6560-50-P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 80

[EPA-HQ-OAR-2018-0167; FRL-XXXX-XX-OAR]

[RIN 2060-AT93]

Renewable Fuel Standard Program: Standards for 2019 and Biomass-Based Diesel Volume for 2020

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed 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 proposes 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 2019. Relying on statutory waiver authority that is available when the projected cellulosic biofuel production volume is less than the applicable volume specified in the statute, EPA is proposing volume requirements for cellulosic biofuel, advanced biofuel, and total renewable fuel that are below the statutory volume targets. We are also proposing the applicable volume of biomass-based diesel for 2020.

DATES: Comments. Comments must be received on or before August 17, 2018.

Public Hearing. EPA will announce the public hearing date and location for this proposal in a supplemental **Federal Register** document.

ADDRESSES: Submit your comments, identified by Docket ID No. EPA-HQ-OAR-2018-0167, at http://www.regulations.gov. Follow the online instructions for submitting comments. Once submitted, comments cannot be edited or removed from Regulations.gov. The EPA may publish any comment received to its public docket. Do not submit electronically any information you consider to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Multimedia submissions (audio, video, etc.) must be accompanied by a written comment. The written comment is considered the official comment and should include discussion of all points you wish to make. The EPA will generally not consider comments or comment contents located outside of the primary submission (i.e., on the web, cloud, or other file sharing system). For additional submission methods, the full EPA

public comment policy, information about CBI or multimedia submissions, and general guidance on making effective comments, please visit https://www.epa.gov/dockets/commenting-epa-dockets.

FOR FURTHER INFORMATION CONTACT: Julia MacAllister, Office of Transportation and Air Quality, Assessment and Standards Division, Environmental Protection Agency, 2000 Traverwood Drive, Ann Arbor, MI 48105; telephone number: 734-214-4131; email address: macallister.julia@epa.gov.

SUPPLEMENTARY INFORMATION:

Entities potentially affected by this proposed 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 affected categories include:

Category	NAICS[1] Codes	SIC[2] Codes	Examples of Potentially Affected 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).

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be affected by this proposed action. This table lists the types of entities that EPA is now aware could potentially be affected by this proposed action. Other types of entities not listed in the table could also be affected. To determine whether your entity would be affected by this proposed action, you should carefully examine the applicability criteria in 40 CFR part 80. If you have any questions regarding the applicability of this proposed 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] increase[ing] the production of clean renewable fuels."[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 proposing the applicable volumes for cellulosic biofuel, advanced biofuel, and total renewable fuel for 2019, and biomass-based diesel (BBD) for 2020.[3] We are also proposing the annual percentage standards (also known as "percent standards") for cellulosic biofuel, BBD, advanced biofuel, and total renewable fuel that would apply to all gasoline and diesel produced or imported in 2019.[4]

Today, nearly all gasoline used for transportation purposes contains 10 percent ethanol (E10), and on average diesel fuel contains nearly 5 percent biodiesel and/or renewable diesel.[5] However, the market has fallen well short of the statutory volumes for cellulosic biofuel, resulting in shortfalls in the advanced biofuel and total renewable fuel volumes. In this action, we are proposing a volume requirement for cellulosic biofuel at the level we project to be available for 2019, along with an associated applicable percentage standard. For advanced biofuel and total renewable fuel, we are proposing reductions under the "cellulosic waiver authority" that would result in advanced biofuel and total renewable fuel volume requirements that are lower than the statutory targets by the same magnitude as the reduction in the cellulosic biofuel reduction. This would effectively maintain the implied statutory volumes for non-cellulosic advanced biofuel and conventional biofuel.[6]

The resulting proposed volume requirements for 2019 are shown in Table I-1 below. Relative to the levels finalized for 2018, the 2019 volume requirements for advanced biofuel and

[1] 75 FR 14670, March 26, 2010.
[2] Pub. L. No. 110-140, 121 Stat. 1492 (2007). Hereinafter, "EISA."
[3] The 2019 BBD volume requirement was established in the 2018 final rule.
[4] For a list of the statutory provisions for the determination of applicable volumes, see the 2018 final rule (82 FR 58486; Table I.A-2).
[5] Average biodiesel and/or renewable diesel blend percentages based on EIA's April 2018 Short Term Energy Outlook (STEO).
[6] The statutory total renewable fuel, advanced biofuel and cellulosic biofuel requirements for 2019 are 28.0, 13.0 and 8.5 billion gallons respectively. This implies a conventional renewable fuel applicable volume (the difference between the total renewable fuel and advanced biofuel volumes, which can be satisfied by with conventional (D6) RINs) of 15.0 billion gallons, and a non-cellulosic advanced biofuel applicable volume (the difference between the advanced biofuel and cellulosic biofuel volumes, which can be satisfied with advanced (D5) RINs) of 4.5 billion gallons.

total renewable fuel would be higher by 590 million gallons. Approximately 90 million gallons of this increase would be due to the increase in the projected production of cellulosic biofuel in 2019 relative to 2018. We are also proposing to establish the volume requirement for BBD for 2020 at 2.43 billion gallons. This volume is 330 million gallons higher than the volume for 2019.

Table I-1
Proposed Volume Requirements[a]

	2018[b]	2019 Statutory Volumes	2019 Proposed Volumes	2020 Proposed Volumes
Cellulosic biofuel (million gallons)	288	8,500	381	n/a
Biomass-based diesel (billion gallons)	2.1	≥1.0	2.1[c]	2.43
Advanced biofuel (billion gallons)	4.29	13.00	4.88	n/a
Renewable fuel (billion gallons)	19.29	28.00	19.88	n/a

[a] All values are ethanol-equivalent on an energy content basis, except for BBD which is biodiesel-equivalent.
[b] The 2018 volume requirements for cellulosic biofuel, advanced biofuel, and renewable fuel were established in the 2018 final rule (82 FR 58486, December 12, 2017). The 2018 BBD volume requirement was established in the 2017 final rule (81 FR 89746, December 12, 2016).
[c] The 2019 BBD volume requirement was established in the 2018 final rule (82 FR 58486, December 12, 2017).

A. Summary of Major Provisions in This Action

This section briefly summarizes the major provisions of this final rule. We are proposing applicable volume requirements and associated percentage standards for cellulosic biofuel, advanced biofuel, and total renewable fuel for 2019; for BBD we are proposing the percentage standard for 2019 and the applicable volume requirement for 2020.

1. Approach to Setting Volume Requirements

For advanced biofuel and total renewable fuel, we are proposing reductions based on the "cellulosic waiver authority" that would result in advanced biofuel and total renewable fuel volume requirements that are lower than the statutory targets by the same magnitude as the reduction in the cellulosic biofuel applicable volume. This follows the same general approach as in the 2018 final rule. The proposed volumes for cellulosic biofuel, advanced biofuel, and total renewable fuel exceed the required volumes for these fuel types in 2018.

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 2019 cellulosic biofuel volume, based on a projection of production that reflects a neutral aim at accuracy. Section IV describes our assessment of advanced biofuel and total renewable fuel. Finally, Section VI provides our proposal regarding the 2020 BBD volume requirement, reflecting a proposed analysis of a set of factors stipulated in CAA section 211(o)(2)(B)(ii).

2. Cellulosic Biofuel

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 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 this rule we are proposing a cellulosic biofuel volume requirement of 381 million ethanol-equivalent gallons for 2019 based on our production projection. Our projection reflects consideration of RIN generation data for past years and 2018 to date that is available to EPA through EMTS; 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 2019 we used the same basic methodology described in the 2018 final 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. EPA anticipates that our final projection of cellulosic biofuel will be based on additional data we will obtain prior to issuing the final rule, including an estimate of cellulosic biofuel production for 2019 to be provided by the Energy Information Administration (EIA).

3. Advanced Biofuel

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." The conditions that caused us to reduce the 2018 volume requirement for advanced biofuel below the statutory target remain relevant in 2019. As for 2018, we investigated the projected availability of non-cellulosic advanced biofuels in 2019. 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 uses to the production of advanced biofuel used in the U.S., the fact that the biodiesel tax credit is currently not available for 2019, the tariffs on imports of biodiesel from Argentina and Indonesia, as well as the cost of advanced biofuels. Based on these considerations we are proposing to reduce the statutory volume target for advanced biofuel by the same amount as we are reducing the statutory volume target for cellulosic biofuel. This would result in an advanced biofuel volume for 2019 of 4.88 billion gallons, which would be 590 million gallons higher than the advanced biofuel volume for 2018.

4. Total Renewable Fuel

As for advanced biofuel, we are proposing the maximum reduction permissible under the cellulosic waiver authority. We are proposing that the reduction in total renewable fuel would be the same as the reduction in advanced biofuel, such that the resulting implied volume requirement for conventional renewable fuel would be 15 billion gallons.

5. 2020 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, provided 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.[7] For 2016 and 2017, we set the BBD volume requirements at 1.9 and 2.0 billion gallons respectively. Finally, for 2018 and 2019 the BBD volume requirement was set a 2.1 billion gallons. We are proposing to increase the BBD volume for 2020 to 2.43 billion gallons.

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. While EPA continues to believe it is appropriate to maintain the opportunity for other advanced biofuels to compete for market share, the vast majority of the advanced biofuel obligations in recent years have been satisfied with BBD. Thus, after a review of the implementation of the program to date and considering the statutory factors, and in light of the 500 million gallon increase we are proposing for non-cellulosic advanced biofuels, we are proposing, in coordination with USDA and DOE, an applicable volume of BBD for 2020 of 2.43 billion gallons.[8]

6. Annual Percentage Standards

The renewable fuel standards are expressed as a volume percentage and are used by each refiner 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

[7] 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.

[8] The proposed 330 million gallon increase for BBD would generate approximately 500 million RINs, due to the higher equivalence value of biodiesel (1.5 RINs/gallon) and renewable diesel (generally 1.7 RINs/gallon).

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 proposed percentage standards was based on the April 2018 version of EIA's Short-Term Energy Outlook.[9] The proposed percentage standards for 2019 are shown in Table I.B.6-1. Detailed calculations can be found in Section VII, including the projected gasoline and diesel volumes used.

Table I.B.6-1
Proposed 2019 Percentage Standards

	Proposed Percentage Standards
Cellulosic biofuel	0.209%
Biomass-based diesel	1.72%
Advanced biofuel	2.67%
Renewable fuel	10.88%

B. RIN Market Operations

In the rulemaking notice proposing the 2018 RFS volume requirements, EPA noted that various stakeholders had raised concerns regarding lack of transparency and potential manipulation in the RIN market. We asked for comment from the public on those issues, and received multiple suggestions from stakeholders in response. Commenters suggested a number of potential steps EPA could take, including increasing the public availability of data related to the RIN market; establishing new regulations relating to the purchase, ownership, and retirement of RINs; and increasing coordination with sister federal agencies. Since receiving those comments, we have held additional meetings with stakeholders on these topics, through which we have continued to hear various perspectives on RIN market operations and potential changes.

A number of the comments received in response to the 2018 NPRM suggested increasing the amount of data related to the RIN market that EPA makes publicly available. For example, commenters urged EPA to consider increasing the frequency at which currently available information is posted. EPA is currently exploring the possibility of posting regular updates to the number of RINs we anticipate will be required for compliance. These updates could take into account several factors, such as updated information on gasoline and diesel consumption throughout the year, the impact of small refinery exemptions, and the volume of renewable fuel exported from the United States for which RINs were generated, and would thus need to be retired. EPA is also considering publicly posting average RIN prices based on the price

[9] The final percentage standards will be based on the most recent gasoline and diesel projected volumes provided by EIA.

information submitted to EPA through EMTS. Other information that may be of interest to the public could be aggregated information related to the number of RINs held by different categories of entities, such as renewable fuel producers, obligated parties, and parties that neither produce renewable fuel nor have an RVO under the RFS program. Finally, we are considering whether there may be value in increasing the frequency of the release of data that is already posted publicly, such as information related to RIN generation by D-code and fuel type.

Stakeholders have also suggested ways EPA could amend the RFS regulations to change rules related to who may purchase RINs, the duration for which RINs could be held, and other rules related to the buying, selling, or holding of RINs. The goal of such changes would be to minimize or eliminate potential manipulation in the market. EPA is currently considering a handful of ideas, including: prohibiting parties other than obligated parties from purchasing separated RINS; requiring public disclosure if a party holds a certain percentage of the RIN market; and/or requiring obligated parties to retire RINs for compliance purposes on a more frequent basis (e.g., requiring monthly compliance). EPA requests comment on the expected impact that these specific potential regulatory changes could have on the RIN market, positively or negatively, as well as on any other potential regulatory changes commenters may recommend to address perceived vulnerabilities in the RIN market. Today's action is not proposing to make any such regulatory changes. Should EPA decide to move forward on any of these ideas, we would do so through a separate proposed rulemaking. That rulemaking would be informed by comments received in response to today's notice.

Finally, we note that multiple stakeholders have encouraged cooperation and coordination between EPA and other federal agencies that may play an oversight role in the RFS or broader fuels market, including the Commodity Futures Trading Commission and the Federal Trade Commission. EPA has engaged with both agencies on an ongoing basis and will continue to do so.

C. EPA Response to Court Decision in Americans for Clean Energy v. EPA

In the annual rule establishing the 2014-2016 renewable fuel standards, we determined that there would be an "inadequate domestic supply" of renewable fuel to consumers in 2016, and so exercised the general waiver authority to reduce the applicable volume of total renewable fuel to a level we believed could be supplied.[10] In response to a petition for review of the 2014-2016 rule, the United States Court of Appeals for the District of Columbia Circuit ruled that EPA improperly focused on assessing the supply of renewable fuel to consumers, and that the statute instead requires a "supply-side" assessment of the volumes of renewable fuel that can be supplied to refiners, importers and blenders. The court vacated EPA's decision to reduce the total renewable fuel volume requirements for 2016 using general waiver authority, and remanded the rule to EPA for further consideration in light of the decision. *Americans for Clean Energy ("ACE") v. EPA*, 864 F.3d 691 (2017).

EPA is currently considering a number of issues raised by the need to respond to the

[10] See 80 FR 77420 (December 14, 2015).

court's remand in a separate process from this annual rulemaking. EPA is not requesting comment on this rulemaking process at this time and any comments on this issue will be treated as outside of the scope of this rulemaking. EPA understands that there is a compelling need ot respond to the remand and intends to expeditiously move ahead with a separate rule to resolve this matter.

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. As described in the executive summary, we are proposing a single volume requirement for cellulosic biofuel at the level we project to be available for 2019, and an associated applicable percentage standard. For advanced biofuel and total renewable fuel, we are proposing volume requirements and associated applicable percent standards, based on use of the "cellulosic waiver authority" that would result in advanced biofuel and total renewable fuel volume requirements that are lower than the statutory targets by the same magnitude as the reduction in the cellulosic biofuel reduction. This would effectively maintain the implied statutory volumes for non-cellulosic advanced biofuel and conventional biofuel.[11]

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, then 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" but must make a projection that "takes neutral aim at accuracy." *API v. EPA*, 706 F.3d 474, 479, 476 (D.C. Cir. 2013). Pursuant to this provision, EPA has set the cellulosic biofuel requirement lower than the statutory volume for each year since 2010. As described in Section III.D, the projected volume of cellulosic biofuel production for 2019 is less than the 8.5 billion gallon volume target in the statute. Therefore, for 2019, we are proposing to set the cellulosic biofuel volume requirement at a level lower than the statutory applicable volume, in accordance with this provision.

[11] The statutory total renewable fuel, advanced biofuel and cellulosic biofuel requirements for 2019 are 28.0, 13.0, and 8.5 billion gallons, respectively. This implies a conventional renewable fuel applicable volume (the difference between the total renewable fuel and advanced biofuel volumes, which can be satisfied by with conventional (D6) RINs) and a non-cellulosic advanced biofuel applicable volume (the difference between the advanced biofuel and cellulosic biofuel volumes, which can be satisfied with advanced (D5) RINs) of 15.0 and 4.5 billion gallons, respectively.

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 2019, we are also proposing to reduce the applicable volumes of advanced biofuel and total renewable fuel under this authority.

EPA has used the cellulosic waiver authority to lower the cellulosic biofuel, advanced biofuel and total renewable fuel volumes every year since 2014. Further discussion of the cellulosic waiver authority, and EPA's interpretation of it, can be found in the preamble to the 2017 final rule.[12] 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); *Americans for Clean Energy v. EPA* ("*ACE*"), 864 F.3d 691 (D.C. Cir. 2017) (discussed below).

