

WHITE PAPER / **RENEWABLE FUEL STANDARD PROGRAM**

UNDERSTANDING THE ROLE OF RFS IN OUR ENERGY TRANSITION

The current federal renewable energy policy is on the table for extension, debate or cancellation. To advocate for a robust renewable fuel program, it is essential to understand the challenges associated with the current version and how it might be strengthened to invest in a greener future.



RENEWABLE FUEL STANDARD POLICY

At its most basic level, the Renewable Fuel Standard (RFS) program in the United States, created under the Energy Policy Act of 2005, seeks to increase the amount of renewable fuel incorporated into the national transportation fuel supply incrementally, year after year. As the implementing body of the RFS, the U.S. Environmental Protection Agency (EPA) reviews and sets the renewable volume obligations (RVOs) on an annual basis. Whether a refiner or importer, the obligated party's RVO varies depending on its own production volume of gasoline or diesel, and it is set at a certain production percentage for the year based on the overall dictated renewable fuel volume.

To track RVOs, each gallon of qualifying biofuel is assigned a Renewable Identification Number (RIN). RINs essentially act as the currency of the RFS program. Obligated parties can generate RINs in a few ways: by blending qualifying biofuel directly into transportation fuel; purchasing RINs from a third party; or carrying over excess annual RIN credits and submitting them the next year for volume credit.

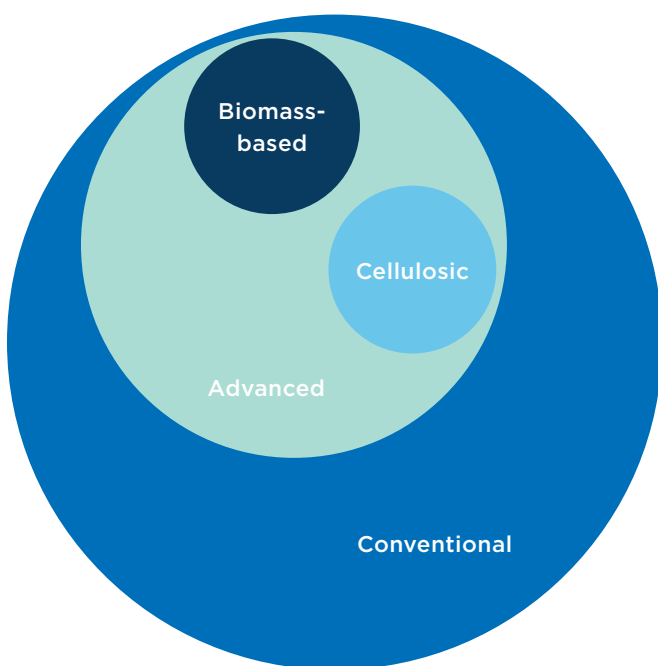


FIGURE 1: Renewable fuels.

BIOFUEL TYPE	% LIFE CYCLE GHG REDUCTION	FEEDSTOCK
Total renewable	20	Conventional
Advanced	50	Nonconventional
Biomass-based diesel	50	Biomass
Cellulosic	60	Cellulose, hemicellulose, lignin

FIGURE 2: Summary of categorical biofuel requirements.

RENEWABLE BIOFUEL CATEGORIES

Renewable biofuels are categorized into four nested categories; total renewable, advanced, biomass-based diesel, and cellulosic biofuels (see Figure 1). These categories are differentiated by their feedstocks as well as their greenhouse gas (GHG) emission reduction requirements.

The EPA defines advanced biofuels as those that do not use conventional feedstocks. Conventional feedstocks compete directly with the food supply chain, the primary example of this being ethanol derived from cornstarch. The nonfood biomass used in advanced biofuels does not interrupt the food chain, which means scaling up production will not compete with food production.

