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Overview of the Renewable Fuel Standard Program

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RFS Program Structure

The Renewable Fuel Standard program under the Clean Air Act was created under the Energy Policy Act of 2005 and further expanded by the Energy Independence and Security Act of 2007. EPA implements the RFS program in consultation with U.S. Department of Agriculture and the Department of Energy.

The RFS program is a national policy that requires a certain volume of renewable fuel be used to replace or reduce the quantity of fossil fuel in transportation fuel, home heating oil, or jet fuel. The four renewable fuel categories under the RFS program are:

- Biomass-based diesel
- Cellulosic biofuel
- Advanced biofuel
- Total renewable fuel

The 2007 enactment of EISA significantly increased the size of the RFS program and made key changes, including:

- Extending and increasing yearly volume requirements out to 2022.
- Adding explicit definitions for renewable fuels to qualify (e.g., renewable biomass, lifecycle greenhouse gas (GHG) emissions).
- Creating grandfathering allowances for volumes from certain existing facilities.
- Including specific types of waiver authorities.

The CAA provides EPA with the authority to establish or “set” the applicable renewable fuel volume targets for calendar years after 2022 via rulemaking. The CAA also provides that EPA must determine the applicable volumes of each biofuel category based on a review of implementation of the program and an analysis of multiple factors. Those factors include, for example, the impact of the use of renewable fuels on the cost to consumers of transportation, and the impact of the use of renewable fuel on other factors, including job creation, the price and supply of agricultural commodities, rural economic development, and food prices.

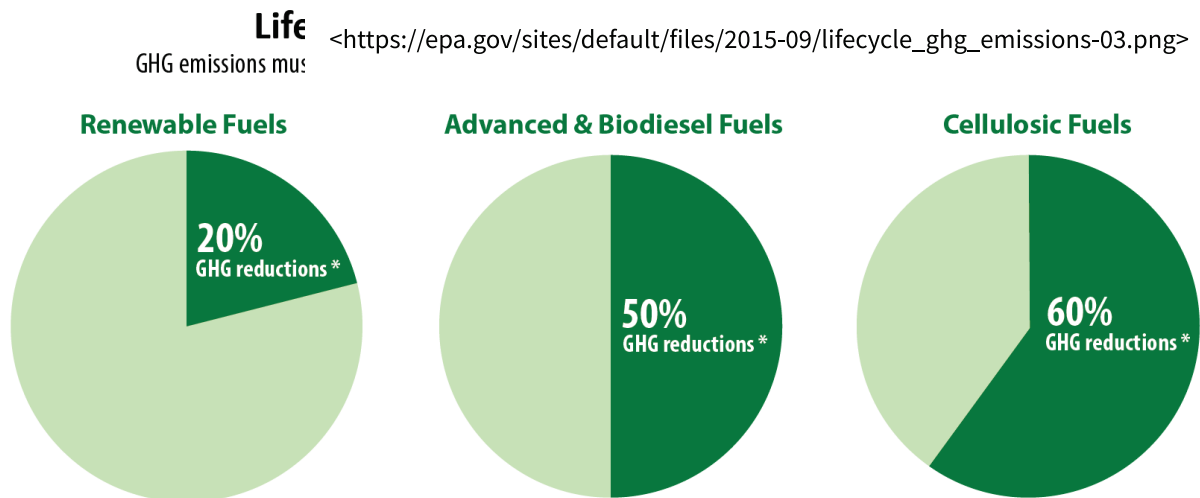
Fuel Pathways

For a fuel to qualify as a renewable fuel under the RFS program, EPA must determine that the fuel qualifies under both the statute and implementing RFS regulations. Among other requirements, fuels must achieve a certain reduction in GHG emissions as compared to a 2005 petroleum baseline.

EPA has approved fuel pathways under the RFS program under all four categories of renewable fuel. Advanced biofuel pathways already approved include ethanol made from sugarcane; jet fuel made from soybean oil; cellulosic ethanol made from crop residue; renewable compressed natural gas from landfills; and many others.

- Biomass-based diesel must be produced from qualifying renewable biomass and must meet a 50% lifecycle GHG reduction.
- Cellulosic biofuel must be produced from cellulose, hemicellulose, or lignin and must meet a 60% lifecycle GHG reduction.
- Advanced biofuel must be produced from qualifying renewable biomass (except corn starch) and must meet a 50% lifecycle GHG reduction.
- Renewable fuel (or conventional biofuel) typically refers to ethanol derived from corn starch and must meet a 20% lifecycle GHG reduction.

Lifecycle GHG reduction comparisons are based on a 2005 petroleum baseline as mandated by EISA. Biofuel facilities (domestic and foreign) that were producing fuel prior to enactment of EISA in 2007 are “grandfathered” under the statute, meaning these facilities are not required to meet the GHG reduction targets for their baseline volumes. EPA continues to review and approve new pathways, including for fuels made with advanced technologies or with new feedstocks.



