6560-50-P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 80

[EPA-HQ-OAR-2017-0091; FRL-9971-73-OAR]

RIN 2060-AT04

Renewable Fuel Standard Program: Standards for 2018 and Biomass-Based Diesel Volume for 2019

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: Under section 211 of the Clean Air Act, the Environmental Protection Agency (EPA) is required to set renewable fuel percentage standards every year. This action establishes the annual percentage standards for cellulosic biofuel, biomass-based diesel, advanced biofuel, and total renewable fuel that apply to gasoline and diesel transportation fuel produced or imported in the year 2018. Relying on statutory waiver authority that is available when projected cellulosic biofuel production volumes are less than the applicable volume specified in the statute, the EPA is establishing volume requirements for cellulosic biofuel, advanced biofuel, and total renewable fuel that are below the statutory volume targets. In this action, we are also establishing the applicable volume of biomass-based diesel for 2019.

DATES: This final rule is effective on [**insert date 60 days after publication in the Federal Register**].

ADDRESSES: The EPA has established a docket for this action under Docket ID No. EPA-HQ-OAR-2017-0091. All documents in the docket are listed on the http://www.regulations.gov web

site. Although listed in the index, some information is not publicly available, e.g., CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available electronically through http://www.regulations.gov.

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SUPPLEMENTARY INFORMATION:

Entities potentially affected by this final rule are those involved with the production, distribution, and sale of transportation fuels, including gasoline and diesel fuel or renewable fuels such as ethanol, biodiesel, renewable diesel, and biogas. Potentially regulated categories include:

Category	NAICS[1] Codes	SIC[2] Codes	Examples of Potentially Regulated Entities
Industry	324110	2911	Petroleum Refineries
Industry	325193	2869	Ethyl alcohol manufacturing
Industry	325199	2869	Other basic organic chemical manufacturing
Industry	424690	5169	Chemical and allied products merchant wholesalers
Industry	424710	5171	Petroleum bulk stations and terminals
Industry	424720	5172	Petroleum and petroleum products merchant wholesalers
Industry	221210	4925	Manufactured gas production and distribution
Industry	454319	5989	Other fuel dealers

[1] North American Industry Classification System (NAICS).
[2] Standard Industrial Classification (SIC) system code.

This table is not intended to be exhaustive, but rather provides a guide for readers regarding

entities likely to be regulated by this action. This table lists the types of entities that EPA is now aware could potentially be regulated by this action. Other types of entities not listed in the table could also be regulated. To determine whether your entity would be regulated by this action, you should carefully examine the applicability criteria in 40 CFR part 80. If you have any questions regarding the applicability of this action to a particular entity, consult the person listed in the **FOR FURTHER INFORMATION CONTACT** section.

Outline of this preamble

I. Executive Summary

The Renewable Fuel Standard (RFS) program began in 2006 pursuant to the requirements in Clean Air Act (CAA) section 211(o) that were added through the Energy Policy Act of 2005 (EPAct). The statutory requirements for the RFS program were subsequently modified through the Energy Independence and Security Act of 2007 (EISA), leading to the publication of major revisions to the regulatory requirements on March 26, 2010.[1] EISA's stated goals include moving the United States (U.S) toward "greater energy independence and security [and] to increase the production of clean renewable fuels." Today, nearly all gasoline used for transportation purposes contains 10 percent ethanol (E10), and on average diesel fuel contains more than 4 percent biodiesel and/or renewable diesel.[2]

The statute includes annual volume targets, and requires EPA to translate those volume targets (or alternative volume requirements established by EPA in accordance with statutory waiver authorities) into compliance obligations that obligated parties must meet every year. In this action, we are establishing the annual percentage standards for cellulosic biofuel, biomass-based diesel (BBD), advanced biofuel, and total renewable fuel that would apply to all gasoline and diesel produced or imported in 2018. We are also establishing the applicable volume of BBD for 2019.

Real-world challenges, in particular the slower-than-expected development of the cellulosic biofuel industry, has slowed progress towards meeting Congressional goals for

[1] 75 FR 14670, March 26, 2010.
[2] Average biodiesel and/or renewable diesel blend percentages based on EIA's October 2017 Short Term Energy Outlook (STEO).

renewable fuels. Given the nested nature of the standards, the shortfall in cellulosic biofuels has made the volume targets established by Congress for 2018 for advanced biofuels and total renewable fuels beyond reach. On July 21, 2017, EPA published a proposed rulemaking, containing proposed volume requirements for the RFS Program's four categories of renewable fuels that would apply in 2018 (and 2019 for BBD).[3] On August 1, EPA hosted a public hearing on the proposed rule, and EPA received over 235,000 written comments on the proposed rule as well. On October 4, 2017 (82 FR 46174), EPA published an "Availability of Supplemental Information; Request for Further Comment," (hereinafter, "October 4 document") seeking further comment on the possible use of other waiver authorities in the final rule. Transcripts of the public hearing, along with all the comments received on the proposed rule and the October 4 document are available in the docket. After careful review of the information before us we are finalizing volume requirements for 2018 for cellulosic biofuel, advanced biofuel and total renewable fuel that are lower than the statutory targets, but nevertheless will ensure these renewable fuels will continue to play a critical role as a complement to our petroleum-based fuels. The final rule modifies the volume requirements slightly relative to the proposed rule, and in this notice we explain where and why such modifications were made.

In this action, we are finalizing volume requirements for cellulosic biofuel at the level we project to be available for 2018. We are using the "cellulosic waiver authority" provided by the statute to finalize volume requirements for advanced biofuel and total renewable fuel that are lower than the statutory targets by the same magnitude as the reduction in the cellulosic biofuel reduction (i.e., the volumes we are finalizing for cellulosic biofuel, advanced biofuel, and total renewable fuel are all 6.71 billion gallons lower than the statutory volumes). We are not reducing

[3] 82 FR 34206, July 21, 2017.

volumes through use of the general waiver authority or the biomass-based diesel waiver authority.[4] We note that while we are reducing the required volume of total renewable fuel, advanced biofuel and cellulosic biofuel below statutory levels, the required volumes in this rule would achieve the implied statutory volumes for conventional biofuel[5] and non-cellulosic advanced biofuel[6] for 2018.

The final volume requirements for 2018 are shown in Table I-1 below. Relative to the levels finalized for 2017, the 2018 volume requirements for advanced biofuel and total renewable fuel are higher by 10 million gallons. EPA is reducing the advanced biofuel and total renewable fuel statutory volumes by the same amount as we are reducing the cellulosic biofuel volume. These reductions effectively preserve the implied statutory volumes for conventional renewable fuel and non-cellulosic advanced biofuels. We are establishing the volume requirement for BBD for 2019 at the proposed volume of 2.1 billion gallons.

Table I-1
Final Volume Requirements[a]

	2018	2019
Cellulosic biofuel (million gallons)	288	n/a
Biomass-based diesel (billion gallons)	2.1[b]	2.1
Advanced biofuel (billion gallons)	4.29	n/a
Renewable fuel (billion gallons)	19.29	n/a

[a] All values are ethanol-equivalent on an energy content basis, except for BBD which is biodiesel-equivalent.
[b] The 2018 BBD volume requirement was established in the 2017 final rule (81 FR 89746, December 12, 2016).

[4] See 42 USC 7545(o)(7)(A)(i-ii). See also the discussion of the general waiver authority in Section II.A.2. below.
[5] Throughout this final rule conventional biofuel refers to biofuel that qualifies as renewable fuel, but does not qualify as an advanced biofuel. RINs generated for conventional biofuels have a D code of 6.
[6] Throughout this final rule non-cellulosic advanced biofuel refers to biofuel that qualifies as advanced biofuel, but does not qualify as cellulosic biofuel. RINs generated for non-cellulosic advanced biofuels have a D code of 4 or 5.

A. Purpose of This Action

The national volume targets of renewable fuel that are intended to be achieved under the RFS program each year (absent an adjustment or waiver by EPA) are specified in CAA section 211(o)(2). The statutory volume targets for 2018 are shown in Table I.A-1, along with the 2017 targets for comparison. The cellulosic biofuel and BBD categories are nested within the advanced biofuel category, which is itself nested within the total renewable fuel category. This means, for example, that each gallon of cellulosic biofuel or BBD that is used to satisfy the individual volume requirements for those fuel types can also be used to satisfy the requirements for advanced biofuel and total renewable fuel.

Table I.A-1
Applicable Volume Targets Specified in the Clean Air Act (billion gallons)[a]

	2017	2018
Cellulosic biofuel	5.5	7.0
Biomass-based diesel	≥1.0	≥1.0
Advanced biofuel	9.0	11.0
Renewable fuel	24.0	26.0

[a] All values are ethanol-equivalent on an energy content basis, except values for BBD which are given in actual gallons.

Under the RFS program, EPA is required to determine and publish annual percentage standards for each compliance year. The percentage standards are calculated to ensure use in transportation fuel of the national "applicable volumes" of the four types of biofuel (cellulosic biofuel, BBD, advanced biofuel, and total renewable fuel) that are set forth in the statute or established by EPA in accordance with the Act's requirements. The percentage standards are used by obligated parties (generally, producers and importers of gasoline and diesel fuel) to calculate their individual compliance obligations. Each of the four percentage standards is

applied to the volume of non-renewable gasoline and diesel that each obligated party produces or imports during the specified calendar year to determine their individual volume obligations with respect to the four renewable fuel types. The individual volume obligations determine the number of Renewable Identification Numbers (RINs) of each renewable fuel type that each obligated party must acquire and retire to demonstrate compliance.

EPA is establishing the annual applicable volume requirements for cellulosic biofuel, advanced biofuel, and total renewable fuel for 2018, and for BBD for 2019.[7] Table I.A-2 lists the statutory provisions and associated criteria relevant to determining the national applicable volumes used to set the percentage standards in this final rule.

Table I.A-2
Statutory Provisions for Determination of Applicable Volumes

Applicable volumes	Clean Air Act reference	Criteria provided in statute for determination of applicable volume
Cellulosic biofuel	211(o)(7)(D)(i)	Required volume must be lesser of volume specified in CAA 211(o)(2)(B)(i)(III) or EPA's projected volume.
	211(o)(7)(A)	EPA in consultation with other federal agencies may waive the statutory volume in whole or in part if implementation would severely harm the economy or environment of a State, region, or the United States, or if there is an inadequate domestic supply.

[7] The 2018 BBD volume requirement was established in the 2017 final rule.

Biomass-based diesel	211(o)(2)(B)(ii) and (v)	Required volume for years after 2012 must be at least 1.0 billion gallons, and must be based on a review of implementation of the program, coordination with other federal agencies, and an analysis of specified factors.
	211(o)(7)(A)	EPA in consultation with other federal agencies may waive the statutory volume in whole or in part if implementation would severely harm the economy or environment of a State, region, or the United States, or if there is an inadequate domestic supply.
	211(o)(7)(E)	EPA in consultation with other federal agencies shall issue a temporary waiver of applicable volumes of BBD where there is a significant feedstock disruption or other market circumstance that would make the price of BBD fuel increase significantly. When exercising this authority, EPA is also authorized to reduce the applicable volumes of advanced and total renewable fuel by the same or a lesser volume.
Advanced biofuel	211(o)(7)(D)(i)	If applicable volume of cellulosic biofuel is reduced below the statutory volume to the projected volume, EPA may reduce the advanced biofuel and total renewable fuel volumes in CAA 211(o)(2)(B)(i)(I) and (II) by the same or lesser volume. No criteria specified.
	211(o)(7)(A)	EPA in consultation with other federal agencies may waive the statutory volume in whole or in part if implementation would severely harm the economy or environment of a State, region, or the United States, or if there is an inadequate domestic supply.
	211(o)(7)(E)	If applicable volume of biomass-based diesel is reduced, EPA may reduce the advanced biofuel and total renewable fuel volumes in CAA 211(o)(2)(B)(i)(I) and (II) by the same or lesser volume.

Total renewable fuel	211(o)(7)(D)(i)	If applicable volume of cellulosic biofuel is reduced below the statutory volume to the projected volume, EPA may reduce the advanced biofuel and total renewable fuel volumes in CAA 211(o)(2)(B)(i)(I) and (II) by the same or lesser volume. No criteria specified.
	211(o)(7)(A)	EPA in consultation with other federal agencies may waive the statutory volume in whole or in part if implementation would severely harm the economy or environment of a State, region, or the United States, or if there is an inadequate domestic supply.
	211(o)(7)(E)	If applicable volume of biomass-based diesel is reduced, EPA may reduce the advanced biofuel and total renewable fuel volumes in CAA 211(o)(2)(B)(i)(I) and (II) by the same or lesser volume.

As shown in Table I.A-2, the statutory authorities allowing EPA to modify or set the applicable volumes differ for the four categories of renewable fuel. Under the statute, EPA must annually determine the projected volume of cellulosic biofuel production for the following year. If the projected volume of cellulosic biofuel production is less than the applicable volume specified in CAA section 211(o)(2)(B)(i)(III) of the statute, EPA must lower the applicable volume used to set the annual cellulosic biofuel percentage standard to the projected production volume. In Section III of this final rule, we present our analysis of cellulosic biofuel production and the applicable volume for 2018. This analysis is based primarily on the estimate of cellulosic biofuel production for 2018 conducted by the Energy Information Administration (EIA),[8] information reported to EPA through our Electronic Moderated Transaction System (EMTS), comments received on our proposed rule, and an evaluation of producers' production plans and progress to date following discussions with cellulosic biofuel producers.

[8] "Letter from EIA to EPA on 2018 projected volumes," available in docket EPA-HQ-OAR-2017-0091.

With regard to BBD, CAA section 211(o)(2)(B) specifies the applicable volumes of BBD to be used in the RFS program only through year 2012. For subsequent years the statute sets a minimum volume of 1 billion gallons, and directs EPA, in coordination with the U.S. Departments of Agriculture (USDA) and Energy (DOE), to determine the required volume after review of implementation of the renewable fuels program and consideration of a number of factors. The BBD volume requirement must be established 14 months before the year in which it will apply. In the 2017 final rule we established the BBD volume for 2018. In Section VI of this preamble we discuss our assessment of statutory and other relevant factors and our final volume requirement for BBD for 2019, which has been developed in coordination with USDA and DOE. We are establishing an applicable volume of 2.1 billion gallons of BBD for use in deriving the BBD percentage standard in 2019. This volume is equal to the applicable volume of BBD established in a prior rulemaking for 2018, and would provide continued support to an industry that is a significant contributor to the pool of advanced biofuel, while at the same time setting the volume requirement in a manner anticipated to provide a continued incentive for the development of other types of advanced biofuel.

Regarding advanced biofuel and total renewable fuel, Congress provided several mechanisms through which the statutory targets could be reduced if necessary. If we reduce the applicable volume of cellulosic biofuel below the volume specified in CAA section 211(o)(2)(B)(i)(III), we also have the authority to reduce the applicable volumes of advanced biofuel and total renewable fuel by the same or a lesser amount. We refer to this as the "cellulosic waiver authority." We may also reduce the applicable volumes of any of the four

renewable fuel types using the "general waiver authority" provided in CAA section 211(o)(7)(A) if EPA, in consultation with USDA and DOE, finds that implementation of the statutory volumes would severely harm the economy or environment of a State, region, or the U.S., or if there is inadequate domestic supply. We are also authorized under CAA section 211(o)(7)(E) to reduce the applicable volume of BBD established for 2018, and to make equal or lesser reductions in the 2018 applicable volumes of advanced biofuel and total renewable fuel, if we determine that there is a significant renewable feedstock disruption or other market circumstance that would make the price of BBD increase significantly. Sections II and IV of this final rule describe our use of the cellulosic waiver authority alone to derive the volumes of advanced biofuel and total renewable fuel that are below the statutory target volumes, and our assessment that the resulting volumes can be met. We believe that reductions in the statutory targets for cellulosic biofuel, advanced biofuel and total renewable fuel for 2018 are necessary. However, in light of our review of available information, we are making those reductions under the cellulosic waiver authority alone and are not reducing them further under other waiver authorities. Thus, the reductions in both the advanced and total renewable fuel standards are directly attributable to the significant shortfall in cellulosic biofuel production, as compared to the statutory targets. A discussion of our consideration of the general waiver authority and biomass-based diesel waiver authority to further reduce the required biofuel volumes in 2018 can be found in Section V.

B. Summary of Major Provisions in This Action

This section briefly summarizes the major provisions of this final rule. We are establishing applicable volume requirements and associated percentage standards for cellulosic biofuel, advanced biofuel, and total renewable fuel for 2018; for BBD we are establishing the percentage standard for 2018 and the applicable volume requirement for 2019.

1. Approach to Setting Volume Requirements

The approach we have taken in this final rule of using the cellulosic waiver authority to reduce advanced biofuel and total renewable fuel by the same amount as the reduction in the required volume of cellulosic biofuel is the same approach as in our proposed rule, but is a departure from our approach to using the cellulosic biofuel waiver authority in previous years. In previous years we have used the cellulosic waiver authority to reduce the advanced biofuel and total renewable fuel volume requirements by a lesser amount than the reduction in the cellulosic biofuel volume requirement to allow reasonably attainable volumes of advanced biofuels to partially backfill for missing cellulosic biofuel volumes. However, the approach we have taken for 2018 does not result in a reduction in the volume requirement for non-cellulosic advanced biofuel. While the implied statutory volume for non-cellulosic advanced biofuel increased by 500 million gallons from 2017 to 2018, through our 2017 action we effectively required early use of approximately 0.5 billion gallons of non-cellulosic advanced volume that Congress envisioned would be first used in 2018.[9] Therefore, despite using the cellulosic waiver

[9] The statutory advanced biofuel and cellulosic biofuel requirements for 2018 are 11.0 and 7.0 billion gallons respectively. This implies a non-cellulosic advanced biofuel statutory volume of 4.0 billion gallons. The statutory advanced biofuel and cellulosic biofuel requirements for 2017 are 9.0 and 5.5 billion gallons respectively. This implies a non-cellulosic advanced biofuel statutory volume of 3.5 billion gallons. In 2017 EPA established required

authority to reduce the volume of advanced biofuel by the same amount as cellulosic biofuel, the advanced biofuel volume requirement for 2018 is 10 million gallons higher than the advanced biofuel volume requirement in 2017. In this rule we are reducing all three volume requirements by the same amount after considering the greenhouse gas (GHG), energy security benefits, and anticipated costs of advanced biofuels that would occur at levels beyond those being finalized today.

Section II provides a general description of our approach to setting volume requirements in today's rule, including a review of the statutory waiver authorities and our consideration of carryover RINs. Section III provides our assessment of the 2018 cellulosic biofuel volume, based on a projection of production that reflects a neutral aim at accuracy. Sections IV and V describe our assessments of advanced biofuel and total renewable fuel, and consideration of the general and biomass-based diesel waiver authorities. Finally, Section VI provides our determination regarding the 2019 BBD volume requirement, and reflects an analysis of a set of factors stipulated in CAA section 211(o)(2)(B)(ii).

2. Cellulosic Biofuel

In the past several years the cellulosic biofuel industry has continued to make progress towards increased commercial scale production. Cellulosic biofuel production reached record levels in 2016 and has continued to grow throughout 2017, driven largely by compressed natural

volumes of advanced biofuel and cellulosic biofuel of 4.28 billion and 311 million gallons respectively, implying a non-cellulosic advanced biofuel volume of 3.97 billion gallons.

gas (CNG) and liquefied natural gas (LNG) derived from biogas. Liquid cellulosic biofuels, while produced in much smaller quantities than CNG/LNG derived from biogas, have been produced at steady but relatively small volumes throughout 2017. In this rule we are establishing a cellulosic biofuel volume requirement of 288 million ethanol-equivalent gallons for 2018 based on our production projection. Our projection reflects consideration of a production estimate from EIA, RIN generation data available to EPA through EMTS, comments we received on the proposed rule, the information we have received regarding individual facilities' capacities, production start dates and biofuel production plans, a review of cellulosic biofuel production relative to EPA's projections in previous annual rules, and EPA's own engineering judgment. To project cellulosic biofuel production for 2018 we used the same basic methodology described in the proposed rule. However, we have used updated data to derive percentile values used in our production projection for liquid cellulosic biofuels and to derive the year-over-year change in the rate of production of CNG/LNG derived from biogas that is used in the projection for CNG/LNG. (See Section III for further detail on the methodology used to project cellulosic biofuel production).

In estimating the volume of liquid cellulosic biofuel that will be made available in the U.S. in 2018, we considered all potential production sources by company and facility. This included facilities still in the commissioning or start-up phases, as well as facilities already producing some volume of cellulosic biofuel.[10] From this universe of potential liquid cellulosic biofuel sources, we identified the subset that is expected to produce commercial volumes of qualifying liquid cellulosic biofuel for use as transportation fuel, heating oil, or jet fuel by the

[10] Facilities primarily focused on research and development (R&D) were not the focus of our assessment, as production from these facilities represents very small volumes of cellulosic biofuel, and these facilities typically have not generated RINs for the fuel they have produced.

end of 2018. To arrive at projected volumes, we collected relevant information on each facility. We then developed projected production ranges based on factors such as progress towards construction and production goals, facility registration status, production volumes achieved, and other significant factors that could potentially impact fuel production or the ability of the produced fuel to qualify for cellulosic biofuel RINs. We also used this information to group these companies based on production history and to select a value within the aggregated projected production ranges that we believe best represents the most likely production volume from each group of companies in 2018.

For 2018, we are using an industry wide, rather than a facility-by-facility approach to project the production of CNG/LNG derived from biogas. We believe this approach is appropriate due to the mature state of this technology, the large number of facilities that are registered to produce cellulosic biofuel RINs for these fuels, and the fact that their volumes are likely to be affected more by market wide factors than individual company situations. Further discussion on our projection of cellulosic biofuel production in 2018, including the factors considered and the way these factors were used to determine our final cellulosic biofuel projection, can be found in Section III.

3. Advanced Biofuel

We are finalizing required advanced biofuel requirements using the same approach used in the July proposed rulemaking. As was the case at the time of proposal, the conditions that

compelled us to reduce the 2017 volume requirement for advanced biofuel below the statutory target remain relevant in 2018. As for 2017, we investigated the ability of volumes of non-cellulosic advanced biofuels to backfill unavailable volumes of cellulosic biofuel in 2018. We took into account the various constraints on the ability of the market to make advanced biofuels available, the ability of the standards we set to bring about market changes in the time available, the potential impacts associated with diverting biofuels and/or biofuel feedstocks from current use to the production of advanced biofuel used in the U.S., the fact that the biodiesel tax credit is currently not available for 2018, the proposed countervailing duties on imports of biodiesel from Argentina and Indonesia, as well as the cost of advanced biofuels. Based on these considerations we have decided to reduce the applicable volume of advanced biofuel by the same amount as we are reducing the applicable volume of cellulosic biofuels. This results in an advanced biofuel volume for 2018 that is 10 million gallons higher than the advanced biofuel volume for 2017. Although we determined that a small amount of reasonably attainable volumes of advanced biofuel could be used to backfill a portion of the missing cellulosic biofuel, for reasons described in Section IV, we are not exercising the discretion provided under the cellulosic waiver authority in a manner that would lead to that result.

As mentioned above, we are exercising our cellulosic waiver authority to reduce the statutory applicable volume of advanced biofuel to a volume requirement of 4.29 billion gallons for 2018. This applicable volume for 2018 is 10 million gallons higher than the applicable volume for advanced biofuel for 2017.

4. Total Renewable Fuel

Following our determination of the appropriate volume reduction for advanced biofuel for 2018 using the cellulosic waiver authority, we calculated what the total renewable fuel volume would be if we provide the same level of reduction using the cellulosic waiver authority. The resulting volume is 19.29 billion gallons.

5. Other Waiver Authorities.

We have evaluated whether additional reductions in cellulosic biofuel, biomass-based diesel, advanced biofuel, or total renewable fuel are warranted for 2018 using either the general waiver authority or the BBD waiver authority and have determined that additional reductions are not warranted at this time.

6. 2019 Biomass-Based Diesel

In EISA, Congress specified increasing applicable volumes of BBD through 2012. Beyond 2012 Congress stipulated that EPA, in coordination with DOE and USDA, was to establish the BBD volume taking into consideration implementation of the program to date and various specified factors, providing that the required volume for BBD could not be less than 1.0 billion gallons. For 2013, EPA established an applicable volume of 1.28 billion gallons. For

2014 and 2015 we established the BBD volume requirement to reflect the actual volume for each of these years of 1.63 and 1.73 billion gallons.[11] For 2016 and 2017, we set the BBD volume requirements at 1.9 and 2.0 billion gallons respectively. Finally, for 2018 the BBD volume requirement was set a 2.1 billion gallons. We proposed to maintain this level for 2019.

Given current and recent market conditions, the advanced biofuel volume requirement is driving the production and use of biodiesel and renewable diesel volumes over and above volumes required through the separate BBD standard, and we expect this to continue. For 2019, EPA continues to believe that it would still be appropriate to provide a floor above the statutory minimum of 1 billion gallons to provide a guaranteed level of support for the continued production and use of BBD. However, we also believe that the volume of BBD supplied in previous years demonstrates that the advanced biofuel standard is capable of incentivizing additional supply of these fuels above the volume required by the BBD standard. Thus, based on a review of the implementation of the program to date and all the factors required under the statute, and in coordination with USDA and DOE, we are finalizing an applicable volume of BBD for 2019 at the proposed volume of 2.1 billion gallons.

7. Annual Percentage Standards

[11] The 2015 BBD standard was based on actual data for the first 9 months of 2015 and on projections for the latter part of the year for which data on actual use was not available at the time.

The renewable fuel standards are expressed as a volume percentage and are used by each producer and importer of fossil-based gasoline or diesel to determine their renewable fuel volume obligations.

Four separate percentage standards are required under the RFS program, corresponding to the four separate renewable fuel categories shown in Table I.A-1. The specific formulas we use in calculating the renewable fuel percentage standards are contained in the regulations at 40 CFR 80.1405. The percentage standards represent the ratio of the national applicable volume of renewable fuel volume to the national projected non-renewable gasoline and diesel volume less any gasoline and diesel attributable to small refineries granted an exemption prior to the date that the standards are set. The volume of transportation gasoline and diesel used to calculate the percentage standards was based on a letter provided to the EPA by EIA, as required by statute.[12] The percentage standards for 2018 are shown in Table I.B.7-1. Detailed calculations can be found in Section VII, including the projected gasoline and diesel volumes used.

Table I.B.7-1
Final 2018 Percentage Standards

Cellulosic biofuel	0.159 %
Biomass-based diesel	1.74 %
Advanced biofuel	2.37 %
Renewable fuel	10.67 %

8. Assessment of Aggregate Compliance

[12] "Letter from EIA to EPA on 2018 projected volumes," available in docket EPA-HQ-OAR-2017-0091.

By November 30 of each year we are required to assess the status of the aggregate compliance approach to land use restrictions under the definition of renewable biomass for both the U.S. and Canada. In today's action we are providing the final announcements for these administrative actions. As described in Section VIII.A, based on data provided by the USDA and using the methodology in place since 2014, we have estimated that U.S. agricultural land totaled approximately 376 million acres in 2017 and thus did not exceed the 2007 baseline acreage. This assessment means that the aggregate compliance provision can continue to be used in the U.S. for calendar year 2018.

On September 29, 2011, EPA approved the use of a similar aggregate compliance approach for planted crops and crop residue grown in Canada. As described in Section VIII.B, based on data provided by Canada, we have estimated that Canadian agricultural land totaled approximately 117.8 million acres in 2017 and thus did not exceed the 2007 baseline acreage. This assessment means that the aggregate compliance provision can continue to be used in Canada for calendar year 2018.

II. Authority and Need for Waiver of Statutory Applicable Volumes

The CAA provides EPA with the authority to enact volume requirements below the applicable volume targets specified in the statute under specific circumstances. This section discusses those authorities.

A. Statutory Authorities for Reducing Volume Targets

In CAA section 211(o)(2), Congress specified increasing annual volume targets for total renewable fuel, advanced biofuel, and cellulosic biofuel for each year through 2022, and for BBD through 2012, and authorized EPA to set volume requirements for subsequent years in coordination with USDA and DOE, and after consideration of specified factors. However, Congress also recognized that under certain circumstances it would be appropriate for EPA to set volume requirements at a lower level than reflected in the statutory volume targets, and thus provided waiver provisions in CAA section 211(o)(7).

