



LCFS Guidance

Revised: October 2023



Low Carbon Fuel Standard (LCFS) Guidance 19-01

Book-and-Claim Accounting for Low-CI Electricity

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 designed to summarize and describe LCFS Regulation requirements related to the use of book-and-claim accounting¹ for indirectly supplied low-CI electricity, including zero-CI electricity.² Appendix A in this guidance provides step-by-step instructions for using the Western Renewable Energy Generation Information System (WREGIS) to retire renewable energy certificates (RECs) for low-CI electricity claimed in the LCFS. For reporting transactions in Q1 2019 and onwards, the LCFS recognizes the use of book-and-claim accounting of environmental attributes³ for electricity that is either used as a transportation fuel or used in

¹ Book-and-claim accounting refers to the chain-of-custody model in which decoupled environmental attributes, such as Renewable Energy Certificates, are used to represent the ownership and transfer of transportation fuel under the LCFS without regard to physical traceability.

² All citations to the LCFS Regulation are found in Title 17, California Code of Regulations (CCR), sections 95480-95503. Book-and-claim accounting is primarily addressed in section 95488.8(i) of the LCFS Regulation.

³ For the purposes of the LCFS Regulation, "Environmental Attribute" means greenhouse gas emission reduction recognition in any form, including verified emission reductions, voluntary emission reductions, offsets, allowances, credits, avoided compliance costs, emission rights and authorizations under any law or regulation, or any emission reduction registry, trading system, or reporting or reduction program for

electrolysis to produce hydrogen for transportation purposes (including hydrogen that is used in the production of a transportation fuel).

BOOK-AND-CLAIM REQUIREMENTS FOR LOW-CI ELECTRICITY PATHWAYS

1. *Deliverability.* The low-CI electricity used must be supplied to the grid by a resource located within a California Balancing Authority (or local balancing authority for electrolytic hydrogen produced outside of California). Alternatively, to show electricity generated from an out-of-state resource was supplied to the California grid, the low-CI electricity must meet the deliverability requirements of California Public Utilities Code section 399.16, subdivision (b)(1) which details the deliverability requirements for Portfolio Content Category 1 Renewable Energy Certificates.
2. *Additionality.* The low-CI electricity used must be in addition to California Renewables Portfolio Standard (RPS) requirements (or local renewable requirements for electrolytic hydrogen produced outside of California), and RECs or other environmental attributes of the electricity cannot be claimed under any other program with the exception of the federal Renewable Fuel Standard (RFS) and California's Cap-and-Trade program (provided that the low-CI electricity is not claimed in the Cap-and-Trade Program's Voluntary Renewable Electricity (VRE) program, which prohibits claims on the renewable electricity or the use of RECs in any other voluntary or mandatory program).⁴ In order to demonstrate additionality to the RPS, RECs must be retired in WREGIS on behalf of the LCFS for all low-CI generation sources that are eligible to generate RECs in WREGIS. The quantity of RECs retired must correspond to the aggregate electricity quantities reported quarterly⁵ and must be retired into the LCFS-specific WREGIS sub-account corresponding to the fuel pathway code used for reporting.⁶
3. *Time Limit.* Book-and-claim accounting for low-CI electricity may span only three quarters. If a quantity of low-CI electricity (and all associated environmental attributes, including a beneficial CI) is supplied to the grid in the first calendar quarter, the quantity claimed for LCFS reporting must be matched

greenhouse gas emissions that is established, certified, maintained, or recognized by any international, governmental, or nongovernmental agency. (LCFS Regulation section 95481(a)(47).)

⁴ See Section 95841.1(b)(1)(E) of the Cap-and-Trade Regulation in Title 17, CCR. VRE questions may be directed to: vreprogram@arb.ca.gov.

⁵ REC retirements must be rounded up to whole quantities reported for each pathway for each quarter. The quantity of RECs may be aggregated over multiple fueling supply equipment (FSE), but must be equal to or greater than the quantity of electricity claimed per fuel pathway code.

⁶ Electricity claimed as low-CI process energy to reduce a fuel pathway's carbon intensity score per section 95488.8(h)(1)(A) may not also claim the associated process-electricity RECs using book-and-claim accounting.

to grid electricity used as a transportation fuel or for electrolytic hydrogen production no later than the end of the third calendar quarter.

