ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 80

[EPA–HQ–OAR–2015–0111; FRL–9939–72–OAR]

RIN 2060–AS22

Renewable Fuel Standard Program: Standards for 2014, 2015, and 2016 and Biomass-Based Diesel Volume for 2017

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: Under section 211 of the Clean Air Act, the Environmental Protection Agency (EPA) is required to set renewable fuel percentage standards every year. This action establishes the annual percentage standards for cellulosic biofuel, biomass-based diesel, advanced biofuel, and total renewable fuel that apply to all motor vehicle gasoline and diesel produced or imported in the years 2014, 2015, and 2016. The EPA is establishing a cellulosic biofuel volume for all three years that is below the applicable volume specified in the Act, and is also rescinding the cellulosic biofuel standard for 2011. Relying on statutory waiver authorities, the EPA is adjusting the applicable volumes of advanced biofuel and total renewable fuel for all three years. The 2016 standards are expected to spur further progress in overcoming current constraints in renewable fuel distribution infrastructure, which in turn is expected to lead to substantial growth over time in the production and use of renewable fuels. In this action, we are also establishing the applicable volume of biomass-based diesel for 2017. Finally, we are setting the compliance and attest reporting deadlines for the years 2013, 2014, and 2015, as well as finalizing regulatory amendments to clarify the scope of the existing algal biofuel pathway.

DATES: This final rule is effective on February 12, 2016.

ADDRESSES: The EPA has established a docket for this action under Docket ID No. EPA–HQ–OAR–2015–0111. All documents in the docket are listed on the *http://www.regulations.gov* Web site. Although listed in the index, some information is not publicly available, *e.g.,* CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed in the electronic docket and will be publicly available only in hard copy form. Publicly available docket materials are available electronically through *http://www.regulations.gov*.

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SUPPLEMENTARY INFORMATION:

General Information

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

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

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

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

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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), resulting in the publication of major revisions to the regulatory requirements on March 26, 2010.[1] [2] EISA's stated goals include moving the United States toward ''greater energy independence and security, to increase the production of clean renewable fuels.'' Since the initial promulgation of the RFS program regulations in 2007, domestic production and use of renewable fuel in the U.S. has increased substantially. According to the Energy Information Administration (EIA), fuel ethanol production in the U.S. more than doubled in volume from approximately 6.5 billion gallons in 2007 to about 14.3 billion gallons in 2014.[3] Growth in biodiesel and renewable diesel production in the U.S. has increased more than two and a half times, from approximately 0.5 billion gallons in 2007 to 1.46 billion gallons in 2014.[4] Today, nearly all of the approximately 139 billion gallons of gasoline used for transportation purposes contains 10 percent ethanol (E10).

The fundamental objective of the RFS provisions under the CAA is clear: To increase the use of renewable fuels in the U.S. transportation system every year through at least 2022 in order to reduce greenhouse gases (GHGs) and increase energy security. Further, renewable fuels from facilities that commenced construction after 2007 must be better performing in terms of their greenhouse gas emissions, as compared on a lifecycle basis, to the petroleum based fuels they are replacing. Cellulosic biofuels are required to have 60 percent or greater greenhouse gas (GHG) emissions benefits on a lifecycle basis than the petroleum based fuels they replace; advanced biofuels (including biomass-based diesel) must have a 50 percent or greater benefit; and conventional biofuels (other than grandfathered facilities) must have a 20 percent or better benefit. Increased use of renewable fuels means less use of fossil fuels, which generally results in lower GHG emissions over time, especially when advanced biofuel production and use becomes more commonplace. By aiming to diversify the country's fuel supply, Congress also intended to increase the nation's energy security. Renewable fuels represent an opportunity for the U.S. to move away from fossil fuels towards a set of lower GHG transportation fuels, and a chance for a still-developing low GHG technology sector to grow. These lower GHG renewable fuels include corn starch ethanol, the predominant renewable fuel in use to date, but Congress envisioned the majority of growth over time to come from advanced biofuels, as the non-advanced (conventional) volumes remain constant in the statutory volume tables starting in

[1] 75 FR 14670, March 26, 2010.

[2] A full description of the statutory basis of the RFS program and EPA's actions to develop and implement the regulatory program are provided in a memorandum to the docket. See, ''Statutory basis of the RFS program and development of the regulatory program,'' memorandum from Madison Le to EPA docket EPA–HQ–OAR–2015–0111.

[3] EIA's Monthly Energy Review, April 2015, Table 10.3.

[4] 2007 volume represents biodiesel only, from EIA's Monthly Energy Review, April 2015, Table 10.4. 2014 volume represents biodiesel and renewable diesel domestic production from EMTS.

2015 while the advanced volumes continue to grow.[5]

The statute includes annual volume targets,[6] 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 refiners and importers must meet every year. In this action, EPA is establishing the annual percentage standards for cellulosic biofuel, biomass-based diesel, advanced biofuel, and total renewable fuel that apply to all motor vehicle gasoline and diesel produced or imported in the years 2014, 2015, and 2016. We are also establishing the applicable volume of biomass-based diesel for 2017.

In the June 10, 2015 notice of proposed rulemaking (NPRM), we proposed standards based on an approach that sought to achieve the Congressional intent of increasing renewable fuel use over time in order to address climate change and increase energy security, while at the same time accounting for the real-world challenges that have slowed progress toward such goals.[7] Those challenges have made the volume targets established by Congress for 2014, 2015, and 2016 beyond reach. In the NPRM we proposed to use waiver mechanisms that Congress provided to allow for the volume targets to be reduced if necessary. The proposed volume requirements were lower than the statutory targets but set at a level that we believed would spur growth in renewable fuel use, consistent with Congressional intent.

In this action, we are finalizing standards that make use of the statute's waiver provisions. The final standards differ from the proposed standards based on new information, consideration of public comments, and corrected calculations. Details of these changes are provided below. By finalizing the percentage standards for 2016 by November 30, 2015, we are returning to the statutory timeline for issuing standards under the RFS program.[8]

We received a substantial number of comments on our proposed use of the statute's waiver authorities, with commenters both supporting and opposing our approach. In addition to comments on our proposed use of waiver authorities, we received comments on multiple other areas of the proposal, including our proposed treatment of carryover RINs, our proposed approach to determining the volume requirements, and other areas. We address these comments in this preamble as well as in a response-to-comment (RTC) document, which can be found in the docket for this action.

While we are using the statutory waiver authorities in establishing final 2014, 2015, and 2016 standards for cellulosic biofuel, advanced biofuel, and total renewable fuel, as we proposed to do, the volumes we are finalizing differ from the proposed volumes in order to reflect updated and corrected information, and to provide year-to-year growth consistent with the statute's intent. Key corrections and updates include:

- Updating our assessment of volumes of renewable fuel that can be blended at various concentrations into petroleum fuel and our calculation of all of the percentage standards to take into account changes in EIA's projected gasoline and diesel demand for 2016.
- Correcting an error in determining actual volumes of ethanol supplied in 2014. EPA acknowledged this error in July 2015 by placing a memo in the docket.[9] Correcting the error leads to a higher 2014 total renewable fuel volume requirement than the level in the NPRM.
- Accounting for higher than expected supply of biodiesel and renewable diesel in 2015, providing a basis for expecting similar growth in biodiesel and renewable diesel volumes in 2016.

For 2016, we are finalizing volume requirements that are significantly higher than proposed, and that represent significant growth compared to actual renewable fuel use in 2015. While some stakeholders commented that reductions from the statutory targets would lead to a stagnation in growth, we disagree with this view. We proposed a 2016 volume requirement for total renewable fuel that was 1.1 billion gallons greater than the proposed 2015 volume requirement—a significant level of growth in one year. Our final 2016 volume requirements are also ambitious, with substantial growth in all four categories relative to 2015. We are also setting a final volume requirement for BBD for 2017 that continues the growth in that category of renewable fuel. The final volume requirements are shown in Table I–1 below.

TABLE I–1—FINAL VOLUME REQUIREMENTS [a]

	2014	2015	2016	2017
Cellulosic biofuel (million gallons)	33	123	230	n/a
Biomass-based diesel (billion gallons)	1.63	1.73	1.90	2.00
Advanced biofuel (billion gallons)	2.67	2.88	3.61	n/a
Renewable fuel (billion gallons)	16.28	16.93	18.11	n/a

[a] All values are ethanol-equivalent on an energy content basis, except for BBD which is biodiesel-equivalent.

Our decision to finalize volumes for total renewable fuel that rely on exercising the general waiver authority is based on the same fundamental reasoning we relied upon in the June 10, 2015 proposal. Despite significant increases in renewable fuel use in the United States, real-world constraints, such as the slower than expected development of the cellulosic biofuel industry and constraints in the marketplace needed to supply certain biofuels to consumers, have made the timeline laid out by Congress impossible to achieve. These challenges remain, even as we recognize the success of the RFS program over the past decade in boosting renewable fuel use, and the recent signs of progress towards development of increasing volumes of advanced, low GHG-emitting fuels, including cellulosic biofuels.

We believe that the RFS program can and will drive renewable fuel use and, indeed, we have considered the ability of the market to respond to the standards we set when we assessed the

[5] In this document we follow the common practice of using the term ''conventional'' renewable fuel to mean any renewable fuel that is not an advanced biofuel.

[6] CAA section 211(o)(2)(B).

[7] See 80 FR 33100.

[8] We are also setting the BBD volume requirement for 2017 in this final rule. Under the statute, it was required to be set by November 1, 2015.

[9] See Docket Item No. EPA–HQ–OAR–2015–0111–1219.

amount of renewable fuel that can be supplied. Therefore, while this final rule applies the tools Congress provided to make adjustments to the statutory volume targets in recognition of the constraints that exist today, we believe the standards we are finalizing today will drive growth in renewable fuels, particularly advanced biofuels which achieve the lowest lifecycle GHG emissions. In our view, while Congress recognized that supply challenges may exist as evidenced by the waiver provisions, it did not intend growth in the renewable fuels market to be stopped by those challenges, including those associated with the ''E10 blendwall.'' [10] The fact that Congress chose to mandate increasing and substantial amounts of renewable fuel clearly signals that it intended the RFS program to create incentives to increase renewable fuel supplies and overcome constraints in the market. The standards we are finalizing will provide those incentives.

The final volume requirements will push the fuels sector to produce and blend more renewable fuels in 2016 in a manner that is consistent with the goals Congress envisioned. The final volumes are less than the statutory targets for 2016 but higher than what the market would produce and use in the absence of such market-driving standards. The 2016 standards are expected to spur further progress in overcoming current challenges and lead to continued growth in the production and use of qualifying renewable fuels, including higher-level ethanol blends. In this regard the final standards are intended to fulfill the spirit and intent of Congress and provide guidance to market participants.

Various commenters in the biofuels industry disagreed with our assessment that the approach described in the NPRM, in which we proposed to reduce the statutory targets using the available waiver authorities, would nevertheless support growth in renewable fuels. We address these comments throughout this document and the response to comments (RTC) document. We emphasize, however, that our fundamental goal is to implement the RFS program in such a way as to promote growth of renewable fuel use over time. We have conducted significant technical analysis, both in the proposed rule and in this final rule, to better understand and characterize the renewable fuels market and the RFS program, all in an effort to implement the program on a schedule that matches as nearly as possible that set forth in the statute.[11] We believe the approach taken in this final rule—in which we use the general waiver authority only to the extent necessary in light of real world constraints to make the requirements reasonably achievable, and we use the cellulosic waiver authority for advanced biofuel in a manner that allows advanced biofuel to significantly backfill for missing volumes of cellulosic biofuel—will achieve that goal.

The RFS program can be thought of as a market forcing policy. The objective of the program is to introduce increasing volumes of renewable fuels, with a focus on cellulosic and other advanced renewable fuels, into the marketplace. Congress made the decision that this is an appropriate policy objective, and put in place a program to achieve that policy goal. A key issue in implementing any program designed to advance new technologies and increase use of existing technologies, however, is the question of lead time. Technologies are typically phased in over time—in many cases over many years—to allow for the development of the technology and the steady growth in penetration of that technology into the marketplace. New technologies do not typically start at 90 or 100 percent penetration rates; they can take time to overcome investment, technical, and market hurdles to their development, deployment and use. The greater the number and type of these challenges, the longer the lead time must be to achieve the desired policy goal. In establishing the RFS program, Congress not only recognized that biofuels would need to phase in over time, and thus established a ramp-up of renewable fuel volume targets over time, but also established provisions in the law allowing EPA to waive in whole or in part implementation of those targets under certain circumstances. Our exercising of those waiver authorities is not an attempt to undermine program growth, as some commenters argue, but rather a recognition of real world constraints that necessitate an adaptive approach to managing the program. Growth will, and must, continue under the law, but Congress recognized that in some cases, driving the introduction of a new technology requires an acknowledgment that new technologies can in some cases require longer lead times to achieve success. Trying to force growth at rates that prove infeasible would only undermine the certainty in the RFS program that is needed to sustain long-term growth.

As stated in the NPRM, this final rule comes during a period of transition for the RFS program. In the program's early years, compliance with the advanced biofuel and total renewable volume requirements could be readily achieved in large part by blending increasing amounts of ethanol into gasoline and biodiesel into diesel fuel. As the program progresses, however, significantly increasing renewable fuel volumes will require pushing beyond current constraints on ethanol and biodiesel use and will require sustained growth in the development and use of advanced, non-ethanol renewable fuels, including drop-in renewable fuels. This final rule acknowledges this transition by finalizing volume requirements based not only on the volumes of renewable fuels that have already been achieved in 2014 and the months in 2015 leading up to this final action, but also on the volumes that can be supplied in 2016 as the market addresses infrastructure and other constraints. Our final rule includes volumes of renewable fuel that will require either ethanol use at levels significantly beyond the level of the E10 blendwall, or significantly greater use of non-ethanol renewable fuels, such as biodiesel and renewable diesel, than has occurred to date, depending on how the market responds to the standards we set. The standards we are finalizing are consistent with the purpose of the statute: to significantly increase the amount of renewable fuel used in the supply of transportation fuel over time, particularly renewable fuels with the lowest lifecycle GHG emissions.

Since the amount of renewable fuel that can be produced and imported is larger than the volume that can be consumed due to limited demand for transportation fuel and constraints on supply of renewable fuels to vehicles and engines, there is necessarily competition among biofuels for retail consumption in the United States. In setting the biomass-based diesel volume requirement we have worked to achieve an appropriate and reasonable balance between setting a volume requirement that would provide support for the established BBD industry, while also providing opportunities under the

[10] The ''E10 blendwall'' represents the volume of ethanol that can be consumed domestically if all gasoline contains 10% ethanol and there are no higher-level ethanol blends consumed such as E15 or E85.

[11] See, for example, the supporting documents ''A Preliminary Assessment of RIN Market Dynamics, RIN Prices, and Their Effects,'' ''An Assessment of the Impact of RIN Prices on the Retail Price of E85,'' and ''Correlating E85 consumption volumes with E85 price''. These documents discuss the expected impacts of the price of RINs on the transportation fuels and renewable fuels marketplace, the potential for the RFS program to incentivize additional production and use of renewable fuels, and the observed impacts of the RFS on the fuels market over the past several years.

advanced biofuel volume requirement to incentivize continued development and production of emerging biofuels. The approach we have used to determine the final volumes is consistent with Congressional intent in establishing the RFS program in that it provides an opportunity for a diverse array of renewable fuel types to be used for compliance. Competition is good for market participants, including obligated parties and consumers, as it permits the market to determine the most efficient, lowest cost, best performing fuels for meeting the increasingly higher volume requirements anticipated over time under the program. However, it is also important to provide support to existing successful biofuels and to provide incentives for those fuels, especially advanced biofuels, which produce the greatest reductions in GHGs. To this end, as discussed in Section III, we are finalizing specific volume requirements for biomass-based diesel (BBD) through 2017.

As indicated in the NPRM, in establishing the standards for 2014, we must acknowledge that the compliance year has passed and any standard EPA sets for 2014 can no longer influence renewable fuel production or use in that year. Therefore, we are issuing a final rule for 2014 that reflects those volumes of renewable fuel that were actually supplied in 2014. Details regarding how we calculated the final ''actual'' volumes used in 2014 are discussed in Section II.C below.

With regard to 2015, the proposed volume requirements were based in part on actual volumes supplied in the first part of the year, and in part based on a determination of growth that was possible (and which could be incentivized through the NPRM) in the balance of the year. Actual data on supply after release of the June 10, 2015 NPRM indicates that the market responded to the NPRM by increasing supply in comparison to the period prior to the release of the NPRM. The final standards for 2015 have been set based on updated production and consumption data available as of issuance of this final rule, and a projection of what is expected to be produced and used through the end of 2015, taking into account the inability of the market to respond to this final action in light of the little time remaining in the year.

For 2016, our approach is to set final volumes that take into account both the constraints in the supplies that exist, and the ability of the RFS program to incentivize growth. Where appropriate we also take into consideration other factors such as the impact of the BBD standard on incentivizing the production and use of other advanced biofuels, and the benefits provided by advanced biofuels in backfilling some of the volume that Congress envisioned would be provided in 2016 by cellulosic biofuels.

This final rule represents EPA's commitment and continued support for steady growth in renewable fuel use. We recognize that the RFS standards are only one element among many that factor into the success of renewable fuel development and use over time. The standards that EPA sets each year are an important part of the overall picture, but this program is complemented and supported by programs managed by the U.S. Departments of Agriculture (USDA) and Energy (DOE), as well as myriad of efforts and initiatives at the regional and local level and within the private sector. DOE has invested considerable resources to help deploy the advanced technologies needed to achieve the statutory aims of lower carbon fuels, and has leveraged several billion dollars more in private support for development of advanced renewable fuels. USDA's Biofuel Infrastructure Partnership program will provide $100 million in grants for the expansion of renewable fuel infrastructure, and their Biorefinery Assistance Program has provided loan guarantees for the development and construction of commercial scale biorefineries with a number of the new projects focused on producing fuels other than ethanol. Greater GHG benefits are expected to be realized as the production and use of advanced biofuels accelerates, and the volume requirements that we are finalizing support this goal.

A. Purpose of This Action

The national volume targets of renewable fuel that are intended to be achieved under the RFS program each year (absent an adjustment or waiver by EPA) are specified in CAA section 211(o)(2). The statutory volumes for 2014, 2015, and 2016 are shown in Table I.A–1. The cellulosic biofuel and BBD categories are nested within the advanced biofuel category, which is itself nested within the total renewable fuel category. This means, for example, that each gallon of cellulosic biofuel or BBD that is used to satisfy the individual volume requirements for those fuel types can also be used to satisfy the requirements for advanced biofuel and total renewable fuel.

TABLE I.A–1—APPLICABLE VOLUMES SPECIFIED IN THE CLEAN AIR ACT

[Billion gallons] [a]

	2014	2015	2016
Cellulosic biofuel	1.75	3.0	4.25
Biomass-based diesel	≥1.0	≥1.0	≥1.0
Advanced biofuel	3.75	5.5	7.25
Renewable fuel	18.15	20.5	22.25

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

Under the RFS program, EPA is required to determine and publish annual percentage standards for each compliance year. The percentage standards are calculated to ensure use in transportation fuel of the national ''applicable volumes'' of the four types of biofuel (cellulosic biofuel, BBD, advanced biofuel, and total renewable fuel) that are set forth in the statute or established by EPA in accordance with the Act's requirements. The percentage standards are used by obligated parties (generally, producers and importers of gasoline and diesel fuel) to calculate their individual compliance obligations. Each of the four percentage standards is applied to the volume of non-renewable gasoline and diesel that each obligated party produces or imports during the specified calendar year to determine their individual volume obligations with respect to the four renewable fuel types. The individual volume obligations determine the number of RINs of each renewable fuel type that each obligated party must acquire and retire to demonstrate compliance.

Today EPA is establishing the annual applicable volume requirements for cellulosic biofuel, advanced biofuel, and total renewable fuel for 2014, 2015, and 2016, and for BBD for 2014, 2015, 2016,

and 2017. Table I.A–2 lists the statutory provisions and associated criteria relevant to determining the national applicable volumes used to set the percentage standards in this final rule.

TABLE I.A–2—STATUTORY PROVISIONS FOR DETERMINATION OF APPLICABLE VOLUMES

Applicable volumes	Clean Air Act reference	Criteria provided in statute for determination of applicable volume
Cellulosic biofuel	211(o)(7)(D)(i)	Required volume must be lesser of volume specified in CAA section 211(o)(2)(B)(i)(III) or EPA's projected volume in coordination with other federal agencies.
	211(o)(7)(A)	EPA may waive the statutory volume in whole or in part if implementation would severely harm the economy or environment of a State, region, or the United States, or if there is an inadequate domestic supply.
Biomass-based diesel [12]	211(o)(2)(B)(ii) and (v)	Required volume for years after 2012 must be at least 1.0 billion gallons, and must be based on a review of implementation of the program, coordination with other federal agencies, and an analysis of specified factors.
	211(o)(7)(A)	EPA may waive the statutory volume in whole or in part if implementation would severely harm the economy or environment of a State, region, or the United States, or if there is an inadequate domestic supply.
Advanced biofuel	211(o)(7)(D)(i)	If applicable volume of cellulosic biofuel is reduced below the statutory volume to the projected volume, EPA may reduce the advanced biofuel and total renewable fuel volumes in CAA section 211(o)(2)(B)(i)(I) and (II) by the same or lesser volume. No criteria specified.
	211(o)(7)(A)	EPA may waive the statutory volume in whole or in part if implementation would severely harm the economy or environment of a State, region, or the United States, or if there is an inadequate domestic supply.
Total renewable fuel	211(o)(7)(D)(i)	If applicable volume of cellulosic biofuel is reduced below the statutory volume to the projected volume, EPA may reduce the advanced biofuel and total renewable fuel volumes in CAA section 211(o)(2)(B)(i)(I) and (II) by the same or lesser volume. No criteria specified.
	211(o)(7)(A)	EPA may waive the statutory volume in whole or in part if implementation would severely harm the economy or environment of a State, region, or the United States, or if there is an inadequate domestic supply.

By re-proposing the 2014 standards along with a proposed rule for the 2015 and 2016 standards, we were not only able to formulate a proposed rule for public comment that takes into account the fact that 2014 is over, but we were also able to coordinate the treatment of 2014 with the treatment of 2015, where part of the year has likewise already passed. We therefore withdrew the November 29, 2013, NPRM,[13] and the June 10, 2015, NPRM replaced and superseded that earlier proposed rule. The timing of this final rule is being issued consistent with terms of a final consent decree entered into by the EPA on April 10, 2015. This consent decree resolves pending litigation concerning EPA's failure to establish standards for 2014 and 2015 by the statutory deadlines and includes a requirement for EPA to promulgate final standards for 2014 and 2015 by November 30, 2015.[14]

As shown in Table I.A–2, the statutory authorities that provide direction to EPA for how to modify or set the applicable standards differ for the four categories of renewable fuel. Under the statute, EPA must annually determine the projected volume of cellulosic biofuel production for the following year. If the projected volume of cellulosic biofuel production is less than the applicable volume specified in 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 volume of production during the year. In Section IV of this final rule, we present our analysis of cellulosic biofuel production and the final applicable volumes for 2014, 2015, and 2016. This analysis is based on an assessment of actual cellulosic biofuel supply in 2014 and parts of 2015, estimates from EIA, an evaluation of producers' production plans and progress to date following discussions with cellulosic biofuel producers, and review of comments we received in response to the NPRM.

With regard to BBD, CAA section 211(o)(2)(B) specifies the applicable volumes of BBD to be used in the RFS program only through year 2012. For subsequent years the statute sets a minimum volume of 1 billion gallons, and directs EPA to set the required volume after review of the renewable fuels program, consultation with USDA and DOE as well as consideration of a number of factors. In Section III of this preamble we discuss our assessment of statutory and other relevant factors and our final volume requirements for BBD for 2014, 2015, 2016, and 2017. We are finalizing growth in the required volume of BBD in such a way that both the BBD market and other advanced biofuels will grow.

Regarding advanced biofuel and total renewable fuel, Congress provided several mechanisms through which

[12] Section 211(o)(7)(E) also authorizes EPA to issue a temporary waiver of applicable volumes of BBD where EPA determines that there is a significant feedstock disruption or other market circumstance that would make the price of BBD fuel increase significantly.

[13] See 78 FR 71732 (November 29, 2013) and 79 FR 73007 (December 9, 2014).

[14] See *American Fuel and Petrochemical Manuf. et al.* v. *EPA* (No. 15–cv–394, D.D.C.). The consent decree also requires that EPA respond by November 30, 2015 to the plaintiffs' petition seeking a waiver in part of the 2014 statutory volume targets.

those volumes could be reduced if necessary. If we lower the applicable volume of cellulosic biofuel below the volume specified in CAA section 211(o)(2)(B)(i)(III), we also have the authority to reduce the applicable volumes of advanced biofuel and total renewable fuel by the same or a lesser amount. We refer to this as the ''cellulosic waiver authority.'' We may also reduce the applicable volumes of any of the four renewable fuel types under the ''general waiver authority'' provided at CAA section 211(o)(7)(A) if EPA finds that implementation of the statutory volumes would severely harm the economy or environment of a State, region, or the United States, or if there is inadequate domestic supply. Section II of this final rule describes our use of the cellulosic waiver authority to reduce volumes of advanced biofuel and total renewable fuel and the general waiver authority to further reduce volumes of total renewable fuel. Exercise of our waiver authorities is necessary to address important realities, including:

- Substantial limitations in the supply of cellulosic biofuel,
- Insufficient supply of other advanced biofuel to offset the shortfall in cellulosic biofuel, and
- Practical and legal constraints on the ability of the market to supply renewable fuels to the vehicles that can use them.

We believe these realities justify the exercise of the authorities Congress provided us to waive the statutory volumes. At the same time, we are mindful that the primary objective of the statute is to increase renewable fuel use over time. For the total renewable fuel requirement in this rule, we are using the waiver authorities only to the extent necessary to derive applicable volumes that reflect the maximum supply that can reasonably be expected to be produced and consumed by a market that is responsive to the RFS standards. This is a very challenging task not only in light of the myriad complexities of the fuels market and how individual aspects of the industry might change in the future, but also because we cannot precisely predict how the market will respond to the volume-driving provisions of the RFS program. Thus the determination of the final total renewable fuel volume requirement is one that we believe necessarily involves considerable exercise of judgment. Based on our assessment of available renewable fuel supply, and after consultation with the Departments of Agriculture and Energy, we believe that adjustments to the statutory targets for total renewable fuel are warranted for 2014, 2015, and 2016. While the final volume requirements for 2014 and 2015 are either equal to actual supply or (for 2015) a projection from actual supply, the volume requirement for 2016 will lead to growth in supply beyond the levels achieved in the past, based on the expectation that the market can and will respond to the standards we set.

For the advanced biofuel volume requirements, we are using the cellulosic waiver authority to derive a volume requirement for 2014 that is based on actual supply; a volume requirement for 2015 that is based on actual supply during months for which data are available, and a projection from those levels for the remaining months in the year; and a volume requirement for 2016 that is reasonably attainable and which to a significant extent will result in backfilling the shortfall in cellulosic biofuel volumes with other advanced biofuels that also provide substantial GHG emission reductions.[15]

B. Summary of Major Provisions in This Action

This section briefly summarizes the major provisions of this final rule. We are establishing applicable volume requirements for cellulosic biofuel, BBD, advanced biofuel, and total renewable fuel for 2014, 2015, and 2016, as well as the applicable volume requirement for BBD for 2017. This action also includes a final response to several requests we received in 2013 for a waiver of the 2014 standards. We are also finalizing an amendment to the regulations designed to clarify the scope of the algal biofuel pathway. Finally, we are establishing new deadlines for annual compliance reporting and attest reporting for the 2013, 2014 and 2015 compliance years.

1. Final Approach to Setting Standards for 2014, 2015, and 2016

Because 2014 has passed, this final rule cannot alter the volumes of renewable fuel produced and consumed during 2014. We believe it is appropriate, therefore, that the standards we establish for 2014 reflect the actual supply of renewable fuel in 2014. Although we believe that the standards we set for advanced biofuel and total renewable fuel must be ambitious to be consistent with the intent of Congress in establishing the RFS program, we also recognize that the final standards we set cannot affect the past. Therefore, in this action we are basing the applicable volume requirements for 2014 on actual renewable fuel use, as determined by data on the number of Renewable Identification Numbers (RINs) generated from the EPA-Moderated Transaction System (EMTS), minus the number of RINs retired to account for renewable fuel export as reported by the Census Bureau, or retired for other purposes unrelated to demonstrating compliance with the annual standards as reported through EMTS.[16] While this approach would result in exactly the number of 2014 RINs available for compliance that would be needed for compliance with the 2014 standards, we recognize that it does not guarantee that every individual obligated party will have the exact number of 2014 RINs needed for compliance with its individual RVOs. Thus there may be some cost associated with the reallocation of 2014 RINs to those obligated parties that need them. However, such variations in RIN holdings between obligated parties can occur in any year. We do not believe it would be appropriate to exercise our waiver authority to reduce the 2014 standards below the number of 2014 RINs that were generated and are available for compliance. Rather, we believe that we should rely on the market to sort out the distribution of RINs among obligated parties as was the intent in establishing the RIN trading mechanism. We are revising the deadline for obligated parties to demonstrate compliance with the RFS standards to afford obligated parties additional time to engage in transactions to acquire the RINs they need for compliance.[17]

For the 2015 standards, we proposed volume requirements in the June 10, 2015 NPRM that projected growth in renewable fuel use over the calendar year, even though the proposed volume requirements were issued mid-way through the year. The market appears to have responded to the proposal as monthly supply after the NPRM was about 5% higher than monthly supply before the NPRM. We believe that the final rule, however, will be issued too late in the year to have any further effect on supply in 2015. Therefore, in deriving the final 2015 volume requirements we used the data on actual

[15] As discussed in Section II.B.1, EPA has considerable discretion in exercising the cellulosic waiver authority, and is not constrained to consider any particular factor or list of factors in doing so.

[16] A RIN is a unique number generated by the producer and assigned to each gallon of a qualifying renewable fuel under the RFS program, and is used by refiners and importers to demonstrate compliance with the volume requirements under the program. RINs may be retired for a number of reasons, including to account for renewable fuel spills or to correct for RIN generation errors.

[17] Other compliance flexibilities also exist, including use of carryover RINs and the ability for parties that do not have a 2013 compliance deficit to carry a 2014 deficit forward into 2015.

supply that is available to us (through September 2015), along with a projection of supply for the remaining months of 2015 based on actual supply in the months for which we have data and historical trends regarding seasonal renewable fuel supply. In other words, the 2015 volume requirements are based on a combination of actual volumes supplied and an extrapolation of likely volumes for the remainder of the year that assumes that our final standards are issued too late in the year to have further influence on the renewable fuel supply.

For 2016, our final volume requirements are issued on the statutory schedule, allowing the full compliance year for obligated parties and the market to react to the standards we set. Therefore, we assume that the standards can influence greater renewable fuel use than would be the case in the absence of the standards. For advanced biofuel and total renewable fuel, our assessment of 2016 supply simultaneously reflects the statute's purpose to drive growth in renewable fuels, while also accounting for constraints in the market that make the volume targets specified in the statute beyond reach, as described more fully in Section II. Our determination regarding the BBD volume requirement has been based on consultation with USDA and DOE and an analysis of a set of factors stipulated in CAA section 211(o)(2)(B)(ii), as described in more detail in Section III. Finally, as described in Section IV, the cellulosic biofuel volume requirement is based on a projection of production in 2016 that reflects a neutral aim at accuracy.

2. Advanced Biofuel and Total Renewable Fuel

Since the EISA-amended RFS program began in 2010, we have reduced the applicable volume of cellulosic biofuel each year in the context of our annual RFS standards rulemakings to the projected production levels, and we have considered whether to also reduce the advanced biofuel and total renewable fuel statutory volumes pursuant to the waiver authority in section 211(o)(7)(D)(i). In the past we have determined that reductions in the statutory targets for advanced biofuel and total renewable fuel were not necessary. However, for 2014 and later years this is not the case. For 2014, this final rulemaking is too late to influence the market, and renewable fuel supply must necessarily be determined based on historical data. This is also largely the case for 2015, though we have included a projection for the latter part of the year for which data on actual use is not available. For both of these years, the supply of advanced and total renewable fuels was insufficient to satisfy the statutory targets.

For 2016 we have determined that the volume of ethanol in the form of E10 or higher ethanol blends that can be supplied to vehicles, together with the volume of non-ethanol renewable fuels that can be supplied to vehicles, is insufficient to attain the statutory targets for both total renewable fuel and advanced biofuel. As a result, we are using the waiver authorities provided in CAA section 211(o)(7) to set lower volume requirements for these renewable fuel categories in 2016. We expect future standards to both reflect and anticipate progress of the industry and market in providing for continued expansion of the supply of renewable fuels.

