



## Low Carbon Fuel Standard (LCFS) Guidance 19-08

### Fuel Pathway Allocation for Produced Fuel and Quarterly Fuel Transactions Reporting

#### 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.

#### APPLICABILITY

This guidance document is designed to summarize and describe reporting and recordkeeping requirements in the LCFS Regulation<sup>1</sup> for a fuel producer or fuel reporting entity who may assign different carbon intensities (CI) to portions of fuel produced,<sup>2</sup> under the following cases:

- Multiple feedstocks are simultaneously processed (e.g., biodiesel, renewable diesel, alternative jet fuel, corn and sorghum starch ethanol);<sup>3</sup>
- Chemical analysis is used to determine yield (e.g., starch and fiber ethanol);<sup>4</sup> and
- Two or more co-products are simultaneously produced.<sup>5</sup>

---

<sup>1</sup> All citations to the LCFS Regulation are title 17 to the California Code of Regulation (CCR), sections 95480-95503.

<sup>2</sup> Section 95488.4(c)-(e) describes the conditions under which a fuel producer or reporting entity may assign different CIs to portions of fuel produced.

<sup>3</sup> Section 95491(d)(1)(C) specifies the methods to allocate feedstocks to quantities of fuel produced under each certified fuel pathway code (FPC).

<sup>4</sup> Section 95491(d)(1)(C)3. specifies that the most recent prior chemical analysis data must be used to calculate yield and determine quantities of fuel to associate with each FPC.

<sup>5</sup> Section 95488.4(e)(2) specifies that the proportion of the co-product stream is used to determine quantities of fuel to associate with each FPC.

## DRAFT

This guidance describes fuel pathway allocation methods for the production of a single fuel, and does not apply to the renewable portion of a diesel fuel derived from co-processing biomass with a petroleum feedstock, which is defined in the regulation as a separate fuel type.<sup>6</sup>

Beginning Q1 2019, fuel reporting entities and fuel producers must use fuel pathway allocation methods specified in the regulation. Fuel reporting entities and fuel producers may use an alternate methodology than prescribed in the regulation if they have prior approval from CARB. In order for CARB to review and approve an alternate method, fuel reporting entities and fuel producers must submit their proposed allocation methodology at the time of application.<sup>7</sup> Recordkeeping by the fuel producer or fuel reporting entity must demonstrate how the fuel pathway allocation method(s) are followed for labeling units of fuel for sale in product transfer documents, or similar documents, and for reporting quarterly fuel transactions.

### MULTIPLE FEEDSTOCKS USING FEEDSTOCK INVENTORY ACCOUNTING

If a fuel production facility simultaneously processes multiple feedstocks, pursuant to section 95491(d)(1)(C)1.a. of the LCFS Regulation, the following fuel pathway allocation methodology must be used:

$$Q_{Fuel\ i}^n = Y_{average\ yield} \times Q_{Feedstock\ i}^n$$

where:

- $Q_{Fuel\ i}^n$  is the quantity of produced fuel with a fuel pathway  $i$  at a production facility during reporting period  $n$ .
- $Y_{average\ yield}$  is the facility's average production yield for all feedstocks as determined during pathway certification.
- $Q_{Feedstock\ i}^n$  is the quantity of feedstock counted as processed for a fuel pathway  $i$  at a production facility during reporting period  $n$ .

The inventory accounting system, whether computerized or manual, must maintain a quarterly material balance of all feedstocks processed at the facility. The producer or fuel reporting entity must associate each portion of the total fuel produced with feedstocks in inventory and received by the fuel production facility during a reporting period (calendar quarter), regardless of whether those units were sold to California. Feedstock quantities must not be counted more than once for any fuel produced. Monthly ending feedstock inventories may be negative, but quarterly ending feedstock inventories must not be negative. Quantities of feedstock must be associated with produced fuel under the following constraints.

---

<sup>6</sup> Section 95481(123)

<sup>7</sup> Section 95491(d)(1)(C)2.