Q1	Q2	Q3	Q4
"X" MWh electricity generated	"X" RECs listed in WREGIS for "X" MWh		
Electricity (kWh) dispensed in Q1	Electricity (kWh) dispensed in Q2	Electricity (kWh) dispensed in Q3	
	Data reported for Q1	Data reported for Q2	Data reported for Q3
	"X" RECs can be retired and matched with electricity supplied and reported in the LCFS for Q1, Q2 or Q3		



Three quarters allowed for book-and-claim accounting

Figure 1. Three Quarter Limit for Book-and-Claim Accounting (Example)

DEMONSTRATING SUPPLY OF LOW-CI ELECTRICITY

Options for demonstrating the supply of low-CI electricity through book-and-claim accounting (section 95488.8(i)(1)) are through enrollment in a Green Tariff program offered through a utility or other load-serving entity, or through a contractual electricity supply relationship, including the retirement of Renewable Energy Certificates (REC).

General requirements for demonstrating supply of low-CI electricity using book-and-claim accounting:

- **Through Participation in a Green Tariff Program⁷**
 - Any uniquely defined rate tariff option to purchase electricity from a pool of renewable or low-carbon resources that an electricity consumer knowingly opts into may be considered a green tariff program under the LCFS.
 - The Fuel Pathway Applicant must be the Load Serving Entity (LSE) offering a green tariff program. Apply in the Alternative Fuel Portal (AFP) to obtain a certified CI based on the resource mix of the specific green tariff.

⁷ "Green Tariff" means a program in which a retail seller of electricity offers its customers an opportunity to purchase electricity sourced from low-carbon intensity energy resources. This includes the Green Tariff Shared Renewables program established pursuant to California Senate Bill 43 (2013) and defined under the California Public Utilities Code sections 2831-2833. (LCFS Regulation section 95481(a)(68)).

- If the green tariff has any resources eligible for registration in WREGIS, the LSE must use WREGIS to demonstrate REC retirement for the aggregate quantity of low-CI electricity that is claimed under the LCFS in each quarterly report in the LCFS Reporting Tool (LRT) (see Appendix A for details on REC retirement and reporting).
- The Fuel Reporting Entity registers in the LRT to report using the certified CI for their LSE's green tariff mix.
- The Fuel Reporting Entity must demonstrate enrollment in the specific green tariff.
- **Through Other Contractual Supply Relationship**
 - The procurement of RECs using WREGIS is considered a qualifying contractual electricity supply relationship under the LCFS.⁸
 - The Fuel Pathway Applicant applies in the AFP to obtain a certified CI based on the resource or resource mix of RECs to be matched to electricity used in transportation (e.g., EV charging) or electrolytic hydrogen production. For Lookup Table pathways, the Fuel Pathway Applicant must also be the Fuel Reporting Entity.
 - The Fuel Reporting Entity registers in the LRT to report using the certified CI.
 - The Fuel Reporting Entity must demonstrate an active account in WREGIS under the same entity name used for reporting in the LRT.
 - The Fuel Reporting Entity must demonstrate REC retirement on behalf of the LCFS for the aggregate quantity of low-CI electricity that is claimed under the LCFS in each quarterly report in the LRT (see Appendix A for details on REC retirement and reporting).

See Appendix A for details on retiring RECs in WREGIS and for demonstrating that the generation source meets the deliverability requirements specified above.⁹

PATHWAY APPLICATION OPTIONS FOR LOW-CI ELECTRICITY

In order to claim low-CI electricity, a fuel pathway application must be certified through the Alternative Fuels Portal. Sections 95488 through 95488.10 of the LCFS Regulation provide details on applying for a fuel pathway.

There are two fuel pathway classifications (application methods) for low-CI electricity:
(1) a Lookup Table Pathway, or

⁸ Demonstration requirements for low-CI resources that are not eligible to be registered within WREGIS (e.g., natural gas with carbon capture and sequestration, or nuclear) will be evaluated during the Tier 2 pathway application certification process.

⁹ Additional documentation to substantiate scheduling and deliverability of electricity will likely be requested for any low-CI resources obtained from outside a California Balancing Authority that are not eligible to be registered in WREGIS.

(2) a Tier 2 Pathway

The electricity resource mix determines whether an applicant can use the Lookup Table or Tier 2 application method. Under the Retirement of RECs option, the resource mix consists of the underlying sources of electricity that generate the RECs. For the Green Tariff option, the resource mix consists of all sources of electricity that are procured to provide the tariff.