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 advanced biofuel volume to a level that was reasonably attainable, and then provided a comparable reduction under this authority for total renewable fuel.[13] 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."[14] 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.[15] 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.[16] 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.[17]

In this action we are proposing to use the cellulosic waiver authority to reduce the statutory volume targets for advanced biofuels and total renewable fuel by equal amounts, consistent with our long-held interpretation of this provision and our approach in setting the 2014-2018 standards. This approach considers the Congressional objectives reflected in the volume tables in the statute, and the environmental objectives that generally favor the use of

[12] See 81 FR 89752-89753 (December 12, 2016).
[13] See 80 FR 77433-34 (December 14, 2015).
[14] *ACE*, 864 F.3d at 730.
[15] *Id.* at 733.
[16] *Id.*
[17] *Id.* at 734.

advanced biofuels over non-advanced biofuels. See 81 FR 89752-89753 (December 12, 2016). See also 78 FR 49809-49810 (August 15, 2013); 80 FR 77434 (December 14, 2015). We are proposing, as described in Section IV, that the applicable volume for advanced biofuels specified in the statute for 2019 is not attainable, and thus to exercise our cellulosic waiver authority to lower the applicable volume of advanced biofuel by the same quantity as the reduction in cellulosic biofuel, and to provide an equal reduction under the cellulosic waiver authority in the applicable volume of total renewable fuel. The 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 the implied statutory volume for 2019.

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 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. At this time, we do not believe that the circumstances exist that would justify a waiver of volumes under the general waiver authority.

As discussed further in Section IV.C below, EPA is soliciting comment on whether further reductions under the general waiver authority could be justified.

B. Treatment of Carryover RINs

Consistent with our approach in the final rules establishing the RFS standards for 2013 through 2018, we have also considered the availability and role of carryover RINs in evaluating whether we should exercise our discretion to use our waiver authorities in setting the cellulosic, advanced, and total volume requirements for 2019. Neither the statute nor EPA regulations specify how or whether EPA should consider the availability of carryover RINs in exercising the cellulosic waiver authority.[18] As noted in the context of the rules establishing the RFS standards

[18] 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 percent 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 2019.

for 2014 through 2018, 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.[19] 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.[20] 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 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.[21] EPA's approach to the consideration of carryover RINs in exercising our cellulosic waiver authority was affirmed in *Monroe Energy* and *ACE*.[22]

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 for a new waiver of the standards, undermining the market certainty so critical to the RFS program. Moreover, 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.[23]

1. Carryover RIN Bank Size

At the time of the 2018 standards final rule, we estimated that there were approximately 2.22 billion total carryover RINs available and decided that carryover RINs should not be

[19] See 80 FR 77482-87 (December 14, 2015), 81 FR 89754-55 (December 12, 2016), and 82 FR 58493-95 (December 12, 2017).
[20] See 72 FR 23900 (May 1, 2007), 80 FR 77482-87 (December 14, 2015), 81 FR 89754-55 (December 12, 2016), and 82 FR 58493-95 (December 12, 2017).
[21] See 79 FR 49793-95 (August 15, 2013).
[22] *Monroe Energy v. EPA*, 750 F.3d 909 (D.C. Cir. 2014), *ACE* at 713.
[23] Here we use the term "buffer" as shorthand reference to all of the benefits that are provided by a sufficient bank of carryover RINs.

counted on to avoid or minimize the need to reduce the 2018 statutory volume targets.[24] We also stated that we may or may not take a similar approach in future years, and that we would evaluate the issue on a case-by-case basis considering the facts in future years. Since that time, obligated parties have submitted their compliance demonstrations for the 2017 compliance year and we now estimate that there are currently approximately 3.06 billion total carryover RINs available, an increase of 840 million RINs from the previous estimate of 2.22 billion total carryover RINs in the 2018 final rule.[25] This increase in the total carryover RIN bank compared to that projected in the 2018 final rule results from various factors, including market factors, regulatory and enforcement actions, and judicial proceedings. They include the approximately 1,460 million RINs that were not required to be retired by small refineries that were granted hardship exemptions for 2017 and approximately 790 million RINs that were not required to be retired by small refineries that were granted hardship exemptions for 2016, along with the RINs that Philadelphia Energy Solutions Refining and Marketing, LLC ("PESRM") was not required to retire as part of its bankruptcy settlement agreement.[26] While EPA cannot predict how obligated parties will comply in 2018 or the amount of additional small refinery hardship exemptions that may be granted in the future, the 2016 and 2017 exemptions have directly increased the number of carryover RINs that will likely be available for compliance with the 2019 standards. This total volume of carryover RINs is approximately 15 percent of the total renewable fuel volume requirement that EPA is proposing for 2019, which is less than the 20 percent maximum limit permitted by the regulations to be carried over for use in complying with the 2019 standards.[27]

The above discussion applies to total carryover RINs; we have also considered the available volume of advanced biofuel carryover RINs. At the time of the 2018 final rule, we estimated that there were approximately 810 million advanced carryover RINs available.[28] Since that time, obligated parties have submitted their compliance demonstrations for the 2017 compliance year and we now estimate that there are currently approximately 640 million advanced carryover RINs available, a decrease of 170 million RINs from the previous estimate in the 2018 final rule.[29] This volume of advanced carryover RINs is approximately 14 percent of the advanced renewable fuel volume requirement that EPA is proposing for 2019, which is less

[24] See 82 FR 58494 (December 12, 2017).
[25] The calculations performed to estimate the number of carryover RINs currently available can be found in the memorandum, "Carryover RIN Bank Calculations for 2019 NPRM," available in the docket.
[26] Per PESRM's bankruptcy filings, PESRM had an RVO of 467 million RINs for 2017 (including its deficit carryforward from 2016). Pursuant to the settlement agreement, which was based on the unique facts and circumstances present in this case, including the insolvency and risk of liquidation, PESRM agreed to retire 138 million RINs to meet its 2017 RVO and the portion of its 2018 RVO during the bankruptcy proceedings (approximately 97 million RINs). See docket for PES Holdings, LLC, 1:18bk10122, ECF Document Nos. 244 (proposed settlement agreement), 347 (United States' motion to approve proposed settlement agreement), and 376 (order approving proposed settlement agreement), (Bankr. D. Del.).
[27] See 40 CFR 80.1427(a)(5).
[28] See "Carryover RIN Bank Calculations for 2018 Final Rule," Docket Item No. EPA-HQ-OAR-2017-0091-4989.
[29] The calculations performed to estimate the number of carryover RINs currently available can be found in the memorandum, "Carryover RIN Bank Calculations for 2019 NPRM," available in the docket.

than the 20 percent maximum limit permitted by the regulations to be carried over for use in complying with the 2019 standards.[30]

However, there remains considerable uncertainty surrounding these estimates for a number of reasons, including the potential impact of any future action to address the remand in *ACE*, the possibility of additional small refinery exemptions, and the impact of 2018 RFS compliance on the bank of carryover RINs. In addition, we note that there have been enforcement actions in past years that 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 2019. In light of these uncertainties, the net result could be a bank of total carryover RINs larger or smaller than 15 percent of the proposed 2019 total renewable fuel volume requirement, and a bank of advanced carryover RINs larger or smaller than 14 percent of the proposed 2019 advanced biofuel volume requirement.

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

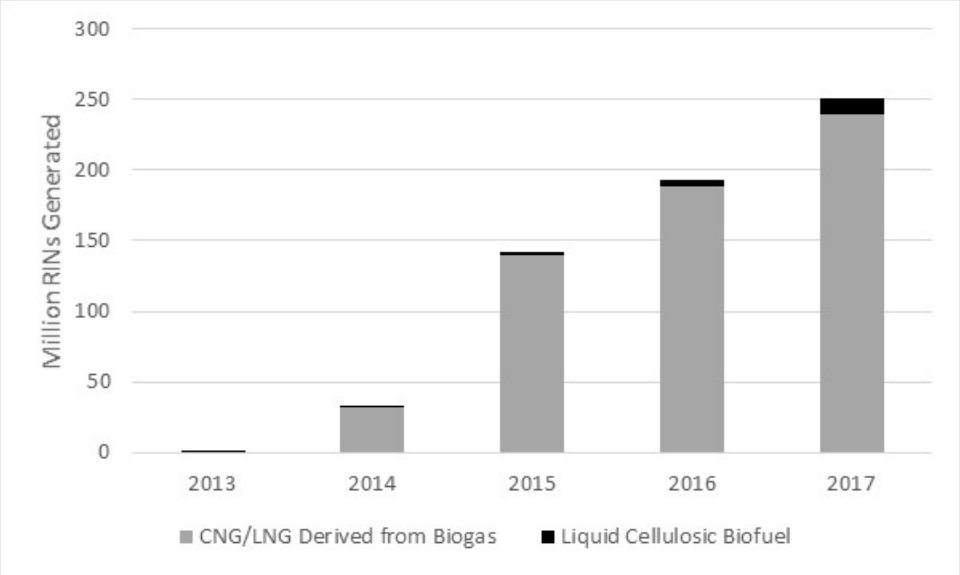
We have evaluated the volume of carryover RINs currently available and considered whether it would justify a reduced use of our cellulosic waiver authority in setting the 2019 volume requirements in order to intentionally draw down the carryover RIN bank. For the reasons described above and in Section IV, we do not believe this to be the case. The current bank of carryover RINs provides an important and necessary programmatic buffer that will both facilitate individual compliance and provide for smooth overall functioning of the program. 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. Therefore, for the reasons noted above and consistent with the approach we took in the final rules establishing the RFS standards for 2014 through 2018, we are not proposing to set the 2019 volume requirements at levels that would envision an intentional drawdown in the bank of carryover RINs.

[30] See 40 CFR 80.1427(a)(5).

III. Cellulosic Biofuel Volume for 2019

In the past several years, production of cellulosic biofuel has continued to increase. Cellulosic biofuel production reached record levels in 2017, driven largely by CNG and LNG derived from biogas. Production volumes have continued to increase in 2018.[31] Production of liquid cellulosic biofuel has also increased in recent years, even as the total production of liquid cellulosic biofuels remains much smaller than the production volumes of CNG and LNG derived from biogas. 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.

Figure III-1
Cellulosic RINs Generated (2013-2017)[a]



[a]Cellulosic RIN generation data from EMTS

In order to project the volume of cellulosic biofuel production in 2019, we considered the accuracy of the methodologies used to project cellulosic biofuel production in previous years, 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 2019. Our projection of cellulosic biofuel in the final rule will also reflect Energy Information Administration's (EIA) projection of cellulosic biofuel production, comments received on the 2019 NPRM, and updated data on cellulosic biofuel production in 2018 and projections for 2019.

[31] 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.

There are two main elements to the cellulosic biofuel production projection. To project the range of potential production volumes of liquid cellulosic biofuel we used the same methodology as the methodology used in the 2018 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 updated information (through the end of 2017) 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 same year-over-year growth rate methodology as in the 2018 final rule. 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 and previous years. 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.C-1 and III.C-2 below.

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 methodologies used by EPA to project cellulosic biofuel production in 2019 and the resulting projection of 381 million ethanol-equivalent gallons.

A. Statutory Requirements

CAA section 211(o)(2)(B)(i)(III) states the statutory volume targets for cellulosic biofuel. The volume of cellulosic biofuel specified in the statute for 2019 is 8.5 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.[32]

In addition, if EPA reduces the required volume of cellulosic biofuel below the level specified in the statute, we may reduce the applicable volumes of advanced biofuels and total renewable fuel by the same or a lesser volume,[33] and we are also required to make cellulosic waiver credits available.[34] Our consideration of the 2019 volume requirements for advanced biofuel and total renewable fuel is presented in Section IV.

[32] CAA section 211(o)(7)(D)(i). 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 (D.C. 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." *Id.* at 480, 479.

[33] CAA section 211(o)(7)(D)(i).

[34] See CAA section 211(o)(7)(D)(ii); 40 CFR 80.1456.

B. Cellulosic Biofuel Industry Assessment

In order to project liquid cellulosic biofuel production for 2019 we have tracked the progress of a number of potential cellulosic biofuel production facilities, located both in the U.S. and in foreign countries. 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 2019. The volume of cellulosic biofuel produced from R&D and pilot-scale facilities is 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.[35] We have therefore not considered production from R&D and pilot-scale facilities in our projection of cellulosic biofuel production for 2019.

From this list of commercial-scale facilities capable of producing liquid cellulosic biofuel, we used information from EMTS, the registration status of potential biofuel production facilities as cellulosic biofuel producers in the RFS program, publicly available information (including press releases and news reports), 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 2019. 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 2019. 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 accuracy of EPA's past cellulosic biofuel projections. EPA used a consistent methodology to project cellulosic biofuel production in the final three months of 2015 and all of 2016 and 2017.[36] The record of actual production indicates that EPA's projection was lower than the actual number of cellulosic RINs made available in

[35] 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 March 2018 has been less than 150,000 RINs. This is approximately 0.6 percent of all liquid cellulosic biofuel production through March 2018. See "D3 RIN generation by Company Through March 2018 – CBI."

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

2015,[37] and higher than the actual number of RINs made available in 2016 and 2017.[38] 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 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 order to make our projections more accurate.

EPA's projections of liquid cellulosic biofuel were higher than the actual volume of liquid cellulosic biofuel produced in 2015 - 2017. As a result of these over-projections, and in an effort to take into account the most recent data available and make the liquid cellulosic biofuel projections more accurate, EPA adjusted our methodology in the 2018 final rule.[39] In this 2019 proposed rule we are once again using adjusted percentile values to project liquid cellulosic biofuel production based on actual liquid cellulosic biofuel production in 2016 and 2017. Use of this updated data also results in different percentile values than we used to project production of liquid cellulosic biofuel for 2018. We believe that the use of the methodology (described in Section III.C.1 below), with the adjusted 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. At this time, we do not have sufficient data to assess the accuracy of this methodology to project cellulosic biofuel production for 2018, however we anticipate that for the final rule we will assess the accuracy of this methodology in projecting liquid cellulosic biofuel in 2018 and will make adjustments where appropriate.

We next turn to the projection of CNG/LNG derived from biogas. For 2018, EPA used for the first time 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. As described in Section III.C.2 below, EPA is again proposing to project production of CNG/LNG derived from biogas by 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 April 2016 – March 2017 to the RIN generation for these same fuels from April 2017 – March 2018 (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 2017 (the most recent year for which complete data are available), to estimate the production of CNG/LNG derived from biogas in 2019.

[37] 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.

[38] EPA projected that 123 million, 230 million cellulosic, and 311 million RINs would be generated in 2015, 2016, and 2017 respectively. The number of available cellulosic RINs in these years (RINs generated minus RINs retired for non-compliance reasons) was 140 million, 190 million, and 250 million RINs. All numbers are derived from EMTS data.

[39] 82 FR 58486 (December 12, 2017).

The remainder of this section describes in more detail the methodology EPA is using to project cellulosic biofuel production in 2019 (including a review of cellulosic biofuel production and the accuracy of the projection methodology in previous years).

1. Potential Domestic Producers

There are several companies and facilities[40] 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 2019. The financial incentive provided by cellulosic biofuel RINs,[41] combined with the fact that to date nearly all cellulosic biofuel produced in the U.S. has been used domestically[42] 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. 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 have successfully generated RINs.[43] 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 2019 can be found in a memorandum to the docket for this final rule.[44] General information on each of these companies or group of companies considered in our projection of the potentially available volume of cellulosic biofuel in 2019 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 2019. These

[40] 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.
[41] According to data from Argus Media, the price for 2017 cellulosic biofuel RINs averaged $2.78 in 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 $0.99 in 2017 while the price for a 2017 cellulosic waiver credit is $2.00 (EPA-420-B-17-036).
[42] The only known exception was a small volume of fuel produced at a demonstration scale facility exported to be used for promotional purposes.
[43] Most 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 and Ensyn's Port-Cartier, Quebec facility.
[44] "Cellulosic Biofuel Producer Company Descriptions (May 2018)," memorandum from Dallas Burkholder to EPA Docket EPA-HQ-OAR-2018-0167.

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 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.

