



North American Biofuel Policies

IRA 45Z, LCFS and CFR

Conexao SAF, 09/06/2025

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International leader in third-party sustainability certification



30,000+

Certifications in
125 countries



15,000+

Clients – Corporate,
Government, NGOs



40+ Years

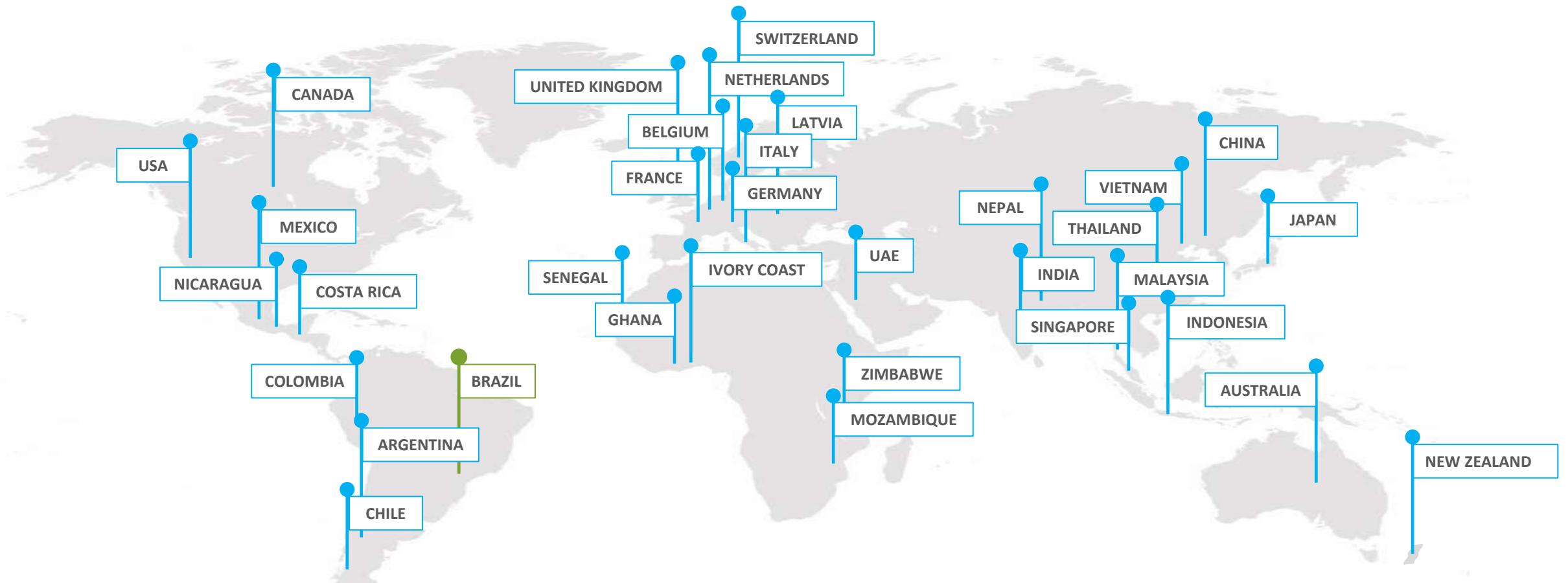
Sustainability
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Auditors

Every major
market

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- Biobased Products
- Environmental Product Declarations
- Flooring and Carpet
- Furniture
- Health Product Declarations
- Indoor Air Quality
- Jewelry
- Material Transparency
- Metals and Mining
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- Plastic Waste Reduction
- Recycled Content
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Food & Agriculture

- Better Bee Certified
- Certified Sustainably Grown
- Cut Flowers & Horticulture
- Equitable Food Initiative
- Fair Trade USA
- Food Safety Training/Certification
- Gluten-Free
- Non-GMO
- Organic
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- Plant-Based
- Rainforest Alliance
- Regenerative Organic Certified
- Responsible Sourcing
- SMETA Audits



Natural Resources & Energy

- Aquaculture Stewardship Council (ASC)
- **Biofuels**
- Carbon Offset Verification
- Fiber Sourcing
- Responsible Forestry (FSC, SFI)
- Forest Products Chain of Custody
- **ISCC EU and ISCC Plus**
- **Low Carbon Fuel Standard**
- Marine Stewardship Council (MSC)
- Responsibly Sourced Palm Oil
- Timber Legality
- Water Stewardship Programs



Corporate Sustainability

- Amazon Technical Services
- Amazon Pledge Friendly
- Amazon Compact By Design
- Carbon Footprint
- Carbon Offset
- Carbon Neutral
- Green Retail Consulting
- **Life Cycle Assessment**
- Responsible Sourcing Strategies
- Sustainable Supply Chains
- Sustainability Report Assurance
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SCS stands for Scientific Certification Systems.

Our work is firmly rooted in the latest developments in **peer-reviewed science**.

Technology

We research, develop and utilize the latest technology to enhance certification, validation and verification processes

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We use best-in-class testing protocols and data to ensure our standards and work meet provenance and supply chain requirements

Innovation

Our team of experts continuously seek out new ideas, strategy, and tech to provide sustainability and business solutions

Partnerships

We partner with top global for-profit and non-profit organizations around the world to develop, launch and deploy rigorous standards

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Certification, Verification, and
Auditing



SCSstandards

Sustainability-Based
Standards Development



Sustainable Business Solutions



Slowing Global Warming with Full
Climate Accounting

IRA 45Z

The Section 45Z Clean Fuel Production Credit, established under the Inflation Reduction Act, is a Federal tax incentive **aimed at supporting the domestic production of low-emission transportation fuels**, including both sustainable aviation fuel (SAF) and other qualifying fuels suitable for use as fuel in a highway vehicle.