1. Cellulosic Waiver Authority

Section 211(o)(7)(D)(i) of the CAA provides that if EPA determines that the projected volume of cellulosic biofuel production for a given year is less than the applicable volume specified in the statute, that EPA must reduce the applicable volume of cellulosic biofuel

required to the projected production volume for that calendar year. In making this projection, EPA may not "adopt a methodology in which the risk of overestimation is set deliberately to outweigh the risk of underestimation" and must make a projection that "aims at accuracy." *API v. EPA*, 706 F.3d 474, 479 (D.C. Cir. 2013). Pursuant to this provision, EPA has set the cellulosic biofuel requirement lower than the statutory volumes for each year since 2010. As described in Section III.D, the projected volume of cellulosic biofuel production for 2018 is less than the 7.0 billion gallon volume target in the statute. Therefore, for 2018, we are setting the cellulosic biofuel volume requirement at a level lower than the statutory applicable volume, in accordance with this provision.

CAA section 211(o)(7)(D)(i) also provides EPA with the authority to reduce the applicable volume of total renewable fuel and advanced biofuel in years when it reduces the applicable volume of cellulosic biofuel under that provision. The reduction must be less than or equal to the reduction in cellulosic biofuel. For 2018, we are also reducing the applicable volumes of advanced biofuel and total renewable fuel under this authority.

The cellulosic waiver authority is discussed in detail in the preamble to the 2017 final rule and that discussion is incorporated by reference.[13] See also, *API v. EPA*, 706 F.3d 474 (D.C. Cir. 2013) (requiring that EPA's cellulosic biofuel projections reflect a neutral aim at accuracy), *Monroe Energy v. EPA*, 750 F.3d 909 (D.C. Cir. 2014) (affirming EPA's broad discretion under the cellulosic waiver authority to reduce volumes of advanced biofuel and total renewable fuel), and *Americans for Clean Energy v. EPA* ("*ACE*"), 864 F.3d 691 (D.C. Cir. 2017) (discussed below).

[13] See 81 FR 89752-89753 (December 12, 2016).

In *ACE*, the court evaluated EPA's use of the cellulosic waiver authority in the 2014-2016 annual rulemaking to reduce the advanced biofuel and total renewable fuel volumes for 2014, 2015, and 2016. There, EPA used the cellulosic waiver authority to reduce the standard for advanced biofuel to a volume that was reasonably attainable, and then provided a comparable reduction under this authority for total renewable fuel.[14] The Court of Appeals for the District of Columbia, relying on the analysis in *Monroe Energy*, reaffirmed that EPA enjoys "broad discretion" under the cellulosic waiver authority "to consider a variety of factors—including demand-side constraints in the advanced biofuels market."[15] The Court noted that the only textual limitation on the use of the cellulosic waiver authority is that it cannot exceed the amount of the reduction in cellulosic biofuel.[16] The Court contrasted the general waiver authority under CAA section 211(o)(7)(A) and the biomass based diesel waiver authority under CAA section 211(o)(7)(E), which "detail the considerations and procedural steps that EPA must take before waiving fuel requirements," with the cellulosic waiver authority, which identifies no factors regarding reductions in advanced and total renewable fuel other than the limitation that any such reductions may not exceed the reduction in cellulosic biofuel volumes.[17] The Court also concluded that the scope of EPA's discretionary authority to reduce advanced and total volumes is the same under the cellulosic waiver provision whether EPA is declining to exercise its authority to waive volumes, or choosing to do so.[18]

[14] See 80 FR 77433-34 (December 14, 2015).
[15] *ACE* at 730.
[16] *Id.* at 733.
[17] *Id.*
[18] *Id.*

In this action we are reducing the statutory volume targets for advanced biofuels and total renewable fuel by equal amounts, as was our approach in using the cellulosic waiver authority in setting the 2014-2017 standards. EPA's reasoning for an equal reduction is explained in the 2017 final rule.[19] We have made a determination, as described in Section IV, that the applicable volume for advanced biofuels specified in the statute for 2018 cannot be achieved and we are exercising our cellulosic waiver authority to lower the applicable volume of advanced biofuel, and to provide an equal reduction in the applicable volume of total renewable fuel. In addition, we have determined that there is likely to be adequate supply to satisfy the total renewable fuel volume derived through applying an equal volume reduction as for advanced biofuel as discussed in Section V. Therefore, we have determined that no further reductions of the total renewable fuel volume requirement are necessary to address supply concerns.[20] The resulting volumes of advanced and total renewable fuel resulting from this exercise of the cellulosic waiver authority provide for an implied volume allowance for conventional biofuel of fifteen billion gallons, equal to that envisioned by Congress for 2018.

2. General Waiver Authority

Section 211(o)(7)(A) of the CAA provides that EPA, in consultation with the Secretary of Agriculture and the Secretary of Energy, may waive the applicable volumes specified in the Act in whole or in part based on a petition by one or more States, by any person subject to the

[19] See 81 FR 89752 – 89753 (December 12, 2016). See also, 78 FR 49809 –49810 (August 15, 2013); 80 FR 77434 (December 14, 2015).
[20] As described in the Response to Comments document accompanying this action, we have also determined that additional waivers are not appropriate to address either severe economic or severe environmental harm.

requirements of the Act, or by the EPA Administrator on his own motion. Such a waiver must be based on a determination by the Administrator, after public notice and opportunity for comment that: 1) implementation of the requirement would severely harm the economy or the environment of a State, a region, or the United States; or 2) there is an inadequate domestic supply.

In the October 4 document, EPA sought comment on the possible use of the general waiver authority to reduce volumes of advanced biofuel and total renewable fuel for the 2018 standards below the levels proposed in the 2018 NPRM.[21] The October 4 document provided information on historic domestic production, imports, and exports of advanced biofuel, as well as additional information, and sought comment on how that information could inform a potential determination of inadequate domestic supply or severe economic harm.

Based on an evaluation of supply and potential economic impact of the volumes of advanced and total renewable fuel that result after use of the cellulosic waiver authority, comments from stakeholders, and as further discussed in Section V, EPA is not using the general waiver authority on the basis of severe economic or environmental harm or inadequate domestic supply to further reduce those volumes for 2018. EPA's response to comments addressing possible use of the general waiver authority are provided in a memorandum to the docket[22] and in the Response to Comments (RTC) document accompanying this action.

3. Biomass-Based Diesel Waiver Authority

[21] See 82 FR 46174 (October 4, 2017).
[22] "Assessment of waivers for severe economic harm or BBD prices for 2018," memorandum from David Korotney to docket EPA-HQ-OAR-2017-0091.

Section 211(o)(7)(E)(ii) of the CAA provides that if EPA determines that there is a significant renewable feedstock disruption or other market circumstance that would make the price of BBD increase significantly, EPA shall, in consultation with the Secretary of Energy, and the Secretary of Agriculture, issue an order to reduce, for up to a 60-day period, the annual volume requirement for BBD by an appropriate quantity that does not exceed 15 percent. The statute also stipulates that EPA is authorized to reduce applicable volumes of advanced biofuel and total renewable fuel by the same or a lesser volume than the reduction in BBD.

In the October 4 document, EPA sought comment on potential interpretations of this authority, as well as the potential use of the BBD waiver authority to reduce the 2018 volume requirement for BBD by as much as 315 million gallons, and to concurrently reduce the advanced biofuel and total renewable fuel volume requirements by as much as 473 million gallons. The notice provided information on the price of biodiesel in light of the expiration of the federal tax credit, and the potential imposition of new duties on imports of biodiesel from Argentina and Indonesia.

As described in the RTC document, EPA has determined that it would not be appropriate at this time to use the BBD waiver authority. Based on information provided in comments, as well its own analysis discussed in Section V, EPA believes that there is an insufficient basis to support a finding that the biomass based diesel prices currently in the marketplace, or reasonably anticipated in the immediate future, represent a "significant" increase in prices that would justify use of this waiver authority.

B. Treatment of Carryover RINs

Consistent with our approach in the 2013, 2014-16, and 2017 final rules, we have also considered the availability and role of carryover RINs in evaluating whether we should exercise our discretion to use the cellulosic waiver authority in setting the cellulosic, advanced, and total volume requirements for 2018. Neither the statute nor EPA regulations specify how or whether EPA should consider the availability of carryover RINs in exercising the cellulosic waiver authority.[23] As noted in the context of the rules establishing the 2014-16 and 2017 RFS standards, we believe that a bank of carryover RINs is extremely important in providing obligated parties compliance flexibility in the face of substantial uncertainties in the transportation fuel marketplace, and in providing a liquid and well-functioning RIN market upon which success of the entire program depends.[24] Carryover RINs provide flexibility in the face of a variety of circumstances that could limit the availability of RINs, including weather-related damage to renewable fuel feedstocks and other circumstances potentially affecting the production and distribution of renewable fuel.[25] On the other hand, carryover RINs can be used for compliance purposes, and in the context of the 2013 RFS rulemaking we noted that an abundance of carryover RINs available in that year, together with possible increases in

[23] CAA section 211(o)(5) requires that EPA establish a credit program as part of its RFS regulations, and that the credits be valid to show compliance for 12 months as of the date of generation. EPA implemented this requirement though the use of RINs, which can be used to demonstrate compliance for the year in which they are generated or the subsequent compliance year. Obligated parties can obtain more RINs than they need in a given compliance year, allowing them to "carry over" these excess RINs for use in the subsequent compliance year, although use of these carryover RINs is limited to 20% of the obligated party's RVO. For the bank of carryover RINs to be preserved from one year to the next, individual carryover RINs are used for compliance before they expire and are essentially replaced with newer vintage RINs that are then held for use in the next year. For example, if the volume of the collective carryover RIN bank is to remain unchanged from 2017 to 2018, then all of the vintage 2017 carryover RINs must be used for compliance in 2018, or they will expire. However, the same volume of 2018 RINs can then be "banked" for use in the next year.

[24] See 80 FR 77482-87 (December 14, 2015) and 81 FR 89754-55 (December 12, 2016).

[25] See id., and 72 FR 23900 (May 1, 2007).

renewable fuel production and import, justified maintaining the advanced and total renewable fuel volume requirements for that year at the levels specified in the statute.[26] EPA's approach to the consideration of carryover RINs in exercising our cellulosic waiver authority was affirmed in *Monroe Energy* and *ACE*.[27]

In the 2018 NPRM, EPA estimated that the size of the carryover RIN bank was then approximately 2.06 billion carryover RINs (including all D codes).[28] We proposed that in light of this relatively limited volume and the important functions provided by the RIN bank, that we would not set the volume requirements for 2018 in a manner that would intentionally lead to a drawdown in the bank of carryover RINs. In their comments on the 2018 NPRM, parties generally expressed two opposing points of view. Commenters representing obligated parties supported EPA's proposed decision to not assume a drawdown in the bank of carryover RINs in determining the appropriate volume requirements. These commenters reiterated the importance of maintaining the carryover RIN bank in order to provide obligated parties with necessary compliance flexibilities, better market trading liquidity, and a cushion against future program uncertainty. Commenters representing renewable fuel producers, however, contended that carryover RINs represent actual supply and should be accounted for when establishing the annual volume standards. These commenters stated that not accounting for carryover RINs goes against Congressional intent of the RFS program, deters investment in next-generation biofuels,

[26] See 79 FR 49794 (August 15, 2013).
[27] *Monroe Energy v. EPA*, 750 F.3d 909 (D.C. Cir. 2014), *ACE* at 713.
[28] This was an increase of 520 million RINs from the previous estimate of 1.54 billion carryover RINs in the 2017 final rule. This increase in the carryover RIN bank compared to that projected in the 2017 final rule was not due to an underestimate by EPA in the amount of gasoline, diesel fuel, or ethanol that was consumed in 2016, but rather was driven almost entirely by a combination of over-compliance by biodiesel producers facing an expiring biodiesel tax credit at the end of 2016 and approximately 390 million RINs that small refineries granted a hardship exemption for 2016 were not required to retire.

and ignores other programmatic buffers and flexibilities such as carry-forward deficits and small refinery hardship exemptions.[29]

1. Updated Projection of Carryover RIN Volume

Based on currently available information, our estimate of the carryover RIN bank has increased to 2.22 billion RINs, an increase of 160 million RINs from the previous estimate of 2.06 billion carryover RINs in the 2018 NPRM.[30] Part of the update considers small refinery hardship exemptions for 2016 that were granted since the 2018 NPRM was issued. These additional small refinery hardship exemptions led to the return to the RIN marketplace of approximately 125 million 2016 RINs that would otherwise have been required for compliance by the small refineries granted an exemption for 2016.

The carryover RIN volume is 11.5 percent of the total renewable fuel volume requirement that EPA is finalizing for 2018, which is less than the 20 percent maximum limit permitted by the regulations to be carried over for use in complying with the 2018 standards.[31] However, there remains considerable uncertainty surrounding this number for a number of reasons, including the possible impact of an action to address the remand in *ACE*, the possibility of additional small refinery exemptions, and the impact of 2017 RFS compliance on the bank of carryover RINs. In addition, we note that there have been enforcement actions in past years that

[29] A full description of comments received, and our detailed responses to them, is available in the Response to Comments document in the docket.
[30] The calculations performed to estimate the number of carryover RINs currently available can be found in the memorandum, "Carryover RIN Bank Calculations for 2018 Final Rule," available in the docket.
[31] See 40 CFR 80.1427(a)(5).

have resulted in the retirement of carryover RINs to make up for the generation and use of invalid RINs and/or the failure to retire RINs for exported renewable fuel. Future enforcement actions could have similar results, and require that obligated parties and/or renewable fuel exporters settle past enforcement-related obligations in addition to the annual standards, thereby potentially creating demand for RINs greater than can be accommodated through actual renewable fuel blending in 2018. Collectively, the result of satisfying RFS obligations in 2017 and settling enforcement-related accounts could be an effective reduction in the size of the collective bank of carryover RINs. In light of these uncertainties, it is possible that the net result would be a bank of carryover RINs larger or smaller than 11.5 percent of the final 2018 total renewable fuel volume requirement.

2. EPA's Decision Regarding the Treatment of Carryover RINs

EPA has decided to maintain the proposed approach, and not set the volume requirements in the final rule with the intention or expectation of drawing down the current bank of carryover RINs. In addition, we do not believe that the availability of carryover RINs, together with the potential supply of renewable fuel in volumes higher than we are requiring though this final rule, should lead us to increase the volume requirements. In finalizing this approach, we carefully considered the comments received, including on the role of carryover RINs under our waiver authorities and the policy implications of our decision. While we have not assumed an intentional drawdown in the overall bank of carryover RINs owned by obligated parties collectively in establishing the volume requirements for 2018, we understand that some obligated

parties may choose to sell or use all or part of their individual banks of carryover RINs. To the extent that they do, other obligated parties would be in a position to bank carryover RINs by using available renewable fuel or purchasing RINs representing such fuel, with the expected net result that the standards adopted in this action will have no effect on the size of the overall bank of carryover RINs that is owned collectively by obligated parties.[32]

We believe that a balanced consideration of the possible role of carryover RINs in achieving the statutory volume objectives for advanced and total renewable fuels, versus maintaining an adequate bank of carryover RINs for important programmatic functions, is appropriate when EPA exercises its discretion under the cellulosic waiver authority, and that the statute does not specify the extent to which EPA should require a drawdown in the bank of carryover RINs when it exercises this authority.

An adequate RIN bank serves to make the RIN market liquid. Just as the economy as a whole functions best when individuals and businesses prudently plan for unforeseen events by maintaining inventories and reserve money accounts, we believe that the RFS program functions best when sufficient carryover RINs are held in reserve for potential use by the RIN holders themselves, or for possible sale to others that may not have established their own carryover RIN reserves. Were there to be no RINs in reserve, then even minor disruptions causing shortfalls in renewable fuel production or distribution, or higher than expected transportation fuel demand (requiring greater volumes of renewable fuel to comply with the percentage standards that apply to all volumes of transportation fuel, including the unexpected volumes) could lead to the need

[32] We expect that any renewable fuel produced in the U.S. that is not used to satisfy the 2018 renewable fuel standards will be exported, thereby not leading to an increase in the bank of 2018 RINs or carryover RINs.

for a new waiver of the standards, undermining the market certainty so critical to the RFS program. However, a significant drawdown of the carryover RIN bank leading to a scarcity of RINs may stop the market from functioning in an efficient manner (i.e., one in which there are a sufficient number of reasonably available RINs for obligated parties seeking to purchase them), even where the market overall could satisfy the standards. For all of these reasons, the collective carryover RIN bank provides a needed programmatic buffer that both facilitates individual compliance and provides for smooth overall functioning of the program.[33] We have evaluated the volume of carryover RINs likely available for 2018, and we believe it is prudent not to intentionally draw down this volume of carryover RINs in establishing the 2018 standards. In addition, we have considered whether the current bank of carryover RINs, together with the additional supply of renewable fuel available in 2018 above the levels we are requiring be used, would justify reduced use of the cellulosic waiver authority. For the reasons described above and in Sections IV.C and D, we do not believe this to be the case.

Therefore, for the reasons noted above, and consistent with the approach we took in the 2014-2016 and 2017 final rules, we are making a determination that, under current circumstances, an intentional drawdown of the carryover RIN bank should not be assumed in establishing the 2018 volume requirements. In addition, we do not believe that the presence of the current bank of carryover RINs, together with additional potential supplies of renewable fuel in 2018, justifies reduced use of the cellulosic waiver authority in setting the 2018 advanced biofuel and total renewable fuel volumes. However, we note that we may or may not take a similar approach in future years; we will assess the situation on a case-by-case basis going

[33] Here we use the term "buffer" as shorthand reference to all of the benefits that are provided by a sufficient bank of carryover RINs.

forward, and take into account the size of the carryover RIN bank in the future and any lessons learned from implementing past rules.

III. Cellulosic Biofuel Volume for 2018

In the past several years the cellulosic biofuel industry has continued to make progress towards increased commercial-scale production. Cellulosic biofuel production reached record levels in 2016, driven largely by CNG and LNG derived from biogas. Production volumes have continued to increase in 2017.[34] While multiple large cellulosic ethanol facilities struggled to achieve production rates consistent with their nameplate capacity, several facilities consistently produced cellulosic ethanol from corn kernel fiber at a smaller scale during 2016 and 2017. This section describes our assessment of the volume of cellulosic biofuel that we project will be produced or imported into the U.S. in 2018, and some of the uncertainties associated with those volumes.

In the July NPRM, EPA proposed cellulosic volumes based on a methodology that differed in a couple of important ways from the approach we used in 2017. We proposed changes to the percentile values used to project liquid cellulosic biofuel production and a new industry-wide methodology for projecting the production of CNG/LNG derived from biogas. For this action, we are finalizing volumes for 2018 based on an approach that is similar, but not identical, to what we proposed. We discuss the changes we made from proposal to final below. In our RTC document, we respond to the multiple comments EPA received on the changes to the cellulosic projection methodology we proposed in July.

[34] The majority of the cellulosic RINs generated for CNG/LNG are sourced from biogas from landfills; however, the biogas may come from a variety of sources including municipal wastewater treatment facility digesters, agricultural digesters, separated MSW digesters, and the cellulosic components of biomass processed in other waste digesters.

In order to project the volume of cellulosic biofuel production in 2018 we considered EIA's projection of cellulosic biofuel production,[35] comments received on the 2018 NPRM, data reported to EPA through EMTS, and information we collected through meetings with representatives of facilities that have produced or have the potential to produce qualifying volumes of cellulosic biofuel for consumption as transportation fuel, heating oil, or jet fuel in the U.S. in 2018. There are two main parts to this projection. To project the range of potential production volumes of liquid cellulosic biofuel we used the same methodology as the methodology used in the 2017 final rule. However, we have adjusted the percentile values used to select a point estimate within a projected production range for each group of companies based on recent information, and with the objective of improving the accuracy of the projections. To project the production of cellulosic biofuel RINs for CNG/LNG derived from biogas we use the methodology discussed in the proposed rule with updated data. This methodology reflects the mature status of this industry, the large number of facilities registered to generate cellulosic biofuel RINs from these fuels, and EPA's continued attempts to refine its methodology to yield estimates that are as accurate as possible. This methodology is an improvement on the methodology that EPA used to project cellulosic biofuel production for CNG/LNG derived from biogas in the 2017 final rule. EPA has updated the list of potential cellulosic biofuel producers, projected facility start-up dates, facility capacities, production volumes, and other relevant information with the most recent information available. The methodologies used to project the production of liquid cellulosic biofuels and cellulosic CNG/LNG derived from biogas are described in more detail in Sections III.D-1 and III.D-2 below.

[35] "Letter from EIA to EPA on 2018 projected volumes," available in docket EPA-HQ-OAR-2017-0091.

After a brief description of the statutory requirements in Section III.A, we discuss the companies the EPA reviewed in the process of projecting qualifying cellulosic biofuel production in the U.S. in 2018 in Section III.B. Section III.C discusses the projection of cellulosic biofuel production provided to EPA by EIA, and Section III.D discusses the methodologies used by EPA to project cellulosic biofuel production in 2018 and the resulting projection of 288 million ethanol-equivalent gallons.

A. Statutory Requirements

The volumes of renewable fuel to be produced and used as transportation fuel under the RFS program each year (absent an adjustment or waiver by EPA) are specified in CAA section 211(o)(2)(B)(i)(III). The volume of cellulosic biofuel specified in the statute for 2018 is 7.0 billion gallons. The statute provides that if EPA determines, based on a letter provided to the EPA by EIA, that the projected volume of cellulosic biofuel production in a given year is less than the statutory volume, then EPA shall reduce the applicable volume of cellulosic biofuel to the projected volume available during that calendar year.[36]

In addition, if EPA reduces the required volume of cellulosic biofuel below the level specified in the statute, the Act also indicates that we may reduce the applicable volumes of advanced biofuels and total renewable fuel by the same or a lesser volume, and we are required

[36] The U.S. Court of Appeals for the District of Columbia Circuit evaluated this requirement in *API v. EPA* 706 F.3d 474, 479-480 (DC Cir. 2013), in the context of a challenge to the 2012 cellulosic biofuel standard. The Court stated that in projecting potentially available volumes of cellulosic biofuel EPA must apply an "outcome-neutral methodology" aimed at providing a prediction of "what will actually happen."

to make cellulosic waiver credits available.[37] Our consideration of the 2018 volume requirements for advanced biofuel and total renewable fuel is presented in Section IV.

B. Cellulosic Biofuel Industry Assessment

In order to project cellulosic biofuel production for 2018, we have tracked the progress of several dozen potential cellulosic biofuel production facilities. As we have done in previous years, we have focused on facilities with the potential to produce commercial-scale volumes of cellulosic biofuel rather than small research and development (R&D) or pilot-scale facilities. Larger commercial-scale facilities are much more likely to generate RINs for the fuel they produce and the volumes they produce will have a far greater impact on the cellulosic biofuel standard for 2018. The volume of cellulosic biofuel produced from R&D and pilot-scale facilities is quite small in relation to that expected from the commercial-scale facilities. R&D and demonstration-scale facilities have also generally not generated RINs for the fuel they have produced in the past. Their focus is on developing and demonstrating the technology, not producing commercial volumes. RIN generation from R&D and pilot-scale facilities in previous years has not contributed significantly to the overall number of cellulosic RINs generated.[38] We have therefore not considered production from R&D and pilot-scale facilities in our projection of cellulosic biofuel production for 2018.

[37] See 40 CFR 80.1456.
[38] While a few small R&D and pilot scale facilities have registered as cellulosic RIN generators, total production from each of these facilities from 2011 through September 2017 has been less than 150,000 RINs. This is approximately 1% of all liquid cellulosic biofuel production through September 2017.

From this list of commercial-scale facilities we used information from EMTS, publicly available information (including press releases and news reports), comments on the 2018 NPRM, information from EIA, and information provided by representatives of potential cellulosic biofuel producers, to make a determination of which facilities are most likely to produce liquid cellulosic biofuel and generate cellulosic biofuel RINs in 2018. Each of these companies was investigated further in order to determine the current status of its facilities and its likely cellulosic biofuel production and RIN generation volumes for 2018. Both in our discussions with representatives of individual companies and as part of our internal evaluation process we gathered and analyzed information including, but not limited to, the funding status of these facilities, current status of the production technologies, anticipated construction and production ramp-up periods, facility registration status, and annual fuel production and RIN generation targets.

As an initial matter, it is useful to review the success of EPA's recent cellulosic biofuel projections. EPA used a consistent methodology to project cellulosic biofuel production in the final three months of 2015 and in 2016 and 2017.[39] The record of actual production indicates that EPA's projection was lower than the actual number of cellulosic RINs made available in 2015,[40] and higher than the actual number of RINs made available in 2016.[41] While we currently only have data available through September 2017, it appears likely that the number of cellulosic RINs

[39] This methodology is most recently described in the 2017 final rule. See 81 FR 89746, 89755 (December 12, 2016).

[40] EPA only projected cellulosic biofuel production for the final three months of 2015, since data on the availability of cellulosic biofuel RINs (D3+D7) for the first nine months of the year were available at the time the analyses were completed for the final rule.

[41] EPA projected that 123 million and 230 million cellulosic RINs would be generated in 2015 and 2016, respectively. The number of available cellulosic RINs in these years (RINs generated minus RINs retired for non-compliance reasons) was 140 and 190 million RINs. See "Assessment of the Accuracy of Cellulosic Biofuel Production Projections in 2015 and 2016 (June 2017 Update)," memorandum from Dallas Burkholder to EPA Air Docket EPA-HQ-OAR-2017-0091 for more detail.

made available in 2017 will fall short of EPA's projection in our 2017 final rule.[42] The fact that the projections made using this methodology have been somewhat inaccurate, under-estimating the actual number of RINs made available in 2015 and over-estimating in 2016 and (most likely) 2017, reflects the inherent difficulty with projecting cellulosic biofuel production. It also emphasizes the importance of continuing to make refinements to our projection methodology in an effort to produce accurate projections.

EPA's projections of liquid cellulosic biofuel were higher than the actual volume of liquid cellulosic biofuel produced in both 2015 and 2016, and appear likely to be higher than actual liquid cellulosic biofuel production in 2017. We believe this recent data warrants a change to the percentile values used to project liquid cellulosic biofuel from the percentile values used in prior years in an effort to take into account the most recent data available and make the projections for 2018 more accurate. We are therefore adjusting the percentile values used to project liquid cellulosic biofuel production based on actual liquid cellulosic biofuel production in 2016 and through September 2017. Use of this updated data also results in different percentile values than we proposed to use for 2018. We believe that the use of the methodology (described in the 2018 NPRM and in Section III.D.1 below), with the adjusted approach to developing the percentile values used to project production volumes for liquid cellulosic biofuels, results in a projection that reflects a neutral aim at accuracy since it accounts for expected growth in the near future by using historical data that is free of any subjective bias.

[42] Additional information on our current projection of cellulosic biofuel production for 2017 can be found in "Calculating the Percentile Values Used to Project Liquid Cellulosic Biofuel Production," memorandum from Dallas Burkholder to EPA Air Docket EPA-HQ-OAR-2017-0091.

In previous years, we used the same general methodology for CNG/LNG derived from biogas as for liquid cellulosic biofuel, but used different percentile values to project CNG/LNG derived from biogas and liquid cellulosic biofuels, reflecting the more established nature of the CNG/LNG industry relative to liquid cellulosic biofuel production. For 2018, EPA proposed using an industry-wide approach, rather than an approach that projects volumes for individual companies or facilities, to project the production of CNG/LNG derived from biogas. This updated approach reflects the fact that this industry is far more mature than the liquid cellulosic biofuel industry, and that there are a large number of facilities registered to generate cellulosic biofuel RINs from biogas, rendering a facility-by-facility analysis difficult and unnecessary for purposes of accuracy.[43] As described in Section III.D.2 below, EPA is instead calculating a year-over-year rate of growth in the renewable CNG/LNG industry by comparing RIN generation for CNG/LNG derived from biogas from October 2015 – September 2016 to the RIN generation for these same fuels from October 2016 – September 2017 (the most recent month for which data are available. We then apply this year-over-year growth rate to the total number of cellulosic RINs available for compliance from CNG/LNG in 2016 (the most recent year for which complete data are available), to estimate the production of CNG/LNG derived from biogas in 2018.[44]

[43] EPA received a large number of affidavits from companies that produce (or intend to produce) CNG/LNG derived from biogas as comments on our proposed rule. These affidavits are publicly available as part of the comments submitted by the Coalition for Renewable Natural Gas. EPA reviewed and considered the information contained in these affidavits in establishing the required volume of cellulosic biofuel for 2018. These affidavits confirmed that it was reasonable to believe that the relatively high year-over-year rate of growth used to project volumes of CNG/LNG derived from biogas for 2018 could be achieved based on a number of project expansions and new projects expected to begin producing CNG/LNG derived from biogas in 2018.