Our determination in this final rule that the required volumes of advanced biofuel and total renewable fuel should be reduced from the statutory targets is based on a consideration of the ability of the market to supply such fuels through domestic production or import; the ability of available renewable fuels to be used as transportation fuel, heating oil, or jet fuel; and the ability of the standards to bring about market changes in the time available.[18] Increasing renewable fuel supply requires all aspects of the market to be in place to support those increased volumes. Yet the renewable fuel marketplace is very complex, and includes such diverse elements as feedstock (*e.g.* corn, soybeans) production and transport, renewable fuel production and import facilities, distribution capacity (*e.g.,* pipeline, rail, barge, and tank truck), terminal storage, facilities at terminals to blend renewable fuel into gasoline and diesel, vehicles/engines designed to use renewable fuel, and consumer fuel consumption. Compounding this complexity is the fact that these elements are typically under the control of different entities, making coordinated investment decisions more difficult. A constraint anywhere in this system can lead to shortfalls in renewable fuel supply in comparison to the statutory targets. As described in more detail in Section II.B, we believe that the availability of qualifying renewable fuels and constraints on their supply to vehicles that can use them are valid considerations under both the cellulosic waiver authority under section 211(o)(7)(D)(i) and the general waiver authority under section 211(o)(7)(A). We are using the waiver authorities in a limited way that reflects our understanding of how to reconcile real marketplace constraints with Congress' intent to cause growth in renewable fuel use over time.

We have established applicable volumes for advanced biofuel and total renewable fuel for 2016 that would result in significant volume growth over the levels supplied in previous years. Moreover, the 2016 volume requirement for total renewable fuel is, in our judgment, as ambitious as can reasonably be justified, and reflects the growth rates that can be attained under a program explicitly designed to compel the market to respond. The advanced biofuel volume requirement is set at a level that will allow reasonably attainable volumes of advanced biofuel to backfill for missing cellulosic biofuel volumes.

3. Biomass-Based Diesel

As for advanced and total renewable fuel in 2014 and 2015, we believe that it is appropriate to establish the 2014 and 2015 volume requirements of BBD to reflect actual supply (including a projection for the latter part of 2015 that is primarily based on supply in the earlier part of the year for which data is available). For 2016 and 2017, to preserve the important role that BBD plays in the RFS program, as well as to support the volume requirements for advanced biofuel, we believe that it is appropriate to increase the BBD volume requirement for each year. However, we also believe that it is of ongoing importance that opportunities for other types of advanced biofuel, such as renewable diesel co-processed with petroleum, renewable gasoline blendstocks, and renewable heating oil, as well as others that are under development be incentivized and expanded. Thus, based on a review of the implementation of the program to date and all the factors required under the statute, we are not only finalizing the 2014 and 2015 BBD volume requirement at the actual volumes of 1.63 and 1.73 billion gallons,[19] respectively, but we are also finalizing increases in the applicable volume of BBD to 1.9 and 2.0 billion gallons for years 2016 and 2017, respectively. We believe that these increases support the overall goals of the program while also maintaining the incentive for development and growth in production

[18] While the fuels that are subject to the percentage standards are currently only non-renewable gasoline and diesel, renewable fuels that are valid for compliance with the standards include those used as transportation fuel, heating oil, or jet fuel.

[19] The 2015 BBD standard is based on actual data for the first 9 months of 2015 and a projection for the latter part of the year for which data on actual use is not available.

of other advanced biofuels. We believe establishing the volumes at these levels will encourage BBD producers to manufacture higher volumes of fuel that will contribute to the advanced biofuel and total renewable fuel requirements, while also leaving considerable opportunity within the advanced biofuel mandate for investment in and growth in production of other types of advanced biofuel with comparable or potentially superior environmental or other attributes.

4. Cellulosic Biofuel

The cellulosic biofuel industry continues to transition from research and development (R&D) and pilot scale operations to commercial scale facilities, leading to significant increases in production capacity. RIN generation from the first commercial scale cellulosic biofuel facility began in March 2013. Cellulosic biofuel production increased substantially in 2014, with over 33 million gallons in that year. This volume included a significant number of cellulosic biofuel RINs generated for cellulosic CNG/LNG from biogas through a new pathway approved by EPA in 2014.[20] For 2014 we are finalizing a cellulosic biofuel standard of 33 million gallons, consistent with the total number for RINs generated in 2014 that may be used toward satisfying an obligated party's cellulosic biofuel obligation (both cellulosic biofuel (D3) and cellulosic diesel (D7) RINs). We are also finalizing a cellulosic biofuel standard of 123 million ethanol-equivalent gallons for 2015 and 230 million ethanol-equivalent gallons in 2016 based on the information we have received regarding individual facilities' capacities, production start dates and biofuel production plans, as well as input from other government agencies, and EPA's own engineering judgment.

As part of estimating the volume of cellulosic biofuel that will be made available in the U.S. in 2015 and 2016, we researched all potential production sources by company and facility. This included sources still in the planning stages, facilities under construction, facilities in the commissioning or start-up phases, and facilities already producing some volume of cellulosic biofuel. Facilities primarily focused on R&D were not the focus of our assessment, as production from these facilities represents very small volumes of cellulosic biofuel, and these facilities typically have not generated RINs for the fuel they have produced. From this universe of potential cellulosic biofuel sources, we identified the subset that is expected to produce commercial volumes of qualifying cellulosic biofuel for use as transportation fuel, heating oil, or jet fuel by the end of 2016. To arrive at projected volumes, we collected relevant information on each facility. We then developed projected production ranges based on factors such as the current and expected state of funding, the status of the technology being used, progress towards construction and production goals, facility registration status, production volumes achieved, and other significant factors that could potentially impact fuel production or the ability of the produced fuel to qualify for cellulosic biofuel RINs. We also used this information to group these companies based on production history and to select a value within the aggregated projected production ranges that we believe best represents the most likely production volumes from each group for each year. EPA also received a projection of liquid cellulosic biofuel production in 2016 from EIA, which helped form the basis of our production for these types of cellulosic biofuels. Further discussion of these factors and the way they were used to determine our final cellulosic biofuel projections for 2014, 2015, and 2016 can be found in Section IV.

5. Annual Percentage Standards

The renewable fuel standards are expressed as a volume percentage and are used by each producer and importer of fossil-based gasoline or diesel to determine their renewable fuel volume obligations. The percentage standards are set so that if each obligated party meets the standards, and if EIA projections of gasoline and diesel use for the coming year prove to be accurate, then the amount of renewable fuel, cellulosic biofuel, BBD, and advanced biofuel actually used will meet the volumes required on a nationwide basis.

Four separate percentage standards are required under the RFS program, corresponding to the four separate renewable fuel categories shown in Table I.A–1. The specific formulas we use in calculating the renewable fuel percentage standards are contained in the regulations at 40 CFR 80.1405 and repeated in Section V.B.1. The percentage standards represent the ratio of renewable fuel volume to projected non-renewable gasoline and diesel volume. The volume of transportation gasoline and diesel used to calculate the final percentage standards was provided by EIA. The final percentage standards for 2014, 2015, and 2016 are shown in Table I.B.5–1. Detailed calculations can be found in Section V, including the projected gasoline and diesel volumes used.

TABLE I.B.5–1—FINAL PERCENTAGE STANDARDS

	2014 (%)	2015 (%)	2016 (%)
Cellulosic biofuel	0.019	0.069	0.128
Biomass-based diesel	1.41	1.49	1.59
Advanced biofuel	1.51	1.62	2.01
Renewable fuel	9.19	9.52	10.10

6. Response to Requests for a Waiver of the 2014 Standards

Concurrently with the November 29, 2013, proposed rule for 2014 RFS standards, we also published a separate **Federal Register** Notice [21] indicating that the American Petroleum Institute (API) and the American Fuel & Petrochemical Manufacturers (AFPM) had submitted a joint petition requesting a partial waiver of the 2014 applicable RFS volumes, and that several individual refining companies had also submitted similar petitions. We noted that any additional similar requests would also be docketed and considered together with requests already received. EPA has subsequently received additional waiver petitions, including those submitted by eight Governors.[22]

[20] See 79 FR 42128 (July 18, 2014).

[21] 78 FR 71732 (November 29, 2013) and 78 FR 71607 (November 19, 2013), respectively.

[22] EPA has received, to date, waiver petitions from Governors Deal (GA), Fallin (OK), Perry (TX),

The petitions generally asserted that for 2014 there is an inadequate domestic supply of renewable fuel and therefore RINs, due both to the E10 blendwall and constraints on the supply of higher-level ethanol blends, and of non-ethanol renewable fuels. Many of the petitioners argued that this inadequate supply of renewable fuel (and RINs) will lead to an inadequate supply of gasoline and diesel, because refiners and importers, faced with a shortage of RINs, will reduce their production of gasoline and diesel for the domestic market. They argued that this will in turn severely harm the economy.

As calendar year 2014 has passed, we believe it is appropriate to set the applicable volume requirements at the volumes that were actually supplied in 2014. We do not believe that use of 2014 renewable fuel volumes severely harmed the economy, and we believe that it is straightforward to conclude that there was an adequate supply of the volumes of renewable fuel that were actually used in 2014. For total renewable fuel, cellulosic biofuel and advanced biofuels, this approach results in volume requirements as close to the statutory volume targets as possible absent using the availability of carryover RINs as a justification for setting higher requirements. We considered that option, but, as described in detail in Section II.H., we do not interpret carryover RINs to be part of the ''supply'' of renewable fuel for purposes of assessing whether an inadequate domestic supply exists to justify a waiver under section 211(o)(7)(A) and, although they are a relevant consideration in determining whether or not we should exercise our discretion to grant a waiver under either the general waiver authority or the cellulosic waiver authority, we have determined that the current bank of carryover RINs serves important program functions, and that the requirements for 2014–2016 should not be intentionally set at levels that would require a draw-down in the current bank of carryover RINs. We also considered, given the late nature of this rulemaking with respect to 2014, the possibility of setting the 2014 requirements at the levels originally proposed in November 2013, as suggested by some obligated party commenters that asserted that they used those proposed levels for planning purposes. However, we do not believe it would have been reasonable for obligated parties to assume that the November 2013 proposed volumes would be finalized unchanged. The statutory volume targets for cellulosic biofuel, advanced biofuel and total renewable fuel, as well as NPRM preamble statements for these fuels and biomass-based diesel, clearly provided notice to obligated parties that the final volume requirements could be substantially different than proposed. Nevertheless, we have extended the 2014 compliance demonstration deadline to allow such parties additional time to acquire the RINs needed for compliance. In light of all of these considerations, we have determined that it is appropriate to establish volume requirements for 2014 that reflect actual renewable fuel supply in that year.

To the extent that EPA's independent action to reduce statutory volumes satisfies the petition requests, those requests are now moot and EPA is taking no further action with respect to them. EPA is denying the waiver petitions to the extent they seek differing reductions in applicable volumes than are set forth in this final rule. We believe it is unnecessary to evaluate concerns raised by certain petitioners that implementation of the statutory applicable volumes would cause severe economic harm, since such concerns were predicated on underlying concerns of inadequate domestic supply and such supply concerns are directly addressed by this final rule.

7. Changes to Regulations

In addition to finalizing the aforementioned volume requirements and associated percentage standards, we are also finalizing amendments to the RFS requirements to address two issues. First, we are finalizing changes with respect to the previously-approved algal oil pathways in Table 1 to 40 CFR 80.1426 to clarify that only biofuels produced from oil from algae grown photosynthetically qualify for the RFS program under the algal oil pathways in Table 1 to 40 CFR 80.1426. Since EPA assumed that algae would be grown photosynthetically when it evaluated the lifecycle greenhouse gas emissions associated with the existing algal oil pathways, we are clarifying the regulatory description of these pathways to align with EPA's technical assessment and interpretation of the scope of the pathways.

We are aware of companies that plan to produce biofuels from algae that use non-photosynthetic types of metabolism. Companies wishing to produce biofuels from algae grown with a non-photosynthetic stage of growth must apply to EPA for approval of their pathway pursuant to 40 CFR 80.1416. EPA has not conducted a full lifecycle GHG analysis of emissions associated with biofuel produced using non-photosynthetic algae. Such analysis would need to be completed in order to determine whether fuels produced using these microorganisms meet the lifecycle GHG threshold for advanced biofuels.

We are also finalizing revisions to the annual compliance reporting deadlines for obligated parties and renewable fuel exporters, and the attest engagement reporting deadlines for obligated parties, RIN-generating renewable fuel producers and importers, other parties holding RINs, renewable fuel exporters, and independent third-party auditors for the 2013, 2014, and 2015 compliance years. The deadlines vary for each of these parties depending on the applicable compliance period, and some parties will be required to submit partial annual reports representing a portion of the 2014 compliance year. A detailed description of our changes to reporting deadlines can be found in Section VI.B.

8. Assessment of Aggregate Compliance Approach

By November 30 of each year we are required to assess the status of the aggregate compliance approach to land-use restrictions under the definition of renewable biomass for both the U.S. and Canada. In today's action we are providing the final announcements for these administrative actions.

As part of the RFS regulations, EPA established an aggregate compliance approach for renewable fuel producers who use planted crops and crop residue from U.S. agricultural land. This compliance approach relieved such producers (and importers of such fuel) of the individual recordkeeping and reporting requirements otherwise required of producers and importers to verify that such feedstocks used in the production of renewable fuel meet the definition of renewable biomass. EPA determined that 402 million acres of U.S. agricultural land was available in 2007 (the year of EISA enactment) for production of crops and crop residue that would meet the definition of renewable biomass, and determined that as long as this total number of acres is not exceeded, it is unlikely that new land has been devoted to crop production based on historical trends and economic considerations. We indicated that we would conduct an annual evaluation of total U.S. acreage that is cropland, pastureland, or conservation reserve program land, and that if the value exceed 402 million

Otter (ID), LePage (ME), Martinez (NM), Herbert (UT), and Haley (SC). In addition to the waiver petition from API/AFPM, EPA has also received waiver petitions from the following companies: Delek, ExxonMobil, Holly Frontier, Lion Oil Petroleum, Marathon Oil, NCRA, PBF Holding Company, Phillips 66, and Tesoro.

acres, producers using domestically grown crops or crop residue to produce renewable fuel would be subject to individual recordkeeping and reporting to verify that their feedstocks meet the definition of renewable biomass. As described in Section VII.A, based on data provided by the USDA, we have estimated that U.S. agricultural land did not exceed the 2007 baseline acreage in 2013, 2014, or 2015. This assessment means that the aggregate compliance provision can continue to be used in the U.S. for calendar years 2014, 2015, and 2016.

On September 29, 2011, EPA approved the use of a similar aggregate compliance approach for planted crops and crop residue grown in Canada. The Government of Canada utilized several types of land use data to demonstrate that the land included in their 124 million acre baseline is cropland, pastureland or land equivalent to U.S. Conservation Reserve Program land that was cleared or cultivated prior to December 19, 2007, and was actively managed or fallow and non-forested on that date (and is therefore RFS2 qualifying land). As described in Section VII.B, based on data provided by Canada, we have estimated that Canadian agricultural land did not exceed the 2007 baseline acreage in 2013, 2014, or 2015. This assessment means that the aggregate compliance provision can continue to be used in Canada for calendar years 2014, 2015, and 2016.

C. Authority for Late Action and Applicability of the Standards

Under CAA section 211(o)(3)(B)(i), EPA must determine and publish the annual percentage standards by November 30 of the preceding year, and under CAA section 211(o)(3)(B)(ii) it must establish applicable volumes for biomass-based diesel 14 months in advance of the corresponding compliance year. EPA did not meet these statutory deadlines for the 2014 and 2015 percentage standards, or for the BBD applicable volumes established in this rule. Nevertheless, the percentage standards established through this rulemaking will apply to all gasoline and diesel produced or imported in calendar years 2014, 2015, or 2016 as applicable, and the 2017 applicable volume will form the basis for the BBD percentage standard that is required by statute to be established by November 30, 2016, that will apply to all biodiesel produced or imported in 2017.

We acknowledge that this rule is being finalized later than the statutory deadlines noted above. However, the statute requires that EPA established percentage standards applicable to each calendar year, and applicable volumes for BBD, and we do not believe we are relieved of these obligations by missing the statutory deadlines. Moreover, parties have been producing and using renewable fuels, and generating and acquiring RINs for compliance even in the absence of the annual standards being in place, with the expectation that the requirements would ultimately be finalized. We believe it is important not to upset these reasonable expectations, both for the parties involved and for the long-term integrity of the RFS program. The delay does not deprive EPA of authority to issue applicable volumes and standards for these calendar years. The United States Court of Appeals for the District of Columbia Circuit upheld the 2013 RFS standards even though they were issued more than eight months after statutory deadline. *Monroe Energy* v. *EPA,* 750 F.3.d 909 (D.C. Cir. 2014). The court noted that it had resolved the question of EPA's authority to issue RFS standards after the statutory deadline for issuing the annual RFS standards in *NPRM* v. *EPA,* 630 F.3d 145 (D.C. Cir. 2010). In that case, the court explained that courts have declined to treat a statutory direction that an agency ''shall'' act within a specified time period as a jurisdictional limit that precludes action later. Id. at 154 (citing *Barnhart* v. *Peabody Coal,* 537 U.S. 149, 158 (2003)). Moreover, the court noted that the statute here requires that EPA regulations ''ensure'' that transportation fuel sold or introduced into commerce ''on an annual average basis, contains at least the volumes of renewable fuel'' that are required pursuant to the statute. Id. at 152–153. This statutory directive requires EPA action, even if late. Therefore EPA believes it has authority to issue RFS standards for calendar years 2014 and 2015, and BBD applicable volumes for 2014–2017, notwithstanding EPA's delay.

EPA is exercising its authority to issue standards applicable to past time periods in a reasonable way. Thus, for 2014, EPA is establishing renewable fuel obligations that reflect actual renewable fuel used as transportation fuel, heating oil, or jet fuel during that time period, and the final August 1, 2016 compliance deadline for 2014 (which is two months later than proposed) will allow time for obligated parties to complete necessary transactions to meet obligations. For 2015 we are similarly taking into account actual renewable fuel use during the time that has already passed in 2015, and establishing an extended compliance demonstration deadline of December 1, 2016—a full year after signature of today's rule, and 11 months after the close of the 2015 compliance period. Renewable fuel producers generated RINs throughout 2014, and have also been generating 2015 RINs since the beginning of the calendar year. To varying degrees, obligated parties have been acquiring RINs since the beginning of 2014 in anticipation of the final volume requirements and standards. While we acknowledge the uncertainty that the market has experienced due to the delay, our final rule bases the applicable volume requirements for 2014 and 2015 on an assessment of past production. As a result, there will be an adequate quantity of RINs available to satisfy those portions of the final requirements. In addition, there are a number of program flexibilities that will facilitate compliance. There is a bank of carryover RINs that will make the RIN market more fluid, and facilitate the acquisition of RINs that can be used to comply with the 2014 RVOs. That same bank of carryover RINs can be rolled forward to assist in compliance with 2015 and 2016 requirements. We acknowledge that there is a theoretical possibility that parties that accumulate RINs through their own blending activities could decide to bank the maximum quantity of RINs for their own future use or for future sale, and that if this practice were widespread that there could be a shortfall in available RINs for parties who do not engage in renewable fuel blending activities themselves and have not entered into sufficient contracts with blenders or other parties to acquire sufficient RINs. Such practices are possibilities in any year, and in any competitive marketplace, and we believe that obligated parties have had sufficient experience with the RFS program to have learned to take appropriate precautionary measures to avoid such results. Even where they have not done so, and find compliance with a given year's standards infeasible, they may avail themselves of the option of carrying a compliance deficit forward for that compliance year to the next. Some commenters asserted that BBD volume requirements for 2014 and 2015 should be set at the level proposed in November, 2013, rather than levels actually supplied in those years. Some commenters suggested that all 2014 volume requirements should be set equal to those proposed in 2013. As described in Section III, EPA disagrees with these commenters that obligated parties lacked notice that EPA could set final volume requirements for these

years higher than proposed in 2013, or that setting the requirements to reflect actual supply would pose an unreasonable burden on obligated parties, particularly in light of the nested nature of the standards. Sufficient RINs were generated in these years to allow compliance, and carryover RINs, deficit carryforwards and delayed compliance demonstration deadlines are all in place to facilitate compliance. In sum, we believe that EPA's final approach is authorized and reasonable, though late.

D. Outlook for 2017 and Beyond

We recognize the important public policy goals at the heart of the RFS program, and we acknowledge that a number of challenges must be overcome in order to fully realize the potential for greater use of renewable fuels in the United States. We also recognize that the RFS program plays a central role in creating the incentives for realizing that potential. The standards being finalized today require that significant progress is made in overcoming those challenges. We expect future standards to both reflect and anticipate progress of the industry and market in providing for continued expansion in the supply of renewable fuels, and we intend to set standards in future years that continue to capitalize on the market's ability to respond to those standards with expansions in production and infrastructure.

We believe that the supply of renewable fuels can continue to increase in the coming years despite the constraints associated with shortfalls in cellulosic biofuel production and other advanced biofuels, and constraints associated with supplying renewable fuels to the vehicles and engines that can use them. As described in Section II.E, we believe that the market is capable of responding to ambitious standards by expanding all segments of the market needed to increase renewable fuel supply and modify fuel pricing to provide incentives for the production and use of renewable fuels.

In future years, we would expect to use the most up-to-date information available to project the growth that can realistically be achieved considering the ability of the RFS program to spur growth in the volume of ethanol, biodiesel, and other renewable fuels that can be supplied and consumed by vehicles as we have for the 2016 volumes in this rule. In particular we will focus on the emergence of advanced biofuels including cellulosic biofuel consistent with the statute. Many companies are continuing to invest in efforts ranging from research and development to the construction of commercial-scale facilities to increase the production potential of next generation biofuels. We will continue to evaluate new pathways especially for advanced biofuels and respond to petitions, expanding the availability of feedstocks, production technologies, and fuel types eligible under the RFS program.

We also intend to take additional steps to facilitate the development and use of advanced biofuels. In particular, we will be initiating action to allow the production of renewable fuels to occur in steps at more than one facility. Partial conversion of a renewable feedstock into a so-called ''biointermediate'' at remote facilities for subsequent final processing into renewable biofuel at the primary production facility has been identified by several industry members as an important option to reduce the cost and enhance the availability of cellulosic and other advanced biofuels. However, under the existing RFS regulations, renewable fuels must generally be produced from renewable feedstocks at a single facility in order to be eligible to generate RINs. We are currently working on a rulemaking that would propose amendments to the RFS program to allow for more favorable treatment of such biointermediates. We believe a rulemaking is necessary to provide clarity for stakeholders and for proper compliance and enforcement oversight.

We believe that the use of biointermediates to produce renewable fuels holds considerable promise for the future growth in production of the cellulosic and advanced biofuels required under the RFS program. While near-term production may be modest, significant potential for further growth in the long-term exists, as these technologies can lower the cost of utilizing cellulosic and other feedstocks for the production of renewable fuels by reducing the storage and transportation costs associated with cellulosic biomass and taking advantage of existing ethanol and petroleum refinery assets to convert the biomass to renewable fuel. This makes biointermediates a critical component of the growth of the RFS program in the future and in particular the growth of cellulosic biofuel volumes.

In addition to ongoing efforts to evaluate new pathways for advanced biofuel production, we are aware that other actions can also play a role in improving incentives provided by the RFS program to overcome challenges that limit the potential for increased volumes of renewable fuels. A number of commenters provided ideas in this regard, including suggestions that EPA take regulatory action to modify the administration of the cellulosic waiver credit (CWC) program to better provide stronger support for actual volume purchases, and to change the RFS program's point of obligation from its current focus on producers and importers of gasoline and diesel. Both of these issues are beyond the scope of this rulemaking. However, we will continue to actively monitor the functioning of the market, assess all relevant data, and review our options as necessary.

II. Advanced Biofuel and Total Renewable Fuel Volumes for 2014–2016

The national volume targets of 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). However, two statutory provisions authorize EPA to reduce these volumes under certain circumstances. EPA may reduce these volumes to the extent that we reduce the applicable volume for cellulosic biofuel pursuant to CAA section 211(o)(7)(D), or if the criteria are met for use of the general waiver authority under CAA section 211(o)(7)(A). We have evaluated the capabilities of the market and have concluded that the volumes for advanced biofuel and total renewable fuel specified in the statute cannot be achieved in 2014, 2015, or 2016. As a result we are exercising our discretion under these statutory provisions to reduce the applicable volumes of advanced biofuel and total renewable fuel to reflect the fact that this final rule cannot have an impact on renewable fuel use in the past, and to address constraints on the supply of renewable fuels in the future that are driven by both limitations in production or importation of these fuels and factors that limit supplying them to vehicles that can consume them.

While we are using our waiver authorities under the law to reduce applicable volumes from the statutory levels, we are setting the final volume requirements at levels that are intended to drive significant growth in renewable fuel use beyond what would occur in the absence of such requirements, as Congress intended. The final volume requirements recognize the ability of the market to respond to the standards we set while staying within the limits of feasibility. The net impact of these final volume requirements is that the necessary volumes of both advanced biofuel and conventional (non-advanced) renewable fuel would significantly increase over levels used in the past. The volumes that we are finalizing today are shown below.

TABLE II–1—FINAL VOLUME REQUIREMENTS

[Billion gallons]

	2014	2015	2016
Advanced biofuel	2.67	2.88	3.61
Total renewable fuel	16.28	16.93	18.11

A. Fulfilling Congressional Intent To Increase Use of Renewable Fuels

Although there is scant legislative history for the Energy Independence and Security Act (EISA) to confirm the facts that were considered by Congress at the time of enactment, we believe that when Congress specified the renewable fuel volume targets that the RFS program was to attain, that it likely was with the understanding that the growth reflected in the statutory tables of applicable volumes would be well beyond any previously demonstrated ability of the industry to produce, distribute, and consume renewable fuels. For example, the annual average growth reflected in the statutory volumes for the time period between 2009 and 2022 is 1.6 billion gallons per year for advanced biofuel and 1.9 billion gallons per year for total renewable fuel. However, in the period 2001 to 2007 leading up to enactment of EISA, annual average supply growth rates were far lower: 0.8 billion gallons per year for ethanol (what has to date been the principal non-advanced renewable fuel under the RFS program), and 0.07 billion gallons per year for biodiesel (the principal advanced biofuel to date under the RFS program).[23] The supply of other renewable fuels during this timeframe was close to zero. In other words, Congress set targets that envisioned growth at a pace that far exceeded historical growth and prioritized that growth as occurring principally in advanced biofuels (contrary to historical growth patterns). Congressional intent is evident in the fact that the non-advanced volumes remain at a constant 15 billion gallons in the statutory volume tables starting in 2015 while the advanced volumes continue to grow through 2022 to a total of 21 billion gallon. It is apparent, therefore, that Congress intended changes in the extent and pace of growth of renewable fuel use that would be unlikely to occur absent the new program.

Moreover, it is highly unlikely that Congress expected the very high volumes that it specified in the statute to be reached only through the consumption of E10; indeed the statute does not explicitly require the use of ethanol at all. At the time EISA was passed in 2007, EIA's Annual Energy Outlook for 2007 (AEO 2007) projected that 17.3 billion gallons of ethanol was the maximum that could be consumed in 2022 if all gasoline contained E10 and there was no E0, E15, or E85.[24] Furthermore, the AEO 2007 did not reflect the fuel economy standards that were also enacted in EISA, which has further reduced the amount of gasoline consumed based on more strict vehicle fuel economy and efficiency standards. However, 17.3 billion gallons is far less than the 36 billion gallons of renewable fuel that Congress targeted for use in 2022.[25] Thus, if the statutory targets for 2022 were to be achieved, 18.7 billion gallons of renewable fuel would need to be consumed in 2022 either as higher level ethanol blends (E11–E85), or as non-ethanol fuels. Such levels were far beyond the industry's abilities at the time of EISA's enactment, strongly suggesting that Congress expected the RFS program to drive substantial market changes in a relatively short period of time.

Some commenters stated that EPA would be acting in a manner inconsistent with Congressional intent to increase renewable fuel use if we finalized volumes below the statutory volume targets. These commenters believed Congress set these targets at a level that would help incentivize investments such as building out new and existing capacity, installing storage/distribution infrastructure and advancing technology—all of which would help to increase volumes and achieve the targets within the specified timeframe in the statute. We agree that Congress set ambitious volume targets as a mechanism to push renewable fuel volume growth under the RFS program. However, Congress also provided EPA with waiver authority, in part to address the situation where supply of renewable fuel does not match these ambitious target levels. As a result we disagree with commenters who asserted that any EPA action to lower applicable volumes is not aligned with Congressional intent. The final volume requirements are set consistent with the Congressionally-established waiver authorities. The volumes required by this rule are ambitious and to attain them will require new investments and a responsive market.

Congress did not explicitly indicate, in EISA or in any other document associated with the legislation, the sort of changes that may have been expected to occur to reach 36 billion gallons by 2022. Today we know that possible approaches to significantly expand renewable fuel use fall into a number of areas, such as:

- Increased use of E15 in model year 2001 and later vehicles,
- Increased use of E85 or other higher level ethanol blends in flex-fuel vehicles (FFVs),
- Increased production and/or importation of non-ethanol biofuels (*e.g.,* biodiesel, renewable diesel, renewable gasoline, and butanol) for use in conventional vehicles and engines,
- Increased use of biogas in CNG vehicles,
- Increased use of renewable jet fuel and heating oil,
- Increased use of cellulosic and other non-food based feedstocks, and
- Co-development of new technology vehicles and engines optimized for new fuels.

Some commenters stated that the changes in these areas (which were also noted in the NPRM) cannot help to achieve growth in renewable fuel use within the timeframe necessary to help meet the 2015 and 2016 volumes requirements. Commenters further stated that some of these ideas should not be supported at all, such as increasing imports of biofuels because

[23] Based on data from the Energy Information Administration.

[24] Assumes that AEO2007's 2022 demand for gasoline energy was fulfilled entirely by E10. AEO2007 however, projected that considerably less gasoline used in 2022 would be E10. We have converted the projected 2022 gasoline energy demand into an equivalent volume of E10 to determine the maximum volume of ethanol that could have been consumed in 2022, based on the AEO2007, if all gasoline was E10.

[25] Congress specified that a minimum of 1 billion gallons of the 2022 total would be biomass-based diesel, but did not otherwise specify what specific fuel types would comprise the total. For example, although Congress envisioned substantial growth in cellulosic biofuels, that fuel category is defined by reference to the feedstock used and the GHG reductions obtained; finished cellulosic biofuels could include such diverse products as ethanol, renewable gasoline, naphtha, compressed natural gas, or electricity.

doing so would be inconsistent with Congressional intent to increase energy security through domestic biofuels. We agree with commenters that we will not see dramatic changes in every area we highlighted in the timeframe necessary to increase renewable fuel supply through 2016, but we believe that developments in some of these areas have been and will continue to occur, and that such changes will contribute to attaining the volumes finalized in this rule. We disagree with commenters that supporting imports of biofuels is inconsistent with Congressional intent. The statute does not discriminate between domestically-produced and imported biofuels and an increased diversity of fuels, including those imported from a variety of countries, helps improve energy security. For further discussion of imports, see Sections II.E.3.iii and II.F.

In the near term we expect that increases in E85 and biodiesel will dominate efforts to increase the use of renewable fuel, with smaller roles played by other renewable fuels (*e.g.,* increased E15 use and other non-ethanol renewable fuels such as naphtha). In the longer term, sustained ambitious volume requirements are necessary to provide the certainty of a guaranteed future market that is needed by investors; the development of new technology won't occur unless there is clear profit potential, and it requires multiple years to build new production, distribution, and consumption capacity. We believe that the approach we take to setting the standards must be consistent with Congress' clear goal of ambitiously increasing the use of renewable fuel over time. To this end, the approach presented in this action makes use of the statutory waiver authorities only to the degree necessary.

We believe that over time use of both higher level ethanol blends and non-ethanol biofuels can and will increase, consistent with Congress' intent in enacting EPAct and EISA. As stated above, while Congress provided waiver authority to account for supply and other challenges, we do not believe that Congress intended that the E10 blendwall or any other particular limitation would present a barrier to the expansion of renewable fuels. The fact that Congress set volume targets reflecting increasing and substantial amounts of renewable fuel use clearly signals that it intended the RFS program to create incentives to increase renewable fuel supplies and overcome supply limitations. Notwithstanding these facts, Congress also authorized EPA to adjust statutory volumes as necessary to reflect situations where only partial progress had been made towards eliminating supply limitations, as well as to address situations involving unexpected severe economic or environmental harm resulting from program implementation.

B. Statutory Authorities for Reducing Volume Targets

Congress specified increasing annual volume targets in the statute for total renewable fuel, advanced biofuel, and cellulosic biofuel for every year through 2022, and for biomass-based diesel (BBD) through 2012, and authorized EPA to set volume requirements for subsequent years after consideration of several specified factors. However, Congress recognized that circumstances could arise that might require a reduction in the volume targets specified in the statute as evidenced by the waiver provisions in CAA section 211(o)(7). As described below, we believe that limitations in production and importation of cellulosic biofuels provide EPA with authority to waive volumes of cellulosic biofuel, total renewable fuel, and advanced biofuel volumes pursuant to section 211(o)(7)(D). In addition, limitations in the production and importation of qualifying renewable fuels, along with factors that limit supplying those fuels to the vehicles that can consume them constitute circumstances that warrant a waiver of the total renewable fuel requirement under section 211(o)(7)(A).