Recent renewable energy policies in US

- **Section 45V - Clean Hydrogen** by U.S. Department of the Treasury and Internal Revenue Service (IRS) on Jan. 3rd. + **45VH2 GREET**.
- **Section 45Z - Clean Fuels Production Credit** by Treasury and IRS **on Jan. 10th.**
+45ZCF-GREET. Notice 2025-10; Notice 2025-11
- **CSA** - Interim rule on Technical Guidelines for **Climate-Smart Agriculture** Crops Used as Biofuel Feedstocks by U.S. Department of Agriculture (USDA) **on Jan. 15th . + USDA FD-CIC GREET**

Main eligibility criteria for the § 45Z credit

- Produce the fuel in the United States;
- Fuel must be suitable for use as a fuel in a **highway vehicle or aircraft**;
- Facility registered as a producer of clean fuel **under § 4101**;
- Valid for fuel produced **after Dec. 31, 2024**, and sold before **Jan. 1, 2028**.
- Emissions rate which is **not greater than 47.4 gCO2e/MJ** (50 kg CO2e/MMBtu);
- **Producer must also provide unrelated party certification** demonstrating compliance with certain criteria

Current discussion at the US Government

45Z is not yet published at the Federal Registry

There is an ongoing discussions to amend the 45Z clean fuel production credit:

- **Extend** the 45Z credit through Dec. 31, 2031.
- **Limit** availability of the credit to **fuels produced from feedstocks grown in the U.S. only**.
- **Exclude indirect land use change (ILUC)** from being used to calculate the lifecycle greenhouse gas (GHG) emissions of eligible fuel.

45Z Producers Tax Credit

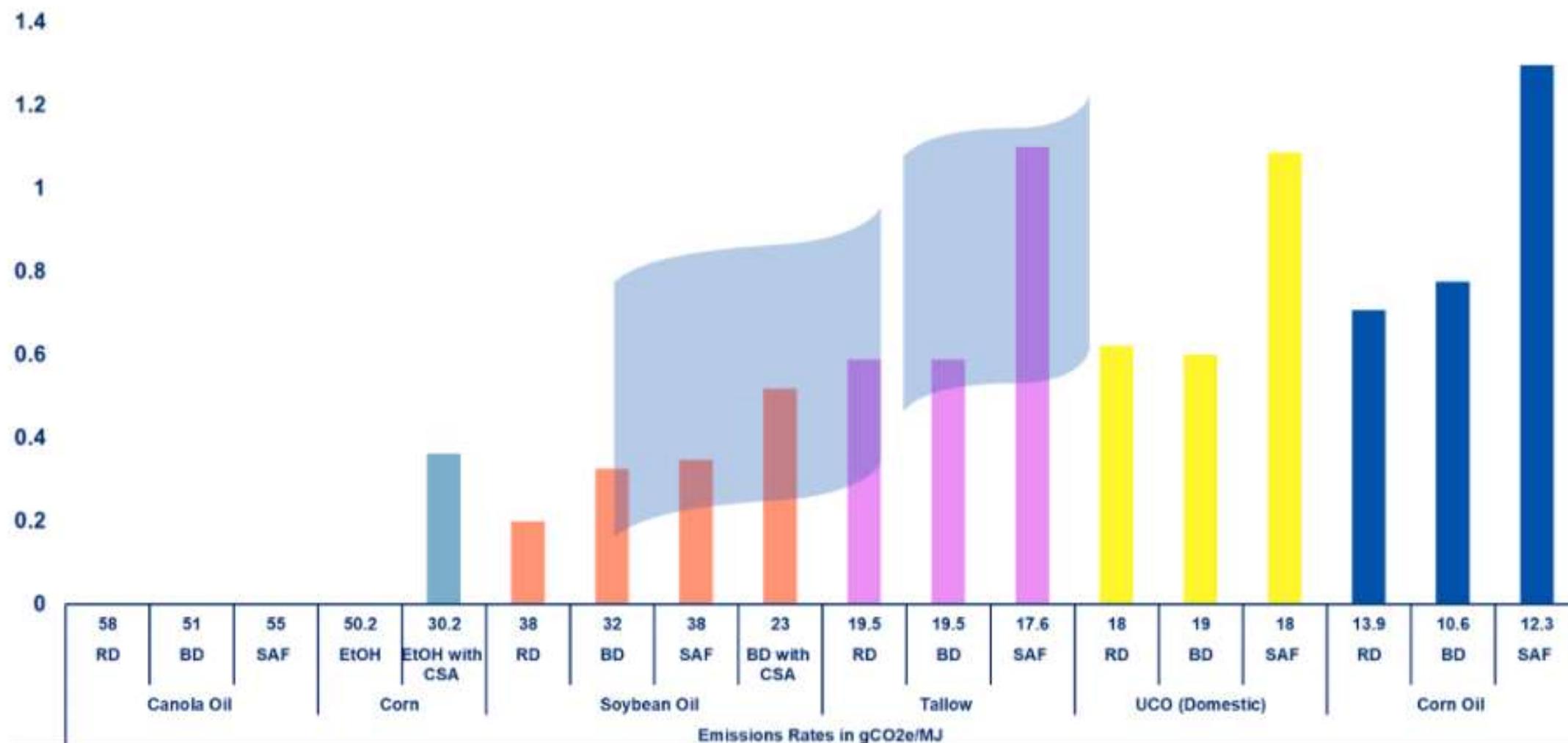
When fuel produced at a qualified facility that **does not** satisfy the **prevailing wage and apprenticeship requirements**, the term base amount means:

- (A) For non-SAF transportation fuel, **20 cents** subject to inflation adjustment
- (B) For SAF transportation fuel, **35 cents** subject to inflation