[44] Historically RIN generation for CNG/LNG derived from biogas has increased each year. It is possible, however, that RIN generation for these fuels in the most recent 12 months for which data are available could be lower than the preceding 12 months. We believe our methodology accounts for this possibility. In such a case, the calculated rate of growth would be negative.

The remainder of this section discusses the companies and facilities EPA expects to be in a position to produce commercial-scale volumes of cellulosic biofuel by the end of 2018 and describes in more detail the methodology EPA is using to project cellulosic biofuel production in 2018 (including a review of cellulosic biofuel production and the accuracy of the projection methodology in previous years).

1. Potential Domestic Producers

There are a number of companies and facilities[45] located in the U.S. that have either already begun producing cellulosic biofuel for use as transportation fuel, heating oil, or jet fuel at a commercial scale, or are anticipated to be in a position to do so at some time during 2018. The financial incentive provided by cellulosic biofuel RINs,[46] combined with the facts that to date nearly all cellulosic biofuel produced in the U.S. has been used domestically[47] and all the domestic facilities we have contacted in deriving our projections intend to produce fuel on a commercial scale for domestic consumption and plan to use approved pathways, gives us a high degree of confidence that cellulosic biofuel RINs will be generated for any fuel produced by domestic commercial scale facilities. In order to generate RINs, each of these facilities must be registered with EPA under the RFS program and comply with all the regulatory requirements.

[45] The volume projection from CNG/LNG producers does not represent production from a single company or facility, but rather a group of facilities utilizing the same production technology.
[46] According to data from Argus Media, the price for 2017 cellulosic biofuel RINs averaged $2.73 in 2017 (through September 2017). Alternatively, obligated parties can obtain a RIN value equivalent to a cellulosic biofuel RIN by purchasing an advanced (or biomass-based diesel) RIN and a cellulosic waiver credit. The price for 2017 advanced biofuel RINs averaged $1.00 in 2017 (through September 2017) while the price for a 2017 cellulosic waiver credit is $2.00.
[47] The only known exception was a small volume of fuel produced at a demonstration scale facility exported to be used for promotional purposes.

This includes using an approved RIN-generating pathway and verifying that their feedstocks meet the definition of renewable biomass. Most of the domestic companies and facilities considered in our assessment of potential cellulosic biofuel producers in 2018 have already successfully completed facility registration, and many have successfully generated RINs.[48] A brief description of each of the domestic companies (or group of companies for cellulosic CNG/LNG producers) that EPA believes may produce commercial-scale volumes of RIN generating cellulosic biofuel by the end of 2018 can be found in a memorandum to the docket for this final rule.[49] General information on each of these companies or group of companies considered in our projection of the potentially available volume of cellulosic biofuel in 2018 is summarized in Table III.B.3-1 below.

2. Potential Foreign Sources of Cellulosic Biofuel

In addition to the potential sources of cellulosic biofuel located in the U.S., there are several foreign cellulosic biofuel companies that may produce cellulosic biofuel in 2018. These include facilities owned and operated by Beta Renewables, Enerkem, Ensyn, GranBio, and Raizen. All of these facilities use fuel production pathways that have been approved by EPA for cellulosic RIN generation provided eligible sources of renewable feedstock are used and other regulatory requirements are satisfied. These companies would therefore be eligible to register

[48] Many of the facilities listed in Table III.B.3-1 are registered to produce cellulosic (D3 or D7) RINs with the exception of several of the producers of CNG/LNG derived from biogas, many of the facilities projected to produce cellulosic ethanol using Edeniq's technology, Enerkem's Edmonton facility, and Ensyn's Port-Cartier, Quebec facility.

[49] "Cellulosic Biofuel Producer Company Descriptions (November 2017)," memorandum from Dallas Burkholder to EPA Air Docket EPA-HQ-OAR-2017-0091.

their facilities under the RFS program and generate RINs for any qualifying fuel imported into the U.S. While these facilities may be able to generate RINs for any volumes of cellulosic biofuel they import into the U.S., demand for the cellulosic biofuels they produce is expected to be high in their own local markets.

EPA is charged with projecting the volume of cellulosic biofuel that will be produced or imported into the U.S.[50] For the purposes of this final rule we have considered all of the registered foreign facilities under the RFS program to be potential sources of cellulosic biofuel in 2018. We believe that due to the strong demand for cellulosic biofuel in local markets, the significant technical challenges associated with the operation of cellulosic biofuel facilities, and the time necessary for potential foreign cellulosic biofuel producers to register under the RFS program and arrange for the importation of cellulosic biofuel to the U.S., cellulosic biofuel imports from foreign facilities not currently registered to generate cellulosic biofuel RINs are generally highly unlikely in 2018. For purposes of our 2018 cellulosic biofuel projection we have, with two exceptions (described below), excluded potential volumes from foreign cellulosic biofuel production facilities that are not currently registered under the RFS program.

Cellulosic biofuel produced at four foreign facilities (Ensyn's Renfrew facility, GranBio's Brazilian facility, and the CNG/LNG facilities Complexe Enviro Progressive Ltee and Saint-Thomas Biomethane Plant) generated cellulosic biofuel RINs for fuel exported to the U.S.

[50] EPA has consistently interpreted the "projected volume of cellulosic biofuel production" required in CAA section 211(o)(7)(D) to include volumes of cellulosic biofuel likely to be made available in the United States, including from both domestic production and imports (see 80 FR 77420 (December 14, 2015) and 81 FR 89746 (December 12, 2016)). We do not believe it would be reasonable to include in the projection all cellulosic biofuel produced throughout the world, regardless of likelihood of import to the United States, since volumes that are not imported would not be available to obligated parties for compliance and including them in the projection would render the resulting volume requirement and percentage standards unachievable.

in 2017; projected volumes from each of these facilities are included in our projection of available volumes for 2018. EPA has also included projected volume from two foreign facilities (Enerkem's Canadian facility and Ensyn's Port-Cartier, Quebec facility) that are not currently registered to generate cellulosic biofuel RINs under the RFS program. We believe that it is appropriate to include volume from these facilities in light of their proximity to the U.S., the proven technology used by these facilities, the volumes of cellulosic biofuel exported to the U.S. by the company in previous years (in the case of Ensyn), and the company's stated intentions to market fuel produced at these facilities to qualifying markets in the U.S. One additional foreign facility (Raizen's Costa Pinto) has registered as a cellulosic biofuel producer, but has not yet generated any cellulosic RINs. EPA attempted to contact representatives from this facility to inquire about their intentions to export cellulosic biofuel to the U.S. in 2018, but received no response. We have therefore not projected any cellulosic biofuel exports from this facility to the U.S. in 2018. All of the facilities included in EPA's cellulosic biofuel projection for 2018 are listed in Table III.B.3-1 below.

3. Summary of Volume Projections for Individual Companies

General information on each of the cellulosic biofuel producers (or group of producers in the case of producers of CNG/LNG derived from biogas and liquid cellulosic biofuel facilities using Edeniq's technology) that factored into our projection of cellulosic biofuel production for 2018 is shown in Table III.B.3-1. This table includes both facilities that have already generated cellulosic RINs, as well as those that have not yet generated cellulosic RINs, but are projected to

do so by the end of 2018. As discussed above, we have focused on commercial-scale cellulosic biofuel production facilities. Each of these facilities (or group of facilities) is discussed further in a memorandum to the docket.[51] In addition to the facilities (or groups of facilities) discussed in Table III.B.3-1 below, EPA is aware of an additional technology that may be used to produce qualifying cellulosic biofuel in 2018. Multiple companies, in addition to Edeniq and Quad County Corn Processors, are working to commercialize technology to convert corn kernel fiber to cellulosic ethanol at existing corn ethanol facilities. At this point, however, none of these other companies have successfully registered a facility to generate cellulosic RINs using their technology.[52] In light of the significant challenges associated with accurately and reliably determining the conversion of cellulosic feedstocks to biofuel in processes that simultaneously convert both cellulosic and non-cellulosic feedstocks, EPA has included volumes of cellulosic biofuel associated with the simultaneous conversion of corn kernel fiber and corn starch only in cases where the facilities intend to use a technology with a methodology for quantifying the volume of ethanol produced form the cellulosic fraction of corn fiber that has been approved by EPA (Quad County Corn Processors and facilities using Edeniq's technology).

[51] "Cellulosic Biofuel Producer Company Descriptions (November 2017)," memorandum from Dallas Burkholder to EPA Air Docket EPA-HQ-OAR-2017-0091.

[52] A significant issue that must be resolved to register a facility to produce cellulosic biofuel from corn kernel fiber at an existing ethanol production facility is the quantification of the volume of ethanol produced from cellulosic feedstocks rather than non-cellulosic feedstocks such as starch. Until these companies develop a methodology for quantifying cellulosic biofuel production that is approved by EPA we do not believe it is appropriate to include an estimate of cellulosic biofuel production from these facilities in our projection of cellulosic biofuel production in 2018.

Table III.B.3-1
Projected Producers of Cellulosic Biofuel by 2018

Company Name	Location	Feedstock	Fuel	Facility Capacity (Million Gallons per Year)[53]	Construction Start Date	First Production[54]
CNG/LNG Producers[55]	Various	Biogas	CNG/ LNG	Various	N/A	August 2014
Edeniq	Various	Corn Kernel Fiber	Ethanol	Various	Various	October 2016
Enerkem	Edmonton, AL, Canada	Separated MSW	Ethanol	10[56]	2012	September 2017[57]
Ensyn	Renfrew, ON, Canada	Wood Waste	Heating Oil	3	N/A	2014
Ensyn	Port-Cartier, QC, Canada	Wood Waste	Heating Oil	10.5	June 2016	January 2018
GranBio	São Miguel dos Campos, Brazil	Sugarcane bagasse	Ethanol	21	Mid 2012	September 2014
Poet-DSM	Emmetsburg, IA	Corn Stover	Ethanol	20	March 2012	4Q 2015
QCCP	Galva, IA	Corn Kernel Fiber	Ethanol	4	Late 2013	October 2014

[53] The Facility Capacity is generally equal to the nameplate capacity provided to EPA by company representatives or found in publicly available information. If the facility has completed registration and the total permitted capacity is lower than the nameplate capacity then this lower volume is used as the facility capacity. For companies generating RINs for CNG/LNG derived from biogas the Facility Capacity is equal to the lower of the annualized rate of production of CNG/LNG from the facility at the time of facility registration or the sum of the volume of contracts in place for the sale of CNG/LNG for use as transportation fuel (reported as the actual peak capacity for these producers).

[54] Where a quarter is listed for the first production date EPA has assumed production begins in the middle month of the quarter (i.e., August for the 3rd quarter) for the purposes of projecting volumes.

[55] For more information on these facilities see "November 2017 Assessment of Cellulosic Biofuel Production from Biogas (2018)," memorandum from Dallas Burkholder to EPA Air Docket EPA-HQ-OAR-2017-0091.

[56] The nameplate capacity of Enerkem's facility is 10 million gallons per year. However, we anticipate that a portion of their feedstock will be non-biogenic MSW. RINs cannot be generated for the portion of the fuel produced from non-biogenic feedstocks. We have taken this into account in our production projection for this facility.

[57] This date reflects the first production of ethanol from this facility. The facility began production of methanol in 2015.

C. Projection from the Energy Information Administration

Section 211(o)(3)(A) of the CAA requires EIA to "...provide to the Administrator of the Environmental Protection Agency an estimate, with respect to the following calendar year, of the volumes of transportation fuel, biomass-based diesel, and cellulosic biofuel projected to be sold or introduced into commerce in the U.S." EIA provided these estimates to EPA on October 11, 2017.[58] With regard to cellulosic biofuel, the EIA estimated that the available volume in 2018 would be 13 million gallons.

In their letter, EIA did not identify the facilities on which their estimate of cellulosic biofuel production was based. EIA did, however, indicate in their letter that they included neither estimates of cellulosic biofuel produced by foreign entities and imported into the U.S., nor estimates of cellulosic heating oil or CNG/LNG produced from biogas, which together represent approximately 96 percent of our projected cellulosic biofuel volume for 2017. When limiting the scope of our projection to the companies assessed by EIA, we note that while our volume projections are not identical, they are very similar. EPA projects approximately 10 million gallons of liquid cellulosic biofuel will be produced domestically in 2017 (when excluding heating oil, as EIA did in their estimate of cellulosic biofuel production). EIA did not provide detail on the basis of their projections, so we cannot say precisely why EPA and EIA's projections differ. We further note that if we used EIA's projections for domestic liquid cellulosic biofuel production without modification in place of our own assessment of these

[58] "Letter from EIA to EPA on 2018 projected volumes," available in docket EPA-HQ-OAR-2017-0091.

facilities the impact on the cellulosic biofuel standard overall for 2018 would be approximately 1%.[59]

D. Cellulosic Biofuel Volume for 2018

1. Liquid Cellulosic Biofuel

For our 2018 liquid cellulosic biofuel projection, we use the same general approach as we have in projecting these volumes in previous years. We begin by first categorizing potential liquid cellulosic biofuel producers in 2018 according to whether or not they have achieved consistent commercial scale production of cellulosic biofuel to date. Next we define a range of likely production volumes for 2018 for each group of companies. Finally, we use a percentile value to project from the established range a single projected production volume for each group of companies in 2018. As explained below, however, we are using a different approach to selection of the appropriate percentile values for purposes of this rule than we have used in prior years. In this final rule we have used the most recent data available to determine which facilities are likely to produce liquid cellulosic biofuel in 2018, categorize the companies according to whether or not they have consistently produced commercial scale volumes of liquid cellulosic biofuels, adjust the projected production range for each group of companies, and adjust the

[59] If EPA increased our projection of liquid cellulosic biofuel produced in the United States in 2018 (excluding heating oil) to 13 million gallons to be consistent with EIA's projection our total projected volume of cellulosic biofuel would increase by 3 million gallons. This is approximately 1% of the total volume of cellulosic biofuel projected to be produced in 2018 (3/288 = 0.01).

percentile values used for each group of companies. This methodology is briefly described here, and is described in detail in memos to the docket.[60]

Consistent with our approach in previous years, we separated the list of potential producers of cellulosic biofuel (listed in Table III.B.3-1) into two groups according to whether or not the facilities have achieved consistent commercial-scale production and cellulosic biofuel RIN generation. We next defined a range of likely production volumes for each group of potential cellulosic biofuel producers. The low end of the range for each group of producers reflects actual RIN generation data over the last 12 months for which data are available at the time our technical assessment was completed (October 2016 – September 2017). For potential producers that have not yet generated any cellulosic RINs, the low end of the range is zero. For the high end of the range of production volumes for companies expected to produce liquid cellulosic biofuel we considered a variety of factors, including the expected start-up date and ramp-up period,[61] facility capacity. The projected range for the groups of companies considered in our 2018 cellulosic biofuel projection are shown in Tables III.D.1-1 and III.D.1-2 below.[62]

[60] "November 2017 Liquid Cellulosic Biofuel Projections for 2018 CBI" and "Calculating the Percentile Values Used to Project Liquid Cellulosic Biofuel Production," memorandums from Dallas Burkholder to EPA Air Docket EPA-HQ-OAR-2017-0091.

[61] As in our 2015-2017 projections, EPA calculated a high end of the range for each facility (or group of facilities) based on the expected start-up date and a six-month straight line ramp-up period. The high end of the range for each facility (or group of facilities) is equal to the value calculated by EPA using this methodology, or the number of RINs the producer expects to generate in 2018, whichever is lower.

[62] More information on the data and methods EPA used to calculate each of the ranges in these tables in contained in "November 2017 Liquid Cellulosic Biofuel Projections for 2018 CBI" memorandum from Dallas Burkholder to EPA Air Docket EPA-HQ-OAR-2017-0091. Unlike in previous years, we have not shown the projected ranges for each individual company. This is because the high end of the range for some of these companies are based on the company's production projections, which they consider confidential business information (CBI). Additionally, the low end of the range for facilities that have achieved consistent commercial scale production is based on actual RIN generation data in the most recent 12 months, with is also claimed as CBI. EPA has included additional information on the calculations used to define the production ranges, including the production ranges for each individual company or facility, in a memo to the docket.

Table III.D.1-1
2018 Production Ranges for Liquid Cellulosic Biofuel Producers without Consistent Commercial Scale Production (million gallons)

Companies Included	Low End of the Range	High End of the Range[a]
Facilities using Edeniq's technology (new facilities), Enerkem, Ensyn (Port Cartier facility)	0	47

[a]Rounded to the nearest million gallons.

Table III.D.1-2
2018 Production Ranges for Liquid Cellulosic Biofuel Producers with Consistent Commercial Scale Production (million gallons)

Companies Included	Low End of the Range[a]	High End of the Range[a]
Facilities using Edeniq's technology (active facilities), Ensyn (Renfrew facility), Poet-DSM, GranBio, Quad County Corn Processors	7	24

a Rounded to the nearest million gallons

After defining likely production ranges for each group of companies we next considered the percentile values to use in projecting a production volume for each group of companies. In the proposed rule, we used the 1st and 43rd percentile to project production from facilities that had not yet achieved consistent commercial scale production of liquid cellulosic biofuels and those that had, respectively, based on data indicating what percentile of production from within the 2016 projected range facilities included in our 2016 cellulosic biofuel projection actually achieved. However, for this final rule we are adjusting the percentile values used to project liquid cellulosic biofuel production from within the range of projected production values, by using data on actual liquid cellulosic biofuel production from both 2016 and 2017 (through September). We believe an adjustment to the percentile values used to generate a projected production volume from the range of potential production volumes for each group of facilities is warranted. EPA's estimates for liquid cellulosic biofuel exceeded actual production of liquid

cellulosic biofuel in both 2015 and 2016.[63] Further, as discussed in the NPRM we are considering additional RIN generation data from 2017 that was not available for the NPRM in this final rule. While we currently only have cellulosic biofuel production data through September 2017, additional data available from months after the release of our proposed rule suggests that further changes to the percentile values used in the NPRM are likely to result in more accurate projections of cellulosic biofuel production in 2018. We believe that the adjusted percentile values used in this final rule will improve the accuracy of the production projection and will further EPA's objective to project volumes with a "neutral aim at accuracy."

The projected ranges for liquid cellulosic biofuel production in 2016, along with the percentile values used to project a production volume within the calculated ranges the actual number of cellulosic RINs generated in 2016 that are available for compliance, and the percentile values that would have resulted in a projection equal to the actual production volume are shown in Table III.D.1-3 below.

[63] EPA notes that once standards are set based on these projections, cellulosic biofuel RINs can be generated for either type of cellulosic biofuel. Cellulosic biofuel RINs generated for liquid biofuels and CNG/LNG derived from biogas can be used to satisfy an obligated party's cellulosic biofuel obligation. There are no separate standards for liquid and gaseous cellulosic biofuels.

Table III.D.1-3
Projected and Actual Liquid Cellulosic Biofuel Production in 2016 (million gallons)

	Low End of the Range	High End of the Range	Percentile (2016 FRM)	Projected Production	Actual Production[64]	Actual Percentile
New Facilities	0	76	25th	19	1.06	1st
Consistent Producers[65]	2	5	50th	4	3.28	43rd

Since the actual production in 2016 was lower than the projected production for both new facilities and consistent producers, we determined that for the purposes of our proposed rule it would be appropriate to adjust the percentiles to attempt to make them more accurate. To this end, EPA calculated the percentile values that would have resulted in accurate production projections in 2016 based on the actual number of cellulosic biofuel RINs generated for liquid cellulosic biofuels and available for compliance in 2016. These calculated percentile values are the 1st percentile for new facilities (replacing in the NPRM the 25th percentile used for 2016 and 2017) and the 43rd percentile for consistent producers (replacing in the NPRM the 50th percentile used for 2016 and 2017). These percentile values, however, do not reflect the updated production data EPA has from liquid cellulosic biofuel producers in 2017.

EPA currently only has data on cellulosic biofuel production in 2017 through the end of September. While we believe that any final assessment of the accuracy of a projection method cannot be made until complete data for the year are available, we nevertheless believe it is appropriate to consider data from 2017 and adjust the percentile values used in the final rule as appropriate. To calculate the percentile values that would have resulted in a projection equal to

[64] Actual production is calculated by subtracting RINs retired for any reason other than compliance with the RFS standards from the total number of cellulosic RINs generated.
[65] In the 2014-2016 Annual Rule EPA categorized Ensyn and Quad County Corn Processors as consistent cellulosic biofuel producers for 2016. All other companies were categorized as new facilities. This is in contrast to 2018, for which EPA has categorized additional facilities as consistent cellulosic biofuel producers.

the actual production volume for 2017 we first need to project the volume of cellulosic biofuel that will be produced in the 4th quarter of 2017 for each group of facilities.[66] EPA projected cellulosic biofuel production in the 4th quarter of 2017 by first comparing cellulosic biofuel production in the 4th quarter of 2016 to the cellulosic biofuel production in the first 3 quarters of 2016. In 2016, cellulosic biofuel production in the 4th quarter (1.25 million gallons) was 40 percent of cellulosic biofuel production in the first 3 quarters (3.09 million gallons). We then used this factor, together with actual production data from the first 3 quarters of 2017 to project cellulosic biofuel production in the 4th quarter of 2017.[67] The projected ranges for liquid cellulosic biofuel production in 2017, along with the percentile values used to project a production volume within the calculated ranges, the actual number of cellulosic RINs generated in 2017 that are available for compliance, and the percentile values that would have resulted in a projection equal to the actual production volume are shown in Table III.D.1-4 below. Note that the percentile value that would have resulted in the projected volume of cellulosic biofuel in 2017 is negative, as the projected volume is lower than the low end of the range from the 2017 final rule.

[66] Unlike in the case of CNG/LNG derived from biogas, discussed in Section III.D.2 below, EPA can only use calendar years, rather than consecutive 12 month periods to evaluate the accuracy of the percentile values used in our projections in previous years. This is because the percentile values are used in conjunction with the calculated ranges to produce production estimates. The ranges were defined for the purpose of projecting cellulosic biofuel production in the context of our annual rules and therefore are specific to calendar years. Since production in any calendar year is not expected to be consistent (i.e., with equal production volumes each month) it is not possible to use the projected ranges from two calendar years to generate a range for a 12 month period that spans two calendar years.

[67] More detail on these calculations can be found in "November 2017 Liquid Cellulosic Biofuel Projections for 2018 CBI" memorandum from Dallas Burkholder to EPA Air Docket EPA-HQ-OAR-2017-0091.

Table III.D.1-4
Projected and Actual Liquid Cellulosic Biofuel Production in 2017 (million gallons) (through September)

	Low End of the Range	High End of the Range	Percentile (2017 FRM)	Projected Production (2017 FRM)	Projected Production (2018 FRM)[68]	Actual Percentile
New Facilities	0	33	25th	8	6.07	18th
Consistent Producers[69]	3.5	7	50th	5	2.85	-18th

The liquid cellulosic biofuel production data from 2017 indicates that adjustments to the percentile values used to project cellulosic biofuel production within the calculated range are appropriate. For this final rule EPA has projected cellulosic biofuel production from facilities that have not yet achieved consistent commercial scale production at the 10th percentile of the calculated range and projected cellulosic biofuel production from facilities that have achieved commercial scale production at the 12th percentile.[70] These percentiles are calculated by averaging the percentiles that would have produced cellulosic biofuel projections equal to the volumes produced by each group of companies in 2016 and 2017, as shown in Table III.D.1-5 below. We have not considered data from years prior to 2016, as prior to 2016 a different methodology was used to project available volumes of cellulosic biofuel. In determining the percentile values to use for 2018 we have decided to weight the observed actual percentile values from 2016 and 2017 equally. While the percentile value from 2017 represents the most recent

[68] This number includes an updated projection of cellulosic biofuel production for each group of facilities in the 4th quarter of 2017 as described in the preceding paragraph. Note that the low end of the potential production range for companies that have achieved consistent commercial scale production (7 million gallons) is based on the most recent 12 months for which data is available (October 2016 – September 2017) while the projected production number in this table is our current projection for calendar year 2017 based on RIN generation data through September 2017.
[69] In the 2014-2016 Annual Rule, EPA categorized Ensyn and Quad County Corn Processors as consistent cellulosic biofuel producers for 2016. All other companies were categorized as new facilities. This is in contrast to 2018, for which EPA has categorized additional facilities as consistent cellulosic biofuel producers.
[70] The percentile value for 2018 for facilities that have not yet achieved consistent commercial scale production (10th percentile) is higher than the percentile used in the proposed rule (1st percentile) but lower than the percentile used in the 2017 rule (25th percentile). The percentile value for 2018 for facilities that have achieved consistent commercial scale production (12th percentile) is lower than both the percentile used in both the proposed rule (43rd percentile) and the percentile used in the 2017 rule (50th percentile).

data available, it is also dependent on a projection of the volume of cellulosic biofuel that will be produced in the 4th quarter of 2017. Conversely, the percentile values from 2016 are calculated using actual data for the full year, however this data is older and may not reflect the current state of cellulosic biofuel production technologies and commercial scale facilities as data from 2017. We believe that an average of these percentile values appropriately incorporate the data available to EPA at the time of this rulemaking to project liquid cellulosic biofuel production with a neutral aim at accuracy. We will continue to monitor the accuracy of our projection methodology and will use updated data to adjust the percentile values and/or other elements of our methodology as appropriate.[71]

Table III.D.1-5
Percentile Values that Would Have Produced Accurate Projection in 2016 and 2017

	2016	2017	Average (Used to Project Volume in 2018)
New Facilities	1st	18th	10th
Consistent Producers	43rd	-18th	12th

Finally, we used these percentile values, together with the ranges determined for each group of companies discussed above, to project a volume for each group of companies in 2018. These calculations are summarized in Table III.D.1-6 below.

[71] Additional information on the calculation of the percentile values for 2016 and 2017 can be found in "Calculating the Percentile Values Used to Project Liquid Cellulosic Biofuel Production," memorandum from Dallas Burkholder to EPA Air Docket EPA-HQ-OAR-2017-0091.

Table III.D.1-6
Projected Volume of Liquid Cellulosic Biofuel in 2018
(million gallons)

	Low End of the Range[a]	High End of the Range[a]	Percentile	Projected Volume[a]
Liquid Cellulosic Biofuel Producers; Producers without Consistent Commercial Scale Production	0	47	10th	5
Liquid Cellulosic Biofuel Producers; Producers with Consistent Commercial Scale Production	7	24	12th	9
Total	N/A	N/A	N/A	14

[a] Volumes rounded to the nearest million gallons

EPA also considered whether it would be appropriate to modify other individual components of the past methodology for projecting liquid cellulosic biofuel based on a narrow consideration of each factor, but we do not believe that such changes are warranted. Making the adjustment to the percentile values used in the methodology while keeping other components of the methodology constant should, we believe, provide an appropriate refinement of the methodology that reflects recent experience. We acknowledge, however, that using the calculated percentile values from previous years to project liquid cellulosic biofuel production in future years does not eliminate the possibility that actual production will differ from our projections. This is especially true for the liquid cellulosic biofuel industry, which is currently in the early stages of commercialization. Nevertheless, based on the record before us, we believe the ranges of projected production volumes for each company (or group of companies for those using the Edeniq technology) are reasonable, and that projecting overall production in 2018 in the manner described above results in a neutral estimate (neither biased to produce a projection that is too high or too low) of likely liquid cellulosic biofuel production in 2018 (14 million gallons).

2. CNG/LNG Derived from Biogas

For 2018, EPA is using a new methodology to project production of CNG/LNG derived from biogas used as transportation fuel. We believe a new methodology is warranted for purposes of this rule for two primary reasons: the over-projection of CNG/LNG derived from biogas in 2016 (and the likely over-projection of CNG/LNG derived from biogas in 2017), and the relative maturity of the CNG/LNG industry relative to the liquid cellulosic biofuel industry. EPA's projection of the production of CNG/LNG derived from biogas in 2016 was 207 million ethanol-equivalent gallons. Actual production of cellulosic biofuel RINs for CNG/LNG derived from biogas that were available for compliance in 2016 was 185 million gallons, indicating that the approach we took to projecting CNG/LNG derived from biogas in 2016 resulted in an overestimate by 22 million ethanol-equivalent gallons (12 percent). Similarly, EPA's projection of the production of CNG/LNG derived from biogas in 2017 was 298 million ethanol-equivalent gallons. Actual production of cellulosic biofuel RINs for CNG/LNG derived from biogas that has been produced in 2017 (through the end of September, the most recent month for which data are available) is 151 million gallons. While data for all of 2017 are not available at this time, and despite the observed historical pattern of higher RIN generation for CNG/LNG derived from biogas in the latter months of the year relative to the earlier months of the year, the available data strongly suggests that actual RIN generation from CNG/LNG derived from biogas in 2017 is likely to fall short of our projections in the 2017 final rule. RIN generation of CNG/LNG derived from biogas from January 2017 – September 2017 is 22 percent higher than RIN generation in the same months in 2016. In order to meet the projected volume for 2017 (298

million gallons), however, RIN generation in the remainder of 2017 would need to be 58 percent higher in 2017 than the total RIN generation from these fuels in 2016.