* compared to a 2005 petroleum baseline

Click the image for a larger version.

Learn more about fuel pathways under the RFS program <https://epa.gov/renewable-fuel-standard-program/fuel-pathways-under-renewable-fuel-standard>.

RFS Program Compliance Basics

Obligated parties under the RFS program are refiners or importers of gasoline or diesel fuel. Obligated parties achieve compliance by obtaining and retiring for compliance enough credits representing renewable fuel (called “Renewable Identification Numbers” or RINs) sufficient to meet their Renewable Volume Obligation for each renewable fuel category (i.e., cellulosic biofuel, biomass-based biofuel, advanced biofuel, and total renewable fuel).

Through rulemaking, EPA establishes annual volume targets based on consideration of a number of statutory factors and calculates corresponding percentage standards using projections of gasoline and diesel production. Obligated parties use these percentage standards to calculate their individual RVOs and must demonstrate compliance annually. Obligated parties calculate their annual RVOs by using the following formula for each of the four renewable fuel types:

$$\text{Annual RVO} = \text{Production or import volume for combined gasoline \& diesel} \times \text{Annual percentage standard set for CB, BBD, AB, and RF} + \text{Any carry-over deficit from previous year}$$

Exporters of neat renewable fuel, as well as exporters of renewable fuel blended with other fuels (including, but not limited to, gasoline, diesel, heating oil, jet fuel, and marine fuel) are also required to demonstrate compliance with their exporter RVO(s) by using the following formula for each type of renewable fuel they export:

$$\text{Exporter RVO} = \text{Fuel type volume (ethanol, biodiesel, etc.)} \times \text{Associated equivalence value}$$

Each fuel type is assigned a “D-code” – a code that identifies the renewable fuel type – based on the feedstock used, fuel type produced, energy inputs and GHG reduction thresholds, among other requirements. The four categories of renewable fuel have the following assigned D-codes:

- Cellulosic biofuel is assigned a D-code of 3 (e.g., cellulosic biofuel) or 7 (cellulosic diesel).
- Biomass-based diesel is assigned a D-code of 4.
- Advanced biofuel is assigned a D-code of 5.
- Renewable fuel (conventional biofuel) is assigned a D-code of 6 (grandfathered fuels are also assigned a D-code of 6).

More information on RINs:

- RINs are generally generated when a producer makes a gallon of renewable fuel.

- One RIN represents an ethanol-equivalent gallon of renewable fuel produced and used for transportation purposes within the U.S.
- RINs can be traded between parties, including non-obligated third parties (e.g., brokers, traders).
- Obligated parties can obtain RINs either by separating RINs from renewable fuel after blending with gasoline or diesel, or by purchasing already-separated RINs on the open market.
- RINs can be used to demonstrate compliance for the year in which they are generated or the following year, after which they expire and are invalid.

The RFS program's four renewable fuel standards are nested within each other. For example, advanced biofuel RINs (e.g., biodiesel or sugarcane ethanol) can be used to meet both the advanced biofuel and total renewable fuel standards, and cellulosic biofuel and biomass-based diesel RINs can both be used to meet the advanced biofuel standard.

The table below shows which RIN type and D-code can be used to demonstrate compliance with the four categories of RVOs:

D-Code	Cellulosic Biofuel	Biomass-Based Diesel	Advanced Biofuel	Total Renewable Fuel
3	X		X	X
4		X	X	X
5			X	X
6				X
7*	X	X	X	X

*Note: Obligated parties may only use a D-code 7 RIN for either their cellulosic biofuel RVO or biomass-based diesel RVO, but not both.

Obligated parties achieve compliance by obtaining and retiring for compliance enough RINs to meet their annual RVO for each renewable fuel category. Exporters of renewable fuel achieve compliance by obtaining and retiring enough RINs to satisfy their RVO associated with each discrete volume of exported renewable fuel within thirty days of export.

When an obligated party does not retire enough RINs to meet an RVO for a given compliance year, the result is a compliance deficit that is carried forward into the next compliance year and is added to the obligated party's RVO calculation. However, this deficit must be made up the following year and the obligated party is also prohibited from carrying forward a deficit for the next compliance year. Exporters of renewable fuel must meet their exporter obligations in full as there is no compliance deficit option.

For the cellulosic biofuel standard, an additional flexibility is provided for years in which EPA exercises its cellulosic waiver authority to reduce the required volume of cellulosic biofuel. Cellulosic waiver credits (CWCs) are offered by EPA at a price determined by formula in the statute. For years in which CWCs are offered, obligated parties have the option of purchasing CWCs plus retiring a corresponding number of advanced RINs in lieu of retiring cellulosic RINs.

Learn more about cellulosic waiver credits <<https://epa.gov/renewable-fuel-standard-program/cellulosic-waiver-credits-under-renewable-fuel-standard-program>>.

Learn more about RFS program compliance at Fuels Registration, Reporting and Compliance Help <<https://epa.gov/fuels-registration-reporting-and-compliance-help>>.

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