## DRAFT

- If the quantity of fuel produced during a reporting period is greater than the quantity calculated above (i.e., if the actual yield exceeds the historical average yield calculated during certification), then determine how to report the additional fuel:
  - If all feedstocks in inventory and received by the production facility during the reporting period were associated with certified pathways, then the additional fuel must be reported under the fuel pathway with the highest CI associated with those feedstocks;<sup>8</sup> or
  - If feedstocks in inventory and received by the production facility during the reporting period were *not* included in the fuel pathway application, or were *not* associated with a certified fuel pathway, the additional fuel must be reported under a Temporary pathway<sup>9</sup> or it may not be claimed for LCFS credit generation. Please contact CARB to apply for the use of a Temporary pathway.
- The quantity of fuel reported to the LCFS Reporting Tool and Credit Bank & Transfer System (LRT-CBTS) per pathway must always be constrained by the physical quantity of fuel produced during a reporting period (i.e., if the actual yield is less than the average yield).

An example of quarterly balance calculations is provided in the Appendix for a biodiesel facility that processes multiple feedstocks.

### **MULTIPLE FEEDSTOCKS USING CHEMICAL ANALYSIS OF CALCULATED YIELD**

Facilities with multiple certified fuel pathways that do not use feedstock inventory accounting must use chemical analysis data supporting the calculated yield in annual Fuel Pathway Reports. The fuel producer or fuel reporting entity must use the yield calculated from the most recent analysis to determine the quantities of reported fuel associated with that feedstock.<sup>10</sup>

The cellulosic converted fraction is the percentage of total ethanol produced that is eligible to be claimed under the certified CI for fiber ethanol, based on a CARB-approved chemical analysis test procedure and calculation method. The chemical analysis method must be submitted with the fuel pathway application for approval by CARB.<sup>11</sup> Any change in the test method used to determine cellulosic converted fraction must be approved by CARB. The converted fraction is subject to the following constraints.<sup>12</sup>

- The cellulosic converted fraction expires 365 days after the previous chemical analysis test date or within 10 business days of producing 500,000 gallons of fiber ethanol after the previous test date, whichever occurs first.

---

<sup>8</sup> Section 95491(d)(1)(C)1.b.

<sup>9</sup> Section 95488.9(b), Table 8. Temporary Pathways for Fuels with Indeterminate CIs.

<sup>10</sup> Section 95491(d)(1)(C)3.

<sup>11</sup>Tier 1 Simplified CI Calculator for Starch and Fiber Ethanol, August 13, 2018, section 95488.3(b)(1)

<sup>12</sup>[Web address for Tier 1 Simplified CI Calculator for Starch and Fiber Ethanol and Instruction Manual.](#)

## DRAFT

- The fuel pathway holder must change its reporting constraint (i.e., yield calculation) within five business days of receiving a new cellulosic converted fraction test result and apply the new converted fraction result to subsequent fuel production. A reporting entity must therefore also report using the most recent converted fraction analysis.

Quantities of fiber ethanol produced during the period of an expired test result are not eligible to be reported under a fiber ethanol pathway for credit generation in the LRT-CBTS; the total volume of ethanol produced during this period may be reported for credit generation under a certified starch ethanol pathway. Physical inventory at the end of each quarter constrains the fiber ethanol gallons available for rollover into the next calendar quarter. All fuel sold must result in drawdown from inventory of quantities of fuel eligible to be sold per pathway. Once a fuel is reported in the LRT-CBTS, fiber ethanol, like all liquid fuels, is constrained by a three quarter limit for reporting transactions with obligation.<sup>13</sup>

### MULTIPLE CO-PRODUCTS

When two or more co-products are being simultaneously produced, the fuel producer or fuel reporting entity must either report all fuel produced under a single, composite CI or may assign different CIs to portions of the fuel produced.<sup>14</sup> For example, a corn ethanol plant may dry only a portion of the distiller's grains it produces; a portion of the distiller's grains produced is sold dry and the remainder is sold wet.

If the production facility has separate certified pathways associated with the production of each co-product, the producer or fuel reporting entity must associate the produced fuel in proportion to the bone dry co-product stream fraction that each co-product comprises.<sup>15</sup>

### RECORDKEEPING REQUIREMENTS

When units of produced fuel with different CIs are comingled, fuel producers and fuel reporting entities must associate a CI with each unit of fuel sold in California, as set forth in section 95488.4(b). Fuels reported in the LRT-CBTS must have an auditable supply chain demonstrating that fuel quantities, of a certain pathway, can be traced back to production. Section 95491.1(a)(1) requires fuel reporting entities to maintain all records and calculations relied upon for data reported in the LRT-CBTS, which includes but is not limited to the following:

- Product transfer documents;
- Copies of data reports submitted to CARB;
- Records related to each fuel transaction;
- Chain of custody evidence for a produced fuel imported to California; and

---

<sup>13</sup> Section 95483(a)(3).