When fuel produced at a qualified facility that **satisfies the prevailing wage and apprenticeship requirements**, the term alternative amount:

- (A) For non-SAF transportation fuel, **\$1.00** subject to inflation adjustment
- (B) For SAF transportation fuel, **\$1.75** subject to inflation adjustment

45Z Producers Tax Credit (USD/gal)



Source: <https://www.clearbluemarkets.com/knowledge-base/decoding-the-45z-clean-fuel-production-credit>

Primary Feedstocks Included in 45ZCF-GREET by Conversion Pathway

Conversion Pathway	Primary Feedstock(s)
Hydroprocessed Esters and Fatty Acids (HEFA)	U.S. soybean oil
	U.S./Canadian canola oil/rapeseed oil
	Used cooking oil (UCO) ^a
	Tallow
	U.S. distillers corn oil (DCO)
	U.S. carinata oil (intermediate crop)
	U.S. camelina oil (intermediate crop)
Transesterification	U.S. soybean oil
	U.S./Canadian canola oil/rapeseed oil
	U.S. used cooking oil (UCO) ^a
	Tallow
	U.S. distillers corn oil (DCO)
	U.S. carinata oil (intermediate crop)
	U.S. camelina oil (intermediate crop)
Fermentation	U.S. corn starch
	U.S. sorghum grain
	Brazilian sugarcane (for use as feedstock for SAF-ATJ only)
	U.S. corn stover
Alcohol-to-Jet (ATJ)	Ethanol (from fermentation pathways listed above)
Gasification and Fischer-Tropsch	U.S. corn stover
Anaerobic Digestion and Biogas Upgrading	U.S. wastewater sludge
	U.S. animal manures
	U.S. landfill gas
Coal Mine Methane (CMM) Capture and Upgrading	Coal mine methane
Hydrogen (well-to-gate pathways as defined in the user manual for the most recent 45VH2-GREET model, gate-to-wheels as modeled in 45ZCF-GREET)	Hydrogen (well-to-gate, 300 psia), as defined in the user manual for the most recent 45VH2-GREET model

- In the case of any transportation fuel for which an **emissions rate has not been established** in the table, it is needed to request a **provisional emissions rate (PER)** determined by the Secretary with respect to such fuel.
- The emissions rate table notably **excludes many foreign produced feedstocks**.

45ZCF-GREET

45ZCF-GREET

Select a Technology

Ethanol from Corn via Fermentation

Generate LCA Results

Products (per period of operation)

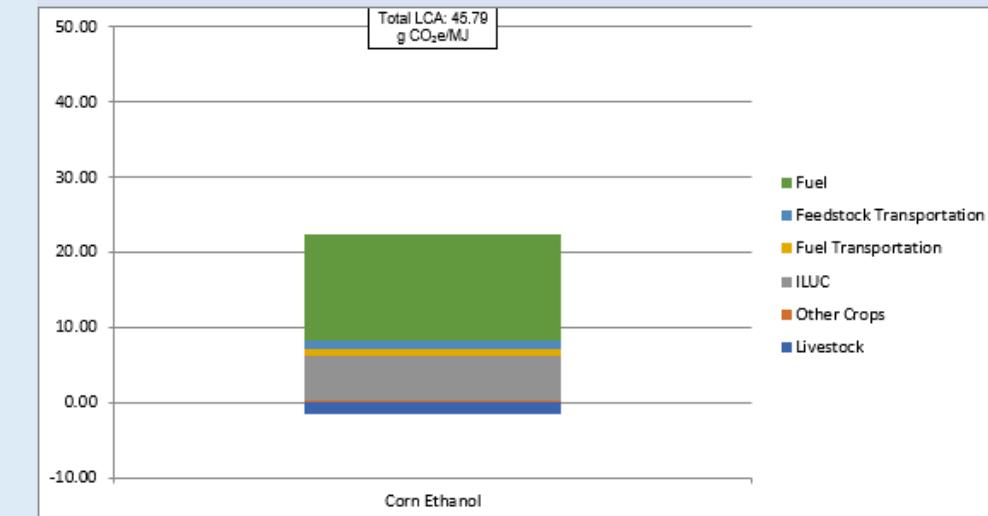
Parameter	Sample Input	User Input	Unit
Ethanol Production	1.0	1.0	million gallons

Process Inputs (per period of operation)

Parameter	Sample Input	User Input	Unit
Feedstock: Corn	0.3	0.3	million bushel
Fossil Natural Gas	22.4	22.4	thousand MMBtu
Pipeline CMM	0.0	0.0	thousand MMBtu
45Z Modeled RNG	0.0	0.0	thousand MMBtu
45Z Modeled RNG CI	23.3	23.3	g CO ₂ e/MJ
Coal	4.2	4.2	short ton
Agricultural Residue Input	0.0	0.0	wet short ton
Agricultural Residue Moisture Content	12%	12%	percentage
Electricity: Grid Electricity	0.6	0.6	million kWh
Imported Renewable Electricity: Energy Attribute Credit (EAC)	0.0	0.0	million kWh
Onsite Behind-The-Meter Electricity (BTM): EAC	0.0	0.0	million kWh

Selections (per period of operation)

Parameter	User Selection	Input Type
Needs Region Electricity Source	1	Selection
Enable/Disable Carbon Capture and Sequestration (CCS) for Grain Etha	1	Selection
Coal Type: 1 - Bituminous, 2 - Subbituminous, 3 - Lignite	1	Selection



Life Cycle Stage	Corn Ethanol
D-LCA (g CO ₂ e/MJ)	41.21
Feedstock	25.05
Fuel	14.12
Feedstock Transportation	1.02
Fuel Transportation	1.03
I-Effects (g CO ₂ e/MJ)	
ILUC	5.75
Other Crops	0.41
Livestock	-1.58
Total LCA Results (g CO ₂ e/MJ)	45.79
Total LCA Results (kg CO ₂ e/MMBtu)	48.31
Fuel Production	1000000 Gallons

Data needed for 45ZCF-GREET

45ZCF-GREET requires users to **enter foreground data specific to their facility** in order to generate an emissions rate for the purposes of the 45Z.

