

# FINAL EPA RULE FOR RENEWABLE FUEL STANDARD 2014-2016 VOLUMES

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SUMMARIZE  
REGULATORY  
AND OTHER  
DEVELOPMENTS  
RELATED TO CLEAN  
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WORLDWIDE.

On November 30, 2015 EPA released its final rule for volume standards for the Renewable Fuel Standard (RFS) program in 2014-2016 as well as the biomass-based diesel (BBD) volume for 2017. This final rule follows a Notice of Proposed Rulemaking (NPRM) released in May 2015, as well as a controversial NPRM to set 2014 volume standards that was withdrawn in that year.

This policy update provides an overview of the main elements of the final rule, how it differs from the NPRM, and what it indicates about EPA's approach for implementing the RFS beyond 2016.

## MAIN ELEMENTS OF RULE

For the first time, EPA is setting volumes for the advanced biofuel and renewable fuel categories that are lower than the statutory levels in the Energy Independence and Security Act of 2007, the law that created the second phase of the RFS (the RFS categories are nested: cellulosic biofuel and biomass-based diesel are both subsets of advanced biofuel, which is a subset of renewable fuel).<sup>1</sup> Table 1 compares these volumes for 2014-2016. At the point the final rule was released, 2014 had passed and there was only one month remaining in 2015; volumes for these years were therefore set based on actual biofuel production.<sup>2</sup> The main impact of this rule will be in setting the 2016 volumes for all categories (see Table 1) and the 2017 volume standard for BBD (2 billion gallons).

<sup>1</sup> For background on how the RFS works, see <http://www.theicct.org/briefing-how-rfs2-works>  
<sup>2</sup> 2015 volumes were extrapolated from actual production over the first 9 months of the year.

**Table 1.** RFS statutory volumes compared to volumes set in EPA’s final rule for 2014-2016.<sup>3</sup>

Billion gallons per year	Statutory volumes			Volumes in final rule		
	2014	2015	2016	2014	2015	2016
<b>Cellulosic</b>	1.75	3	4.25	0.033	0.123	0.230
<b>BBD</b>	>1.0	>1.0	>1.0	1.63	1.73	1.9
<b>Advanced</b>	3.75	5.5	7.25	2.67	2.88	3.61
<b>Renewable</b>	18.15	20.5	22.25	16.28	16.93	18.11

In every year of the RFS, actual cellulosic biofuel production has fallen below the statutory volumes, and so in anticipation of this shortfall EPA has used its Cellulosic Waiver Authority to reset these volumes lower in every volume of rulemaking. This year, EPA is also using its General Waiver Authority to reduce volumes of advanced and renewable fuel, which are mostly met with ethanol, because the U.S. market has become saturated with E10 (10% ethanol in gasoline), and there are significant constraints on supplying higher blends of ethanol, including manufacturer warranties for vehicles and fueling infrastructure. In legal terms, EPA argues the General Waiver Authority is invoked by a shortage in renewable fuel supply, defining the situation as a shortage in supply of higher ethanol blends (E15-E85) to vehicles that can use them.

EPA has calculated the amount of ethanol that can be consumed under the RFS according to expected consumption of different ethanol blends: E0 (gasoline with no ethanol that is necessary for boats and small engines), E10, E15 (15% ethanol in gasoline, which can be consumed by newer cars but is rarely supplied at fueling stations), and E85 (51-83% ethanol in gasoline that can only be consumed by flex fuel vehicles). The E10 market is now fully saturated, and so, given the slow rate of E15 adoption, an increase in ethanol consumption can effectively be achieved only through an increase in E85.

This decision therefore effectively limits the amount of ethanol that must be supplied in U.S. transport fuel compared to the statutory volumes — almost all of the renewable fuel pool other than advanced biofuel historically has been corn ethanol, and much of the advanced pool has been filled with sugarcane ethanol imported from Brazil.