EPA received many comments on our proposed approach to projecting production of CNG/LNG derived from biogas in 2018. Some commenters critiqued EPA's calculation of a year-over-year rate of growth based on production during the first five months of 2017 (relative to production in the first five months of 2016) and suggested that EPA use updated production data in the final rule, or that EPA calculate the annual rate of growth based on comparisons of time periods no less than 12 months. Many commenters characterized EPA's proposed approach as inappropriately "backwards looking," and claimed that while this approach may adequately project production from facilities that are currently producing CNG/LNG derived from biogas it did not adequately consider the new facilities the industry expects will begin production in 2018. Many of these commenters provided facility specific information on facilities capable of producing CNG/LNG derived from biogas in 2018 for both facilities that are currently producing CNG/LNG and those that expect to begin producing in 2018.[72] Many of these commenters requested that EPA use the facility by facility approach used by EPA in our 2017 final rule to project the production of CNG/LNG derived from biogas in 2018.

In this final rule EPA has used updated data in projecting the production of CNG/LNG derived from biogas, consistent with our stated intentions in the proposed rule and as requested by several commenters. At the time the analyses were performed for this final rule, EPA had data

[72] The Coalition for Renewable Natural Gas collected and submitted a large number of affidavits from project owners and operators of facilities that are currently producing CNG/LNG derived from biogas, as well as those that anticipate beginning production in 2018. Many of these affidavits are publicly available in the docket, while others have claimed these submissions as confidential business information.

available through the end of September 2017. EPA has adjusted our calculated year-over-year rate of growth based on this new data. EPA also agrees with commenters who stated that it is more appropriate to calculate a year-over-year rate of growth using a full year's (12 months) worth of data, as this captures any seasonality and would (in future years) minimize the opportunity for producers of CNG/LNG derived from biogas to attempt to influence the projected growth rate for the next year by intentionally shifting production to particular months of the year.

For this final rule, EPA has calculated the year-over-year growth rate in CNG/LNG derived from biogas by comparing RIN generation from October 2016 – September 2017 (the most recent 12 months for which data are available) to RIN generation in the 12 months that immediately precede this time period (October 2015 – September 2016). These RIN generation volumes are shown in Table III.C.2-1 below.

Table III.D.2-1
Generation of Cellulosic Biofuel RINs for CNG/LNG Derived from Biogas (million gallons)

RIN Generation (October 2015 – September 2016)	RIN Generation (October 2016 – September 2017)	Year-Over-Year Increase
177.28	215.52	21.6%

EPA then applied this 21.6 percent year-over-year growth rate to the total number of 2016 cellulosic RINs generated for CNG/LNG that were available for compliance (185.14 million) to project the production of cellulosic RINs from these fuels in 2017, and then repeated the calculation to arrive at a projection for 2018. This methodology results in a projection of

273.6 million gallons of CNG/LNG derived from biogas in 2018.[73] We believe that projecting the production of CNG/LNG derived from biogas in this manner appropriately takes into consideration the actual recent rate of growth of this industry, and that this growth rate accounts for both the potential for future growth and the challenges associated with increasing RIN generation from these fuels in future years. While this methodology may not be appropriate to use once the projected volume of CNG/LNG derived from biogas approaches the total volume of CNG/LNG that is used as transportation fuel, this is not currently a constraint as our projection for 2018 is well below the total volume of CNG/LNG that is currently used as transportation fuel.[74] The comments submitted to EPA on our proposed rule contained information related to a number of production facilities expected to begin producing CNG/LNG derived from biogas in 2018 (and the final few months of 2017). Although commenters generally believed that this information supported a different approach for projecting production of CNG/LNG derived from biogas in 2018, we believe that these comments generally support our projection of CNG/LNG for 2018, insofar as they demonstrate that there is reason to expect that the significant rate of growth observed in the production of CNG/LNG derived from biogas in recent years will continue throughout 2018.

[73] To calculate this value, EPA multiplied the total number of 2016 RINs generated for CNG/LNG derived from biogas and available for compliance by 1.216 (representing a 21.6% year-over-year increase), and then multiplied the product by 1.216 a second time (to project the annual production volume in 2018, rather than 2017). The number 2016 of RINs generated for CNG/LNG derived from biogas and available for compliance (185.14) is based on EMTS data.

[74] EPA projects that 580 million ethanol-equivalent gallons of CNG/LNG will be used as transportation fuel in 2018 based on EIA's October 2017 Short Term Energy Outlook (STEO). To calculate this estimate, EPA used the Natural Gas Vehicle Use from the STEO Custom Table Builder (0.12 billion cubic feet/day in 2018). This projection includes all CNG/LNG used as transportation fuel from both renewable and non-renewable sources. EIA does not project the amount of CNG/LNG from biogas used as transportation fuel. To convert billion cubic feet/day to ethanol-equivalent gallons EPA used conversion factors of 1020 BTU per cubic foot of natural gas and 77,000 BTU of natural gas per ethanol-equivalent gallon.

EPA disagrees with commenters who claimed that a facility-by-facility approach to projecting cellulosic RIN generation for CNG/LNG derived from biogas would necessarily result in a more accurate projection than an industry-wide projection methodology. We continue to believe that in case of nascent industries with a small number of participants, such as the liquid cellulosic biofuel industry, industry wide projection methodologies may be inappropriate as they do not capture the specific circumstances that may impact each participant. In industries where the number of participants is small, failing to adequately assess each individual participant can have a significant impact on the overall accuracy of industry projections. However, as the number of market participants grows the impact of any single participant on the overall performance of the industry decreases. In these cases, industry-wide projection methods are more accurate than a more individualized approach, especially as macro market and economic factors become more influential on total production than the success or challenges at any single facility.

Further, the accuracy of a facility by facility approach to projecting production is heavily dependent on the accuracy of the information available to EPA on the projected RIN generation volumes of each of the potential production facilities for 2018. Conversely, the market wide approach used by EPA in this final rule relies on actual RIN generation data, rather than individual company projections for 2018, to calculate a demonstrated rate of growth. As the number of potential production facilities increases, EPA's ability to verify the accuracy of the information we receive, and make a determination about the likelihood that the producers will produce CNG/LNG derived from biogas at the projected levels decreases. This is especially challenging in situations where there are a large number of potential producers that have

previously overestimated the actual production from their facilities. In our 2017 final rule, EPA projected that 26 new facilities would begin producing CNG/LNG derived from biogas in 2017, largely based on information we received from the renewable CNG/LNG industry through the Coalition for Renewable Natural Gas. While we currently only have data available for the first 9 months of 2017, to date only two new facilities have generated cellulosic RINs for CNG/LNG derived from biogas in 2017. While additional new facilities may generate cellulosic RINs for CNG/LNG derived from biogas in the final 3 months of 2017, many projected that they would be producing cellulosic RINs by this point in the year, and it is highly unlikely that all 26 of these facilities will successfully generate cellulosic RINs by the end of 2017. The failure of these new facilities to generate cellulosic RINs in 2017, together with the over-projection by many of the facilities that have generated cellulosic RINs in 2017 resulted in the facility specific approach recommended by many commenters appearing to have significantly over-estimated the production of CNG/LNG in 2017. EPA has therefore used an alternative methodology based on actual production data in previous years, rather than production projections by individual facilities, to project production of CNG/LNG derived from biogas in this final rule. We believe the production of CNG/LNG derived from biogas has matured to a point where an industry wide projection methodology is more appropriate than a facility by facility approach, and is likely to result in a more accurate projection. We will monitor the success of this new approach, and will make appropriate modifications in the future if warranted.

We also disagree with commenters who claim that our proposed projection methodology does not appropriately account for new facilities expected to begin producing CNG/LNG derived from biogas in 2018. The methodology used by EPA in this final rule compared the total

projection of CNG/LNG derived from biogas from October 2016 – September 2017 to production in the 12 months that immediately precede this time period (October 2015 – September 2016). The production increases observed in October 2016 – September 2017, as compared to the preceding 12 months, were the result of both increased production from facilities that had previously produced CNG/LNG derived from biogas as well as production from facilities that had not previously produced this fuel. For example, from October 2015 – September 2016 a total of 34 facilities generated cellulosic RINs for CNG/LNG derived from biogas. From October 2016 – September 2017 the number of facilities that produced cellulosic RINs for CNG/LNG derived from biogas increased to 41. We believe, therefore, that while our projection methodology uses a growth rate based on historical data it adequately anticipates higher production volumes in future years, including both increased production from existing facilities as well as production from new facilities. In this way it is a forward, rather than backward looking methodology that satisfies our charge to project future cellulosic biofuel production in a reasonable manner, and with neutrality.

3. Total Cellulosic Biofuel in 2018

After projecting production of cellulosic biofuel from liquid cellulosic biofuel production facilities and producers of CNG/LNG derived from biogas, EPA combined these projections to project total cellulosic biofuel production for 2018. These projections are shown in Table III.D.3-1. Using the methodologies described in this section, we project that 288 million ethanol-equivalent gallons of cellulosic biofuel will be produced in 2018. We believe that projecting overall production in 2018 in the manner described above results in a neutral estimate

(neither biased to produce a projection that is too high nor too low) of likely cellulosic biofuel production in 2018.

Table III.D.3-1
Projected Volume of Cellulosic Biofuel in 2018
(million gallons)

	Projected Volume[a]
Liquid Cellulosic Biofuel Producers; Producers without Consistent Commercial Scale Production	5
Liquid Cellulosic Biofuel Producers; Producers with Consistent Commercial Scale Production	9
CNG/LNG Derived from Biogas	274
Total	288

[a] Volumes rounded to the nearest million gallons

Further discussion of the individual companies we believe will produce cellulosic biofuel and make it commercially available in 2018 can be found in a memorandum to the docket.[75]

[75] "Cellulosic Biofuel Producer Company Descriptions (November 2017)," memorandum from Dallas Burkholder to EPA Air Docket EPA-HQ-OAR-2017-0091. In the case of cellulosic biofuel produced from CNG/LNG and facilities using Edeniq's technology we have discussed the production potential from these facilities as a group rather than individually.

IV. Advanced Biofuel and Total Renewable Fuel Volumes for 2018

The national volume targets for advanced biofuel and total renewable fuel to be used under the RFS program each year through 2022 are specified in CAA section 211(o)(2)(B)(i)(I) and (II). Congress set annual renewable fuel volume targets that envisioned growth at a pace that far exceeded historical growth and, for years after 2011, prioritized that growth as occurring principally in advanced biofuels (contrary to previous growth patterns where most growth was in conventional renewable fuel, principally corn-ethanol). Congressional intent is evident in the fact that the portion of the total renewable fuel volume target in the statutory volume tables that is not required to be advanced biofuel is 15 billion gallons for all years after 2014, while the advanced volumes, driven by growth in cellulosic volumes, continue to grow through 2022 to a total of 21 billion gallons.

In this Section we discuss our use of the discretion afforded by the cellulosic waiver authority at CAA section 211(o)(7)(D)(i) to reduce volumes of advanced biofuel and total renewable fuel. We first discuss our assessment of advanced biofuel and the considerations, including comments received in response to the proposal and October 4 document, which have led us to conclude that the advanced biofuel volume target in the statute should be reduced by the full amount permitted under the cellulosic waiver authority. We then address total renewable fuel in the context of our interpretation, articulated in previous annual rulemakings, that advanced biofuel and total renewable fuel should be reduced by the same amount under the cellulosic waiver authority. In Section V we discuss our consideration of additional reductions

for both advanced biofuel and total renewable fuel beyond those permitted under the cellulosic waiver authority, using other waiver authorities provided by the statute.

To begin, we have evaluated the capabilities of the market and are making a finding that the 11.0 billion gallons specified in the statute for advanced biofuel cannot be reached in 2018. This is primarily due to the expected continued shortfall in cellulosic biofuel; production of this fuel type has consistently fallen short of the statutory targets by 95 percent or more, and as described in Section III, we project that it will fall far short of the statutory target of 7.0 billion gallons again in 2018. In addition, although for the 2016 and 2017 standards we determined that the projected reasonably attainable supply of non-cellulosic advanced biofuel and other considerations justified establishing standards that included a partial backfill of the shortfall in cellulosic biofuel with advanced biofuel, for reasons described in this section we are reducing the advanced biofuel applicable volume by the full amount of the shortfall in cellulosic biofuel for 2018.

In previous years when exercising the cellulosic waiver authority to determine the required volume of advanced biofuel, we have taken into account the availability of advanced biofuels, their energy security and GHG impacts, and the apparent intent of Congress as reflected in the statutory volumes tables to substantially increase the use of advanced biofuels over time, as well as factors such as increased costs associated with the use of advanced biofuels and the environmental and food competition concerns raised by some commenters. In considering these factors, in those years, we have concluded that it was appropriate to set the advanced biofuel standard in a manner that would allow the partial backfilling of missing cellulosic volumes with

non-cellulosic advanced biofuels. For purposes of this final rule we have again taken these factors into consideration, but rely more heavily on consideration of cost as a result of a stronger policy focus on the economic impacts of the RFS program to conclude that such backfilling with non-cellulosic advanced biofuel volumes should not be required in 2018. In other words, we are reducing the statutory volume target for advanced biofuel by the same amount as the reduction in cellulosic biofuel. This results in the non-cellulosic component of the advanced biofuel volume requirement being equal to the implied statutory volume of 4.00 billion gallons. We believe this new approach to balancing relevant considerations and exercising our discretion under the cellulosic waiver authority is permissible under the statute, and consistent with the principles articulated in *FCC v. Fox TV Stations* (556 US. 502, 514-15 (2009)), regarding circumstances when an agency may appropriately depart from prior policy. In making this final determination for 2018, we have considered comments on the appropriate balancing of factors under the cellulosic waiver authority that were provided by stakeholders in response to the proposal and the October 4 document, as discussed in the accompanying RTC document.

We note that the predominant non-cellulosic advanced biofuels available in the near term are advanced biodiesel and renewable diesel.[76] We expect a decreasing rate of growth in the availability of feedstocks used to produce these fuel types. In addition, we expect diminishing GHG benefits and higher per gallon costs as the required volumes of advanced biodiesel and renewable diesel increase. These outcomes are a result of the fact that the lowest cost and most easily available feedstocks are typically used first, and each additional increment of advanced biodiesel and renewable diesel requires the use of feedstocks that are incrementally more costly

[76] While sugarcane ethanol can also contribute to the supply of advanced biofuel, in recent years, supply of sugarcane ethanol has been considerably lower than supply of advanced biodiesel or renewable diesel.

and/or more difficult to obtain. Moreover, to the extent that higher advanced biofuel requirements cannot be satisfied through growth in the production of advanced biofuel feedstocks, they would instead be satisfied through a re-direction of such feedstocks from competing uses. Parties that were formerly using these feedstocks are likely to replace the advanced biofuel feedstocks with the lowest cost alternatives, likely derived from palm or petroleum sources, leading to lower overall GHG emission benefits. There would also likely be market disruptions and increased burden associated with shifting feedstocks among the wide range of companies that are relying on them today and which have optimized their processes to use them. Higher advanced biofuel standards could also be satisfied by diversion of foreign advanced biofuel from foreign markets, and there would likely be diminished benefits associated with such diversions. Taking these considerations into account, we believe, as discussed in more detail below, that we should not exercise our discretion under the cellulosic waiver authority to set the advanced biofuel volume requirement at a level that would lead to such diversions.

Furthermore, two other factors have added uncertainty regarding advanced biofuel volumes that are reasonably attainable and appropriate. The first is the fact that the tax credit for biodiesel has not been renewed, and if renewed could be in the form of a producer's tax credit rather than a blender's tax credit.[77] The second is the preliminary determination by the Department of Commerce that countervailing duties should be imposed on biodiesel imports from Argentina and Indonesia.[78]

[77] See American Renewable Fuel and Job Creation Act of 2017, S.944, 115th Cong. (2017).
[78] "Commerce Finds Countervailable Subsidization of Imports of Biodiesel from Argentina and Indonesia," available in EPA docket number EPA-HQ-OAR-2017-0091.

We believe that the factors and considerations noted above are all appropriately considered in our exercise of the broad discretion provided under the cellulosic waiver authority, and that a comprehensive consideration of these factors supports our use of the authority. Some of the considerations discussed in this final rule are related to the availability of non-cellulosic advanced biofuels (e.g., historic data on domestic supply, expiration of the biodiesel blenders' tax credit, potential imports of biodiesel in light of the Commerce Departments preliminary determination on countervailing duties on biodiesel imports from Argentina and Indonesia, potential imports of sugarcane ethanol, and anticipated decreasing growth in production of feedstocks for advanced biodiesel and renewable diesel), while others focus on the potential benefits and costs of requiring use of available volumes (e.g., relative cost of advanced biofuels to the petroleum fuels they displace, GHG reduction benefits and energy security benefits). Having determined that we should not exercise the discretion afforded EPA under the cellulosic waiver authority so as to require the use of advanced biofuel volumes that would lead to diversion of advanced feedstocks from other uses or diversion of advanced biofuels from foreign sources, our analytical approach to identifying the appropriate volume requirement is to first identify volumes that we believe would be reasonably attainable in 2018 without such feedstock or fuel diversions, and then discuss whether or not other considerations, such as cost and GHG impacts, indicate that it would be appropriate to set the advanced biofuel volume requirement so as to require use of such volumes to partially backfill for missing cellulosic volumes.

The net impact of our exercise of the cellulosic waiver authority is that after waiving the cellulosic biofuel volume down to the projected available level, and applying the same volume reduction to the statutory volume target for advanced biofuel, the resulting volume requirement

for advanced biofuel for 2018 is 10 million gallons more than the applicable volume used to derive the 2017 percentage standard. Furthermore, after applying the same reduction to the statutory volume target for total renewable fuel, the volume requirement for total renewable fuel is also 10 million gallons more than the applicable volume used to derive the 2017 percentage standard. The remainder of this section provides our justification for this approach to the determination of the volume requirements for advanced biofuel and total renewable fuel. Section V discusses our consideration of further reductions in either advanced biofuel or total renewable fuel using either the general waiver authority or the BBD waiver authority, and our justification for not applying such further reductions.

A. Volumetric Limitation on Use of the Cellulosic Waiver Authority

As described in Section II.A, when making reductions in advanced biofuel and total renewable fuel under the cellulosic waiver authority, the statute limits those reductions to no more than the reduction in cellulosic biofuel. As described in Section III.D, we are establishing a 2018 applicable volume for cellulosic biofuel of 288 million gallons, representing a reduction of 6,712 million gallons from the statutory target of 7,000 million gallons. As a result, 6,711 million gallons is the maximum volume reduction for advanced biofuel and total renewable fuel that is permissible using the cellulosic waiver authority. Use of the cellulosic waiver authority to

this maximum extent would result in volumes of 4.29 and 19.29 billion gallons for advanced biofuel and total renewable fuel, respectively.[79]

Table IV.A-1
Lowest Permissible Volumes
Using only the Cellulosic Waiver Authority (million gallons)

	Advanced biofuel	Total renewable fuel
Statutory target	11,000	26,000
Maximum reduction permitted under the cellulosic waiver authority	6,712	6,712
Lowest 2018 volume requirement permitted using only the cellulosic waiver authority	4,288	19,288

We are authorized under the cellulosic waiver authority to reduce the advanced biofuel and total renewable fuel volumes "by the same or a lesser" amount as the reduction in the cellulosic biofuel volume. As discussed in Section II.A, EPA has broad discretion in using the cellulosic waiver authority in instances where its use is authorized under the statute, since Congress did not specify factors that EPA must consider in determining whether to use the authority or what the appropriate volume reductions (within the range permitted by statute) should be. This broad discretion was affirmed in both *Monroe* and *ACE*.[80] Thus, EPA could potentially set the 2018 advanced biofuel standard at a level that is designed to partially backfill for the shortfall in cellulosic biofuel. As discussed below, doing so would result in perhaps an additional 110 million gallons of advanced biofuel. However, based on our consideration of the

[79] When expressing volumes in billion gallons, we use standard rounding methods to two decimal places, as done in previous annual standard-setting rulemakings. Volumes are sometimes shown in million gallons for clarity, but it is volumes in billion gallons that are used to calculate the applicable percentage standards.
[80] See *ACE* at 730-35.

factors described in more detail below, we are using the full extent of the cellulosic waiver authority in deriving volume requirements for 2018.[81]

B. Reasonably Attainable Volumes of Advanced Biofuel

It is appropriate to consider the availability of advanced biofuel, both to inform our exercise of the cellulosic waiver authority and to ascertain whether there might be an "inadequate domestic supply" justifying use of the general waiver authority. As the Court noted in *ACE*, EPA may consider demand-side considerations in addition to supply-side considerations when it assesses "reasonably attainable" volumes for purposes of its cellulosic waiver assessment. However, EPA may not consider demand-side factors in assessing whether there is an "inadequate domestic supply" that would justify use of the general waiver authority.[82] Our assessment of reasonably attainable volumes of advanced biofuel is described below.

In *ACE*, the Court noted that in assessing what volumes are "reasonably attainable," EPA had considered the availability of feedstocks, domestic production capacity, imports, and market capacity to produce, distribute, and consume renewable fuel.[83] We are taking a similar approach for 2018, with the added consideration of the possibility that higher volume requirements would lead to "feedstock switching" or diversion of advanced biofuels from use in other countries,

[81] We specify the volume requirements as billion gallons with two decimal places to be consistent with the volume targets as given in the statute. The only exception is for cellulosic biofuel which we specify in million gallons due to the substantial reduction from the statutory target. However, calculations are typically shown in million gallons for all four standards for clarity.
[82] See *ACE* at 734 and 696.
[83] *ACE* at 735-36.

which we took into account in setting the 2017 volume requirements and, we believe, are appropriate considerations under the broad discretion provided by the cellulosic waiver authority.

As noted above, a higher advanced biofuel volume requirement has a greater potential to increase the incentive for switching advanced biofuel feedstocks from existing uses to biofuel production. Such market reactions could cause disruptions and/or price increases in the non-biofuel markets that currently use these feedstocks. Increasing the required volumes of advanced biofuels without giving the market adequate time to adjust by increasing supplies could also result in diversion of advanced biofuels from foreign countries to the U.S. without increasing total global volumes. We believe it is likely that the parties that formerly used advanced biofuel feedstocks would seek to replace the advanced biofuel feedstocks with the cheapest alternatives, likely products derived from palm oil or petroleum, rather than forgoing the use of oil-based products. Increasing volumes of advanced biofuels used in the U.S. in this way (by shifting the end use of advanced feedstocks to biofuel production and satisfying the current markets for these advanced feedstocks with non-qualifying or petroleum based feedstocks, or by simply shifting advanced biodiesel or renewable diesel from foreign to domestic use – referred to for simplicity as "feedstock/fuel diversions") would therefore likely not produce the GHG benefits that would otherwise be expected. We have decided not to set the advanced biofuel volume requirement at a level that would require such feedstock/fuel diversions. Our individual assessments of reasonably attainable volumes of advanced biofuels reflect this approach. That is, while we refer to them as "reasonably attainable" volumes for convenience, they represent those volumes that are not likely to lead to feedstock/fuel diversions. Greater volumes could likely be made available if such diversions were not of concern.

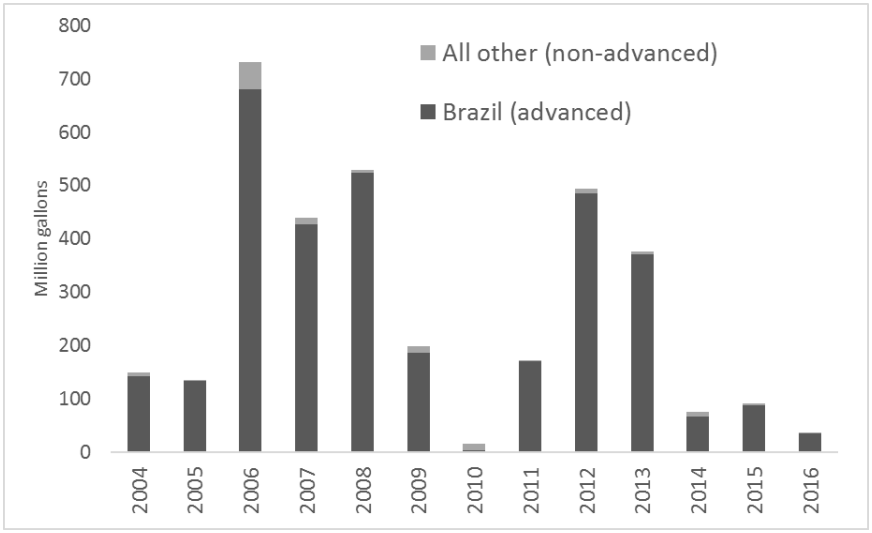
1. Imported Sugarcane Ethanol

The predominant available source of advanced biofuel other than cellulosic biofuel and BBD is imported sugarcane ethanol. In setting both the 2016 and 2017 standards, we determined that 200 million gallons of imported sugarcane ethanol would be reasonably attainable. In deriving this estimate of sugarcane ethanol, we attempted to balance indications of lower potential imports from recent data with indications that higher volumes were possible based on older data. We also pointed to the high variability in ethanol import volumes in the past (including of Brazilian sugarcane ethanol, the predominant form of imported ethanol, and the only significant source of imported advanced ethanol), increasing gasoline consumption in Brazil, and variability in Brazilian production of sugar as reasons that it would be inappropriate to assume that sugarcane ethanol imports would reach the much higher levels suggested by some stakeholders.

The data on 2016 ethanol imports suggests that we overestimated the volume of sugarcane ethanol imports for that year. Despite the fact that the applicable standards for 2016 were set prior to the beginning of 2016, and despite suggestions from UNICA[84] that 2016 imports could reach as high as 2 billion gallons, total ethanol imports only reached 34 million gallons.

[84] UNICA is the Brazilian Sugarcane Industry Association.

Figure IV.B.1-1
Historical Ethanol Imports[a]



Source: "US Imports of Fuel Ethanol from EIA," docket EPA-HQ-OAR-2017-0091.
[a] Imports from Brazil include those that are transmitted through the Caribbean Basin Initiative (CBI) and Central America Free Trade Agreement (CAFTA), and are produced from sugarcane. Imports from other countries are typically not produced from sugarcane and do not qualify as advanced biofuel.

Available data for imports in 2017 similarly suggests that imports are again likely to fall well below the 200 million gallons that we assumed when setting the 2017 standards; for January through August of 2017, total imports of sugarcane ethanol were 75 million gallons; by the end of 2017, total imports of sugarcane ethanol might be about 100 million gallons.[85] The combined experience for 2016 and 2017 suggests that 200 million gallons is too high for the purposes of projecting reasonably attainable volumes of advanced biofuel for 2018. At the same time, higher import volumes than those which occurred in 2016 are clearly possible, as reflected by imports seen in prior years. Taking all of these considerations into account, we are using 100 million gallons of imported sugarcane ethanol for the purposes of projecting reasonably attainable volumes of advanced biofuel for 2018. This level reflects a balancing of the information

[85] "Imports of ethanol 2011 - 2017," available in docket EPA-HQ-OAR-2017-0091.

available to EPA at this time; both the lower import volumes that have occurred more recently with the higher volumes that are possible based on earlier years.

We note that the future projection of imports of sugarcane ethanol is inherently imprecise, and that actual imports in 2018 could be lower or higher than 100 million gallons. Factors that could result in import volumes below 100 million gallons include weather and harvests in Brazil, world ethanol demand and prices, and constraints associated with the E10 blendwall in the U.S. Also, global sugar consumption has continued to increase steadily, while production has decreased. If the trend continues, Brazilian production of sugar could increase, with a concurrent reduction in production of ethanol.[86] On the other hand, the world average price of sugar has been projected to remain relatively flat between 2016 and 2018, suggesting little change in sugar production and implying that ethanol production in Brazil might likewise remain unchanged.[87] After considering these factors, and in light of the high degree of variability in historical imports of sugarcane ethanol, we believe that 100 million gallons is a reasonable projection for 2018.