In addition to projecting the domestic production of cellulosic biofuel, EPA also projects the volume of cellulosic biofuel that will be imported into the U.S.[45] For the purposes of this final rule we have considered all the registered foreign facilities under the RFS program to be potential sources of cellulosic biofuel in 2019. 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 2019. For purposes of our 2019 cellulosic biofuel projection we have, with one exception (described below), excluded potential volumes from foreign cellulosic biofuel production facilities that are not currently registered under the RFS program.

Cellulosic biofuel produced at three foreign facilities (Ensyn's Renfrew facility, GranBio's Brazilian facility, and Raizen's Brazilian facility) generated cellulosic biofuel RINs for fuel exported to the U.S. in 2017; projected volumes from each of these facilities are included in our projection of available volumes for 2019. EPA has also included projected volume from two additional foreign facilities. One of these facilities has completed the registration process as a cellulosic biofuel producer (Enerkem's Canadian facility). The other facility (Ensyn's Port-Cartier, Quebec facility), while not yet registered as a cellulosic biofuel producer, is owned by a Ensyn, a company that has previously generated cellulosic biofuel RINs using the same technology at a different facility. 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. All of the facilities included in EPA's cellulosic biofuel projection for 2019 are listed in Table III.B.3-1 below.

[45] EPA has consistently interpreted the term "projected volume of cellulosic biofuel production" in CAA section 211(o)(7)(D)(i) to include volumes of cellulosic biofuel likely to be made available in the U.S., 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 U.S., 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.

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 2019 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 2019. 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.[46]

[46] "Cellulosic Biofuel Producer Company Descriptions (May 2018)," memorandum from Dallas Burkholder to EPA Docket EPA-HQ-OAR-2018-0167.

Table III.B.3-1
Projected Producers of Cellulosic Biofuel in 2019

Company Name	Location	Feedstock	Fuel	Facility Capacity (Million Gallons per Year)[47]	Construction Start Date	First Production[48]
CNG/LNG Producers[49]	Various	Biogas	CNG/ LNG	Various	Various	August 2014
Edeniq	Various	Corn Kernel Fiber	Ethanol	Various	Various	October 2016
Enerkem	Edmonton, AL, Canada	Separated MSW	Ethanol	10[50]	2012	September 2017[51]
Ensyn	Renfrew, ON, Canada	Wood Waste	Heating Oil	3	2005	2014
Ensyn	Port-Cartier, QC, Canada	Wood Waste	Heating Oil	10.5	June 2016	January 2018
Envia Energy	Oklahoma City, OK	Biogas	Diesel	2	May 2015	February 2017
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
Raizen	Piracicaba City, Brazil	Sugarcane bagasse	Ethanol	11	January 2014	July 2015

[47] The Facility Capacity is generally equal to the nameplate capacity provided to EPA by company representatives or found in publicly available information. Capacities are listed in physical gallons (rather than ethanol-equivalent gallons). 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).

[48] 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.

[49] For more information on these facilities see "May 2018 Assessment of Cellulosic Biofuel Production from Biogas (2019)," memorandum from Dallas Burkholder to EPA Docket EPA-HQ-OAR-2018-0167.

[50] 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 (See "May 2018 Liquid Cellulosic Biofuel Projections for 2018 CBI").

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

C. Cellulosic Biofuel Volume for 2019

1. Liquid Cellulosic Biofuel

For our 2019 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 2019 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 2019 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 2019. As in 2018, we are proposing to calculate percentile values for each group of companies based on the past performance of each group relative to our projected production ranges. This methodology is briefly described here, and is described in detail in memoranda to the docket.[52]

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 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 (April 2017 – March 2018).[53] 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, facility capacity, and the number of RINs the producer expects to generate in 2019.[54] The projected range for the groups of companies considered in our 2019 cellulosic biofuel projection are shown in Tables III.C.1-1 and III.C.1-2 below.[55]

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[52] "May 2018 Liquid Cellulosic Biofuel Projections for 2018 CBI" and "Calculating the Percentile Values Used to Project Liquid Cellulosic Biofuel Production for the 2019 NPRM," memorandums from Dallas Burkholder to EPA Docket EPA-HQ-OAR-2018-0167.

[53] Consistent with previous years, we have considered whether there is reason to believe any of the facilities considered as potential cellulosic biofuel producers for 2019 is likely to produce a smaller volume of cellulosic biofuel in 2019 than in the previous 12 months for which data are available. At this time, EPA is not aware of any information that would indicate lower production in 2019 from any facility considered than in the previous 12 months for which data are available.

[54] As in our 2015-2018 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 2019, whichever is lower.

[55] More information on the data and methods EPA used to calculate each of the ranges in these tables in contained in "May 2018 Liquid Cellulosic Biofuel Projections for 2018 CBI" memorandum from Dallas Burkholder to EPA Docket EPA-HQ-OAR-2018-0167. 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

Table III.C.1-1
2019 Production Ranges for Liquid Cellulosic Biofuel Producers without Consistent Commercial Scale Production (million ethanol-equivalent gallons)

Companies Included	Low End of the Range	High End of the Range[a]
Enerkem, Ensyn (Port Cartier facility), Envia Energy	0	18

[a]Rounded to the nearest million gallons

Table III.C.1-2
2019 Production Ranges for Liquid Cellulosic Biofuel Producers with Consistent Commercial Scale Production (million ethanol-equivalent gallons)

Companies Included	Low End of the Range[a]	High End of the Range[b]
Facilities using Edeniq's technology (registered facilities), Ensyn (Renfrew facility), Poet-DSM, GranBio, Quad County Corn Processors, Raizen	15	56

[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 this proposed rule we have calculated the percentile values used to project liquid cellulosic biofuel production from within the range of projected production values, using data on actual liquid cellulosic biofuel production from both 2016 and 2017. This is consistent with the approach taken in the 2018 final rule, however we now have complete data from 2017, rather than only data through September 2017. For the final rule we anticipate using available production data from 2018 to make further adjustments to the percentile values used to project liquid cellulosic biofuel production for 2019.

The projected ranges for liquid cellulosic biofuel production in 2016 and 2017, along with the actual number of cellulosic RINs generated in each year that are/were 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.C.1-3 below.

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, "May 2018 Liquid Cellulosic Biofuel Projections for 2018 CBI").

Table III.C.1-3
Projected and Actual Liquid Cellulosic Biofuel Production in 2016 and 2017 (million gallons)

	Low End of the Range	High End of the Range	Actual Production[56]	Actual Percentile
New Facilities[57]				
2016	0	76	1.06	1st
2017	0	33	8.79	27th
Average[a]	N/A	N/A	N/A	14th
Consistent Producers[58]				
2016	2	5	3.28	43rd
2017	3.5	7	3.02	-14th
Average[a]	N/A	N/A	N/A	15th

[a]We have not averaged the low and high ends of the ranges, or actual production, as we believe it is more appropriate to average the actual percentiles from 2016 and 2017 rather than calculating a percentile value for 2016 and 2017 in aggregate. This approach gives equal weight to the accuracy of our projections from 2016 and 2017, rather than allowing the average percentiles calculated to be dominated by years with greater projected volumes.

For this proposed rule EPA has projected cellulosic biofuel production from facilities that have not yet achieved consistent commercial scale production at the 14th percentile of the calculated range and projected cellulosic biofuel production from facilities that have achieved commercial scale production at the 15th percentile.[59] 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. 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 2019 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 data available, it is also dependent on the performance of a relatively small number of companies in a single year. Using data from multiple years is likely more representative of the future performance of these groups of companies than data from any single year. For the final rule we anticipate using available production data from 2018 (likely January - September), along with updated production

[56] 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.
[57] Companies characterized as new producers in the 2014-2016 and 2017 final rules were as follows: Abengoa (2016), CoolPlanet (2016), DuPont (2016, 2017), Edeniq (2016, 2017), GranBio (2016, 2017), IneosBio (2016), and Poet (2016, 2017).
[58] Companies characterized as consistent producers in the 2014-2016 and 2017 final rules were as follows: Ensyn (2016 and 2017) and Quad County Corn Processors (2016 and 2017).
[59] In the 2018 final rule EPA used the 10th and 12th percentile for new facilities and consistent producers respectively. The slightly higher percentile values used to project liquid cellulosic biofuel production in 2019 reflect additional production data from the fourth quarter of 2017 that was not available at the time the analyses were completed for the 2018 final rule. For more detail on the calculation of the percentile values used in this proposed rule see "Calculating the Percentile Values Used to Project Liquid Cellulosic Biofuel Production for the 2019 NPRM," available in EPA docket EPA-HQ-OAR-2018-0167.

projections for months in which data is not available (likely October – December) to make further adjustments to the percentile values used to project liquid cellulosic biofuel production for 2019. We propose using production volumes for months for which data is not available (likely October – December 2018) in a similar manner to the way we projected production volumes for months in which data were not available in the 2018 final rule (based on available historical data along with seasonal production trends; see "Calculating the Percentile Values Used to Project Liquid Cellulosic Biofuel Production for 2018, EPA-HQ-OAR-2017-0091). We request comment on this projection methodology, as well as the appropriateness of using data from 2018 to adjust the percentile values used to projection liquid cellulosic biofuel production for 2019. We believe that adjusting the 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." We request comment on the data that should be used to calculate the percentile values used to project liquid cellulosic biofuel production in 2019 (e.g. whether we should use data from 2016-2018, or just a sub-set of this data) and how to weight data from each of these years.[60]

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 2019. These calculations are summarized in Table III.C.1-4 below.

Table III.C.1-4
Projected Volume of Liquid Cellulosic Biofuel in 2019
(million ethanol-equivalent 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	18	14th	3
Liquid Cellulosic Biofuel Producers; Producers with Consistent Commercial Scale Production	15	56	15th	21
Total	N/A	N/A	N/A	24

[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 (such as the factors

[60] For example, rather than weighting the percentiles that would have resulted in the actual production volumes in 2016 and 2017 equally, EPA could first aggregate the projected ranges for companies with and without consistent commercial scale production for 2016 and 2017 (5.5 million – 12 million and 0 – 109 million respectively) and then use the combined production volumes for 2016 and 2017 for each group (6.3 million and 9.8 million respectively) to calculate percentile values for each group of companies for 2019. This would result in slightly different percentile values (12th percentile for companies with consistent production and the 9th percentile for companies without consistent production).

used to calculate the high or low end of the projected range for each company), but we do not believe that such changes are warranted at this time. 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 2019 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 2019 (24 million gallons).

2. CNG/LNG Derived from Biogas

For 2019, EPA is using the same methodology as in the 2018 final rule, an industry wide projected based on a year-over-year growth rate, to project production of CNG/LNG derived from biogas used as transportation fuel.[61] For this proposed rule, EPA has calculated the year-over-year growth rate in CNG/LNG derived from biogas by comparing RIN generation from April 2017 – March 2018 (the most recent 12 months for which data are available) to RIN generation in the 12 months that immediately precede this time period (April 2016 – March 2017). These RIN generation volumes are shown in Table III.C.2-1 below.

Table III.C.2-1
Generation of Cellulosic Biofuel RINs for CNG/LNG Derived from Biogas (million gallons)[62]

RIN Generation (April 2016 – March 2017)	RIN Generation (April 2017 – March 2018)	Year-Over-Year Increase
189	247	30.5%

EPA then applied this 30.5 percent year-over-year growth rate to the total number of 2018 cellulosic RINs projected to be generated for CNG/LNG in the 2018 final rule. This methodology results in a projection of 358 million gallons of CNG/LNG derived from biogas in

[61] 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.

[62] Further detail on the data used to calculate each of these numbers in this table, as well as the projected volume of CNG/LNG derived from biogas used as transportation fuel in 2019 can be found in "May 2018 Assessment of Cellulosic Biofuel Production from Biogas (2019)" memorandum from Dallas Burkholder to EPA Docket EPA-HQ-OAR-2018-0167.

2019.[63] 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. This methodology may not be appropriate to use as the projected volume of CNG/LNG derived from biogas approaches the total volume of CNG/LNG that is used as transportation fuel, as RINs can be generated only for CNG/LNG used as transportation fuel. We do not believe that this is yet a constraint, however, as our projection for 2019 is well below the total volume of CNG/LNG that is currently used as transportation fuel.[64] We request comment on estimates of the volume of CNG/LNG likely to be used as transportation fuel in 2019, as well as the ability of the CNG/LNG market to provide the documentation necessary to verify the use of this fuel as transportation fuel.

EPA has also reviewed data submitted by potential producers of CNG/LNG derived from biogas that is used as transportation fuel. The total volume of CNG/LNG derived from biogas projected to be produced in 2019 by the potential producers of these fuels exceeds the volume that EPA is projecting for 2019. Since producers of CNG/LNG derived from biogas have historically over-estimated their production of these fuels, it would not be appropriate to simply adopt this projection for 2019. The fact that the industry projections exceed EPA's projected volume, however, indicates that the volume of these fuels projected for 2019 can be satisfied by a combination of projects currently producing CNG/LNG derived from biogas for these purposes and projects expected to product biogas by the end of 2019.

We believe 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 satisfies our charge to project future cellulosic biofuel production in a reasonable manner, and with neutrality, despite the fact that it does not consider all potential producers of these fuels on a facility-by-facility basis. For the final rule we anticipate using all available data from 2018 to update both the year-over-year increase as well as the projected production volume of cellulosic biofuel for 2018 to which we apply the year-over-year increase to project the production of CNG/LNG derived from biogas in 2019.

[63] To calculate this value, EPA multiplied the number of 2018 RINs projected to be generated for CNG/LNG derived from biogas in the 2018 final rule (274 million), see 82 FR 58502-03, by 1.305 (representing a 30.5 percent year-over-year increase).

[64] EPA projects that 580 million ethanol-equivalent gallons of CNG/LNG will be used as transportation fuel in 2019 based on EIA's March 2018 Short Term Energy Outlook (STEO). To calculate this estimate, EPA used the Natural Gas Vehicle Use from the STEO Custom Table Builder (0.13 billion cubic feet/day in 2019). 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 946.5 BTU per cubic foot of natural gas (lower heating value, per calculations using ASTM D1945 and D3588) and 77,000 BTU of natural gas per ethanol-equivalent gallon per §80.1415(b)(5).

3. Total Cellulosic Biofuel in 2019

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 2019. These projections are shown in Table III.C.3-1. Using the methodologies described in this section, we project that 381 million ethanol-equivalent gallons of cellulosic biofuel will be produced in 2019. We believe that projecting overall production in 2019 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 2019.

Table III.C.3-1
Projected Volume of Cellulosic Biofuel in 2019
(million gallons)

	Projected Volume[a]
Liquid Cellulosic Biofuel Producers; Producers without Consistent Commercial Scale Production	3
Liquid Cellulosic Biofuel Producers; Producers with Consistent Commercial Scale Production	21
CNG/LNG Derived from Biogas	358
Total	381[b]

[a] Volumes rounded to the nearest million gallons

[b] Total projection of cellulosic biofuel appears less than the sum of the projected volume for each group of companies due to rounding

Further discussion of the individual companies we believe will produce cellulosic biofuel and make it commercially available in 2019 can be found in a memorandum to the docket.[65] We request comment on this projection of cellulosic biofuel production for 2019, including the various aspects of the methodology used to project production of both liquid cellulosic biofuels and CNG/LNG derived from biogas.

[65] "Cellulosic Biofuel Producer Company Descriptions (May 2018)," memorandum from Dallas Burkholder to EPA Docket EPA-HQ-OAR-2018-0167. 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 2019

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). Congressional intent is evident in the fact that the implied statutory volume for conventional renewable fuel is 15 billion gallons for all years after 2014, while the advanced volumes, driven largely by growth in cellulosic volumes, continue to grow each year through 2022 to a total of 21 billion gallons.

Due to a shortfall in reasonably attainable volumes of cellulosic and advanced biofuel, and consistent with our long-held interpretation of the cellulosic waiver authority as best interpreted and applied by providing equal reductions in advanced biofuel and total renewable fuel, we are proposing a reduction from the statutory volumes for both advanced biofuel and total renewable fuel for 2019 using the full extent of the cellulosic waiver authority.

In this Section we discuss our proposed use of the discretion afforded by the cellulosic waiver authority at CAA 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 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.

To begin, we have evaluated the capabilities of the market and are proposing to find that the 13.0 billion gallons specified in the statute for advanced biofuel cannot be reached in 2019. 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 8.5 billion gallons in 2019. For this and other reasons described in this section we are proposing to reduce the advanced biofuel statutory target by the full amount of the shortfall in cellulosic biofuel for 2019.

