selected and the COI and NOVS approved the application is sent to validation through the LCFS Data Management System, along with a list of required inputs demonstrating compliance with sections 95489(c)(1) and 95489(c)(2). Only after these approvals, CARB releases the application for validation, and the VB can start its review, including site visits and data checks. Applicants should engage the VB early to so the VB can be selected in the LRT-CBTS, all required validation documents can be submitted and reviewed, and the application can be released to the VB in a timely manner. The validation process will confirm compliance with LCFS requirements, including metering, behind-the-meter electricity use, and threshold calculations. A positive or qualified positive validation statement must be received by the Executive Officer from the verification body in order for CARB’s evaluation and certification of the project application to proceed. LCFS credits

⁵ Refer to the LCFS Guidance on Redaction of CBI, located at:
https://ww3.arb.ca.gov/fuels/lcfs/guidance/lcfsguidance_20-05_ADA.pdf

may be generated beginning in the calendar quarter in which CARB approves the application..

After receiving a positive or qualified positive validation statement, the Executive Officer will post the application at <http://www.arb.ca.gov/fuels/lcfs/lcfs.htm>. Public comments will be accepted for 14 days following the date on which the application was posted. Only comments related to potential factual or methodological errors may be considered. The Executive Officer will forward to the applicant all comments identifying potential factual or methodological errors. Within 30 days, the applicant shall either submit revisions to its application to the Executive Officer, or submit a detailed written response to the Executive Officer explaining why no revisions are necessary.

The Executive Officer shall not approve an application if the Executive Officer determines, based upon the information submitted in the application and any other available information, that:

1. The proposed crude production or transport method is not an innovative method, as that term is defined in section 95489(c)(1).
2. Based upon the application information submitted pursuant to this section, the applicant's greenhouse gas emissions calculations cannot be replicated using the CARB OPGEE model or alternative model or LCA methodology approved by the Executive Officer.

At the time of approval, CARB may prescribe conditions of the approval that contain special limitations, recordkeeping and reporting requirements, and operating conditions. If CARB determines that the application will not be approved, the applicant will be notified in writing.

6) Post-approval Recordkeeping, Reporting, and Auditing

Each applicant that receives approval for an innovative method must maintain records identifying each facility at which it produces crude oil for sale in California under the approved innovative method. For each such facility, the regulated entity must report quarterly or annually (through a Project Report). A regulated entity electing to report annually is required to submit its annual Project Report to CARB for the previous compliance year by April 30 of each year. Records of each such facility must be maintained for at least ten years showing:

1. The volume (barrels) of crude oil produced or transported using the approved innovative method and the crude name(s) under which it is marketed.
2. If the crude oil produced with an approved innovative method is marketed as part of a crude blend (that is not wholly refined in California), the crude oil producer must also report the name of the blend and the volume fraction that the crude produced with the innovative method contributes to the blend.
3. For crude oil imported into California, documentation showing that the innovative crude was supplied to one or more California refinery and the volume (barrels) of innovative crude supplied to each California refinery.
4. For crude oil produced in California, documentation showing the innovative crude was supplied to one or more California refinery, the total volume (barrels) of innovative crude supplied to California refineries, and the total volume (barrels) of innovative crude exported from California.
5. Metered data on solar or wind electricity consumed at the crude oil production or transport facilities during the reporting period (kWh)
6. Metered data on total electricity consumed at the crude oil production or transport facilities during the reporting period (kWh); and
7. An attestation letter stating that all solar or wind electricity was supplied directly for crude oil production or transport and that the solar or wind electricity reported for generating LCFS credit did not produce renewable energy certificates or other environmental attributes recognized or credited by any other jurisdiction or regulatory program, other than the market-based compliance mechanism set forth in title 17, California Code of Regulations Chapter 1, Subchapter 10, article 5 (commencing with section 95800).
8. Any additional records that the Executive Officer requires to be kept in pursuant to section 95489(c)(3)(E), and records that demonstrate compliance with all special limitations and operating conditions specified pursuant to section 95489(c)(3)(E). These records shall be submitted to the Executive Officer during the quarterly or annual reporting period specified in section 95491(b).