The following diagram outlines the possible pathway application methods for electricity and electrolytic hydrogen. Pathways under which low-CI electricity can be supplied through book-and-claim accounting are shown with blue fill.

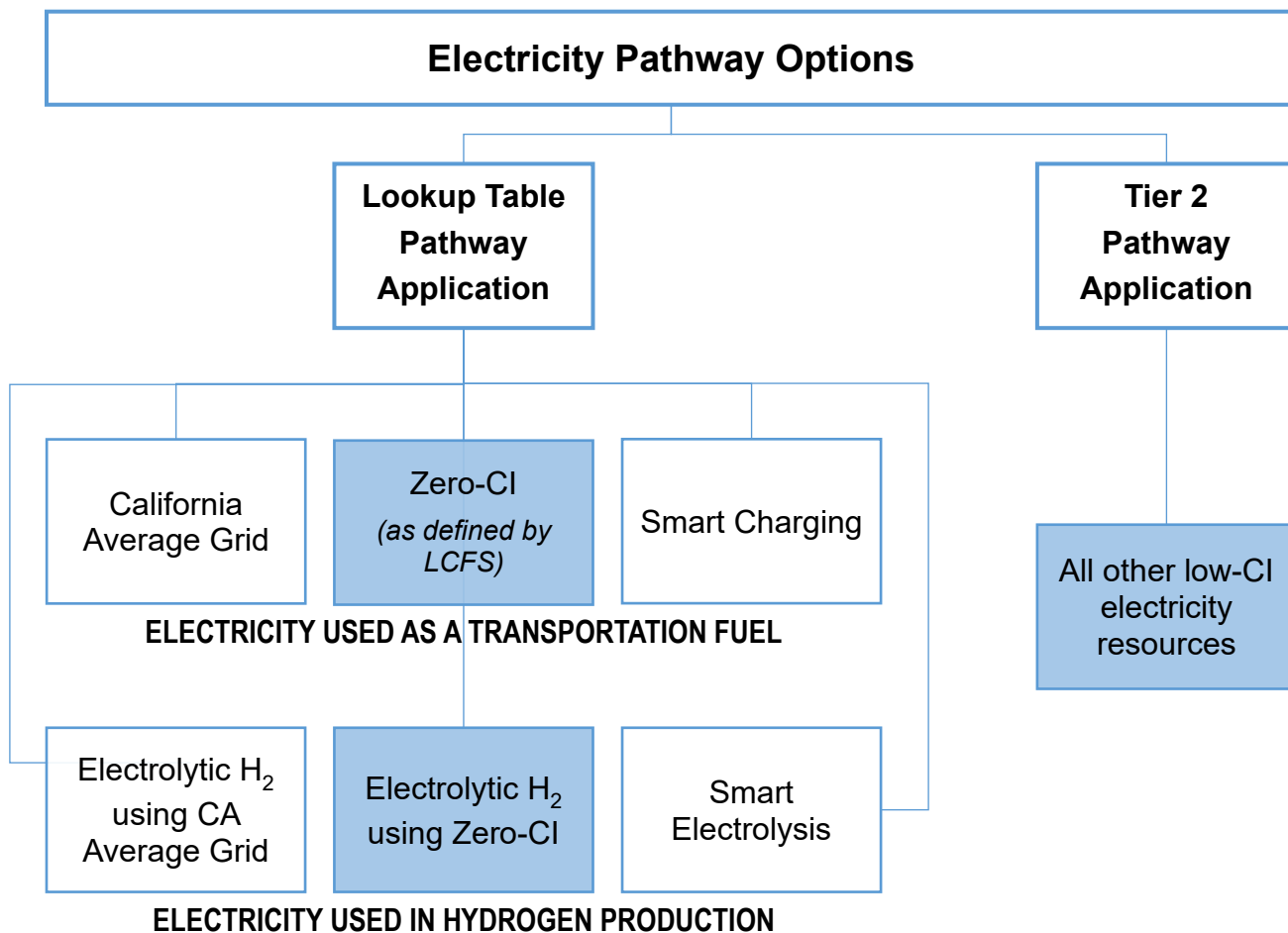


Figure 2. Pathways for Electricity and Electrolytic Hydrogen

1. ZERO-CI ELECTRICITY LOOKUP TABLE PATHWAY

The Zero-CI Lookup Table Pathway may be used when the resource mix consists exclusively of zero-CI sources of electricity. Under the LCFS accounting framework, the following are defined as zero-CI sources:¹⁰

“eligible renewable energy resources as defined in California Public Utilities Code sections 399.11-399.36, excluding biomass, biomethane, geothermal, and municipal solid waste.”