In previous years when we have used the cellulosic waiver authority, we have determined the appropriate amount of the permissible waiver to apply to advanced biofuel by taking into account the availability of advanced biofuels, their energy security and GHG impacts, the availability of carryover RINs, 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 reduced benefits likely associated with use of advanced volumes achieved through diversion of foreign fuels or substitution of advanced feedstocks from other uses to biofuel production. Until the 2018 standards rule, the consideration of these factors led us to conclude 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.[66] For the 2018 standards, we placed a greater emphasis on cost considerations in the context of balancing the various considerations, ultimately concluding that partial backfilling with non-cellulosic advanced biofuels was not warranted and the applicable volume requirement for advanced biofuel should be based on the maximum reduction permitted under the cellulosic waiver authority.

Although we continue to believe that the factors earlier considered in exercising the cellulosic waiver authority are relevant and appropriate, we project that there will be insufficient reasonably attainable volumes of non-cellulosic biofuels in 2019 to allow any backfilling for missing volumes of cellulosic biofuel. As a result of this projection and our proposed consideration of carryover RINs, we are proposing to reduce the statutory volume target for advanced biofuel by the same amount as the reduction in cellulosic biofuel. This would result in the non-cellulosic component of the advanced biofuel volume requirement being equal to the implied statutory volume of 4.5 billion gallons in 2019.

We note that the predominant non-cellulosic advanced biofuels available in the near term are advanced biodiesel and renewable diesel.[67] We expect a decreasing rate of growth in the availability of feedstocks used to produce these fuel types, absent the diversion of these feedstocks from other uses. 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 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. Products that were formerly produced using these feedstocks are likely to be replaced by products produced using the lowest cost alternatives, likely derived from palm or petroleum sources. This in turn could increase the lifecycle GHG emissions associated with these incremental volumes of non-cellulosic advanced biofuel. 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 also likely be diminished benefits associated with such diversions. Taking these considerations into account, we believe, as discussed in more detail below, that we should exercise our discretion under the cellulosic waiver authority to set the advanced biofuel volume requirement at a level that would minimize such diversions.

[66] For instance, see 81 FR 89750 (December 12, 2016).

[67] While sugarcane ethanol, as well as a number of other fuel types, can also contribute to the supply of advanced biofuel, in recent years supply of these other advanced biofuels has been considerably lower than supply of advanced biodiesel or renewable diesel. See Table IV.B.3-1.

Furthermore, two other factors have added uncertainty regarding the volume of advanced biofuels that we project to be attainable in 2019. The first is the fact that the tax credit for biodiesel has not been renewed for 2019. The second is the final determination by the Department of Commerce that tariffs should be imposed on biodiesel imports from Argentina and Indonesia, and the potential for those tariffs to increase.[68,69] Each of these factors is discussed in more detail in Section IV.B.2 below.

We believe that the factors and considerations noted above are all appropriate to consider under the broad discretion provided under the cellulosic waiver authority, and that consideration of these factors supports our proposed use of this authority. Many of the considerations discussed in this proposed 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 Department's determination on tariffs 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). As discussed in further detail in the following sections, EPA's preliminary projection of the available volume of advanced biofuel in 2019 suggests that while achieving the implied statutory volume for non-cellulosic advanced biofuel in 2019 (4.5 billion gallons) may be attainable, doing so would likely require a higher rate of growth in the domestic advanced biofuel industry than we have seen in recent years. This is especially true if the tariffs on biodiesel imported from Argentina and Indonesia result in decreased volumes of imported advanced biofuel in 2019. While it may also be possible that a volume of non-cellulosic advanced biofuel greater than 4.5 billion gallons may be attainable, this higher volume would very likely result in the diversion of advanced feedstocks from other uses or diversion of advanced biofuels from foreign sources. In that case, our preliminary assessment of other factors, such as cost and GHG impacts, indicate that it would not 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 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 2019 would be 590 million gallons more than the applicable volume used to derive the 2018 percentage standard. Furthermore, after applying the same reduction to the statutory volume target for total renewable fuel, the volume requirement for total renewable fuel would also be 590 million gallons more than the applicable volume used to derive the 2018 percentage standard.

[68] "Affirmative Final Antidumping Duty Determinations on Biodiesel From Argentina and Indonesia," available in docket EPA-HQ-OAR-2018-0167.
[69] "US adds more duties on biodiesel from Argentina & Indonesia," Reuters article available in docket EPA-HQ-OAR-2018-0167.

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 proposing to establish a 2019 applicable volume for cellulosic biofuel of 381 million gallons, representing a reduction of 8,119 million gallons from the statutory target of 8,500 million gallons. As a result, 8,119 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 4.88 and 19.88 billion gallons for advanced biofuel and total renewable fuel, respectively.[70]

Table IV.A-1
Lowest Permissible Volumes
Using Only the Cellulosic Waiver Authority (million gallons)[a]

	Advanced biofuel	Total renewable fuel
Statutory target	13,000	28,000
Maximum reduction permitted under the cellulosic waiver authority	8,119	8,119
Lowest 2019 volume requirement permitted using only the cellulosic waiver authority	4,881	19,881

[a] Calculations are typically shown in million gallons for all four standards for clarity. However, when using volumes to calculate percentage standards, 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.

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.[71] 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*.[72] Thus, EPA could potentially set the 2019 advanced biofuel standard at a level that is designed to partially backfill for the shortfall in cellulosic biofuel. However, based on our consideration of a number of relevant factors, we are proposing to use the full extent of the cellulosic waiver authority in deriving volume requirements for 2019.

[70] 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 with the exception of cellulosic biofuel it is volumes in billion gallons that are used to calculate the applicable percentage standards. For cellulosic biofuel, it is million gallons that are used to calculate the percentage standards.
[71] CAA section 211(o)(7)(D)(i).
[72] See *ACE*, 864 F.3d at 730-35 (citing *Monroe*, 750 F.3d 909, 915-16).

B. Attainable Volumes of Advanced Biofuel

We have considered both reasonably attainable and attainable volumes of advanced biofuel to inform our exercise of the cellulosic waiver authority. Volumes described as "reasonably attainable" are those that can be reached without market disruptions and/or higher costs, such as those that could result from diverting advanced biofuels or advanced biofuel feedstocks from existing uses. We use this phrase in today's action in the same way that we used it in previous actions. Volumes described as "attainable," in contrast, are those we believe can be reached, but would likely result in market disruption and/or higher costs. Neither "reasonably attainable" nor "attainable" are meant to convey the "maximum achievable" level, which as described in the 2017 final rule we do not consider, in our discretion, to be an appropriate target under the cellulosic waiver authority.[73]

As in prior rulemakings, EPA has considered what volumes of advanced biofuels are reasonably attainable. 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.[74] Our proposed 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.[75] We are taking a similar approach for 2019, 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, which we took into account in setting the 2017 and 2018 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. We are proposing to set the advanced biofuel volume requirement at a level that would seek to minimize such feedstock/fuel diversions. Our individual assessments of reasonably attainable volumes of each type of advanced biofuel reflects 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.

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[73] 81 FR 89762 (December 12, 2016).
[74] See *ACE*, 864 F.3d at 730-35. 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. See *id.* at 704-13.
[75] See *ACE*, 864 F.3d at 735-36.

EPA proposes to find that 100 million gallons of advanced ethanol, 60 million gallons of other advanced biofuels, and 2.65 billion gallons of advanced biodiesel and renewable diesel are reasonably attainable. Together with our projected volume of 381 million gallons of cellulosic biofuel, the sum of these volumes falls short of 4.88 billion gallons, which is the lowest advanced biofuel requirement that EPA can determine under the cellulosic waiver authority.

Therefore, we also have considered whether the market can nonetheless make available 4.88 billion gallons of advanced biofuel, notwithstanding likely feedstock/fuel diversions. In particular, we assess whether additional volumes of advanced biodiesel and renewable diesel are attainable. We conclude that 2.8 billion gallons of advanced biodiesel and renewable diesel is likely attainable notwithstanding likely feedstock/fuel diversions. This quantity of advanced biodiesel and renewable diesel, together with the cellulosic biofuel, sugarcane ethanol, and other advanced biofuels described above, would enable the market to make available 4.88 billion gallons of advanced biofuels.

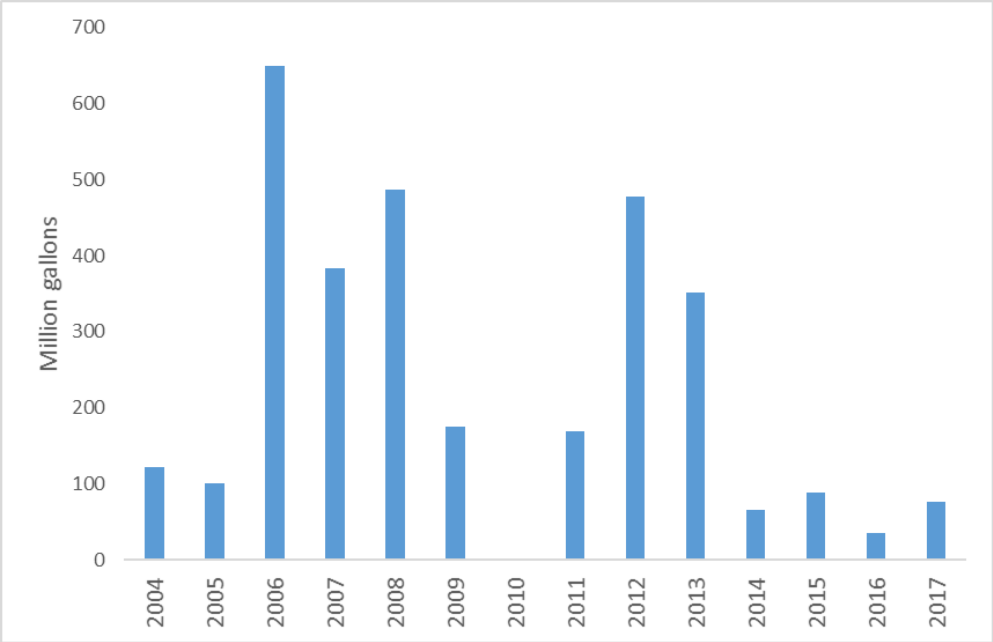
1. Imported Sugarcane Ethanol

The predominant available source of advanced biofuel other than cellulosic biofuel and BBD is imported sugarcane ethanol. In setting the 2018 standards, we estimated that 100 million gallons of imported sugarcane ethanol would be reasonably attainable.[76] This was a reduction from the 200 million gallons we had assumed for 2016 and 2017, and was based on a combination of data from 2016 and part of 2017 as well as an attempt to balance the lower-than-expected imports from recent data with indications that higher volumes were possible based on older data. We also noted 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.

During 2017 when we were developing the 2018 standards rulemaking, we used available data from a portion of 2017 to estimate that import volumes of sugarcane ethanol were likely to fall significantly below the 200 million gallons we had assumed when we set the 2017 standards. Import data for most of 2017 is now available, and indicates that imports of sugarcane ethanol reached just 77 million gallons.

[76] 82 FR 58507 (December 12, 2017).

Figure IV.B.1-1
Historical Sugarcane Ethanol Imports



Source: "US Imports of Advanced Fuel Ethanol from EIA," docket EPA-HQ-OAR-2018-0167. Includes imports directly from Brazil and those that are transmitted through the Caribbean Basin Initiative (CBI) and Central America Free Trade Agreement (CAFTA). 2017 data is through November.

While it is difficult to predict imports for 2019, we believe it would be reasonable not to increase the assumed volume above 100 million gallons for purposes of determining whether an advanced biofuel volume requirement of 4.88 billion gallons is reasonably attainable for 2019. Although imports of advanced ethanol have been below 100 million gallons for 2014 - 2017, our proposed advanced biofuel volume requirement for 2019 would be higher than that for 2018, creating some incentive for increases in imports. However, the E10 blendwall and the fact that imported sugarcane ethanol typically costs more than corn ethanol create disincentives for increasing imports above the levels in recent years. Taking all of these considerations into account, we propose using 100 million gallons of imported sugarcane ethanol for the purposes of projecting reasonably attainable volumes of advanced biofuel for 2019. This level reflects a balancing of the information 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 and under the influence of the higher standards in 2019.

We note that the future projection of imports of sugarcane ethanol is inherently imprecise, and that actual imports in 2019 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, constraints associated with the E10 blendwall in the U.S, and the cost relative to that of corn ethanol. Also, global sugar

consumption has continued to increase steadily, while global production has decreased.[77] If this trend continues, Brazilian production of sugar could increase, with a concurrent reduction in Brazilian production of ethanol. 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.[78] 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 reasonably attainable for 2019. As we have done in past years, we plan to take into consideration available data on imports in 2018, as well as information provided in comments, in making a final estimate of reasonably attainable volumes of sugarcane ethanol for the final rule.

2. Other Advanced Biofuel

In addition to cellulosic biofuel, imported sugarcane ethanol, and advanced biodiesel and renewable diesel, there are other D5 advanced biofuels that can be counted in the determination of reasonably attainable volumes of advanced biofuel for 2019. These other D5 advanced biofuels include non-cellulosic CNG, naphtha, heating oil, and domestically-produced advanced ethanol. However, the supply of these fuels has been relatively low in the last several years.

Table IV.B.2-1
Historical Supply of Other Advanced Biofuels
(million ethanol-equivalent gallons)

	CNG/LNG	Heating oil	Naphtha	Domestic Ethanol	Total[a]
2013	26	0	3	23	52
2014	20	0	18	26	64
2015	0	1	24	25	50
2016	0	2	26	27	55
2017	2	2	32	26	62

[a] Excludes consideration of D5 renewable diesel, as this category of renewable fuel is considered separately as part of advanced biodiesel and renewable diesel in Section IV.B.3 below.

The downward trend over time in CNG/LNG from 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).[79] Total supply of these other advanced biofuels has exhibited no consistent trend during 2013 – 2017. Based on this historical record, we propose that 60 million gallons would be reasonably attainable in 2019.

[77] "Sugar - World Markets and Trade," USDA, November 2016. Available in docket EPA-HQ-OAR-2018-0167.
[78] "Commodity Markets Outlook," World Bank Group, January 2017. Available in docket EPA-HQ-OAR-2018-0167.
[79] 79 FR 42128 (July 18, 2014).

We recognize that the potential exists for additional volumes of advanced biofuel from sources such as jet fuel, liquefied petroleum gas (LPG), butanol, and liquefied natural gas (as distinct from compressed natural gas), as well as non-cellulosic CNG from biogas produced in digesters. However, since they have been produced, if at all, in only de minimis and sporadic amounts in the past, we do not have a basis for projecting substantial volumes from these sources in 2019.[80]

3. Biodiesel and Renewable Diesel

Having projected the production volume of cellulosic biofuel, and the reasonably attainable volumes of imported sugarcane ethanol and "other" advanced biofuels, we next calculated the volume of advanced biodiesel and renewable diesel that would need to be supplied to meet the volume of advanced biofuel for 2019 after reducing the advanced biofuel volume by the same amount as the cellulosic biofuel volume. Based on our projections of other advanced biofuels presented in the preceding sections, the market would need to supply 2.8 billion gallons of biodiesel and renewable diesel, generating 4.34 billion RINs, to meet a total advanced biofuel volume of 4.88 billion gallons. This calculation is shown in Table IV.B.3-1 below.

Calculating the volume of advanced biodiesel and renewable diesel that would be needed to meet the volume of advanced biofuel for 2019 is an important benchmark to help inform EPA's consideration of our waiver authorities. In situations where the reasonably attainable volume of biodiesel and renewable diesel exceeds the volume of these fuels that would be needed to meet the volume of advanced biofuel after reducing the advanced biofuel volume by the same amount as the cellulosic biofuel volume, as was the case in 2017 and 2018, EPA may consider whether or not to allow additional volumes of these fuels to backfill for missing cellulosic biofuel volumes. In situations where the reasonably attainable volume of biodiesel and renewable diesel is less than the volume of these fuels that would be needed to meet the volume of advanced biofuel after reducing the advanced biofuel volume by the same amount as the cellulosic biofuel volume, EPA may consider whether or not to use additional waiver authorities, to the extent available, to make further reductions to the advanced biofuel volume.

[80] No RIN-generating volumes of these other advanced biofuels were produced in 2017, and less than 1 million gallons total in prior years.