This information must be uploaded into the LRT-CBTS within the first 45 days after the end of the quarter. It is recommended that documents be uploaded in a zip-archived format. For more detailed information about the Annual Report and

Verification Deadlines, please see Section C of the most up-to-date [LCFS 22-01 Guidance document](#)⁶.

All records justifying the above reporting shall be retained for ten years and all data and calculations supplied to CARB for credit determination are subject to third-party verification by a verification body accredited by CARB and possible direct audit by CARB.

7) Verification of Project Reports and Monitoring Plan

Project operators and joint applicants must obtain the services of a verification body accredited by the Executive Officer for purposes of conducting verification services, including required site visit(s), for Project Reports submitted under section 95500(e).

Entities submitting Project Reports may elect to conduct quarterly or annual verification. Entities must determine before the initial verification of a Project Report whether to conduct quarterly or annual verification. If an entity elects to conduct quarterly verification, it may only switch to annual verification at the beginning of a calendar year. Refer to 95500(e)(2) for schedule of quarterly or annual verification.

An entity that is required to contract for verification must not use the same verification body or individual verifier(s) to perform verification services for a period of more than six consecutive years, beginning January 1, 2020. Refer to 95500(g) for verification body and individual verifier rotation requirements.

Each entity responsible for obtaining a verification statement must complete and retain for review by a verifier, or the Executive Officer, a written Monitoring Plan. Refer to section 95491.1(c) for the requirements of the Monitoring Plan.

8) Credits for Producing or Transporting Crude Oil Using Innovative Methods

Credits for producing or transporting crude oil using innovative methods may be generated quarterly or annually, at the discretion of the credit generating party. After receiving reports from California refineries detailing crude names and

⁶ Refer to LCFS 22-01 Guidance document located at: <https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard/lcfs-guidance-documents-user-guides-and-faqs>

volumes supplied to the refineries during the applicable crediting period, any records requested of the applicant to be reported, and a positive or qualified positive verification of the applicable Project Reports, the Executive Officer will determine the number of credits to be issued to the crude oil producer or transporter, joint applicant, or purchasing refinery for the innovative method. An adverse verification statement would result in no credit issuance and Executive Officer investigation. Except for carbon capture and sequestration (CCS) projects, the crediting period for projects eligible for credit generation pursuant to section 95489(c) will end no later than December 31, 2040.

CONTACT

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

APPENDIX A: THRESHOLD CALCULATION

The innovative method must achieve an emissions reduction of at least 1,000 metric tons CO₂e per year. If the innovative method involves more than one crude producer or transporter using electricity produced at a single third-party facility, the threshold criteria listed above may apply to the aggregated project total.

Credits for producing or transporting crude oil with innovative methods using solar or wind based must be calculated as specified below:

$$Credits_{Innov}(MT) = 329 \times \frac{E_{electricity} \times f_{renew}}{V_{crudeproduced}} \times V_{Innov} \times C$$

Where:

$Credits_{Innov}(MT)$ means the amount of LCFS credits generated (a positive value), in metric tons, by the volume of a crude oil produced or transported using the innovative method and delivered to California refineries for processing;

$V_{crudeproduced}$ means the volume, in barrels, of crude oil produced or transported using the innovative method;

V_{Innov} means the volume, in barrels, of crude oil produced or transported using the innovative method and delivered to California refineries for processing. If the crude produced or transported using the innovative method and delivered to California refineries is part of a blend, then V_{Innov} is the volume of blend delivered to California refineries times the volume fraction of the crude within the blend that was produced or transported using the innovative method.

$$C = 1.0 \times 10^{-6} \frac{MT}{gCO_2e}$$

$E_{electricity}$ means the overall electricity consumption to produce or transport the crude, in kW-hr;

f_{renew} means the fraction of consumed electricity that is produced using qualifying solar or wind power.

NOTE

It should be mentioned that, considering the updated credit calculation methodology for innovative crude projects using solar electricity under the amended LCFS regulations effective July 1, 2025, the new equation, which includes the revised additive factor of 329 kg CO₂e/MWh, is effective beginning Q3 2025 (July 1, 2025) and applies to all innovative crude projects, including those that were previously approved and are currently reporting credits.