Therefore, a mix comprised solely of RPS-eligible resources, e.g., solar thermal, photovoltaic, wind, RPS-eligible hydroelectric generation, ocean wave, ocean thermal, or tidal current, may be certified to use the Zero-CI Lookup Table pathway CI.

Refer to the Application Checklist for the Zero-CI Lookup Table pathway, available at <https://www.arb.ca.gov/fuels/lcfs/fuelpathways/pathwayapplicationprocess.htm> for specific documentation requirements.



Only RECs from **zero-CI sources** may be retired to demonstrate supply of electricity reported using the zero-CI Lookup Table pathway. If ineligible RECs are retired, the fuel pathway holder is out of compliance and subject to investigation by the Executive Officer and possible enforcement action.

If the resource mix contains any source that is not zero-CI as defined in the LCFS regulation, then the applicant may report using the Lookup Table CI for California Average Grid Electricity,¹¹ or may submit a Tier 2 Fuel Pathway application for low-CI electricity. To report using the California Average Grid Electricity pathway CI, a fuel pathway application is not required.¹²

2. TIER 2 FUEL PATHWAY

A Tier 2 Fuel Pathway Application is required for any particular low-CI generation source or for a resource mix that includes one or more generation sources that do not qualify for a zero-CI Lookup Table pathway as outlined above, which includes any non-RPS eligible resources. The Tier 2 application will require the submittal of a completed CA-GREET3.0 model for each source of electricity in the resource mix, except for zero-CI sources as defined above.

¹⁰ Lookup Table pathways are listed in section 95488.1(b) of the LCFS regulation. Zero-CI sources are specified in section 95488.1(b)(2)(A). The CI application process is described in section 95488.5.

¹¹ See CA-GREET3.0 Lookup Table Pathways – Technical Support Documentation (August 13, 2018) for additional details related to the California Average Grid Electricity and other Lookup Table pathway CI calculations. Available at: <https://www.arb.ca.gov/fuels/lcfs/ca-greet/ca-greet.htm>.

¹² Lookup Table pathways that do not require a fuel pathway application are listed in section 95488.1(b)(1).

Refer to the Application Checklist for Tier 2 Electricity pathways, available at <https://www.arb.ca.gov/fuels/lcfs/fuelpathways/pathwayapplicationprocess.htm> for specific documentation requirements.



If the operational CI of the resource mix exceeds the certified Tier 2 pathway CI, the fuel pathway holder is out of compliance and subject to credit adjustment and possible enforcement action. An exceedance of CI may occur as a result of a change in the projected proportion of electricity from each source in the resource mix, or due to a change in the emissions of a single resource or generating unit.

3. ELECTROLYTIC HYDROGEN FUEL PATHWAYS

Similar to electricity pathways, hydrogen providers may submit a Lookup Table pathway application for hydrogen produced by electrolysis using California average grid electricity, using zero-CI electricity, or a Tier 2 pathway application for electrolysis using non-zero CI electricity resources.

VERIFICATION CONSIDERATIONS FOR BOOK-AND-CLAIM LOW-CI ELECTRICITY

Zero-CI electricity and electrolytic hydrogen Lookup Table pathways do not require third-party validation or verification because they do not contain site-specific CI data. Fuel pathways with site-specific CI data (e.g., Tier 2 fuel pathways) require validation of applications beginning in 2020 and verification of annual fuel pathway reports in 2021 by CARB-accredited LCFS third-party verification bodies; See sections 95500(a)(1)(A) and 95500(b)(1)(A). Renewable hydrogen refinery projects also require verification by CARB-accredited third-party verification bodies beginning with 2020 data (section 95500(e)).

Tier 2 fuel pathway holders or reporting entities using Tier 2 fuel pathways and entities reporting renewable hydrogen refinery projects must provide evidence demonstrating supply of low-CI electricity using book-and-claim accounting to their verifiers. This may include evidence pertaining to the green tariff program and REC retirement (i.e. WREGIS reports), as applicable.