Table IV.B.3-1
Determination of Volume of Biodiesel and Renewable Diesel Needed in 2019
to Achieve 4.88 Billion Gallons of Advanced Biofuel
(million ethanol-equivalent gallons except as noted)

Lowest 2019 advanced biofuel volume requirement permitted using under the cellulosic waiver authority	4,881
Cellulosic biofuel	381
Imported sugarcane ethanol	100
Other advanced	60
Calculated advanced biodiesel and renewable diesel needed (ethanol-equivalent gallons / physical gallons)[81]	4,340 / 2,800

Having calculated the volume of advanced biodiesel and renewable diesel that would need to be supplied to meet the volume of advanced biofuel for 2019 after reducing the advanced biofuel volume by the same amount as the cellulosic biofuel volume., EPA next projected the reasonably attainable volume of these fuels for 2019. With regard to advanced biodiesel and renewable diesel, there are many different factors that could potentially influence the reasonably attainable volume of these fuels used as transportation fuel or heating oil in the U.S. These factors could include the availability of qualifying biodiesel and renewable diesel feedstocks, the production capacity of biodiesel and renewable diesel facilities (both in the U.S. and internationally), and the availability of imported volumes of these fuels.[82] 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 (including the availability of advanced feedstocks, the expiration of the biodiesel tax credit, recent tariffs on biodiesel from Argentina and Indonesia, and other market-based factors) that are likely to affect the supply of advanced biodiesel and renewable diesel.

In addition to a review of the volumes of advanced biodiesel and renewable diesel used in previous years, we believe the likely growth in production of feedstocks used to produce these fuels, as well as the total projected available volumes of these feedstocks, are important factors

[81] To calculate the volume of advanced biodiesel and renewable diesel that would generate the 4.34 billion RINs needed to meet the proposed advanced biofuel volume EPA divided the 4.34 billion RINs by 1.55. 1.55 is the approximate average (weighted by the volume of these fuels expected to be produced in 2019) of the equivalence values for biodiesel (generally 1.5) and renewable diesel (generally 1.7).

[82] 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).

to consider. This is because while there are many factors that could potentially limit the production and availability of these fuels, the impacts of increasing production of advanced biodiesel and renewable diesel on factors such as costs, energy security, and GHG emissions are expected to vary depending on whether the feedstocks used to produce these fuels are sourced from increased production of advanced feedstocks or alternatively from diverting these feedstocks from existing uses. 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 to renewable fuel production or the diversion of advanced biodiesel and renewable diesel from foreign markets. This is especially true 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 2019.[83] In this case the global supply of advanced biodiesel and renewable diesel would not increase, and the potential benefits associated with increasing the diversity of the supply of transportation fuel (energy security) and the production of additional volumes of advanced biodiesel and renewable diesel (low GHG sources of transportation fuel) would not be realized. Such feedstock switching or fuel diversion could also result in unintended negative consequences, such as market disruption in other markets where such oils are used, which could offset some or all of the anticipated GHG benefits of the production and use of advanced biofuels.

Before considering the projected growth in the production of qualifying feedstocks that could be used to produce advanced biodiesel and renewable diesel, as well as the total volume of feedstocks that could be used to produce these fuels, 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 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.[84] In previous years, biodiesel and renewable diesel produced in the U.S. have been almost exclusively advanced biofuel.[85] Imports of advanced biodiesel have also increased in recent years, 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 many economic factors.

[83] We believe palm or petroleum derived products would likely be used replace advanced biodiesel and renewable diesel diverted to the U.S. as these products are currently the lowest cost sources.
[84] From 2011 through 2017 approximately 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 (11,701 million gallons of the 12,323 million gallons) according to EMTS data.
[85] From 2011 through 2017 over 99.9% of all the domestically produced biodiesel and renewable diesel supplied to the U.S. qualified as advanced biodiesel and renewable diesel (10,089 million gallons of the 10,096 million gallons) according to EMTS data.

Table IV.B.2-1
Advanced (D4 and D5) Biodiesel and Renewable Diesel from 2011 to 2017
(Million Gallons)[a]

	2011	2012	2013	2014[b]	2015[b]	2016	2017
Domestic Biodiesel (Annual Change)	967 (N/A)	1,014 (+47)	1,376 (+362)	1,303 (-73)	1,253 (-50)	1,633 (+380)	1,573 (-60)
Domestic Renewable Diesel (Annual Change)	58 (N/A)	11 (-47)	92 (+81)	155 (+63)	175 (+20)	221 (+46)	258 (+37)
Imported Biodiesel (Annual Change)	44 (N/A)	40 (-4)	156 (+116)	130 (-26)	261 (+131)	561 (+300)	462 (-99)
Imported Renewable Diesel (Annual Change)	0 (N/A)	28 (+28)	145 (+117)	129 (-16)	121 (-8)	170 (+49)	193 (+23)
Exported Biodiesel and Renewable Diesel (Annual Change)	48 (N/A)	102 (+54)	125 (+23)	134 (+9)	133 (-1)	129 (-4)	157 (+28)
Total (Annual Change)	1021 (N/A)	991 (-30)	1,644 (+653)	1,583 (-61)	1,677 (+94)	2,456 (+779)	2,329 (-127)

[a] All data 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 volume 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	2017
Domestic Biodiesel (Annual Change)	0 (N/A)	0 (+0)	6 (+6)	1 (-5)	0 (+0)	0 (+0)	0 (+0)
Domestic Renewable Diesel (Annual Change)	0 (N/A)	0 (+0)	0 (+0)	0 (+0)	0 (+0)	0 (+0)	0 (+0)
Imported Biodiesel (Annual Change)	0 (N/A)	0 (+0)	31 (+31)	52 (+21)	74 (+22)	113 (+39)	0 (-113)
Imported Renewable Diesel (Annual Change)	0 (N/A)	0 (+0)	53 (+53)	0 (-53)	106 (+106)	43 (-63)	144 (+101)
Exported Biodiesel and Renewable Diesel (Annual Change)	0 (N/A)	0 (+0)	0 (+0)	0 (+0)	0 (+0)	1 (+1)	0 (-1)
Total (Annual Change)	0 (N/A)	0 (+0)	90 (+90)	53 (-37)	180 (+127)	155 (-25)	144 (-11)

[a] All data 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 volume 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 used in the U.S. have varied greatly, from a low of negative 127 million gallons from 2016 to 2017 to a high of 779 million gallons from 2015 to 2016. These changes were likely influenced by multiple 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 2018 to 2019, nor does it indicate that the low (or negative) growth rates observed in other years would recur in 2019. 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 volume of biodiesel and renewable diesel used in the U.S. in any given year. While the biodiesel blenders tax credit has applied in each year from 2010 – 2017, it has only been prospectively 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), December 2015 (for 2015 and 2016), and February 2018 (for 2017). 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 volume of advanced biodiesel and renewable diesel used in the U.S. over the previous year (653 million gallons and 779 million gallons respectively). However, following these large increases in 2013 and 2016, there was little to no growth in the use of advanced biodiesel and renewable diesel in the following years, only 33 million gallons from 2013 to 2015 and negative 127 million gallons from 2016 to 2017. This decrease from 2016 to 2017 happened despite the fact that the required volume of advanced biofuel increased from 3.61 in 2016 to 4.28 billion gallons in 2017. This pattern is likely the result of both accelerated production and/or importation of biodiesel and renewable diesel in the final few months of years during which the tax credit was available to take advantage of the expiring tax credit, as well as relatively lower volumes of biodiesel and renewable diesel production and import in 2014, 2015, and 2017 than would have occurred if the tax credit had been in place.[86]

The historical data suggests that the supply of advanced biodiesel and renewable diesel could potentially increase from 2.33 billion gallons in 2017 to 2.8 billion gallons in 2019 (the projected volume needed to meet the advanced biofuel volume for 2019 after reducing the statutory advanced biofuel volume by the same amount as the cellulosic biofuel reduction). This would represent an average annual rate of growth of approximately 235 million gallons per year,

[86] 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. Further, the preliminary tariffs on biodiesel imported from Argentina and Indonesia announced in August 2017 likely had a negative impact on the volume of biodiesel supplied in 2017.

slightly higher than the average increase in the volume of advanced biodiesel and renewable diesel used in the U.S. from 2011 through 2017 (218 million gallons per year) and significantly less the highest annual increase during this time (779 million gallons from 2015 to 2016).

After reviewing the historical volume of advanced biodiesel and renewable diesel used in the U.S. and considering the possible impact of the expiration of the biodiesel tax credit (discussed above), EPA next considers other factors that may impact the production, import, and use of advanced biodiesel and renewable diesel in 2019. The production capacity of registered advanced biodiesel and renewable diesel production facilities is highly unlikely to limit the production of these fuels, as the total production capacity for biodiesel and renewable diesel at registered facilities in the U.S. (4.1 billion gallons) exceeds the volume of these fuels that are projected to be needed to meet the advanced biofuel volume for 2019 after exercising the cellulosic waiver authority (2.8 billion gallons).[87] Significant registered production also exists internationally. Similarly, the ability for the market to distribute and use advanced biodiesel and renewable diesel appears unlikely constrain the growth of these fuels to a volume lower than 2.8 billion gallons. The investments required to distribute and use this volume of biodiesel and renewable diesel are expected to be modest, as this volume is less than 200 million gallons greater than the volume of biodiesel and renewable diesel produced, imported, and used in the U.S. in 2016.

Conversely, the availability of advanced feedstocks that can be used to produce advanced biodiesel and renewable diesel and the projected availability of imported advanced biodiesel and renewable diesel may limit the volume of these fuels available to the U.S. in 2019. 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, and that volume of advanced biodiesel and renewable diesel and advanced feedstocks produced globally exceeds the volume projected to be required in 2019 (2.8 billion gallons of advanced biodiesel and renewable diesel and the corresponding volume of advanced feedstocks) by a significant margin.[88] However, 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 from 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 the potential adverse effect on lifecycle GHG emissions associated with feedstocks for biofuel production that would have been used for other purposes and which must then be backfilled with other feedstocks. Similarly, increasing the

[87] The production capacity of the sub-set of biodiesel and renewable diesel producers that generated RINs in 2017 is approximately 3.1 billion gallons. See "Biodiesel and Renewable Diesel Registered Capacity (May 2018)" Memorandum from Dallas Burkholder to EPA Docket EPA-HQ-OAR-2018-0167.

[88] The March 2018 WASDE projects production of vegetable oils in 2017/18 in the World to be 197.78 million metric tons. This quantity of vegetable oil would be sufficient to produce approximately 56.5 billion gallons of biodiesel and renewable diesel.

supply of biodiesel and renewable diesel to the U.S. by diverting fuel that would otherwise have been used in other countries results in higher lifecycle GHG emissions 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 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 2019, we believe this increase is limited as most of these waste oils, fats, and greases that can be recovered economically are already being recovered and used in biodiesel and renewable diesel production or for other purposes. Most of the vegetable oil used to produce advanced biodiesel and renewable diesel that is sourced from planted crops comes from crops 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.[89] This is true for soybeans and corn, which are the two largest sources of feedstock from planted crops used for biodiesel production in the U.S.[90] We do not believe that the increased demand for soybean oil or corn oil caused by a higher 2019 advanced biofuel standard would result in an increase in soybean or corn prices large enough to induce significant changes in agricultural activity, at least for the changes in advanced biodiesel and renewable diesel feedstock demand that may be caused by this proposed 2019 standard.

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). At the time of our assessment for this proposed rule, the most current version of the WASDE report only projects domestic vegetable oil production through 2018. Based on domestic vegetable oil production from 2011-2017 as reported by WASDE, the average annual increase in vegetable oil production in the U.S. was 0.278 million metric tons per year.[91] Assuming a similar increase in domestic vegetable oil production from 2018 to 2019, this additional quantity of vegetable oils

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

[90] According to EIA data 6,230 million pounds of soy bean oil and 1,579 million pounds of corn oil were used to produce biodiesel in the U.S. in 2017. Other significant sources of feedstock were yellow grease (1,471 million pounds), canola oil (1,452 million pounds), and white grease (591 million pounds). Numbers from EIA's March 2018 Monthly Biodiesel Production Report.

[91] According to the March 2018 WASDE report, U.S. vegetable oil production in the 2016/2017 agricultural marketing year is estimated to be 11.43 million metric tons. According to the January 2013 WASDE report, U.S. vegetable oil production in the 2010/2011 agricultural marketing year was 9.76 million metric tons.

could be used to produce approximately 80 million additional gallons of advanced biodiesel or renewable diesel in 2019 relative to 2018.[92]

In addition to virgin vegetable oils, we also expect increasing volumes of distillers corn oil[93] to be available for use in 2019. 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. For this proposed rule EPA is using results from the World Agricultural Economic and Environmental Services (WAEES) model to project the growth in the production of distillers corn oil.[94] In assessing the likely increase in the availability of distillers corn oil from 2018 to 2019, 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 167 million pounds, from 2615 million pounds in agricultural marketing year 2017/2018 to 2,782 million pounds in agricultural marketing year 2018/2019. 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 22 million additional gallons of advanced biodiesel or renewable diesel in 2019. We believe it is reasonable to use these estimates from the WAEES model for these purposes.

While the vast majority of the increase in advanced biodiesel and renewable diesel feedstocks produced in the U.S. from 2018 to 2019 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 to produce biodiesel or renewable diesel, or in other markets. In fact, the WAEES model projects a decrease of 3 million gallons in the volume of biodiesel produced from feedstocks other than soybean oil, canola oil, and distillers corn oil from 2018 to 2019.[95] In total, we expect that increases in feedstocks produced in the U.S. are sufficient to produce approximately 100 million more gallons of advanced biodiesel and renewable diesel in 2019 relative to 2018. In our 2018 final rule, we determined that 2.55 billion gallons of advanced biodiesel and renewable diesel were reasonably attainable in 2018,[96] therefore our projection of the reasonably attainable volume of advanced biodiesel and renewable diesel in 2019 is 2.65 billion gallons.

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[92] 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 soybean oil (http://extension.missouri.edu/p/G1990), which is the largest source of feedstock used to produce advanced biodiesel and renewable diesel. Conversion rates for other types of vegetable oils used to produce biodiesel and renewable diesel are similar to those for soybean oil.

[93] Distillers corn oil is non-food grade corn oil produced by ethanol production facilities.

[94] For the purposes of this 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).

[95] Id.

[96] 82 FR 58512 (December 12, 2017).

EPA's projections of the growth of advanced feedstocks does not, however, suggest that the total supply of advanced biodiesel and renewable diesel to the U.S. in 2018 will be limited to 2.65 billion gallons. Rather, this is the volume of these fuels that we project could be supplied without diverting significant quantities of advanced feedstocks or biofuels from existing uses. The March 2018 WASDE reports that production of vegetable oil in the U.S. in the 2017/2018 market year (the latest year for which projections are available) will be sufficient to produce approximately 3.3 billion gallons of biodiesel and renewable diesel (including both advanced and conventional biofuels) if the entire volume of vegetable oil was used to produce these fuels. Additional advanced biodiesel and renewable diesel could be produced from waste fats, oils, and greases. The global production of vegetable oil projected in the 2017/2018 marketing year would be sufficient to produce approximately 56.5 billion gallons of biodiesel and renewable diesel (including both advanced and conventional biofuels).[97] While it would not be reasonable to assume that all, or even a significant portion, of global vegetable oil production could be available to produce biodiesel or renewable diesel supplied to the U.S. for a number of reasons,[98] the large global supply of vegetable oil strongly suggests that under the right market conditions 2.8 billion gallons of advanced biodiesel and renewable diesel is attainable in 2019. Reaching these levels, however, may result in the diversion of advanced feedstocks currently used in other markets and/or the import of biodiesel and renewable diesel from these feedstocks.

Further, the supply of advanced biodiesel and renewable diesel to the U.S. in 2019 could be increased by approximately 150 million gallons if all of the exported volumes of these fuels were used domestically. Diverting this fuel to markets in the U.S. may be complicated, however, as doing so would likely require higher prices for these fuels in the U.S. (to divert the fuels from foreign markets that are presumably more profitable currently). It may also be more difficult and costly to distribute this additional volume of biodiesel and renewable diesel to domestic markets than the current foreign markets. Finally, reducing advanced biodiesel and renewable diesel exports may indirectly result in the decreased availability of imported volumes of these fuels, as other countries seek to replace volumes previously imported from the U.S.

