CA LCFS FUEL PATHWAYS: VALIDATION AND VERIFICATION



Eamon Cullinane

Senior Consultant – CA Lead Verifier

January 20, 2022







AGENDA

- o CA LCFS Basics (History, Goals, Mechanism)
- $\,\circ\,$ Life Cycle Analysis and Carbon Intensities
- Overview of Credit Generation and Fuel Pathway Based Crediting
- Overview of Pathway Verification/Validation Process and Timeline
- Conflict of Interest Requirements
- Validation of CA-GREET Calculator and Common Operating Conditions
- Chain of Custody/Point of Origin for Specified Source Feedstocks (UCO, Tallow, etc.)
- Facility Site Visit
- o Operating vs. Certified CI Value
- \circ Validation Outcomes

LOW CARBON FUEL STANDARD

History

- Original adoption in 2009, amended in 2011, re-adopted in 2015, amended in 2018
- In 2009, the Board approved the LCFS regulation to reduce the carbon intensity (CI) of transportation fuel used in California by at least 10% by 2020 from a 2010 baseline.

Goal

- Encourage the use of cleaner low-carbon transportation fuels in California, encourage the production of those fuels, and therefore, reduce GHG emissions and decrease petroleum dependence in the transportation sector.
- Reduce carbon intensity (CI) of transportation fuel pool by at least 20% by 2030.

Mechanism

- Annual Carbon Intensity "CI" Standards/Benchmarks for gasoline and diesel.
- Fuels introduced into the California fuel system that have a CI higher than the benchmark generate deficits.
- Fuels with CIs below the benchmark generate credits.
- Annual compliance is achieved when a regulated party uses credits to match its deficits.



CARBON INTENSITY

Definition

- Carbon intensity is expressed in grams of carbon dioxide equivalent per megajoule of energy provided by that fuel.
- CI takes into account the GHG emissions associated with all of the steps of producing, transporting, and consuming a fuel—also known as a complete life cycle of that fuel.



Source(s): CARB



LIFE CYCLE ANALYSIS

- LCFS life cycle emissions quantification methodology takes into account GHG emissions from the full fuel cycle, referred to as "well-to-wheel" (GREET Model).
- "Well-to-tank" emissions include emissions generated "upstream" (e.g., by feedstock production and transport processes), as well as emissions generated at the fuel production facility and transport of the fuel to California blending terminals or fueling stations.
- The "Tank-to-Wheel" component takes into account use of the fuel in vehicles, incorporating tailpipe emissions and efficiency differences in different vehicle technologies.





REDUCTION TARGETS



Source(s): CARB, TM&C Fuels Regulatory



FUEL PATHWAY CREDIT CALCULATION

Example Credit Calculation						
2020 Diesel CI Standard (gCO2e/MJ) Representative UCO Pathway to BBD (gCO2e/MJ)	92.92			LCF	S Credit \$ / MT	t Price
	-22.0			100	200	300
x Biodiesel Energy Density of Fuel (MJ/gal)	72.92	Feedstock	Typical CI Score (gCO2e/MJ)	RD Incentive, \$/gal		
	8,945	UCO	22	0.89	1.77	2.66
/ 1e6 to convert to CO2e/MT	0.0091974	Corn Oil	33	0.74	1.49	2.23
		Tallow	35	0.72	1.44	2.15
x Current LCFS Credit Price (\$/MT)	200	Soybean or Canola Oil	55	0.46	0.92	1.38

\$/gallon UCO +1.77

Source(s): CARB, TM&C Fuels Regulatory



FUEL PATHWAY-BASED CREDITING

- Under fuel pathway-based crediting, all transportation fuels need a **carbon intensity score** to participate in the LCFS, and the fuel type dictates which process is used to determine that CI.
- Lookup Table: Simplest pathways, including CARBOB and diesel; CI is predetermined by CARB (not subject to verification since no site-specific CI).
- Tier 1: For the most common low carbon fuels; use a Simplified CI Calculator to determine CI.
- Tier 2: For innovative, next generation fuel pathways, including fuel pathways with carbon capture and sequestration, use the full CA-GREET 3.0 model.



Starting in 2020, Tier 1 and Tier 2 pathways require Third-Party Verification Services.

THIRD-PARTY VERIFICATION BODY

- Entities are required to retain the services of independent verifiers accredited by CARB, beginning with 2020 fuel pathway applications and LCFS data reports.
- Only CARB-accredited verification bodies may provide LCFS verification services.
- 30 Accredited Verification Bodies



TM&C: Provided services for 10+ entities and 50+ pathways this past year spanning across Ethanol, Biodiesel, Renewable Diesel, Biogas, Renewable Naphtha, and Sustainable Aviation Fuel.