Table 5. Example Transportation Fuel Production Pathways in 45ZCF-GREET with Selected Foreground and Background Data

45ZCF-GREET Input Data		Ethanol Fermentation	ATJ to Ethanol	Transesterification	HEFA	Gasification and FT	AD and Biogas Upgrading	Hydrogen
Primary Feedstock(s)								
	Feedstock Amount(s)	▲	▲	▲	▲	▲	▲	▲
Production Process								
	Grid Electricity	▲	▲	▲	▲	▲	▲	N/A
	Onsite Behind-the-Meter (BTM) Electricity	▲	▲	▲	▲	▲	▲	N/A
Energy Sources for Heat and Power	Imported Renewable Electricity: Energy Attribute Credit (EAC)	▲	▲	▲	▲	▲	▲	N/A
	Fossil Natural Gas	▲	▲	▲	▲	▲	▲	N/A
	45Z Modeled Renewable Natural Gas	▲	▲	▲	▲	▲	N/A	N/A
	Coal	▲	N/A	▲	N/A	▲	N/A	N/A
	Agricultural Residue	▲	N/A	N/A	N/A	N/A	N/A	N/A
	Methanol Offsite Fossil SMR - Hydrogen	N/A	N/A	▲	N/A	N/A	N/A	N/A
	Offsite 45Z Modeled Hydrogen	N/A	▲	N/A	▲	N/A	N/A	N/A
Carbon Capture and Storage								
Fuel Output								
	Sustainable Aviation Fuel (SAF)	N/A	▲	N/A	▲	▲	N/A	N/A
Non-SAF Fuels	Ethanol	▲	N/A	N/A	N/A	N/A	N/A	N/A
	Biodiesel	N/A	N/A	▲	N/A	N/A	N/A	N/A
	Renewable Diesel	N/A	▲	N/A	▲	▲	N/A	N/A
	Naphtha	N/A	N/A	N/A	▲	N/A	N/A	N/A
	Propane	N/A	N/A	N/A	▲	N/A	N/A	N/A
	Renewable Natural Gas	N/A	N/A	N/A	N/A	N/A	▲	N/A
	Hydrogen (300 psia)	N/A	N/A	N/A	N/A	N/A	N/A	▲
Co-Product Outputs								
	Non-Fuel Co-Products	●	N/A	▲	N/A	N/A	N/A	N/A
Transportation, Conditioning and End Use								
Transportation	Feedstock and Intermediate Transport to Fuel Production Facility	●	●	●	●	●	●	●
	Fuel Blending or Conditioning for Use in Transportation	●	●	●	●	●	●	●
Transportation and End Use	Finished Fuel Transportation and End Use	●	●	●	●	●	●	●

Accreditation from CORSIA

For taxpayers using **CORSIA Default** or **CORSIA Actual** to determine the emissions rate **for SAF** transportation fuel, the term qualified certifier means any individual or organization with **active accreditation from ISCC, RSB**, or other sustainability certification scheme approved by ICAO.

For taxpayers using the **45ZCF-GREET model** to determine the emissions rate **for SAF** transportation fuel, the term qualified certifier means any individual or organization **with active accreditation**:

- (A) From the **American National Standards Institute National Accreditation Board** to conduct validation and verification in accordance with the requirements of **ISO 14065**; **or**
- (B) As a **verifier, lead verifier, or verification body** under the **California Air Resources Board Low Carbon Fuel Standard** program.

The regulation mentions that the 45ZCF-GREET model is a “similar methodology” to CORSIA because like CORSIA, it evaluates emissions throughout the full fuel lifecycle.

Procedures for certification of lifecycle GHG emission rates

Rules on unrelated party certification for SAF transportation fuel pursuant to section 45Z

A taxpayer must attach a certification to the taxpayer's **Form 7218**

Clean Fuel Production Credit

(December 2024)

Department of the Treasury
Internal Revenue ServiceAttach to your tax return.
Go to www.irs.gov/Form7218 for instructions and the latest information.

OMB No. 1545-0123

Attachment
Sequence No. 218

Name(s) shown on return

Identifying number

Part I Facility and Other Information (see instructions)

Caution: The facility must be a qualified facility under section 45Z(d)(4). Your eligibility to claim this credit is restricted if you have taken credits for this facility related to section 45V, section 46 (to the extent such credit is attributable to a section 48(a)(15) election), or section 45Q. See instructions.

1 If making an elective payment election or transfer election, enter the IRS-issued registration number for the facility: _____

2a Description of facility: _____

b If different than filer, enter (i) owner's name: _____ and (ii) owner's TIN: _____

c Address of the facility (if applicable): _____

d Coordinates. (i) Latitude: . (ii) Longitude: . Enter a ⁺ (plus) or ⁻ (minus) sign in the first box.

3 Date construction began (MM/DD/YYYY): _____

4 Date placed in service (MM/DD/YYYY): _____

5a Enter the producer registration number: _____

b Date of registration approval for activity letter "CA" and/or "CN": _____

6 Check this box if you are using provisional emissions rate(s) (PER) to determine your amount of credit

7 Does the facility satisfy IRC 45Z(f)(6) prevailing wage requirements and IRC 45Z(f)(7) apprenticeship requirements?

a Yes.
b No.