BBD is the only biofuel category that EPA has set above its statutory mandate. The law does not specify BBD volumes beyond 2012, but sets a minimum of 1 billion gallons per year. EPA has increased that mandated volume in every year since then. Part of the context for increasing BBD volumes is that these fuel types are not generally constrained by a blendwall — fatty acid methyl ester biodiesel can be blended up to 5% in diesel without requiring labeling, and the current nationwide average is still under 2%. Hydrotreated vegetable oil (HVO) renewable diesel can be supplied at any blend rate. However, the environmental benefit of increased BBD production is not clear. Although EPA concluded that BBD reduces GHG emissions by more than 50% compared to diesel in their original 2010 RFS2 rulemaking, since then increased diversion of U.S. soybean oil to biodiesel has resulted in increased palm oil imports.<sup>4</sup> Palm oil expansion is linked to very high GHG emissions from peat drainage in Malaysia and Indonesia, and thus the carbon intensity of soy biodiesel is likely being underestimated.<sup>5</sup>

<sup>3</sup> Biomass-based diesel is given in biodiesel-equivalent volumes. Biodiesel is more energy dense than ethanol and so each gallon of BBD counts as 1.5 gallons towards the Advanced and Renewable categories.

<sup>4</sup> See <http://www.theicct.org/blogs/staff/renewable-fuel-standard-inadvertently-driving-us-palm-oil-imports>

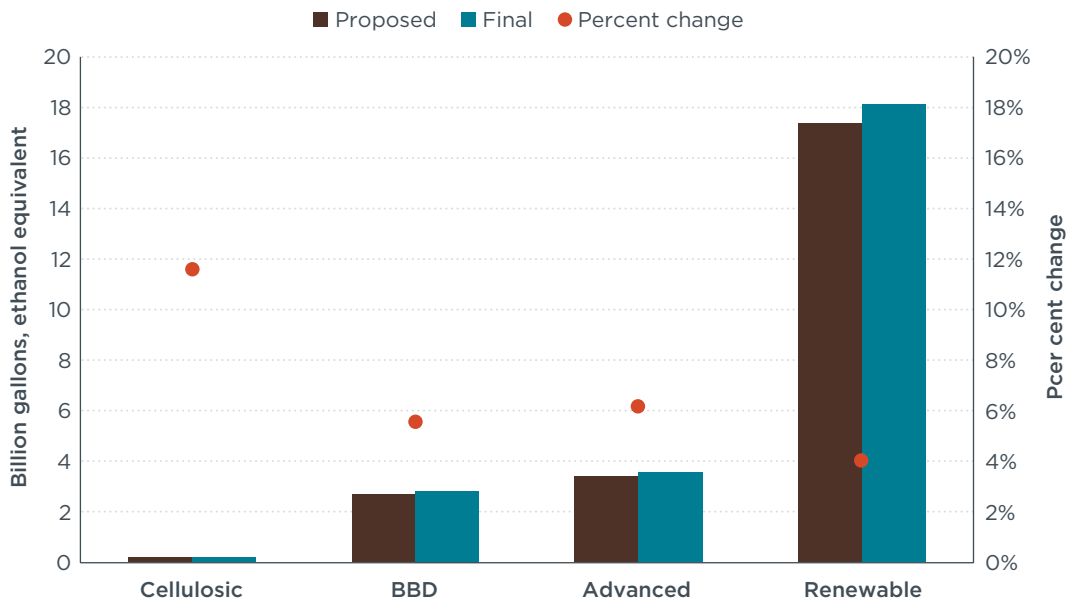
<sup>5</sup> See <http://www.theicct.org/historical-analysis-and-projection-oil-palm-plantation-expansion-peatland-southeast-asia>; <http://www.theicct.org/review-peat-surface-greenhouse-gas-emissions-oil-palm-plantations-southeast-asia>

The RFS category that delivers the greatest climate benefit per gallon — cellulosic biofuel — is still far behind the statutory schedule, but is finally starting to deliver significant volumes with 123 million gallons expected to be produced in 2015 and an almost doubling of this amount to 230 million gallons in 2016. This large jump in production from just 33 million gallons in 2014 is mostly due to EPA’s recent approval of a new pathway for cellulosic biogas from farm digesters that can either be purified and blended into fossil natural gas for compressed natural gas (CNG) or liquefied natural gas (LNG) vehicles, or combusted for electricity to power electric vehicles. To date, facilities have been approved for blending biogas into CNG/LNG, but the electric vehicle route has not yet been utilized.