TIER 1 PATHWAY



Source(s): CARB



TIER 2 PATHWAY





Source(s): CARB

FUEL PATHWAY-BASED CREDITING



VERIFICATION PROCESS DIAGRAM



Source(s): CARB



CONFLICT OF INTEREST (COI)

- COI is any situation that would impair or may be perceived as impairing the verifier's ability to perform an impartial and objective verification (see full definition in §95481).
- Self-assessment of potential COI between the regulated entity and the Verification Body (VB), including members of the verification team, based on recent, current, and emerging relationships
- Five-year lookback for disclosure to CARB and self-assessment
- Continued monitoring, disclosure, and assessment for one year after last verification statement submitted for the client
- VB or regulated entity may request CARB approval prior to contracting.



CONFLICT OF INTEREST

High

- Verification services are prohibited.
- Example: A member of the VB conducts an LCFS readiness audit for the regulated entity.
- Phase-in period: Specified services are deemed medium COI through August 31, 2023, if meet the minimum mitigation plan requirements.

Medium

- Must have Plan to avoid, neutralize, or mitigate, must be submitted to CARB (mitigation plan)
- Example: When personal or family relationships exist between members of the VB and members of the regulated entity

Low

• The value of nonverification services the VB or any member of verification the team provided to the entity within the five-year lookback period is less 20% of the than verification contract value

Excluded from the risk assessment: RFS Attest Engagement Services & RFS Engineering Reviews, et al.

Source(s): CARB, TM&C Fuels Regulatory



DATA CHECKS: SIMPLIFIED CALCULATOR

Requirements

- Confirm the primary sources of data
- Check supporting calculations that provide reported data
- Ask client to demonstrate how they arrive at specific numbers in the report
- Ask client to reproduce a source report used to complete CARB report
- Observe online data acquisition systems and other reporting software in action

Common Issues

- Incorrect units or conversion factors used
- Bad formulas (weighted averages etc.)
- User errors (typed in wrong number)
- Edited a noninput cell
- Incorrect drop-down selections
- Your VB is not your "consultant"



POINT-OF-ORIGIN

Requirements

- A fuel producer processing specified source feedstock(s) is required to demonstrate chain of custody back to the point of origin to mitigate risk of mischaracterization.
- Verifiers will sample chain-of-custody documentation retained by the fuel production facility and may require trader, first collection point, as well as point-of-origin access. In some cases visits to the location of central data management must be included.

Common Issues

- Yellow grease (combination of UCO and animal fat) must be characterized as Animal fat under LCFS if you cannot prove quantities.
- Documents lack clarity on feedstock characterization (e.g., UCO/Yellow Grease/Animal Fat)
- Missing contact information for various entities in the chain of custody
- Did not have agreements in place with upstream entities to help verification process





FACILITY SITE VISIT

Requirements

- Visits to multiple sites may be required when more than one facility contributes site-specific CI data to the fuel pathway application.
- In some cases visits to the location of central data management must be included.
- Verify equipment (meters, etc.)
- Observe major high-risk sources (take pictures with permission)
- Confirm all emissions/fuel sources

Common Issues

- Did not have intermediate facility registered or aware of site-visit requirement
- Unaware of central data management sitevisit requirements
- Unaware that verifiers can conduct site visits at upstream entities in the chain of custody for specified source feedstocks
- Internal Meter Calibration requirements
- Virtual Site-Visit Issues



VERIFICATION STATEMENTS

Term	Definition
Positive statement	VB is reasonably assured that the reported value is free of material misstatement and conforms to the requirements of the LCFS Regulation
Qualified positive statement	VB is reasonably assured that the reported value is free of material misstatement and is in conformance with the requirement to fix correctable errors, but the data may include one or more other nonconformance(s).
Adverse statement	VB is NOT reasonably assured reported value is free of a material misstatement, or (2) the data submitted contain one or more correctable errors, or (3) both, and thus is not in conformance with the requirement to fix such errors pursuant to §95501(b)(6)





OPERATING VS. CERTIFIED CI VALUE

- Entity submits production data covering the 3 24 months of operations and calculates an operational CI value.
- Verification body reviews that data and certifies the CI value depending on conformance of regulations and material misstatement (within 5% or 2gCO2eMJ of verifier calculated CI)
- The following year, entity submits production data for rolling 24 months of operations. If the verified operational CI is found by CARB to be **lower** than the certified CI, and a positive verification statement is issued for this period, the following options are available:
 - The fuel pathway holder may elect to keep the original certified CI;
 - The fuel pathway holder may request to replace the certified CI with the verified operational CI based on the most recent 24 months of operational data.
- If the verified operational CI is found by CARB to be **greater** than the certified CI, the fuel pathway holder is out of compliance with this subarticle and subject to investigation by CARB and possible enforcement action.



CONTACT INFORMATION



Eamon Cullinane

Senior Consultant P.O. Box 130808 | Dallas, Texas 75313 Main: 214-754-0898 | Direct: 972-918-5024 ecullinane@turnermason.com | www.turnermason.com