EPA next considered potential changes 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.

[97] The March 2018 WASDE projects production of vegetable oils in 2017/18 in the U.S. and the World to be 11.64 and 197.78 million metric tons respectively. To convert projected vegetable oil production to potential biodiesel and renewable diesel production we have used a conversion of 7.7 pounds of feedstock per gallon of biodiesel.

[98] These reasons include the demand for vegetable oil in the food, feed, and industrial markets both domestically and globally; constraints related to the production, import, distribution, and use of significantly higher volumes of biodiesel; and the fact that biodiesel and renewable diesel produced from much of the vegetable oil available globally would not qualify as an advanced biofuel under the RFS program.

The RFS requirements and California's LCFS are expected to continue to provide an incentive for imports of advanced biodiesel and renewable diesel in 2019. Several other factors, however, may negatively impact the volume of these fuels imported in 2019. In February 2018 the biodiesel blenders tax credit, which had expired at the end of 2016, was retroactively reinstated for biodiesel blended in 2017 but was not extended to apply to biodiesel blended in 2018 or 2019.[99] Perhaps more significantly, in December 2017 the U.S. International Trade Commission adopted tariffs on biodiesel imported from Argentina and Indonesia.[100] According to data from EIA,[101] no biodiesel was imported from Argentina or Indonesia from September 2017 – February 2018, after a preliminary decision to impose tariffs on biodiesel imported from these countries was announced in August 2017. Biodiesel imports from these countries were significant, accounting for over 550 million gallons in 2016 and approximately 290 million gallons in 2017. At this time, the ultimate impact these tariffs will have on overall imports of advanced biodiesel and renewable diesel to the U.S. remains uncertain. It is possible that imports of advanced biodiesel and renewable diesel from other countries not impacted by these tariffs will increase to make up for all, or some portion of the biodiesel imported from Argentina and Indonesia in previous years. The volume of imported biodiesel in 2017 sourced from countries not impacted by the tariffs, however, is significantly less than the volume supplied by Argentina and Indonesia.[102] It is possible, therefore, that the supply of imported advanced biodiesel and renewable diesel available in the U.S. in 2019 will decrease from the relatively high levels in recent years.[103]

Domestic production of advanced biodiesel and renewable diesel in 2016 and 2017 was approximately 1.85 billion gallons. Of this total, approximately 150 million gallons of domestically produced biodiesel was exported in 2016 and 2017. An additional 100 to150 million gallons of these fuels were imported from countries unaffected by the recent tariffs. If, by 2019, alternative sources of imported biodiesel and renewable diesel are identified and the imported volume of advanced biodiesel and renewable diesel returns to the levels observed in 2016 and 2017 (approximately 700 million gallons per year) domestic production would need to increase by approximately 125 million gallons per year in both 2018 and 2019 to reach a total advanced biodiesel and renewable diesel supply of 2.8 billion gallons by 2019.[104] These

[99] Bipartisan Budget Act of 2018, Pub. L. 115–123, 132 Stat. 64 §§ 40406, 40407, and 40415 (2018).
[100] "Biodiesel from Argentina and Indonesia Injures U.S. Industry, says USITC," Available online at: https://www.usitc.gov/press_room/news_release/2017/er1205ll876.htm.
[101] See "EIA Biomass-Based Diesel Import Data" available in docket EPA-HQ-OAR-2018-0167.
[102] According to EIA data, total biodiesel imports from countries other than Argentina and Indonesia totaled 153 million gallons in 2016 and 103 million gallons in 2017. See "EIA Biomass-Based Diesel Import Data" available in docket EPA-HQ-OAR-2018-0167.
[103] According to data from EMTS, 954 million gallons of advanced biodiesel and renewable diesel were imported into the U.S. in 2016 and 854 million gallons of these fuels were imported in 2017. Note that imported volumes of biodiesel and renewable diesel from EMTS and EIA do not precisely match. The primary reason for this difference is that EIA data is sourced from EIA surveys, while the EMTS data is generated by the parties that produce and/or import biodiesel and renewable diesel into the U.S. For the purposes of this discussion we have cited the EIA data, as this data more easily allows us to quantify the fuel impacted by the recent tariffs (biodiesel imported from Argentina and Indonesia).
[104] Note that this estimate assumes that the U.S. consumes all domestically produced biodiesel and renewable diesel, rather than exporting any of this fuel. Alternatively, if the U.S. continues to export approximately 150 million

increases appear attainable, as they are lower than the average annual increase of advanced biodiesel and renewable diesel production in the U.S. between 2011 and 2017 (134 million gallons per year). These increases are also approximately equal to the projected increases in advanced feedstock availability in 2017 and 2018.[105] We therefore project that a volume of 2.8 billion gallons of advanced biodiesel and renewable diesel is attainable in 2019 if the imported volume of these fuels does not fall significantly below the volumes imported in 2016 and 2017. We note, however, that using this volume of advanced biodiesel and renewable diesel in the U.S. would likely result in the diversion of advanced biodiesel and renewable diesel and/or feedstocks used to produce these fuels, as advanced biodiesel and renewable diesel that is currently exported would instead be used in the U.S. and alternative sources for significant volumes of these fuels would need to be found.

After a careful consideration of the factors discussed above, EPA has determined that 2.8 billion gallons of advanced biodiesel and renewable diesel projected needed to satisfy the implied statutory volume for non-cellulosic advanced biofuel in 2019 (4.5 billion gallons) are attainable. The total production capacity of registered biodiesel and renewable diesel producers is significantly higher than 2.8 billion gallons, even if only those facilities that generated RINs for advanced biodiesel and renewable diesel in 2017 are considered. This volume (2.8 billion gallons) is also not significantly higher than the total volume of biodiesel and renewable diesel supplied in 2016 (approximately 2.6 billion gallons), strongly suggesting that production capacity and the ability to distribute and use biodiesel and renewable diesel will not limit the supply of advanced biodiesel and renewable diesel to a volume below 2.8 billion gallons in 2018. Sufficient feedstocks are expected to be available to produce this volume of advanced biodiesel and renewable diesel in 2019, however doing so may result in some level of diversion of advanced feedstocks and/or advanced biodiesel and renewable diesel from existing uses. Achieving this level of advanced biodiesel and renewable diesel in 2019, however, will likely require finding alternative sources for biodiesel imports to replace the volume of biodiesel and renewable diesel that were supplied from Argentina and Indonesia in 2016 and 2017. Alternatively, obligated parties could rely on the significant volume of carryover advanced RINs projected to be available in 2019 (See Section II.B for a further discussion of carryover RINs).

C. Proposed Volume Requirement for Advanced Biofuel

In exercising the cellulosic waiver authority for 2017 and earlier, 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, notwithstanding the

gallons of biodiesel per year in 2019 domestic production of advanced biodiesel and renewable diesel would have to increase by approximately 200 million gallons per year.

[105] In the 2018 final rule, EPA projected that advanced biodiesel and renewable diesel feedstocks would increase to allow production of approximately 150 million additional gallons of advanced biodiesel and renewable diesel in 2018. 82 FR 58511 (December 12, 2017). In this proposed rule we are projecting additional growth in advanced biodiesel and renewable diesel feedstocks to allow production of approximately 100 million additional gallons of advanced biodiesel and renewable diesel in 2019 (relative to the volume of advanced feedstocks projected for 2018).

increase in costs associated with those decisions.[106] For the 2018 standards, in contrast, we placed a greater emphasis on cost considerations in the context of balancing the various considerations, ultimately concluding that the applicable volume requirement should be based on the maximum reduction permitted under the cellulosic waiver authority. We are proposing to take a similar approach for 2019. That is, while it may be possible that more than 4.88 billion gallons of advanced biofuel might be attainable in 2019, requiring additional volumes would lead to higher costs, feedstock switching and/or diversion of foreign advanced biofuels. We do not believe that it would be appropriate to set the advanced biofuel volume requirement higher than 4.88 billion gallons given that it could lead to these results.

Based on the information presented above, we believe that 4.88 billion gallons of advanced biofuel is attainable in 2019. After a consideration of the projected volume of cellulosic biofuel and reasonably attainable volumes of imported sugarcane ethanol and other advanced biofuels, we determined that 2.8 billion gallons of advanced biodiesel and renewable diesel would be needed to reach 4.88 billion gallons of advanced biofuel. Based on a review of the factors relevant to the supply of advanced biodiesel and renewable diesel as discussed in Section IV.B.2 above, including historic production and import data, the production capacity of registered biodiesel and renewable diesel producers, and the availability of advanced feedstocks, we have determined that 2.8 billion gallons of BBD is attainable in 2019.

However, we also acknowledge that 2.8 billion gallons of BBD is considerably higher than the 2.33 billion gallons actually supplied in 2017 and the 2.55 billion gallons determined to be reasonably attainable in 2018. While 2.8 billion gallons would require an average growth in supply of 235 million gallons per year between 2017 and 2019, this is only slightly higher than the average annual growth rate in years 2011 – 2017. Nevertheless, there is some uncertainty regarding whether 2.8 billion gallons is attainable in 2019. This fact has led us to consider whether the use of carryover RINs might be appropriate.

The carryover RIN bank has continued to grow over the past several years as described in Section II.B, and is currently at its largest historical level. It represents a source of RINs that could help obligated parties meet an advanced biofuel volume requirement of 4.88 billion gallons in 2019 if the market fails to supply sufficient advanced biofuels in 2019. If the market does choose to meet a volume requirement of 4.88 billion gallons in this way, it would be for the first time in the history of the RFS program. Although we did point to the carryover RIN bank in 2013, along with the potential for additional volumes of E85, as a means for meeting the statutory volume requirement of 16.55 billion gallons, in that case the concern was the portion of the standard that is not required to be advanced biofuel (e.g. conventional biofuel). Ultimately, the market supplied more advanced biofuel than it needed to meet the applicable volume requirement for advanced biofuel while falling short of the total renewable fuel volume requirement.

[106] See, e.g., Response to Comments Document for the 2014-2016 Rule, pages 628-631, available in docket EPA-HQ-OAR-2015-0111.

Although we believe that the 2.8 billion gallon volume is attainable, and any shortfalls could be met through the use of carryover RINs, we also solicit comment and supporting data and rationale on whether circumstances exist that would warrant further reductions in volumes through the exercise of the general waiver authority (e.g., due to severe economic harm). We recognize that identifying severe economic harm caused by the implementation of RFS requirements is a difficult and complex issue and one of intense interest to a number of stakeholders. We discussed in past notices, and in the most recent annual rulemaking for 2018, the type of information we generally think would be relevant to identifying severe economic harm. For example, in 2008, we examined modeling showing expected levels of production and price for both corn and ethanol with and without a waiver. We also provided quantitative estimates of the impact of a waiver on: food expenditures for average and lowest quintile households; feeds costs for cattle, pigs, poultry and dairy; and gasoline prices and gasoline expenditures for average and lowest quintile households.

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 4.5 billion gallons in 2019 would be maintained. This represents an increase of 0.5 billion gallons from the 2018 volume requirements.

D. Proposed Volume Requirement 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.[107] For the reasons we have previously articulated, 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 volume of 15 billion gallons. Applying an equal reduction of 8.12 billion gallons to both the statutory target for advanced biofuel and the statutory target for total renewable fuel would result in a total renewable fuel volume of 19.88 billion gallons as shown in Table IV.A-1.[108] A memorandum to the docket provides a description of the ways in which the market could make this volume of total renewable fuel available.[109]

[107] 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.

[108] 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.

[109] "Market impacts of biofuels in 2019," memorandum from David Korotney to docket EPA-HQ-OAR-2018-0167. In prior actions including the 2018 annual rule proposal, similar analyses indicated that the market was capable of both producing and consuming the required volume of renewable fuels, and that as a result there was no basis for finding an inadequate domestic supply of total renewable fuel. See 82 FR 34229 & n.82. Given the D.C. Circuit's decision in *ACE*, however, the current assessment of demand-side constraints is no longer relevant for determining inadequate domestic supply. However, we believe consideration of the ways that the market could make this volume available may still be relevant to whether and how EPA exercises its waiver authorities, such as our consideration of whether the proposed volumes will cause severe economic harm.

This volume of total renewable fuel results in an implied volume of 15 billion gallons of conventional fuel, which is the same as in the 2018 final rule.

V. Impacts of 2019 Volumes on Costs

In this section, EPA presents its assessment of the illustrative costs of the proposed 2019 RFS rule. It is important to note that these illustrative costs do not attempt to capture the full impacts of this proposed rule. We frame the analyses we have performed for this proposed rule as "illustrative" so as not to give the impression of comprehensive estimates. These estimates are provided 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 illustrative cost estimates. For example, there are many 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.

Illustrative cost estimates are provided below for the proposal discussed in Sections III and IV that reduces the cellulosic, advanced, and total renewable fuel volume requirements using the cellulosic waiver authority under CAA section 211(o)(7)(D)(i). For this proposal, we examine two different cases. In the first case, we provide illustrative cost estimates by comparing the proposed 2019 renewable fuel volumes to 2019 statutory volumes under CAA section 211(o)(7)(D)(i). In the second case, we examine the proposed 2019 renewable fuel volumes to the final 2018 renewable fuel volumes to estimate changes in the annual costs of the proposed 2019 RFS volumes in comparison to the 2018 volumes.

A. Illustrative Costs Analysis of Exercising the Cellulosic Waiver Authority Compared to the 2019 Statutory Volumes Baseline

In this section, EPA provides illustrative cost estimates that compare the proposed 2019 cellulosic biofuel volume requirements to the 2019 cellulosic statutory volume that would be required absent the exercise of our cellulosic waiver authority under CAA section 211(o)(7)(D)(i). As described in Section III, we are proposing a cellulosic volume of 381 million gallons for 2019. The result is that we are using our cellulosic waiver authority to waive the statutory cellulosic volume of 8.5 billion gallons by 8.12 billion gallons. Estimating the cost savings from volumes that are not projected to be produced is inherently challenging. EPA has taken the relatively straightforward methodology of multiplying this waived volume of 8.12 billion gallons by the wholesale per-gallon costs of cellulosic biofuel production relative to the petroleum fuels they displace.

While there may be growth in other cellulosic renewable fuel sources, we believe it is appropriate to use cellulosic ethanol produced from corn kernel fiber as the representative cellulosic renewable fuel. The majority of liquid cellulosic biofuel in 2019 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, we believe that production of the major alternative cellulosic biofuel – CNG/LNG derived from

biogas – is limited to approximately 630 million gallons due to a limitation in the number of vehicles capable of using this form of fuel.[110]

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. 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 cost 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 costs of the cellulosic ethanol to the petroleum fuels that would be replaced at the wholesale stage, since that is when the two are blended together.

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 travel the same distance as on gasoline due to the ethanol's lower energy content.

Table V.A-1 below presents the cellulosic fuel cost savings with this proposed rule that are estimated using this approach.[111] The per-gallon cost difference estimates for cellulosic ethanol ranges from $0.49 – $2.65 per ethanol-equivalent gallon.[112] Given that cellulosic ethanol production is just starting to become commercially available, the cost estimates have a

[110] EPA projects that 580 million ethanol-equivalent gallons of CNG/LNG will be used as transportation fuel in 2019 based on EIA's April 2018 Short Term Energy Outlook (STEO). To calculate this estimate, EPA used the Natural Gas Vehicle Use from the STEO Custom Table Builder (0.13 billion cubic feet/day in 2019). 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 946.5 BTU per cubic foot of natural gas (lower heating value, per calculations using ASTM D1945 and D3588) and 77,000 BTU of natural gas per ethanol-equivalent gallon per §80.1415(b)(5).

[111] Details of the data and assumptions used can be found in a Memorandum available in the docket entitled "Cost Impacts of the Proposed 2019 Annual Renewable Fuel Standards", Memorandum from Michael Shelby, Dallas Burkholder, and Aaron Sobel available in docket EPA-HQ-OAR-2018-0167.

[112] 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 April 2018 STEO.

significant range. Multiplying those per-gallon cost differences by the amount of cellulosic biofuel waived in this proposed rule results in approximately $4.0 – $22 billion in cost savings.