With regard to ethanol, a number of market factors combine to place significant restrictions on the continued growth in the volume of ethanol that can be supplied to vehicles at the present time. The maximum amount of ethanol that can be consumed if all gasoline was E10, the limited number and limited geographic distribution of retail stations that offer higher ethanol blends such as E15 and E85, and the limited number of FFVs that have access to E85. Additionally, available information indicates that biodiesel also faces marketplace constraints in the rate at which it can grow, not only in the past (*e.g.,* 2013 when despite rapid growth it was still insufficient to achieve the total and advanced standards) but also in the future. These constraints on the availability of biodiesel to U.S. consumers include a combination of competing uses for feedstocks, international competition for biodiesel, the inconsistent nature of the biodiesel tax credit, limited investments to ensure quantity and quality of biodiesel product, limited infrastructure to distribute and blend biodiesel, and the limited ability of the market to consume biodiesel. Based on our assessment of the maximum amount of renewable fuel that can be supplied in 2014, 2015 and 2016 in light of these constraints, we believe that circumstances exist that warrant a reduction in the statutory applicable volumes of total renewable fuel and advanced biofuel for 2014, 2015 and 2016.

EPA is separately using two complementary legal authorities to set required volumes of advanced biofuel and total renewable fuel at levels below the volume targets provided in the statute: The cellulosic waiver authority under CAA section 211(o)(7)(D)(i), and the general waiver authority under CAA section 211(o)(7)(A). This section discusses both of these statutory authorities and briefly describes how we have used them to determine appropriate reductions in advanced biofuel and total renewable fuel in comparison to the statutory volumes.

1. Cellulosic Waiver Authority

Under CAA section 211(o)(7)(D)(i), if EPA determines that the projected volume of cellulosic biofuel production for the following year is less than the applicable volume provided in the statute, then EPA must reduce the applicable volume of cellulosic biofuel to the projected volume available during that calendar year. We refer to this provision as the agency's ''cellulosic wavier authority'' under the statute.

Section 211(o)(7)(D)(i) also provides that ''[f]or any calendar year in which the Administrator makes such a reduction, the Administrator may also reduce the applicable volume of renewable fuel and advanced biofuels requirement established under paragraph (2)(B) by the same or a lesser volume.'' Using this authority, the reductions in total renewable fuel and advanced biofuel can be less than or equal to, but no more than, the amount of reduction in the cellulosic biofuel volume. In prior actions EPA has interpreted this provision as authorizing EPA to reduce both total renewable fuel and advanced biofuel, by the same amount, if EPA reduces the volume of cellulosic biofuel.

The cellulosic waiver provision was discussed by the United States Court of Appeals for the District of Columbia Circuit, in the context of its review of EPA's 2013 annual RFS rule. As the Court explained,

> [T]he Clean Air Act provides that if EPA reduces the cellulosic biofuel requirement, as it did here, then it ''may also reduce'' the advanced biofuel and total renewable fuel quotas ''by the same or a lesser volume.'' 42 U.S.C. 7545(o)(7)(D)(i). There is no requirement to reduce these latter quotas, nor

does the statute prescribe any factors that EPA must consider in making its decision. See id. In the absence of any express or implied statutory directive to consider particular factors, EPA reasonably concluded that it enjoys broad discretion regarding whether and in what circumstances to reduce the advanced biofuel and total renewable fuel volumes under the cellulosic biofuel waiver provision. *Monroe* v. *EPA,* 750 F.3d 909, 915 (D.C. Cir. 2014).

For the 2013 RFS rule, the Court determined that EPA had reasonably declined to use the cellulosic waiver authority to reduce the advanced and total renewable fuel statutory applicable volumes by analyzing ''the availability of renewable fuels that would qualify as advanced biofuel and renewable fuel, the ability of those fuels to be consumed, and carryover RINs from 2012.'' Id. at 916.

Some stakeholders commented that EPA may only exercise the cellulosic waiver authority to reduce total and advanced volumes in circumstances described in section 211(o)(7)(A) (that is, where there is inadequate domestic supply or severe harm to the environment or economy), or that it must in considering use of the cellulosic waiver authority consider the factors specified in section 211(o)(2)(B)(ii) that are required considerations when EPA sets applicable volumes for years in which the statute does not do so. Contrary to these comments, the D.C. Circuit found in *Monroe* that the statute does not prescribe any factors that EPA must consider in making its decision; EPA has broad discretion under section 211(o)(7)(D)(i) to determine when and under what circumstances to reduce the advanced and total renewable fuel volumes when it reduces the statutory applicable volume of cellulosic biofuel.

In general, we do not believe that it would be consistent with the energy security and greenhouse gas reduction goals of the statute to reduce the applicable volumes of renewable fuel set forth in the statute absent a substantial justification for doing so. When using the cellulosic waiver authority, we believe that there would be a substantial justification to exercise our discretion to lower volumes of total and advanced renewable fuels in circumstances where there is inadequate projected production or import of potentially qualifying renewable fuels, or where constraints exist that limit the ability of those biofuels to be used for purposes specified in the Act (*i.e.,* in transportation fuel, heating oil or jet fuel). In particular, we believe that the cellulosic waiver authority is appropriately used to provide adequate lead time and a sufficient ramp-up period for non-cellulosic biofuels to be produced and constraints on their use for qualifying purposes eliminated, so they can fill the gap presented by a shortfall in cellulosic biofuels. As discussed in Section IV, we are reducing the applicable volume of cellulosic biofuel for 2014, 2015, and 2016, and thus are authorized to reduce the required volumes of advanced biofuel and total biofuel by the same or a lesser amount under the provisions of section 211(o)(7)(D)(i).[26] For this rulemaking, we have ascertained the availability of other advanced biofuel to satisfy some of the cellulosic biofuel volume shortfall, taking into consideration the constraints (including distribution and infrastructure constraints) that limit the use of non-cellulosic advanced biofuels to completely fill the cellulosic volume shortfall and are exercising our cellulosic waiver authority to reduce the advanced biofuel applicable volume to a level we have determined to be reasonably attainable.[27]

We are also using this authority to reduce total renewable volumes by the same amount. In past actions we have interpreted the cellulosic waiver authority as requiring equal reductions in advanced and total renewable fuel, based on concerns that EPA waiver decisions should not allow non-advanced biofuels to backfill volumes intended by Congress to be satisfied by advanced biofuels. In addition to this consideration, the equal reduction in total renewable fuel is justifiable under the cellulosic waiver authority based on an assessment of volumes that can be produced and imported, and consideration of the extent to which those volumes can be distributed and used as specified in the Act. However, this level of reduction is insufficient to address all of the supply limitations associated with total renewable fuel. Therefore, we are also using the general waiver authority as justification for further reductions in total renewable fuel volumes, as discussed in the next section.[28]

Some commenters argued that to the extent volume reductions are needed at all, EPA could rely solely on the cellulosic waiver authority to provide such reductions.[29] These commenters suggested that a reduction of the total renewable fuel and advanced biofuel volumes by the full amount of the waiver of cellulosic biofuel targets would result in volumes that are ''reasonably achievable,'' and that consequently additional reductions under the general waiver authority would be unnecessary. However, commenters' interpretation of a ''reasonably achievable'' volume assumed that a large number of carryover RINs would be used, and largely ignored the practical and legal constraints on the consumption of renewable fuel. As discussed in Section II.E, we have determined that we should not set standards for the 2014–2016 time period so as to intentionally draw down the current bank of carryover RINs. We also present a detailed discussion of the constraints on renewable fuel supply in this and subsequent sections. Additionally, we believe that a reduction of the advanced biofuel volume by the full amount of the waiver of cellulosic biofuels is not necessary; higher advanced volumes can be attained by substituting other advanced biofuels for the shortfall in cellulosic biofuel, and moreover requiring their use at higher levels furthers the GHG reduction objectives of the Act. What commenters suggested would result in increased volumes of conventional renewable fuel, and decreased volumes of advanced fuels as compared to the levels EPA is finalizing today. Given the superior GHG performance of advanced biofuels, and the important role of the current volume of carryover RINs to RFS program operation, EPA does not believe that the commenters' suggested approach would be either an appropriate exercise of its waiver authorities or be in the best interest of the RFS program.

2. General Waiver Authority

CAA section 211(o)(7)(A) provides that EPA, in consultation with the Secretary of Agriculture (USDA) and the

[26] EPA had proposed to use both the cellulosic waiver authority and the general waiver authority as a basis for reducing the advanced biofuel applicable volume. However, such an approach is unnecessary given that the reductions in advanced biofuel volumes in 2014, 2015 and 2016 are less than the reductions in cellulosic biofuel applicable volumes in those years. Thus, for the final rule, EPA is relying only on the cellulosic waiver authority in section 211(o)(7)(D) as a basis for its reductions in the advanced biofuel applicable volumes.

[27] We have considered the possible role of carryover RINs in avoiding the need to reduce the statutory applicable volumes, as we did in setting the 2013 RFS standards. However, we have determined that the current volume of the carryover RIN bank is needed as a program buffer to ensure flexibility to address unforeseen circumstances, and provide RIN market liquidity, and so should not be used as a basis for setting volume requirements higher than can be achieved through renewable fuel production and use. For further discussion of our assessment of the use of carryover RINs, see Section II.H.

[28] The volume reduction for advanced biofuels is not larger than the final reduction in the applicable volume of cellulosic biofuel, thus, EPA could rely on the cellulosic waiver authority alone for its final action with respect to advanced biofuel.

[29] See, *e.g.,* Comments from Growth Energy, RFA, POET, Novozymes, The Andersons, ACORE.

Secretary of Energy (DOE), may waive the applicable volume 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 her own motion. Such a waiver must be based on a determination by the Administrator, after public notice and opportunity for comment, that:

- Implementation of the requirement would severely harm the economy or the environment of a State, a region, or the United States; or
- There is an inadequate domestic supply.

In today's final action, we are using the general waiver authority based on the statute's authorization for the Administrator to act on her own motion on a finding of inadequate domestic supply.[30] As required by statute, we have consulted with both USDA and DOE in taking this action. We are using this authority to provide an additional increment of volume reduction for total renewable fuel beyond the reduction accomplished through the use of the cellulosic waiver authority.

Because the general waiver provision provides EPA the discretion to waive the volume requirements of the Act ''in whole or in part,'' we interpret this section as granting EPA authority to waive any or all of the four applicable volume requirements in appropriate circumstances. Thus, for example, unlike the cellulosic waiver authority, a reduction in total renewable fuel pursuant to the general waiver authority is not limited to the reduction in cellulosic biofuel.

EPA has had only limited opportunity to date to interpret and apply the waiver provision in CAA section 211(o)(7)(A)(ii) related to ''inadequate domestic supply,''has never before done so in the context of deriving an appropriate annual RFS standard.[31] As explained in greater detail below, we believe that this undefined ambiguous provision is reasonably and best interpreted to encompass the full range of constraints that could result in an inadequate supply of renewable fuel to the ultimate consumers, including fuel infrastructure and other constraints. This would include, for instance, factors affecting the ability to produce or import qualifying renewable fuels as well as factors affecting the ability to distribute, blend, dispense, and consume those renewable fuels in vehicles.

The waiver provision at CAA section 211(o)(7)(A)(ii) is ambiguous in several respects. First, it does not specify what the general term ''supply'' refers to. The common understanding of this term is an amount of a resource or product that is available for use by the person or place at issue.[32] Hence the evaluation of the supply of renewable transportation fuel, a product, is best understood in terms of the person or place using the product. In the RFS program, various parties interact across several industries to make renewable transportation fuel available for use by the ultimate consumers in transportation fuel. Supplying biofuel to obligated parties and terminal blenders is one part of this process, while supplying renewable fuel to the ultimate consumer as part of their transportation fuel is a different and later aspect of this process. For example, the biofuels ethanol and biodiesel are typically supplied to obligated parties or blenders as a neat fuel, but in almost all cases are supplied to the consumer as a blend with conventional fuel (ethanol blended in gasoline or biodiesel blended in diesel). The waiver provision does not specify what product is at issue (for example, neat biofuel or renewable fuel that is blended with transportation fuel) or the person or place at issue (for example, obligated party, blender or ultimate consumer), in determining whether there is an ''inadequate domestic supply.''

We believe that our interpretation is consistent with the language of section 211(o), and Congressional intent in enacting the program. It is evident from section 211(o) that Congress's intent was not simply to increase production of biofuel, but rather to provide that certain volumes of biofuel be used by the ultimate consumer as a replacement for the use of fossil-based fuel in the United States. The very definition of ''renewable fuel'' requires that the fuel be ''used to replace or reduce the quantity of fossil fuel present in a transportation fuel.'' CAA section 211(o)(1)(J). In addition the definition of ''additional renewable fuel'' specifies that it is fuel that is ''used to replace or reduce the quantity of fossil fuel present in home heating oil or jet fuel.'' CAA section 211(o)(1)(A.). Thus, there is no ''renewable fuel'' and the RFS program does not achieve the desired benefits of the program unless biofuels like ethanol and biodiesel are actually used to replace fossil-based transportation fuels, heating oil or jet fuel in the United States.[33] For example, the greenhouse gas reductions and energy security benefits that Congress sought to promote through this program are realized only through the use by consumers of renewable fuels that reduce or replace fossil fuels present in transportation fuel, heating oil or jet fuel in the United States. Imposing RFS volume

[30] We note that there are also pending requests pursuant to CAA section 211(o)(7(A) from a number of parties for EPA to exercise its waiver authorities to reduce applicable volumes for 2014. While the Administrator is acting on her own motion, she also resolves those petitions through and/or consistent with this final rule establishing 2014 volume requirements.

[31] Some commenters referred to EPA's 2010 RFS2 rule, 75 at 14698, where we stated that ''. . . it is ultimately the availability of qualifying renewable fuel, as determined in party by the number of RINs in the marketplace, that will determine the extent to which EPA should issue a waiver of RFS requirements on the basic of inadequate domestic supply,'' as indicating that EPA had previously determined that carryover RINs must be counted as part of ''supply.'' We disagree. The quoted language makes no explicit reference to carryover RINs, and the content indicates that the point of passage was to explain that it is in the interest of biofuel producers to generate RINs for all qualifying biofuel to avoid or minimize the possibity that EPA would grant waivers. The commenter attempts to make too much of this generally-worded sentence; it does not specify in what way the EPA will consider the ''RINs in the marketplace'' as ''part'' of its assessment of the availability of renewable fuels. Indeed, contrary to the commenters' suggestion, the focus on the ''availability of renewable fuels'' in this sentence could suggest that only those RINs in the marketplace representing liquid volumes used in the compliance year (and not carryover RINs representing historic volumes) should be taken into considertion. In any case, this sentence is entirely consistent with the approach we are taking today to interpret ''supply'' to refer to the volume of biofuels that is available and which can be expected to satify all of the definitional requirements to be renewable fuel (including ultimate use as transportation fuel, heating oil or jet fuel). To the extent we find inadequate supply of such fuels, we then determine whether or not we should exercise our discretion to issue a waiver, and we explicitly consider the availability of carryover RINs as part of that assessment. To extent the interpretation of general waiver authority we are asserting in this final rule appears inconsistent with our statement in 2010, or inconsistent with any other past statement made at a time when we were not actually exercising the authority, we intend for the interpretation we are clearly setting forth today to be clarification/modification of such prior statements.

[32] For example, see *http://oxford dictionaries.com/us/definition/american_english/supply* (a stock of a resource from which a person or place can be provided with the necessary amount of that resource: ''*There were fears that the drought would limit the exhibition's water supply.*''); *http://www.macmillandictionary.com/us/dictionary/american/supply* (''*A limited oil supply has made gas prices rise.*'' *and* ''*Aquarium fish need a constant supply of oxygen.*'').

[33] For this reason, EPA's implementing regulations specify that RINs may not be generated for biofuels with multiple possible end uses, such as biogas or electricity, absent a demonstration that they will be used by the ultimate consumers as transportation fuel. See 40 CFR 80.1426(f)(10)(ii)(B), (f)(11)(i)(B) and (f)(11)(ii)(B). Similarly, although RINs are generated upon production for biofuels like denatured ethanol that do not have uses other than as transportation fuel, our regulations require the retirement of RINs for any volumes of such fuels that are exported, since exported biofuels are not used as transportation fuel in the U.S. See 72 FR 23909 col 2–3; 40 CFR 80.1430. See also §§ 80.1460(c)(2), and 80.1460(g), specifying that use of RINs representing fuel used for non-qualifying purposes for compliance with RVOs is a prohibited act.

requirements on obligated parties without consideration of the ability of the obligated parties and other parties to deliver the biofuel to the ultimate consumers would achieve no such benefits and would fail to account for the complexities of the fuel system that delivers qualifying fuels to consumers. We do not believe it would be appropriate to interpret the RFS general waiver provision in such a narrow way. We are thus interpreting ''inadequate domestic supply'' in light of the definitions of ''renewable fuel'' and ''additional renewable fuel'' and the requirements of CAA section 211(o)(2)(A)(i) that requires that the fuel be ''used to replace or reduce the quantity of fossil fuel present in a transportation fuel'' or in ''home heating oil or jet fuel'' in the United States.

In determining whether ''supply'' is adequate, we believe that we should consider only those volumes of biofuel that are expected to satisfy all of the relevant statutory definitions and requirements. There are two principal components to the definition of renewable fuel and additional renewable fuel: That it be made from renewable biomass and that it be used in transportation fuel. CAA section 211(o)(1)(J); CAA section 211(o)(1)(A). Ignoring the extent to which a fuel can actually be used in transportation fuel (or in heating oil or jet fuel) in the inadequate domestic supply inquiry would involve ignoring a critical element of the definition, and begs the question of whether in assessing ''supply'' EPA should also ignore the renewable biomass component of the definition of renewable fuel or other requirements specified in the Act such as the requirement that transportation fuel containing renewable fuel be used in the United States and that sub-categories of renewable fuel achieve specified levels of GHG reduction. We believe that ignoring any component of the definition of renewable fuel or the other provisions of the Act that affect the types of renewable fuels that qualify under the Act would be inconsistent with the objective of the waiver provision, which is to determine if sufficient qualifying fuels are present. For example, if there was abundant production of biofuel that was not made from renewable biomass (and therefore did *not* qualify as renewable fuel under the Act), but insufficient volumes of fuel that was made from renewable biomass and met other requirements, we believe that EPA would be authorized to grant a waiver on the basis of inadequate domestic supply since compliance would not be possible notwithstanding the abundance of non-qualifying biofuel. This situation is directly comparable to the one we are experiencing at present where an abundance of biofuels are produced that cannot actually be used in transportation fuel, heating oil or jet fuel in the United States. The biofuels that cannot actually be used for qualifying uses, due to constraints discussed in Sections II.E and II.F, are not ''renewable fuels'' and, we believe, are appropriately excluded from our assessment of ''supply.''

The waiver provision also does not specify what factors are relevant in determining the adequacy of the supply. Adequacy of the supply would logically be understood in terms of the parties who use the supply of renewable qualifying fuels. Adequacy of supply could affect various parties, including obligated parties, blenders, and consumers. Adequacy of the renewable fuel supply with respect to the consumer might well involve consideration of factors different from those involved when considering adequacy of the upstream supply of biofuels to the obligated parties. We believe that interpreting this waiver provision as authorizing EPA to consider the adequacy of supply of renewable fuel to the ultimate consumer appropriately allows consideration of upstream supply constraints to all of the relevant parties, including the adequacy of supply of biofuels to obligated parties and blenders, as well as the ability to deliver qualifying renewable fuels to the consumer. This is particularly appropriate in the context of a fuel program that is aimed at increasing the use of renewable fuel by consumers in transportation fuel, heating oil or jet fuel. In our view, this is the most reasonable and appropriate construction of this ambiguous language in light of the overall policy goals of the RFS program.

EPA has reviewed other fuel related provisions of the Clean Air Act with somewhat similar waiver authorities, and they highlight both the ambiguity of the RFS general waiver authority and the reasonableness of applying it broadly to include adequacy of supply to the ultimate consumer of qualifying fuels. For example, CAA section 211(k)(6) provides EPA with authority for EPA to defer the application of reformulated gasoline (RFG) in states seeking to opt-in to the program. There are two categories of states that may opt-in: Those with nonattainment classifications indicating a more serious and/or longstanding air quality problem (leading to classification as a Marginal, Moderate, Serious or Severe nonattainment area) and those that do not have such serious concerns, but which are nevertheless within the ''ozone transport region'' established by CAA section 184(a). For the states with more serious problems that seek to opt-in to the RFS program, section 211(k)(6)(A)(ii) allows EPA to defer application of RFG requirements if EPA determines that ''there is insufficient domestic *capacity to produce* reformulated gasoline.'' (Emphasis added.) However, for states with less serious ozone nonattainment concerns that are part of the ozone transport region, EPA may defer application of RFG requirements if EPA finds that there is ''insufficient *capacity to supply* reformulated gasoline.'' (Emphasis added.) We believe Congress likely intended the ''capacity to supply'' RFG as being broader in scope than the ''capacity to produce'' RFG. This is consistent with the common understanding of the word ''supply'' noted above as the amount of a resource or product that is available for use by the person or place at issue. Thus, while a source can have a ''capacity to produce,'' regardless of whether it has a market for its product, the concept of ''supply'' carries with it an implication that there is a person intending to make use of the product. The term ''capacity to supply'' would therefore be expected to include consideration of the infrastructure needed to deliver RFG to vehicles in the state within the ozone transport region that is seeking to opt in to the program. This distinction in the context of CAA section 211(k)(6) is logical, since Congress can be expected to have put a higher premium on use of RFG in states with the more serious ozone nonattainment issues, thereby constraining EPA discretion to defer RFG requirements to the limited situation where there is ''insufficient capacity to produce'' RFG. For states with less serious problems, it would be logical for Congress to have provided EPA with somewhat more latitude to defer application of RFG, and Congress referred to this broader set of circumstances as situations where there is an ''insufficient capacity to supply'' RFG. The language of the RFS general waiver provision, in comparison, involves use of a single ambiguous phrase, ''inadequate domestic supply,'' without elaboration or clarification as to whether it refers solely to production capacity or also includes additional factors relevant to the ability to supply the renewable fuel in transportation fuel, heating oil or jet fuel to the ultimate consumer. As in the RFG provision, however, the adequacy of

supply referred to in the RFS general waiver provision can logically—and we believe should—be read to include factors beyond capacity to produce that impact the ability of consumers to use the fuel for a qualifying purpose.[34] This would be consistent with Congress's apparent intent in using the term ''supply'' in the context of the RFG provision.

CAA section 211(c)(4)(C)(ii) provides EPA with waiver authority to address ''extreme and unusual fuel or fuel additive supply circumstances . . . which prevent the distribution of an adequate supply of the fuel or fuel additive to consumers.'' The supply circumstances must be the result of a natural disaster, an Act of God, a pipeline or refinery equipment failure or another event that could not reasonably have been foreseen, and granting the waiver must be ''in the public interest.'' In this case, Congress clearly specified that the adequacy of the supply is judged in terms of the availability of the fuel or fuel additive to the ultimate consumer, and includes consideration of the ability to distribute the required fuel or fuel additive to the ultimate consumer. The RFS waiver provision does not contain any such explicit clarification from Congress, thus its broad and ambiguous wording provides EPA the discretion to reasonably interpret the scope of the RFS waiver provision as relating to supply of renewable fuel to the ultimate consumer.

CAA section 211(m)(3)(C) allows EPA to delay the effective date of oxygenated gasoline requirements for certain carbon monoxide nonattainment areas if EPA finds ''an inadequate domestic supply of, or distribution capacity for, oxygenated gasoline . . . or fuel additives'' needed to make oxygenated gasoline. Here, Congress chose to expressly differentiate between ''domestic supply'' and ''distribution capacity,'' indicating that each of these elements was to be considered separately. This would indicate that the term inadequate supply, although ambiguous for the reasons discussed above, could in appropriate circumstances be read as more limited in scope. In contrast to the RFS waiver provision, the section 211(m) waiver provision includes additional text that makes clear that EPA's authority includes consideration of distribution capacity—reducing the ambiguity inherent in using just the general phrase ''inadequate domestic supply.'' Presumably this avoids a situation where ambiguity would result in an overly narrow administrative interpretation. The oxygenated gasoline waiver provision is also instructive in that it clarifies that it applies separately to both finished oxygenated fuel and to oxygenated fuel blending components. That is, there could be an adequate supply of the oxygenate, such as ethanol, but not an adequate supply of the blended fuel which is sold to the consumer. The RFS waiver provision employs the phrase ''inadequate domestic supply'' without further specification or clarification, thus providing EPA the discretion to determine whether the adequacy of the supply of renewable fuel can reasonably be judged in terms of availability for use by the ultimate consumer, including consideration of the capacity to distribute the product to the ultimate consumer. In contrast to the section 211(m) waiver provision, Congress arguably did not mandate that the RFS waiver provision be interpreted as providing authority to address problems affecting the supply of renewable fuel to the ultimate consumer. However, given the ambiguity of the RFS provision, we believe that it does provide EPA the discretion to adopt such an interpretation, resulting in a policy approach consistent with that required by the less ambiguous section 211(m) waiver provision.[35]

As the above review of various waiver provisions in Title II of the Clean Air Act makes clear, Congress has used the terms ''supply'' and ''inadequate supply'' in different waiver provisions. In the RFS general waiver provision, Congress spoke in general terms and did not address the scope of activities or persons or places that are the focus in determining the adequacy of supply. In other cases, Congress provided, to varying degrees, more explicit direction. Overall, the various waiver provisions lend support to the view that it is permissible, where Congress has used just the ambiguous phrase ''inadequate domestic supply'' in the general waiver provision, to consider supply in terms of distribution of renewable transportation fuel, heating oil and jet fuel in the United States and use by the ultimate consumer, and that the term ''inadequate supply'' of a fuel need not be read as referring to just the capacity to produce biofuels or the capacity to supply biofuels to obligated parties and blenders.

We are aware, as a number of commenters pointed out, that prior to final adoption of the Energy Independence and Security Act of 2007, Congress had before it bills that would have provided for a waiver in situations where there was ''inadequate domestic supply or distribution capacity to meet the requirement.'' [36] EPA is not aware of any conference or committee reports, or other legislative history, explaining why Congress ultimately enacted the language in EISA in lieu of this alternative formulation. There is no discussion, for example, of whether Congress did or did not want EPA to consider distribution capacity, whether Congress believed the phrase ''inadequate domestic supply'' was sufficiently broad or the definition of renewable fuel sufficiently clear that a reference to distribution capacity would be unnecessary or superfluous, or whether Congress considered the alternative language as too limiting, since it might suggest that constraints other than ''distribution capacity'' on delivering renewable fuel to the ultimate consumer should not be considered for purposes of granting a

[34] The reasons why we believe the statute should be interpreted in this way can be illustrated by examining the differences between the RFG opt-in situation and the RFS program. Limiting EPA's consideration to ''capacity to produce'' in the context of deferring RFG implementation in a state with serious air quality concerns is not likely to cause implementation problems because: (1) Infrastructure upgrades necessary to shift from use of conventional gasoline to RFG are relatively modest, (2) the statute provides for up to one year between EPA's receipt of an opt-in request and the effective date of a rule requiring use of RFG, allowing time for the needed infrastructure upgrades, and (3) opt-ins typically occur one state at a time, allowing available infrastructure expansion resources to be focused in a relatively small geographic area. In contrast allowing RFS waivers only where there is insufficient ''capacity to produce'' renewable fuel would be extremely problematic because: (1) The ethanol industry has the ability to produce far more ethanol than can currently be distributed and consumed in the U.S., (2) ethanol is already being supplied at E10 levels, and any further growth in ethanol use requires the time consuming installation of costly new E15 or E85 pumps and tanks, (3) the number of vehicles that can use higher ethanol bends is limited, (4) the statute envisions only one month between establishment of annual standards and the start of a compliance year, allowing limited time for infrastructure enhancements, and (5) the RFS is a nationwide program, and infrastructure improvements would be needed throughout the country at the same time to increase the nation's ability to consume renewable fuels at levels corresponding with production capacity. An analogous situation applies for biodiesel as discussed in section II.E.3.

[35] In CAA section 211(h)(5)(C)(ii), Congress authorized EPA to delay the effective date of certain changes to the federal requirements for Reid vapor pressure in summertime gasoline, if the changes would result in an ''insufficient supply of gasoline'' in the affected area. As with the RFS general waiver provision, Congress did not specify what considerations would warrant a determination of insufficient supply. EPA has not been called upon to apply this provision to date and has not interpreted it.

[36] H.R. 6 and S. 606 as reported by Senate Envt. & Public Works in Senate Report 109–74.

waiver.[37] Given the lack of interpretive value typically given to a failure to adopt a legislative provision, and the lack of explanation in this case, we find the legislative history to be uninformative with regard to Congressional intent on this issue. It does not change the fact that the text adopted by Congress, whether viewed by itself or in the context of other fuel waiver provisions, is ambiguous.

We believe that it is permissible under the statute to interpret the term ''inadequate domestic supply'' to authorize EPA to consider the full range of constraints, including legal, fuel infrastructure and other constraints, that could result in an inadequate supply of qualifying renewable fuels to consumers in the United States in the form of transportation fuel, heating oil or jet fuel. Under this interpretation, we do not limit ourselves to consideration of the capacity to produce or import biofuels but also consider practical and legal constraints affecting the volume of qualifying renewable fuel supplied to the ultimate consumer in the United States.

As described in more detail in Section II.E. below, although at least for 2014 and possibly 2015 and 2016, there is sufficient capacity to produce and import biofuels such as ethanol to meet the statutory applicable volume of total renewable fuel, there are practical and legal constraints on the ability of sufficient volumes to be delivered to and used in transportation fuel by vehicles in the United States, or in jet fuel or heating oil. 10% ethanol blends (E10) can legally be used in all gasoline vehicles, but only some subsets of vehicles and nonroad equipment can legally use up to either 15% ethanol (for 2001 and newer light-duty vehicles, which represent about 85% of the in-use fleet) or up to 85% ethanol (for flex fuel vehicles, which represent about 6% of all light-duty cars and trucks).[38] Similarly, according to ASTM standards diesel fuel blends up to 5% biodiesel (B5) are simply considered to be diesel fuel, but only a subset of diesel vehicles and engines have been designed and warranted to use higher concentrations. In addition there are marketplace and infrastructure constraints, including access to limited numbers of retail fuel pumps, that limit the use of higher level (>10%) ethanol blends. These considerations prevent the fuel market from supplying vehicles and engines with the volumes of qualifying ethanol and other renewable fuels needed to meet the statutory level of total renewable fuel, and as such they result in an inadequate domestic supply of qualifying renewable fuel, since insufficient renewable fuel can actually be delivered to consumers and used in transportation fuel, heating oil or jet fuel in the United States. We have evaluated this situation, and in this final rule are using the general waiver authority to address this inadequate domestic supply situation.

A number of stakeholders disagreed that a review of other CAA waiver authorities supports the conclusion that the term ''inadequate domestic supply'' is ambiguous, and that it can be interpreted to include consideration of infrastructure and other constraints related to the delivery to and use of renewable fuel by vehicles. They argued that inadequate domestic supply unambiguously refers to the production capacity of biofuels that could become renewable fuel if put to qualifying uses. Commenters also focused on section 211(m)(3)(C)(i), which provides for a waiver of the requirement to use oxygenated gasoline in certain carbon monoxide nonattainment areas where there is ''an inadequate domestic supply of, or distribution capacity for, oxygenated gasoline.'' They argued that this provision demonstrates that infrastructure considerations are distinct from supply, and that Congress would have used similar language in section 211(o)(7)(A) if it intended EPA to consider infrastructure and other constraints as a basis for an RFS waiver. These stakeholders asserted that there can be no inadequate domestic supply if there is sufficient biofuels produced and available for purchase by obligated parties and, consequently, that any difficulty that obligated parties may experience in delivering renewable fuels to consumers is irrelevant under CAA section 211(o)(7)(A). However, these stakeholders' analysis is clearly not persuasive when sections 211(m)(3)(C)(i) and 211(o)(7)(A) are considered together with all of the CAA provisions containing similar waiver provisions. For example, as discussed above, in section 211(k)(6) Congress used the term ''capacity to produce'' in one RFG waiver context for opt-in states and ''capacity to supply'' in another context. This suggests that the term ''supply'' does not unambiguously mean the same thing as ''produce,'' as these commenters argue. The term ''supply'' can mean something different, and logically does in the context of section 211(k)(6) where the two waiver provisions at issue use these different terms and apply in different contexts, to states with considerably different levels of air quality concern. The different ways that the term ''supply'' is used in the various CAA provisions indicates that in section 211(o)(7)(A) the word ''supply'' is ambiguous and may reasonably be interpreted consistent with the Act's objectives.

Some stakeholders have asserted that interpreting the general waiver authority to allow consideration of all constraints on the use of ethanol by the ultimate consumer would amount to focusing on ''demand'' rather than ''supply'' and would, therefore, be impermissible under the Act. EPA does not agree that a broad consideration of such factors as physical limitations in infrastructure (*e.g.,* availability of E15 and E85 pumps), legal barriers to use of renewable fuel, or ability of vehicles to use renewable fuel at varying concentrations, represent consideration of ''demand'' rather than ''supply.'' These factors operate as practical and legal limits to how much biofuel can be distributed to and used by consumers in the United States, and therefore clearly relate to how much biofuel can be ''supplied'' to them as renewable fuel. Although there may be some element of consumer preference (*i.e.,* demand) reflected in the historic growth patterns of renewable fuel infrastructure and the current status of the infrastructure, it is nevertheless the case as of today that there are a limited number of fueling stations selling high-ethanol blends (approximately 3,000 retail stations), and as a result, the number of stations operates as a constraint on how much ethanol can be delivered. Similarly, only flex fuel vehicles (FFVs) can legally use fuel with ethanol concentrations greater than 15 percent. The population of FFVs has grown considerably in recent years, but is still only a small fraction of the passenger vehicle fleet and there is an even smaller number of FFVs that have ready access to an E85 retail outlet. As a result, the number of FFVs with access to E85 also operates as a constraint on how much ethanol can be delivered. These constraints limit the supply of ethanol to vehicles in the 2014–2016 time period and, we believe, are appropriately considered in evaluating the need for an RFS waiver under section 211(o)(7)(A).