Part II Clean Aviation and Non-Aviation Transportation Fuel Production Credit

1 Enter the amount from Part III, line 25(h) 1
2 Clean fuel production credit from partnerships, S corporations, cooperatives, estates, and trusts 2
3 Add lines 1 and 2. Cooperatives, estates, and trusts, go to line 4. Partnerships and S corporations not electing transfer, stop here and report on Schedule K. All others, stop here and report this amount on Form 3800, Part III, line 1q. See instructions 3
4 Amount allocated to patrons of the cooperative or beneficiaries of the estate or trust 4
5 Cooperatives, estates, and trusts, subtract line 4 from line 3. Report this amount on Form 3800, Part III, line 1q 5

Form 7218 (12-2024)

Part III Clean Aviation and Non-Aviation Transportation Fuel Produced and Sold After 2024 (see instructions)

	(a) Type of fuel	(b) Type of feedstock	(c) Calendar year sold	(d) Emissions Rate or PER Value in kg of CO ₂ e per mmbTU	(e) Subtract (d) from 50 kg of CO ₂ e per mmbTU and divide the result by 50 kg of CO ₂ e per mmbTU	(f) Gallons or gallon equivalents	(g) Inflation-adjusted applicable amount for fuel sold	(h) Multiply columns (e) x (f) x (g)
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25	Total of column (h)							25

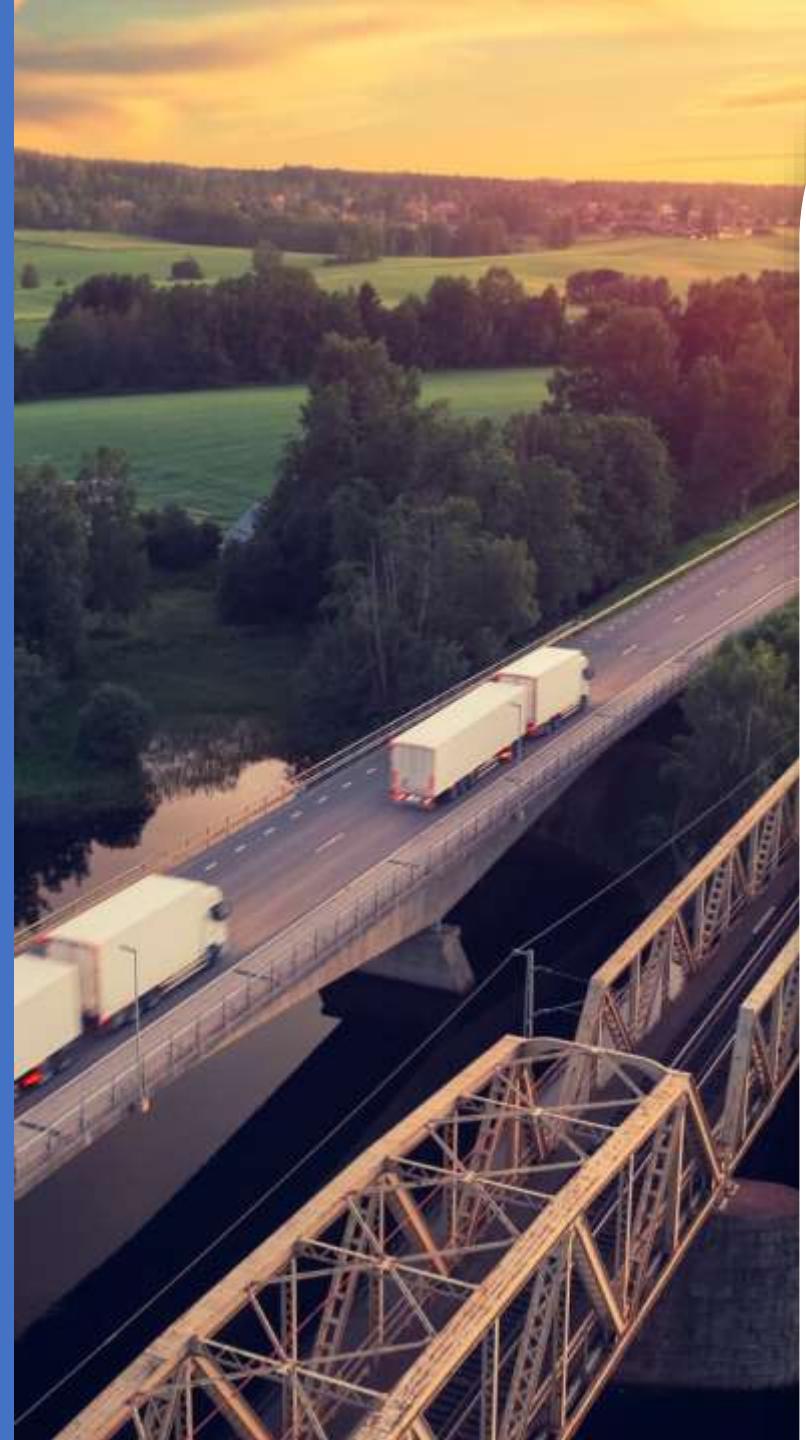
Part III Clean Aviation and Non-Aviation Transportation Fuel Produced and Sold After 2024 (see instructions)

	(a) Type of fuel	(b) Type of feedstock	(c) Calendar year sold	(d) Emissions Rate or PER Value in kg of CO ₂ e per mmbTU	(e) Subtract (d) from 50 kg of CO ₂ e per mmbTU and divide the result by 50 kg of CO ₂ e per mmbTU	(f) Gallons or gallon equivalents	(g) Inflation-adjusted applicable amount for fuel sold	(h) Multiply columns (e) x (f) x (g)
1	Ethanol	Corn	2025	48.31	0.03	1000,000	1.00	33,000
2								
3								
4								
5								
6								
7								
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24								
25	Total of column (h)							25