2. Biodiesel and Renewable Diesel

With regard to biodiesel and renewable diesel, there are many different factors that could potentially influence the *total* reasonably attainable volume of these fuels (including both

[86] "Sugar - World Markets and Trade," USDA, November 2016.
[87] "Commodity Markets Outlook," World Bank Group, January 2017.

advanced and non-advanced forms) used as transportation fuel or heating oil in the U.S.[88] These factors could include the availability of qualifying biodiesel and renewable diesel feedstocks, and the production capacity of biodiesel and renewable diesel facilities (both in the U.S. and internationally). The degree to which these and other factors may affect the total supply of both advanced and conventional forms of biodiesel and renewable diesel in 2018, is discussed in a memo to the docket.[89]

However, the primary considerations in our determination of the reasonably attainable volumes of *advanced* biodiesel and renewable diesel for 2018 are data on the use of advanced biodiesel and renewable diesel in previous years, the uncertain impact of the continued absence of the biodiesel tax credit and proposed tariffs on biodiesel from certain countries on biodiesel production and importation, the projected growth in production of advanced biodiesel and renewable diesel feedstocks in 2018.[90] A review of the volumes of advanced biodiesel and renewable diesel used in previous years is especially useful in projecting the potential for growth in the production and use of such fuels, since for these fuels there are a number of complex and inter-related factors beyond simply the total production capacity for biodiesel and renewable diesel and ability to distribute these fuels (including the availability of advanced feedstocks, the expiration of the biodiesel tax credit, and other market-based factors) that are likely to affect the

[88] For a further discussion of the factors that influence the availability of biodiesel and renewable diesel see Section V.B.2 of the preamble and a further discussion of these factors from the 2017 final rule (81 FR 89781 – 89789, December 12, 2016).
[89] "Market impacts of biofuels," memorandum from David Korotney to docket EPA-HQ-OAR-2017-0091.
[90] Throughout this section we refer to advanced biodiesel and renewable diesel as well as advanced biodiesel and renewable diesel feedstocks. In this context, advanced biodiesel and renewable diesel refer to any biodiesel or renewable diesel for which RINs can be generated that satisfy an obligated party's advanced biofuel obligation (i.e., D4 or D5 RINs). An advanced biodiesel or renewable feedstock refers to any of the biodiesel, renewable diesel, jet fuel, and heating oil feedstocks listed in Table 1 to §80.1426 or in petition approvals issued pursuant to §80.1416, that can be used to produce fuel that qualifies for D4 or D5 RINs. These feedstocks include, for example, soy bean oil; oil from annual cover crops; oil from algae grown photosynthetically; biogenic waste oils/fats/greases; non-food grade corn oil; camelina sativa oil; and canola/rapeseed oil (See pathways F, G, and H of Table 1 to §80.1426).

total supply. We also believe the likely growth in production of feedstocks used to produce these fuels is an important factor to consider. This is because the energy security and GHG reduction value associated with the growth in the use of advanced biofuels is greater when that growth is associated with an increase in advanced feedstock production, rather than a switching of existing advanced feedstocks from other uses or the diversion of advanced biodiesel and renewable diesel from foreign markets if the parties that previously used the advanced biofuel or feedstocks replace these oils with low cost palm or petroleum derived products, as we believe would likely be the case in 2018. Such feedstock switching or fuel diversion could result in unintended negative consequences, such as market disruption in other markets where such oils are used, which could offset some of the anticipated benefits of the production and use of advanced biofuels.

The volume of advanced biodiesel and renewable diesel projected to be available based on a consideration of these factors is less than the maximum volume of biodiesel and renewable diesel we believe could be produced (based solely on an assessment of the available production capacity) or consumed (based on an assessment of the ability of the market to distribute and use biodiesel and renewable diesel). Production capacity and the ability for the market to distribute and use biodiesel and renewable diesel are therefore not constraining factors in our assessment of the reasonably attainable volume of advanced biodiesel and renewable diesel in 2018.

Before considering the projected growth in the production of qualifying feedstocks that could be used to produce advanced biodiesel and renewable diesel, it is helpful to review the volumes of biodiesel and renewable diesel that have been used in the U.S. in recent years. While

historic data and trends alone are insufficient to project the volumes of biodiesel and renewable diesel that could be provided in future years, historic data can serve as a useful frame of reference in considering future volumes. Past experience suggests that a high percentage of the biodiesel and renewable diesel used in the U.S. (from both domestic production and imports) qualifies as advanced biofuel.[91] In previous years, biodiesel and renewable diesel produced in the U.S. has been almost exclusively advanced biofuel.[92] Imports of advanced biodiesel have increased in recent years, however, as seen in Table IV.B.2-1. Volumes of imported advanced biodiesel and renewable diesel have varied significantly from year to year, as they are impacted both by domestic and foreign policies, as well as economic factors.

[91] From 2011 through 2016 over 95% of all biodiesel and renewable diesel supplied to the U.S. (including domestically-produced and imported biodiesel and renewable diesel) qualified as advanced biodiesel and renewable diesel (9,372 million gallons of the 9,850 million gallons) according to EMTS data.

[92] From 2011 through 2016 over 99.9% of all the domestically produced biodiesel and renewable diesel supplied to the U.S. qualified as advanced biodiesel and renewable diesel (8,258 million gallons of the 8,265 million gallons) according to EMTS data.

Table IV.B.2-1
Advanced (D4 and D5) Biodiesel and Renewable Diesel from 2011 to 2016
(Million Gallons)[a]

	2011	2012	2013	2014[b]	2015[b]	2016
Domestic Biodiesel	967	1,014	1,376	1,303	1,253	1,633
(Annual Change)	(N/A)	(+47)	(+362)	(-73)	(-50)	(+380)
Domestic Renewable	58	11	92	155	175	221
Diesel (Annual Change)	(N/A)	(-47)	(+81)	(+63)	(+20)	(+46)
Imported Biodiesel	44	40	156	130	261	561
(Annual Change)	(N/A)	(-4)	(+116)	(-26)	(+131)	(+300)
Imported Renewable	0	28	145	129	121	170
Diesel (Annual Change)	(N/A)	(+28)	(+117)	(-16)	(-8)	(+49)
Exported Biodiesel and Renewable Diesel (Annual Change)	48 (N/A)	102 (+54)	125 (+23)	134 (+9)	133 (-1)	129 (-4)
Total	1021	991	1,644	1,583	1,677	2,456
(Annual Change)	(N/A)	(-30)	(+653)	(-61)	(+94)	(+779)

[a] All data for 2011-2016 from EMTS. EPA reviewed all advanced biodiesel and renewable diesel RINs retired for reasons other than demonstrating compliance with the RFS standards and subtracted these RINs from the RIN generation totals for each category in the table above to calculate the supply in each year.
[b] RFS required volumes for these years were not established until December 2015.

Table IV.B.2-2
Conventional (D6) Biodiesel and Renewable Diesel from 2011 to 2016 (Million Gallons)[a]

	2011	2012	2013	2014[b]	2015[b]	2016
Domestic Biodiesel	0	0	6	1	0	0
(Annual Change)	(N/A)	(+0)	(+6)	(-5)	(+0)	(+0)
Domestic Renewable	0	0	0	0	0	0
Diesel (Annual Change)	(N/A)	(+0)	(+0)	(+0)	(+0)	(+0)
Imported Biodiesel	0	0	31	52	74	113
(Annual Change)	(N/A)	(+0)	(+31)	(+21)	(+22)	(+39)
Imported Renewable	0	0	53	0	106	43
Diesel (Annual Change)	(N/A)	(+0)	(+53)	(-53)	(+106)	(-63)
Exported Biodiesel and Renewable Diesel (Annual Change)	0 (N/A)	0 (+0)	0 (+0)	0 (+0)	0 (+0)	1 (+1)
Total	0	0	90	53	180	155
(Annual Change)	(N/A)	(+0)	(+90)	(-37)	(+127)	(-25)

[a] All data for 2011-2016 from EMTS. EPA reviewed all conventional biodiesel and renewable diesel RINs retired for reasons other than demonstrating compliance with the RFS standards and subtracted these RINs from the RIN generation totals for each category in the table above to calculate the supply in each year.
[b] RFS required volumes for these years were not established until December 2015.

Since 2011 the year-over-year changes in the volume of advanced biodiesel and renewable diesel in the U.S. have varied greatly, from a low of negative 61 million gallons from 2011 to 2012 to a high of 779 million gallons from 2015 to 2016. These changes were likely influenced by a number of factors such as the cost of biodiesel feedstocks and petroleum diesel, the status of the biodiesel blenders tax credit, growth in marketing of biodiesel at high volume truck stops and centrally fueled fleet locations, demand for biodiesel and renewable diesel in other countries, biofuel policies in both the U.S. and foreign countries, and the volumes of renewable fuels (particularly advanced biofuels) required by the RFS. This historical information does not indicate that the maximum previously observed increase of 779 million gallons of advanced biodiesel and renewable diesel would be reasonable to expect from 2017 to 2018, nor does it indicate that the low growth rates observed in other years represent the limit of potential growth in 2018. Rather, these data illustrate both the magnitude of the increases in advanced biodiesel and renewable diesel in previous years and the significant variability in these increases.

The historic data indicates that the biodiesel tax policy in the U.S. can have a significant impact on the supply of biodiesel and renewable diesel in any given year. While the biodiesel blenders tax credit has applied in each year from 2010 – 2016, it has only been in effect during the calendar year in 2011, 2013 and 2016, while other years it has been applied retroactively. The biodiesel blenders tax credit expired at the end of 2009 and was re-instated in December 2010 to apply retroactively in 2010 and extend through the end of 2011. Similarly, after expiring at the end of 2011, 2013, and 2014 the tax credit was re-instated in January 2013 (for 2012 and 2013), December 2014 (for 2014), and December 2015 (for 2015 and 2016). Each of the years

in which the biodiesel blenders tax credit was in effect during the calendar year (2013 and 2016) resulted in significant increases in the supply of advanced biodiesel and renewable diesel over the previous year (653 million gallons and 779 million gallons respectively). However, following this large increase in 2013, the increase in the supply of advanced biodiesel and renewable diesel in 2014 and 2015 was minimal, only 33 million gallons from 2013 to 2015. This pattern is likely the result of both accelerated production and/or importation of biodiesel and renewable diesel in the final few months of 2013 to take advantage of the expiring tax credit as well as relatively lower volumes of biodiesel and renewable diesel production and import in 2014 and 2015 than would have occurred if the tax credit had been in place.[93]

We believe it is reasonable to anticipate a similar production pattern in 2016 through 2018 as observed in 2013 through 2015; that increases in the volumes of advanced biodiesel and renewable diesel will be modest in 2017 and 2018, following the significant increase in 2016. In 2013 the tax credit was in place through the entire year. This was followed by two years (2014 and 2015) in which the tax credit was not in place, but was eventually reinstated retroactively. Similarly, the tax credit in place through 2016, but at the time of this rulemaking not applicable to 2017 or 2018.[94] Available RIN generation data further supports this pattern. Very high volumes of advanced biodiesel and renewable diesel were supplied in the last quarter of 2016, likely driven by a desire to capture the expiring tax credit, while significantly smaller volumes of

[93] We also acknowledge that the fact that EPA did not finalize the required volumes of renewable fuel under the RFS program for 2014 and 2015 until December 2015 likely had an impact on the volume of advanced biodiesel and renewable diesel supplied in these years.

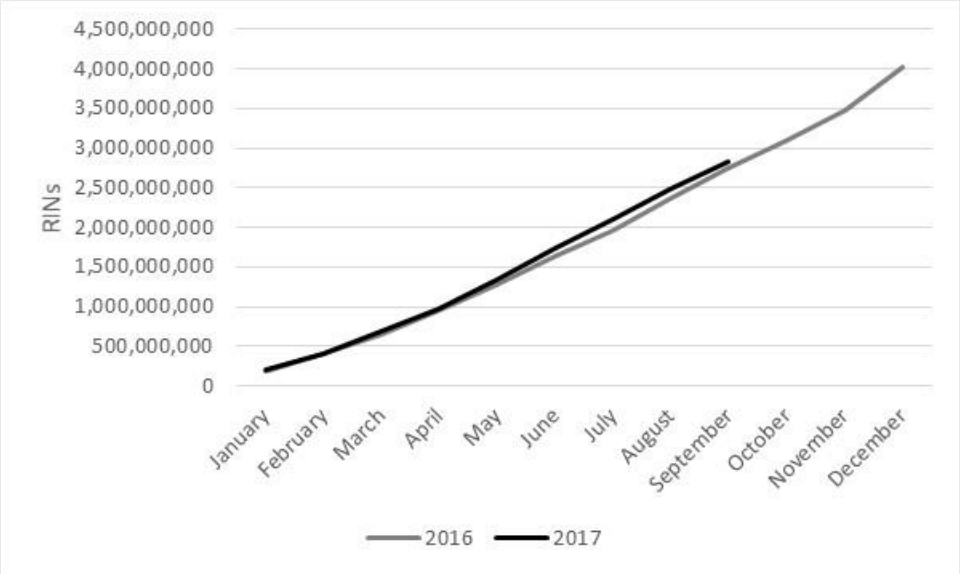
[94] At this time, it is uncertain whether the tax credit would be retroactively applied to 2017 or applied in any manner (prospectively or retroactively) in 2018.

these fuels were supplied in the first quarter of 2017.[95] Data on advanced biodiesel and renewable diesel RIN generation in 2017 was available through September at the time the analyses were performed for this rulemaking. Our review of this data suggests that the generation of RINs for advanced biodiesel and renewable diesel in 2017 (through September) is slightly higher than RIN generation for these fuels during the same time period in 2016 (see Figure IV.B.2-1 below). Total 2016 RIN generation for advanced biodiesel and renewable diesel through September 2016 was 2.76 billion RINs, while total 2017 RIN generation for these fuels through September 2017 was 2.82 billion RINs. Total supply of advanced biodiesel and renewable diesel in 2016 was 2.46 billion gallons, suggesting that a total supply of approximately 2.5 billion gallons in 2017 (slightly higher than the volume supplied in 2016) is likely.[96] This is consistent with our projection of advanced biodiesel and renewable diesel in the 2017 rule (2.4 billion gallons) and expectations based on RIN generation patterns in previous years of modest increases in the supply of advanced biodiesel and renewable diesel in the years following the expiration of the biodiesel tax credit. This data also supports our expectation that the reasonably attainable volume of advanced biodiesel and renewable diesel in 2018 will reflect modest increases from the reasonably attainable volumes of these fuels in 2016 and 2017. It is not clear from this data whether or not higher RFS volume requirements alone would be sufficient to drive significant increases in the supply of advanced biodiesel and renewable diesel in the absence of a tax credit.

[95] According to data on EPA's public website, RINs were generated for 823 million gallons of biomass-based diesel in the last quarter of 2016 while RINs were generated for 444 million gallons of biomass-based diesel in the first quarter of 2017. The vast majority of advanced biodiesel and renewable diesel qualifies as biomass-based diesel.

[96] The supply of advanced biodiesel and renewable diesel in 2016 accounts for all RIN generation, as well as all RIN retirements for reasons other than compliance with the annual standards. At this time, we do not have sufficient data to compare RIN retirements for reasons other than compliance with the annual standards in 2017 to those in 2016, as this data often lags RIN generation by several months. However, at this time we have no reason to believe RINs retired for reasons other than compliance with the annual standards in 2017 would be significantly different that retirements for the same reasons in 2017.

Figure IV.B.2-1
Cumulative RIN Generation for Advanced Biodiesel and Renewable Diesel (2016-2017)



After reviewing the historical supply of advanced biodiesel and renewable diesel and consideration of the possible impact of the expiration of the biodiesel tax credit (discussed above), EPA next considered the expected increase in the availability of advanced biodiesel and renewable diesel feedstocks in 2018. We acknowledge that an increase in the required use of advanced biodiesel and renewable diesel could be realized through a diversion of advanced feedstocks from other uses, or a diversion of advanced biodiesel and renewable diesel from existing markets in other countries. We perceive the net benefits associated with such increased advanced biofuel and renewable fuel volumes to be significantly less than the net benefits associated with the production of additional advanced biodiesel and renewable diesel with the use of newly-available advanced feedstocks due to the likelihood that parties that previously used advanced biofuel feedstocks will replace them with low cost palm or petroleum derived products. This is both because of the potential disruption and associated cost impacts to other industries resulting from feedstock switching, and a reduced GHG reduction benefit related to

use of feedstocks for biofuel production that would have been used for other purposes and which must then be backfilled with other feedstocks with potentially greater GHG emissions. Similarly, increasing the supply of biodiesel and renewable diesel to the U.S. by diverting fuel that would otherwise have been used in other countries results in lesser GHG benefits than if the supply of these fuels was increased through additional biofuel production, especially if this diversion results in increased consumption of petroleum fuels in the countries that would have otherwise consumed the biodiesel or renewable diesel. By focusing our assessment of the potential growth in the reasonably attainable volume of biodiesel and renewable diesel on the expected growth in the production of advanced feedstocks (rather than the total supply of these feedstocks in 2018, which would include feedstocks currently being used for non-biofuel purposes), we are attempting to minimize the incentives for the RFS program to increase the supply of advanced biodiesel and renewable diesel through feedstock switching or diverting biodiesel and renewable diesel from foreign market to the U.S.

Advanced biodiesel and renewable diesel feedstocks include both waste oils, fats and greases and oils from planted crops. While we believe a small increase in supply of waste oils, fats, and greases may be possible in 2018, we believe this increase is limited as most of these oils, fats, and greases are already being recovered and used in biodiesel and renewable diesel production or for other purposes. Many of the planted crops that supply vegetable oil for advanced biodiesel and renewable diesel production are primarily grown for purposes other than providing feedstocks for biodiesel and renewable diesel, such as for livestock feed with the oil that is used as feedstock for renewable fuel production a co-product or by-product.[97] This is true

[97] For example, corn oil is a co-product of corn grown primarily for feed or ethanol production, while soy and canola oil are primarily grown as livestock feed.

for soy beans and corn, which are the two largest sources of feedstock from planted crops used for biodiesel production in the U.S.[98] We do not believe that the increased demand for soybean oil or corn oil will result in an increase in soybean or corn prices large enough to induce significant changes in agricultural activity, at least for the relatively modest changes in advanced biodiesel and renewable diesel feedstock demand that we envision as a result of the RVOs we are finalizing in this rule. The vegetable oils produced are not the primary source of revenue for these crops, meaning that the planted acres of these crops are likely to be based on broader economic factors, rather than on demand for vegetable oil to produce biofuels or for other markets.

Increasing the demand for advanced biodiesel and renewable diesel beyond the volumes that could be made from the projected increase in the feedstocks used to produce these fuels would likely require diverting volumes of advanced biodiesel and renewable diesel (or the feedstocks used to produce these fuels) from existing markets to be used to produce biofuels supplied to the U.S. Increasing the short-term supply of advanced biodiesel and renewable diesel to the U.S. in this manner (simply shifting the end use of advanced feedstocks to biodiesel and renewable diesel production and meeting non-biofuel demand for these feedstocks with conventional renewable and/or petroleum based feedstocks or diverting advanced biodiesel and renewable diesel from foreign markets to the U.S.) may not advance the full GHG or energy security goals of the RFS program. In a worst case scenario, higher standards could cause supply disruptions to a number of markets as biodiesel and renewable diesel producers seek additional

[98] According to EIA data 6,096 million pounds of soy bean oil and 1,306 million pounds of corn oil were used to produce biodiesel in the U.S. in 2016. Other significant sources of feedstock were yellow grease (1,389 million pounds), canola oil (1,130 million pounds), white grease (578 million pounds), tallow (332 million pounds), and poultry fat (220 million pounds). Numbers from EIA's February 2017 Monthly Biodiesel Production Report. Available at https://www.eia.gov/biofuels/biodiesel/production/archive/2016/2016_12/biodiesel.pdf.

supplies of advanced feedstocks and the parties that previously used these feedstocks, both within and outside of the fuels marketplace, seek out alternative feedstocks. Similarly, advanced biodiesel and renewable diesel could be diverted to the U.S. from foreign countries and displaced with petroleum fuels. These actions could result in significant cost increases, for both biodiesel and renewable diesel as well as other products produced from renewable oils, with reduced GHG benefits.

We believe the most reliable source for projecting the expected increase in vegetable oils in the U.S. is USDA's World Agricultural Supply and Demand Estimates (WASDE). According to the September 2017 WASDE report, domestic vegetable oil production is expected to increase by 0.33 million metric tons in 2018, from 11.42 million metric tons in the 2016/2017 agricultural marketing year to 11.75 million metric tons in the 2017/2018 agricultural marketing year.[99] This quantity of vegetable oils (0.33 million metric tons) could be used to produce approximately 94 million gallons of advanced biodiesel or renewable diesel.[100]

In addition to virgin vegetable oils, we also expect increasing volumes of distillers corn oil[101] to be available for use in 2018. The WASDE report does not project distillers corn oil production, so EPA must use an alternative source to project the growth in the production of this feedstock. EPA is using the results of the World Agricultural Economic and Environmental

[99] For this assessment we have assumed the vegetable oils produced in the 2017/2018 agricultural marketing year are the feedstocks most likely to be used to produce biodiesel and renewable diesel in 2018.
[100] To calculate this volume we have used a conversion of 7.7 pounds of feedstock per gallon of biodiesel. This is based on the expected conversion of soy oil (http://extension.missouri.edu/p/G1990), which is the largest source of feedstock used to produce advanced biodiesel and renewable diesel. We believe that it is also a reasonable conversion factor to use for all virgin vegetable oils.
[101] Distillers corn oil is non-food grade corn oil produced by ethanol production facilities

Services (WAEES) model to project the growth in the production of distillers corn oil.[102] In assessing the likely increase in the availability of distillers corn oil from 2017 to 2018, the authors of the WAEES model considered the impacts of an increasing adoption rate of distillers corn oil extraction technologies at domestic ethanol production facilities, as well as increased corn oil extraction rates enabled by advances in this technology. The WAEES model projects that production of distillers corn oil in 2018 will increase by 316 million pounds, from 2,299 million pounds in agricultural marketing year 2016/2017 to 2,615 million pounds in agricultural marketing year 2017/2018. According to the WAEES model, this projected increase in the production of distillers corn oil, if devoted entirely to biofuel production, could be used to produce approximately 39 million gallons of biodiesel or renewable diesel in 2018. We believe that this is a reasonable projection. While the vast majority of the increase in advanced biodiesel and renewable diesel feedstocks produced in the U.S. from 2016 to 2017 is expected to come from virgin vegetable oils and distillers corn oil, increases in the supply of other sources of advanced biodiesel and renewable diesel feedstocks, such as biogenic waste oils, fats, and greases, may also occur. These increases, however, are expected to be modest, as many of these feedstocks that can be recovered economically are already being used for the production of biodiesel or renewable diesel, or in other markets. In total, we expect that increases in feedstocks produced in the U.S. are sufficient to produce approximately 150 million more gallons of advanced biodiesel and renewable diesel in 2018 relative to 2017.[103]

[102] For the purposes of this final rule, EPA relied on WAEES modeling results submitted as comments by the National Biodiesel Board on the 2018 final rule (Kruse, J., "Implications of an Alternative Advanced and Biomass Based Diesel Volume Obligation for Global Agriculture and Biofuels", August 21, 2017, World Agricultural Economic and Environmental Services (WAEES), EPA–HQ–OAR–2017-0091-3880).

[103] This projection includes a projected increase in the availability fats and oils other than virgin vegetable oils and distillers corn oil sufficient to produce approximately 15 million gallons of biodiesel. The WAEES model projects an increase in the quantity of "other fats and oils" (including inedible tallow, lard & white grease, yellow grease, brown grease, poultry fat, and other) sufficient to produce 31 million gallons of biodiesel. It is not clear from the WAEES model, however, if the projected increased use of other fats and oils as feedstock for biodiesel production is

We have also considered the expected increase in the imports of advanced biodiesel and renewable diesel produced in other countries. In previous years, significant volumes of foreign produced advanced biodiesel and renewable diesel have been supplied to markets in the U.S. (see Table IV.B.2-1 above). These significant imports were likely the result of a strong U.S. demand for advanced biodiesel and renewable diesel, supported by the RFS standards, the LCFS in California, the biodiesel blenders tax credit, and the opportunity for imported biodiesel and renewable diesel to realize these incentives. At this time the impact of the expiration of the biodiesel blenders tax credit on the volumes of foreign-produced biodiesel and renewable diesel imported into the U.S., is highly uncertain. Additionally, in August 2017 the Department of Commerce announced a preliminary determination that it would be appropriate to place countervailing duties of 41 percent to 68 percent on biodiesel imported from Argentina and Indonesia. According to data from EIA, biodiesel imports from Argentina were 10,679 thousand barrels in 2016 (approximately 449 million gallons) and 5,601 billion barrels (approximately 235 million gallons) through July 2017 (the most recent month for which data were available at the time of this assessment). Biodiesel imports from Indonesia were 2,554 thousand barrels in 2016 (approximately 107 million gallons), with no biodiesel imported in 2017 through July 2017. At this time, it is uncertain whether or not the preliminary determination by the Department of Commerce will be finalized, and it is uncertain what impact the finalization of these duties would have on overall imports of advanced biodiesel and renewable diesel to the U.S. In recent years

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the result of increased production/collection of these feedstocks or diverting them from other uses. We therefore think our slightly more conservative projected increase in these feedstocks sufficient to produce 15 million gallons of biodiesel (without diverting feedstocks from existing uses) is appropriate. We note, however, using the slightly higher projection from the WAEES model (feedstock increase sufficient to produce 31 million gallons of biodiesel) has a very minimal impact on our assessment of the reasonably attainable volume of advanced biodiesel and renewable diesel in 2018, and would have no impact on the required volume of advanced biofuel for 2018.

imports of advanced biodiesel and renewable diesel have increased year-over-year, and absent these actions it may be reasonable to anticipate continued increases in the imported volume of these fuels. In light of this uncertainty, however, we do not believe it would be reasonable at this point to either increase or decrease our projection of the reasonably attainable volume of biodiesel and renewable diesel for 2018 as compared to the levels we projected for 2017.[104]

After a careful consideration of the factors discussed above, EPA has determined, for the purposes of this final rule, that approximately 2.55 billion gallons of advanced biodiesel and renewable diesel is reasonably attainable for use in our determination of the appropriate applicable volume of advanced biofuel to require for 2018. This volume is 150 million gallons higher than the volume of advanced biodiesel and renewable diesel determined to be reasonably attainable and appropriate for the purposes of deriving the advanced biofuel standard in 2017.

The 150 million gallon increase in advanced biodiesel and renewable diesel that we project will be reasonably attainable for 2018 represents a smaller annual increase in advanced biodiesel and renewable diesel than we assumed in deriving the 2017 advanced biofuel standard (approximately 300 million gallons over 2016 levels). We believe that this reflects that the circumstances presented with respect to 2018 are different from those we anticipated for 2017. The primary differences are a smaller projected increase in advanced feedstock production in the U.S., the continued absence of the biodiesel tax credit, and the preliminary determination placing duties on biodiesel imported from Argentina and Indonesia.

[104] We further note that there have been recent efforts to reinstate the biodiesel tax credit as a producers' tax credit, rather than a blenders tax credit. If the biodiesel tax credit were reinstated as a producers' tax credit it would not apply to foreign biodiesel producers, further limiting the likely supply of imported advanced biodiesel and renewable diesel.

3. Other Advanced Biofuel

In addition to cellulosic biofuel, imported sugarcane ethanol, and advanced biodiesel and renewable diesel, there are other advanced biofuels that can be counted in the determination of reasonably attainable volumes of advanced biofuel for 2018. These other advanced biofuels include biogas, naphtha, heating oil, butanol, jet fuel, and domestically-produced advanced ethanol.[105] However, the supply of these fuels has been relatively low in the last several years.

Table IV.B.3-1
Historical Supply of Other Advanced Biofuels
(million ethanol-equivalent gallons)

	CNG	Heating oil	Naphtha	Renewable diesel[a]	Domestic Ethanol	Total
2013	26	0	3	64	23	116
2014	20	0	18	15	26	79
2015	0	1	24	8	25	58
2016	0	2	26	8	27	63

[a] Some renewable diesel generates D5 rather than D4 RINs as a result of being produced through co-processing with petroleum or being produced from the non-cellulosic portions of separated food waste or annual cover crops.

