

Treasury Circulates Draft Regulations for Section 45Z Clean Fuel Production Credit

A new tax credit is proposed to calculate a fuel's emissions factor based on its full carbon life cycle of production.

Notices 2025-10 and 2025-11 (Notices), released on January 10, 2025, outline the intention of the Department of the Treasury (Treasury Department) and the Internal Revenue Service (IRS) to propose regulations for the clean fuel production credit under Internal Revenue Code Section 45Z (45Z Credit). Prior to the release of the Notices, minimal guidance had been available on the 45Z Credit, which was newly created as part of the Inflation Reduction Act.

Among other changes described below, the Notices clarify the determination of emissions rates, including by publishing a Section 45Z Emissions Rate Table attached as an appendix to Notice 2025-11, and the rules prohibiting "stacking" of 45Z Credits with other federal income tax credits for hydrogen and carbon capture and sequestration.

Overview of 45Z Credit

The 45Z Credit is a federal income tax credit designed to incentivize the production of clean transportation fuels in the United States. The credit is calculated by reference to the quantity of clean fuel that a registered producer generates and sells to an unrelated person between January 1, 2025 and December 31, 2027.

For transportation fuels, the base credit is \$0.20 per gallon, increasing to \$1.00 per gallon if the facility meets certain prevailing wage and apprenticeship requirements. For sustainable aviation fuels (SAF), the base credit value is \$0.35, rising to \$1.75 if the facility meets the prevailing wage and apprenticeship requirements. Credits for both transportation fuels and SAF can scale based on the emissions factor of a particular fuel. The credit amounts are subject to annual inflation adjustments starting in 2025.

Eligible fuel must be produced in the United States, have a life cycle greenhouse gas (GHG) emissions rate not exceeding 50 kilograms (kg) of carbon dioxide equivalent (CO₂e) per million British thermal units (mmBTU), and be sold to an unrelated person for use in a trade or business, for further mixture with a transportation fuel, or for retail sale. Eligible fuel must be produced at a facility that is used for producing transportation fuels but for which no tax credit for clean hydrogen or carbon capture is allowed.

Calculating the Emissions Factor (and Emissions Rate) for Eligible Fuels

The emissions factor used to scale the credits is the difference between 50 kgCO₂e/mmBTU and the emissions rate of the fuel, divided by 50 kgCO₂e/mmBTU. The Notices state that the 45Z Credit framework evaluates the emissions factor of a particular fuel, calculated on a full carbon life cycle of fuel production, from feedstock extraction to end-use. This “well-to-wheel” analysis ensures that all stages of fuel production and use are considered in the emissions factor. While a larger emissions rate should reduce (and a lower emissions rate should increase) the 45Z Credit, the possibility of credit increases due to negative emissions rates are not directly addressed in the Notices. The emissions rate is the key metric in the emissions factor formula. To calculate this rate, the Notices direct taxpayers to the Section 45Z Emissions Rate Table (see below) that is attached as an appendix to Notice 2025-11, and lists fuel types, pathways, and feedstocks, as well as which model the taxpayer should use.

Section 45Z Emissions Rate Table

Type of Fuel	Category of Fuel		Determination of Emissions Rate (calculated to be expressed in kg of CO ₂ e/mmBTU)
	Pathway	Primary Feedstock	
Ethanol	Fermentation	US corn starch	Calculate using the most recent determinations under the 45ZCF-GREET model (see Section 4.01 of Notice 2025-11).
		US sorghum grain	
		Brazilian sugarcane (for use as feedstock for SAF-Alcohol-to-Jet (ATJ) only)	
	Hydrolysis and Fermentation	US corn stover	
Biodiesel	Transesterification	US soybean oil	Calculate using the most recent determinations under the 45ZCF-GREET model (see Section 4.01 of Notice 2025-11).
		US/Canadian canola oil/rapeseed oil	
		US used cooking oil (UCO)	
		Tallow	
		US distillers corn oil (DCO)	
		US carinata oil (intermediate crop)	
		US camelina oil (intermediate crop)	
		US pennycress oil (intermediate crop)	
Renewable Diesel	Hydroprocessed esters and fatty acids (HEFA)	US soybean oil	Calculate using the most recent determinations
		US/Canadian canola oil/rapeseed oil	
		US UCO	