(2) Certification Requirements

Must be prepared by a **qualified certifier** under penalties of perjury and must contain:

- (i) A statement from the qualified certifier regarding the **production of SAF** transportation fuel, including that the **inputs used to determine the lifecycle** GHG emissions rate of the production process are accurate (**production statement**);
- (ii) A statement from the qualified certifier regarding the **amount of SAF** transportation fuel sold (**sale statement**);
- (iii) A statement from the qualified certifier regarding **conflicts of interest** (**conflict statement**);
- (iv) Information regarding the **qualified certifier**, including documentation of the qualified certifier's qualifications (**qualified certifier statement**);
- (v) Certain general information about the **qualified facility** at which the SAF transportation fuel production undergoing certification occurred;
- (vi) Any documentation necessary to **substantiate the certification process** given the standards and best practices prescribed by the qualified certifier's accrediting body and the circumstances of the taxpayer and the qualified facility;



Canadian Clean Fuels Regulation

The Canadian Clean Fuels Regulation (CFR) is a regulation that sets the requirements for selling transportation fuels into Canadian markets. The regulation was launched in March 2021 and sets out mandatory minimum lifecycle carbon intensity performance requirements that liquid fuel producers must meet, with the aim of reducing the carbon intensity of liquid fuels by at least 12% by 2030.



Overview

The Clean Fuel Regulations (CFR) is intended to reduce GHG emissions from producing and using liquid fuels (gasoline and diesel) in Canada. It established a **credit market**, where each credit represents a lifecycle emission reduction (1t CO₂e).

The CFR places a requirement on **primary suppliers** to decrease the carbon intensity of their fuel pool by using **compliance credits**. A primary supplier demonstrates compliance with their reduction requirement by creating credits or acquiring credits from other creators.

Primary Supplier

- (a) owns, leases, operates, controls or manages a fuel production facility in Canada at which gasoline or diesel is produced; or
- (b) imports gasoline or diesel into Canada.

Credits are required for compliance



Registered Creators

Create compliance credits by

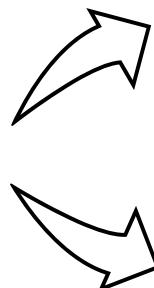
- Undertaking projects that reduce the life cycle CI of liquid fossil fuels (e.g., CCS) (Compliance Category 1)
- Supplying low CI fuels (e.g., ethanol, biodiesel) (Compliance Category 2)
- Supplying fuel or energy to advanced vehicle technology (Compliance Category 3)

Carbon Intensity Value

To create compliance credits, the **CI value** (**Fuel LCA Model** or Default Values) may be required for a low-Cl fuel, material input (renewable natural gas, biogas, renewable propane, or hydrogen), or energy source (electricity or hydrogen)

A **registered creator** or **foreign supplier** (the owner of a facility outside Canada at which a low-Cl fuel is produced or the person who leases, operates, controls or manages such a facility) may elect to determine the carbon intensity of a low-Cl fuel, or the CI of a material input, using the **Fuel LCA model** once there is 24 months of operating data

Fuel LCA model



Existing pathway (verification of **CI Applications** are required)

New pathway created by the registered creator, carbon-intensity contributor or foreign supplier

A new pathway requires a **Pathway Application** to be approved by ECCC prior to submitting a CI Application

Compliance Category 2 (Low CI Fuel)

Requirements

Quantitative

Low CI Fuel produced or imported into Canada - Fuel LCA Model or default

Qualitative

Sustainability, Land Use and Biodiversity (LUB)
(Feedstock type; protected areas; cultivation, harvesting and transportation practices; indirect land use change; excluded land)

Compliance Category 2 (Low CI Fuel)

Reporting Cycle – CI

CI Application

Carbon Intensity
(Registered Creator
or Foreign Supplier)
Schedule 8

CI Pathway Report

Carbon Intensity
(Registered Creator or
Foreign Supplier)
Schedule 14

Apr 30



Compliance Category 2 (Low CI Fuel)