The downward trend over time in biogas as advanced biofuel with a D code of 5 is due to the re-categorization in 2014 of landfill biogas from advanced (D code 5) to cellulosic (D code 3).[106] Apart from biogas, total supply of advanced biofuel other than imported sugarcane ethanol has been relatively constant during 2014 - 2016. Based on this historical record, we find that 60

[105] Advanced biofuel with a D code of 5.
[106] 79 FR 42128, July 18, 2014.

million gallons would be reasonably attainable in 2018.[107] This represents the approximate average of the two most recent years (2015 and 2016) for which complete data are available.

We recognize that the potential exists for additional volumes of advanced biofuel from sources such as jet fuel, liquefied petroleum gas (LPG), and liquefied natural gas (as distinct from compressed natural gas), as well as non-cellulosic biogas such as from digesters. However, since they have been produced in only de minimis and sporadic amounts in the past, we do not have a basis for projecting substantial volumes from these sources in 2018.[108]

4. Total Advanced Biofuel

The total volume of advanced biofuel that we believe is reasonably attainable in 2018 is the combination of cellulosic biofuel and the sources described above: imported sugarcane ethanol, biodiesel and renewable diesel which qualifies as BBD, and other advanced biofuels such as advanced biogas that does not qualify as cellulosic biofuel, heating oil, naphtha, domestic advanced ethanol, and advanced renewable diesel that does not qualify as BBD. Our assessment of the reasonably attainable volumes of these sources, discussed in the preceding sections, is summarized below. We note that the reasonably attainable volumes of each of these advanced biofuels cannot themselves be viewed as volume requirements. The volumes for each advanced biofuel type represent one significant factor that is considered in the analysis used to

[107] For the purposes of determining the availability of total renewable fuel, we are using a volume of 40 million gallons of non-ethanol other advanced biofuel and 20 million gallons of advanced domestic ethanol (see discussion in Section V.B.2).

[108] For instance, no RIN-generating volumes of these other advanced biofuels were produced in 2016, and less than 1 mill gal total in prior years.

determine the reasonably attainable volumes of advanced biofuel. As discussed in more detail in a memorandum to the docket, there are many ways that the market could respond to the percentage standards we establish, including use of higher or lower volumes of these fuel types than discussed in this section.[109] In addition, as discussed below, we do not believe it would be appropriate to require use of all volumes we have determined to be reasonably attainable.

Table IV.B.4-1
Reasonably Attainable Volumes of Advanced Biofuel in 2018
(million ethanol-equivalent gallons except as noted)

Cellulosic biofuel	288
Advanced biodiesel and renewable diesel (ethanol-equivalent volume / physical volume)	3,953 / 2,550
Imported sugarcane ethanol	100
Other advanced	60
Total advanced biofuel	4,401

C. Exercise of Cellulosic Waiver Authority for Advanced Biofuel

Based on the information presented above, we believe that 4.40 billion gallons of advanced biofuel would be reasonably attainable in 2018. This volume is 110 million gallons higher than the 4.29 billion gallons that would result from reducing the applicable volume of advanced biofuel by the same amount as the reduction to the statutory applicable volume of cellulosic biofuel (see Section III for a discussion of the cellulosic biofuel volume requirement for 2018). In exercising the cellulosic waiver authority in past years, we determined it was appropriate to require a partial backfilling of missing cellulosic volumes with volumes of non-cellulosic advanced biofuel we determined to be reasonably attainable and appropriate,

[109] "Market impacts of biofuels," memorandum from David Korotney to docket EPA-HQ-OAR-2017-0091.

notwithstanding the increase in costs associated with this decision.[110] However, this year we are balancing the various considerations in a different manner in setting the 2018 standards, placing a greater emphasis on cost considerations.[111]

In Section IV.E we present illustrative cost projections for sugarcane ethanol and soybean biodiesel in 2018, the two advanced biofuels that would be most likely to provide the marginal increase in volumes of advanced biofuel in 2018 in comparison to 2017. Sugarcane ethanol results in a cost increase compared to gasoline that ranges from $0.61 - $1.56 per ethanol-equivalent gallon.[112] Soybean biodiesel results in a cost increase compared to diesel fuel that ranges from $0.95 - $1.30 per ethanol-equivalent gallon.[113] The cost of these renewable fuels is high as compared to the petroleum fuels they displace. In light of these comparative costs, we believe it is reasonable to forgo the marginal benefit that might be achieved by establishing the advanced biofuel standard to require an additional 110 million gallons. See Section IV.E for a further discussion of the projected cost of this final rule.

Based on consideration of the volumes that may be reasonably attainable in 2018, along with a balancing of the costs and benefits associated with the option of setting the advanced

[110] See, e.g., Response to Comments Document for the 2014-16 Rule, pages 628-631, available at https://www.epa.gov/sites/production/files/2015-12/documents/420r15024.pdf.
[111] EPA notes that while the factors considered under the cellulosic waiver authority to reduce volumes could apply to volumes beyond the reduction in cellulosic biofuel, EPA is limited in the exercise of its cellulosic waiver authority to reductions up to the amount of the reduction in cellulosic biofuel. Any further reductions would require a determination under the general waiver authority that the volumes would result in severe economic or environmental harm, or that there is an inadequate domestic supply, as discussed in Section V below.
[112] Sugarcane ethanol results in a projected cost increase of $0.92 - $2.34 per gasoline-equivalent gallon. The projected cost of gasoline in 2018 is $1.64 per gallon based on EIA Short-Term Energy Outlook, October 2017, Custom Table Builder, "Refiner Wholesale Gasoline Price."
[113] Soybean biodiesel results in a projected cost increase of $1.62 - $2.22 per diesel-equivalent gallon. The projected cost of diesel in 2018 is $1.74 per gallon based on EIA Short-Term Energy Outlook, October 2017, Custom Table Builder, "Diesel Fuel Refiner Wholesale Price."

biofuel standard at a level that would require use of all volumes that we have estimated could be reasonably attainable, we are exercising our cellulosic waiver authority to reduce advanced biofuel volumes to 4.29 billion gallons for 2018.[114] This advanced biofuel volume requirement for 2018 is similar to the requirement for 2017 when we allowed a portion of the shortfall in cellulosic biofuel to be backfilled with other advanced biofuel.

It should be noted that by exercising the full cellulosic waiver authority for advanced biofuel, the implied statutory volume target for non-cellulosic advanced biofuel of 4.0 billion gallons in 2018 is maintained. Although the implied volume for non-cellulosic advanced biofuel in the statute increases from 3.5 billion gallons in 2017 to 4.0 billion gallons in 2018, the applicable volume requirements for 2017 as finalized by EPA included an allowance for 4.0 billion gallons of non-cellulosic advanced biofuel, one year before envisioned by the statute. Through our 2017 action, we effectively required early use of the 0.5 billion gallon increment of non-cellulosic advanced volume that Congress envisioned would be first used in 2018. The net result of our action for 2018, after deciding that no further reductions beyond those obtained by exercise of the cellulosic waiver authority are appropriate (see Section V), is that the advanced biofuel volume requirement for 2018 is 10 million gallons higher than the advanced biofuel volume requirement for 2017, but the portion of this volume requirement that may be satisfied with non-cellulosic biofuels remains constant.

[114] EPA also considered the availability of advanced carryover RINs in determining whether reduced use of the cellulosic waiver authority would be warranted. For the reasons described in Section II.B, we do not believe this to be the case.

D. Exercise of Cellulosic Waiver Authority for Total Renewable Fuel

As discussed in Section II.A.1, we believe that the cellulosic waiver provision is best interpreted to provide equal reductions in advanced biofuel and total renewable fuel. We have consistently articulated this interpretation.[115] We believe this interpretation is consistent with the statutory language and best effectuates the objectives of the statute. If EPA were to reduce the total renewable fuel volume requirement by a lesser amount than the advanced biofuel volume requirement, we would effectively increase the opportunity for conventional biofuels to participate in the RFS program beyond the implied statutory cap of 15 billion gallons.[116]

Applying an equal reduction of 6.71 billion gallons to both the statutory target for advanced biofuel and the statutory target for total renewable fuel results in a total renewable fuel volume of 19.29 billion gallons as shown in Table IV.A-1.[117] If we were to determine that there is a basis to exercise the general waiver authority or the biomass-based diesel waiver authority, we could provide further reductions to the total renewable fuel volume. However, as described in more detail below in Section V, we believe that there is not sufficient justification for such further reductions in 2018.

[115] For instance, see discussion in the final rules setting the 2013, 2014-2016, and 2017 standards: 78 FR 49809 – 49810, August 15, 2013; 80 FR 77434, December 14, 2015; 81 FR 89752 – 89753, December 12, 2016. We incorporate by reference the rationale for this interpretation that was articulated in these prior rules.

[116] Since the advanced biofuel volume requirement is nested within the total renewable fuel volume requirement, the statutory implied volume for conventional renewable fuel in the statutory tables can be discerned by subtracting the applicable volume of advanced biofuel from that of total renewable fuel. Performing this calculation with respect to the tables in CAA section 211(o)(2)(B) indicates a Congressional expectation that in the time period 2015–2022, advanced biofuel volumes would grow from 5.5 to 21 billion gallons, while the implied volume for conventional renewable fuel would remain constant at 15 billion gallons.

[117] EPA also considered the availability of carryover RINs in determining whether reduced use of the cellulosic waiver authority would be warranted. For the reasons described in Section II.B, we do not believe this to be the case.

E. Impacts of 2018 Standards on Costs

In this section, EPA presents its assessment of the illustrative costs of the final 2018 RFS rule. It is important to note that these illustrative costs do not attempt to capture the full impacts of this final rule. These estimates are provided solely for the purpose of showing how the cost to produce a gallon of a "representative" renewable fuel compares to the cost of petroleum fuel. There are a significant number of caveats that must be considered when interpreting these cost estimates. There are a number of different feedstocks that could be used to produce biofuels, and there is a significant amount of heterogeneity in the costs associated with these different feedstocks and fuels. Some renewable fuels may be cost competitive with the petroleum fuel they replace; however, we do not have cost data on every type of feedstock and every type of fuel. Therefore, we do not attempt to capture this range of potential costs in our illustrative estimates.

The annual standard-setting process encourages consideration of the RFS program on a piecemeal (i.e., year-to-year) basis, which may not reflect the full, long-term costs and benefits of the program. For the purposes of this final rule, other than the estimates of costs of producing a "representative" renewable fuel compared to cost of petroleum fuel, EPA did not quantitatively assess other direct and indirect costs or benefits of changes in renewable fuel volumes. These direct and indirect costs and benefits include infrastructure costs, investment, GHG emissions and air quality impacts, or energy security benefits, which all are to some degree affected by the annual standards. While some of these impacts were analyzed in the 2010 final rulemaking that

established the current RFS program,[118] we have not analyzed these impacts for the 2018 volume requirements. We framed the analyses we have performed for this final rule as "illustrative" so as not to give the impression of comprehensive estimates.

1. Illustrative Cost Savings Associated with Reducing Statutory Cellulosic Volumes

To provide an illustrative estimate of the cost of the 2018 cellulosic biofuel requirements, EPA has compared the 2018 cellulosic biofuel volume requirements to the statutory volume that would be required absent the exercise of our cellulosic waiver authority under CAA section 211(o)(7)(D)(i).[119] As described in other sections of this final rule, we believe that the additional 6.71 billion gallons of cellulosic biofuel envisioned by the statute will not be produced in 2018. Therefore, estimating costs of this volume reduction is inherently challenging. However, we have taken the relatively straightforward methodology of multiplying the per-gallon costs associated with the volumes that would be required under this final rule by the amount of cellulosic renewable fuel that is being waived. This comparison results in a cost savings estimated to be $5.3 – $15.9 billion.

To estimate the overall cost savings from waiving the cellulosic biofuel volumes, EPA has taken the following steps. First, EPA determined the magnitude of the volume reduction of cellulosic biofuel we are establishing in this rule, relative to the statutory volume. In this rule we are reducing the required volume of cellulosic biofuel by 6.71 billion gallons, with

[118] RFS2 Regulatory Impact Analysis (RIA). U.S. EPA 2010, Renewable Fuel Standard Program (RFS2) Regulatory Impact Analysis. EPA-420-R-10-006. February 2010. Docket EPA-HQ-OAR-2009-0472-11332.
[119] EPA is also using its discretion to reduce the advanced biofuel and total renewable fuel requirements using the cellulosic waiver authority. This discretionary action is based partially on the costs of advanced biofuels and provides additional cost savings.

corresponding reductions in the advanced biofuel and total renewable fuel standards. Second, we estimated the per-gallon costs of producing cellulosic ethanol derived from corn kernel fiber that would be expected in complying with the standards. Third, the per-gallon costs of cellulosic biofuel from corn fiber were multiplied by 6.71 billion gallons.

While there may be growth in other cellulosic biofuel sources, for this exercise we believe it is appropriate to use corn kernel fiber as the representative cellulosic biofuel. The majority of liquid cellulosic biofuel in 2018 is expected to be produced using this technology, and application of this technology in the future could result in significant incremental volumes of cellulosic biofuel. In addition, as explained in Section III.D.2, we believe that production of the major alternative cellulosic biofuel – CNG/LNG derived from biogas – is limited to approximately 580 million gallons due to a limitation in the number of vehicles capable of using this form of fuel.[120]

EPA uses a "bottom-up" engineering cost analysis to quantify the costs of producing a gallon of cellulosic ethanol derived from corn kernel fiber. There are multiple processes that could yield cellulosic ethanol from corn kernel fiber. EPA assumes a cellulosic ethanol production process that generates biofuel using distiller's grains, a co-product of generating corn starch ethanol that is commonly dried and sold into the feed market as distillers dried grains with solubles (DDGS), as the renewable biomass feedstock. We assume an enzymatic hydrolysis process with cellulosic enzymes to break down the cellulosic components of the distiller's grains.

[120] To calculate this estimate, EPA used the Natural Gas Vehicle Use from the STEO Custom Table Builder (0.12 billion cubic feet/day in 2018). This projection includes all CNG/LNG used as transportation fuel from both renewable and non-renewable sources. EIA does not project the amount of CNG/LNG from biogas used as transportation fuel. To convert billion cubic feet/day to ethanol-equivalent gallons, EPA used conversion factors of 1020 BTU per cubic foot of natural gas and 77,000 BTU of natural gas per ethanol-equivalent gallon.

This process for generating cellulosic ethanol is similar to approaches currently used by industry to generate cellulosic ethanol at a commercial scale, and we believe these costs estimates are likely representative of the range of different technology options being developed to produce ethanol from corn kernel fiber. We then compare the per-gallon wholesale costs of the cellulosic ethanol to the petroleum fuels that would be replaced.

These cost estimates do not consider taxes, retail margins, or other costs or transfers that occur at or after the point of blending (transfers are payments within society and are not additional costs). We do not attempt to estimate potential cost savings related to avoided infrastructure costs (e.g., the cost savings of not having to provide pumps and storage tanks associated with higher-level ethanol blends). When estimating per-gallon costs, we consider the costs of gasoline on an energy equivalent basis as compared to ethanol, since more ethanol gallons must be consumed to go the same distance as gasoline due to the ethanol's lower energy content.

Table IV.E.1-1 below presents the cost savings associated with this final rule that are estimated using this approach.[121] The statutory cellulosic biofuel target in EISA for 2018 is seven billion gallons (ethanol equivalent). The cellulosic biofuel volume used in this rule to establish the 2018 cellulosic biofuel percentage standard is 288 million gallons. The amount of cellulosic biofuel being waived is 6.71 billion gallons. The per-gallon cost difference estimates for

[121] Details of the data and assumptions used can be found in a Memorandum available in the docket entitled "Cost Impacts of the Final 2018 Annual Renewable Fuel Standards", Memorandum from Michael Shelby, Dallas Burkholder, and Aaron Sobel to EPA Docket EPA-HQ-OAR-2017-0091.

cellulosic ethanol ranges from $0.79 – $2.37 per ethanol equivalent gallon.[122] Given that cellulosic ethanol production is just starting to become commercially available, the cost estimates have a significant range. Multiplying those per-gallon cost differences by the amount of cellulosic biofuel waived in this final rule, 6.71 billion gallons, results in approximately $5.3 – $15.9 billion in cost savings.

Table IV.E-1
Impacts of the Difference between EISA Volumes for the
Cellulosic Biofuel Standard and Final Cellulosic Volume in 2018

	2018 EISA Cellulosic Volume Standard	2018 Final Cellulosic Volume
Cellulosic Volume Required (Million Ethanol-Equivalent Gallons)[123]	7,000	288
Change in Required Cellulosic Biofuels (Million Gallons as Ethanol)	-	(6,712)
Cost Difference Between Cellulosic Corn Fiber-Derived Ethanol and Gasoline Per Gallon ($/EGE) [124]	-	$0.79 - $2.37
Estimated Cost Difference in Meeting Cellulosic Biofuel Volume (Billion $)[125]	-	$(5.3) - $(15.9)

2. Illustrative Cost Analysis of Advanced Biofuels Using 2017 as the Baseline

We recognize that for the purpose of estimating the cost of the 2018 RFS volume requirements that a number of different scenarios using different "baselines" would be of interest

[122] For the purposes of the cost estimates in this section, EPA has not attempted to adjust the price of the petroleum fuels to account for the impact of the RFS program, since the changes in the renewable fuel volume are relatively modest. Rather, we have simply used the wholesale price projections for gasoline and diesel as reported in EIA's October 2017 STEO.
[123] Overall fuel volumes may not match due to rounding.
[124] Approximate costs are rounded to the cents place.
[125] Approximate costs are rounded to the first decimal place.

to stakeholders. Therefore, in this section, we are also providing an illustrative cost analysis that shows the costs of the advanced biofuel standard as compared to those associated with the preceding year's standard, which as discussed in section IV.C. will lead to an increase of 10 million gallons of advanced biofuel in 2018 in comparison to 2017.[126]

EPA is providing an illustrative cost analysis for the increase in the overall advanced biofuel volume of 10 million ethanol equivalent gallons (as compared to 2017 volumes) using four different scenarios, assuming this increase in advanced biofuel volumes is comprised of: (1) cellulosic biofuel from CNG/LNG, (2) cellulosic biofuel from corn kernel fiber, (3) soybean oil BBD, or (4) sugarcane ethanol from Brazil. Showing the illustrative costs of soybean oil BBD and sugarcane ethanol is consistent with the methodology EPA developed for previous rulemakings. However, this discussion should not be interpreted as suggesting that the various renewable fuel types discussed are necessarily available in the marketplace. The availability of different types of renewable fuel is discussed in other sections of this preamble; in this section we assess costs as if the different fuel types are available, without intending to suggest that they are.

In previous annual RFS rules, EPA provided an illustrative cost estimate for the entire change in the total renewable fuel volume standard assuming it was satisfied with conventional (i.e., non-advanced) corn ethanol. As there is no change in the 2018 implied conventional volume relative to the 2017 volume, all of the changes in both the advanced and total renewable fuel volumes are properly attributed to advanced biofuel.

[126] There is also an increase of 10 million gallons in the 2018 applicable volume of total renewable fuel as compared to the 2017 volume. However, in light of the nested standards, that increase is entirely attributable to the increase in the advanced volume.

As described earlier, we are focusing on the wholesale level in our cost scenarios, and do not consider taxes, retail margins, additional infrastructure, or other costs or transfers that occur at or after the point of blending. More background information on this section, including details of the data sources used and assumptions made for each of the scenarios, can be found in a memorandum available in the docket.[127]

Table IV.E.2-1 below presents estimates of per energy-equivalent gallon costs for producing soybean biodiesel, Brazilian sugarcane ethanol, CNG/LNG derived from landfill biogas, and cellulosic ethanol derived from corn fiber relative to the petroleum fuels they replace at the wholesale level. For each of the four scenarios, these per-gallon costs are then multiplied by the 10 million ethanol-equivalent gallon increase in the 2018 advanced standard relative to the previous 2017 standard to obtain an overall cost estimate.

[127] "Cost Impacts of the Final 2018 Annual Renewable Fuel Standards", Memorandum from Michael Shelby, Dallas Burkholder, and Aaron Sobel to EPA Docket EPA-HQ-OAR-2017-0091.

Table IV.E.2-1
Illustrative Costs of the 10 Million Gallon Increase in the Advanced Biofuel Volume Requirement in 2018 Relative to the 2017 Volume Requirement

Soybean Biodiesel Scenario	
Cost Difference Between Soybean Biodiesel and Petroleum Diesel Per Gallon ($/EGE)[128]	$0.89 - $1.22
Annual Change in Overall Costs (Million $)[129]	$9 - $12
Brazilian Sugarcane Ethanol Scenario	
Cost Difference Between Sugarcane Ethanol and Gasoline Per Gallon ($/EGE)	$0.61 - $1.56
Annual Change in Overall Costs (Million $)	$6 - $16
CNG/LNG Derived from Landfill Biogas Scenario	
Cost Difference Between CNG/LNG Derived from Biogas and Natural Gas ($/EGE)[130]	$(0.04) - $0.07
Annual Change in Overall Costs (Million $)	$(0.4) - $0.7
Corn Fiber-Derived Ethanol Scenario	
Cost Difference Between Cellulosic Corn Fiber-Derived Ethanol and Gasoline Per Gallon ($/EGE)	$0.79 - $2.37
Annual Change in Overall Costs (Million $)	$8 - $24

Based on this illustrative analysis of four separate hypothetical scenarios, EPA estimates that the costs for changes in the advanced fuel volumes compared to 2017 could range from $(0.4) – $24 million in 2018. It is important to note that these illustrative costs do not take into consideration the benefits of the program.[131] For the purpose of this annual rulemaking, we have not quantified benefits for the 2018 standards. For example, we do not have a quantified estimate of the GHG or energy security benefits for a single year (e.g., 2018). Also, there are impacts that

[128] Per-gallon cost differences compare illustrative biofuels to their petroleum fuel counterparts on an ethanol gallon equivalent (EGE) basis, accounting for the differences in energy content between fuels, and then multiplied by the total RINs needed to meet the change in volume obligations.
[129] Overall costs may not match per-gallon costs times volumes due to rounding.
[130] CNG/LNG derived from biogas and natural gas costs are compared on an ethanol gallon equivalent (EGE) energy content basis.
[131] The small negative cost estimate is likely a result of the methodology undertaken for these illustrative costs.

are difficult to quantify, such as rural economic development and employment changes from more diversified fuel sources, that are not quantified in this rulemaking.

V. Consideration of Additional Reductions Using Other Waiver Authorities

As discussed in previous sections, we are reducing the statutory volume target for cellulosic biofuel to reflect the projected production volume of that fuel type in 2018, and we are reducing both advanced biofuel and total renewable fuel by the maximum permissible amount authorized under the cellulosic waiver authority in CAA section 211(o)(7)(D)(i).

We have also considered whether it would be appropriate to provide further reductions for these renewable fuel categories pursuant to the general waiver authority in CAA section 211(o)(7)(A), or for these renewable fuel categories and the 2018 BBD using the BBD waiver authority in CAA section 211(o)(7)(E). We have concluded that further reductions in volumes using any of these other waiver authorities are not warranted. We note that in the October 4 Federal Register document we solicited comment on possible new interpretations of the general waiver authority for inadequate domestic supply and severe economic harm and of the biomass-based diesel waiver authority.[132] We find it unnecessary to resolve whether to adopt such interpretations at this point in time because under any approach we would find exercise of these waiver authorities not appropriate based on the record before us.

As a result, we are finalizing advanced biofuel and total renewable fuel volume requirements resulting from the exercise of the cellulosic biofuel waiver authority alone, and we are not modifying the 2018 BBD applicable volume of 2.1 billion gallons established through a prior rulemaking. The implied volume for conventional renewable fuel (calculated by subtracting

[132] 82 FR 46174, October 4, 2017.

the advanced volume from the total volume) will be 15.0 billion gallons, consistent with the statutory target provided in the statute for 2018.

A. Inadequate Domestic Supply

On July 21, 2017, we proposed to reduce the 2018 statutory volume targets for advanced biofuel and total renewable fuel by the maximum permissible amount using the cellulosic waiver authority, and not to reduce these volumes further using other authorities. However, we requested comment on the possible additional use of the general waiver authority or other authorities to provide further reductions in the proposed volume requirements.[133] To evaluate the possibility for using the general waiver authority on the basis of a finding of inadequate domestic supply, we considered the projected volumes of renewable fuel that can be supplied to refiners, importers, and blenders in 2018 from both domestic production and imports. In addition, consistent with the approach identified for consideration in the October 4 document, we considered the projected volumes of renewable fuel that can be supplied to refiners and blenders solely from domestic production. Under either approach we conclude a waiver is not warranted.

In Section III we discussed our projection that 288 million gallons of cellulosic biofuel will be made available in 2018. In Section IV we described our assessment that about 4.40 billion gallons of advanced biofuel would be reasonably attainable in 2018 from both domestic production and imports but that, after considering a number of factors, such as the potential for feedstock/fuel diversions and cost of advanced biofuel, we would exercise our discretion to use

[133] 82 FR 34206 at 34213, October 4, 2017.

the full cellulosic waiver authority to reduce the applicable volume to 4.29 billion gallons.[134] As a result, we do not anticipate an inadequate domestic supply of advanced biofuels to meet a volume requirement of 4.29 billion gallons for advanced biofuel, when both domestic production and imports are considered.

Having determined that there will not be an inadequate domestic supply of advanced biofuel, we further considered whether there may be an inadequate domestic supply to satisfy the portion of the total renewable fuel volume requirement that can be satisfied with non-advanced (conventional) renewable fuel. After application of the full cellulosic waiver authority to the advanced biofuel and total renewable fuel statutory volume targets, the implied statutory volume for conventional renewable fuel is 15.0 billion gallons. The total domestic production capacity of corn ethanol in the U.S. is about 16 billion gallons, and total production of denatured and undenatured ethanol from these facilities in 2016 exceeded 15 billion gallons.[135] As a result, there does not appear to be an inadequate domestic supply of renewable fuel to satisfy the implied 15 billion gallon conventional renewable fuel volume that results from full application of the cellulosic waiver authority to reduce statutory volume targets for advanced biofuel and total renewable fuel. We note that this assessment does not include imported volumes of fuel, such as conventional biodiesel, which could also be used to satisfy the volume requirements. In light of this finding, we conclude that there is not an inadequate domestic supply of volumes than can be

[134] Because EPA's authority under the cellulosic waiver authority affords EPA more discretion to reduce volumes of advanced and total renewable fuel than the general waiver authority under an evaluation of inadequate domestic supply, EPA has evaluated the supply of advanced biofuel for purposes of a determination on the adequacy of supply without consideration of these factors.

[135] "2017 Ethanol Industry Outlook" by the Renewable Fuels Association indicates that 2017 nationwide production capacity is 16.0 bill gal and actual production in 2016 was 15.25 bill gal. "US Fuel Ethanol Plant Production Capacity from EIA," estimates 2017 nameplate production capacity at 15.51 bill gal. In "Ethanol Production in 2016 from EIA," EIA indicates that 2016 actual production was 15.45 bill gal. All documents are available in docket EPA-HQ-OAR-2017-0091.

used to meet the 15 billion gallon implied volume for conventional renewable fuel, and thus that further reductions of the 19.29 billion gallon total renewable fuel volume requirement derived through use of the cellulosic waiver authority would not appropriate when taking into account both domestic production and imports.

In the October 4 document, we discussed comments on the proposal suggesting that EPA should interpret the undefined term ''domestic'' in the phrase ''inadequate domestic supply'' to account for only volumes of renewable fuel that are produced domestically. If EPA were to adopt this interpretation, we could exclude potential imports of renewable fuel in our assessment of domestic supply but, even if we found domestic supply to be inadequate, could take factors such as potential imports and the availability of carryover RINs into account in determining the extent to which we should exercise our discretion to grant a waiver on the basis of inadequate domestic supply.[136] As described in more detail in the RTC document, stakeholders who addressed this issue provided varying perspectives on the extent to which such an interpretation would have a relevant impact on renewable fuel supply.