		Tallow	under the 45ZCF-GREET model (see Section 4.01 of Notice 2025-11).
		US DCO	
		US carinata oil (intermediate crop)	
		US camelina oil (intermediate crop)	
		US pennycress oil (intermediate crop)	
ATJ	Ethanol (from fermentation pathways listed above)		
	Gasification and Fischer-Tropsch	US corn stover	
Renewable Natural Gas	Anaerobic Digestion and Biogas Upgrading	US wastewater sludge	Calculate using the most recent determinations under the 45ZCF-GREET model (see Section 4.01 of Notice 2025-11).
		US animal manures	
		US landfill gas	
Propane	HEFA	US soybean oil	Calculate using the most recent determinations under the 45ZCF-GREET model (see Section 4.01 of Notice 2025-11).
		US/Canadian canola/rapeseed oil	
		US UCO	
		Tallow	
		US DCO	
		US carinata oil (intermediate crop)	
		US camelina oil (intermediate crop)	
		US pennycress oil (intermediate crop)	
Naphtha	HEFA	US soybean oil	Calculate using the most recent determinations under the 45ZCF-GREET model (see Section 4.01 of Notice 2025-11).
		US /Canadian Canola/rapeseed oil	
		US UCO	
		Tallow	
		US DCO	
		US carinata oil (intermediate crop)	
		US camelina oil (intermediate crop)	
		US pennycress oil (intermediate crop)	

<p>Hydrogen</p>	<p>Various, as defined in the user manual for the most recent 45VH2-GREET model*</p>	<p>Various, as defined in the user manual for the most recent 45VH2-GREET model</p>	<p>Calculate well-to-gate emissions using the most recent determinations under the 45VH2-GREET model; then calculate the full well-to-wheel emissions using the most recent determinations under the 45ZCF-GREET model (see Section 4.01 of Notice 2025-11). See the 45ZCF-GREET User Manual for additional instructions.</p>							
<p>Sustainable Aviation Fuel (SAF)</p>	<table border="1"> <tr> <td data-bbox="508 751 808 1209"> <p>HEFA</p> </td> <td data-bbox="808 751 1122 1209"> <p>US soybean oil</p> <p>US/Canadian canola/rapeseed oil</p> <p>US UCO</p> <p>Tallow</p> <p>US DCO</p> <p>US carinata oil (intermediate crop)</p> <p>US camelina oil (intermediate crop)</p> <p>US pennycress oil (intermediate crop)</p> </td> </tr> <tr> <td data-bbox="508 1209 808 1346"> <p>ATJ</p> </td> <td data-bbox="808 1209 1122 1346"> <p>Ethanol (from fermentation pathways above)</p> </td> </tr> <tr> <td data-bbox="508 1346 808 1451"> <p>Gasification and Fischer-Tropsch</p> </td> <td data-bbox="808 1346 1122 1451"> <p>US corn stover</p> </td> </tr> <tr> <td data-bbox="508 1451 808 1688"> <p>Any pathway established in CORSIA Default or CORSIA Actual for a transportation fuel that is SAF that is not represented above.</p> </td> <td data-bbox="808 1451 1122 1688"> <p>Any feedstock for a pathway established in CORSIA Default or CORSIA Actual for a transportation fuel that is SAF that is not represented above.</p> </td> </tr> </table>	<p>HEFA</p>	<p>US soybean oil</p> <p>US/Canadian canola/rapeseed oil</p> <p>US UCO</p> <p>Tallow</p> <p>US DCO</p> <p>US carinata oil (intermediate crop)</p> <p>US camelina oil (intermediate crop)</p> <p>US pennycress oil (intermediate crop)</p>	<p>ATJ</p>	<p>Ethanol (from fermentation pathways above)</p>	<p>Gasification and Fischer-Tropsch</p>	<p>US corn stover</p>	<p>Any pathway established in CORSIA Default or CORSIA Actual for a transportation fuel that is SAF that is not represented above.</p>	<p>Any feedstock for a pathway established in CORSIA Default or CORSIA Actual for a transportation fuel that is SAF that is not represented above.</p>	<p>Calculate using one of the following: 1) the most recent determinations under the 45ZCF-GREET model (see section 4.01 of this notice) or 2) the most recent version of CORSIA Default or CORSIA Actual (see section 4.02 of this notice).</p> <p>Calculate using the most recent version of CORSIA Default or CORSIA Actual (see Section 4.02 of Notice 2025-11).</p>
<p>HEFA</p>	<p>US soybean oil</p> <p>US/Canadian canola/rapeseed oil</p> <p>US UCO</p> <p>Tallow</p> <p>US DCO</p> <p>US carinata oil (intermediate crop)</p> <p>US camelina oil (intermediate crop)</p> <p>US pennycress oil (intermediate crop)</p>									
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*The 45VH2-GREET model and the 45VH2-GREET User Manual are both available at <https://www.energy.gov/eere/greet>.