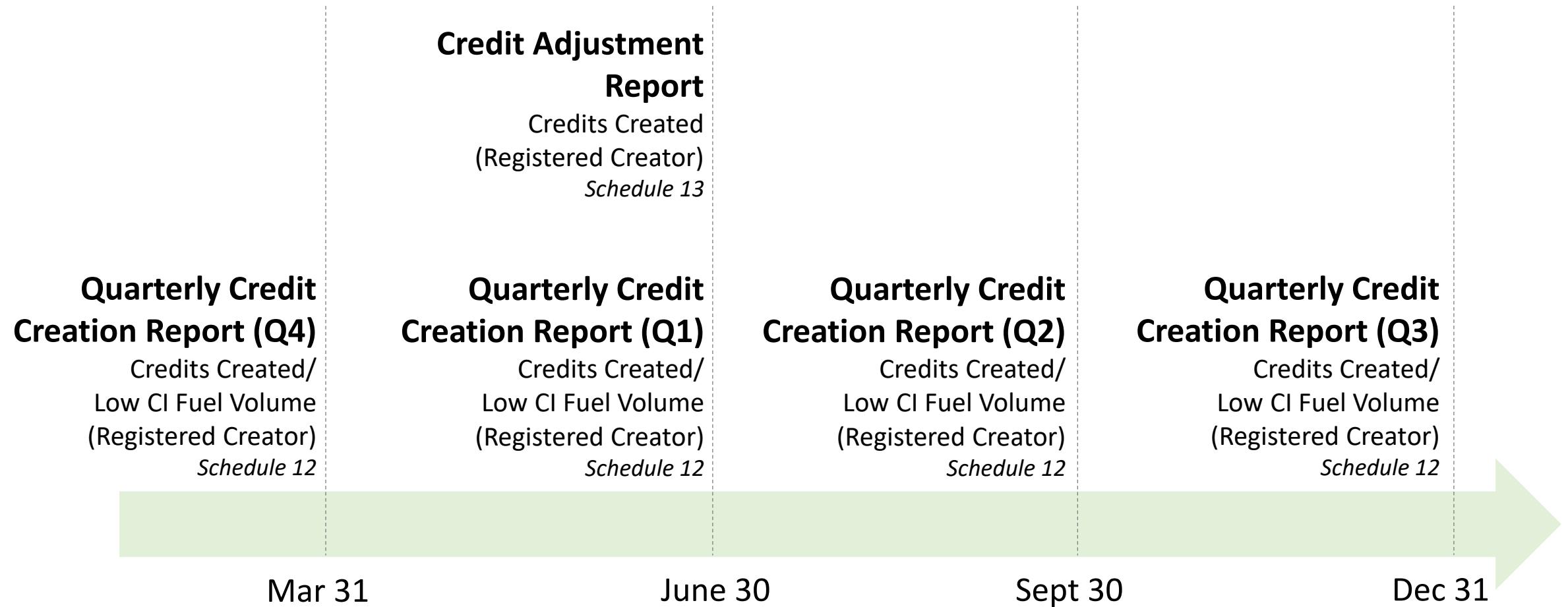
Reporting Cycle – LUB

Material Balance Report
Feedstock
(Registered Creator or Foreign Supplier)
Schedule 15

Apr 30

Compliance Category 2 (Low CI Fuel)

Reporting Cycle – Credit Creation



LCFS

SCS Global Services is approved and accredited by the California Air Resources Board (CARB) to help companies comply with California's Low Carbon Fuel Standard (LCFS). We provide fuel pathway validations, annual verifications of fuel pathway reports, annual verifications of quarterly fuel transportation reports, and quarterly reviews of fuel transaction reports.



Overview

In 2009, the Board approved the **Low Carbon Fuel Standard (LCFS)**, designed to decrease the carbon intensity of **California's transportation fuel pool** and provide an increasing range of low-carbon and renewable alternatives. The LCFS sets annual carbon intensity (CI) standards/benchmarks for gasoline, diesel, and the fuels that replace them. The market will determine which mix of fuels will be used to reach the program targets.

There are three ways to generate credits:

Fuel Pathway-based crediting

Suppliers of low carbon fuels used in California transportation **generate credits** by obtaining a **certified CI score** (fuel type dictates which process is used). Credits are calculated relative to the annual CI benchmark with verification post credit generation. Transaction quantities are reported on a quarterly basis.

Project-based crediting

Actions to reduce GHG emissions in the petroleum supply chain/CCS using DAC. Credits are based on emission reductions and issued after the reported reductions are verified.

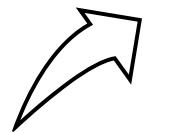
Zero emission vehicle (ZEV) infrastructure (capacity-based) crediting

Based on the capacity of the hydrogen station or EV fast charging site minus the actual fuel dispensed.

Carbon Intensity

The CI includes **the direct effects** of producing and using the fuel, considering two models - **CA-GREET** (direct carbon intensity of fuel production and use) and Oil Production Greenhouse gas Emissions Estimator **OPGEE** (direct carbon intensity of crude production and transport to the refinery) - and **indirect** - Global Trade Analysis Project **GTAP** (indirect land use change) and the Agro-Ecological Zone Emissions Factor **AEZ-EF** (to supplement GTAP's estimates).

Certified CI



Lookup Table pathways: the simplest pathways, CI predetermined by CARB using industry-wide average inputs, or conservative assumptions



Tier 1: for the most common low carbon fuels; a simplified CI Calculator is used to determine their site-specific fuel production and transport emissions



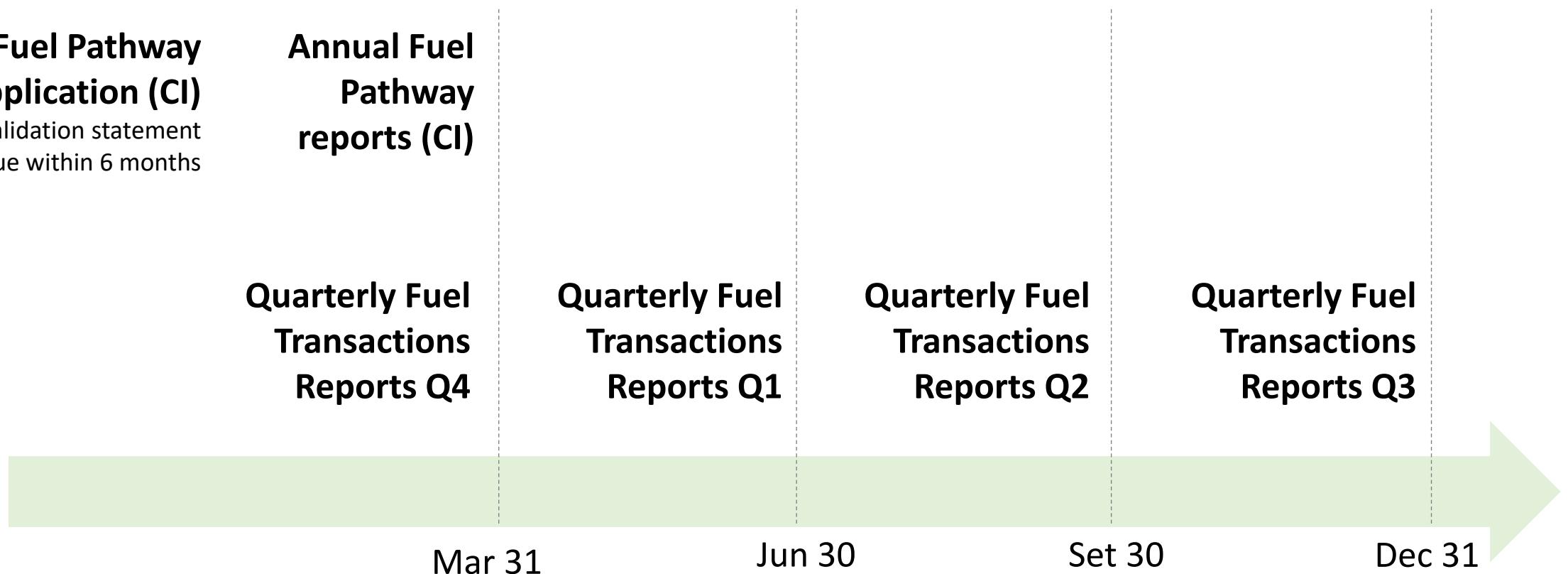
Tier 2: for innovative, next-generation pathways (e.g. CCS, alternative jet fuel, and any other pathway that is not eligible to use the Lookup Table or Tier 1 process). Applicants can customize the California GREET model to accurately determine their site-specific CI.