Some stakeholders have stated that even if the term ''inadequate domestic supply,'' were ambiguous, EPA's final interpretation is not reasonable because it would either reward obligated parties for their intransigence in planning to

[37] There are, for example, legal constraints on the amount of certain renewable fuels that may be blended into transportation fuels. These are discussed in Section II.E.1.

[38] See, *e.g.,* EPA partial waiver decisions at 75 FR 68094 (Nov. 4, 2010) and 76 FR 4662 (Jan. 26, 2011).

supply the volumes set forth in the statute, or because EPA's interpretation would effectively enshrine the status quo, and would prevent the growth in renewable fuel use that Congress sought to achieve in establishing the program. We agree that obligated parties have had years to plan for the E10 blendwall and that there clearly are steps that obligated parties could take to increase investments needed to increase renewable fuel use above current levels, as we have noted in prior actions, and note in Section II.B.5.[39] We also note, however, that biofuel producers could also have taken appropriate measures, and that nothing precludes biofuel producers from independently marketing E85 or increasing the production of non-ethanol renewable fuels. The regulatory structure created in the RFS1 program places the responsibility on producers and importers to ensure that transportation fuel sold or introduced into commerce contains the required volumes of renewable fuel, but does not require obligated parties to take specific actions other than acquiring RINs. EPA agrees that its approach to interpreting the term 'inadequate domestic supply' should be consistent with the objectives of the statute to grow renewable fuel use over time by placing appropriate pressure on all stakeholders to act within their spheres of influence to increase biofuel production and use of renewable fuels, while also providing the relief to obligated parties that was intended through the statutory waiver authorities to address supply difficulties that cannot be remedied in the time period over which a waiver would apply. We believe that our final action appropriately reflects these concepts.

3. Assessment of Past Versus Future Supply

EPA is taking somewhat different approaches for its assessment of renewable fuel supply for past time periods covered by this rule as compared to future time periods. For 2014 and most of 2015, our assessment of the ''supply'' available for RFS compliance must necessarily focus on the number of RINs actually generated that are available for compliance with the applicable standards because this final rule cannot influence the volumes of renewable fuel produced and consumed in the past. To set the volume requirements at a higher level would require either noncompliance, which EPA deems an unreasonable approach, or the drawdown of the bank of carryover RINs. Although the availability of carryover RINs is a relevant consideration in determining the extent to which a waiver is justified, *see Monroe* 750 F.3d at 917, we believe that the current bank of carryover RINs serves an important function under the program, including providing a means of compliance in the event of natural disasters and other unforeseen circumstances, and that in the present circumstances EPA should not set the annual standards at levels that would clearly necessitate a reduction in the current bank of carryover RINs. See Section II.H for further discussion of our consideration of carryover RINs in this final rule.

For 2014, we have set the volume requirements for renewable fuel as equal to the number of RINs generated that are available for compliance. With respect to 2015, because this final rule is being signed at the end of November, it cannot influence renewable fuel use during prior months, and, given lead-time considerations cannot reasonably be expected to influence renewable fuel use in the remaining month of the year. Accordingly, we have assessed the supply of total renewable fuel in 2015 by determining the number of RINs generated and available for compliance in the part of 2015 for which data are available and projecting that renewable fuel will be used at the same rate for the remainder of the year.[40]

In the context of a forward-looking annual RFS standards rulemaking issued consistent with the statutory schedule, such as for 2016 in this rule, we believe that the evaluation of ''supply'' for purposes of determining the appropriate volume reduction of total renewable fuel under section 211(o)(7)(A) should compare the statutory targets, and the ability of the market to both produce and consume renewable fuels, in the context of a market that is responsive to the standards that we set. In the context of this assessment, while we have examined the circumstances and issues related to individual sources of renewable fuel, our determination of the final volume requirements is based on an assessment of overall volumes that can be achieved given the interactions that occur between individual sources under the influence of the standards we set.

4. Combining Authorities for Reductions in Total Renewable Fuel

EPA is reducing the applicable volumes of total renewable fuel for 2014, 2015 and 2016 using two separate authorities. We are making initial reductions in total renewable fuel for these years that are equal to the volume reductions in advanced biofuel, using the cellulosic waiver authority.[41] We are also further reducing total renewable fuel volumes based on a determination of inadequate domestic supply, including consideration of both the limitations in the production and import of biofuels and factors that constrain supplying available volumes for the qualifying uses (as transportation fuel, heating oil or jet fuel) specified in the Act. These considerations are relevant to an assessment of inadequate domestic supply. We believe that using the general waiver authority to reduce the applicable volumes of total renewable biofuel in these years is an appropriate response to these circumstances. We are using the cellulosic biofuel waiver authority to reduce the statutory volumes for total renewable fuel by an initial increment of 1.08 billion gallons in 2014, 2.62 billion gallons in 2015 and 3.64 billion gallons in 2016. In addition, as the volume reduction required to address supply limitations for total renewable fuel is greater than can be achieved using the cellulosic waiver authority, we are using the general waiver authority exclusively as the basis for further reducing the applicable volume of total renewable fuel by an additional 0.79 billion gallons in 2014, 0.95 billion gallons in 2015 and 0.50 billion gallons in 2016.

[39] See, for instance, 77 FR 70773 (November 27, 2012), column 1.

[40] We projected that our NPRM would incentivize some growth in renewable fuel use during the latter half of 2015, and available data indicates that indeed the monthly average supply after the NPRM was released was about 5% higher than the monthly average supply in the first half of the year.

[41] In the final rule we are only using our cellulosic waiver authority to make the initial reduction in the total renewable fuel volume, but note that this reduction could also be justified under the general waiver authority due to inadequate domestic supply.

TABLE II.B.4–1—FINAL TOTAL VOLUME REQUIREMENTS

[Billion gallons]

	2014	2015	2016
Statutory Applicable Volumes	18.15	20.5	22.25
Initial Use of Cellulosic Waiver Authorities	17.07	17.88	18.61
Use of General Waiver Authority	16.28	16.93	18.11

5. Inability To Reach Statutory Volumes

In order to use the general waiver authority in CAA section 211(o)(7)(A) to reduce the applicable volumes of total renewable fuel, we must make a determination that there is either ''inadequate domestic supply'' or that implementation of the statutory volumes would severely harm the economy or environment of a State, a region or the United States. This section summarizes our determination that there is an inadequate domestic supply of total renewable fuel in the time period 2014–2016, and thus that the statutory volume targets are not achievable with volumes supplied in these three years. Additionally, this determination that the statutory volume targets are not achievable with volumes supplied also supports our use of the cellulosic waiver authority under CAA section 211(o)(7)(D) to reduce the applicable volumes of advanced and total renewable fuel.

As described in Section II.C below, actual supply of renewable fuel in 2014, determined by an assessment of RINs generated minus RINs retired for non-compliance reasons such as exports of renewable fuel or spills, was below the applicable volume targets in the statute. For total renewable fuel, actual supply was 1.87 billion gallons below the statutory volume target of 18.15 billion gallons, while for advanced biofuel, actual supply was 1.08 billion gallons below the statutory volume target of 3.75 billion gallons. As we noted in the NPRM, the requirements we establish at this time for 2014 cannot change what occurred in the past, and as a result our assessment of the ''supply'' available for RFS compliance during 2014 must necessarily focus on actual renewable fuel use. While many stakeholders agreed with this position, some did not. Those that disagreed generally pointed to the bank of carryover RINs as additional ''supply'' that could be used to increase the 2014 standards above actual wet gallon supply in 2014, or to the fact that renewable fuel volumes that were exported in 2014 would have been available for compliance purposes if EPA had set the 2014 standards by the statutory deadline of November 30, 2013. As described in Section II.H, we do not believe it would be appropriate to intentionally reduce the current bank of carryover RINs to increase the applicable 2014 volume requirements above the supply of wet gallons to consumers in 2014. Regarding exports of renewable fuels, many of those volumes were produced specifically for the purpose of export rather than being produced for general domestic distribution. Stakeholders who suggested that they would have been used for compliance purposes provided no evidence that they would have been available for compliance given export agreements and/or contracts. Furthermore, as discussed in Section II.E.1, legal and practical constraints on the domestic use of renewable fuel are operating in the 2014–2016 time period to limit renewable fuels that have been produced from actually being supplied to consumers. Finally, regardless of any possibility that they could have been used if EPA had acted by the statutory deadline to establish RFS requirements for 2014, it is undisputed that RINs representing fuel exported in 2014 are not currently available for compliance, and it is the current circumstances that are relevant in determining what the applicable volume requirements for 2014 should be. Thus, we do not believe that these arguments warrant an increase in the applicable 2014 volume requirements above the volume of wet gallons actually supplied to consumers in 2014. In sum, we have determined that there was a 1.87 billion gallon shortfall in the supply of total renewable fuel in 2014, and that a waiver of the 2014 statutory target for total renewable fuel is therefore warranted pursuant to section 211(o)(7)(A) on the basis of inadequate domestic supply. In addition, we believe the same set of facts support a waiver of the total renewable fuel applicable volume using the cellulosic waiver authority in section 211(o)(7)(D), and we are also asserting that waiver authority in support of 1.08 billion gallons of this volume reduction (which is equal to the reduction in the advanced biofuel volume using the cellulosic waiver authority, as described below).

Because this final rulemaking is being released after almost all of 2015 has passed, the factual situation for 2015 is essentially the same as it is for 2014: the requirements we establish at this time for 2015 cannot change what occurred in the past, and in addition it is being issued too late to influence the fuels market in the remaining month of the year. Therefore, our assessment of the ''supply'' available for RFS compliance during 2015 is based on actual renewable fuel use for the months for which data are available, together with a projection for the remainder of the year. In sum, we have concluded that the statutory volumes for 2015 cannot be met with available supply, and that a waiver is justified.

The statute sets a target of 22.25 billion gallons of total renewable fuel in 2016. We have determined that this volume cannot be achieved under even the most optimistic assumptions given current and near-future circumstances. To make this determination, we first assumed that every gallon of gasoline would contain 10% ethanol, and also assumed production and use of BBD[42] volumes at the highest annual historical level, which occurred in 2014. When these supplies of renewable fuel are taken into account, a significant additional volume of renewable fuel would still be needed for the statutory volume targets to be met.

TABLE II.B.5–1—ADDITIONAL VOLUMES NEEDED IN 2016 TO MEET STATUTORY TARGET FOR TOTAL RENEWABLE FUEL

[Million ethanol-equivalent gallons]

Statutory target for total renewable fuel	22,250
Maximum ethanol consumption as E10[a]	−14,000
Historical maximum biomass-based diesel supply[b]	−2,490
Additional volumes needed	5,760

[a] Derived from projected gasoline energy demand from EIA's Short-Term Energy Outlook (STEO) from October 2015.

[b] Represents the 1.63 billion gallons of biodiesel and renewable diesel supplied in 2014.

[42] BBD includes both advanced biodiesel and advanced renewable diesel.

Based on the current and near-future capabilities of the industry, we expect that only a relatively small portion of the additional volumes needed would come from non-ethanol cellulosic biofuel, non-ethanol advanced biofuels other than BBD, and non-ethanol conventional renewable fuels; non-ethanol supply other than BBD was 237 million gallons in 2013, 165 million gallons in 2014, and 323 million gallons in 2015. In total these sources could account for several hundred million gallons, as demonstrated by supply of these sources in previous years.[43] Aside from these relatively small sources, renewable fuel that could fulfill the need for 5.76 billion gallons in 2016 would be ethanol or BBD. As discussed below, we do not believe that these fuels could be produced and used in sufficient quantities to attain this volume.

If all of the additional volumes needed were biodiesel, the industry would need to supply a total of about 5.5 billion physical gallons in 2016. As described more fully in Section II.D, actual supply of biodiesel through the end of 2015 is expected to be about 1.73 billion gallons. While this final rule will be released before 2016, we nevertheless do not believe that the market could supply 5.5 billion gallons of biodiesel in 2016; as described more fully in Section II.E.3 below, the constraints on biodiesel supply are such that 5.5 billion gallons is beyond reach. For instance, there currently exist only about 2.7 billion gallons of registered biodiesel production capacity in the U.S. In addition to expanding the registered production capacity, the industry would need to restart all idled facilities, secure sufficient feedstocks including diverting them from current uses, implement significantly expanded distribution, blending, and retail sales infrastructure, and establish new contracts for distribution and sales.

Just as importantly, biodiesel volumes on the order of 5.5 billion physical gallons in 2016 are far in excess of what could actually be consumed in this short timeframe. This volume of BBD would constitute about 10% of the diesel pool in 2016.[44] Although most medium and heavy-duty engine manufacturers now warrant the use of blends up to B20 in their more recent models, the largest of these manufacturers does not, and neither do some light-duty engine manufacturers. Furthermore, much of the in-use fleet is made up of highway and nonroad diesel engines that were produced in the past and are warranted for no more than 5% biodiesel.[45] Also, as pointed out by CountryMark Cooperative Holding Corporation, biodiesel concentrations in the winter months are sometimes kept to lower levels by engine owners due to cold weather operability and storage concerns, and some parties avoid selling biodiesel at all during winter months. Constraints on the use of biodiesel at concentrations above 5% due to engine warranty limitations, plus resistance on the part of some parties to using biodiesel in winter months, means that a nationwide average of 10% biodiesel in the diesel pool, for an entire calendar year, is not reasonably achievable in 2016. We acknowledge that the National Biodiesel Board has extensive efforts underway working with the vehicle and engine manufacturers to continue to expand product offerings capable of operating on B20, working with their membership to improve fuel quality, expanding infrastructure to address cold temperature issues, and working with dealers and technicians to clear away obstacles standing in the way of expanding biodiesel acceptance in the marketplace.[46] There are also efforts to increase the use of biodiesel in heating oil. These will continue to bear fruit, allowing the biodiesel volume to continue to rise over time, but not to the levels that would be needed in 2016 if 5.5 billion gallons of biodiesel were to be required.

Alternatively, if all of the additional volumes shown in Table II.B.5–1 were ethanol, the U.S. would need to consume volumes of E85 far higher, in our estimation, than the market is capable of supplying: In 2016 it would need to be about 8.7 billion gallons.[47] [48] These volumes are about 60 times higher than actual E85 consumption in 2014, and would require many of those FFVs that do not have an E85 retail outlet anywhere close by (due to the fact that only 2% of retail stations currently offer E85) to use it.[49]

The additional volume of 5.76 billion gallons in 2016 could also be satisfied through production and use of a combination of BBD and E85. However, even in this case the volumes are untenable. For instance, one possible combination for 2016 would be 4.4 billion gallons of E85 and 3.6 billion gallons of biodiesel. While both of these volumes are considerably less than the maximums that would be required if the market supplied only one or the other, both levels are beyond the reach of the market under current circumstances.[50] Based on this assessment, we do not believe that the statutory volumes for advanced biofuel and total renewable fuel can be met in 2016.

In response to the NPRM, some parties said that EPA had not sufficiently described why the statutory target for advanced biofuel cannot be reached in 2016. In the NPRM we did point out that more than 70% of the additional ethanol-equivalent volumes that would be needed to reach the statutory targets would need to be advanced biofuel, and discussed the impracticability of attaining those volumes. After a consideration of comments received, we have determined that for our final volume requirements for 2016, about 80% of the 5.76 billion gallons of additional volumes would need to be advanced biofuel in order to reach the statutory target of 7.25 billion gallons of advanced biofuel.[51] However, we agree that it is appropriate to elaborate on the limitations in the supply of advanced biofuel that have led us to conclude that the statutory target for advanced biofuel cannot be reached in 2016. A more detailed discussion of constraints on supply of advanced biofuel can be found in Section II.F.

The RINs available for meeting the advanced biofuel standard include all cellulosic biofuel RINs, all biomass-based diesel RINs, and all advanced biofuel RINs. Cellulosic biofuel that is expected to be available, including all

[43] Details of actual supply in 2013, 2014, and 2015 can be found in the docket.

[44] Based on EIA's October 2015 Short-Term Energy Outlook (online interactive table), nationwide diesel consumption is projected to be 56.3 bill gal in 2015 and 57.7 bill gal in 2016.

[45] While some stakeholders provided information on when certain manufacturers began permitting the use of biodiesel blends higher than B5 in their engines, stakeholders provided no data on which models or model years were affected, nor did any stakeholder provide an analysis of the fraction of the current in-use fleet whose warranties specifically permit the use of B5 versus higher blend levels. Based on the fact that engine manufacturers have only been warranting their new engines for B20 for the last five years or so, and heavy-duty engines typically have a long lifespan, a significant fraction of the in-use fleet must be warranted for no more than B5. *See* further discussion of this issue in Section II.E.3.

[46] ''NBB Technical Update for EPA, April 30, 2015'' in docket EPA–HQ–OAR–2015–0111. *See* also comments submitted by NBB in response to the June 10, 2015 NPRM.

[47] In general when discussing efforts to increase the use of ethanol beyond the blendwall we focus on the volume of E85 that is consumed, since volumes of E15 are likely to be small by comparison. *See* additional discussion of this issue in Section II.E.2.iv below.

[48] Due to relative ethanol content (74% versus 10%) and the fact that E85 displaces some E10, each gallon of ethanol above the E10 blendwall requires the use of 1.51 gallons of E85.

[49] Further discussion of E85 can be found in Section II.E.2.v.

[50] *See* further discussion of E85 in Section II.E.2.v and further discussion of biodiesel in II.E.3.

[51] Assumes that all ethanol consumed as E10 in Table II.B.5–1 is conventional (non-advanced).

biogas, is accounted for within the context of the determination of the cellulosic biofuel standard as discussed in Section IV. While there are some opportunities for moderate growth through the end of 2016 in such advanced biofuels as domestically-produced ethanol, heating oil, naphtha, and renewable diesel, it is possible that only about a hundred million gallons will be available from these sources.[52] Thus the primary sources of advanced biofuel that are in a position to help meet the advanced biofuel standard are imported sugarcane ethanol and biomass-based diesel.

The statutory target for advanced biofuel in 2016 is 7.25 billion gallons. After accounting for cellulosic biofuel, the BBD volume requirement, and potential other domestically-produced advanced biofuels, the total volume of advanced biofuel that would be needed to meet the statutory target of 7.25 billion gallons is 4.07 billion gallons.

TABLE II.B.5–2—ADDITIONAL VOLUMES NEEDED TO MEET STATUTORY TARGETS FOR ADVANCED BIOFUEL IN 2016

[Million ethanol-equivalent gallons]

Statutory target for advanced biofuel	7,250
Requirement for cellulosic biofuel	230
Requirement for biomass-based diesel	[a] 2,850
Potential other advanced (ethanol and non-ethanol)	100
Additional volumes needed	4,070

[a] Represents 1.9 bill gal of biodiesel.

We do not believe that 4.07 billion gallons of additional advanced biofuel can be supplied in 2016, even if the burden of meeting this requirement were shared between biomass-based diesel and imports of sugarcane ethanol. For instance, if sugarcane ethanol imports reached 1.5 billion gallons in 2016, the total volume of BBD would need to be 3.6 billion gallons.[53] We do not believe that either of these levels is achievable in 2016. Notwithstanding UNICA's comments to the contrary as discussed in Section II.F, imports of sugarcane ethanol have been highly variable in the past and appear to be highly dependent on factors others than the RFS program. Moreover, as explained in the NPRM, the highest volume of sugarcane ethanol that has ever been imported to the U.S. was 680 million gallons in 2006, and since that time international demand has increased substantially.[54] Similarly, we do not believe that 3.6 billion gallons of BBD are possible in 2016. The total amount of domestic biodiesel production capacity in the U.S. that is registered under the RFS program is about 2.7 billion gallons.[55] Not only would the market need to supply 900 million gallons more than existing registered capacity, but substantial feedstocks would need to be diverted from the current uses to the production of biodiesel. Even if some portion of the increase were supplied from imports, the total volume of biodiesel supplied to diesel engines would more than double in comparison to that supplied in 2014, requiring that distribution, blending, storage, and dispensing routes would need to be expanded in an extremely short period.[56] We do not believe that this is possible in 2016. As a result, we do not believe that the statutory target for advanced biofuel can be met in 2016.[57]

In response to the NPRM, a number of stakeholders placed the blame for the market's inability to meet the statutory targets on both the EPA for not meeting the statutory deadlines for setting standards and obligated parties for not investing sufficiently in the required infrastructure. While we agree that the delay in setting standards has created some uncertainty and could have led to a slowdown in investment in both production capacity and infrastructure for blending and dispensing renewable transportation fuels, we do not believe that the statutory targets could have been met in 2014, 2015, and 2016 if only EPA had established the applicable standards on the statutory schedule. Stakeholders who took the position that the statutory targets were achievable in 2014 and 2015 generally based that position on the potential for a substantial draw-down in the bank of carryover RINs. As described in the NPRM and in Section II.H, we believe that it would be inappropriate to intentionally drawn down the current bank of carryover RINs in order to raise the applicable volume requirements above the levels that could be met with RINs generated for actual renewable fuel supplied in 2014, 2015, and 2016. Many of these same stakeholders also argued that the statutory targets could be met if the EPA merely set the standards at the statutory levels. They argued, in essence, that the market's ability to respond to the standards EPA sets is effectively unlimited and that the market will rise to meet the expectations placed upon it. As described in Section II.E.1, we believe that the market is in fact limited in its ability to respond to the standards that EPA sets for 2016. Setting the volume requirements at the statutory targets would not compel the market to respond with sufficient changes in production levels, infrastructure, and fuel pricing at retail to result in the statutory volumes actually being consumed in 2016, but would instead lead to noncompliance and/or additional petitions for a waiver of the standards.

Many stakeholders also decried obligated parties' failure to invest in the infrastructure needed to permit expanded use of higher ethanol blends such as E15 and E85. They argued that EPA should not reward obligated parties for their recalcitrance by reducing the applicable volume requirements below the statutory targets. In taking these positions, stakeholders cited both the statutory requirement that obligations be placed on ''refineries, blenders, and importers, as appropriate'' and EPA's regulations which (with limited exceptions) further narrow the applicability of the obligations to producers and importers of gasoline and diesel. Suggestions in the NPRM that renewable fuel producers could contribute to efforts to expand infrastructure were generally met by these commenters with references to the statutory language and their belief that all responsibility for investing in expanded infrastructure rests on obligated parties.

We agree that the statutory language, in combination with the regulatory structure, generally places the

[52] The total ethanol-equivalent volume of advanced biofuel other than imported sugarcane ethanol was 87 mill gal in 2013, 79 mill gal in 2014, and projected to be 53 mill gal in 2015. We expect some growth in the industries providing these fuels, such that supply is likely to be somewhat higher in 2016 than it was in the recent past.

[53] (4.07 bill gal needed − 1.5 bill gal sugarcane ethanol)/1.5 = 1.71 bill gal biodiesel + 1.9 bill gal BBD requirement = 3.6 bill gal biodiesel needed. The 1.5 factor used in this equation represents the equivalence value of biodiesel.

[54] ''Global ethanol consumption 2006–2012,'' docket EPA–HQ–OAR–2015–0111.

[55] *See* ''Registered biodiesel production capacity as of 8–24–15'' in EPA docket EPA–HQ–OAR–2015–0111.

[56] Supply of biodiesel and renewable diesel in 2015 is projected to be 1.8 bill gal. The current infrastructure is sufficient to manage this level, and is likely to be capable of managing volumes above 2.0 bill gal. However, 3.6 bill gal of biodiesel is far larger than the current infrastructure is prepared to manage.

[57] We note that if an obligated party could not be attain compliance in 2016, it could carry a deficit into 2017 if it did not carry a deficit into 2016, and that deficit would need to be satisfied in 2017 along with the 2017 requirements. However, establishing the 2016 total renewable fuel volume requirement at the statutory volume target would result in massive deficits among many parties, and would likely only defer for one year the need for a substantial waiver of the total renewable fuel volume requirements. Accordingly, we do not believe that the flexibility offered by deficit carryovers is a valid basis for setting the 2016 volume requirements at the statutory targets.

responsibility on producers and importers of gasoline and diesel to ensure that transportation fuel sold or introduced into commerce contains the required volumes of renewable fuel. Obligated parties have a variety of options available to them, both to increase volumes in the near term (*i.e.* through the period being addressed by this final rule) and the longer term. The standards that we are establishing today reflect both the responsibility placed on obligated parties as well as the short-term activities available to them, and we expect obligated parties to be taking actions now that will help to increase renewable fuel volumes in future years. However, this general responsibility does not require obligated parties to take actions specific to E15 and/or E85 infrastructure, as the RFS program does not require ethanol specifically. Moreover, we do not believe the statute should be interpreted to require that refiners and importers change the nature of their businesses so as to comply with RFS requirements, as this would be a far-reaching result that Congress can be expected to have clearly specified if it was intended. For example, to the extent that commenters imply that refiners should be required to build or purchase renewable fuel production facilities, take ownership of retail stations, produce or sell cars capable of using high-ethanol blends, or plant cropland to provide feedstock for increased renewable fuel production, we would disagree. Rather, if other parties engaged in these activities fail to adjust those activities to allow the statutory volume targets to be met, we believe the result is an inadequate domestic supply of renewable fuel that justifies granting a waiver pursuant to section 211(o)(7)(A). The primary role that obligated parties play in the RFS program is to acquire RINs, and it is this demand for RINs that in turn drives demand for renewable fuel and which should stimulate other parties to increase their activities to supply it.

Nevertheless, there are actions that obligated parties can take that are more directly related to their roles as importers and refiners, such as investing in or otherwise influencing business practices in such a way as to promote increases in renewable fuel use. We noted several ways in which this could happen in the NPRM.[58] In response, obligated parties described why the suggestions were not practical or would not provide any benefits for 2016. We disagree. There are actions that obligated parties can take in the near-term to increase renewable fuel use and which are consistent with their current businesses. These could include modifying their requirements for branded retail stations to make it easier to offer and advertise sales of E15, E85, and biodiesel, creating a consortium to pool funds for investment in infrastructure at retail, and coprocessing renewable biomass with fossil fuel in their existing facilities to produce a fuel that is partly renewable. These are certainly not the only options available to obligated parties, and we expect them to make ongoing efforts to further the goals of the RFS program. It would also be in the interests of renewable fuel producers to take similar, related, and/or complementary steps to increase the ability of the marketplace to supply their products to the vehicles and engines that can use them, notwithstanding the fact that the legal and regulatory responsibility for the purchase of RINs rests upon obligated parties.

6. Inability To Reach Volumes Using Only the Cellulosic Waiver Authority

In the NPRM we proposed that for each of years 2014, 2015, and 2016 we would reduce both the advanced biofuel and total renewable fuel volumes by the same amount using the cellulosic waiver authority, and then further reduce the total renewable fuel volumes using just the general waiver authority. However, we requested comment on whether it would be appropriate in the final rule to use the cellulosic waiver authority alone. In response to the NPRM, a number of parties agreed that some reductions from the statutory targets are warranted, but, they suggested that reductions under the cellulosic waiver authority would be sufficient, and that the market would be capable of meeting the applicable volume requirements using this approach with the use of carryover RINs to meet any shortfalls in actual renewable fuel supply. Stakeholders who suggested this approach included Growth Energy and the Renewable Fuels Association, among others.

We continue to believe that the applicable standards should be based on available information on actual renewable fuel supplied in 2014 and 2015, as described more fully in Sections II.C and II.D below. Today's rule cannot influence renewable fuel use in either year. Furthermore, we do not believe it would be appropriate to intentionally draw down the bank of carryover RINs as a means for increasing the applicable volume requirements for 2014, 2015, and 2016 beyond the actual renewable fuel supply, since we believe that the current bank of carryover RINs provides important program benefits, as discussed in Section II.H. Even if we were to use the availability of carryover RINs as a basis for setting the standards for 2014 and 2015 at the statutory targets instead of setting them at actual renewable fuel supply, then, assuming we entered the 2014 compliance year with 1.74 billion carryover RINs, the amount of carryover RINs available for 2016 would only be on the order of 0.1 billion RINs. This would be insufficient to maintain the statutory volumes for 2016 contrary to the commenter's claims. Since the appropriate volume reductions in total renewable fuel (to levels representing actual renewable fuel supply) can only be achieved through the use of the general waiver authority, we continue to believe that it would be inappropriate to use only the cellulosic waiver authority.

With regard to 2016 specifically, stakeholders that supported the use of the cellulosic waiver authority alone differed in whether the advanced biofuel and total renewable fuel requirements ought to be reduced by the full amount permitted under the cellulosic waiver authority, or instead only the amount needed to bring the advanced biofuel volume requirement to a level consistent with projected supply. Those supporting the former view pointed out that advanced biofuels in excess of the advanced biofuel standard can be used to meet the non-advanced portion of the total renewable fuel standards. While we agree that this is the case, explicitly and intentionally establishing a volume requirement for advanced biofuel that is below the level that we believe is reasonably attainable would be inconsistent with the goals of the RFS program. Since advanced biofuels have significantly superior GHG reduction performance, we believe we should structure our decision so as to promote the production and use of advanced biofuel volumes that can be reasonably supplied. Therefore, our assessment of the use of the cellulosic waiver authority alone focused on a case in which advanced biofuel and total renewable fuel are both reduced only to the degree necessary to yield an appropriate volume of advanced biofuel (*i.e.,* both are reduced by a lesser amount than the reduction in cellulosic biofuel). Furthermore, for the reasons described in Section II.H, the scenario does not envision a draw-down in the bank of carryover RINs.

Using the advanced biofuel volume requirement of 3.61 billion gallons that we have determined to be reasonably attainable in 2016, and which we are finalizing today, represents a volume

[58] *See* third column of page 33129 of the June 10, 2015 NPRM.

reduction of 3.64 billion gallons in comparison to the statutory target of 7.25 billion gallons. A corresponding reduction in the statutory target for total renewable fuel would result in a total volume of 18.6 billion gallons.

TABLE II.B.6–1—HYPOTHETICAL 2016 VOLUME REQUIREMENTS USING ONLY THE CELLULOSIC WAIVER AUTHORITY

[Billion gallons]

Advanced biofuel:	
Volume Requirement	3.61
Statutory Target	7.25
Reduction	3.64
Total renewable fuel:	
Volume Requirement	18.61
Statutory Target	22.25
Reduction	3.64

Using only the cellulosic waiver authority, the need for non-advanced (conventional) renewable fuel would be 15.0 billion gallons (18.61 − 3.61). If only ethanol was used in 2016 to supply this volume of conventional renewable, more than 1.6 billion gallons of E85 would be required.[59] This level is in excess of what we believe is possible in 2016 under even the most optimistic assumptions as described more fully in Section II.E.2.iii. Accounting for expected 2016 volumes of cellulosic ethanol and other advanced ethanol would make it even more difficult for 15 billion gallons of conventional ethanol to be used.

Under a hypothetical scenario wherein reductions were made only under the cellulosic waiver authority, the required volumes of non-ethanol renewable fuel would be in excess of the levels we believe can be achieved in 2016. Even in the unlikely event that E85 volumes reached 400 million gallons,[60] a very high but perhaps possible level, there would need to be 385 million ethanol-equivalent gallons of non-ethanol supplied, equivalent to about 250 million gallons of biodiesel (the predominant source of non-ethanol renewable fuel, which in this case could be either advanced biofuel or conventional renewable fuel).

TABLE II.B.6–2—INABILITY UNDER EVEN HIGHLY UNLIKELY SUPPLY CONDITIONS TO MEET AN 18.61 BILLION GALLON REQUIREMENT FOR TOTAL RENEWABLE FUEL IN 2016

[Million gallons]

E10	[a] 139,688
E85	[b] 400
Total ethanol	14,265
Non-ethanol cellulosic biofuel	210
Advanced and conventional biodiesel and renewable diesel	[c] 3,750
Total renewable fuel	18,225
Shortfall in comparison to the 18.61 bill gal needed under the cellulosic waiver authority	385

[a] This level is less than the amount of ethanol that can be used as E10 in all 2016 gasoline, because some of that gasoline is used in this scenario to make E85.

[b] Assumed to contain 74% denatured ethanol.

[c] Represents 2.5 billion gallons, the maximum supply that is reasonably achievable as described in Section II.E.3.

When added to the 2.5 billion gallons of biodiesel and renewable diesel (3.75 billion RINs) that, as discussed in Section II.E.3, is the maximum we believe can reasonably be achieved in 2016, the total volume of 2.75 billion gallons of biodiesel and renewable diesel is beyond the reach of a responsive market. Attaining a total of 2.75 billion gallons of biodiesel and renewable diesel in 2016 would require that all of the idled registered biodiesel capacity in the U.S. be brought into production at the beginning of 2016, with the attendant hiring of workers, arranging for feedstock purchases including diverting many feedstocks from existing uses, and arranging routes for distribution, blending, and sale of the finished product. In combination with other challenges as described in Section II.E.3, it is highly unlikely that 2.75 billion gallons of biodiesel supply could be achieved in 2016. Especially when combined with the fact that 400 million gallons of E85 is highly unlikely, we do not believe that this scenario is tenable.

