

Updated February 18, 2025

The Section 45Z Clean Fuel Production Credit

P.L. 117-169, commonly known as the Inflation Reduction Act (IRA), added the clean fuel production credit (CFPC) to Section 45Z of the Internal Revenue Code (IRC). The credit may be claimed by taxpayers producing and selling qualifying transportation fuel between 2025 and 2027.

The CFPC, in effect, consolidates and replaces several fuel-related credits that expired at the end of 2024, including credits for biodiesel, biodiesel mixtures, agri-biodiesel, renewable diesel, second-generation biofuel, mid-level ethanol blends, sustainable aviation fuel, alternative fuels, and alternative fuels mixtures. In contrast to these expiring provisions, which subsidize specific types of clean or renewable fuels, the CFPC is technology neutral and subsidizes the production of any transportation fuel with zero or low lifecycle greenhouse gas (GHG) emissions.

This *In Focus* provides an overview of the eligibility requirements, credit amounts, and budgetary cost of the CFPC. It also discusses Internal Revenue Service (IRS) notices issued in January 2025 that address complicated issues such as the measurement of lifecycle GHG emissions, the use of feedstocks in the fuel production process, and the types of fuels that qualify for the credit. Given the scope of regulatory authority in implementing the CFPC, current and future IRS regulations may be of ongoing interest to Congress.

Credit Requirements and Restrictions

The following criteria must be satisfied for credit eligibility:

- Producers must be registered with the IRS.
- All production facilities used to claim the credit must be located in the United States or its possessions (i.e., Puerto Rico, Guam, the U.S. Virgin Islands, and other territories).
- To be considered “clean,” fuel produced at such facilities must have lifecycle emissions of no more than 50 kilograms of CO₂ or CO₂ equivalent per 1 million British Thermal Units (mmBTU).
- Qualifying fuel must be deemed “suitable for use as a fuel in a highway vehicle or aircraft” and must be sold to “unrelated persons” as defined in IRC Section 52(b).

The CFPC is eligible for *direct pay* and *transferability*. Direct pay allows certain organizations—generally states, localities, nonprofits, and other tax-exempt entities—to receive tax credits as cash payments even if they do not owe federal taxes. Transferability allows entities ineligible for direct pay to sell their credits to other entities; this can be advantageous for organizations whose tax credits exceed

their tax liabilities. Payments received for the sale of credits are excluded from income, and thus not subject to taxation, but purchases of credits cannot be deducted from income.

Taxpayers cannot use the same production facility to claim both the CFPC and the Section 45V clean hydrogen production credit, the Section 48 investment credit for a specified clean hydrogen production facility, or the Section 45Q credit for carbon oxide sequestration.

Maximum Credit Values

The CFPC is structured on a sliding scale, so that producers become eligible for larger credits as the lifecycle GHG emissions of their fuels approach zero. For producers meeting prevailing wage and registered apprenticeship (W&A) requirements, the maximum credit is \$1 per gallon of nonaviation fuel and \$1.75 per gallon of aviation fuel.

To satisfy the wage requirements, laborers and mechanics constructing, altering, or repairing a facility, must be paid wages at or above the “prevailing wage” (as determined by the Secretary of Labor) of workers performing similar work in the same locality. For facilities placed in service before 2025, the prevailing wage requirements only apply to laborers and mechanics performing alteration work or repair work after calendar year 2024.

The apprenticeship requirements stipulate that registered apprentices must provide at least 12.5% (if the facility begins construction in 2023) or 15% (if the facility begins construction after 2023) of the labor hours associated with constructing, altering, or repairing any facilities claimed under the CFPC. Firms are deemed to have met the apprenticeship requirements if they request apprentices from a registered apprenticeship program and either do not receive a response within five business days or are denied for reasons other than their refusal to comply with the requirements.

For producers not meeting the W&A requirements, the maximum credit is 20 cents per gallon of nonaviation fuel and 35 cents per gallon of aviation fuel.

Maximum credit amounts are adjusted annually for inflation using the GDP implicit price deflator.

Credit Phaseout

Producers of fuels with low but nonzero GHG emissions may still receive a credit depending on their fuel’s lifecycle GHG emissions rate.

To determine the size of each producer’s credit, the maximum credit value is multiplied by an *emissions factor* that is a function of the fuel’s “carbon dioxide equivalent”

(CO₂e) per mmBTU. For greenhouse gases other than CO₂, the *carbon dioxide equivalent* is the quantity of CO₂ that would produce the same amount of global warming as the given non-CO₂ GHG. Specifically, the emissions factor is

$$\text{Emissions Factor} = [(50 \text{ kg. of CO}_2\text{e per mmBTU}) - (\text{Fuel kg. of CO}_2\text{e per mmBTU})] / [50 \text{ kg. of CO}_2\text{e per mmBTU}]$$

As an example, the emissions factor for fuel emitting 40 kilograms of CO₂e per mmBTU would be

$$\text{Emissions Factor} = [50 - 40] / [50] = 0.2$$

Table 1 displays the credits available to producers at various assumed CO₂e emissions rates, depending on the type of fuel produced (aviation or nonaviation) and whether the producer meets prevailing wage and apprenticeship requirements. Because only aviation fuel and highway vehicle fuel qualify for the CFPC, the values displayed for “nonaviation fuels” implicitly apply to highway vehicles.