Table V.A-1
Illustrative Costs of Exercising the Cellulosic Waiver Authority
Compared to the 2019 Statutory Volumes Baseline

Cellulosic Volume Required (Million Ethanol-Equivalent Gallons)	381
Change in Required Cellulosic Biofuel from 2019 Statutory Volume (Million Ethanol-Equivalent Gallons)	(8,119)
Cost Difference Between Cellulosic Corn Kernel Fiber Ethanol and Gasoline Per Gallon ($/Ethanol-Equivalent Gallons)[113]	$0.49 - $2.65
Annual Change in Overall Costs (Million $)[114]	$(4,000) - $(22,000)

B. Illustrative Costs Analysis of Exercising the Cellulosic Waiver Authority Compared to the 2018 RFS Volumes Baseline

In this section, we provide illustrative cost estimates for EPA exercising its cellulosic waiver authority to reduce statutory cellulosic volumes for 2019 (with corresponding reductions to the advanced and total renewable fuel volumes) compared to the final 2018 RFS volumes. This results in an increase in cellulosic volumes for the 2019 RFS of 93 gallons (ethanol-equivalent) and an increase in the non-cellulosic advanced biofuel volumes for 2019 of 500 million gallons (ethanol-equivalent).

1. Cellulosic Biofuel

We anticipate that the increase in proposed 2019 cellulosic biofuel volumes would be composed of 10 million gallons of liquid cellulosic biofuel and 84 million gallons of CNG/LNG derived from landfill biogas.[115] Based upon the methodology outlined above in V.A, we use corn kernel fiber as the representative liquid cellulosic biofuel to develop cost estimates of cellulosic ethanol. We estimate a cost difference between cellulosic corn fiber-derived ethanol and gasoline of $0.49 – $2.65 on an ethanol-equivalent gallon basis. Next, the per-gallon costs of cellulosic renewable fuel are multiplied by the 10 million gallon increase between the proposed 2019 cellulosic volume and the final 2018 cellulosic RFS volume requirements to estimate the total costs from the increase in cellulosic ethanol.

[113] For this table and all subsequent tables in this section, approximate costs in per gallon cost difference estimates are rounded to the cents place.
[114] For this table and all subsequent tables in this section, approximate resulting costs (other than in per-gallon cost difference estimates) are rounded to two significant figures.
[115] These volumes do not add to 93 million gallons due to rounding.

For CNG/LNG-derived cellulosic biogas, we provide estimates of the cost of displacing natural gas with CNG/LNG derived from landfill biogas to produce 84 million ethanol-equivalent gallons of cellulosic fuel. To estimate the cost of production of CNG/LNG derived from landfill gas (LFG), EPA uses Version 3.2 of the Landfill Gas Energy Cost Model, or LFG cost-Web. EPA ran the financial cost calculator for projects with a design flow rate of 1,000 and 10,000 cubic feet per minute with the suggested default data and a project start year of 2019. The costs estimated for this analysis exclude any pipeline costs to transport the high BTU gas, as well as any costs associated with compressing the gas to CNG/LNG. These costs are not expected to differ significantly between LFG or natural gas. In addition, the cost estimates excluded the gas collection and control system infrastructure at the landfill, as EPA expects that landfills that begin producing high BTU gas in 2019 are very likely to already have this infrastructure in place.[116]

To estimate the illustrative cost impacts of the change in CNG/LNG derived from LFG, we compared the cost of production of CNG/LNG derived from LFG in each case to the projected price for natural gas in 2019 in EIA's April 2018 STEO.[117] Finally, we converted these costs to an ethanol-equivalent gallon basis. The resulting cost estimates are shown in Table V.B.2-1. Adding the cost of cellulosic ethanol to the costs of CNG/LNG landfill gas, the total costs of the proposed 2019 cellulosic volume compared to 2018 RFS cellulosic volume range from $2.3 – $32 million.

2. Advanced Renewable Fuel

EPA provides a range of illustrative cost estimates for the increases in the advanced standard of 500 million ethanol-equivalent gallons using two different advanced biofuels. In the first scenario, we assume that all the increase in advanced biofuel volumes is comprised of soybean oil BBD. In the second scenario, we assume that all the increase in the advanced volume is comprised of sugarcane ethanol from Brazil.

Consistent with the analysis in previous annual RFS volume rules, a "bottom-up" engineering cost analysis is used that quantifies the costs of producing a gallon of soybean-based biodiesel and then compares that cost to the energy-equivalent gallon of petroleum-based diesel. We compare the cost of biodiesel and diesel fuel at the wholesale stage, since that is when the two are blended together and represents the approximate costs to society absent transfer payments and any additional infrastructure costs. On this basis, EPA estimates the costs of producing and transporting a gallon of biodiesel to the blender in the U.S.

To estimate the illustrative costs of sugarcane ethanol, we compare the cost of sugarcane ethanol and gasoline at the wholesale stage, since that is when the two are blended together and represents the approximate costs to society absent transfer payments and any additional

[116] Ibid.
[117] Henry Hub Spot price estimate for 2019. Energy Information Administration (EIA), Short Term Energy Outlook (STEO) available in docket EPA-HQ-OAR-2018-0167.

infrastructure costs (e.g., blender pumps). On this basis, EPA estimates the costs of producing and transporting a gallon of sugarcane ethanol to the blender in the U.S. More background information on the cost assessment described in 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.[118]

Table VI.B.2-1 below also presents estimates of per energy-equivalent gallon costs for producing: (1) soybean biodiesel (in ethanol-equivalent gallons) and (2) Brazilian sugarcane ethanol, relative to the petroleum fuels they replace at the wholesale level. For each of the fuels, these per-gallon costs are then multiplied by the increase in the 2019 non-cellulosic advanced volume relative to the 2018 final advanced standard volume to obtain an overall cost increase of $380 – $710 million. In addition, in Table V.B.2-1, we also present estimates of the total cost of this proposal relative to 2018 RFS fuel volumes. We add the increase in cost of the proposed 2019 cellulosic standard volume, $2.3 – $32 million, with the additional costs of the increase in non-cellulosic advanced biofuel volumes resulting from the proposed 2019 advanced standard volume, $380 – $710 million. The overall total costs of this proposal range from $380 – $740 million.

Table V.B.2-1
Illustrative Costs of Exercising the Cellulosic Waiver Authority
Compared to the 2018 RFS Volumes Baseline

Cellulosic Volume	
Corn Kernel Fiber Cellulosic Ethanol Costs	
Cost Difference Between Cellulosic Corn Kernel Fiber Ethanol and Gasoline Per Gallon ($/Ethanol-Equivalent Gallons)	$0.49 - $2.65
Annual Increase in Overall Costs (Million $)	$4.9 - $26
CNG/LNG Derived from Biogas Costs	
Cost Difference Between CNG/LNG Derived from Landfill Biogas and Natural Gas Per Gallon ($/Ethanol-Equivalent Gallons)	$(0.03) - $0.08
Annual Increase in Overall Costs (Million $)	$(2.6) - $6.4
Annual Increase in Costs with Cellulosic Volume (Million $)	$2.3 - $32
Advanced Volume	
Soybean Biodiesel Scenario	
Cost Difference Between Soybean Biodiesel and Petroleum Diesel Per Gallon ($/Ethanol-Equivalent Gallons)	$1.04 - $1.43
Annual Increase in Overall Costs (Million $)	$520 - $710
Brazilian Sugarcane Ethanol Scenario	
Cost Difference Between Sugarcane Ethanol and Gasoline Per Gallon ($/Ethanol-Equivalent Gallons)	$0.76 - $1.22
Annual Increase in Overall Costs (Million $)	$380 - $610
Annual Increase in Overall Costs with Non-Cellulosic Advanced Volume (Million $)	$380 - $710
Cellulosic and Advanced Volumes	
Annual Increase in Overall Costs with Cellulosic and Advanced Volume (Million $)	$380 - $740

The annual volume-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 proposed 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 may include infrastructure costs, investment, lifecycle GHG emissions and air quality impacts, and energy security benefits, which all are to some degree affected by the annual volumes. For example, we do not have a quantified estimate of the lifecycle GHG or energy security benefits for a single year (e.g., 2019). Also, there are impacts that are difficult to quantify, such as rural economic development and employment changes from more diversified fuel sources, that are not quantified in this rulemaking. While some of these impacts were analyzed in the 2010 final rulemaking that established the current RFS program,[119] we have not analyzed these impacts for the 2019 volume requirements.

[119] 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.

VI. Biomass-Based Diesel Volume for 2020

In this section we discuss the proposed BBD applicable volume for 2020. We are proposing 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 proposing the BBD percentage standards that would apply to obligated parties in 2020 but intend to do so in late 2019, after receiving EIA's estimate of gasoline and diesel consumption for 2020. 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 2020 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.[120] 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

[120] See CAA section 211(o)(2)(B)(v).

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. In general, 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 2020 Applicable Volume of Biomass-Based Diesel

One of the primary considerations in determining the BBD volume for 2020 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. Table VI.B.1-1 below shows, for 2011-2017, the number of BBD RINs generated, the number of RINs retired due to export, the number of RINs retired for reasons other than compliance with the annual BBD standards, the consequent number of available BBD RINs, and the BBD and advanced biofuel standards for 2011-2019.

Table VI.B.1-1
Biomass-Based Diesel (D4) RIN Generation and Advanced Biofuel and Biomass-Based Diesel Standards in 2011-2019 (million RINs or gallons)[121]

	BBD RINs Generated	Exported BBD (RINs)	BBD RINs Retired, Non-Compliance Reasons	Available BBD RINs[a]	BBD Standard (Gallons)	BBD Standard (RINs)	Advanced Biofuel Standard (RINs)
2011	1,692	72	98	1,522	800	1,200	1,350
2012	1,737	102	90	1,545	1,000	1,500	2,000
2013	2,739	124	101	2,514	1,280	1,920	2,750
2014	2,710	134	92	2,484	1,630	2,490[b]	2,670
2015	2,796	145	32	2,619	1,730	2,655[b]	2,880
2016	4,008	203	96	3,709	1,900	2,850	3,610
2017	3,849	244	35	3,570	2,000	3,000	4,280
2018	N/A	N/A	N/A	N/A	2,100	3,150	4,290
2019	N/A	N/A	N/A	N/A	2,100	3,150	4,880

[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. While some fuels that qualify as BBD generate more than 1.5 RINs per gallon, EPA multiplies the required volume of BBD by 1.5 in calculating the percent standard per 80.1405(c). In 2014 and 2015 however, 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, rather than by multiplying the required volume of BBD by 1.5. Some of the volume used to meet the BBD standard in these years was renewable diesel, with an equivalence value higher than 1.5.

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, 2016 and 2017. 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,[122] 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.[123] In 2016, with RFS standards established prior to the beginning of the year and the blenders tax credit in place, available BBD RINs exceeded the volume required by the BBD standard by 859 million RINs (30 percent). In 2017, the RFS standards were established prior to

[121] Available BBD RINs Generated, Exported BBD RINs, and BBD RINs Retired for Non-Compliance Reasons information from EMTS.
[122] 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. In February 2018 the biodiesel tax credit was authorized and applied retroactively for all of 2017.
[123] See 80 FR 77490-92, 77495 (December 14, 2015).

the beginning of the year, and the blenders tax credit was only applied retroactively; even without the certainty of a tax credit, the available BBD RINs exceeded the volume required by the BBD standard by 570 million RINs (19 percent). This indicates that in appropriate circumstances there is demand for BBD beyond the required volume of BBD. We also note that while EPA has consistently established the required volume in such a way as to allow non-BBD fuels to compete for market share in the advanced biofuel category, since 2016 the vast majority of non-cellulosic advanced biofuel used to satisfy the advanced biofuel obligations has been BBD.

The prices paid for advanced biofuel and BBD RINs beginning in early 2013 through the March 2018 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.[124] If, however, BBD RINs are being used (or are expected to be 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.[125] 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 March 2018, shown in Figure VI.B.2-1 below, we see that beginning in early 2013 and through March 2018 (the last month for which data are available) the advanced RIN price and BBD RIN prices were approximately equal. Similarly, from early 2013 through 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. The advanced biofuel standard has incentivized additional volumes of BBD since 2013, while the total standard had incentivized additional volumes of BBD from 2013 through 2016.[126] While final standards were not in place throughout 2014 and most of 2015, EPA had issued proposed rules for both of these years.[127] 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

[124] This is because when an obligated party retires a BBD RIN (D4) 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 (D5) count towards both the advanced and total renewable fuel obligations, while conventional RINs (D6) count towards only the total renewable fuel obligation.

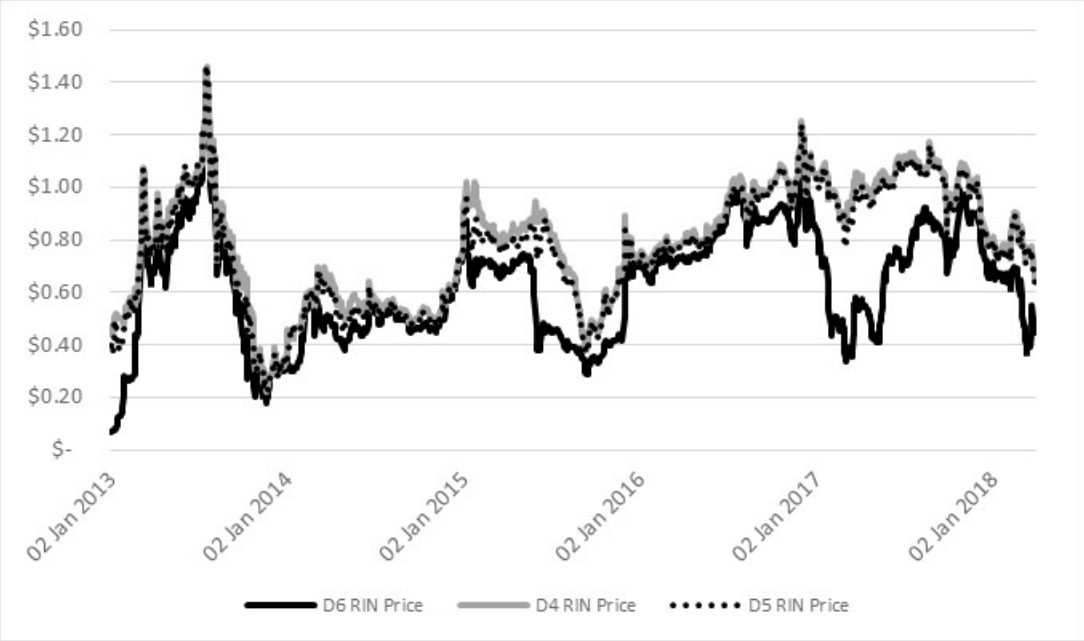
[125] We would still expect D4 RINs to be valued at a slight premium to D5 and D6 RINs in this case (and D5 RINs at a slight premium to D6 RINs) to reflect the greater flexibility of the D4 RINs to be used towards the BBD, advanced biofuel, and total renewable fuel standard. This pricing has been observed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

[126] 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).

[127] See 80 FR 33100 (2014-16 standards proposed June 10, 2015); 78 FR 71732 (2014 standards proposed Nov. 29, 2013).

advanced and total biofuel standards.[128] 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.

Figure VI.B.2-1
D4, D5, and D6 RIN Prices (January 2013 – March 2018)



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." [129] 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

[128] 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.
[129] 77 FR 59458, 59462.

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.[130] 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 had the potential to increase 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. The RIN generation data also show that while EPA has consistently preserved the opportunity for fuels other that BBD to contribute towards satisfying the required volume of advanced biofuel, these other advanced biofuels have not been supplied in significant quantities since 2013.

Table VI.B.1-2
Opportunity for and RIN Generation of "Other" Advanced Biofuels (million RINs)

	Opportunity for "Other" Advanced Biofuels[a]	Available Advanced (D5) RINs	Available BBD (D4) RINs in Excess of the BBD Requirement[b]
2011	150	225	322
2012	500	597	45
2013	829	552	594
2014[c]	192	143	39
2015[c]	162	147	24
2016	530	97	903
2017	969	144	570

[130] 594 million advanced ethanol RINs were generated in 2012.

[a]The required volume of "other" advanced biofuel is calculated by subtracting the number of cellulosic biofuel and BBD RINs required each year from the number of advanced biofuel RINs required. This portion of the advanced standard can be satisfied by advanced (D5) RINs, BBD RINs in excess of those required by the BBD standard, or cellulosic RINs in excess of those required by the cellulosic standard.
[b]The available BBD (D4) RINs in excess of the BBD requirement is calculated by subtracting the number of BBD RINs required each year from the number of BBD RINs available for compliance in that year. This number does not include carryover RINs.
[c]The 2014 and 2015 volume requirements were established in November 2015 and were set equal to the number of RINs projected to be available for each year.