A number of stakeholders said that using the cellulosic waiver authority alone would ensure that 15 billion gallons of corn-ethanol would be used in the U.S. in 2016. Although the implied requirement for conventional renewable fuel would be 15 billion gallons under this scenario, domestic use of corn-ethanol would be essentially no different than it would be under the volume requirements we are finalizing today using both the cellulosic waiver authority and the general waiver authority. This is due to the fact that the legal and practical constraints on the supply of ethanol to consumers are not likely to be relieved to a greater extent with higher standards than they are with the standards we are adopting today, as described more fully in Section II.E.2 below. While the supply of renewable fuel, including ethanol, can increase over time under the influence of the standards we set, the volume requirements for 2016 would not be achievable if only the cellulosic waiver authority were used. Thus we believe that using the cellulosic waiver authority alone would provide no practical advantage to the corn-ethanol industry, but instead would simply lead to a draw-down in the bank of carryover RINs and/or noncompliance.

C. 2014 Advanced Biofuel and Total Renewable Fuel Volume Requirements

In the NPRM, we proposed to base the applicable volume requirements for 2014 on the number of RINs supplied in 2014 that are expected to be available for use in complying with the standards. We based this approach on the notion that the standards we set cannot affect actual supply of renewable fuel in 2014, and that consequently the only result of setting a higher standard would be to require a draw-down in the bank of carryover RINs, which we explained would not be in the best interests of the program.

While many stakeholders agreed with our proposed approach, some did not. The primary objection was that carryover RINs should be counted as part of the ''supply'' available for compliance with the 2014 standards and, therefore, that the 2014 statutory volume targets cannot or should not be waived so long as the existing supply of RINs in 2014 that are available for compliance plus carryover RINs is sufficient to attain the statutory targets. As described in Section II.H below, we continue to believe that it would be imprudent and contrary to the long term objectives of the program to intentionally set renewable fuel volume requirements at a level higher than the estimated supply of renewable fuel based on an intentional draw down of the current bank of carryover RINs to achieve compliance. The statute does not define the term ''supply,'' and it is logical to interpret the term to mean the supply of actual renewable fuel to the vehicles that can use it. However, in assessing whether this supply is ''inadequate,'' and whether EPA should use its discretion to waive the statutory targets, it is appropriate to consider the extent to which the available bank of

[59] It is also possible that the use of E15 could rise to help provide a means for consuming 15.0 bill gal of ethanol. However, as described in Section II.E.2.v, it is highly unlikely that increases in E15 could rise high enough to significantly reduce the amount of E85 needed.

[60] As discussed in a memorandum to the docket, 400 mill gal of E85 in 2016 would likely require significant and unprecedented reductions in the retail price of E85 compared to E10 and increases in the number of service stations offering E85. *See* ''Correlating E85 consumption volumes with E85 price,'' memorandum from David Korotney to docket EPA–HQ–OAR–2015–0111. See also further discussion of E85 in Section II.E.2.iii.

carryover RINs can be drawn down without negatively impacting program operation.[61] Thus, we do not interpret carryover RINs to be part of the ''supply'' referenced in the term ''inadequate domestic supply,'' but we do consider them as a factor that may influence our discretion regarding whether or not to issue a waiver when we have found that an inadequate supply of renewable fuel exists. However, as described in detail in Section II.H, we have assessed the number of carryover RINs available at the current time, and have determined that this bank of carryover RINs should not be intentionally drawn down by setting volume requirements at a level higher than the supply of renewable fuel in the 2014–2016 time period. In other words, for purposes of this rule, we have determined that the availability of carryover RINs does not provide a good basis for EPA to either decline to exercise its discretion to reduce volumes under the general waiver authority in CAA section 211(o)(7)(A), or to use that authority in a manner that would result in volume requirements for total renewable fuel at a level higher than the supply of renewable fuel in 2014.[62]

A secondary objection to setting the 2014 volume requirements at the level of actual supply focused on our proposed calculation of the number of RINs generated in 2014 that would actually be available for compliance with the standards. Specifically, some parties argued that all RINs generated in 2014 should be counted as being available for compliance regardless of whether some were retired for purposes other than compliance with the annual percentage standards by obligated parties. In addition to exports, such ''non-compliance'' RIN retirements could occur for a variety of reasons, such as:

- Spills
- Contaminated or spoiled fuel
- Enforcement obligation
- Fuel not used as transportation fuel, heating oil, or jet fuel
- Improperly generated or otherwise invalid RINs
- Volume corrections
- RINs generated by foreign producers for volumes exported to other countries

Parties taking this position argued that, had the 2014 standards been in place by the statutory deadline of November 30, 2013, at least some of the RINs retired for non-compliance reasons would instead have been used for compliance purposes. We disagree. The earlier issuance of 2014 standards would not have changed events such as spills, improperly generated RINs, or enforcement obligations, and is very unlikely to have resulted in fuel being used in transportation fuel, heating oil, or jet fuel rather than for some non-qualifying use. It is theoretically possible that qualifying renewable fuel that was exported in 2014 might instead have been used in the U.S. had the applicable standards been in place and had been at a level that discouraged exports. However, even if this were so, it would nevertheless be inappropriate to identify exported renewable fuel as being available for compliance since the standards that we set now cannot cause a change in 2014 exports. If we were to include exported renewable fuel in the volume available for compliance with the 2014 standards, obligated parties would be forced to draw down the bank of carryover RINs to account for those exports. As described above and in Section II.H, we do not believe this would be appropriate.

Some stakeholders who argued for the consideration of carryover RINs in setting the 2014 standards did so recognizing that 2014 supply of renewable fuel would be unaffected, but said that doing so might actually increase supply in 2015 or 2016 above levels that would occur otherwise. More specifically, these stakeholders expressed concern that obligated parties would respond to increasing volume requirements in 2015 and 2016 by using carryover RINs rather than entering into contracts or other arrangements to increase the actual supply of renewable fuel. Given the value of carryover RINs to obligated parties as a compliance flexibility tool that is available to address unforeseen RIN shortfalls such as those that may be caused by natural disasters and other supply problems, and considering that obligated parties are likely to consider that increasing RFS requirements in the future could make compliance more difficult in coming years, we do not believe it is likely that obligated parties would intentionally draw down their carryover RIN banks as an alternative to purchasing RINs generated from increasing supplies of renewable fuel. As described further below, we are setting the applicable volume requirements for 2014, 2015, and 2016 at levels that we believe can be supplied by actual gallons of renewable fuel used in those years, without the need for carryover RINs.

In the NPRM, we explained that the total number of RINs that will be retired to cover exports of renewable fuel in 2014 will only be recorded in EMTS after the compliance demonstration deadline for 2014 has passed. As described in Section VI.B, we are amending the current rules in this action to specify March 1, 2016 as the deadline for renewable fuel exporters to demonstrate compliance with those 2014 RVOs not already satisfied. Since we recognized in the NPRM that the compliance deadline for all 2014 RIN exports would not have passed by the time we issued the final 2014 standards, we proposed to estimate likely RIN retirements for renewable fuel exports by using renewable fuel export information from EIA. Ethanol export data reported by EIA is derived from surveys collected by the Census Bureau. These surveys distinguish between ethanol that is denatured and ethanol that is undenatured, with approximately 460 million gallons being described as denatured and approximately 350 million gallons being described as undenatured for 2014. In the NPRM we assumed that all 810 million gallons of ethanol exported in 2014 had been denatured in the United States. We based this approach on the expectation that ethanol producers had an incentive to denature all ethanol for tax purposes, and thus would only sell undenatured ethanol if it was contractually designated for export. Because denatured ethanol meets the regulatory definition of renewable fuel, we assumed that RINs had been generated for this entire volume, and that an equal number of RINs would need to be retired by the exporters of this renewable fuel. RINs retired for exported renewable fuel are not available for use by obligated parties in complying with their 2014 obligations. Thus we calculated the supply of renewable fuel for 2014 by subtracting the exported volumes represented by both categories of ethanol from the amount of RINs generated for domestic production or imports of renewable fuel in 2014.

In response to the NPRM, some stakeholders indicated that they believed we had erred in assuming that all exported ethanol was denatured in the U.S., and had RINs generated for it prior to export. Based on these comments and further investigation into

[61] The statute provides that EPA ''may'' waive the statutory volume targets if it finds inadequate domestic supply or other conditions justifying a waiver under CAA section 211(o)(7)(A). Thus, exercise of the waiver authority is discretionary.

[62] For the same reasons, EPA has not assumed a draw-down in the current bank of carryover RINs in deciding the extent to which it should exercise its discretion under CAA section 211(o)(7)(D) to reduce the statutory targets for advanced biofuel and total renewable fuel.

the manner in which the Census Bureau data are collected, we believe that the Census Bureau survey data are likely to be more reliable than we previously believed with regards to whether exported batches were denatured or undenatured. That is, we believe the Census Bureau data provides the best information available on the amount of denatured versus undenatured ethanol that was exported in 2014. Therefore, the volume of undenatured ethanol the Census Bureau reported as exported in 2014 should not be subtracted from the total number of RINs generated for fuel ethanol in 2014 for purposes of calculating the available supply of renewable fuel for 2014. We have made this correction to the calculation of 2014 supply by only subtracting the approximately 460 million gallons of exported denatured ethanol from those generated in 2014, rather than the full volume of about 810 million gallons of denatured and undenatured ethanol exported.

Several stakeholders raised a similar issue with respect to biodiesel exports, contending that producers never generated RINs for some biodiesel that was exported, and thus all biodiesel exports should not have been subtracted from the number of biodiesel RINs generated in 2014 in assessing the 2014 domestic supply of biodiesel. These parties based their argument on comparisons between EIA export data and biodiesel RINs separated from biodiesel intended for export as recorded in EMTS for previous years. As pointed out by these stakeholders, a comparison of data from EMTS and EIA for 2011 through 2013 does appear to suggest incongruous measurements of biodiesel exports.

TABLE II.C–1—BIODIESEL EXPORTS

[Million gallons]

	2011	2012	2013
EMTS (based on RINs separated from exported biodiesel)	15	46	106
EIA	73	128	196
Difference	58	82	91

As a preliminary matter, we note that the discrepancy between EMTS data on biodiesel RINs separated for biodiesel intended for export and EIA data on biodiesel exports is much smaller for 2014 than it was for previous years—the difference is only 10 million gallons.[63] However, we do not believe that these discrepancies between EIA and EMTS data can credibly be used to suggest that EPA's approach to assessing biodiesel supply in 2014 was flawed. Since exporters can receive biodiesel without assigned RINs and can retire RINs to address exports of renewable fuel using RINs acquired on the open RIN market, the EMTS data on the number of RINs separated from biodiesel as shown in the table above is likely to underestimate the actual number of RINs retired for exports. We also note that almost all biodiesel that is produced in the U.S. qualifies for RIN generation, unlike the situation for ethanol where RINs may be generated for denatured ethanol, but not for undenatured ethanol. Finally, since October of 2014 renewable fuel exporters have been required to retire RINs for all exported renewable fuel within 30 days of the exportation. As a result, we were able to compare RINs retired for exports that occurred in 2015 (not merely RINs separated from exported renewable fuel) to renewable fuel exports as reported by the International Trade Commission (ITC).[64] We determined that exports as recorded in EMTS are nearly identical to exports as recorded by ITC.[65] In sum, we conclude that it is reasonable to assume that RINs were generated and then retired for essentially all of the exported biodiesel, and that it continues to be appropriate to use unmodified export volume data from EIA in estimating RIN supply in 2014.

Finally, some parties argued that their operations for 2014 vis-a-vis acquisition of RINs were based on the standards that were proposed in the November 29, 2013 NPRM, and that it would be inappropriate for EPA to set applicable percentage standards for advanced biofuel and total renewable fuel for 2014 that are more stringent than those proposed in November 2013. We disagree. First, the statutory table of applicable volumes has long provided notice to obligated parties that EPA could establish requirements at least that high, and many commenters on the November 2013 NPRM urged EPA to set standards that would require use of those volumes. In addition, it is well understood that requirements in a final rule can differ significantly from those that are proposed. Also, the November 2013 NPRM explicitly provided both a range of possible volume requirements for advanced biofuel and total renewable fuel as well as an indication that the final volume requirements could include a modification of those ranges. For example:

''However, we request comment on whether it would be more appropriate to utilize either the mode or median (50th percentile), or some other value in the appropriate range shown in Table IV.B.4–3 that best reflects renewable fuel volumes that could reasonably be supplied under this program.'' (78 FR 71770)

''However, we request comment on whether one of the alternative values shown in Table IV.C.2.c–2, or some other approach, would be more appropriate as the basis for the required volume of advanced biofuel in the final rule.'' (78 FR 71777)

''With regard to the mean, we request comment on whether it is the most appropriate way to determine the volume within each of the ranges that we would require in the final rule, or whether instead one of the alternatives shown in Tables IV.B.4–3 or IV.C.2.c–2, or some other approach, would be more appropriate.'' (78 FR 71777)

While we proposed volumes representing the mean within the ranges, we also took comment on alternative approaches to selecting final values from within those ranges. More importantly, we are setting the applicable volume requirements for 2014 at levels consistent with the number of RINs generated in 2014 that are available for compliance. While it is true that the 2014 RINs available for compliance may not currently be distributed among obligated parties according to their individual compliance obligations, they are nevertheless available for compliance, and obligated parties can buy and sell RINs in order to ensure compliance. This process is exactly how the RIN

[63] Because exporters of renewable fuel can separate RINs immediately from fuels that are exported, this estimate is unlikely to change by the time that they submit their compliance demonstrations for 2014.

[64] EIA uses the data collected by Census on exports.

[65] ''Comparison of export data between EMTS and ITC for 2015,'' docket EPA–HQ–OAR–2015–0111.

system was designed to operate when originally established in 2007. Obligated parties have had since at least the time of publication of the June 10, 2015 NPRM to understand with greater certainty their likely obligations under today's final rule, and this period should have been sufficient for obligated parties to ready themselves for compliance. To the extent individual obligated parties may still have difficulty acquiring sufficient RINs for compliance, they can avail themselves of the deficit carry-forward provision in the regulations.[66] In addition, we note that the availability of carryover RINs should help to render the RIN market fluid. Finally, we note that we have extended the compliance demonstration deadline for obligated parties for the 2013 standards by one month, and the compliance demonstration deadline for the 2014 standards by two months, as compared to the proposed dates. These extensions will allow obligated parties additional time to engage in needed RIN transactions to come into compliance with 2014 requirements.

The total number of RINs generated in 2014 that are available for compliance includes those that were generated for renewable fuel produced or imported in 2014 as recorded in the EPA-Moderated Transaction System (EMTS), minus any RINs that have already been retired for non-compliance reasons or would be expected to be retired to cover exports of renewable fuels. As described in the NPRM, the total number of RINs actually retired to cover exports of renewable fuel in 2014 will only be recorded in EMTS after the compliance demonstration deadline for 2014 has passed. Since the compliance deadline for all 2014 RIN exports has not yet passed, we have based our estimate of RIN retirements for renewable exports on renewable fuel export information from EIA.[67]

Actual supply in 2014 is shown in Table II.C–2 below. Further details are provided in a memorandum to the docket.[68] Since EIA does not distinguish exports by D code, we assumed that all ethanol exports represent D6 ethanol, and all biodiesel exports represent D4 BBD, since the vast majority of ethanol available for export was produced from corn and the vast majority of biodiesel available for export was produced to meet the requirements of advanced biofuel. As a result, we expect that any errors introduced by these assumptions will be very small.

TABLE II.C–2—2014 ACTUAL SUPPLY

[Million RINs]

D code[a]	Domestic production[c]	Imports[c]	Adjustments[b c]	Exports	Net supply
3 & 7	33	0	0	0	33
4	2,214	496	92	126	2,492
5	79	64	0	0	143
6	14,017	336	287	457	13,609
All advanced biofuel (D3+D4+D5+D7)	2,326	560	92	126	2,669
All Renewable fuel (D3+D4+D5+D6+D7)	16,344	897	380	582	16,278

[a] D3 and D7 represent cellulosic biofuel. D4 represents biomass-based diesel. D5 represents advanced biofuel that is not cellulosic biofuel or biomass-based diesel. D6 represents non-advanced (conventional) renewable fuel.
[b] As described earlier in this section, adjustments represent spills, enforcement obligations, etc.
[c] Values in this table differ from those in the NPRM due to ongoing retrospective corrections that are made to data recorded in EMTS.

Based on these volumes, we are setting the applicable volume requirements for advanced biofuel and total renewable fuel for 2014, as shown in Table II.C–3 below. Additional discussion of the final cellulosic biofuel and BBD volume requirements for 2014 can be found in Sections IV.D and III.C, respectively.

TABLE II.C–3—FINAL VOLUME REQUIREMENTS FOR 2014

[Billion gallons]

Advanced biofuel	2.67
Total renewable fuel	16.28

D. 2015 Advanced Biofuel and Total Renewable Fuel Volume Requirements

In the NPRM, we said that we expected that the market could achieve some growth in 2015 in comparison to 2014 volumes despite the fact that the proposal was being released well into 2015. Our proposed volumes for 2015 represented moderate growth in supplies of both advanced biofuel and total renewable fuel deemed possible based on annual growth in previous years, but tempered by the fact that the market would not have the lead-time envisioned by the statute. Although the proposed volumes could not be construed as requirements, we believed that they would provide signals to the market concerning the levels that EPA believed were achievable, and that the market would respond to these signals. In fact this appears to have been the case, as monthly supply in the months following release of the NPRM was higher than monthly supply prior to the NPRM.

This final rule is being released after 11 months of the year has passed. As was the case for 2014, the final standards that we set for 2015 cannot affect supply that occurred over the previous 11 months, and there is insufficient lead time available to impact renewable fuel use in the remaining one month. Thus we believe that the basic approach we have taken in this final rule to establishing 2014 requirements should also be applied to 2015, with differences only to account for there being an incomplete data set for 2015. The more general issues (*e.g.,* consideration of carryover RINs, determination of export volumes, etc.) that were raised by stakeholders for the determination of the 2014 volume requirements, and our assessment of those issues, also apply to 2015. As for 2014, the final volume requirements for 2015 for advanced biofuel and total renewable fuel effectively represent what the market actually achieved (for months for which data are available) and a projection of supply based on historical information for the remaining

[66] Although the deficit carry-forward provision would not be available for parties who carried forward a deficit from 2013, such parties have known well in advance that they would be required to satisfy both their 2013 and 2014 obligations in 2014, so should have planned early to acquire a sufficient volume of RINs to cover all contingencies regarding possible 2014 requirements. Any excess 2014 RINs purchased could be banked for use in complying with 2015 requirements.

[67] *http://www.eia.gov/dnav/pet/pet_move_expc_a_EPOORDB_EEX_mbbl_m.htm.*

[68] ''2014 RIN Supply,'' docket EPA–HQ–OAR–2015–0111.

months where data were not yet available.

While this final rule is being released after 11 months of the year has passed, the data for determining actual supply was only available for the first 8 to 9 months of the year. EMTS data on RIN generation and various adjustments for RINs that cannot be used for obligated party compliance was available through September, while data on renewable fuel exports from the Census Bureau was available through August.[69] In order to determine total supply for 2015, it was necessary to estimate supply for the remaining months of the year using the data on actual supply that is available for 2015 and supply trends from 2013 and 2014. These supply trends were used to identify seasonal variations in supply that allowed us to project supply in those months in 2015 for which actual supply data are not available. Details of this assessment are provided in the docket, and are summarized below.[70]

TABLE II.D–1—PROJECTED SUPPLY FOR 2015

[Million ethanol-equivalent gallons]

	RINs generated	Adjustments	Exports	Net supply
Advanced biofuel	3,121	92	145	2,884
Total renewable fuel	17,815	379	504	16,931

In the NPRM we requested comment on whether the volume requirements that we were proposing for 2015 appropriately reflected challenges associated with the marketplace increasing renewable fuel supply in response to the rulemaking in the time available. Parties that believed we should set the applicable volume requirements for 2014 at the statutory targets typically said the same for the 2015 volume requirements, arguing that carryover RINs could meet any shortfall in the supply of renewable fuel. Others agreed that the proposed 2015 volume requirements were reasonable and pointed to the fact that the situation for 2015 was essentially the same as for 2014 in that the standards would be set after most of the year had passed and beyond a date where the final rule could influence renewable fuel use.

In general, it is our assessment that comments provided by stakeholders did not include any compelling arguments or information that would lead us to believe that the final volume requirements for 2015 should be set higher than actual supply (including a projection of actual supply for months where data are not available). While some stakeholders expressed a belief that higher standards can influence market dynamics in 2015, we do not believe that this is the case given that this final rule is being released after 11 months of the year has passed. The only possible basis for setting the final volume requirements higher than actual supply would be the availability of carryover RINs, which as described in Section II.H we believe should not be intentionally drawn down in the context of standard-setting at this time.

Some obligated parties argued that the final percentage standards for 2015 should be set at the proposed levels since they were using the proposed percentage standards to guide their acquisition of RINs in the second half of the year. These parties made a similar argument regarding the 2014 percentage standards. However, all regulated parties were aware that the final standards could differ from those we proposed based on comments we received, new information that became available, and new or different EPA analysis. Moreover, the statutory volume targets (which a number of commenters argued should be the basis for the final 2014 standards) provided notice of the maximum volumes that EPA could require in finalizing the rule. As with 2014, we are using the cellulosic waiver authority as the basis for reductions in advanced biofuel, and for an equal reduction in the total renewable fuel volume requirement. For total renewable fuel, we are also using the general waiver authority, based on a determination of inadequate domestic supply, to provide an additional increment of volume reduction to result in a volume requirement equal to our assessment of RINs generated in 2015 that will be available for compliance.

TABLE II.D.2—FINAL VOLUME REQUIREMENTS FOR 2015

[Billion gallons]

Advanced biofuel	2.88
Renewable fuel	16.93

E. Total Renewable Fuel Volume Requirement for 2016

The proposed 2016 volume requirement of 17.40 billion gallons was intended to represent the total supply of renewable fuel for use in transportation fuel in the United States, including both domestic production and imports of renewable fuel, in light of a policy that is intended to induce significant change. In determining the proposed 2016 volume requirements, we targeted substantial growth compared to 2014 and 2015, consistent with the fact that they are being set prospectively, on the schedule contemplated by Congress, and therefore can be expected to influence the increased production and use of renewable fuels in 2016.

Responses to the proposed 2016 volume requirement for total renewable fuel were mixed. Some stakeholders, such as The American Council on Renewable Energy and Trestle Energy, indicated that the proposed volumes appeared to be reasonable given the challenges associated with increasing supply. Stakeholders who were obligated parties, petroleum marketers and retailers, livestock owners, or engine owners typically said that the proposed volumes were too high. These stakeholders typically pointed to expected high costs, adverse impacts on vehicles or engines, or a general inability of the market to supply the proposed volumes. Many treated the constraints associated with the E10 blendwall as representing a firm barrier that could not or should not be crossed. In contrast, renewable fuel producers and farmers generally believed the

[69] We determined that using records from EMTS on 2015 RINs retired for exports would provide an inaccurate estimate of actual 2015 RINs retired for export in specific months. Exporters can record their RIN retirements at any time within the 30 days following an export of renewable fuel. As a result, exports that occurred in August 2015 may be recorded in EMTS in August or September, and exports that occurred in September 2015 may be recorded in EMTS in September or October. Given this, we believe that the Census Bureau data on exports provided a more accurate estimate of exports in specific months.

[70] ''Projection of annual renewable fuel supply in 2015,'' memorandum from David Korotney to docket EPA–HQ–OAR–2015–0111.

proposed volumes to be too low. These stakeholders typically pointed to production capacity and available feedstocks to support their views, and often argued that the power of the market to respond to the standards EPA sets is essentially unlimited in its ability to overcome any potential constraints on supply.

In general, we did not find arguments for reducing the volume requirements below the proposed levels compelling. Our response to comments associated with the E10 blendwall, demand for E0, and the use of higher ethanol blends such as E15 and E85 are discussed in more detail in Section II.E.2 below. In short, stakeholders provided no compelling evidence that a nationwide average ethanol concentration in gasoline cannot exceed 10.0% in 2016. Moreover, the RFS program will not force consumers to use E15 in engines where compatibility may be a concern, such as nonroad engines or vehicles manufactured before 2001, as some commenters suggested. The flexibility inherent in the program will also continue to permit the use of E0 if there is demand for it, addressing concerns about misfueling with higher ethanol blends. Further discussion of these issues can be found in the Response to Comments document.

While we do not believe that the total renewable fuel volume requirement for 2016 should be reduced below the proposed level, we continue to believe that challenges associated with growth in the supply of renewable fuels precludes attainment of the statutory volumes in 2016. Constraints including but not limited to the E10 blendwall, are real and can only be partially overcome by a responsive market in the near term. We acknowledged in the NPRM that the market would need to respond by increasing domestic production and/or imports of those biofuels that have fewer marketplace constraints, by expanding the infrastructure for distributing and consuming renewable fuel, and by improving the relative pricing of renewable fuels and conventional transportation fuels at the retail level to ensure that they are attractive to consumers. However, we also stated our belief in the NPRM that the market is not unlimited in its ability to respond to the standards we set, particularly over the relevant timeframe. Thus while there can be significant growth in renewable fuel supply from 2015 levels in 2016, we continue to believe that the statutory target for total renewable fuel cannot be reached in 2016.

In making a determination to exercise our authority to waive volumes, our objective is to exercise the general waiver authority only to the extent necessary to address the inadequacy in supply.[71] [72] As explained in the NPRM, we are seeking to determine the ''maximum'' volumes of renewable fuel that are reasonably achievable in light of supply constraints. To clarify, we are not aiming to identify the absolute maximum domestic supply that could be available in an ideal or unrealistic situation, or a level that might be anticipated under conditions that are possible, but unlikely to occur. Rather, we are attempting to identify what we think is the most likely maximum volume that can be made available under real world conditions, taking into account the ability of the standards we set to cause a market response and result in increases in the supply of renewable fuels. This is a very challenging task not only in light of the myriad complexities of the fuels market and how individual aspects of the industry might change in the future, but also because we cannot precisely predict how the market will respond to the volume-driving provisions of the RFS program. Thus the determination is one that we believe is not given to precise measurement and necessarily involves considerable exercise of judgment. To this end, we are setting achievable volumes of total renewable fuel in this package that reflect our best judgment as to the domestic supply of renewable fuels in 2016. There are a number of indications, described below, that the volumes we are finalizing today represent a reasonable estimate of this level.

In the NPRM we explained that our approach to determining the applicable volumes of total renewable fuel included estimating the market potential for overcoming the various constraints at play. This approach was based on consideration of the potential future contributions from sources of renewable fuel, including ethanol, biodiesel and renewable diesel, and other types of renewable fuels, in the aggregate rather than individually, and in the context of a market that is responsive to the standards that we set. We explained that we believed this approach to be more straightforward and more likely to provide a correct projection of the available domestic supply of renewable fuels in 2016 than the proposed approach we described in the November 29, 2013 proposal for the 2014 standards.

In response to the NPRM, many parties presented alternative suggestions for volume requirements for total renewable fuel in 2016, either higher or lower than the 17.40 billion gallons that we proposed, and generally based these suggestions on an approach more akin to that used in our November 29, 2013 proposal. That is, they made their own estimates of the achievable levels of various types of renewable fuels that could be produced or renewable fuel blends that could be consumed and used these estimates as the basis for suggesting higher or lower volume requirements. We recognize that an assessment of the contribution that individual sources can make to the total can be valuable in demonstrating both the achievability of the volume requirements and the extent to which they represent the supply of renewable fuels in 2016. In the November 2013 proposal we took a very granular approach to assessing the potential supply of renewable fuels by assessing the potential for growth of individual renewable fuels, quantifying the uncertainty around each assessment, and using a Monte Carlo simulation to assimilate the individual assessments. In our June 2015 proposal we took a much more holistic approach to assessing renewable fuel supply, recognizing that the individual components of the supply are interconnected and do not operate in isolation. We received many comments suggesting that the holistic approach was too broad, that the methodology EPA used in deriving the volume requirements was not sufficiently clear, and that EPA should more closely evaluate potential for growth in the use of individual fuel types as part of its analysis. We continue to believe that because of the complexities of the fuels market, the structure of the standards, and the inherent difficulties associated with predicting which of the many possible scenarios the market will choose to meet any given standard, a very granular approach is not likely to produce an accurate representation of the maximum volume that can reasonably be achieved. At the same time, we recognize the value in better identifying the information on which our technical judgements are based in making an overall assessment of the volume of renewable fuel that can be supplied in 2016.

For the final rule, therefore, we are individually analyzing the potential for growth in broad categories of renewable fuel: Ethanol, biodiesel, and other types of renewable fuels. We believe that

[71] Section 211(o)(7)(A) says, ''The Administrator . . . *may* waive the requirements . . .'' [emphasis added].

[72] As discussed in Section II.B.1, EPA has considerable discretion in exercising the cellulosic waiver authority, and is not constrained to consider any particular factor or list of factors in doing so.

these assessments have helped us to better estimate the most likely maximum achievable volume of renewable fuel that can be supplied in 2016 and, as described below, the revised approach, together with technical corrections, has led to a final volume for total renewable fuel that is somewhat larger than the volume in our proposed rule. The following sections discuss the state of the renewable fuel market in general, our evaluation of the supply of broad categories of renewable fuel in 2016, and our conclusions regarding the most likely maximum achievable supply of renewable fuel in 2016.

1. Renewable Fuel Market Challenges and Opportunities

The fuels marketplace in the United States is large, diverse, and complex, made up of many different players with different, and often competing, interests. Substantial growth in the renewable fuel volumes beyond current levels in 2016 and beyond will require action by many different parts of the fuel market, and a constraint in any one part of the market can limit the growth in renewable fuel supply. Whether the primary constraint is in the technology development and commercialization stage, as has been the case with cellulosic biofuels, or instead related to the infrastructure build out and fuel consumption, as is recently the case with ethanol in the United States, the end result is that these constraints limit the available supply of renewable fuel.

The constraints on supply to vehicles and engines range from legal limitations on the ethanol concentration that can be used in different types of gasoline-powered vehicles to market-based constraints associated with production, distribution, and use of renewable fuels and the ability for these fuels to compete with traditional petroleum-based fuels. A list of the many factors that affect the growth of renewable fuel supply in the United States in 2016 and beyond is shown in Table II.E.1–1 below.

Table II.E.1-1
Factors That Affect the Supply of Renewable Fuel

- Feedstock availability
  - For existing feedstocks
    - Increases in production
    - Diversion from food and other uses, including renegotiation of existing contracts
    - Expansion of distribution and storage infrastructure
  - For new feedstocks
    - Research and development of new feedstocks
    - Development of new harvesting equipment and practices
    - Development of new distribution and storage infrastructure
    - Contracts to enable reliable delivery
- Renewable fuel production
  - Technology research and development
  - Commercialization of new technology
  - Investment in new and expanded production facilities
  - Restarting idle facilities
- Renewable fuel imports
  - Investment in new and expanded production facilities abroad
  - Diversion from domestic and other foreign markets
    - Renegotiation of existing contracts
    - Satisfying competing mandates and incentives abroad
    - Changes in currency valuation domestically and abroad
  - Expansion of foreign distribution and export capacity
  - Expansion of U.S. import capacity and distribution from ports

- U.S. renewable fuel distribution infrastructure expansion
  - Barge, rail car, tanker truck, and pipeline expansion
  - Terminal tankage addition or displacement of existing product offerings
  - Terminal blending capacity expansion
- Refueling infrastructure availability
  - Expansion of retail outlets that offer renewable fuels blends
  - Addressing insurance and liability risks
- Consumption capacity
  - Existence of and expansion of vehicles/engines capable of using the fuel (e.g., FFVs, natural gas vehicles, and engines designed to be compatible with higher biodiesel blends)
  - Existence and expansion of qualifying non-transportation uses (e.g., heating oil)
  - Total transportation fuel use in the United States
- Marketing Effectiveness
  - Vehicle warranties (e.g., E15, B20)
  - Retail fuel prices
  - Product features and image
- Oil prices relative to the cost of production of biofuels

None of the market components listed in Table II.E.1–1 are in and of themselves an insurmountable barrier to growth of renewable fuels. Rather, they are challenges that can be overcome in a responsive marketplace given enough time and in many cases with considerable investment. In this regard the key question is not whether renewable fuel volumes can increase, but rather how quickly. Moreover, the speed with which the market can engage in actions to overcome these constraints is a function of whether and how effectively parties involved in the many diverse aspects of the renewable fuel marketplace respond to the incentives provided by the RFS and other programs designed to incentivize renewable fuel use.

To a certain degree, the RFS standards themselves can help provide certainty and help drive the necessary investments up and down the supply chain by creating expectation for what overall demand will be. However, the RFS standards are still limited in this regard in that they are issued on an annual basis immediately prior to the compliance year (thus offering little lead-time) and provide only an indirect signal to the various components of the marketplace. In order for volumes of many of the renewable fuels to grow it requires a rather complicated series of investments decisions and actions by a wide range of independent businesses in the marketplace, often by companies that are in direct competition with one another. This can make it difficult for the market to increase supply quickly. The significant fluctuations in the price of oil since 2010 further complicates the investment decisions necessary to enable further growth in the supply of renewable fuels.