## WHAT CHANGED FROM EPA’S PROPOSAL TO THE FINAL RULE

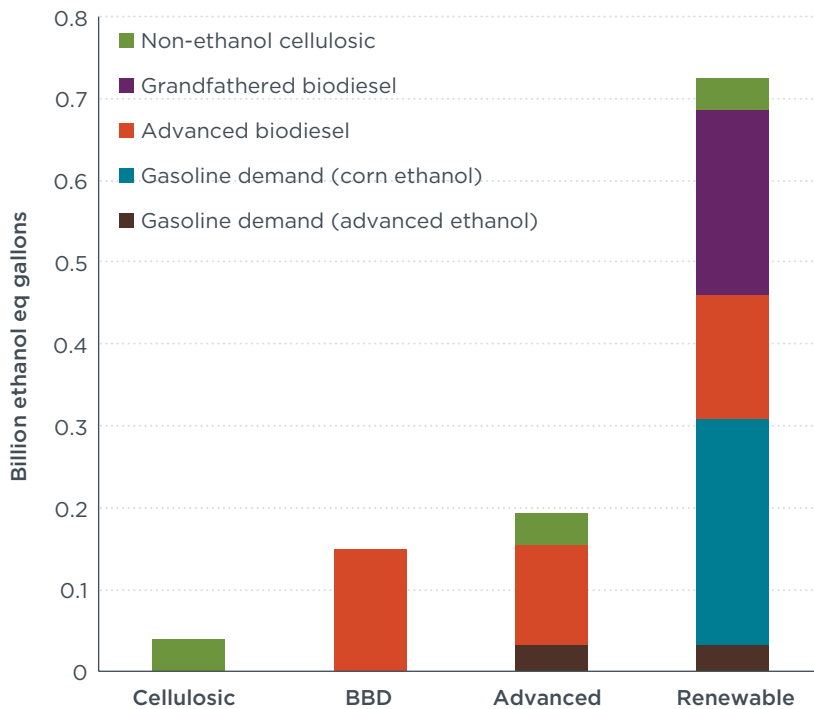
In the final rule, EPA has increased volumes of all categories for 2015 and 2016 above the proposal, except for the 2015 advanced fuel mandate, which has been very slightly decreased. 2015 volumes were increased for cellulosic biofuel, BBD, and total renewable fuel because actual production was greater than anticipated. It is likely that part of this increase was due to higher than forecast gasoline consumption.

2016 volumes are higher for all categories compared to the NPRM, and this change is shown in Figure 1. Although the increase in cellulosic biofuel was not high in terms of actual gallons (a 27 million gallon increase), the relative increase of 12% from the proposal was the greatest across all categories. BBD, advanced biofuel, and renewable fuel volumes each increased by around 5%.



**Figure 1.** 2016 volumes for the RFS biofuel categories in the proposed and final rules, and per cent change from the proposal to the final rule.

EPA set these volume increases based on a number of changes to their calculations, shown in Figure 2. As in 2015, the forecast for total gasoline consumption has increased for 2016 since the NPRM was released. This means that more E10 will be consumed, and thus more ethanol consumed overall. However, the increase in gasoline demand only accounts for about half of the increase in the total renewable fuel volume. EPA has set the BBD mandate about 5% higher in the final rule than the proposal, and because BBD is part of advanced biofuel and renewable fuel under the nested categories of the RFS, this increase contributed to the latter categories as well.