Source: Treasury Department and IRS, Notice 2025-11

45ZCF-GREET Model

The [45ZCF-GREET Model](#) is the most critical tool that the 45Z Credit framework uses to calculate the emissions rate, particularly for non-SAF transportation fuels. Developed by Argonne National Laboratory, this model is specifically tailored to meet the requirements of the 45Z Credit, endeavoring to ensure that emissions calculations are accurate and consistent with statutory objectives. It includes the most commonly used types of fuel that are anticipated to meet the eligibility requirements to claim the 45Z Credit, although additional types of fuel may be added in future versions.

The 45ZCF-GREET Model distinguishes between background data, which are fixed assumptions based on information available to the Treasury Department and the Department of Energy (DOE), and foreground data, which are specific inputs provided by the user. The model is publicly available, allowing taxpayers to access and use the model for their emissions calculations.

The model attempts to provide a consistent framework for calculating emissions across different types and categories of transportation fuels. Such consistency is crucial for ensuring that all fuels are evaluated on a level playing field, allowing for an accurate, fair, and verifiable application of the 45Z Credit. The Notices indicate that the model will be updated periodically to incorporate new data and methodologies, ensuring that it remains current and relevant.

Taxpayers would be required to use the 45ZCF-GREET Model as the authoritative source for determining emissions rates of most eligible fuels to claim a 45Z Credit, including ethanol, biodiesel, renewable diesel, renewable natural gas, propane, and naphtha. However, the 45ZCF-GREET Model is not required for all fuel types, pathways, and feedstocks.

Models for SAF and Hydrogen

To calculate the emissions rate for SAF, taxpayers must use the 45ZCF-GREET Model, the CORSIA¹ Default Life Cycle Emissions Values for CORSIA Eligible Fuels life cycle approach (“CORSIA Default”), or the CORSIA Methodology for Calculating Actual Life Cycle Emissions Values life cycle approach (“CORSIA Actual”). Whether taxpayers can choose which of these three models to use, or whether they are directed to use a specific model, depends on the pathway and feedstock of the SAF.

To calculate the emissions rate for hydrogen, taxpayers would use a combination of the 45VH2-GREET model (which is used to calculate the Section 45V credit for clean hydrogen production) and the 45ZCF-GREET Model. This combination is necessary because the 45VH2-GREET model only calculates “well-to-gate” emissions, not the full life cycle required under the hydrogen tax credit rules. In addition, to calculate the emissions rate for natural gas alternatives (as a production input or as the transportation fuel produced), electricity, and carbon capture and sequestration, taxpayers would have to follow rules similar to those for the 45Z Credit.

Fuels Not Listed in the Emissions Rate Table

If a particular fuel, pathway, or feedstock is not listed in the emissions rate table — such as renewable natural gas produced from food waste or methanol — taxpayers may file a petition for a Provisional Emissions Rate (PER) determination. The PER is available when: (1) a novel type of fuel is not included in the emissions rate table; or (2) the type of fuel is included in the emissions rate table, but such fuel is produced using a pathway or primary feedstock not included in the emissions rate table. Taxpayers cannot use the PER process if the category of transportation fuel, pathway, and feedstock are established in the emissions rate table, even if the taxpayer disagrees with the underlying assumptions or calculation approach.