Biomass-based diesel and cellulosic biofuels are the two specifically defined subcategories of advanced biofuel. Each category has defined volume obligations each year, increasing over time to incentivize investment in and production of these two advanced biofuels. The definition for cellulosic biofuel was widened in 2014 to include renewable compressed natural gas, renewable liquefied natural gas produced from agricultural digesters, biogas from landfills, and municipal wastewater treatment facility digesters. (See Figure 2 for more details on fuel categories.)

For example, if 1,000 gallons of cellulosic ethanol is produced, that fuel fulfills part of the cellulosic advanced and total renewable fuel volume obligation, whereas traditional corn ethanol would only fulfill the total renewable volume obligations. Therefore, fuels that are more deeply nested (i.e., cellulosic and biomass-based diesel) are in higher demand.

The requirements to qualify under a certain biofuel category go beyond the feedstock. The entire life cycle of the fuel is tracked and must follow an EPA-approved pathway. Fuel pathways track the feedstock, fuel production process and end use of the fuel. The life cycle GHG emissions must be a certain percentage less than the emissions required to produce an equivalent volume of diesel or gasoline in 2005. The RFS does make an allowance for biofuel production facilities built before 2007. An additional qualifying factor is that the fuel must be used as either a transportation fuel, heating oil or a jet fuel.

POLICY IMPLEMENTATION

Congress had many motives for creating the RFS in 2005. Among them was the desire to pursue energy security by creating a source of domestically produced transportation fuel. This bipartisan policy also sought to strengthen rural economies, protect the environment and provide resources for an emerging energy economy. The Energy Policy Act of 2005 was expanded upon by the Energy Independence and Security Act (EISA) in 2007, which increased annual volume requirements; added volume requirements based on biofuel category/GHG emission accounting; expanded the definition of cellulosic fuel; and expanded the EPA's waiver authority to lower RFS volumes.

WAIVERS

The 2007 statute was intended to be a "market forcing policy" by creating demand for renewable fuels, specifically biomass-based diesel and cellulosic fuel. The rate at which cellulosic biofuel production was scaled up year over year in the EISA was a premature bet on unproven technology. This aggressive target was established before commercial viability had been proven, when these fuels had only been produced in a lab. Because the technology was unproven, Congress also included the ability to create waivers if cellulosic supply did not expand at pace with the policy's targets. The EPA can partially or completely waive EISA cellulosic biofuel volume requirements — or requirements for any other specific category of biofuel — if it can be proven that severe economic or environmental harm will result from implementing the volume mandates, or if inadequate domestic supply can be demonstrated.

Another part of the EISA mandate, commonly referred to as the "reset provision," requires the modification of applicable volumes under certain circumstances, meaning the EPA can change current (as well as projected) volumes for the rest of the statute duration until 2022. This provision is triggered when either the cellulosic biofuel mandate or biomass-based diesel mandate are decreased by at least 20% for two years in a row or 50% in a single year. However, the statute does not include a detailed methodology to determine the new volumetric requirements. This section of the statute took effect in 2016 and has been controversial for biofuel producers and obligated parties alike.

Additionally, the statute provides the EPA with the ability to issue small refinery exemptions, which should not be confused with waivers. To qualify as a small refinery, a facility's crude oil production must be less than 75,000 barrels per day (BPD). These exemptions are allowed when small refineries can demonstrate "disproportionate economic hardship" would be experienced while trying to fulfill their RVOs. These exemptions, once granted, can be extended. The key to exercising the exemption policy is that it must be granted in the first place, not just assumed by a refinery producing less than 75,000 bpd.

IMPLICATIONS

Among the waivers and exemptions outlined in the statute, two have become the subject of fierce debate. The cellulosic biofuels waiver has been a consistent part of the program ever since cellulosic biofuel was singled out for aggressive commercial expansion in 2007. Originally, Congress projected that the production of this biofuel would be able to climb from 100 million gallons in 2010 to 16 billion gallons in 2022. This projection has been the subject of much scrutiny, as the viability of commercial production was debatable in 2007 and has yet to be proven even as of 2020.

