Section 45Z Emissions Rate Table (For Fuel Produced After 12/31/2024)

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Reference: Appendix to Notice 2025-11

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	U.S. corn starch	Calculate using the most recent determinations under the 45ZCF-GREET model (see section 4.01 of this Notice 2025-11).
		U.S. sorghum grain	
		Brazilian sugarcane (for use as feedstock for SAF-Alcohol-to-Jet (ATJ) only)	
	Hydrolysis and Fermentation	U.S. corn stover	
Biodiesel	Transesterification	U.S. soybean oil	Calculate using the most recent determinations under the 45ZCF-GREET model (see section 4.01 of this Notice 2025-11).
		U.S./Canadian canola oil/rapeseed oil	
		U.S. used cooking oil (UCO)	
		Tallow	
		U.S. distillers corn oil (DCO)	
		U.S. carinata oil (intermediate crop)	
		U.S. camelina oil (intermediate crop)	
		U.S. pennycress oil (intermediate crop)	
Renewable Diesel	Hydroprocessed esters and fatty acids (HEFA)	U.S. soybean oil	Calculate using the most recent determinations under the 45ZCF-GREET model (see section 4.01 of this Notice 2025-11).
		U.S./Canadian canola oil/rapeseed oil	
		U.S. UCO	
		Tallow	
		U.S. DCO	
		U.S. carinata oil (intermediate crop)	
		U.S. camelina oil (intermediate crop)	
		U.S. pennycress oil (intermediate crop)	
	ATJ	Ethanol (from fermentation pathways listed above)	
	Gasification and Fischer-Tropsch	U.S. corn stover	
Renewabe Nlatural Gas	Anaerobic Digestion and Biogas Upgrading	U.S. wastewater sludge	Calculate using the most recent determinations under the 45ZCF-GREET model (see section 4.01 of this Notice 2025-11).
		U.S. animal manures	
		U.S. landfill gas	
Propane	HEFA	U.S. soybean oil	Calculate using the most recent determinations under the 45ZCF-GREET model (see section 4.01 of this Notice 2025-11).
		U.S./Canadian canola/rapeseed oil	
		U.S. UCO	
		Tallow	
		U.S. DCO	

		U.S. carinata oil (intermediate crop)	
		U.S. camelina oil (intermediate crop)	
		U.S. pennycress oil (intermediate crop)	
Naphtha	HEFA	U.S. soybean oil	Calculate using the most recent determinations under the 45ZCF-GREET model (see section 4.01 of this Notice 2025-11).
		U.S. /Canadian Canola/rapeseed oil	
		U.S. UCO	
		Tallow	
		U.S. DCO	
		U.S. carinata oil (intermediate crop)	
		U.S. camelina oil (intermediate crop)	
		U.S. pennycress oil (intermediate crop)	
Hydrogen	Various, as defined in the user manual for the most recent 45VH2-GREET model*	Various, as defined in the user manual for the most recent 45VH2-GREET model	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 this Notice 2025-11). See the 45ZCF-GREET User Manual for additional instructions.
Sustainable Aviation Fuel (SAF)	HEFA	U.S. soybean oil	Calculate using one of the following: 1) the most recent determinations under the 45ZCF-GREET model (see section 4.01 of this Notice 2025-11) or 2) the most recent version of CORSIA Default or CORSIA Actual (see section 4.02 of this Notice 2025-11).
		U.S./Canadian canola/rapeseed oil	
		U.S. UCO	
		Tallow	
		U.S. DCO	
		U.S. carinata oil (intermediate crop)	
		U.S. camelina oil (intermediate crop)	
		U.S. pennycress oil (intermediate crop)	
	ATJ	Ethanol (from fermentation pathways above)	
	Gasification and Fischer-Tropsch	U.S. corn stover	
	Any pathway established in CORSIA Default or CORSIA Actual for a transportation fuel that is SAF that is not represented above.	Any feedstock for a pathway established in CORSIA Default or CORSIA Actual for a transportation fuel that is SAF that is not represented above.	Calculate using the most recent version of CORSIA Default or CORSIA Actual (see section 4.02 of this notice).

*The 45VH2-GREET model and the 45VH2-GREET User Manual are both available at https://www.energy.gov/eere/greet.