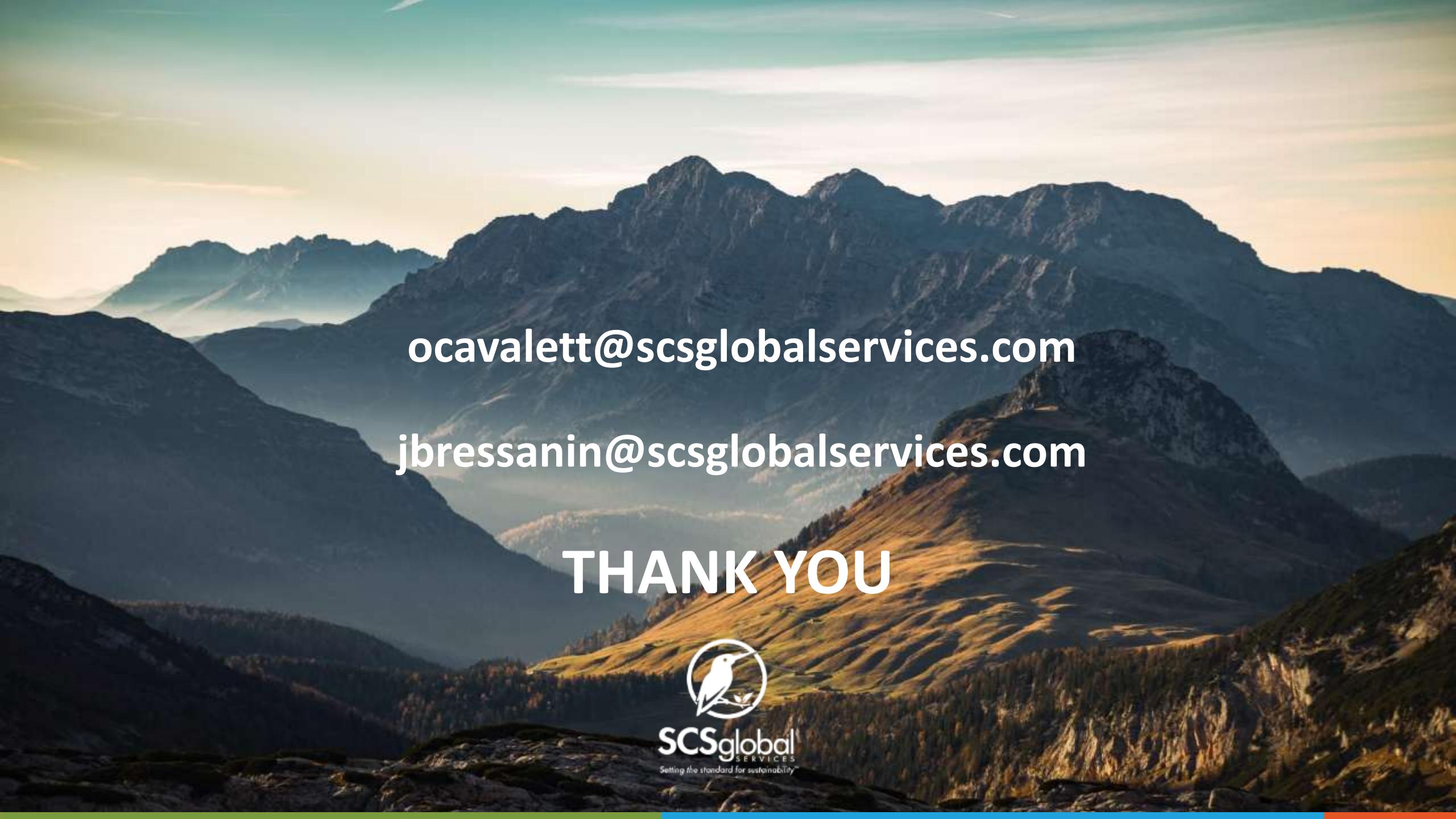
Reporting

Credits calculated based on the **CI score**, the energy economy ratio (**EER**) for the type of vehicle the fuel is used in, and the **quantity of fuel** reported.

Pathways with site-specific CI data will typically be verified annually.

Credits are issued quarterly. Fuel transactions from each calendar quarter are reported during the next calendar quarter.





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THANK YOU