Fuels that are or have been more easily integrated into the marketplace (*e.g.,* ethanol at 10 volume percent or renewable diesel that is fungible with diesel fuel) face fewer challenges to overcome to increase their supply and thus have generally been more attractive to investors than those that might require new and unique changes to the fuel distribution infrastructure and/or vehicle fleet. The greater market certainty associated with these more easily integrated fuels has allowed them to increase relatively quickly. This is consistent with our past experience under the RFS program where we saw rapid growth in E10 ethanol blends, low level biodiesel blends, and more recently CNG/LNG derived from biogas. However, introducing new types of biofuels and higher biofuel concentrations into the marketplace requires new production technology, new vehicles, new retail and distribution system infrastructure, and/or new retail-level incentives, and thus have been slower to expand.

Also, the signal from the RFS standard is for the general categories of cellulosic biofuel, biomass-based diesel, advanced biofuel, and total renewable fuels. The standards are not specific to a fuel type (*e.g.,* ethanol, biodiesel, renewable diesel, biobutanol, biogas, etc.), feedstock (*e.g.,* corn, soy oil, wood

chips), or technology (*e.g.,* biochemical vs thermochemical). This is a strength of the RFS program, as it lets the market, rather than EPA, decide which fuel hold the most promise for future growth. As a result, however, the market is still left to determine which fuels to invest in, requiring action by multiple parties involved in fuel supply to ensure growth. We believe that the market can and will make these decisions, particularly as the picture as to which fuels and technologies hold the greatest potential for growth becomes clearer, but it will take time.

In addition to the market needing time to sort out its investment decisions, it should also be emphasized that it takes time for the market to implement investment decisions it has already made. Each market segment has a certain degree of implementation time associated with it. For instance, diverting relatively small amounts of feedstocks from existing uses could potentially occur in a matter of weeks in some cases and months in others, whereas diverting larger amounts or bringing some new feedstocks to market (*e.g.,* energy crops such as switchgrass) could require years. Restarting existing biofuel production facilities could likewise occur relatively quickly, while developing a new renewable fuel production technology (*e.g.,* cellulosic ethanol) takes years, and once developed it takes years more to produce commercial volumes of renewable fuel from them. Displacing some fuels with others in distribution and storage can often occur in a matter of weeks, but adding new distribution and storage capacity can take months or years. Using compatible fuels in the existing fleet of vehicles can occur almost seamlessly, but developing and expanding a new fleet of purpose-built vehicles will take years. Since this final rulemaking establishes standards for 2016 that will apply to gasoline and diesel fuel produced just one month from the signature of this rule, we do not believe that there is sufficient time for the 2016 standards to lead to dramatic changes in renewable fuel supply that are not already underway. But we do believe that the 2016 standards can drive some growth in the near term while setting the stage for greater growth in the longer term. As a result, the best opportunity for market growth is likely to be for those fuels where the market is already taking action to address any relevant constraints listed in Table II.E.1–1 above.

Cellulosic biofuel provides an example. Growth in cellulosic biofuel volumes and their contribution to the advanced biofuel standard has been limited, and certainly less than Congress envisioned, since the outset of the RFS program due to challenges related to technology development and commercialization. Despite a number of years and billions of dollars spent in research and development of cellulosic biofuel technologies, and several attempts at commercializing these technologies, deriving liquid fuels from cellulosic feedstocks has lagged well behind not only the statutory targets, but also our annual projections. These technologies are just now beginning to introduce significant volumes of liquid cellulosic biofuels to the market as described in Section IV. In contrast, more rapid growth has occurred with CNG/LNG derived from biogas, which was recategorized as a cellulosic biofuel in 2014. Biogas did not face the same renewable fuel production challenges as liquid biofuels, and since it could also utilize the existing natural gas distribution, vehicle, and refueling infrastructure use of cellulosic CNG/LNG derived from biogas as transportation fuel has increased rapidly since 2014. The inclusion of cellulosic biogas in our projections has allowed total cellulosic biofuel volumes to grow rapidly through 2015 and into 2016. However, even this significant and short term growth will become limited as cellulosic biogas will soon face constraints associated with sufficient consumption capacity since the fleet of natural gas vehicles that use CNG/LNG derived from biogas as a transportation fuel is currently limited, and it will likely take time for it to grow.

Even with the RFS standards in place to drive growth, the market itself still has considerable uncertainty in terms of how it will respond to those standards and whether and to what degree it can overcome the various constraints within the next year. These facts make it challenging for the Agency to project the supply of renewable fuel in 2016, as we cannot predict with precision the progress that can be made for every component in the market for all the different fuels, or for the renewable fuel supply as a whole. Every existing and potential renewable fuel is impacted by a number of factors that may limit the renewable fuel's growth potential over the coming year. If EPA were to establish standards that cannot be achieved it would likely result in a significant increase in renewable fuel and RIN prices, and obligated parties would be forced into RIN deficits or even non-compliance. This could serve to erode the certainty and stability for renewable fuel volume growth that the RFS standards are intended to provide. At the same time, there are also reasons for optimism that significant progress can be made in overcoming some of the constraints on renewable fuel use in the coming year. We do not think it would be appropriate to ignore either the potential for growth, or potential challenges on growth, in making our assessment of potential volumes. Because the RFS program allows for a variety of different paths to contribute to overall compliance with the standards, significant growth overall is possible in the coming year even if there is less certainty that individual paths might be able to grow significantly.

In the NPRM we discussed the fact that renewable fuel supply in 2013 [73] and 2014 fell short of the statutory targets, and that we believed that the constraints on supply that contributed to those shortfalls were very likely to continue in 2015 and 2016. Indeed supply in the first half of 2015 has also fallen short of what would be required on an annualized basis to meet the statutory targets, though it was larger than supply in 2014. In response, many stakeholders suggested that the only reason the statutory targets were not reached in 2013 and 2014 was because EPA missed the statutory deadlines for setting RFS standards for those years. They also cited the November 29, 2013 NPRM as establishing an expectation among regulated parties that EPA would not require the statutory targets to be met in 2014 and 2015, and that the market merely responded in the manner of a self-fulfilling prophecy.

In providing these comments, these stakeholders took the view that the market is essentially unlimited in its ability to respond to the standards that EPA sets. That is, if EPA were to establish the applicable volume requirements at the statutory targets and by the statutory deadlines, the market would be able to meet those volume requirements. We disagree. The constraints discussed above, and in greater detail in the following sections, are both real and are expected to continue for at least the next several years, even as volumes produced and used are expected to grow. Our investigations clearly demonstrate that the market is not unlimited in its ability to respond to the standards that we set.

A review of the market response to the RFS standards in 2013 demonstrates that constraints on supply are real. In 2013 EPA had never used its waiver

[73] Although EPA did not waive any renewable fuel requirements in 2013, EPA estimates that obligated parties will only be able to achieve compliance through substantial reliance on carryover RINs.

authorities to lower the statutory advanced and total renewable fuel volumes, and had not proposed to do so in its NPRM for the 2013 standards published on February 7, 2013. The market could have reasonably anticipated that EPA would maintain the statutory applicable volumes for calendar year 2013. Indeed, EPA's final rule, published in August of 2013, maintained the proposed approach, and set percentage standards requiring the use of the statutory applicable volumes of advanced and total renewable fuel. Furthermore, unlike some other years when the biodiesel tax credit has been enacted late in a calendar year, and made retroactive to fuel produced in that year, in 2013 the tax credit was enacted in January 2013 and, therefore, was in place to incentivize the production of biodiesel throughout the calendar year.[74] Thus, in 2013, both tax policy and RFS signals were in place to incentivize large growth in renewable fuel use. As shown in the figures below, there was no sudden increase in supply after the 2013 standards were released on August 15, 2013, consistent with the indications that the market expected EPA to finalize standards requiring use of the statutory applicable volumes. There was a moderate increase in the supply of BBD at the end of 2013, which we believe reflected both market anticipation of the expiration of the biodiesel tax credit at the end of 2013 and the end of the 2013 RFS compliance year. Supply of ethanol (the predominate source of D6 RINs) was essentially no different after August than it was before, and the supply of D5 RINs actually decreased after August. In short, the market had an opportunity to increase supply in order to reach the applicable 2013 standards, but did not do so in the timeframe that was available.[75] We believe this indicates that the market was operating at a peak level, and was constrained from accomplishing more.

[74] Public Law 112–240.

[75] We have considered the possibility that the market did not fully respond to the 2013 RFS standards despite the availability of the biodiesel tax credit in 2013 because of the availability of carryover RINs. We believe that the benefit to obligated parties of maintaining their banks of carryover RINs in 2013—especially in light of ever-increasing RFS volume requirements in future years and uncertainty regarding how EPA may interpret its waiver authorities—would have led obligated parties to strongly favor use of 2013 RINs over banked carryover RINs. We also considered the more limited corn stocks available for much of 2013 due to the 2012 drought. However, we note that ethanol exports were still occurring in 2013 even though ethanol imports increased substantially during this period. Thus, we do not believe that the availability of 2013 carryover RINs nor the historic 2012 drought in the United States undermines our conclusion that the renewable fuel market was constrained in 2013.

Figure II.E.1-1
Monthly Supply of D4 RINs in 2013

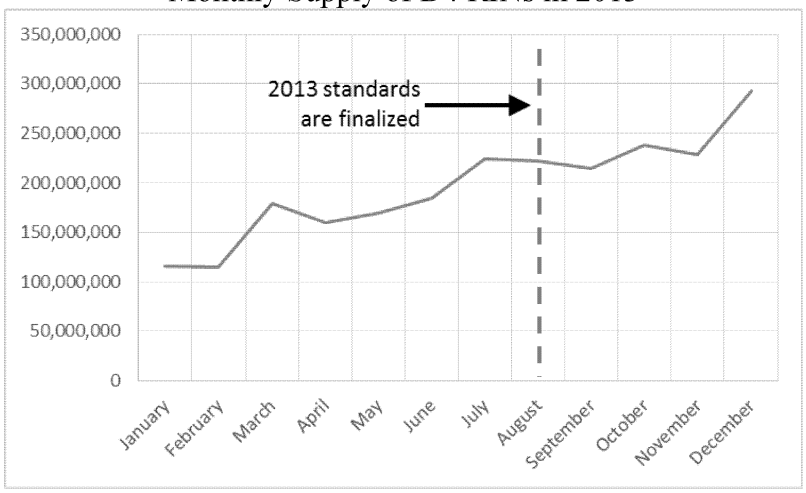


Figure II.E.1-2
Monthly Supply of D5 RINs in 2013

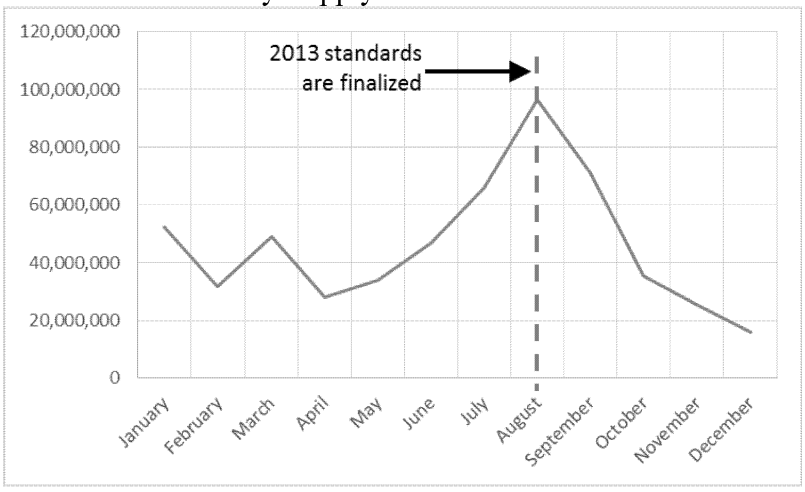
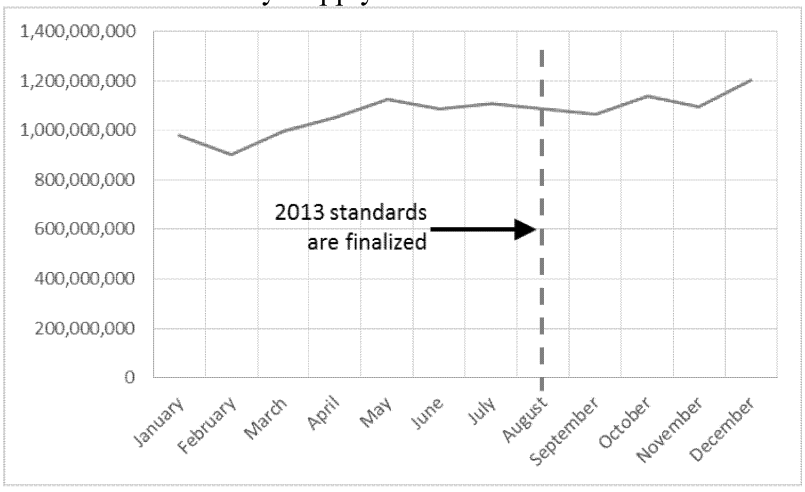


Figure II.E.1-3
Monthly Supply of D6 RINs in 2013



Some stakeholders said that the volume requirements for 2014, 2015, and 2016 that we proposed in the June 2015 NPRM reflected EPA's view that the various constraints represent absolute barriers to the expanded use of

ethanol specifically or renewable fuel in general. This was not the view we expressed in the NPRM and it is not our view now. Instead, these constraints mean that increasing the supply of renewable fuel will require time, and that the statutory volumes cannot be met according to the schedule reflected in the statute. As stated in the NPRM, we do believe that markets have a demonstrated ability to overcome some constraints with the appropriate policy drivers in place given sufficient time, and that the RFS program can drive renewable fuel use. However, the market's ability to overcome constraints is not unlimited, nor do we think change can be instantaneous, and thus it is appropriate to consider both the potential of the market to respond to the standards we set when we assess the amount of renewable fuel consumption that can be achieved, and the limitations in that potential in 2016. Thus, we are setting the total renewable fuel volume requirement for 2016 at a level that takes into account both the constraints on supply and the ability of the RFS program to incentivize RFS stakeholders to overcome those constraints.

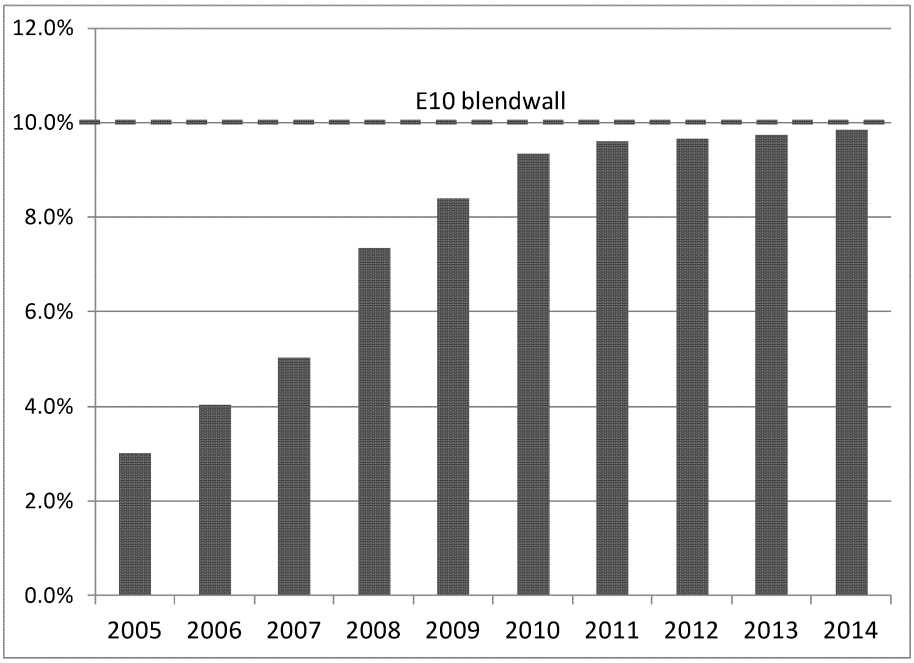
The following sections discuss in further detail our assessment of broad categories of renewable fuel expected to contribute to the total supply of renewable fuel in 2016. We also discuss the particular constraints that we expect will be relevant in projecting the supply of these renewable fuels in 2016.

2. Projecting Ethanol Supply

Ethanol is the most widely produced and consumed biofuel, both domestically and globally. Since the beginning of the RFS program, the total volume of renewable fuel produced and consumed in the United States has grown substantially each year, primarily due to the increased production and use of corn ethanol. Prior to 2013 the primary constraints to the supply of ethanol were the amount of ethanol that could be produced and imported into the United States, and the ability of the market to distribute the ethanol across the country. Virtually all existing retail infrastructure and vehicles were compatible with gasoline containing up to 10% ethanol, and therefore the ethanol supply grew with the production capacity of the domestic ethanol industry and the rapid build-out of the ethanol distribution and terminal blending capacity to supply E10. A combination of factors, including the demand certainty provided by the RFS and the ability to profitably market ethanol in E10 blends due to relatively high gasoline prices, relatively low corn prices, and the blenders tax credit (available through 2011), provided the economic incentive for the investment that led to rapid increases in ethanol production and distribution capacity, dramatically increasing the total supply of ethanol to vehicles.

However, as the gasoline market became saturated with E10 in 2013 and 2014, the constraints on the supply of ethanol began to change. The supply of ethanol depends on the overall demand for gasoline as well as the percentage of ethanol blended into gasoline. In order for the supply of ethanol to increase it now needs to be sold in higher level blends, such as E15 or E85. These fuels are not compatible with much of the existing retail infrastructure and cannot be used in all vehicles and engines. The low number of retail stations selling these higher level ethanol blends, along with poor price advantages for these higher level blends compared to E10, a limited number of FFVs, and ineffective marketing of these fuels represent the biggest challenges to the continued growth of the supply of ethanol as a transportation fuel in the United States. As can be seen in Figure II.E.2–1 below, the rate of growth in the use of ethanol as a percentage of the motor gasoline market decreased dramatically as it approached an average concentration of 10% nationwide.

Figure II.E.2-1
Ethanol Concentration of Gasoline



Source: EIA's Short Term Energy Outlook

Since 2013, the number of FFVs in the fleet and the number of retail stations offering E15 and E85 have grown, and we believe that this growth has been influenced in part by the RFS program. However, this growth has been very modest. The number of retail stations offering E85 was about 3,000 by the end of 2014, representing only about 2% of stations nationwide.[76] There were about 14 million FFVs in the fleet in 2014, representing about 6% of all light-duty cars and trucks. However, with only about 2% of retail stations offering E85 only a minority of those FFVs had an E85 refueling station nearby. Additionally, with E85 almost always priced higher than E10 on a cost per mile basis, only a fraction of the FFV owners with access to a refueling station offering E85 chose to purchase this fuel.[77] These constraints are unlikely to change significantly in 2016, though we do expect some growth in each of these areas under the influence of the standards we set under the RFS program, and as a result of a recent USDA program that will provide $100 million to develop infrastructure for higher ethanol blends, as discussed in Section II.E.2.v.

While the price of the RIN that is generated and assigned to a gallon of ethanol theoretically should allow E85 to be priced at a level to encourage consumers to purchase these fuel blends when available (cheaper than E10 on a per mile basis), data that EPA has reviewed suggest this is unlikely in 2016. In the sections that follow we first discuss the data supporting our conclusion that the RIN is currently an inefficient mechanism for reducing the price for higher level ethanol blends at retail, and therefore unlikely to be able to significantly impact the supply of ethanol in the United States in 2016. We then discuss in detail our projected supply of E0 (which impacts the supply of ethanol by reducing the gasoline pool into which ethanol can be blended), E10, E15, and E85. We note that throughout this discussion we do not differentiate between ethanol produced from corn, sugarcane, or any other feedstock. This is because we believe that the supply of ethanol in 2016 will not be limited by the amount or types of ethanol produced, but rather by other constraints as discussed below. Therefore, in projecting the ethanol supply for the purpose of setting the total renewable fuel volume requirement, the feedstocks used to produce the ethanol and any particular constraints related to these individual feedstocks are not relevant considerations.

i. Ethanol Supply as E10 in 2016

Based on comments received in response to the NPRM, it is clear that the E10 blendwall is viewed differently by different stakeholders. Some stakeholders, most notably refiners, expressed the belief that the constraints on sales of higher ethanol blends such as E15 and E85 are so substantial, and the time available to address those constraints for 2016 is so limited, that exceeding a pool-wide ethanol content of 10% is either unattainable or could occur only at great cost with corresponding increases in fuel prices and disruption to fuel supplies. Other stakeholders, primarily ethanol proponents, instead argued that substantially higher volumes of E15 and/or E85 can be reached in 2016 with available infrastructure, despite insufficient efforts in the past to expand infrastructure for E15 and E85. These stakeholders generally argued that higher standards would result in higher RIN prices, which in turn would result in greater price discounting for E15 and E85 in comparison to E10 and thus higher sales of those higher level ethanol blends. They further argued that higher RIN prices, even if significant, would not result in higher fuel prices to consumers.

Our view of the E10 blendwall falls between these two viewpoints. We believe that there are real constraints on the ability of the market to exceed a pool-wide ethanol content of 10%. However, these constraints do not have the same significance at all levels above 10% ethanol. Instead, for the state of infrastructure that can be available in 2016, the constraints represent a continuum of mild resistance to growth at the first increments above 10% ethanol and evolve to significant obstacles at higher levels of ethanol. This gradual nature of the impacts of the constraints is due to the fact that small increases in ethanol volumes above 10% are likely to be possible with changes in RIN prices, while larger increases are only possible with changes to infrastructure that cannot occur as quickly. The transition from mild resistance to significant obstacles occurs by degrees rather than all at once, and overcoming the constraints will likely require different solutions over different time periods. It is difficult to identify the precise boundary between volumes that can be achieved with mild difficulty in 2016 and those that likely cannot realistically be achieved over the next year. Ultimately the market will determine the extent to which compliance with the annual standards is achieved through the use of greater volumes of ethanol or other, non-ethanol renewable fuels.

The volume requirements that we are setting today, particularly for 2016, are intended to result in pressure on the market to exceed the E10 blendwall, but we do not believe the 2016 standards are capable of overcoming all constraints. Whether the market will respond to the standards we set by increasing the use of E15–E85 is unclear, as it is a function of actions taken by various fuel market participants, including obligated parties, renewable fuel producers, distributors and marketers, gasoline and diesel retailers, and consumers. Nevertheless, the standards we are setting acknowledge that opportunities exist to exceed the E10 blendwall as described more fully in Section II.G below.

Many stakeholders, regardless of their views on whether the E10 blendwall can or should be a consideration in the determination of applicable volume requirements, made the implicit assumption in their comments that the total volume of ethanol that would be used was identical to the volume of non-advanced (*i.e.,* conventional) renewable fuel that would be necessary. Not only is this assumption incorrect, but it oversimplifies the true nature of the standards and the process of determining appropriate levels for those standards. While the portion of the 2016 cellulosic biofuel standard that we expect to be ethanol is only 20 million gallons, significantly larger volumes of ethanol may be used to meet the advanced biofuel volume requirement. As discussed in Section II.F, total volumes of advanced ethanol can reasonably be expected to reach 200 hundred million gallons. It is also likely that a portion of the conventional renewable fuel pool will be non-ethanol as evidenced by production and imports of conventional biodiesel and renewable diesel in the past.

The amount of ethanol associated with the E10 blendwall (the volume of ethanol that could be consumed if all gasoline was E10) is driven by the total demand for gasoline, and thus, if all other considerations are equal, ethanol consumption will tend to increase if gasoline consumption increases and ethanol consumption will tend to decrease if gasoline consumption decreases. In the NPRM we used a projection of 2016 gasoline demand from the May, 2015 version of EIA's Short-Term Energy Outlook (STEO), as

[76] Source: DOE's Alternative Fuels Data Center.

[77] E85 would need to be priced at least 22% below E10 to be equivalent on a cost per mile basis. Instead, E85 price discounts have been less than 18% for the last several years according to E85prices.com.

this was the most recent version available at that time. For this final rule we have used the October, 2015 version of the STEO, again because it is the most recent data available.[78] As shown in the table below, projected 2016 gasoline demand increased by about 1.4% between May and October, most likely driven by lower crude oil prices.

TABLE II.E.2.i–1—PROJECTED 2016 GASOLINE DEMAND AND THE E10 BLENDWALL

	May, 2015	October, 2015	Difference
Demand for gasoline energy (Quad Btu)	16.617	16.852	+0.235
Equivalent volume of E10 (bill gal)	138,045	140,004	+1,959
E10 Blendwall (bill gal)	13,805	14,000	+195

Source: Calculated from volume projections in EIA's Short-Term Energy Outlook for the indicated months, which can be found at *http://www.eia.gov/forecasts/steo/outlook.cfm*. Assumes 3.558 mill Btu/barrel for denatured ethanol and 5.222 mill Btu/barrel for gasoline without ethanol.

In response to our proposed intention to use gasoline projections from EIA, several stakeholders indicated that EIA's projections of gasoline demand have historically tended to be lower than actual demand. They requested that we make an adjustment to EIA's projections to ensure that they are as accurate as possible. We investigated this issue and determined that by and large EIA's projections of gasoline demand have not, in fact, been lower than actual demand. As described in a memorandum to the docket, projected gasoline demand has more often been higher than actual demand, though the errors in demand projections were highly variable.[79] Even so, we do not believe it would be appropriate for EPA to make adjustments to EIA projections to account for potential over- or underestimation of projected gasoline demand. EIA staff are the experts in the analyses required for these particular projections, and EPA does not have the data or expertise necessary to suggest changes to them.

ii. The Impact of RIN Prices on E85 Retail Prices

The RIN system is the mechanism established by EPA for obligated parties to demonstrate compliance with the standards, and is designed to provide obligated parties flexibility in the means they use to achieve compliance. The RFS program, acting through the mechanism of the RIN system, also operates to provide an incentive for renewable fuel producers to increase the production of renewable fuels by, in effect, increasing the price blenders and obligated parties are willing to pay for renewable fuels.[80] Under the RFS program, renewable fuel producers sell not only the fuels they produce, such as ethanol or biodiesel, but also the RINs that are ''assigned'' to the renewable fuel. As the demand for RINs increases based on the obligations applicable to producers and importers of gasoline and diesel, the willingness of the market to pay for renewable fuels and the RINs assigned to them also increases. When working efficiently, this system allows renewable fuel producers to continue to profitably market renewable fuel at times that would otherwise result in negative margins, such as when the price of feedstock and other inputs to renewable fuel production are unusually high, the price of the petroleum fuels that renewable fuels replace is unusually low, or when market demand for renewable fuel is low. In this way the RFS program, through the RIN system, also assists renewable fuel producers seeking to finance the construction of new facilities, especially facilities capable of producing cellulosic or advanced biofuels, by providing certainty that there will be a market for increasing volumes of renewable fuels.

The RIN system should also incentivize the development of the renewable fuel distribution infrastructure by helping to decrease the net cost of renewable fuels. As mentioned above, when fuel blenders or obligated parties purchase renewable fuel directly from renewable fuel producers this fuel generally comes with an assigned RIN. When a fuel blender blends the renewable fuel with petroleum-based fuel to create finished transportation fuel, the blender is able to separate and sell the RIN that was previously assigned to the renewable fuel. Whatever price the fuel blender or obligated party receives when they sell the separated RIN can be thought of as reducing the net purchase price of the renewable fuel. For example, if a fuel blender purchases a gallon of ethanol with an attached RIN for $1.50 and, after blending the ethanol to create transportation fuel, sells the RIN for $0.50, the blender has effectively paid $1.00 for the gallon of ethanol without the RIN. The higher the price received for the RIN, the lower the effective cost of the renewable fuel compared to the petroleum fuel it displaces (and the higher the price of the petroleum fuel or blendstock necessary for the obligated party to recoup the cost of the RIN). Higher RIN prices therefore enable fuel blenders to market finished fuels that contain renewable fuel components at lower prices by allowing them to purchase renewable fuels for a lower effective price. A fuel blender can choose not to reduce the price of the blended fuel and keep the value associated with the RIN as profit, or they can attempt to increase their sales volumes and market share by passing along the lower effective purchase price of the renewable fuel to the customers in the price of their fuel blends.[81] If the blender retains all, or a significant portion, of the RIN value, the ability for the RIN to impact the retail prices and sales volumes of E85 (or other renewable fuels) will be reduced. By increasing the potential profitability of blending renewable fuels, however, higher RIN prices can incentivize the build out of the infrastructure necessary to blend and distribute renewable fuel

[78] We received 2015 and 2016 transportation fuel demand projections from EIA's Adam Sieminski on September 16, 2015, which included gasoline demand projections from the September 2015 STEO. However, we believe it is more appropriate to use gasoline demand projections from the more recent October 2015 STEO. Using the most up to date EIA data on projected gasoline and diesel demand allows our assessment of 2016 supply, and calculation of percentage standards, to be as accurate as possible.

[79] ''Analysis of historical errors in projections of gasoline and distillate demand from EIA,'' David Korotney, memorandum to EPA docket EPA–HQ–OAR–2015–0111.

[80] This is the case for years when the RFS standards are binding, or causing the market to consume renewable fuels in volumes beyond what they would otherwise choose to use, such as 2013. In years prior to 2013 where the RFS standard for total renewable fuel were not binding, the RINs generally reflect transaction costs.

[81] In competitive markets, such as the market for E10, fuel blenders must reflect the lower effective prices of renewable fuel (ethanol) in the price of the E10. For emerging markets, such as E85, there may be greater opportunities for fuel blenders to withhold profit due to a lack of market competition until such a time as other parties enter the E85 market.

blends as parties seek to enter or expand their position within this market.[82]

Finally, the RFS program, operating through the RIN system should also increase the consumption of renewable fuels by ultimately decreasing the cost of renewable fuel blends to consumers relative to the cost of fuel blends that do not contain renewable fuels. RIN prices can be used by blenders to decrease the effective cost of renewable fuel used to create transportation fuel. As more market participants enter the renewable fuel blending and distribution marketplace, and consumers learn to accurately compare the cost of E10 and other higher-level ethanol blends, over some period of time the competition among renewable fuel blenders and distributors should result in a greater portion of the reduced effective cost of renewable fuel blends enabled by the sale of the RIN to be passed on to fuel consumers. Retail prices for transportation fuel that contains renewable fuels should then reflect these cost reductions relative to transportation fuel containing lower volumes of renewable fuel (or no renewable fuel) in proportion to their renewable fuel content; transportation fuel containing a greater percentage of renewable fuels should be priced lower than transportation fuel containing a lesser percentage of renewable fuel. Motivated by the lower fuel prices for transportation fuel containing greater renewable fuel content (such as E85) relative to fuels containing less renewable fuel (such as E10), consumers who own flexible fuel vehicles (FFVs) will then choose to purchase increasing volumes of renewable fuel. If the price discount for renewable fuels is great enough for a long enough period of time, more consumers may also be motivated to purchase vehicles capable of utilizing fuels containing higher percentages of renewable fuels, such as FFVs.

Several commenters pointed to the ability of RIN prices to reduce the price of fuels containing higher concentrations of renewable fuels, such as E85, as a primary justification for establishing a higher total renewable fuel standard. They claimed that if EPA established a higher standard than proposed, RIN prices would rise, retail prices for E85 would fall relative to those for gasoline, and consequently consumers would purchase greater volumes of E85. In effect, these comments said, the RIN mechanism would ensure that greater volumes of renewable fuel would be consumed, the renewable fuels market would expand, and sufficient RINs would be generated to meet the higher standards. Some commenters also noted that since EPA agreed that higher RIN prices would not be expected to impact E10 prices there would be no economic harm in setting a higher total renewable fuel standard, and that this action was necessary in order to drive renewable fuel consumption beyond the E10 blendwall. In contrast, other commenters claimed that higher RIN prices would not have the desired effect of increasing the consumption of renewable fuels, at least not in the short term, and that high RIN prices could have adverse economic impacts, including higher diesel fuel prices, as EPA has already acknowledged.

If higher RIN prices, which would likely result from a higher total renewable fuel standard, are to lead to substantial increases in E85 consumption, two independent events must occur. First, the higher RIN prices must lead to lower E85 retail prices. If this does not happen consumers would have no incentive to purchase additional volumes of E85 as a result of higher RIN prices. Second, FFV owners must respond to these lower prices by purchasing E85 instead of E10 when E85 is available. Authors such as Babcock and Pouliot, who have written about the ability for RINs to drive significant increases in E85 sales volumes, optimistically assume that RIN prices are passed through to E85 prices and that consumers are highly responsive to E85 prices.[83]

EPA examined available data in an attempt to determine whether or not higher RIN prices resulted in lower E85 prices at retail, and whether lower E85 retail prices lead to substantial increases in E85 sales, as economic theory would suggest would be the case when FFV owners receive better value for purchasing E85 rather than E10. Our analysis suggests that the market was not sufficiently responsive to higher RIN prices to drive large increases in E85 sales volumes in the period of time at question. For instance, we found that between January 2013 and July 2015 only 44% of the RIN value was passed on to E85 customers in the form of lower E85 retail prices.[84] Recent work by other parties has reached similar conclusions.[85] We also found that while sales volumes of E85 did increase as the price discount for E85 relative to E10 increased, these sales increases were both less dramatic than many have assumed, and perhaps more importantly, did not increase sharply when the price discount exceeded energy parity, as others, including Babcock and Pouliot have assumed.[86] While we did not investigate all factors that might slow retail response to changing RIN prices, our observations lead us to conclude that if EPA were to increase the total renewable fuel volume requirement significantly, we would expect to see sharply higher RIN prices, but sales volumes of E85 would be expected to see only modest increases that would be insufficient to enable the market to reach the statutory targets.