Table 1. Estimated §45Z Clean Fuel Production Credit Values

Estimated credit per gallon of fuel produced, by fuel type and compliance with wage and apprenticeship requirements, at assumed CO₂e emissions rates

Assumed kilograms of CO ₂ e per mmBTU	Emissions Factor	Does not meet W&A reqs	Meets W&A reqs
Nonaviation Fuels			
0 kg. / mmBTU	1.0	\$0.20	\$1.00
10 kg. / mmBTU	0.8	\$0.16	\$0.80
25 kg. / mmBTU	0.5	\$0.10	\$0.50
40 kg. / mmBTU	0.2	\$0.04	\$0.20
50 kg. / mmBTU	0.0	\$0.00	\$0.00
Aviation Fuels			
0 kg. / mmBTU	1.0	\$0.35	\$1.75
10 kg. / mmBTU	0.8	\$0.28	\$1.40
25 kg. / mmBTU	0.5	\$0.18 ^a	\$0.88 ^a
40 kg. / mmBTU	0.2	\$0.07	\$0.35
50 kg. / mmBTU	0.0	\$0.00	\$0.00

Source: Calculations by CRS based on IRC §45Z.

Notes: “W&A” stands for “wage and apprenticeship.” “CO₂e” stands for “carbon dioxide equivalent.”

a. Value has been rounded to the nearest cent.

Budgetary Costs and Credit Transition

As noted earlier, the CFPC, in effect, consolidates a diverse array of expiring clean fuel tax credits into a single credit. As a replacement for these credits, P.L. 117-169 allows producers to begin claiming the CFPC starting in 2025, with the stipulation that fuel used to claim the credit must be sold no later than December 31, 2027. In its 2024 tax expenditures report, the Joint Committee on Taxation (JCT)

projected that the CFPC will cost \$8.4 billion over the three years it is in effect. This is equivalent to \$2.8 billion of annual spending, which is similar to previous estimates of the costs of the expiring credits.

January 2025 IRS Notices

IRC Section 45Z(e) requires the Secretary of the Treasury to issue guidance for the CFPC, with required guidance including “calculation of emissions factors for transportation fuel” and publication of a table which “sets forth the emissions rate ... of transportation fuels based on the amount of [the fuel’s] lifecycle greenhouse gas emissions” as measured in kilograms of CO₂e per mmBTU.

The IRS published two notices providing the required guidance on January 10, 2025. Notice 2025-11 includes the emissions factor calculation and emissions rate table required by IRC Section 45Z(e). The notice states that lifecycle GHG emissions rates for vehicle fuels must be determined using the Department of Energy’s 45ZCF-GREET model (published January 15, 2025). Aviation fuel producers may use the 45ZCF-GREET model, the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) Default model, or the CORSIA Actual model to determine their fuel’s lifecycle GHG emissions rates. As depicted in the notice’s emissions rate table, qualifying fuel types include ethanol, biodiesel, renewable diesel, propane, naphtha, renewable natural gas, hydrogen, and sustainable aviation fuel. Producers of fuel types not listed in the table may petition the Secretary of the Treasury for a Provisional Emissions Rate (PER) determination.

Notice 2025-10 describes topics for future IRS regulations and interprets certain CFPC terminology. Notice 2025-10 states that for a fuel to be deemed “suitable for use as a fuel in a highway vehicle or aircraft” (as described in statute), the fuel must have “practical and commercial fitness for use ... in a highway vehicle or aircraft.” The notice further states that “actual use as a fuel in a highway vehicle or aircraft is not required.” The notice clarifies that marine diesel fuel and marine methanol (which are ordinarily used to power ships) could qualify for the CFPC, if they are deemed suitable for use in highway vehicles or aircraft.

Notice 2025-10 clarifies that fuel producers, not blenders or compressors, are eligible for the CFPC. For alternative natural gas, for which processing and compression both result in lower GHG emissions, the notice states that the producer is “the person that processes the alternative natural gas ... to remove water, carbon dioxide, and other impurities such that it is interchangeable with fossil natural gas.”

In addition, in notice 2025-10, the Treasury Department and IRS announced their intention to propose rules regarding the use of Climate Smart Agriculture (CSA) practices in emissions calculations. The notice states that if sorghum, soybeans, or corn grown using CSA practices are used as feedstocks in a qualifying fuel, the producer may be credited with a lower lifecycle GHG emissions rate.

Nicholas E. Buffie, Analyst in Public Finance

Disclaimer

This document was prepared by the Congressional Research Service (CRS). CRS serves as nonpartisan shared staff to congressional committees and Members of Congress. It operates solely at the behest of and under the direction of Congress. Information in a CRS Report should not be relied upon for purposes other than public understanding of information that has been provided by CRS to Members of Congress in connection with CRS's institutional role. CRS Reports, as a work of the United States Government, are not subject to copyright protection in the United States. Any CRS Report may be reproduced and distributed in its entirety without permission from CRS. However, as a CRS Report may include copyrighted images or material from a third party, you may need to obtain the permission of the copyright holder if you wish to copy or otherwise use copyrighted material.