<sup>14</sup> Section 95488.4(e)

<sup>15</sup> Section 95488.4(e)(2)

## DRAFT

- Records used for compliance or credit and deficit calculations.

Entities are required by section 95491.1 to document fuel transfers reported in the LRT-CBTS. Pursuant to section 95483(a), liquid fuel reporting entities must provide a product transfer document (PTD) to downstream parties that includes each CI of the produced fuel if multiple pathways are claimed in a given fuel amount.

### **MONITORING PLAN AND THIRD-PARTY VERIFICATION OF ALLOCATION METHODOLOGY**

Entities responsible for obtaining a validation or verification statement<sup>16</sup> must complete and retain for review by a third-party verifier, or CARB, a written monitoring plan. Fuel producers or fuel reporting entities must document the fuel pathway allocation methodology in their monitoring plan.<sup>17</sup> The monitoring plan must either cite one of the fuel pathway allocation methodologies in the LCFS regulation section, or if an alternate method has been approved, the alternate method must be described in detail and the monitoring plan must document CARB's approval.

Entities subject to verification of the annual Fuel Pathway Report (CI data)<sup>18</sup> must ensure that a verification statement is submitted to CARB annually by August 31, beginning in 2021 for the 2020 data report, which includes operations data for the last two calendar years (2019 and 2020), and annually thereafter, unless eligible to defer verification as specified in section 95500(b)(2)(B). Entities required to contract for verification of these reports must develop and maintain a monitoring plan for 2019 operations data and thereafter.

Entities subject to verification of Quarterly Fuel Transactions Reports<sup>19</sup> must ensure a verification statement is submitted annually by August 31, beginning in 2021, for the previous year's transaction data (2020). Entities required to contract for verification of these reports must develop and maintain a monitoring plan for 2020 transactions data and thereafter.

Entities reporting pursuant to LCFS and the Regulation for the Mandatory Reporting of Greenhouse Gas Emissions may use a single monitoring plan if all required elements are included and clearly indicated.<sup>20</sup>

LCFS verification will include a review of feedstock acquisition and fuel production regardless of final market to assure no double counting of feedstock attributes. Verifiers will use the fuel pathway allocation methodology described in the monitoring plan to test conformance with this requirement using source records, such as feedstock invoices

---

<sup>16</sup> Those subject to verification are defined in sections 95500(a) through (f).

<sup>17</sup> Refer to section 95491.1(c) for the requirements of the monitoring plan, including fuel pathway allocation methodology in section 95491.1(c)(1)(Q).

<sup>18</sup> Entities subject to verification of the annual Fuel Pathway Report are listed in section 95500(b)(1).

<sup>19</sup> See section 95500(c).

<sup>20</sup> Section 95491.1(c).

## DRAFT

and fuel sales receipts, to determine the amount of fuel eligible to be reported for a given pathway in the quarterly reporting period.

### **CONTACT**

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

## DRAFT

### APPENDIX

#### ***Example: Multi-Feedstock Fuel Pathway Allocation***

A biodiesel facility processes commingled feedstocks in varying quantities and must determine the quantity of biodiesel eligible to report per fuel pathway using the method prescribed in section 95491(d)(1)(C)1. In quarter 1, a facility processes 20,000 pounds of used cooking oil (UCO), 60,000 pounds of animal fat, and 10,000 pounds of distiller's corn oil (DCO) to produce 10,203 total gallons of biodiesel. In quarter 2, the facility processes 45,000 pounds of UCO and 45,000 pounds of animal fat to produce 10,500 total gallons of biodiesel. In quarter 3, the facility processes 30,000 pounds of animal fat, 30,000 pounds of DCO and 30,000 pounds of an uncertified and unknown feedstock to produce 10,500 total gallons of biodiesel. In quarter 4, the facility processes 20,000 pounds of UCO, 60,000 pounds of animal fat and 10,000 pounds of DCO to produce 10,000 total gallons of biodiesel. The facility's average yield for all feedstocks as determined during pathway certification is 0.84 pounds of biodiesel per pound of feedstock. In the tables below, physical quantities are shown in green and calculated quantities are shown in blue.