The Treasury Department and the IRS said they intend to provide additional guidance related to the PER petition process, which will include obtaining an emissions rate from the DOE that an applicant will use to request a PER determination. Until such guidance is published, the IRS will not accept requests for PER determinations for the 45Z Credit, and the DOE will not issue emissions values. To date, this guidance has not been issued.

Regardless of when the Treasury Department and the IRS publish guidance establishing PER procedures or an emissions rate for new fuels, the Notices state that these emissions rates will apply from January 1, 2025.

Climate Smart Agriculture

The Notices state that rules will be proposed at a future date for taxpayers to access additional reductions in calculating the life cycle greenhouse gas emissions rates by utilizing certain climate smart agriculture (CSA) practices. CSA practices cultivate certain commodity crops, such as domestic corn, domestic soybeans, and domestic sorghum, in ways that result in lower GHG emissions or increases in carbon storage. Crops that were cultivated by using these CSA practices, then used as primary feedstocks for SAF or non-SAF transportation fuel, would be eligible for additional reductions in emissions rates and therefore a greater 45Z Credit. The Department of Agriculture announced an [interim rule](#) on January 17, 2025, with request for public comment, establishing guidelines for the reporting and verification of CSA practices and technologies.

Used Cooking Oil

Likely due to concerns about counterfeit product, fuel pathways that use imported UCO will not be available in the 45ZCF-GREET model until the Treasury Department and the IRS publish further guidance.

Certification of Emissions Rates

The Notices state that taxpayers claiming the 45Z Credit must keep certain records, including, among others, substantiation how the emissions rate for each fuel was determined. A safe harbor may also be available to taxpayers that substantiate their emissions rates with a certification, and forthcoming proposed regulations will outline rules for third-party certification of emissions rates. The Treasury Department and IRS intend to issue a model certificate; taxpayers can use model certificates from Notices 2024-6 and 2024-37 as formatting examples until the model is issued.

Qualified certifiers for the CORSIA Default and CORSIA Actual include sustainability certification schemes approved by the International Civil Aviation Organization (ICAO). Qualified certifiers for the 45ZCF-GREET model include: (1) those accredited by the American National Standards Institute National Accreditation Board; or (2) those verified under the Low Carbon Fuel Standard directed by the California Air Resources Board. Certifiers must have active accreditation when providing certification.

Stacking Credits

The Notices clarify that the 45Z Credit cannot be stacked with certain other tax credits. Specifically, 45Z Credits cannot be claimed on the same facility that is also claiming tax credits for clean hydrogen production or carbon oxide sequestration in any tax year, even if some or all of the components of the facility are owned by different taxpayers. Further, a facility for which an investment tax credit for an investment in hydrogen production facilities is claimed is permanently disqualified from claiming 45Z Credits.

Conclusion and Next Steps

While these Notices are an important step toward implementing the 45Z Credit, they should largely be considered a discussion draft ahead of forthcoming proposed regulations. As widely reported, President Donald Trump has made public statements indicating that his administration will not support policies directed toward the advancement of environmentally sustainable energy production generally and has issued executive orders intended to suspend select renewable energy initiatives. These developments could impact whether and when the IRS and Treasury Department progress in issuing the proposed regulations contemplated by the Notices, and any future administrative action on the 45Z Credits could be impacted by ongoing and future executive actions by the administration, such as the executive order titled "[Regulatory Freeze Pending Review](#)," issued on January 20, 2025.²

The Treasury Department and the IRS seek public comments on the Notices by April 10, 2025. Comments can be submitted electronically via the [Federal eRulemaking Portal](#) (by using the search field on the homepage to find either notice and submit comments). The subject line for the comments should include a reference to the applicable notice, either Notice 2025-10 or Notice 2025-11 (or both).

If you have questions about this Client Alert, please contact one of the authors listed below or the Latham lawyer with whom you normally consult:

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Endnotes

¹ The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) is a global program to reduce carbon dioxide emissions from international flights. The International Civil Aviation Organization (ICAO) established CORSIA in 2018.

² For more information, see Latham's blog, [The Trump Administration: First 100 Days](#).