LCFS Guidance

Low Carbon Fuel Standard (LCFS) Guidance 20-06

Crude Oil Innovative Method Application-Solar or Wind Generated Electricity

July 2020

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 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 (LRT) as an opt-in project operator, either concurrently with the application submittal, or later, in order to receive credits for the approved solar or wind generated electricity project.
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 to CARB.
4. Review for Completeness: Staff has 30 days to review the application for completeness. After staff review, the applicant will be notified that the application is complete or if further work is needed.
5. Public Comment: After determining that an application is complete, CARB staff will post the application for a 10 day public comment period.
6. CARB Approval: After the applicant addresses all pertinent comments, the CARB Executive Officer or designee will approve or disapprove the application.

2) Pre-Application

CARB staff recommends that after reading through this 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

[1] Non-official version of the LCFS regulation text can be found at: https://ww2.arb.ca.gov/sites/default/files/2020-07/2020_lcfs_fro_oal-approved_unofficial_06302020.pdf
[2] The LCFS Innovative Crude Oil Applications page: https://ww2.arb.ca.gov/resources/documents/approved-innovative-crude-oil-applications-under-lcfs

network (i.e. the solar or wind electricity must be supplied "behind the meter").[3]

3. The project must result in either a total emission reduction of 5,000 metric tons carbon dioxide equivalent (CO_2e) annually or a carbon intensity reduction of 0.10 gCO_2e per MJ of crude produced. Calculations to determine if the project meets the threshold criteria are described in Appendix A of this document.
4. If more than one crude producer or transporter receives electricity from a single third-party facility, each crude producer or transporter must submit an independent application with the third party as a joint applicant for each submittal. The threshold requirements above may be calculated using the aggregated project total emission reduction or carbon intensity improvement across all applications.

3) LRT-CBTS Registration Requirements

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

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) Application Submittal

The crude oil producer or transporter must initiate the review of the solar or wind electricity project through a written application. The application package should be

[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.

[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/reportingtool/userguide_lrt_cbts_v2_registration_010919.pdf

submitted through the LRT-CBTS. Every application package 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 one of the threshold requirements discussed 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 credit 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.

Within 30 calendar days of 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.

Once deemed complete, the version of the application with all CBI information redacted will be posted to CARB's webpage for a 10 day public review and comment period. CARB will forward to the applicant all comments identifying potential factual or methodological errors. Within 30 days, the applicant must either submit a revised application addressing the comments or a detailed response explaining why no revisions are necessary.

The application will then be submitted for approval by CARB's Executive Officer or designee. 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

In order to earn LCFS credits following project approval, the applicant will be required to report on a quarterly basis beginning with the quarter in which the project is approved.

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.

[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

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 quarter (kWh);
6. Metered data on total electricity consumed at the crude oil production or transport facilities during the quarter (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).

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.

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

Starting in 2020, 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. Within 30 days of receiving reports from California refineries detailing crude names and 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.

CONTACT

After reviewing this document, if you have additional questions please contact CARB staff:

Questions about innovative crude method application:

Jim Duffy: James.Duffy@arb.ca.gov
Jiqing Fan: Jiqing.Fan@arb.ca.gov

Questions about reporting to the LCFS Reporting Tool and Credit Bank and Transfer System (LRT-CBTS):

Rachel Connors: Rachel.Connors@arb.ca.gov
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APPENDIX A: THRESHOLD CALCULATION

The innovative method must achieve one of the following threshold criteria:

1. An emissions reduction of at least 5,000 metric tons CO_2e per year, or
2. A carbon intensity reduction from the comparison baseline of at least 0.10 gCO_2e/MJ.

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 transport crude oil with innovative methods using solar or wind based must be calculated as specified below:

$$Credits_{Innov}(MT) = 511 \times \frac{E_{electricity} \times f_{renew}}{V_{crudeproduced}} \times V_{Innov} \times C$$

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;

A carbon intensity reduction from the comparison baseline is estimated using the following equation:

$$\Delta CI_{Innov}\left(\frac{gCO_2e}{MJ}\right) = \frac{Emission\ Reduction\left(\frac{MTCO_{2e}}{yr}\right) \times \frac{10^6\ gCO_{2e}}{MTCO_{2e}}}{V_{crudeproduced}\left(\frac{bbl}{yr}\right) \times LHV_{crude}\left(\frac{MJ}{bbl}\right)}$$

For convenience, approximate lower heating values (LHV_{crude}) are shown in Table A1 as a function of crude density (API gravity or specific gravity).

Table A1: Crude oil heating values

Degree API	SG	LHV (MJ/bbl)
8	1.01	6437
9	1.01	6412
10	1	6381
11	0.99	6355
12	0.99	6324
13	0.98	6294
14	0.97	6268
15	0.97	6237
16	0.96	6211
17	0.95	6180
18	0.95	6150
19	0.94	6124
20	0.93	6093
21	0.93	6067
22	0.92	6037
23	0.92	6011
24	0.91	5984
25	0.9	5953
26	0.9	5927
27	0.89	5901
28	0.89	5875
29	0.88	5844
30	0.88	5818
31	0.87	5792
32	0.87	5766
33	0.86	5740
34	0.85	5714

Degree API	SG	LHV (MJ/bbl)
35	0.85	5687
36	0.84	5652
37	0.84	5635
38	0.83	5609
39	0.83	5582
40	0.83	5556
41	0.82	5530
42	0.82	5508
43	0.81	5482
44	0.81	5456
45	0.8	5430