**Figure 2.** Change in 2016 volumes from EPA’s proposal and the final rule by category and by specific changes in calculations of biofuel supply.

In response to the NPRM, ICCT commented that the BBD volumes for 2015-2017 should be reduced because the proposed volume increases could not be supplied by domestically available feedstock supply, based on a study by Wade Brorsen.<sup>6</sup> This study reported that volumes exceeding the growth rate for BBD feedstock would result in feedstock price increases, reduced exports, and/or increased imports. EPA noted this study as evidence that BBD supply would be constrained by feedstock availability and a number of other factors in 2016, and therefore it would not be appropriate to set the BBD volume at the level suggested by the biodiesel industry (2.4 billion gallons, versus 1.9 billion gallons in the final rule). EPA also noted in the final rule that increasing use of vegetable oils in biodiesel could drive increases in palm oil imports, in agreement with our prior research and with Brorsen’s study.

Interestingly, EPA also expects a significant increase in production and imports of grandfathered biodiesel compared to 2015 and compared to the proposal. Biodiesel

<sup>6</sup> See <http://www.ucsusa.org/sites/default/files/attach/2015/07/Brorsen-RFS-Biodiesel-Feedstock-Analysis.pdf>; <http://www.theicct.org/news/comments-rfs-2014-2016-rvo>

facilities, both domestic and foreign, that do not meet the 50% GHG reduction threshold to qualify under the BBD category, but that existed or were under construction at the time the original RFS2 final rule was passed in 2010 are eligible under the renewable fuel category. Grandfathered biodiesel includes inefficient or coal-powered soy biodiesel facilities in the U.S., but also includes imports of palm oil biodiesel from foreign facilities. In fact, 2015 saw a rapid increase in RIN generation from grandfathered palm oil biodiesel as these facilities began to recognize the U.S. market as an opportunity under the incentive of the RFS. Two grandfathered palm biodiesel facilities that have been registered under the RFS could potentially supply as much as 372 million gallons per year of palm biodiesel to the U.S.<sup>7</sup> Like BBD, grandfathered biodiesel has the advantage of not currently being constrained by a blendwall, and so if for any reason total gasoline or E85 consumption is lower than expected, there will be a strong incentive for fuel suppliers to meet their renewable fuel obligation with more biodiesel and renewable diesel.

The increase in the cellulosic biofuel volume from the proposal to the final rule is largely due to an increased forecast for cellulosic biogas production. Because biogas is not affected by the ethanol blendwall, EPA increased the advanced biofuel and renewable fuel volumes by the same amount (Figure 2).

It is notable that the calculation changes that resulted in increased volumes shown in Figure 2 do not include an increase in forecast E85 consumption. With EPA increasing the renewable fuel volume (which is mostly met with corn ethanol) by such a significant amount, one might have inferred that there must be a stronger forecast for E85 consumption. On the contrary, EPA's expectation for E85 in the final rule is, if anything, lower than in the proposal. In the proposal, EPA did not specify a particular volume of E85 that would contribute to ethanol consumption, but described a number of scenarios with E85 consumption ranging from 100-600 million gallons. In the final rule, although EPA stressed that the mandated volumes could be met in a number of ways, the agency based their calculation of the total renewable fuel volume on an assumption of 200 million gallons of E85 in 2016 and state that actual E85 consumption is not likely to be higher than 400 million gallons. This represents an annual increase in E85 consumption of about 15% compared to EPA's estimate of 150 million gallons consumed in 2014. The ethanol industry has been hoping EPA would set renewable fuel mandates so high that they could only be met through rapid growth in E85 consumption, and that this would force investment in E85. Importantly, EPA argues in this final rule that the RFS is not an effective instrument for expanding E85 supply in the short term. The rule presents an analysis showing that when prices of Renewable Identification Numbers (RINs, essentially RFS credits)<sup>8</sup> are high, the value obtained from these credits by blenders is not efficiently passed on to consumers in the form of lower E85 prices. In effect, EPA is saying that the RFS is not able to directly drive substantial short term increases in ethanol consumption given the state of the fuel supply market, and that setting renewable fuel mandates higher would place undue burden on fuel suppliers and consumers without significant impact on the E85 market. However, EPA does expect sustained high RIN prices to encourage investment in E85 over the long term.