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

RETIRING RENEWABLE ENERGY CERTIFICATES FOR LOW-CI ELECTRICITY CLAIMED IN THE LCFS

Using Renewable Energy Certificates (REC) to demonstrate supply of low-CI electricity claimed in the LCFS can be broken down into the following steps:

- Registering your organization with the Western Renewable Energy Generation Information System (WREGIS).
 - Creating and naming an LCFS retirement account.
- Retiring eligible RECs in WREGIS.
- Demonstrating REC Retirement in the LCFS (Quarterly Reporting).
 - Submitting documentation.
- Importing E-Tags into WREGIS (if applicable).
 - Submitting a CA E-Tags Report (if applicable).
- Tier 2 fuel pathway applicants/holders and renewable hydrogen refineries would provide evidence pertaining to participation in a green tariff program and REC retirement (i.e. WREGIS reports), as applicable, to their verifiers.

WREGIS Registration:

1. Register your organization in WREGIS (Please contact WREGIS regarding their organization registration guide, which will be updated by January 2023).
2. All generation units that produce electricity intended to be claimed in LCFS for low-CI electricity pathways or electrolytic hydrogen must be registered in WREGIS (generating unit registration guide can be found [here](#))—or equivalent REC registry for electrolytic hydrogen produced outside of The Western Electricity Coordinating Council (WECC).
3. Create a retirement Account in WREGIS named “LCFS compliance **[pathway]**” where **[pathway]** is a placeholder for the fuel pathway code or description for the LCFS pathway for which RECs are being retired.
 - a. e.g. “LCFS compliance ELCR” would be the account name for retiring RECs to demonstrate compliance under the zero-CI Lookup Table pathway.

REC Retirement in WREGIS:

1. Retire all RECs claimed under LCFS into the LCFS compliance retirement account.
2. From the “Certificates” section, use the filters to locate the certificate batches that you wish to retire. Check the box(es) next to the desired batches and click on “retire” at the top right of the screen. Please note that in state and out of state RECs should be retired in separate transactions.
3. Verify the selected certificate batches and adjust the certificate numbers in each batch, if needed. Click “Next.”
4. Use the radio button to select “Compliance,” a dropdown menu will appear.

5. In the "Type" dropdown, select "Other-Non-RPS Compliance."
6. Using the dropdown menus, select "California" as the "State" and choose the compliance period for which you are retiring RECs.
7. In the notes box, indicate the compliance quarter and whether the RECs are in state or out of state. Ex: Q1 In State. Click "Next."
8. Select the appropriate LCFS retirement account. You can search the available accounts by typing the name at the top of the display screen. Click "Review."
9. Carefully review the batches and reasons selected for retirement. If all is correct, click "Retire." The system will display a "Success" message.

Demonstrating REC Retirement in the LCFS (Quarterly Reporting):

To provide records demonstrating compliance for any given period, download a report of certificates retired by doing the following:

1. From the "Accounts" section, click on the "Retirement" tab.
2. Click on the "Quantity (RECs) hyperlink for the retirement account used for compliance.
3. Use the filters to display only the retired certificates for the specific compliance period.
4. Download the report in CSV and PDF format using the download arrow on the upper right side of the screen.
5. Save the downloaded file and include it as a supplementary file in the applicable Quarterly Fuels Transactions Report or Annual Fuel Pathway Report.



Don't forget to download a report from WREGIS and **upload a copy to the LCFS Reporting Tool** with your quarterly report.

Importing E-Tags into your WREGIS Account:

This only applies to entities who utilize RECs from generating sources outside of a California Balancing Authority. [Instructions](#) for having e-Tags imported into a WREGIS account and then matching those e-Tags to RECs are posted to the WREGIS webpage.

Demonstrating e-Tag usage for retired RECs:

To provide a report demonstrating the appropriate use of e-Tags for any given period, download a report of e-Tags matched with reported RECs by doing the following:

1. From the "Certificates" section, click on the "e-Tag Details" tab, which will bring up all certificates that have e-Tags attached.
2. Use the filters to display the e-Tagged, retired certificates for the compliance period.

3. Download the report using the download arrow on the upper right side of the screen.
4. Save the downloaded file and upload to the LCFS Reporting Tool with your quarterly report.