Step 1: Tabulate the quantity of feedstock in inventory and received at the facility during each quarter. An example is shown in Table 1.

Step 2: Calculate the quantity of fuel eligible to report per pathway using (1) the average yield as determined at the time of certification and (2) the CA-GREET3.0 density for biodiesel (7.410 lbs./gal). See the example calculation below for UCO in quarter 1. The calculated quantity of biodiesel eligible to be reported per feedstock is shown in Table 2, rounded to full gallons (integers).

Step 3: Perform quarterly balances as shown in Table 3, considering the lesser of (1) measured physical production (green column) and (2) the sum of the calculated biodiesel quantities per pathway (blue column). Quarters 2 and 3 are constrained by the calculated biodiesel produced (blue column). In quarter 2, the excess biodiesel is reported under the animal fat pathway because DCO (the certified feedstock with the highest CI) was not in inventory or received during that quarter. In quarter 3, because an unknown feedstock was in inventory, the additional biodiesel produced is associated with "other feedstock" and must be reported under the Temporary pathway for biomass-based diesel produced from any feedstock. In quarter 4, the total biodiesel eligible to be reported in LRT-CBTS is constrained by actual physical production. The fuel producer may select the quantities of feedstock to count as processed in the inventory such that the eligible biodiesel quantities per feedstock type are not exceeded and the actual biodiesel production is not exceeded. In quarter 4, the fuel producer chooses to label the biodiesel as shown in Table 3.

**DRAFT**

Table 1: Feedstock in inventory and received listed in pounds for each quarter.

Balance Period (Calendar Quarter)	UCO [lbs.]	Animal Fat [lbs.]	DCO [lbs.]	Other [lbs.]
Quarter 1 Actual yield = Average yield	20,000	60,000	10,000	-
Quarter 2 Actual yield > Average yield	45,000	45,000	-	-
Quarter 3 Actual yield > Average yield	-	30,000	30,000	30,000
Quarter 4 Actual yield < Average yield	20,000	60,000	10,000	-

Example Calculation for Quarter 1, Biodiesel Eligible for UCO Fuel Pathway:

$$20,000 \text{ lbs UCO} \times 0.84 \frac{\text{lbs BD}}{\text{lbs UCO}} \times \frac{\text{gal BD}}{7.410 \text{ lb BD}} =$$

*2,267 gallons of BD eligible to be reported under UCO pathway in Quarter 1*

Table 2: Calculated quantity of fuel eligible to report per pathway

Balance Period (Calendar Quarter)	Gallons Attributable to UCO	Gallons Attributable to Animal Fat	Gallons Attributable to DCO	Gallons Attributable to Other Feedstock
Quarter 1 Actual yield = Average yield	2,267	6,802	1,134	-
Quarter 2 Actual yield > Average yield	5,101	5,101	-	-
Quarter 3 Actual yield > Average yield	-	3,401	3,401	3,401
Quarter 4 Actual yield < Average yield	2,267	6,802	1,134	-



**DRAFT**

Table 3: Total quantity of biodiesel calculated in step 2 (blue column), the biodiesel produced in each quarter (green column), and the amount of biodiesel eligible to report per fuel pathway (calculation shown).

Balance Period (Calendar Quarter)	Calculated Biodiesel [gallons]	Produced Biodiesel [gallons]	UCO CI = 40 [gallons]	Animal Fat CI = 45 [gallons]	DCO CI = 65 [gallons]	Temporary FPC CI = 100.45 [gallons]
Quarter 1 Actual yield = Average yield	10,203	10,203	2,267	6,802	1,134	-
Quarter 2 Actual yield > Average yield	10,202	10,500	5,101	10,500 - (5,101) = 5,399	-	-
Quarter 3 Actual yield > Average yield	10,203	10,500	-	3,401	3,401	10,500 - (3,401+3,401) = 3,698
Quarter 4 Actual yield < Average yield	10,203	10,000	2,267	6,802	10,000 - (2,267+6,802) = 931	-