While economic theory and the illustrations above support the idea that RINs can serve as a mechanism to increase the production, distribution, and consumption of renewable fuels, it is important to note that this result is dependent on the marketplace working both efficiently and quickly. In reality, there is a timing component associated with each of the steps outlined above. Renewable fuel producers and investors must see a sustained, profitable market for renewable fuels before they will be willing to invest in the construction of additional fuel production capacity, which may take years to construct and bring online. Fuel blenders and distributors must see sustained profit opportunities before they are willing to invest in new infrastructure to increase their capacity to blend and distribute renewable fuels. Market competition must increase before fuel blenders and distributors are willing to pass along all of the reduced effective price of renewable fuel (in essence, the value of RINs) to consumers at retail. New fueling infrastructure will need to be built to facilitate the growth in sales of

[82] For further background information on EPA's understanding of the RIN and renewable fuel market dynamics see ''A Preliminary Assessment of RIN Market Dynamics, RIN Prices, and Their Effects,'' Dallas Burkholder, Office of Transportation and Air Quality, US EPA. May 14, 2015, EPA Air Docket EPA–HQ–OAR–2015–0111.

[83] Babcock, Bruce A. and Sebastien Pouliot. *Feasibility and Cost of Increasing US Ethanol Consumption Beyond E10.* Card Policy Briefs, January 2014. 14–PB 17.

[84] ''An Assessment of the Impact of RIN Prices on the Retail Price of E85,'' Dallas Burkholder, Office of Transportation and Air Quality, US EPA. November 2015. EPA Air Docket EPA–HQ–OAR–2015–0111.

[85] Knittel, Christopher R., Ben S. Meiselman, and James H. Stock. The Passthrough of RIN Prices to Wholesale and Retail Fuels Under the Renewable Fuel Standard. Working Paper 21343. NBER Working Paper Series. Available online <*http://www.nber.org/papers/w21343.pdf*>

[86] Because E85 contains approximately 22% less energy per gallon than E10, economic theory would suggest that minimal volumes of E85 would be sold when the price discount for E85 relative to E10 was less than 22% and that sharply increasing sales volumes would occur when the price discount exceeds 22%. For more information on the observed relationship between E85 retail pricing and E85 sales volumes, see ''Correlating E85 consumption volumes with E85 price,'' memorandum from David Korotney to EPA Docket EPA–HQ–OAR–2015–0111.

fuels containing an increasing percentage of renewable fuel. And as exposure to renewable fuels increases, it will take some time for consumers to learn to identify value in fuel blends containing higher proportions of renewable fuels, as well as their vehicle's ability to handle these fuel blends and where they are available for purchase.

This suggests that while the RFS program can be effective at increasing the renewable content of transportation fuels over time, it likely cannot substantially increase the available supply of renewable transportation fuels to consumers in the United States to the volumes envisioned by Congress in the short term. The program, as Congress clearly indicated, is intended to grow over a period of years. Market participants require long term certainty in EPA's approach to establishing renewable fuel standards to allow them to effectively plan for the most efficient and least costly ways to provide the needed fuels and comply with the standards. EPA remains committed to promoting renewable fuel production and use in the United States, and we believe the RFS program will be effective in achieving this end. Due to the current state of the renewable fuel production, distribution, and consumption marketplace, we believe the required volumes of renewable fuel must be reduced below the statutory levels in the immediate near term. An approach that acknowledges supply constraints when determining the appropriate volume requirements is necessary, is consistent with the statute and Congressional intent, and is the intended outcome of this action.

iii. Ethanol Supply as E85 in 2016

While the use of one gallon of E15 can increase the amount of ethanol used by about 50% in comparison to an energy-equivalent gallon of E10, the use of one gallon of E85 can increase the amount of ethanol over that in an energy-equivalent gallon of E10 by about a factor of nine.[87] As a result, many stakeholders focused on the potential for increases in sales of E85 to quickly and significantly increase total ethanol consumption. Stakeholders who believed that our proposed volume requirements were too high similarly focused on E85 as being an impractical means of exceeding the E10 blendwall.

All stakeholders agreed that actual sales of E85 in the past have been low. A number of parties referenced E85 estimates made using EIA data of about 77 million gallons in 2014. This estimate was based on data collected from two sources: Refiners and blenders, and ethanol production facilities.[88] After further investigation, however, we believe that this estimate is lower than actual E85 use. EIA's Bulk Terminal and Blender Report is administered only to entities with at least 50,000 barrels of product storage capacity, so production at terminals, ethanol production facilities, or blenders that do not meet this threshold is not reported to EIA. EIA also does not collect information on E85 produced using reformulated gasoline or natural gasoline as the petroleum based component.[89] We believe that E85 produced using these petroleum blendstocks represents a significant portion of the total E85 produced in 2014. When considering the E85 production volumes reported to EIA in 2014 in light of the potential for production of E85 not covered by EIA's surveys, we believe that actual E85 sales were closer to about 150 million gallons in 2014. Details of our analysis can be found in a memorandum to the docket.[90]

Although 150 million gallons is about twice as high as the estimate discussed above based on EIA data, it still does not indicate an overall preference among FFV owners for E85 when E85 has been available. Indeed, based on other comments received it is clear that the experience at retail has been mixed. Some retailers, such as 3G Energy, found that E85 sales were good and they were able to make a profit from selling it. Others, such as U.S. Ethanol, found E85 sales to be very poor and have consequently converted E85 tanks to other uses. Other retailers, including some in the Midwest, have recently made decisions to market E0 in lieu of E85 due to greater relative consumer interest in E0 in the current economic climate. There was no consistent trend among comments provided by parties attempting to sell E85 on the attractiveness of the product to FFV owners.

Most stakeholders agreed that one important factor in low historical sales of E85 is the small number of retail stations offering it. According to DOE's Alternative Fuels Data Center, the number of E85 stations reached 2,941 in August of 2015. While the growth in E85 stations was substantial in late 2010 and early 2011—equivalent to about 400 new stations per year—since then growth in the number of E85 stations has been considerably slower at about 120 per year. Most recently growth may have plateaued due to the lower price of crude oil, reducing the attractiveness of E85 to consumers and thus the willingness of retailers to invest to make it available at their stations.

A number of stakeholders cited a recent grant program sponsored by USDA that is designed to provide a total of $100 million for updated and expanded infrastructure at retail for higher level ethanol blends.[91] This is an important program that not only demonstrates the U.S. commitment to expanding the use of renewable fuels, but helps to boost private investment in infrastructure by providing matching funds. It is expected to increase the number of stations offering higher level ethanol blends by 1,486, and to increase the number of underground tanks that can hold higher level ethanol blends by 515.[92] While the infrastructure changes are required to be completed by the end of 2016, there are also opportunities for extensions of up to two additional years. The program supports both E15 and E85 deployment. It is unclear how many new E15 and E85 stations would result from this USDA program in 2016. If E85 stations were installed in 2016 at a rate that rivaled the dramatic increases seen in 2010–2011, about 400 new E85 stations could be added in 2016. This would bring the total number of stations to about 3,300. However, it is not possible to make a precise projection at this time of the impacts of this grant program on the number of E85 stations that will be in operation in 2016.

Even if the number of E85 stations did reach 3,300 in 2016, it would represent an increase of only 12% in comparison

[87] We have assumed that the ethanol content of E85 is 74% on average, consistent with the approach taken by EIA. One gallon of E85 would replace 0.79 gallon of E10 due to the energy content difference. Ethanol content of one gallon of E85 would be 0.74 gal, while ethanol content of 0.79 gal of E10 would be 0.079 gal. 0.74/0.079 = 9.4.

[88] See EIA–810 form, Part 5, where refiners and blenders indicate production of ''Finished motor gasoline, Conventional, Greater than ED55'', *http://www.eia.gov/survey/form/eia_810/form.pdf*, and EIA–819 form, Part 6, where ethanol producers report ''Blending to produce finished motor fuel,'' ''Conventional, Greater than Ed55,'' *http://www.eia.gov/survey/form/eia_819/form.pdf*.

[89] As further evidence for the underestimate of E85 production at ethanol production facilities, we note that the reported E85 production in 2009 was −(minus)228 thousand barrels, strongly suggesting that the accounting involved is not based on E85 volumes alone.

[90] ''Estimating E85 Consumption in 2013 and 2014,'' Dallas Burkholder, Office of Transportation and Air Quality, US EPA. November 2015. EPA Air Docket EPA–HQ–OAR–2015–0111.

[91] ''USDA grant program—Biofuel Infrastructure Partnership'', docket EPA–HQ–OAR–2015–0111.

[92] ''BIP Awards by State,'' docket EPA–HQ–OAR–2015–0111. It is unclear how many of the 515 new tanks will be used for E15 versus E85, nor how many of the additional 1,486 stations will offer E15, E85, or both.

to those in operation as of August, 2015. It is reasonable to assume that a 12% increase in the number of E85 stations would result in overall sales of E85 increasing by 12%, all other things being equal. However, many stakeholders pointed to the power of high-priced RINs to motivate consumers to use more E85 and argued that larger growth was possible from the impact of high-priced RINs than from the growth in the number of E85 stations. More specifically, many ethanol proponents claimed that increasing the volume requirements above the levels proposed in the NPRM, even up to the statutory targets, would increase RIN prices, which in turn would translate into a larger retail price discount for E85 in comparison to gasoline. This larger price discount would make E85 more attractive to FFV owners, and thus sales of E85 would increase beyond a level that is merely proportional to the number of E85 stations.

As discussed in more detail in Section II.E.2.ii, we agree generally that the market could theoretically be expected to work in this way in response to higher standards. However, we have investigated the specific mechanisms involved and have concluded that the process is far more constrained in the immediate future than most ethanol proponents believe it to be. These constraints, discussed further below, make it inappropriate to estimate total potential E85 consumption based on the consumption capacity of all FFVs, or even just those FFVs with reasonable access to E85. It is similarly inappropriate to assume that the E85 throughput at a given retail station can be the same as typical throughput rates for E10. Such estimates demonstrate what is physically possible, not what is likely to occur given the way that the market actually operates under the influence of high RIN prices as evidenced by the limited growth in 2013 despite the standards that were in place.

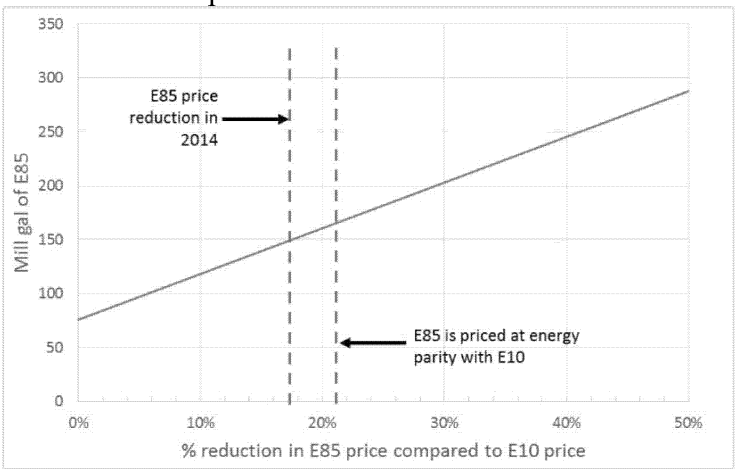
Based on an analysis of available data, we have determined that at this point in the market's development, the constraints on the ability of applicable standards to drive increased consumption of E85 in 2016 are twofold:

- Higher RIN prices are not likely to produce dollar-for-dollar equivalent reductions in E85 retail prices under current circumstances wherein the number of E85 stations is too few to compel competition between them.
- Reductions in E85 retail prices are associated with only moderate increases in E85 sales to FFV owners.

As discussed in a memorandum to the docket, we found that only a minority of the value of RINs has been passed on to FFV owners in the past in the form of lower E85 retail prices.[93] This effect appears to be due to the fact that there is often little incentive for wholesalers to pass the full value of the RIN on to retailers in the form of lower E85 prices, and/or retailers can maximize their overall profits by retaining much of the value of the RIN that they do receive rather than passing that value on to customers in an effort to increase sales of E85.

We have also found that greater E85 price discounts relative to gasoline have not been associated with the substantial increases in E85 sales volumes that would be needed to reach the total E85 consumption levels that some stakeholders said are possible. Based on an analysis of E85 consumption in five states (including the frequently cited E85 consumption data from Minnesota) and the E85 price reductions relative to gasoline in those states, as shown in Figure II.E.2.iii–1 below, we estimate that increasing the E85 price reduction from the 2014 nationwide average of 17.5% to 30% would have increased total 2014 E85 consumption to about 200 million gallons, an increase of only 33%. A recent paper published by Babcock and Pouliot estimated similar sales volumes for these price reductions, projecting that consumers would consume about 250 million gallons of E85 if it was priced at parity on a cost-per-mile basis with E10 (approximately 22% lower on a price-per gallon basis).[94]

Figure II.E.2.iii-1
Estimated Nationwide Relationship Between E85 Price Reductions and Consumption in 2014



It is possible that significant increases in the number of retail stations offering E85 could help to increase E85 consumption. It is also possible that the relationship between E85 consumption and prices in the five states analyzed is not indicative of consumer responses in other states, but instead the consumer responses in other states could be more dramatic. We examined the potential impacts of these factors and determined that collectively it may be possible for

[93] ''An Assessment of the Impact of RIN Prices on the Retail Price of E85,'' Dallas Burkholder, Office of Transportation and Air Quality, U.S. EPA. November 2015. EPA Air Docket EPA–HQ–OAR–2015–0111.

[94] Babcock, Bruce and Sebastien Pouliot. *How Much Ethanol Can Be Consumed in E85?* Card Policy Briefs, September 2015. 15–BP 54.

nationwide E85 consumption to reach as high as 400 million gallons in 2016. This volume could only occur if all relevant factors were extremely favorable, and we do not consider this to be a likely outcome in 2016. Further discussion of these analyses can be found in a memorandum to the docket.[95]

Our observations and analysis lead us to conclude that if EPA were to dramatically increase the total renewable fuel volume requirement for 2016 above the level we proposed, in the near term we would expect to see sharply higher RIN prices, but this would not translate into dramatically higher E85 sales volumes in the near term. However, sustained higher RIN prices would, over the longer term, be expected to provide greater incentive for the market to expand infrastructure.

iv. E0 Demand in 2016

One of the ways that the RFS program can increase the supply of renewable fuels in the United States is by incentivizing the market to continue to transition from E0 (gasoline containing no ethanol) to E10 and other higher level ethanol blends. While the RFS program provides a significant incentive for this transition, the continued availability of E0 in certain markets is also something that we believe we must consider in determining the supply of ethanol in 2016. E0 continues to be marketed in many parts of the country, often at a significant cost premium to E10, including in the Midwest where ethanol is most readily available at the lowest cost. In the NPRM we discussed the potential for ongoing use of E0 through 2016 and into the future. We anticipated that E0 use would remain fairly limited and would tend to decrease over time given the widening use of ethanol overall. We also highlighted one particular market segment, recreational marine engines, that we believed would be particularly difficult to transition from E0. While most nonroad engines in use today can operate on E10, recreational marine engines are a potentially special subcategory. Because such engines are used in a water environment there is a greater potential for water contamination of the fuel. For gasoline that contains ethanol, the ethanol-water mixture may then separate from the gasoline and cause engine damage. As a result, some recreational marine engine owners seek out E0. We believe that we should take into consideration the ongoing preference for some E0 in this context.

In the NPRM we discussed our investigation into the volumes of E0 that are in demand by owners of recreational marine engines. We expressed our view that it is most likely that any recreational marine engines refueled at retail service stations would use only E10 since E0 is rarely offered at retail. Moreover, only a small minority of recreational marine engines refuel at marinas where E0 is more likely to be available. Based on this assessment, we estimated that about 124 million gallons of E0 would be consumed by recreational marine engines in 2016. We estimated that the impact of this volume of E0 used in such applications on the total supply of renewable fuel in 2016 would be very low, and would likely be offset by the small expected use of E15. As a result, we omitted E0 and E15 from the scenarios described in Table II.D.2–2 of the NPRM.

Stakeholders that commented on this topic generally agreed that E0 will continue to exist, but argued that our estimates of the likely volumes of E0 were too low. For instance, in their joint comments on the NPRM, the American Petroleum Institute and the American Fuel and Petrochemical Manufacturers (API/AFPM) suggested that there is ongoing demand for E0 at a level of at least 3% of the total gasoline pool. This would be the equivalent of about 4 billion gallons of E0, considerably higher than the 124 million gallons we estimated in the NPRM. They based this position on data from EIA on the supply of non-ethanol conventional gasoline from refineries, importers, and blenders, corrected to account for exports and stock changes. We investigated the EIA data on which the API/AFPM comments were based, and concluded that it is not an appropriate basis for determining the amount of E0 actually sold at retail, and thus cannot be used to estimate likely E0 sales. While the EIA data at issue does take into account the production of E10 by large terminals from E0 supplied by refiners, it does not account for E10 produced downstream at smaller facilities, truck blending, and blending at retail. Given that there are a number of states that require the supply of E0 at the wholesale level explicitly to permit downstream blending with ethanol, the estimates of E0 supply referenced by API/AFPM that were generated from EIA gasoline supply data overestimate the potential demand for E0 at retail.[96]

In response to the NPRM, a number of organizations disagreed with our assessment of the potential volume of E0 consumed by recreational marine engines. Several stakeholders pointed to EPA's own NONROAD model as providing much higher estimates of total gasoline consumption by these engines. We agree that total gasoline consumption by recreational marine engines is substantial—about 1.55 billion gallons according to a recent estimate from the EPA's NONROAD model.[97] However, we disagree that all of this volume is E0, and no stakeholders provided any data on actual consumption of E0 by recreational marine engines. Instead, stakeholders pointed to anecdotal evidence that owners of recreational marine engines preferentially seek out E0. One stakeholder referenced data purporting to show that states with the greatest number of retail stations offering E0 tend to also be states with the greatest number of registered boats. After reviewing these data we concluded that a weak correlation does exist, but that it nevertheless provides no straightforward mechanism to quantitatively determine the volume of E0 consumed by recreational marine engines. Notably, the same data suggest that not all marinas may offer E0. As described in a memorandum to the docket, we considered several different approaches to estimating the volume of E0 consumed by recreational marine engines.[98]

Based on the information provided by stakeholders and our own analyses, we believe that the volume of E0 consumed by recreational marine engines or otherwise demanded by the marketplace could be as high as several hundred million gallons in 2016. As a result, we have included some estimates of E0 in the volumes scenarios described in Section II.G below. Those scenarios demonstrate that our final volume requirements can be met even in cases where some volume of E0 remains in the marketplace.

v. Ethanol Supply as E15 in 2016

In the NPRM, we discussed the fact that E15 is approved for use in model year 2001 and newer motor vehicles, but that we expected the volume of E15 used in 2016 to be low. We based this assessment on the fact that the number of retail stations offering it at the time of the NPRM was only about 100 out of the approximately 152,000 retail stations in the U.S. We estimated that, at most, the use of E15 in 2016 would

[95] ''Correlating E85 consumption volumes with E85 price,'' memorandum from David Korotney to EPA Docket EPA–HQ–OAR–2015–0111.

[96] ''States that require ethanol-free gasoline,'' docket EPA–HQ–OAR–2015–0111.

[97] ''NONROAD estimate of fuel use in recreational marine,'' docket EPA–HQ–OAR–2015–0111.

[98] ''Estimating E0 use in recreational marine engines,'' memorandum from David Korotney to docket EPA–HQ–OAR–2015–0111.

increase total ethanol consumption by only about 10 million gallons. Since this volume was far lower than the volume requirements under consideration, and its impact in our analysis would likely be offset by the small expected use of E0, we omitted E0 and E15 from the scenarios described in Table II.D.2–2 of the NPRM.

While some stakeholders agreed with our assessment, others said that we had significantly underestimated the volume of E15 that could be consumed in 2016, and that doing so biased our proposed volume requirements low. These stakeholders, including the American Coalition for Ethanol and Growth Energy among others, pointed to both the large number of vehicles that are legally permitted to use E15 and opportunities for expanding the number of retail stations that offer E15.

The number of vehicles that are legally permitted to use E15 is large. Model year 2001 and later vehicles comprise about 85% of the current in-use fleet, or about 195 million vehicles. These vehicles have a total annual gasoline consumption capacity of more than 120 billion gallons, so changing their fuel consumption type from E10 to E15 could increase total ethanol consumption by more than 6 billion gallons. However, as pointed out by several stakeholders, being legally permitted by EPA to operate on E15 for emission compliance purposes under the CAA does not necessarily enable expanded use of E15. These stakeholders highlighted that the operator's manuals and manufacturer warranties for vehicles manufactured before 2012 make no mention of E15 because E15 did not exist at the time that those vehicles were manufactured. Manufacturers have been increasingly citing E15 as an acceptable fuel in owner's manuals for various models since 2012, but as of today these statements are not universal for all makes and models. Whether these facts would cause some vehicle owners to avoid E15 is not clear. This situation is similar to the historical situation with E10. E10 has been permitted under the CAA to be used in all highway vehicles and nonroad engines for many years. Nevertheless, it took years for the vehicle manufacturers, especially the nonroad engine manufacturers, to warrant the use of E10 in their products.

Regardless, we do not believe that the number of vehicles that are legally permitted to use E15, or the number of 2001 or later model year vehicle owners who would choose to use it, are the predominant factors in determining the volume of E15 that is likely to be consumed in 2016. Instead, it is the number of retail stations offering E15 in 2016 that is more likely to determine how much E15 is actually consumed. In the time since E15 was approved for use, the number of retail stations registered to offer E15 has only grown to about 120, or about 0.1% of all retail stations, based on information collected by the RFG Survey Association.[99] Based on comments received from retail station owners, this low number of retail stations offering E15 is most likely due to liability concerns. We stated our belief in the NPRM that the number of retail stations offering E15 is unlikely to increase dramatically by the end of 2016. The recently announced Biofuel Infrastructure Partnership (BIP) program managed by USDA is expected to increase the number of underground storage tanks that can hold higher level ethanol blends by 515 tanks, and to increase the number of stations offering higher level ethanol blends by 1,486 stations. However, it is not clear at present how many of these new tanks or stations offering higher level ethanol blends will expand E15 rather than or in addition to E85, nor how many will be operational in 2016 versus subsequent years. At this time, we continue to believe that the number of retail stations likely to offer E15 in 2016 is unlikely to increase fast enough to provide a significant increase in total ethanol consumption in 2016.

Some stakeholders said that the small number of retail stations currently offering E15 is not relevant when making estimates of potential E15 sales for 2016. They claimed that the equipment at most retail stations is already compatible with E15, and typically cited two studies as the basis for claiming that the number of stations offering E15 could expand significantly in 2016: one by the National Renewable Energy Laboratory (NREL), and another by Stillwater Associates.[100] [101] These stakeholders argued that the number of retail stations offering E15 could expand by many thousands by the end of 2016 if EPA were to create the appropriate incentives by setting the applicable volume requirements much higher than proposed.

In evaluating the potential for expansion of E15 offerings at retail, we think it is important to consider the views of those whose business entails making determinations about which fuels to offer at retail. This perspective was provided by the Petroleum Marketers Association of America, the Society of Independent Gasoline Marketers of America, and the National Association of Convenience Stores. These stakeholders made it clear that retailers will in general offer any fuel that has the potential for generating profit. However, in the specific case of E15, there are liability concerns that make it less likely to be offered.

It may be the case that much of the equipment at many retail stations is compatible with E15, as argued in the NREL and Stillwater studies. But stakeholders arguing that there is greater E15 potential than we assumed in the NPRM oversimplify the situation. In their comments, stakeholders representing retail like those mentioned above clarified that compatibility with E15 is not the same as being approved for E15 use. Recently-amended EPA regulations require that parties storing ethanol in underground tanks in concentrations greater than 10 percent demonstrate compatibility of their tanks with the fuel, through either a certification or listing of underground storage tank system equipment or components by a nationally recognized, independent testing laboratory for use with the fuel, written approval by the equipment or component manufacturer, or some other method that is determined by the agency implementing the new requirements to be no less protective of human health and the environment. The use of any equipment to offer E15 that does not satisfy these requirements, even if that equipment is technically compatible with E15, would pose potential liability for the retailer, including concerns related to liability for equipment damage. Few retailers would be willing to assume such liability, according to comments submitted by their national associations. This issue is of particular concern for underground storage tanks and associated hardware, as the documentation for their design and the types of materials used, and even their installation dates, is often unavailable.

Insofar as equipment can be verified as being compatible with E15 and is approved as such by a testing laboratory such as Underwriter's Laboratory, many retailers are still left with significant concerns about liability for misfueling. Notwithstanding EPA regulations that require pump labeling, a misfueling mitigation plan, surveys, product transfer documents, and approval of equipment configurations, retailer associations indicated that many retail

[99] ''Stations registered to offer E15,'' docket EPA–HQ–OAR–2015–0111.

[100] K. Moriarty and J. Yanowitz, ''E15 and Infrastructure,'' National Renewable Energy Laboratory, May 2015. Attachment 3 of comments submitted by the Renewable Fuels Association.

[101] Stillwater Associates, ''Infrastructure Changes and Cost to Increase RFS Ethanol Volumes through Increased E15 and E85 Sales in 2016,'' July 27, 2015. Submitted with comments provided by Growth Energy.

stations owners are nevertheless concerned about litigation liability for misfueling, either for vehicles manufactured before 2001 or for nonroad engines. This concern creates a disincentive for many retailers to offer E15. While such disincentives are not insurmountable, they do represent a constraint that we must take into consideration.

Apart from retail stations that may already have equipment that could be used to offer E15, some stakeholders pointed to the potential for new equipment to be installed at retail, citing a number of companies which have plans for adding E15 dispensing capabilities to retail stations. However, even if all planned installations sponsored by these companies occurred by the end of 2016, they would only expand the number of retail stations offering E15 by a few hundred based on information provided by stakeholders in their comments. The matching funds provided by the USDA BIP program described above may be leveraged by these stakeholders to allow these increases in E15 retail outlets and even more to materialize.[102] However, it is not clear how many additional stations will be able to offer E15 as a result of the BIP program in 2016 specifically, since the program provides for extensions of the equipment installation timelines into 2018. Even if most of the retail stations that have been targeted by the BIP program were upgraded to offer E15 and this occurred by the end of 2016, they would not all offer E15 for all of 2016. Instead, there would be a ramp up of stations offering E15 throughout 2016. Effectively, then, an average of only about 700 might be offering E15 for all of 2016. Since actual experience with E15 sales is so limited, we cannot conduct a detailed analysis of potential E15 volumes as we did for E85. However, we can make an estimate based on historical gasoline retail station throughout. If all of these retail stations also offered E10, and the fuel throughput was the same for both E10 and E15 at each retail station, the total increase in ethanol consumption due to increased use of E15 would be about 17 million gallons in 2016.[103]

We do not believe, based on past experience, that the core concerns retailers have with liability over equipment compatibility and misfueling would change if the RFS volume requirements were increased significantly. Therefore, setting higher volume requirements would be unlikely to result in dramatic increases in the number of additional retail stations offering E15 in 2016 beyond those that may be upgraded through USDA's BIP program. As a result, we do not believe that the E15 expansion can occur on the scale and timeframe that ethanol proponents believe it can. However, we do believe that retail infrastructure can and will change to offer more E15. To the degree that E15 is used, the volume of E85 that might be needed to reach a given volume of ethanol supply above the E10 blendwall would be less. Therefore, in the scenarios described in Section II.G below, we note that E15 could be used in addition to E85 to result in ethanol use above the E10 blendwall.

vi. Total Ethanol Supply in 2016

The total volume of ethanol that can be supplied in 2016 is a function of the respective volumes of E10, E15, and E85 that we believe can be supplied, while accounting for some E0. Assuming that the total demand for gasoline energy is independent of the amounts of each of these types of fuel (16.85 Quadrillion Btu based on the October, 2015 version of EIA's Short-Term Energy Outlook), estimating the volumes of E0, E15, and E85 that will be supplied provides an estimate of the remaining portion of the gasoline fuel pool which is E10.

As discussed earlier, we continue to believe that the volumes of E0 that are both in demand and needed to address potential water contamination in recreational marine engines will be very small in comparison to total gasoline demand. While information provided by stakeholders was not sufficient to permit us to precisely estimate E0 volumes, we investigated several different approaches in a memorandum to the docket that resulted in a range of about 100–300 million gallons. For the purposes of estimating total ethanol supply, we have assumed an E0 supply of 200 million gallons. Actual volumes of E0 used in recreational marine engines in 2016 may be higher or lower than this level, but we do not expect them to be significantly different than 200 million gallons. This would effectively reduce the total supply of ethanol by 20 million gallons relative to a scenario where all gasoline contained at least 10% ethanol.

Similarly, we continue to believe that supply of E15 will be very small in 2016. As described earlier, the primary limitation in E15 supply is the small number of retail stations offering it. While the number of E15 stations can grow significantly in 2016, we do not believe that it can reach the many thousands that some stakeholders said was possible given that the total number of such stations is about 120 currently and stakeholders representing retail service stations have cited potential liability as an ongoing concern. For the purposes of estimating total ethanol supply, it might be possible that total E15 supply in 2016 could reach 320 million gallons, based on an estimate of an average of about 700 stations offering E15 in 2016 as described in Section II.E.2.v. Actual volumes of E15 in 2016 may be higher or lower than this level, but 320 million gallons represents our best estimate of the most likely maximum volumes that can be reasonably be attained by a market responsive to the RFS. This would effectively increase the total supply of ethanol by 17 million gallons relative to a scenario where the volumes assumed here to be used as E15 are instead used as E10.

Finally, our detailed analysis of E85 has led us to conclude that the very large volumes suggested by some stakeholders are out of reach of the market in 2016, given the various constraints. Even if the number of stations offering E85 continues to grow and the price of E85 continues to fall relative to E10, it is highly unlikely that E85 volumes in 2016 can exceed several hundred million gallons. For the purposes of estimating total ethanol supply, we have estimated that total E85 supply in 2016 will reach 200 million gallons, based on an estimate of growth in the number of E85 stations to about 3,200 and an E85 price discount of 22% relative to E10.[104] Actual volumes of E85 in 2016 may be higher or lower than this level, but 200 million gallons represents our best estimate of the most likely maximum volumes that can be attained by a market responsive to the RFS standards. This amounts to an increase in ethanol supply of about 132 million gallons relative to a scenario where the volumes assumed here to be used as E85 are instead used as E10.

Based on these estimates of E0, E15, and E85 supply, we have determined that 139.33 billion gallons of E10 would be supplied in order to ensure that the full gasoline pool provides the 16.85 Quadrillion Btu that EIA has projected will be in demand in 2016. The

[102] ''USDA announces state finalists for the Biofuel Infrastructure Partnership,'' docket EPA–HQ–OAR–2015–0111.

[103] Per-station annual gasoline throughput is about 916 thousand gallons. If a retail station offers both E10 and E15 at equivalent pricing on an energy basis, the annual sales of each would be 458 thousand gallons. For 700 stations, total E15 sales would be 320 mill gal, which would displace about 315 mill gal E10. $15\% \times 320 - 10\% \times 315 = 17$.

[104] A 22% reduction in the price of E85 relative to the price of E10 would ensure that the price of the two fuels are equivalent on the basis of energy content.

combined contributions from E10, E15, and E85 would produce a total ethanol supply in 2016 of 14.13 billion gallons, equivalent to a poolwide average ethanol content of about 10.09%. This volume of ethanol would be composed of cellulosic ethanol, advanced ethanol such as imported sugarcane ethanol, and conventional ethanol such as that produced from corn starch.

TABLE II.E.2.vi–1—GASOLINE VOLUMES USED TO DETERMINE ETHANOL SUPPLY IN 2016

	Fuel volume (mill gal)	Ethanol volume (mill gal)	Energy (quad Btu)
E0	200	0	0.03
E10	139,325	13,932	16.77
E15	320	48	0.04
E85	200	148	0.02
Total	140,045	14,128	16.85

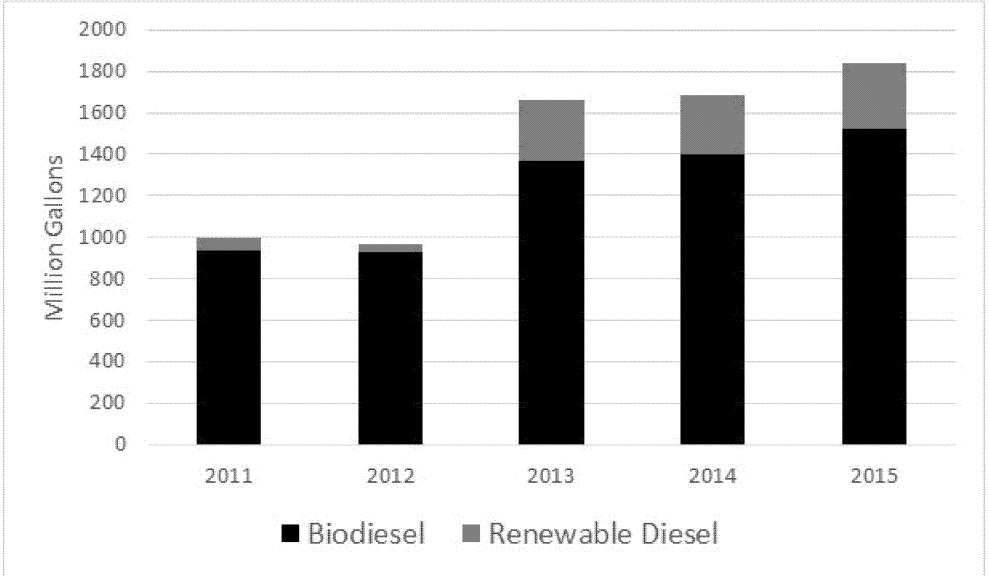
We recognize that the market may not necessarily respond to the final volume requirements for 2016 to produce the volumes of E0, E10, E15 and E85 noted in Table II.E.2.vi–1. However, we believe these volumes are reasonable estimates for use in deriving the final total renewable fuel volume requirement for 2016.