The renewable fuel volume for 2014 was increased by 350 million gallons as EPA corrected an error in the analysis underlying the proposal. EPA had misinterpreted

7 Total capacity of these facilities is 354 million gallons, and the RFS allows a 5% capacity expansion that would still be eligible.

8 For background on RINs, see <http://www.theicct.org/conversational-guide-renewable-identification-numbers-rfs2>

data on ethanol exports from the Census Bureau, assuming that 350 million gallons of exported undenatured ethanol (which is not eligible for RIN generation) had been denatured (eligible for RIN generation). When RINs are generated from biofuel exports, the same number of RINs must later be retired — but RINs from exports do not count towards obligated parties' compliance with the RFS. EPA thus assumed that the total number of RINs generated in 2014 included 350 million RINs that would later be retired without counting towards compliance, and so the agency reduced the total renewable fuel obligation by 350 million gallons below actual RIN generation. In the final rule, EPA acknowledged that these exported gallons had in fact been undenatured and had never contributed to 2014 RIN generation at all, and thus should not have been offset in the proposed volumes. EPA added 350 million gallons to the 2014 renewable fuel volume to correct this error. The error does not affect 2015 or 2016 volumes.

## EPA'S APPROACH MOVING FORWARD

One of the most important elements of this rule is that it sets out new strategies to set volumes beyond 2016, so the logic presented in this rulemaking is likely to be applied to future RFS volumes for several years to come. This means that EPA is likely to set volumes that only slightly increase the percentage of ethanol in gasoline each year. As EPA does not believe the RFS to be an effective instrument in promoting E85 uptake in the short term, the annual change in ethanol volumes in the next few years will largely depend on how E85 responds to other factors. EPA has signaled an intention to continue increasing BBD volumes, but only to a point. The agency expects the BBD industry to face greater challenges in increasing capacity in the future compared to the past, and suggests that annual increases in the volume mandate may slow. In this rulemaking, EPA has used a more conservative methodology for setting cellulosic volumes than in the past, in response to a court ruling that determined the agency must not set volumes greater than expected production. From now on, EPA will now calculate volumes of cellulosic biofuel as the 50<sup>th</sup> percentile estimate of likely production from existing commercial-sized facilities in addition to the 25<sup>th</sup> percentile estimate for new facilities. In our comments on the proposal, we suggested EPA project biogas volumes according to the 75<sup>th</sup> percentile estimate for existing facilities and the 50<sup>th</sup> percentile estimate for new facilities because biogas technology is more established than for other types of cellulosic biofuel. However, EPA has maintained this calculation methodology in the final rule.

A major question is whether EPA will soon undertake a fundamental revision of volumes for all remaining years until 2022. Under the statute, if EPA waives at least 20% of the statutory volumes for two consecutive years, the agency must modify the volumes for all remaining years. This threshold has certainly been met for the cellulosic category, and indeed, more than 20% of the cellulosic volumes have now been waived for the seventh year in a row. Advanced biofuel volumes have now been reduced by more than 20% for three years in a row (2014-2016) and thus may warrant a new schedule as well. The volumes in the NPRM would have triggered a reset for renewable fuel, but these volumes have been increased just enough in the final rule to avoid the 20% reduction threshold, so EPA may not be required to establish new volumes to 2022 for renewable fuel quite yet. On the other hand, there could be value in re-establishing future volumes for all the four categories together, especially given that the difference between statutory and mandated cellulosic volumes will increasingly affect the overall renewable fuel volumes achievable.