In 2014 and 2015, EPA set the BBD and advanced standards at actual RIN generation, and thus the space between the advanced biofuel standard and the biodiesel standard was unlikely to provide an incentive for "other" advanced biofuels. EPA now has data on the amount of "other" advanced biofuels produced in 2016 and 2017 as shown in the table above. For 2016 and 2017, the gap between the BBD standard and the advanced biofuel provided an opportunity for "other" advanced biofuels to be generated to satisfy the advanced biofuel standard. While EPA allowed for up to 530 million and 969 million gallons of "other" advanced for 2016 and 2017 respectively, only 97 million and 144 million gallons of "other" advanced biofuels were generated. This is significantly less than the volumes of "other" advanced available in 2012-2013. Despite creating space within the advanced biofuel standard for "other" advanced, in recent years, that space has not been filled with significant volumes of "other" advanced and BBD continues to fill most of the gap between the BBD standard and the advanced standard.

Thus, while the advanced biofuel standard is sufficient to drive biodiesel volume separate and apart from the BBD standard, there would not appear to be a compelling reason to increase the "space" maintained for "other" advanced biofuel volumes. The overall volume of non-cellulosic advanced biofuel volume is proposed to increase by 500 million gallons for 2019. Increasing the BBD volume by the same amount would preserve the space already available for other advanced biofuels to compete.

At the same time, the rationale for preserving the "space" for "other" advanced biofuels remains. 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 in 2012 and 2017 (the most recent year for which complete RIN generation by company 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.[131] 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

[131] "BBD RIN Generation by Company 2012, 2016, and 2017 CBI," available in EPA docket EPA-HQ-OAR-2017-0167.

companies with dispersed market share. By 2017, the average BBD RIN generation per company had climbed to almost 33 million RINs (22 million gallons) annually, a 3-fold increase. Only 33 percent of the companies produced less than 1 million gallons of BBD in 2017.[132]

We are conscious of public comments claiming that BBD volume requirements that are a significant portion of the advanced volume requirements effectively disincentivize the future development of other promising advanced biofuel pathways.[133] A variety of different types of advanced biofuels, rather than a single type such as BBD, would increase 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.[134]

With the considerations discussed above in mind, as well as our analysis of the factors specified in the statute, we are proposing to set the applicable volume of BBD at 2.43 billion gallons for 2020. This increase, in conjunction with the statutory increase of 500 million gallons of non-cellulosic advanced biofuel in 2019, would continue to preserve a gap between the advanced biofuel volume and the sum of the cellulosic biofuel and BBD volumes. This would allow other advanced biofuels to continue to compete with excess volumes of BBD for market share under the advanced biofuel standard. We believe this volume sets the appropriate floor for BBD, and that the volume of advanced biodiesel and renewable diesel actually used in 2020 will be driven by the level of the advanced biofuel and total renewable fuel standards that the Agency will establish for 2020. It also recognizes that while maintaining an opportunity for other advanced biofuels is important, the vast majority of the advanced biofuel used to comply with the advanced biofuel standard in recent years has been BBD. Based on information now available from 2016 and 2017, despite providing a significant degree of space for "other" advanced biofuels, smaller volumes of "other" advanced have been utilized to meet the advanced standard. EPA believes that the BBD standard we are proposing to set today still provides sufficient incentive to producers of "other" advanced biofuels, while also acknowledging that the advanced standard has been met predominantly with biomass-based diesel. Our assessment of the required statutory factors, summarized in the next section and detailed in a memorandum to the docket (the "2020 BBD docket memorandum"), supports our proposal.[135] We request comment on the biomass-based diesel volume requirement for 2020.

We believe this approach 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 advanced

[132] Id.
[133] See, e.g. Comments from National Biodiesel Board on the 2018 Annual Standards, available in EPA docket EPA-HQ-OAR-2017-0167.
[134] All types of advanced biofuel, including BBD, must achieve lifecycle GHG reductions of at least 50 percent. See CAA section 211(o)(1)(B)(i), (D).
[135] "Memorandum to docket: Draft Statutory Factors Assessment for the 2020 Biomass-Based Diesel (BBD) Applicable Volumes." See Docket EPA-HQ-OAR-2018-0167.

standard continues to drive the ultimate volume of BBD supplied. However, given that BBD has been the predominant source of advanced biofuel in recent years and the 500 million gallon increase in non-cellulosic advanced biofuel we are proposing in this rule, we are proposing a volume of 2.43 billion gallons of BBD for 2020. Setting the BBD standard in this manner would preserve a considerable portion of the advanced biofuel volume that could 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 2020

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.[136] 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.[137] 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. EPA is proposing to increase the BBD volume for 2020 to 2.43 billion gallons from 2.1 billion gallons in 2019 based on our review of the statutory factors and the other considerations noted above and in the 2020 BBD Docket Memorandum. This increase, in conjunction with the statutory increase of 500 million gallons of non-cellulosic advanced biofuel in 2019, would preserve a gap for "other" advanced biofuels, that is the difference between the advanced biofuel volume and the sum of the cellulosic biofuel and BBD volumes. This would allow other advanced biofuels to continue to compete with excess volumes of BBD for market share under the advanced biofuel standard, while also supporting further growth in the BBD industry.

Consistent with our approach in setting the final BBD volume requirement for 2019, EPA's primary assessment of the statutory factors for the 2020 BBD applicable volume is that because the BBD requirement is nested within the advanced biofuel volume requirement, we expect that the 2020 advanced volume requirement, when set next year, will determine the level of BBD production and imports that occur in 2020.[138] Therefore, EPA continues to believe that

[136] See CAA section 211(o)(2)(B)(i)(IV), (II).

[137] While excess BBD production could also displace conventional renewable fuel under the total renewable standard, as long as the BBD applicable volume is 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. We acknowledge, however, that under certain market conditions excess volumes of BBD may also be used to displace conventional biofuels.

[138] Even though we are not proposing to set the 2020 advanced biofuel volume requirement as part of this rulemaking, we expect that, as in the past, the 2020 advanced volume requirement will be higher than the 2020 BBD requirement, and, therefore, that the BBD volume requirement for 2020 would not be expected to impact the volume of BBD that is actually produced and imported during the 2020-time period.

approximately the same overall volume of BBD would likely be supplied in 2020 even if we were to mandate a somewhat lower or higher BBD volume for 2020 in this final rule. Thus, we do not expect our 2020 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 2.43 billion gallons in 2020. Even if BBD volumes were to be impacted by the 2020 BBD standard (which as noted above we do not currently expect), setting a requirement higher or lower than 2.43 billion gallons in 2020 would only be expected to affect BBD volumes minimally, 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(o)(2)(B)(ii), and as described in the 2020 BBD docket memorandum, our assessment does not, based on available information, lead us to conclude that a higher or lower volume requirement for BBD than 2.43 billion gallons is more appropriate for 2020.

Overall and as described in the 2020 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 2020 does not lead us to conclude that we should set the BBD standard at a level higher or lower than 2.43 billion gallons in 2020.

VII. Percentage Standards for 2019

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 II through V provide our rationale and basis for the proposed volume requirements for 2019.[139] The volumes used to determine the proposed percentage standards are shown in Table VII-1.

Table VII-1
Volumes for Use in Determining the Proposed 2019
Applicable Percentage Standards

Cellulosic biofuel	Million ethanol-equivalent gallons	381
Biomass-based diesel	Billion gallons	2.1
Advanced biofuel	Billion ethanol-equivalent gallons	4.88
Renewable fuel	Billion ethanol-equivalent gallons	19.88

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 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 2019 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

[139] The 2019 volume requirement for BBD was established in the 2018 final rule.

biodiesel used in transportation fuel. Since the percentage standards apply only to the non-renewable gasoline and diesel produced or imported, the volumes of renewable fuel 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 under §80.1407.

As specified in the RFS2 final rule,[140] 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 in order to calculate a percentage standard that is on the same basis (i.e., ethanol-equivalent) as the other three standards. However, BBD often contains some renewable diesel, and a gallon of renewable diesel typically generates 1.7 RINs.[141] 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 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 in 2019. That is, we expect that actual supply of BBD, as well as supply of conventional 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

[140] See 75 FR 14670 (March 26, 2010).
[141] In some cases a gallon of renewable diesel generates either 1.5 or 1.6 RINs.

exemption to small refineries[142] 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 disproportionate economic hardship, and may grant refineries exemptions upon such demonstration.

EPA has granted exemptions pursuant to this process in the past. However, at this time no exemptions have been approved for 2019, and therefore we have calculated the percentage standards for 2019 without any adjustment for exempted volumes. EPA is maintaining its approach that any exemptions for 2019 that are granted after the final rule is released will not be reflected in the percentage standards that apply to all gasoline and diesel produced or imported in 2019. EPA is not soliciting comments on how small refinery exemptions are accounted for in the percentage standards formulas in 40 CFR 80.1405, and any such comments will be deemed beyond the scope of this rulemaking.

C. Proposed 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.[143]

[142] A small refiner that meets the requirements of 40 CFR 80.1442 may also be eligible for an exemption.
[143] To determine the 49-state values for gasoline and diesel, the amount of these fuels used in Alaska is subtracted from the totals provided by EIA because petroleum based fuels used in Alaska do not incur RFS obligations. The Alaska fractions are determined from the June 30, 2017 EIA State Energy Data System (SEDS), Energy Consumption Estimates.

Table VII.C-1
Values for Terms in Calculation of the Proposed 2019 Standards[144] (billion gallons)

Term	Description	Value
RFV_{CB}	Required volume of cellulosic biofuel	0.381
RFV_{BBD}	Required volume of biomass-based diesel	2.10
RFV_{AB}	Required volume of advanced biofuel	4.88
RFV_{RF}	Required volume of renewable fuel	19.88
G	Projected volume of gasoline	143.76
D	Projected volume of diesel	56.46
RG	Projected volume of renewables in gasoline	14.74
RD	Projected volume of renewables in diesel	2.83
GS	Projected volume of gasoline for opt-in areas	0.00
RGS	Projected volume of renewables in gasoline for opt-in areas	0.00
DS	Projected volume of diesel for opt-in areas	0.00
RDS	Projected volume of renewables in diesel for opt-in areas	0.00
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 derived from the April 2018 version of EIA's Short-Term Energy Outlook.

[144] See "Calculation of proposed % standards for 2019" in docket EPA-HQ-OAR-2018-0167.

Using the volumes shown in Table VII.C-1, we have calculated the proposed percentage standards for 2019 as shown in Table VII.C-2.

Table VII.C-2
Proposed Percentage Standards for 2019

Cellulosic biofuel	0.209%
Biomass-based diesel	1.72%
Advanced biofuel	2.67%
Renewable fuel	10.88%

VIII. Public Participation

We request comment on all aspects of this proposal. This section describes how you can participate in this process.

A. How Do I Submit Comments?

We are opening a formal comment period by publishing this document. We will accept comments during the period indicated under the **DATES** section above. If you have an interest in the proposed standards, we encourage you to comment on any aspect of this rulemaking. We also request comment on specific topics identified throughout this proposal.

Your comments will be most useful if you include appropriate and detailed supporting rationale, data, and analysis. Commenters are especially encouraged to provide specific suggestions for any changes that they believe need to be made. You should send all comments, except those containing proprietary information, to our Docket (see **ADDRESSES** section above) by the end of the comment period.

You may submit comments electronically through the electronic public docket, www.regulations.gov, by mail to the address shown in ADDRESSES, or through hand delivery/courier. To ensure proper receipt by EPA, identify the appropriate docket identification number in the subject line on the first page of your comment. Please ensure that your comments are submitted within the specified comment period. Comments received after the close of the comment period will be marked "late." EPA is not required to consider these late comments. If you wish to submit Confidential Business Information (CBI) or information that is otherwise protected by statute, please follow the instructions in Section VIII.B below.

EPA will also hold a public hearing on this proposed rule. We will announce the public hearing date and location for this proposal in a supplemental Federal Register document.

B. How Should I Submit CBI To The Agency?

Do not submit information that you consider to be CBI electronically through the electronic public docket, www.regulations.gov, or by e-mail. Send or deliver information identified as CBI only to the following address: U.S. Environmental Protection Agency, Assessment and Standards Division, 2000 Traverwood Drive, Ann Arbor, MI, 48105, Attention Docket ID EPA-HQ-OAR-2018-0167. You may claim information that you submit to EPA as CBI by marking any part or all of that information as CBI (if you submit CBI on disk or CD ROM, mark the outside of the disk or CD ROM as CBI and then identify electronically within the disk or CD ROM the specific information that is CBI). Information so marked will not be disclosed except in accordance with procedures set forth in 40 CFR part 2.

In addition to one complete version of the comments that include any information claimed as CBI, a copy of the comments that does not contain the information claimed as CBI

must be submitted for inclusion in the public docket. This non-CBI version of your comments may be submitted electronically, by mail, or through hand delivery/courier. If you submit the copy that does not contain CBI on disk or CD ROM, mark the outside of the disk or CD ROM clearly that it does not contain CBI. Information not marked as CBI will be included in the public docket without prior notice. If you have any questions about CBI or the procedures for claiming CBI, please consult the person identified in the **FOR FURTHER INFORMATION CONTACT** section.

IX. 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 V of this preamble.

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

This action is expected to be an Executive Order 13771 regulatory action. Details on the estimated costs of this proposed rule can be found in EPA's analysis of the illustrative costs associated with this action. This analysis is presented in Section V 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 proposed 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 proposed rule on small entities from two perspectives: as if the 2019 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 cellulosic biofuel volume by 93 million gallons and the advanced and total

renewable fuel volumes required of obligated parties by 590 million gallons between 2018 and 2019. To evaluate the impacts of the volume requirements on small entities relative to 2018, EPA has conducted a screening analysis[145] 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.[146] 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 V of this preamble and the gasoline and diesel fuel volume projections and wholesale prices from the April 2018 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 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 as required by 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 proposed rule would not impose any additional requirements on small entities beyond those already analyzed, since the impacts of this rule are

[145] "Screening Analysis for the Proposed Renewable Fuel Standards for 2019," memorandum from Dallas Burkholder, Nick Parsons, and Tia Sutton to EPA Air Docket EPA-HQ-OAR-2018-0167.
[146] For a further discussion of the ability of obligated parties to recover the cost of RINs see "Denial of Petitions for Rulemaking to Change the RFS Point of Obligation," EPA-420-R-17-008, November 2017.

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 proposes to increase the 2019 cellulosic biofuel volume requirement by 93 million gallons and the advanced and total renewable fuel volume requirements by 590 million gallons relative to the 2018 volume requirements, but those volumes remain significantly below the statutory volume targets analyzed in the RFS2 final rule. 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 proposing to increase the volume requirement for 2020 by 330 million gallons relative to the 2019 volume requirement we finalized in the 2018 final rule. 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 proposing to set the 2020 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 proposed 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, 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.[147] 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 the refinery is 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 has currently identified a total of 10 small refiners that own 12 refineries subject to the RFS program, all of which have been identified as being small refineries.

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

[147] See CAA section 211(o)(9)(B).

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 20 small refineries for the 2016 RFS standards (3 of which were owned by a small refiner) and 29 small refineries for the 2017 RFS standards (8 of which were owned by a small refiner).[148]

Given that this proposed 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 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.

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 proposed 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.

[148] EPA is currently evaluating 4 additional 2017 petitions, bringing the total number of petitions for 2017 to 33.

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 proposes the required renewable fuel content of the transportation fuel supply for 2019, 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 security 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 proposed 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.

X. 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 proposed 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.

Dated: _____.

_____
E. Scott Pruitt,
Administrator.

For the reasons set forth in the preamble, EPA proposes to amend 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 new paragraph (a)(10) to read as follows:

§80.1405 What are the Renewable Fuel Standards?

(a) * * *

(10) Renewable Fuel Standards for 2019.

(i) The value of the cellulosic biofuel standard for 2019 shall be 0.209 percent.

(ii) The value of the biomass-based diesel standard for 2019 shall be 1.72 percent.

(iii) The value of the advanced biofuel standard for 2019 shall be 2.67 percent.

(iv) The value of the renewable fuel standard for 2019 shall be 10.88 percent.

* * * * *