In light of the fact that the domestic production capacity of conventional biofuel volumes is in excess of 15 billion gallons, whether we were to exclude imported biofuels from our consideration of domestic supply would primarily impact our assessment of the supply of cellulosic biofuel and advanced biofuel volumes, not conventional renewable fuel. With respect to cellulosic biofuel, we note that the vast majority of the supply in 2018 is expected to come from domestic sources. In fact, if EPA excluded consideration of projected cellulosic biofuel

[136] EPA's current regulations provide that qualifying imported biofuel may be used for compliance with the RFS standards; EPA's response to comments on this approach to imported biofuels is provided in the RTC document.

imports, our projection of the available volume of cellulosic biofuel in 2018 would be reduced by only 2 million gallons or less than 1 percent of our projection that 288 million cellulosic biofuel gallons will be made available in 2018. Given the importance that Congress placed on the growth of cellulosic biofuel volumes, our projection that compliance with a 288 million gallon requirement is feasible using RINs generated in 2018, and the availability of carryover cellulosic biofuel RINs and cellulosic waiver credits for additional compliance flexibility, EPA would not exercise its discretion to lower the 288 million gallon projected cellulosic biofuel volume by 2 million gallons even if EPA were to interpret the term "domestic supply" to exclude imported volumes.

With respect to the available supply of advanced biofuel in 2018 in the context of an interpretation of inadequate domestic supply that excludes imports, several commenters noted the data provided by EPA in the October 4 document indicating that a significant portion of the advanced biofuel available in previous years has been from imported biofuels, particularly imported biodiesel and renewable diesel. Some commenters pointed to total domestic production capacity and feedstock availability to argue that domestic producers are capable of compensating for volumes that would not be provided through imports, so that even under an interpretation of "domestic supply" that excluded imports, EPA would not be justified in reducing volumes on the basis of inadequate domestic supply to a level below what was proposed. Others suggested that, without imported volumes, the domestic industry could not ramp up production quickly enough to compensate for the exclusion of imports from our analysis and provide a "domestic supply" equal to the proposed 2018 volume requirements.[137] We

[137] The "domestic supply" of BBD for 2018 would likely be adequate to meet the 2018 standard of 2.1 billion gallons. Domestic production of BBD would need to increase by approximately 300 million gallons as compared to

believe, based on the record before us, that there is uncertainty regarding the capability of the domestic advanced biofuel industry to compensate in 2018 for volumes that would not be provided through imports. Taking this uncertainty into account (including the distinct possibility that the domestic industry could compensate for exclusion of imports), as well as the availability of imported volumes and carryover RINs, EPA would not choose to exercise its authority to grant a waiver on the basis of inadequate domestic supply for 2018 even if it interpreted the term "domestic supply" to exclude imports. In light of this determination, we need not resolve at this time the interpretive issue regarding whether the term "domestic supply" should include consideration of imports.

B. Severe Economic Harm

The proposal and October 4 document requested comment on the possibility of further reductions in the proposed volume requirements, including on the basis of a severe economic harm. We received comments from stakeholders both in support of, and opposed to, further reductions in the advanced biofuel and/or total renewable fuel volume requirements based on a finding of severe economic harm. For instance, several obligated parties stated that the purchase of RINs to comply with the applicable standards represents a significant economic burden to their companies. Some also indicated that they are considering filing for bankruptcy. However, these commenters did not provide sufficient evidence that the purchase of RINs, as opposed to

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the 2016 production. As discussed above, EPA believes this increase is possible and received comments suggesting this volume increase could be met by domestic production. Additionally, carryover RINs and imported volumes could still be used to meet the standard. Therefore, EPA would not chose to exercise its authority to grant a waiver on the basis of inadequate domestic supply for BBD for 2018 even if it interpreted the term "domestic supply" to exclude imports.

other market factors, is responsible for the company's difficult economic circumstances, or why they cannot recoup the cost of RINs through higher prices of their products, or the arguments presented were unconvincing.[138] None of the commenters provided compelling evidence that the proposed RFS volume requirements for 2018 would be likely to cause severe economic harm to a region, State, or the U.S.[139] Further discussion of these comments can be found in the RTC document.

In addition to reviewing comments on the proposed rule and the October 4 document, EPA also reviewed market data from 2017 and previous years to see if there was evidence that the RFS standards are currently causing severe economic harm, or would be likely to cause severe economic harm in 2018. Given that the 2018 volumes generated through the maximum reduction permitted under the cellulosic waiver authority are nearly the same as the volume requirements for 2017, we considered:

1. whether severe economic harm has occurred to date or is likely to occur in 2017, and

2. whether the economic conditions in 2018 might be expected to be substantially different than those in 2017.

[138] We further note that before exercising the general waiver authority on the basis of severe economic harm to a State, a Region or the U.S., EPA would need to consider whether a waiver that would affect the standards applicable to all obligated parties, and would take into account any negative economic impacts to farmers and biofuel producers from a waiver, would be of significant benefit to individual obligated parties facing financial difficulties.
[139] In the October 4 document, we solicited comment on EPA's prior interpretation of the term "severe economic harm." As discussed in the RTC document accompanying this action, we believe that the evidence in the record would be insufficient to support a finding of severe economic harm under any reasonable interpretation of the phrase advanced by commenters, so do not find it necessary to assess changes to our interpretation of the phrase at this time.

To determine whether severe economic harm has occurred to date or is likely to occur in in 2017, we investigated several possible indicators. These included RIN generation for 2017 relative to 2016, refinery closures, retail fuel prices, and corn and soybean prices. Based on our investigation, we do not believe that severe economic harm has occurred thus far in 2017 to any State, region, or the U.S. as a result of the 2017 standards, or is likely occur by the end of 2017. Details of this investigation can be found in a memorandum to the docket.[140]

To determine whether the economic conditions in 2018 might be expected to be substantially different than those in 2017 in ways that could affect the economic impact of compliance with the RFS program, we investigated projections of two primary drivers of the cost of compliance: crop-based feedstock futures prices, and projected gasoline demand. We also investigated the potential market impacts of the final 2018 standards, most specifically in terms of ethanol and biodiesel consumption.[141]

Based on the record before us, we do not believe that there is sufficient evidence to conclude that severe economic harm is occurring currently in 2017 in any State, region, or the United States, and we do not believe that market conditions in 2018 are likely to cause compliance with the applicable standards to be more economically challenging than it is in 2017. Given that the 2018 standards are very similar to the 2017 standards, then, we do not believe that further reductions in the 2018 volume requirements on the basis of severe economic harm are warranted.

[140] "Assessment of waivers for severe economic harm or BBD prices for 2018," memorandum from David Korotney to docket EPA-HQ-OAR-2017-0091.
[141] "Market impacts of biofuels," memorandum from David Korotney to docket EPA-HQ-OAR-2017-0091.

C. Severe Environmental Harm

EPA received comments in response to the proposal asserting that there are negative environmental impacts that may be associated with the RFS program. A significant portion of these concerns center on feedstock production. Although we are authorized to reduce the statutory volume targets on the basis of a finding that the requirements would "severely harm the … environment of a State, region, or the United States," commenters have not presented evidence sufficient to support a determination to make a reduction on this basis for 2018. EPA is not making reductions on this basis for 2018. EPA's response to comments related to perceived environmental harms of the RFS program is set forth in the RTC document accompanying this rule.

D. Biomass-Based Diesel Waiver Authority

The BBD waiver authority in CAA section 211(o)(7)(E)(ii) provides that if EPA determines that there is a significant renewable feedstock disruption or other market circumstance that would make the price of BBD increase significantly, then EPA shall, in consultation with the Secretary of Energy and the Secretary of Agriculture, issue an order to reduce, for up to a 60-day period, the annual volume requirement for BBD by an appropriate quantity that does not exceed 15 percent. If EPA reduces the annual volume requirement for BBD using this waiver authority, we may also reduce the applicable volume of advanced biofuel

and total renewable fuel by an equal or lesser volume than the reduction in BBD. In the October 4 document we requested comment on the expected impact on the price of BBD of the expiration of the biodiesel blenders tax credit, proposed import duties on biodiesel from Argentina and Indonesia, or any other factors. We further requested comment on whether any expected impacts should be considered significant for the purposes of the BBD waiver authority.

To investigate whether a reduction in the 2018 BBD volume requirement would be warranted under CAA section 211(o)(7)(E)(ii), we considered current and historical prices of unblended biodiesel (B100), the price of blended biodiesel (in particular, B20), and BBD (D4) RIN prices. The results of this investigation are described in a memorandum to the docket.[142] EPA discussed in the October 4 document the fact that the Department of Commerce had imposed preliminary tariffs on biodiesel imported from Argentina and Indonesia, and that such tariffs could impact the price of BBD. However, these tariffs have not yet been finalized, nor has EPA observed any significant impact of the announcement of the preliminary tariffs on the price of biomass-based diesel.[143]

Based on the information before us, including the results of our investigation and information and comments submitted in response to the October 4 document, we have concluded that there is not sufficient evidence of a significant increase to the price of BBD due to feedstock disruption or other relevant market circumstances to justify reductions to the 2018 BBD volume requirement using the biomass-based diesel waiver authority.

[142] "Assessment of waivers for severe economic harm or BBD prices for 2018," memorandum from David Korotney to docket EPA-HQ-OAR-2017-0091.
[143] "Assessment of waivers for severe economic harm or BBD prices for 2018," memorandum from David Korotney to docket EPA-HQ-OAR-2017-0091.

VI. Final Biomass-Based Diesel Volume for 2019

In this section we discuss the BBD applicable volume for 2019. We are establishing this volume in advance of those for other renewable fuel categories in light of the statutory requirement in CAA section 211(o)(2)(B)(ii) to establish the applicable volume of BBD for years after 2012 no later than 14 months before the applicable volume will apply. We are not at this time establishing the BBD percentage standards that would apply to obligated parties in 2019 but intend to do so in late 2018, after receiving EIA's estimate of gasoline and diesel consumption for 2019. Although the BBD applicable volume sets a floor for required BBD use, because the BBD volume requirement is nested within both the advanced biofuel and the total renewable fuel volume requirements, any BBD produced beyond the mandated 2019 BBD volume can be used to satisfy both of these other applicable volume requirements.

A. Statutory Requirements

The statute establishes applicable volume targets for years through 2022 for cellulosic biofuel, advanced biofuel, and total renewable fuel. For BBD, applicable volume targets are specified in the statute only through 2012. For years after those for which volumes are specified in the statute, EPA is required under CAA section 211(o)(2)(B)(ii) to determine the applicable volume of BBD, in coordination with the Secretary of Energy and the Secretary of Agriculture, based on a review of the implementation of the program during calendar years for which the statute specifies the volumes and an analysis of the following factors:

1. The impact of the production and use of renewable fuels on the environment, including on air quality, climate change, conversion of wetlands, ecosystems, wildlife habitat, water quality, and water supply;
2. The impact of renewable fuels on the energy security of the United States;
3. The expected annual rate of future commercial production of renewable fuels, including advanced biofuels in each category (cellulosic biofuel and BBD);
4. The impact of renewable fuels on the infrastructure of the United States, including deliverability of materials, goods, and products other than renewable fuel, and the sufficiency of infrastructure to deliver and use renewable fuel;
5. The impact of the use of renewable fuels on the cost to consumers of transportation fuel and on the cost to transport goods; and
6. The impact of the use of renewable fuels on other factors, including job creation, the price and supply of agricultural commodities, rural economic development, and food prices.

The statute also specifies that the volume requirement for BBD cannot be less than the applicable volume specified in the statute for calendar year 2012, which is 1.0 billion gallons. The statute does not, however, establish any other numeric criteria, or provide any guidance on how the EPA should weigh the importance of the often competing factors, and the overarching goals of the statute when the EPA sets the applicable volumes of BBD in years after those for which the statute specifies such volumes. In the period 2013-2022, the statute specifies increasing applicable volumes of cellulosic biofuel, advanced biofuel, and total renewable fuel,

but provides no guidance, beyond the 1.0 billion gallon minimum, on the level at which BBD volumes should be set.

In establishing the BBD and cellulosic standards as nested within the advanced biofuel standard, Congress clearly intended to support development of BBD and especially cellulosic biofuels, while also providing an incentive for the growth of other non-specified types of advanced biofuels. That is, the advanced biofuel standard provides an opportunity for other advanced biofuels (advanced biofuels that do not qualify as cellulosic biofuel or BBD) to compete with cellulosic biofuel and BBD to satisfy the advanced biofuel standard after the cellulosic biofuel and BBD standards have been met.

B. Determination of the 2019 Applicable Volume of Biomass-Based Diesel

One of the primary considerations in determining the BBD volume for 2019 is a review of the implementation of the program to date, as it affects BBD. This review is required by the CAA, and also provides insight into the capabilities of the industry to produce, import, export, and distribute BBD. It also helps us to understand what factors, beyond the BBD standard, may incentivize the production and import of BBD. The number of BBD RINs generated, along with the number of RINs retired due to export or for reasons other than compliance with the annual BBD standards from 2011-2018 are shown in Table VI.B.1-1 below.

Table VI.B.1-1
Biomass-Based (D4) RIN Generation and Standards in 2011-2018 (million RINs or gallons)[144]

	BBD RINs Generated	Exported BBD (RINs)	BBD RINs Retired, Non-Compliance Reasons	Available BBD RINs[a]	BBD Standard (Gallons)	BBD Standard (RINs)
2011	1,692	72	98	1,522	800	1,200
2012	1,737	102	90	1,545	1,000	1,500
2013	2,739	124	101	2,514	1,280	1,920
2014	2,710	134	92	2,484	1,630	2,490[b]
2015	2,796	145	32	2,619	1,730	2,655[b]
2016	4,008	203	96	3,709	1,900	2,850
2017	N/A	N/A	N/A	N/A	2,000	3,000
2018	N/A	N/A	N/A	N/A	2,100	3,150

[a] Available BBD RINs may not be exactly equal to BBD RINs Generated minus Exported RINs and BBD RINs Retired, Non-Compliance Reasons, due to rounding.
[b] Each gallon of biodiesel qualifies for 1.5 RINs due to its higher energy content per gallon than ethanol. Renewable diesel qualifies for between 1.5 and 1.7 RINs per gallon, but generally has an equivalence value of 1.7. In 2014 and 2015 the number of RINs in the BBD Standard column is not exactly equal to 1.5 times the BBD volume standard as these standards were established based on actual RIN generation data for 2014 and a combination of actual data and a projection of RIN generation for the last three months of the year for 2015. Some of the volume used to meet the BBD standard was renewable diesel.

In reviewing historical BBD RIN generation and use, we see that the number of RINs available for compliance purposes exceeded the volume required to meet the BBD standard in 2011, 2012, 2013, and 2016. Additional production and use of biodiesel was likely driven by a number of factors, including demand to satisfy the advanced biofuel and total renewable fuels standards, the biodiesel tax credit,[145] and favorable blending economics. The number of RINs available in 2014 and 2015 was approximately equal to the number required for compliance in those years, as the standards for these years were finalized at the end of November 2015 and EPA's intent at that time was to set the standards for 2014 and 2015 to reflect actual BBD use. In 2016, with RFS standards established prior to the beginning of the year and the blenders tax

[144] Available BBD RINs Generated, Exported BBD RINs, and BBD RINs Retired for Non-Compliance Reasons information from EMTS.
[145] The biodiesel tax credit was reauthorized in January 2013. It applied retroactively for 2012 and for the remainder of 2013. It was once again extended in December 2014 and applied retroactively to all of 2014 as well as to the remaining weeks of 2014. In December 2015 the biodiesel tax credit was authorized and applied retroactively for all of 2015 as well as through the end of 2016.

credit in place, available BBD RINs exceeded the volume required by the BBD standard by 859 million RINs (30 percent). This indicates that in appropriate circumstances there is demand for BBD beyond the required volume of BBD.

The prices paid for advanced biofuel and BBD RINs beginning in early 2013 through the end of 2016 also support the conclusion that advanced biofuel and/or total renewable fuel standards provide a sufficient incentive for additional biodiesel volume beyond what is required by the BBD standard. Because the BBD standard is nested within the advanced biofuel and total renewable fuel standards, and therefore can help to satisfy three RVOs, we would expect the price of BBD RINs to exceed that of advanced and conventional renewable RINs.[146] If, however, BBD RINs are being used by obligated parties to satisfy their advanced biofuel obligations, above and beyond the BBD standard, we would expect the prices of advanced biofuel and BBD RINs to converge.[147] Further, if BBD RINs are being used (or are expected to be used) to satisfy obligated parties' total renewable fuel obligation, above and beyond their BBD and advanced biofuel requirements we would expect the price for all three RIN types to converge.

When examining RIN price data from 2012 through September 2017, shown in Figure VI.B.2-1 below, we see that beginning in early 2013 and through September 2017 the advanced RIN price and BBD RIN prices were approximately equal. Similarly, from early 2013 through

[146] This is because when an obligated party retires a BBD RIN to help satisfy their BBD obligation, the nested nature of the BBD standard means that this RIN also counts towards satisfying their advanced and total renewable fuel obligations. Advanced RINs count towards both the advanced and total renewable fuel obligations, while conventional RINs (D6) count towards only the total renewable fuel obligation.

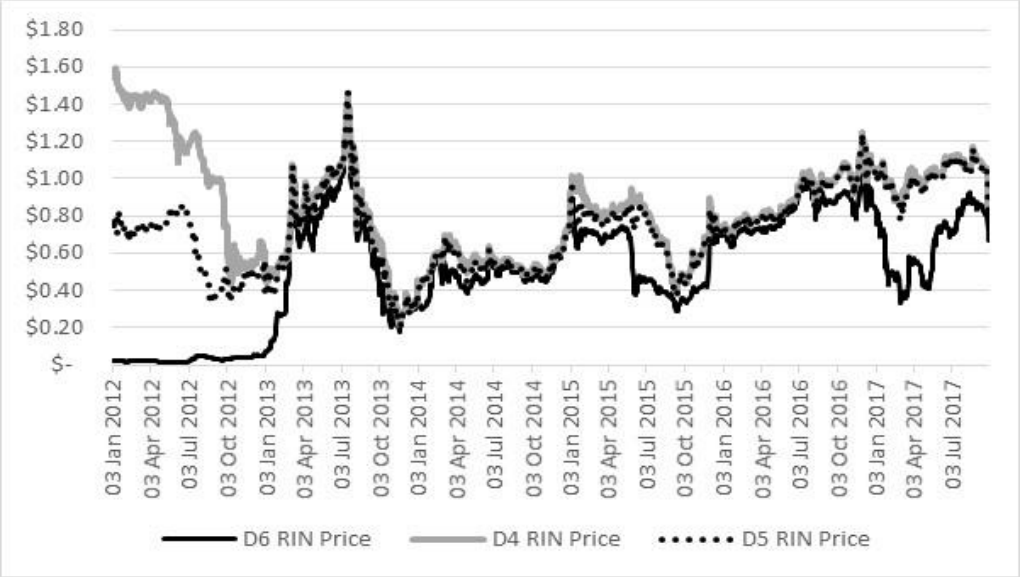
[147] We would still expect D4 RINs to be valued at a slight premium to D5 and D6 RINs in this case (and D5 RINs at a slight premium to D6 RINs) to reflect the greater flexibility of the D4 RINs to be used towards the BBD, advanced biofuel, and total renewable fuel standard. This pricing has been observed over the past several years.

late 2016 the conventional renewable fuel and BBD RIN prices were approximately equal. This suggests that the advanced biofuel standard and/or total renewable fuel standard are capable of incentivizing increased BBD volumes beyond the BBD standard, and operated in this manner starting in 2013.[148] While final standards were not in place throughout 2014 and most of 2015, EPA had issued proposed rules for both of these years. In each year, the market response was to supply volumes of BBD that exceeded the proposed BBD standard in order to help satisfy the proposed advanced and total biofuel standards.[149] Additionally, the RIN prices in these years strongly suggests that obligated parties and other market participants anticipated the need for BBD RINs to meet their advanced and total biofuel obligations, and responded by purchasing advanced biofuel and BBD RINs at approximately equal prices. We do note, however, that in 2012 the BBD RIN price was significantly higher than both the advanced biofuel and conventional renewable fuel RIN prices. In 2012 the E10 blendwall had not yet been reached, and it was likely more cost effective for most obligated parties to satisfy the portion of the advanced biofuel requirement that exceeded the BBD and cellulosic biofuel requirements with advanced ethanol.

[148] Although we did not issue a rule establishing the final 2013 standards until August of 2013, we believe that the market anticipated the final standards, based on EPA's July 2011 proposal and the volume targets for advanced and total renewable fuel established in the statute. (76 FR 38844, 38843, July 1, 2011).

[149] EPA proposed a BBD standard of 1.28 billion gallons (1.92 billion RINs) for 2014 in our November 2013 proposed rule. The number of BBD RINs available in 2014 was 2.67 billion. EPA proposed a BBD standard of 1.70 billion gallons (2.55 billion RINs) for 2015 in our June 2015 proposed rule. The number of BBD RINs available in 2015 was 2.92 billion.

Figure VI.B.2-1
D4, D5, and D6 RIN Prices (January 2012 – September 2017)



RIN Price Source: Argus Media Group

In raising the 2013 BBD volume above the 1 billion gallon minimum mandated by Congress, the EPA sought to "create greater certainty for both producers of BBD and obligated parties" while also acknowledging that, "the potential for somewhat increased costs is appropriate in light of the additional certainty of GHG reductions and enhanced energy security provided by the advanced biofuel volume requirement of 2.75 billion gallons." [150] Unknown at that time was the degree to which the required volumes of advanced biofuel and total renewable fuel could incentivize volumes of BBD that exceeded the BBD standard. In 2012 the available supply of BBD RINs exceeded the required volume of BBD by a very small margin (1,545 million BBD RINs were made available for compliance towards meeting the BBD requirement of 1,500 million BBD RINs). The remainder of the 2.0 billion-gallon advanced biofuel requirement was satisfied with advanced ethanol, which was largely imported from Brazil.[151]

[150] 77 FR 59458, 59462 (September 27, 2012).
[151] 594 million advanced ethanol RINs were generated in in 2012.

From 2012 to 2013 the statutory advanced biofuel requirement increased by 750 million gallons. If EPA had not increased the required volume of BBD for 2013, and the advanced biofuel standard had proved insufficient to increase the supply of BBD beyond the statutory minimum of 1.0 billion gallons, an additional 750 million gallons of non-BBD advanced biofuels beyond the BBD standard would have been needed to meet the advanced biofuel volume requirement.

The only advanced biofuel other than BBD available in appreciable quantities in 2012 and 2013 was advanced ethanol, the vast majority of which was imported sugarcane ethanol. EPA had significant concerns as to whether or not the supply of advanced ethanol could increase this significantly (750 million gallons) in a single year. These concerns were heightened by the approaching E10 blendwall, which increased the challenges associated with supplying increasing volumes of ethanol to the U.S. If neither BBD volumes nor advanced ethanol volumes increased sufficiently, EPA was concerned that some obligated parties might be unable to acquire the advanced biofuel RINs necessary to demonstrate compliance with their RVOs in 2013. Therefore, as discussed above, EPA increased the volume requirement for BBD in 2013 to help create greater certainty for BBD producers (by ensuring demand for their product above the 1.0 billion gallon statutory minimum) and obligated parties (by ensuring that sufficient RINs would be available to satisfy their advanced biofuel RVOs). Since 2013, however, EPA has gained significant experience implementing the RFS program. As discussed above, RIN generation data has consistently demonstrated that the advanced biofuel volume requirement, and to a lesser degree the total renewable fuel volume requirement, are capable of incentivizing the supply of BBD above and beyond the BBD volume requirement.

Finally, we note that the BBD industry in the U.S and abroad has matured since EPA first increased the required volume of BBD beyond the statutory minimum in 2013. To assess the maturity of the biodiesel industry, EPA compared information on BBD RIN generation by company from 2012 and 2016 (the most recent year for which complete RIN generation is available). In 2012, the annual average RIN generation per company producing BBD was about 11 million RINs (about 7.3 million gallons) with approximately 50 percent of companies producing less the 1 million gallons of BBD a year. The agency heard from multiple commenters during the 2012 and 2013 rulemakings that higher volume requirements for BBD would provide greater certainty for the emerging BBD industry and encourage further investment. Since that time, the BBD industry has matured in a number of critical areas, including growth in the size of companies, the consolidation of the industry, and more stable funding and access to capital. In 2012, the BBD industry was characterized by smaller companies with dispersed market share. By 2016, the average BBD RIN generation per company had climbed to almost 33 million RINs (22 million gallons) annually, a 3-fold increase. Only 27 percent of the companies produced less than 1 million gallons of BBD.

We are conscious of public comments claiming that BBD volume requirements that are a significant portion of the advanced volume requirements effectively dis-incentivize the future development of other promising advanced biofuel pathways. A variety of different types of advanced biofuels, rather than a single type such as BBD, would positively impact energy security (e.g., by increasing the diversity of feedstock sources used to make biofuels, thereby reducing the impacts associated with a shortfall in a particular type of feedstock) and increase the

likelihood of the development of lower cost advanced biofuels that meet the same GHG reduction threshold as BBD.[152]

With the considerations discussed above and in Section IV.B.2 in mind, as well as our analysis of the factors specified in the statute, we are setting the applicable volume of BBD at 2.1 billion gallons for 2019. We believe this volume sets the appropriate floor for BBD, and that the volume of advanced biodiesel and renewable diesel actually used in 2019 will be driven by the level of the advanced biofuel and total renewable fuel standards that the Agency will establish for 2019. We have considered the required statutory factors in reaching our decision, as summarized in Section C, below, and in a memorandum to the docket (the "2019 BBD docket memorandum").[153]

We believe our final 2019 BBD volume requirement strikes the appropriate balance between providing a market environment where the development of other advanced biofuels is incentivized, while also maintaining support for the BBD industry. Based on our review of the data, and the nested nature of the BBD standard within the advanced standard, we conclude that the advance standard continues to drive the ultimate volume of BBD supplied. Given the success of the industry in the past few years, as well as the substantial increases in the BBD volume being driven by the advanced standard, we have determined that a volume requirement greater than 2.1 billion gallons for BBD in 2019 is not necessary to provide support for the BBD industry. Setting the BBD standard in this manner continues to allow a considerable portion of

[152] All types of advanced biofuel, including BBD, must achieve lifecycle GHG reductions of at least 50 percent.
[153] "Memorandum to docket: Draft Statutory Factors Assessment for the 2019 Biomass-Based Diesel (BBD) Applicable Volumes." See Docket EPA-HQ-OAR-2017-0091.

the advanced biofuel volume to be satisfied by either additional gallons of BBD or by other unspecified and potentially less costly types of qualifying advanced biofuels.

C. Consideration of Statutory Factors *set forth in CAA Section 211(o)(2)(B)(ii)(I)-(VI) for 2019*

As noted earlier in Section IV.B., the BBD volume requirement is nested within the advanced biofuel requirement and the advanced biofuel requirement is, in turn, nested within the total renewable fuel volume requirement. This means that any BBD produced beyond the mandated BBD volume can be used to satisfy both these other applicable volume requirements. The result is that in considering the statutory factors we must consider the potential impacts of increasing or decreasing BBD in comparison to other advanced biofuels.[154] For a given advanced biofuel standard, greater or lesser BBD volume requirements do not change the amount of advanced biofuel used to displace petroleum fuels; rather, increasing the BBD requirement may result in the displacement of other types of advanced biofuels that could have been used to meet the advanced biofuels volume requirement. While in recent years EPA has annually increased the BBD volume requirement, EPA is, as we proposed, maintaining the 2.1 billion gallon standard for 2019 based on our review of the statutory factors and the considerations noted above and in the 2018 BBD Docket Memorandum. In particular, as EPA noted above in section VI.B., the BBD industry is more mature, and we have increased BBD volumes

[154] While excess BBD production could also displace conventional renewable fuel under the total renewable standard, as long as the BBD applicable volume is significantly lower than the advanced biofuel applicable volume our action in setting the BBD applicable volume is not expected to displace conventional renewable fuel under the total renewable standard, but rather other advanced biofuels.

significantly in recent years so that the BBD standard is now over twice the minimum statutory volume required in CAA section 211(o)(2)(B)(i). In these circumstances we do not believe that an additional increase in the required BBD required volume is necessary to support the industry in 2019.

Consistent with our approach in setting the final BBD volume requirement for 2018, EPA's primary assessment of the statutory factors for the 2019 BBD applicable volume is that because the BBD requirement is nested within the advanced biofuel volume requirement, we expect that the 2019 advanced volume requirement, when set next year, will determine the level of BBD production and imports that occur in 2019.[155] Therefore, EPA continues to believe that the same overall volume of BBD would likely be supplied in 2019 even if we were to mandate a somewhat lower or higher BBD volume for 2019 in this final rule. Thus, we do not expect our 2019 BBD volume requirement to result in a difference in the factors we consider pursuant to CAA section 211(o)(2)(B)(ii)(I)-(VI).