Commercial cellulosic fuel was not produced until 2012, when approximately 20,000 gallons qualified for RINs. The company producing the fuel went out of business a year later. It was not until 2014 that four additional companies produced another 725,000 gallons of cellulosic biofuel. Production reached 2.2 million gallons in 2015, 3.8 million in 2016, and 10 million in 2017. Despite the



significant gain in volumetric production, these numbers fall far short of both the nameplate capacity for all four plants (cumulatively 88 million gallons), as well as the EISA's original mandate of 5.5 billion gallons by 2017. The EPA has had to lower the mandate by approximately 95% to 99% since cellulosic fuels volume obligations began. Despite federally backed loan guarantees and large subsidies, all the original cellulosic biofuel-producing plants have been sold or gone out of business. Without major technological advances, fuel from cellulosic sources will not ascend to the heights hoped for by Congress.

The drastic difference between the EISA projections and actual volumes has called into question the methodology Congress utilized to create the original standard. Subsequent EPA volume projections, created in response to waiver requests, have also come under scrutiny because of a perceived lack of technology neutrality and continued inaccuracy. These necessary waiver provisions and exemptions give the EPA the flexibility required to establish RVOs that are attainable by obligated parties. However, these waivers have also undermined many aspects of the RFS program. The shifting volumetric requirements have eroded the trust of many interested parties. The increased risk associated with these kinds of investments makes them far less appealing, as they are based on a shifting foundation.

In addition, waiver decision deadlines have been missed repeatedly. These decisions have taken much longer than stipulated in the statute, leaving obligated parties in limbo.

A MONUMENTAL TASK

The future production capacity of advanced biofuels is a sizable challenge to predict. The complexity only begins with understanding the highly technical processes required to produce the fuels. The cross section of the economy that the program spans is broad and requires the cooperation of stakeholders with different incentives.

The challenge is compounded by the fact that administering the RFS program is only one part of the EPA's regulatory workload. There are numerous requirements under the RFS umbrella. Among the EPA's RFS obligations:

- **Annual volume standards:** Evaluation of projected biofuel availability in each biofuel category. These standards are released annually.
- **Fuel pathways:** Evaluating and approving new fuel pathways. Over 100 facility-specific pathway petitions have been reviewed since 2010, and over 20 pathways are pending.
- **Lawsuits:** The interpretation of the statute has been challenged by a diverse collection of stakeholders; the policy continues to become better defined because of this litigation.
- **Life cycle GHG emissions:** A continual effort to track life cycle GHGs for all approved fuel pathways, so that they continue to meet the required GHG emission percentage decrease.
- **Small refinery exemptions:** Must be sought by small refineries and granted by the EPA for the exemption to be viable that year and subsequent years.
- **Program compliance and quality assurance:** Accounting for all biofuel production and RIN transfers while also identifying fraudulent RIN generation.
- **Waiver requests:** Must be responded to within 60 days, with the decision on the waiver based on the EPA's interpretation of whether the requirements for the waiver have been met (e.g., inadequate domestic supply, economic environmental hardship).

The EPA has been handed a monumental task to administer a program that it did not draft. The future success of the RFS program will depend on the EPA's ability to accurately predict the future production of biofuels and administer the program within the timelines established in the statute.

CONCLUSION

The RFS has weathered three different presidential administrations, various oil boom-and-bust cycles, and a significant dose of litigation. However, the mere survival of the program does not paint a clear picture of its future.

The EPA was handed a vaguely defined, amorphous program that has taken shape slowly through a combination of experience and sharp edges applied in the courtroom. This legal vetting would be applied to any replacement program created in Congress. But should this sunk cost keep Congress from creating a new program? Some would argue that the RFS program is too fundamentally flawed to continue, while others would say that scrapping the policy would only further erode the trust of all parties involved.

Congress has a choice to make changes in 2022. Will the program continue as is? Will it continue with modifications? Or will it cease to exist entirely? Whatever happens, any policy will require increased investment in the administering body and consistency from year to year to build a solid foundation for the renewable fuels industry of the future.

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