As an additional supplementary assessment, we have considered the potential impacts of selecting an applicable volume of BBD other than 2.1 billion gallons in 2019. Setting a requirement higher or lower than 2.1 billion gallons in 2019 would only be expected to impact BBD volumes on the margin, protecting to a greater or lesser degree BBD from competition with other potential advanced biofuels. In this supplementary assessment we have considered all of the statutory factors found in CAA section 211(2)(B)(ii), and as described in the 2019 BBD

[155] Even though we are not setting the 2019 advanced biofuel volume requirement as part of this rulemaking, we expect that the 2019 advanced volume requirement will be considerably higher than the 2019 BBD requirement, consistent with past practice and, therefore, that the BBD volume requirement for 2019 would not be expected to impact the volume of BBD that is actually produced and imported during the 2019-time period.

docket memorandum, our assessment does not appear, based on available information, to provide a reasonable basis for setting a higher or lower volume requirement for BBD than 2.1 billion gallons for 2019.

Overall and as described in the 2019 BBD docket memorandum, we have determined that both the primary assessment and the supplemental assessment of the statutory factors specified in CAA section 211(o)(2)(B)(ii)(I)-(VI) for the year 2019 does not provide significant support for setting the BBD standard at a level higher or lower than 2.1 billion gallons in 2019.

VII. Percentage Standards for 2018

The renewable fuel standards are expressed as volume percentages and are used by each obligated party to determine their Renewable Volume Obligations (RVOs). Since there are four separate standards under the RFS program, there are likewise four separate RVOs applicable to each obligated party. Each standard applies to the sum of all non-renewable gasoline and diesel produced or imported. The percentage standards are set so that if every obligated party meets the percentages by acquiring and retiring an appropriate number of RINs, then the amount of renewable fuel, cellulosic biofuel, BBD, and advanced biofuel used will meet the applicable volume requirements on a nationwide basis.

Sections III through V provide our rationale and basis for the volume requirements for 2018.[156] The volumes used to determine the percentage standards are shown in Table VII-1.

Table VII-1
Volumes for Use in Setting the 2018 Applicable Percentage Standards (billion gallons)

Cellulosic biofuel	0.288
Biomass-based diesel[a]	2.10
Advanced biofuel	4.29
Renewable fuel	19.29

[a] Represents physical volume.

For the purposes of converting these volumes into percentage standards, we generally use two decimal places to be consistent with the volume targets as given in the statute, and similarly two decimal places in the percentage standards. However, for cellulosic biofuel we use three decimal places in both the volume requirement and percentage standards to more precisely

[156] The 2018 volume requirement for BBD was established in the 2017 final rule.

capture the smaller volume projections and the unique methodology that in some cases results in estimates of only a few million gallons for a single producer.

A. Calculation of Percentage Standards

To calculate the percentage standards, we are following the same methodology for 2018 as we have in all prior years. The formulas used to calculate the percentage standards applicable to producers and importers of gasoline and diesel are provided in 40 CFR 80.1405. The formulas rely on estimates of the volumes of gasoline and diesel fuel, for both highway and nonroad uses, which are projected to be used in the year in which the standards will apply. The projected gasoline and diesel volumes are provided by EIA, and include projections of ethanol and biodiesel used in transportation fuel. Since the percentage standards apply only to the non-renewable gasoline and diesel produced or imported, the volumes of ethanol and biodiesel are subtracted out of the EIA projections of gasoline and diesel.

Transportation fuels other than gasoline or diesel, such as natural gas, propane, and electricity from fossil fuels, are not currently subject to the standards, and volumes of such fuels are not used in calculating the annual percentage standards. Since under the regulations the standards apply only to producers and importers of gasoline and diesel, these are the transportation fuels used to set the percentage standards, as well as to determine the annual volume obligations of an individual gasoline or diesel producer or importer.

As specified in the RFS2 final rule,[157] the percentage standards are based on energy-equivalent gallons of renewable fuel, with the cellulosic biofuel, advanced biofuel, and total renewable fuel standards based on ethanol equivalence and the BBD standard based on biodiesel equivalence. However, all RIN generation is based on ethanol-equivalence. For example, the RFS regulations provide that production or import of a gallon of qualifying biodiesel will lead to the generation of 1.5 RINs. The formula specified in the regulations for calculation of the BBD percentage standard is based on biodiesel-equivalence, and thus assumes that all BBD used to satisfy the BBD standard is biodiesel and requires that the applicable volume requirement be multiplied by 1.5. However, BBD often contains some renewable diesel, and a gallon of renewable diesel typically generates 1.7 RINs.[158] In addition, there is often some renewable diesel in the conventional renewable fuel pool. As a result, the actual number of RINs generated by biodiesel and renewable diesel is used in the context of our assessing reasonably attainable volumes for purposes of deriving the applicable volume requirements and associated percentage standards for advanced biofuel and total renewable fuel, and likewise in obligated parties' determination of compliance with any of the applicable standards. While there is a difference in the treatment of biodiesel and renewable diesel in the context of determining the percentage standard for BBD versus determining the percentage standard for advanced biofuel and total renewable fuel, it is not a significant one given our approach to determining the BBD volume requirement. Our intent in setting the BBD applicable volume is to provide a level of guaranteed volume for BBD, but as described in Section VI.B, we do not expect the BBD standard to be binding. That is, we expect that actual supply of BBD, as well as supply of conventional

[157] See 75 FR 14670 (March 26, 2010).
[158] Although in some cases a gallon of renewable diesel generates either 1.5 or 1.6 RINs.

biodiesel and renewable diesel, will be driven by the advanced biofuel and total renewable fuel standards.

B. Small Refineries and Small Refiners

In CAA section 211(o)(9), enacted as part of the Energy Policy Act of 2005, and amended by the Energy Independence and Security Act of 2007, Congress provided a temporary exemption to small refineries[159] through December 31, 2010. Congress provided that small refineries could receive a temporary extension of the exemption beyond 2010 based either on the results of a required DOE study, or based on an EPA determination of "disproportionate economic hardship" on a case-by-case basis in response to small refinery petitions. In reviewing petitions, EPA, in consultation with the Department of Energy, evaluates whether the small refinery has demonstrated either disproportionate impacts or viability impairment, and may grant refineries exemptions upon demonstration of either criterion.

EPA has granted exemptions pursuant to this process in the past. However, at this time no exemptions have been approved for 2018, and therefore we have calculated the percentage standards for 2018 without any adjustment for exempted volumes. EPA is maintaining its approach that any exemptions for 2018 that are granted after the final rule is released will not be

[159] A small refiner that meets the requirements of 40 CFR 80.1442 may also be eligible for an exemption.

reflected in the percentage standards that apply to all gasoline and diesel produced or imported in 2018.[160]

C. Final Standards

The formulas in 40 CFR 80.1405 for the calculation of the percentage standards require the specification of a total of 14 variables covering factors such as the renewable fuel volume requirements, projected gasoline and diesel demand for all states and territories where the RFS program applies, renewable fuels projected by EIA to be included in the gasoline and diesel demand, and exemptions for small refineries. The values of all the variables used for this final rule are shown in Table VII.C-1.[161]

[160] Further discussion of this issue can be found in the Response to Comments document in the docket for this action.

[161] To determine the 49-state values for gasoline and diesel, the amounts of these fuels used in Alaska is subtracted from the totals provided by DOE because petroleum based fuels used in Alaska do not incur RFS obligations. The Alaska fractions are determined from the June 29, 2016 EIA State Energy Data System (SEDS), Energy Consumption Estimates.

Table VII.C-1
Values for Terms in Calculation of the 2018 Standards[162] (billion gallons)

Term	Description	Value
RFV_{CB}	Required volume of cellulosic biofuel	0.288
RFV_{BBD}	Required volume of biomass-based diesel	2.10
RFV_{AB}	Required volume of advanced biofuel	4.29
RFV_{RF}	Required volume of renewable fuel	19.29
G	Projected volume of gasoline	143.22
D	Projected volume of diesel	54.76
RG	Projected volume of renewables in gasoline	14.71
RD	Projected volume of renewables in diesel	2.53
GS	Projected volume of gasoline for opt-in areas	0
RGS	Projected volume of renewables in gasoline for opt-in areas	0
DS	Projected volume of diesel for opt-in areas	0
RDS	Projected volume of renewables in diesel for opt-in areas	0
GE	Projected volume of gasoline for exempt small refineries	0.00
DE	Projected volume of diesel for exempt small refineries	0.00

Projected volumes of gasoline and diesel, and the renewable fuels contained within them, were provided by EIA on October 11, 2017, as required in the statute at CAA section 211(o)(3)(A).

[162] See "Calculation of final % standards for 2018" in docket EPA-HQ-OAR-2017-0091.

Using the volumes shown in Table VII.C-1, we have calculated the percentage standards for 2018 as shown in Table VII.C-2.

Table VII.C-2
Final Percentage Standards for 2018

Cellulosic biofuel	0.159 %
Biomass-based diesel	1.74 %
Advanced biofuel	2.37 %
Renewable fuel	10.67 %

VIII. Administrative Actions

A. Assessment of the Domestic Aggregate Compliance Approach

The RFS regulations specify an "aggregate compliance" approach for demonstrating that planted crops and crop residue from the U.S. complies with the "renewable biomass" requirements that address lands from which qualifying feedstocks may be harvested.[163] In the 2010 RFS2 rulemaking, EPA established a baseline number of acres for U.S. agricultural land in 2007 (the year of EISA enactment) and determined that as long as this baseline number of acres was not exceeded, it was unlikely that new land outside of the 2007 baseline would be devoted to crop production based on historical trends and economic considerations. The regulations specify, therefore, that renewable fuel producers using planted crops or crop residue from the U.S. as feedstock in renewable fuel production need not undertake individual recordkeeping and reporting related to documenting that their feedstocks come from qualifying lands, unless EPA determines through one of its annual evaluations that the 2007 baseline acreage of 402 million acres agricultural land has been exceeded.

In the 2010 RFS2 rulemaking, EPA committed to make an annual finding concerning whether the 2007 baseline amount of U.S. agricultural land has been exceeded in a given year. If the baseline is found to have been exceeded, then producers using U.S. planted crops and crop residue as feedstocks for renewable fuel production would be required to comply with individual recordkeeping and reporting requirements to verify that their feedstocks are renewable biomass.

[163] 40 CFR 80.1454(g).

The Aggregate Compliance methodology provided for the exclusion of acreage enrolled in the Grassland Reserve Program (GRP) and the Wetlands Reserve Program (WRP) from the estimated total U.S. agricultural land. However, the 2014 Farm Bill terminated the GRP and WRP as of 2013 and USDA established the Agriculture Conservation Easement Program (ACEP) with wetlands and land easement components. The ACEP is a voluntary program that provides financial and technical assistance to help conserve agricultural lands and wetlands and their related benefits. Under the Agricultural Land Easements (ACEP-ALE) component, USDA helps Indian tribes, state and local governments, and non-governmental organizations protect working agricultural lands and limit non-agricultural uses of the land. Under the Wetlands Reserve Easements (ACEP-WRE) component, USDA helps to restore, protect and enhance enrolled wetlands. The WRP was a voluntary program that offered landowners the opportunity to protect, restore, and enhance wetlands on their property. The GRP was a voluntary conservation program that emphasized support for working grazing operations, enhancement of plant and animal biodiversity, and protection of grassland under threat of conversion to other uses.

USDA and EPA concur that the ACEP-WRE and ACEP-ALE represent a continuation in basic objectives and goals of the original WRP and GRP. Therefore, in preparing this year's assessment of the total U.S. acres of agricultural land, the acreage enrolled in the ACEP-WRE and ACEP-ALE was excluded.

Based on data provided by the USDA Farm Service Agency (FSA) and Natural Resources Conservation Service (NRCS), we have estimated that U.S. agricultural land reached

approximately 376 million acres in 2017, and thus did not exceed the 2007 baseline acreage. This acreage estimate is based on the same methodology used to set the 2007 baseline acreage for U.S. agricultural land in the RFS2 final rulemaking, with the GRP and WRP substitution as noted above. Specifically, we started with FSA crop history data for 2017, from which we derived a total estimated acreage of 379,220,752 acres. We then subtracted the ACEP-ALE and ACEP-WRE enrolled areas by the end of Fiscal Year 2017, 2,777,887 acres, to yield an estimate of 376,442,865 acres or approximately 376 million acres of U.S. agricultural land in 2017. The USDA data used to make this derivation can be found in the docket to this rule.[164]

B. Assessment of the Canadian Aggregate Compliance Approach

The RFS regulations specify a petition process through which EPA may approve the use of an aggregate compliance approach for planted crops and crop residue from foreign countries.[165] On September 29, 2011, EPA approved such a petition from the Government of Canada.

The total agricultural land in Canada in 2017 is estimated at 117.8 million acres. This total agricultural land area includes 95.5 million acres of cropland and summer fallow, 12.5 million acres of pastureland and 9.8 million acres of agricultural land under conservation practices. This acreage estimate is based on the same methodology used to set the 2007 baseline

[164] As in 2016, USDA again provided EPA with 2017 data from the discontinued GRP and WRP programs. Given this data, EPA estimated the total U.S. agricultural land both including and omitting the GRP and WRP acreage. In 2017, combined land under GRP and WRP totaled 349,146 acres. Subtracting the GRP, WRP, ACEP-WRE, and ACEP-ALE acreage yields an estimate of 376,093,719 acres or approximately 376 million total acres of U.S. agricultural land in 2017. Omitting the GRP and WRP data yields approximately the same 376 million acres of U.S. agricultural land in 2017.

[165] 40 CFR 80.1457.

acreage for Canadian agricultural land in EPA's response to Canada's petition. The data used to make this calculation can be found in the docket to this rule.

C. RIN Market Operation

Some stakeholders have expressed concerns that the current regulatory provisions related to RIN trading render the RFS program vulnerable to market manipulation. The EPA takes such issues seriously. The RIN system was originally designed with an open trading market in order to maximize its liquidity and ensure a robust marketplace for RINs. However, the EPA is interested in assessing whether and how the current trading structure provides an opportunity for market manipulation. To that effect, the EPA sought comment and input on this issue, including on potential changes to the RIN trading system that might help address these concerns. We received comments from stakeholders suggesting a number changes to the RIN trading system. While EPA received many comments that are helpful to highlight opportunities for improvement to the RIN system, we are not in a position to make significant changes to the RIN system at this time. However, we intend to explore these suggested changes and are open to suggestions for making changes in the future that are within our authority and would help to improve the function and liquidity of the RIN system.

Separate from evaluating the RIN trading options in the RFS program, the EPA is working with appropriate market regulators to analyze targeted concerns of some stakeholders. Although the EPA has not seen evidence of manipulation in the RIN market, the EPA is not a commodity market regulatory agency, and thus we do not have expertise in this field. Claims of

market manipulation prompted the EPA to execute a memorandum of understanding (MOU) with the U.S. Commodity Futures Trading Commission (CFTC), which has the authority and expertise to investigate such claims.

In the meantime, the EPA has continued to explore additional ways to increase program transparency in order to support the program and share data with all stakeholders. The EPA already publishes RFS program data on our website, including data related to RIN generation, sales and holdings, and annual compliance[166]. We are interested in providing more information, to the extent consistent with our obligations to protect confidential business information (CBI). The EPA sought comment on specific data elements and posting frequency that stakeholders believe would be useful to help with market transparency and liquidity. We received comments from stakeholders suggesting a number of different types of data that commenters suggested would be useful to the industry and public. The EPA will need to further evaluate each of these suggestions to determine which information we can be post and, if so, whether we can post it at the frequency that was suggested by the commenters. Our decisions with respect to these suggestions must necessarily strike a balance between achieving the greatest transparency possible, while working within the limitations of our authority and resources (including technology systems), and protecting information that is claimed as CBI.

[166] For public data on the RFS and other EPA fuel programs, refer to: https://www.epa.gov/fuels-registration-reporting-and-compliance-help/public-data-and-registration-lists-fuel-programs.

IX. Public Participation

Many interested parties participated in the rulemaking process that culminates with this final rule. This process provided opportunity for submitting written public comments following the proposal that we published on July 21, 2017 (82 FR 34206), and we also held a public hearing on August 1, 2017, at which many parties provided both verbal and written testimony. All comments received, both verbal and written, are available in Docket ID No. EPA-HQ-OAR-2017-0091 and we considered these comments in developing the final rule. Public comments and EPA responses are discussed throughout this preamble and in the accompanying Response to Comment document, which is available in the docket for this action.

X. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review

This action is an economically significant regulatory action that was submitted to the Office of Management and Budget (OMB) for review. Any changes made in response to OMB recommendations have been documented in the docket. The EPA prepared an analysis of illustrative costs associated with this action. This analysis is presented in Section IV.E of this preamble.

B. Executive Order 13771: Reducing Regulations and Controlling Regulatory Costs

This action is considered an Executive Order 13771 regulatory action. Details on the estimated costs of this final rule can be found in EPA's analysis of the illustrative costs associated with this action. This analysis is presented in Section IV.E of this preamble.

C. Paperwork Reduction Act (PRA)

This action does not impose any new information collection burden under the PRA. OMB has previously approved the information collection activities contained in the existing

regulations and has assigned OMB control numbers 2060-0637 and 2060-0640. The final standards will not impose new or different reporting requirements on regulated parties than already exist for the RFS program.

D. Regulatory Flexibility Act (RFA)

I certify that this action will not have a significant economic impact on a substantial number of small entities under the RFA. In making this determination, the impact of concern is any significant adverse economic impact on small entities. An agency may certify that a rule will not have a significant economic impact on a substantial number of small entities if the rule relieves regulatory burden, has no net burden, or otherwise has a positive economic effect on the small entities subject to the rule.

The small entities directly regulated by the RFS program are small refiners, which are defined at 13 CFR 121.201. We have evaluated the impacts of this final rule on small entities from two perspectives: as if the 2018 standards were a standalone action or if they are a part of the overall impacts of the RFS program as a whole.

When evaluating the standards as if they were a standalone action separate and apart from the original rulemaking which established the RFS2 program, then the standards could be viewed as increasing the advanced and total renewable fuel volumes required of obligated parties by 10 million gallons between 2017 and 2018. To evaluate the impacts of the volume requirements on

small entities relative to 2017, EPA has conducted a screening analysis[167] to assess whether it should make a finding that this action would not have a significant economic impact on a substantial number of small entities. Currently available information shows that the impact on small entities from implementation of this rule would not be significant. EPA has reviewed and assessed the available information, which shows that obligated parties, including small entities, are generally able to recover the cost of acquiring the RINs necessary for compliance with the RFS standards through higher sales prices of the petroleum products they sell than would be expected in the absence of the RFS program.[168, 169] This is true whether they acquire RINs by purchasing renewable fuels with attached RINs or purchase separated RINs. The costs of the RFS program are thus generally being passed on to consumers in the highly competitive marketplace. Even if we were to assume that the cost of acquiring RINs were not recovered by obligated parties, and we used the maximum values of the illustrative costs discussed in Section IV.E of this preamble and the gasoline and diesel fuel volume projections and wholesale prices from the October 2017 version of EIA's Short-Term Energy Outlook, and current wholesale fuel prices, a cost-to-sales ratio test shows that the costs to small entities of the RFS standards are far less than 1 percent of the value of their sales.

While the screening analysis described above supports a certification that this rule would not have a significant economic impact on small refiners, we continue to believe that it is more appropriate to consider the standards as a part of ongoing implementation of the overall RFS

[167] "Screening Analysis for the Final Renewable Fuel Standard Program Renewable Volume Obligations for 2018," memorandum from Dallas Burkholder, Nick Parsons, and Tia Sutton to EPA Air Docket EPA-HQ-OAR-2017-0091.
[168] For a further discussion of the ability of obligated parties to recover the cost of RINs see "A Preliminary Assessment of RIN Market Dynamics, RIN Prices, and Their Effects," Dallas Burkholder, Office of Transportation and Air Quality, US EPA. May 14, 2015, EPA Air Docket EPA-HQ-OAR-2015-0111.
[169] Knittel, Christopher R., Ben S. Meiselman, and James H. Stock. "The Pass-Through of RIN Prices to Wholesale and Retail Fuels under the Renewable Fuel Standard." Working Paper 21343. NBER Working Paper Series. Available online at http://www.nber.org/papers/w21343.pdf.

program. When considered this way, the impacts of the RFS program as a whole on small entities were addressed in the RFS2 final rule (75 FR 14670, March 26, 2010), which was the rule that implemented the entire program required by the Energy Independence and Security Act of 2007 (EISA 2007). As such, the Small Business Regulatory Enforcement Fairness Act (SBREFA) panel process that took place prior to the 2010 rule was also for the entire RFS program and looked at impacts on small refiners through 2022.

For the SBREFA process for the RFS2 final rule, EPA conducted outreach, fact-finding, and analysis of the potential impacts of the program on small refiners, which are all described in the Final Regulatory Flexibility Analysis, located in the rulemaking docket (EPA–HQ–OAR–2005–0161). This analysis looked at impacts to all refiners, including small refiners, through the year 2022 and found that the program would not have a significant economic impact on a substantial number of small entities, and that this impact was expected to decrease over time, even as the standards increased. For gasoline and/or diesel small refiners subject to the standards, the analysis included a cost-to-sales ratio test, a ratio of the estimated annualized compliance costs to the value of sales per company. From this test, it was estimated that all directly regulated small entities would have compliance costs that are less than one percent of their sales over the life of the program (75 FR 14862, March 26, 2010).

We have determined that this final rule will not impose any additional requirements on small entities beyond those already analyzed, since the impacts of this rule are not greater or fundamentally different than those already considered in the analysis for the RFS2 final rule assuming full implementation of the RFS program. This rule establishes the 2018 advanced and

total renewable fuel volume requirements at levels 10 million gallons higher than the 2017 volume requirements, and significantly below the statutory volume targets. This exercise of EPA's waiver authority reduces burdens on small entities, as compared to the burdens that would be imposed under the volumes specified in the Clean Air Act in the absence of waivers – which are the volumes that we assessed in the screening analysis that we prepared for implementation of the full program. Regarding the BBD standard, we are maintaining the volume requirement for 2019 at the same level as 2018. While this volume is an increase over the statutory minimum value of 1 billion gallons, the BBD standard is a nested standard within the advanced biofuel category, which we are significantly reducing from the statutory volume targets. As discussed in Section VI, we are setting the 2019 BBD volume requirement at a level below what is anticipated will be produced and used to satisfy the reduced advanced biofuel requirement. The net result of the standards being established in this action is a reduction in burden as compared to implementation of the statutory volume targets, as was assumed in the RFS2 final rule analysis.

While the rule will not have a significant economic impact on a substantial number of small entities, there are compliance flexibilities in the program that can help to reduce impacts on small entities. These flexibilities include being able to comply through RIN trading rather than renewable fuel blending, 20 percent RIN rollover allowance (up to 20 percent of an obligated party's RVO can be met using previous-year RINs), and deficit carry-forward (the ability to carry over a deficit from a given year into the following year, providing that the deficit is satisfied together with the next year's RVO). In the RFS2 final rule, we discussed other potential small entity flexibilities that had been suggested by the SBREFA panel or through comments,

but we did not adopt them, in part because we had serious concerns regarding our authority to do so.

Additionally, as we realize that there may be cases in which a small entity may be in a difficult financial situation and the level of assistance afforded by the program flexibilities is insufficient. For such circumstances, the program provides hardship relief provisions for small entities (small refiners), as well as for small refineries.[170] As required by the statute, the RFS regulations include a hardship relief provision (at 40 CFR 80.1441(e)(2)) that allows for a small refinery to petition for an extension of its small refinery exemption at any time based on a showing that compliance with the requirements of the RFS program would result in the refinery experiencing a "disproportionate economic hardship." EPA regulations provide similar relief to small refiners that are not eligible for small refinery relief (see 40 CFR 80.1442(h)). EPA evaluates these petitions on a case-by-case basis and may approve such petitions if it finds that a disproportionate economic hardship exists. In evaluating such petitions, EPA consults with the U.S. Department of Energy, and takes the findings of DOE's 2011 Small Refinery Study and other economic factors into consideration. EPA successfully implemented these provisions by evaluating petitions for exemption from 14 small refineries for the 2016 RFS standards.[171]

Given that this final rule would not impose additional requirements on small entities, would decrease burden via a reduction in required volumes as compared to statutory volume targets, would not change the compliance flexibilities currently offered to small entities under the RFS program (including the small refinery hardship provisions we continue to successfully

[170] See CAA section 211(o)(9)(B).
[171] EPA is currently evaluating 2 additional 2016 petitions, bringing the total number of petitions for 2016 to 16.

implement), and available information shows that the impact on small entities from implementation of this rule would not be significant viewed either from the perspective of it being a standalone action or a part of the overall RFS program, we have therefore concluded that this action would have no net regulatory burden for directly regulated small entities.

E. Unfunded Mandates Reform Act (UMRA)

This action does not contain an unfunded mandate of $100 million or more as described in UMRA, 2 U.S.C. 1531–1538, and does not significantly or uniquely affect small governments. This action implements mandates specifically and explicitly set forth in CAA section 211(o) and we believe that this action represents the least costly, most cost-effective approach to achieve the statutory requirements of the rule.

F. Executive Order 13132: Federalism

This action does not have federalism implications. It will not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government.

G. Executive Order 13175: Consultation and Coordination with Indian Tribal Governments

This action does not have tribal implications as specified in Executive Order 13175. This final rule will be implemented at the Federal level and affects transportation fuel refiners, blenders, marketers, distributors, importers, exporters, and renewable fuel producers and importers. Tribal governments would be affected only to the extent they produce, purchase, and use regulated fuels. Thus, Executive Order 13175 does not apply to this action.

H. Executive Order 13045: Protection of Children from Environmental Health Risks and Safety Risks

The EPA interprets Executive Order 13045 as applying only to those regulatory actions that concern environmental health or safety risks that the EPA has reason to believe may disproportionately affect children, per the definition of "covered regulatory action" in section 2-202 of the Executive Order. This action is not subject to Executive Order 13045 because it implements specific standards established by Congress in statutes (CAA section 211(o)) and does not concern an environmental health risk or safety risk.

I. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use

This action is not a "significant energy action" because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. This action establishes the required renewable fuel content of the transportation fuel supply for 2018, consistent with the CAA and waiver authorities provided therein. The RFS program and this rule are designed to achieve positive effects on the nation's transportation fuel supply, by increasing energy independence and lowering lifecycle GHG emissions of transportation fuel.

J. National Technology Transfer and Advancement Act (NTTAA)

This rulemaking does not involve technical standards.

K. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

The EPA believes that this action does not have disproportionately high and adverse human health or environmental effects on minority populations, low income populations, and/or indigenous peoples, as specified in Executive Order 12898 (59 FR 7629, February 16, 1994). This final rule does not affect the level of protection provided to human health or the

environment by applicable air quality standards. This action does not relax the control measures on sources regulated by the RFS regulations and therefore will not cause emissions increases from these sources.

L. Congressional Review Act (CRA)

This action is subject to the CRA, and the EPA will submit a rule report to each House of the Congress and to the Comptroller General of the United States. This action is a "major rule" as defined by 5 U.S.C. 804(2).

XI. Statutory Authority

Statutory authority for this action comes from section 211 of the Clean Air Act, 42 U.S.C. 7545. Additional support for the procedural and compliance related aspects of this final rule comes from sections 114, 208, and 301(a) of the Clean Air Act, 42 U.S.C. sections 7414, 7542, and 7601(a).

List of Subjects in 40 CFR Part 80

Environmental protection, Administrative practice and procedure, Air pollution control, Diesel fuel, Fuel additives, Gasoline, Imports, Oil imports, Petroleum, Renewable fuel.

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Dated: November 30, 2017.

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E. Scott Pruitt,

Administrator.

For the reasons set forth in the preamble, EPA amends 40 CFR part 80 as follows:

PART 80—REGULATION OF FUELS AND FUEL ADDITIVES

1. The authority citation for part 80 continues to read as follows:

Authority: 42 U.S.C. 7414, 7521, 7542, 7545, and 7601(a).

Subpart M—Renewable Fuel Standard

2. Section 80.1405 is amended by adding paragraph (a)(9) to read as follows:

§ 80.1405 What are the Renewable Fuel Standards?

(a) * * *

(9) *Renewable Fuel Standards for 2018.*

(i) The value of the cellulosic biofuel standard for 2018 shall be 0.159 percent.

(ii) The value of the biomass-based diesel standard for 2018 shall be 1.74 percent.

(iii) The value of the advanced biofuel standard for 2018 shall be 2.37 percent.

(iv) The value of the renewable fuel standard for 2018 shall be 10.67 percent.

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