3. Biodiesel and Renewable Diesel

While the market constraints on ethanol supply are readily identifiable as being primarily in the areas of refueling infrastructure and ethanol consumption, it is more difficult to identify and assess the market components that limit potential growth in the use of biodiesel in 2016. Nevertheless, a review of the historical supply volumes of biodiesel and renewable diesel, particularly in 2013, indicates that the growth in supply of these fuels for use in transportation fuel in the United States has constraints.

In 2013 there were two very strong incentives for the increased production, import, and use of biodiesel and renewable diesel in the United States. For the first time in the history of the RFS program, the total renewable fuel standard could not be satisfied by using the minimum amount of biodiesel and renewable diesel required by the BBD volume requirement and blending ethanol as E10. Due to the challenges associated with expanding ethanol consumption through increased sales volumes of E15 and E85 mentioned above, there was a strong demand for non-ethanol fuels. RIN prices for all types of RINs rose as obligated parties sought to meet their RFS obligations. In addition to the incentives provided by the RFS requirements and resulting high RIN prices, the biodiesel blender's tax credit was in place throughout 2013, providing a strong economic incentive for biodiesel growth. With these strong incentives in place, the supply of biodiesel and renewable diesel used in transportation fuel in the United States increased significantly in 2013 (see Figure II.E.3–1 below).

Figure II.E.3-1
Biodiesel and Renewable Supply by Year (2011-2015)



Despite these large increases in the supply of biodiesel and renewable diesel, the number of RINs available to meet the obligated parties' renewable volume obligations fell short of the required volume by about 820 million RINs. This provides a strong indication that the biodiesel and renewable diesel supply in 2013 was limited; if this were not so then we would have expected that the strong demand for RINs in 2013 combined with the availability of the

biodiesel blenders tax credit would have resulted in sufficient production, import, and use of biodiesel and renewable diesel to satisfy the 2013 RFS volume requirements. The situation in 2014 and 2015 is more ambiguous, since there were no final RFS standards in place during 2014 and the first 11 months of 2015 and the availability of the biodiesel blenders tax credit for these years has been very uncertain. Nevertheless, we believe the growth in biodiesel and renewable diesel supplies in 2014 and 2015, together with the market performance in 2013, indicates that while there is significant opportunities for growth in the supply of biodiesel and renewable diesel, supply will be constrained in some way in 2016. The sections that follow discuss the many different factors that may constrain the supply of biodiesel and renewable diesel in 2016.

i. Feedstock Availability

Biodiesel and renewable diesel are produced from biogenic oils, fats, and greases. These can be oils, fats, and greases that are produced as by-products and collected from other industries, oils, fats, and greases recovered from waste streams, or virgin vegetable oils. Increasing the feedstock available for biodiesel and renewable diesel can be done both by diverting feedstocks from other existing uses, increasing the recovery rate of potential feedstocks from waste streams, or increasing the global supply of vegetable oils through greater oil crop cultivation and yields.

Several stakeholders claimed that the level of biodiesel feedstock supply that could be available in 2016 combined with the biodiesel and renewable diesel production capacity that already exists warrant an increase in the required volumes of advanced biofuel and total renewable fuel compared to those we proposed in the NPRM. For instance, the National Biodiesel Board (NBB), in support of their claim that up to 3.4 billion gallons of biodiesel could be available in 2016, submitted a study by LMC International entitled ''*Current and Future Supply of Biodiesel Feedstocks.*'' This study concluded that feedstock availability is not a limiting factor for increasing BBD volumes; there is increased availability of qualifying waste fats, greases, and inedible corn oil, as well as soy, canola and other vegetable oils. According to the study, in 2015 there is enough qualifying feedstock for 6.8 billion gallons of biodiesel globally, and by 2020, there is likely to be sufficient feedstock to support *at least* 8.5 billion gallons of biodiesel.

The LMC International study did not specifically provide estimates of feedstock available for use in the U.S. in 2016, making it difficult to determine how the study might affect our determination of applicable volume requirements for 2016. Moreover, we believe the LMC International study contains an erroneous assumption which contributes to an overestimation of feedstock availability. When estimating availability the study considers the maximum theoretical amount of oil that could be extracted from an oilseed, or ''oil in seed'', versus the amount of oil that is actually expected to be extracted/produced. In reality some amount of the soybean supply is not crushed to produce oil but instead is fed directly to livestock, while in other instances the soybean is crushed and oil is extracted but the oil is added to feed and thus does not enter the oil market. Adding additional soy bean crushing capacity is possible, but would require a strong market signal and take time to construct and bring online. It is unlikely that significant new soy bean oil crushing capacity could be brought online in time to impact the feedstock available for biodiesel and renewable diesel production in 2016. These assumptions result in oil supply estimates that are in some cases significantly higher than USDA estimates. For example, LMC International's estimates of U.S. soybean oil production is more than 80 percent greater than that reported by USDA–WASDE for recent years.

The LCM International study also did not attempt to project the quantity of feedstock that would actually be available for biodiesel and renewable diesel production in light of the demand for these feedstocks from other industries. Currently there is significant competing demand for the feedstocks that can be used to produce biodiesel and renewable diesel from the food, livestock feed and oleochemical industries. Existing feedstock supplies are typically already under contract and/or already set up for certain distribution pathways to end use. These can and do change over time, but they cannot reasonably be expected to do so immediately. Furthermore, even when feedstocks are moved into biodiesel and renewable diesel production, it often means a shifting around of feedstocks, rather than an overall growth in total feedstock production. The existing competing demand for these feedstocks does not go away. If, for example, soy oil feedstocks are drawn away from food use to biodiesel use in response to the recent FDA regulations (as discussed below), it may result in other oil that was being used to produce biodiesel, such as palm or canola oil, now shifting to food use.

Finally, the LMC study did not take into consideration the volumes of feedstocks already devoted to biodiesel and renewable diesel production in the U.S. and abroad. For perspective, according to Statista, 2014 production of biodiesel from the top 15 producing countries was 6.8 billion gallons.[105] This indicates that a considerable amount of the available global feedstock estimated by LMC is already being used for biofuel production, and that much of that biofuel is being used in countries outside the U.S. In essence, the study provides a hypothetical upper limit of BBD oil supply worldwide, not an assessment of the feedstocks available to be used to produce biodiesel and renewable diesel for consumption in the United States in 2016.[106]

The American Soybean Association similarly provided information on higher potential volumes of biodiesel feedstock in 2016. They pointed out that demand for U.S. soybean oil for food use began to decline following the U.S. Food and Drug Administration's (FDA) action in 2003 to require food manufacturers to include trans-fats on nutrition labels. They stated that the likely continued displacement of additional soy oil from food use would make additional soy oil available for biodiesel feedstock. We acknowledge the trend of declining soybean oil use in food, and believe it will continue as a result of a June 2015 FDA determination requiring the elimination by 2018 of all partially hydrogenated oil in food use. To the extent that soy oil is being phased down for food purposes, some supply of soy oil will likely become available for other uses, such as biodiesel production. However, the impact on biodiesel production volumes is not likely to be substantial, particularly for 2016, for two reasons. First, the FDA action will not be complete until 2018. Second, as mentioned above, the removal of some soy oil from food will likely be offset by an increase in the use of other oils in food, with a corresponding reduction in the availability of those other oils for use in making biodiesel. As a result

[105] The world's biggest biodiesel producers in 2014, by country. Statista, Accessed 9/22/2015 *http://www.statista.com/statistics/271472/biodiesel-production-in-selected-countries/*.

[106] We note that a significant portion of the global biodiesel production uses palm oil as a feedstock, which is not a qualifying feedstock in the RFS program. This this production volume is not directly comparable with 6.8 billion gallons of qualifying biodiesel feedstock identified in the LCM International study.

there may be no net impact on biodiesel feedstock supply but rather just a shifting of oils used for different purpose.

We also received comments challenging the availability of additional biodiesel feedstocks and thus the opportunity for increased BBD production. The International Council on Clean Transportation and the Union of Concerned Scientists submitted a study ''Projections of U.S. Production of Biodiesel Feedstock'' by Professor Brorsen at the University of Oklahoma. Professor Brorsen considered all the major sources of U.S. biodiesel feedstock and developed projections of their availability through 2019. The conclusion of the study is that the potential to expand biodiesel production from the feedstocks in the U.S. is quite limited without substantially increasing feedstock prices. The study estimated that the U.S. agricultural sector can increase production of fats/oils beyond 2014 levels by 30 million gallons in 2015, 29 million gallons for 2016, and 25 million gallons in 2017. Thus, according to the study, higher volumes of biodiesel in 2016 beyond the approximately 30 million gallons from the U.S. agricultural sector would have to come from diverting existing feedstocks from current uses, increasing the supply of recovered waste feedstocks, or increasing imports of feedstock or finished biodiesel or renewable diesel, which the study did not address.

We acknowledge that the world supply of oils, fats, and greases that are suitable feedstocks for biodiesel and renewable diesel production has grown and can continue to grow over time. Nevertheless, diverting biodiesel and renewable diesel feedstocks from current uses and increasing total feedstock availability will take time. We believe that this supply can continue to grow as more oilseed crops are planted, productivity from existing crops increases, and recovery rates of waste, fats, oils, and greases adds to the total available supply. The recent development and commercialization of the non-food grade corn oil extracted from distillers dried grains at ethanol plants has also added to the total supply of biodiesel and renewable feedstocks. At the same time, all biodiesel feedstocks are not created equal. They have different markets and require different product handling and process steps, techniques, and conditions to maintain necessary product quality. As individual production facilities are designed to operate on the sources of feedstock available in their local area, growth in other types of feedstocks, even if they have access to it and have production capacity to handle it, does not necessarily allow them to simply increase production.

As the volume of feedstocks expands, the infrastructure for storing the feedstock and distributing it to biodiesel and renewable diesel production facilities will also need to expand. This will require changes to a number of industries depending on the feedstock, potentially including rail cars, barges, trucks, and oil storage facilities. If supply of biodiesel and renewable diesel feedstocks are being sourced internationally, it would also involve expansion of import and export facilities.

It is also worth highlighting that over time the opportunity for continued growth in the feedstocks currently used to produce biodiesel and renewable diesel may begin to plateau, and the volumes of these fuels along with it unless there is a breakthrough in the development of new feedstocks. The bump up in supply brought about by large increases in palm oil production, corn oil extraction, and the increased recovery of waste fats, oils, and greases is limited, and may soon near its practical limit. There has been considerable research and development for many years in the potential for algal bio-oils and other new oilseed crops that could be grown on marginal lands that could serve as a feedstock for biodiesel and renewable diesel. However, the promise of large volumes of algal bio-oils and alternative oilseed crops remains in the future, well beyond the timeframe of the 2016 standards, and near term feedstock supply increases are likely to be incremental.

ii. Biodiesel and Renewable Diesel Production Capacity

As highlighted in the NPRM, the total capacity of all registered biodiesel and renewable diesel production facilities in the United States currently exceeds 2.7 billion gallons. In addition to the domestic production capacity, there is also significant registered capacity overseas. Historically domestic biodiesel production rates have been well short of the production capacity, with facility utilization rates often less than 50%. The reason for this is that the capital cost associated with biodiesel production is a relatively small portion of the cost of biodiesel, allowing facilities to build excess capacity to allow for expansion later as the market develops and grows. The economies of scale associated with biodiesel facilities are also fairly low relative to other types of renewable fuel, allowing biodiesel production facilities operating at low utilization rates or very small biodiesel facilities to be economically viable by taking advantage of low priced local feedstock supplies.

The situation is quite different however, for renewable diesel, where the hydrotreating necessary to convert the oil into diesel fuel requires considerably more capital, economies of scale require facilities to be relatively large, and the size and complexity of the facilities require much more time for financing, design, construction, and commissioning. This helps explain why renewable diesel production facilities are far fewer in number, have much larger production capacities on average, and why the volume of renewable diesel production has grown more slowly.

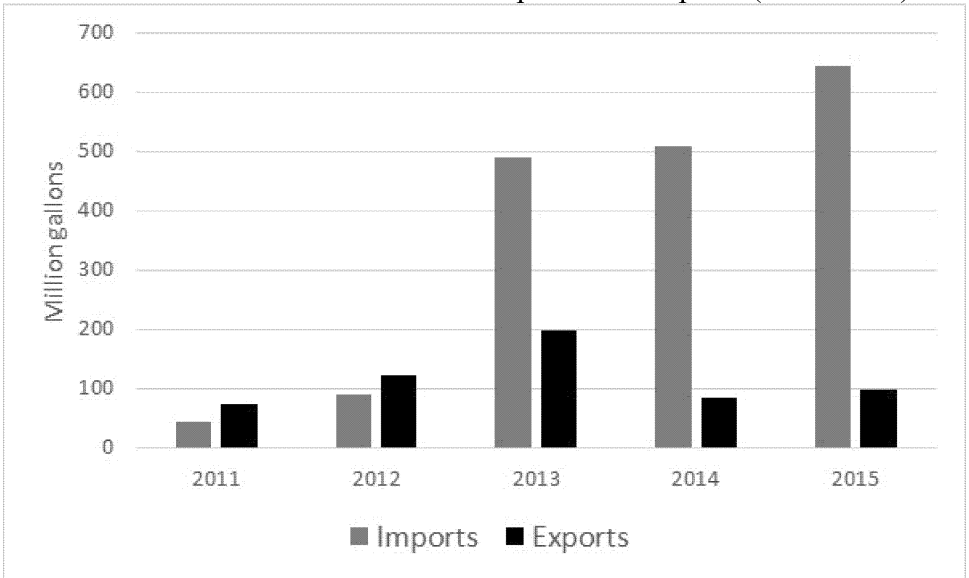
NBB in their comments pointed to the currently existing and registered production capacity as evidence to support its projection of how much biodiesel and renewable diesel could be supplied in 2016. However, while there is certainly potential to increase utilization of the existing production facilities it is uncertain what steps would have to be taken to increase production rates at these facilities. There is therefore uncertainty associated with the ability for an appreciable number of registered biodiesel and renewable diesel production facilities to simultaneously increase production rates given the constraints raised elsewhere in this section. Furthermore, different facilities are designed to handle different feedstocks (*e.g.,* facilities processing waste fats oils and greases require different pre-processing steps and different feedstocks produce fuels with different cold weather performance, necessitating different mitigating actions), and often process feedstocks sourced locally, so increasing volumes of other types of feedstocks, or feedstocks in other locations does not mean excess production capacity can immediately be utilized. Consequently, while we do not believe biodiesel and renewable diesel production capacity will likely be a constraining factor in biodiesel and renewable diesel production in 2016, reaching the 3.4 billion gallons suggested by NBB would likely require the addition of new production capacity.

iii. Biodiesel and Renewable Diesel Import Capacity

Another important market component in assessing biodiesel and renewable diesel supply is the potential for imported volumes and the diversion of biodiesel and renewable diesel exports to domestic uses. In addition to the approximately 500 million gallons imported into the U.S. in 2014, there

were about 80 million gallons exported from the United States to overseas markets in 2014. While 2015 is not yet over, similar trends have been experienced in 2015. Given the right incentives, it might be possible to redirect a portion of the biodiesel consumed in foreign countries to use in the U.S. in 2016. However, the amount of biodiesel and renewable diesel that can be imported into the United States is difficult to predict, as the incentives to import biodiesel and renewable diesel to the U.S. are a function not only of the RFS and other U.S. policies and economic drivers, but also those in the other countries around the world. These policies and economic drivers are not fixed, and change on a continual basis. Over the years there has been significant variation in both the imports and exports of biodiesel and renewable diesel as a result of varying policies and relative economic policies (See Figure II.E.3.iii–1 below). This includes a period from 2004 to 2008 when biodiesel and renewable diesel imports and exports were both simultaneously large due to the so-called ''splash and dash'' practices of importing biodiesel to the U.S., blending it with a small volume of petroleum based diesel to get the U.S. biodiesel blenders tax credit, and then exporting it to Europe where it received additional tax benefits. Because of biodiesel demand in other countries and potential biodiesel distribution constraints in the United States, maintaining or increasing import volumes of biodiesel and/or renewable diesel while at the same time decreasing export volumes may not be feasible in 2016. For example, as discussed above, the combination of the RFS mandate and the biodiesel blender's tax credit provided very large economic incentives for the use of biodiesel in the U.S. in 2013. Yet despite this incentive, biodiesel exports were also at historic highs. Furthermore, a portion of the reported imports and exports is simply trade across the border with Canada. The exported biodiesel satisfies biodiesel mandates in Canada, while also helping to minimize biodiesel transportation costs in situations where the available supply for markets near the border happens to lie in the other country. Thus, on an annual basis we experience both exports to Canada and imports from Canada simply due to market constraints related to biodiesel distribution.

Figure II.E.3.iii-1
Biodiesel and Renewable Diesel Imports and Exports (2011-2015)



Nevertheless, as evidenced in 2015 we have clearly been experiencing some upward growth in imports of biodiesel and renewable diesel. Much of the increase in biodiesel imports in 2015 has been from grandfathered facilities that are exempt from the 20% lifecycle GHG reduction requirement. Fuel from these facilities qualifies for D6 RINs that can be used to satisfy the total renewable fuel standard.

In order for foreign biodiesel and renewable diesel producer to increase their imports into the U.S., they will need to either increase their total production (which may require building new production capacity), or divert exports from domestic use and/or other foreign markets currently relying on these volumes to meet their own requirements. If the former, it may require the expansion of foreign distribution and export capacity which will take some time to put in place. If the latter, it will require a number of changes, including:

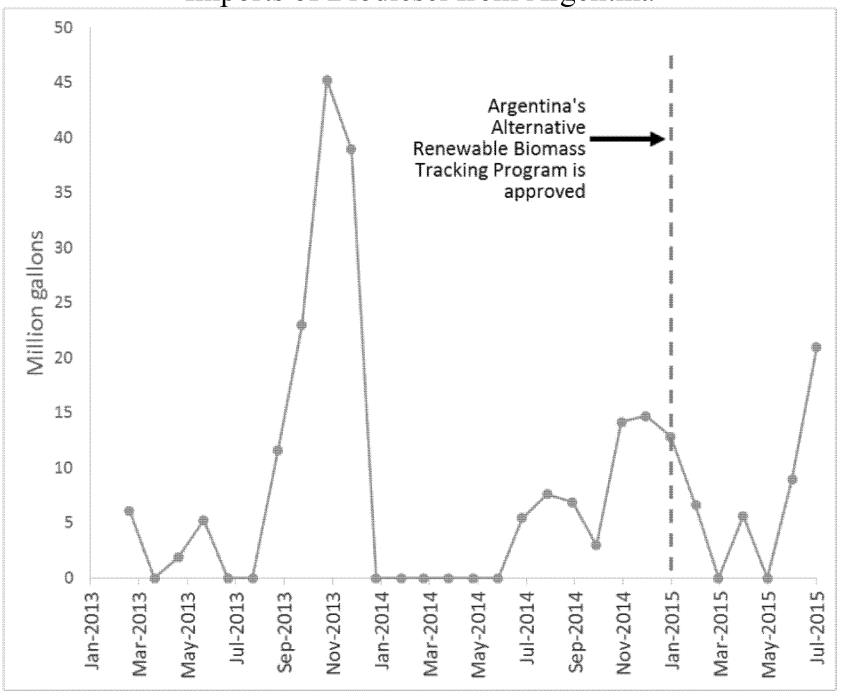
- A clear economic advantage (*e.g.,* higher prices) for exports to be directed to the U.S. relative to other destinations,
- Time to renegotiate existing contracts and commitments,
- Certainty that economic and political conditions won't change that ultimately undermine such a decision,
- Time to expand available U.S. import terminal facilities, including not only tankage, loading, and offloading infrastructure, but also the rail and truck fleet necessary to transport the fuel from the import terminal to new markets.

All of this can and is expected to occur over time, however the degree to which this can be accomplished in the coming year is uncertain.

To demonstrate the uncertainty associated with increasing biodiesel and renewable imports it is instructive to consider the case of imports from Argentina in recent years. Several stakeholders expressed concern that Argentina would significantly increase exports of biodiesel to the U.S. in 2016, and that this potential for increased imports must be accounted for in the determination of the applicable 2016

volume requirements.[107] This concern was based on the facts that pre-existing opportunities for export to European countries had recently been closed off, and the EPA had recently approved an alternative biomass tracking program for Argentina which commenters assumed would make it easier for Argentinean biodiesel producers to document that their product complies with the land use provisions associated with the RFS definition of renewable biomass. Some stakeholders suggested that imports of Argentinean biodiesel could be as high as several hundred million gallons in 2016. Our review of the available information, including that submitted by other stakeholders, does not support this view. For instance, the approval of the alternative biomass tracking program for Argentina was not followed by a sudden increase in imports to the U.S. as shown below. In fact, imports actually declined compared to months immediately preceding that approval.[108]

Figure II.E.3.iii-2
Imports of Biodiesel from Argentina



Source: Energy Information Administration

[107] There have also been imports of biodiesel from other countries, but by and large such biodiesel did not qualify as advanced biofuel.

[108] While it is possible that the full impact of EPA's approval of the alternative biomass tracking program for Argentina is not yet reflected in the data (*i.e.,* that it will take longer for the effects to be seen), we note that there are elements of the approved tracking program that are considerably more exacting than the pre-existing renewable biomass verification process, so we are not persuaded that EPA's approval will in fact lead to an increase in Argentinean biodiesel imports.

Additionally, the annualized volume of imported Argentinean biodiesel for 2015, based on data collected through July, is 94 million gallons. This level is far less that the potential volumes projected by the National Biodiesel Board and several others. Brazil has also just recently proposed increasing its biodiesel mandate from 7% to 8% in 2016, which may provide another attractive destination for exports of Argentinean biodiesel.[109] There are also indications that Argentina's production of biodiesel in 2015 will be significantly reduced compared to prior years.[110] Finally, Argentina has changed the applicable tax on exported biodiesel several times since the beginning of 2015, highlighting the uncertainty associated with projecting potential future imports into the U.S.[111] Based on these facts, we believe that the volume of biodiesel and renewable diesel imported from Argentina in 2016 is likely to be far less than the several hundred million gallons suggested by some commenters.

iv. Biodiesel and Renewable Diesel Distribution Capacity

While biodiesel and renewable diesel are similar in that they are both diesel fuel replacements produced from the same types of feedstocks, there are significant differences in their fuel properties that result in differences in the way the two fuels are distributed and consumed. Biodiesel is an oxygenated fuel rather than a pure hydrocarbon. It cannot currently be distributed through most pipelines due to contamination concerns with jet fuel, and often requires specialized storage facilities to prevent the fuel from gelling in cold temperatures. A number of studies have investigated the impacts of cold temperatures on storage, blending, distribution, and use of biodiesel, along with potential mitigation strategies.[112] [113] [114] Renewable diesel, in contrast, is a pure hydrocarbon fuel that is nearly indistinguishable from petroleum based diesel. As a result, there are fewer constraints on its growth with respect to distribution capacity.

Comments we received from stakeholders on biodiesel supply challenges related to biodiesel distribution, storage, or use due to cold temperatures reveal differing opinions on the degree to which this may be a constraint on the growth of biodiesel and renewable diesel. The National Biodiesel Board stated that there are no constraints related to the distribution of biodiesel and renewable diesel because options such as heated storage tanks and the use of biodiesel produced from feedstocks with better cold temperature properties are available to address the issue. They pointed specifically to some states which require the use of biodiesel year-round. Others, such as CountryMark, indicated that they or their members stop blending biodiesel in the winter months. These comments suggest that the constraints on biodiesel supply due to cold temperatures may not be as pronounced as suggested in the NPRM, but that they continue to exist. Furthermore, the existence of methods for addressing potential challenges related to the cold temperature issues associated with biodiesel does not mean that these solutions can be employed nationwide in 2016. Since the market will determine the specific types and amounts of renewable fuels to use to meet the applicable volume requirements, investments and actions needed to address cold weather issues will certainly be a consideration for some parties, and their hesitancy to blend biodiesel in winter months may constrain the total supply of biodiesel in 2016.

Another factor potentially constraining the supply of biodiesel is the number of terminals and bulk plants that currently distribute biodiesel. At present there are about 600 distribution facilities reported as selling biodiesel either in pure form or blended form.[115] Our review of these locations indicates that the vast majority of them are what we refer to as bulk plants. These are not the major gasoline and diesel distribution terminals, but rather much smaller terminals that receive diesel fuel mostly by truck from the major terminals. These 600 facilities are a small subset of the 1400 terminals and approximately 9000 bulk plants nationwide.[116] This small subset, however, appears to be concentrated in most of the population centers of the country, in addition to the Midwest. As a result, as the market continues to expand, it may require greater investment per volume of biodiesel supplied, as the new biodiesel distribution facilities will generally have access to smaller markets than the existing facilities, or face competition from existing distribution facilities.

Transportation of biodiesel to and from the terminals and bulk plants is also an important consideration. There are two aspects to the distribution infrastructure of importance here; the distribution of biodiesel in pure/near pure form from biodiesel production or import facilities to terminals and bulk plants, and the distribution from the terminals/bulk plants in blended form to retail stations. As mentioned above, the unique properties of biodiesel have precluded blends from being transported in common carrier pipelines either in pure form (B100) or in blended form (such as B5 or B20). NBB has been working with the pipeline industry for many years in an effort to enable biodiesel blends to be transported by pipeline, as the ability to transport biodiesel by pipeline would quickly open new markets in farther ranging locations. In 2013 a major pipeline approved the transport of low level biodiesel blends (B5) in limited pipeline segments that do not carry jet fuel.[117] While an important step, the pipeline segments that have been approved to ship biodiesel blends only serve a small portion of the U.S. market.

In lieu of pipeline transport, biodiesel currently relies primarily on rail car, barge, and especially tanker truck fleets for distribution from production and import facilities to blending terminals and bulk plants. Due to the unique properties of biodiesel, such transport typically has required the use of heated/insulated tanks, especially in winter to keep the product from gelling or freezing. This requirement for specialized equipment increases the cost of biodiesel distribution and further limits the speed at which biodiesel distribution can grow. Increasing biodiesel distribution capacity is not simply a matter of shifting barge/rail/truck infrastructure from other

[109] ''Brazil Proposes Raising Biodiesel Mandate To B10,'' docket EPA–HQ–OAR–2015–0111.

[110] ''Argentina's biodiesel output to drop 30% in 2015—Industry group,'' docket EPA–HQ–OAR–2015–0111.

[111] ''Argentina changes biodiesel export tax—Biofuels Digest,'' docket EPA–HQ–OAR–2015–0111.

[112] ''Biodiesel Cloud Point and Cold Weather Issues,'' NC State University & A&T State University Cooperative Extension, December 9, 2010.

[113] ''Biodiesel Cold Weather Blending Study,'' Cold Flow Blending Consortium.

[114] ''Petroleum Diesel Fuel and Biodiesel Technical Cold Weather Issues,'' Minnesota Department of Agriculture, Report to Legislature, February 15, 2009.

[115] List of biodiesel distributers from Biodiesel.org Web site (*http://biodiesel.org/using-biodiesel/finding-biodiesel/locate-distributors-in-the-us/distributors-map*). Accessed 10/8/15.

[116] Number of terminals from the American Fuel and Petrochemical Manufacturer's (AFPM) Web site, ''AFPM Industry 101, Fuels Facts'', (*http://education.afpm.org/refining/fuels-facts/*). Accessed 10/28/15. Number of bulk plants from the Regulatory Impact Analysis for the Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements, EPA420–R–00–026, December 2000.

[117] Sapp, Meghan. ''Colonial Pipeline to Start B5 Transportation in Georgia.'' *Biofuels Digest.* March 19, 2013. Available online: *http://www.biofuelsdigest.com/bdigest/2013/03/19/colonial-pipeline-to-start-b5-transportation-in-georgia/.*

competing uses, as it may require specialized and/or purpose built equipment. The result of this has been that in order to respond as quickly as possible to market demand, biodiesel distribution has often instead been met using the existing non-specialized tanker truck fleets where the haul distance is limited—limiting the time the fuel is exposed to cold temperatures. While the use of the existing tanker trucks expands the volume of biodiesel that can be transported, it also limits the distribution of biodiesel to a smaller geographic area near production and distribution facilities. This then translates into the need for more and disparately located production facilities and import terminals. Once blended with diesel fuel at the bulk plant, further distribution concerns are typically minimized by shorter transportation distances between the bulk plants and retail stations and lower biodiesel blend ratios that have fewer cold weather limitations.

The net result is that the expansion of terminals and bulk plants selling biodiesel and biodiesel blends, and the distribution infrastructure necessary to transport biodiesel to and from these facilities, is a significant challenge facing the rapid expansion of biodiesel. This is an area in which the biodiesel industry has made steady progress over time, and we anticipate that this steady progress can and will continue into the future, particularly with the ongoing incentive for biodiesel growth provided by the RFS standards. As with many of these potential supply constraints, however, increasing the biodiesel distribution capacity will require time, limiting the potential growth in 2016.

v. Biodiesel and Renewable Diesel Retail Infrastructure Capacity

For renewable diesel, we do not expect that refueling infrastructure (*e.g.* refueling stations selling biodiesel blends) will be a significant limiting factor in 2016 due to its similarity to petroleum based diesel and the relatively small volumes expected to be supplied in the United States. The situation is different, however, for biodiesel. Biodiesel is typically distributed in blended form with diesel fuel as varying blends from B2 up to B20. Biodiesel blends up to and including B20 can be sold using existing retail infrastructure, and generally does not require any upgrades or modifications at the retail level. Expanding the number of refueling stations offering biodiesel blends is therefore constrained less by the retail facilities themselves, and more by the lack of nearby wholesale distribution networks that can provide the biodiesel blends to retail.

EPA is currently unaware of reliable data on the number of retail stations that offer biodiesel blends nationwide. The Web site Biodiesel.org shows the names and locations of 1090 stations that currently offer biodiesel blends.[118] Based on the amount of biodiesel sold in the United States in recent years, however, we think this is a significant underestimate. This is likely due to the fact that diesel fuel that contains 5% or less biodiesel can be sold without special labeling. It is probable that many station selling biodiesel blends of 5% or lower are therefore not included in this count. Nevertheless, the relatively low number of terminals and bulk plants offering biodiesel is a strong indication that biodiesel blends are not available at retail stations nationwide. Biodiesel blends greater than B5 are still only available in a very small fraction of possible refueling locations. Of the approximately 4,800 truck stops nationwide, and the approximately 50,000 diesel retail stations, only 717 stations offer biodiesel in blends of B20 of greater.[119] While the number of refueling stations offering higher level biodiesel blends is relatively small, the fact that diesel sales volumes in the United States are dominated by truck stops and the very large centrally fueled fleets, suggests that expanding the refueling infrastructure for these biodiesel blends will be relatively straightforward as production and distribution allow. The biggest challenge may be the reluctance of retailers and fleets to switch to biodiesel blends due to concerns over fuel quality, vehicle warranties, liability, or other factors.

There is some indication that the number of refueling stations willing or able to market biodiesel may become a factor that constrains the growth of biodiesel supply in the United States, either in 2016 or in future years. A number of retail locations that market diesel fuel are only offering biodiesel blends that exceed 5% (B5), which is the maximum amount of biodiesel for which many diesel vehicles are warranted. For example, the LOVES truck stop chain is a major retailers of biodiesel. A recent review of their Web site indicated that 221 of their 354 stations were selling B15.[120] This is despite the fact that many of the newer,[121] and especially the older heavy-duty diesel truck engines were only designed and warranted for biodiesel blends up to B5. Similarly, in the state of Illinois nearly all sales of biodiesel blends are reported to be at B11 in order to benefit from the state tax subsidy, despite the fact that not all vehicles and engines have been designed and warranted for its use. The fact that some retailers are only offering biodiesel blends that are not approved for use in the engines of many of their customers may suggest that the rate at which the number of refueling stations offering biodiesel blends can be increased could be a significant constraining factor to the supply of biodiesel in 2016. Were more retail outlets willing and able to dispense biodiesel, then, increasing volumes of biodiesel could be distributed at concentrations of B5 or less without raising any warranty concerns.

vi. Biodiesel and Renewable Diesel Consumption Capacity

Virtually all diesel vehicles and engines now in the in-use fleet have now been warranted for the use of B5 blends. In fact both FTC and ASTM specification for diesel fuel (16 CFR part 306 and ASTM D975 respectively) allows for biodiesel concentrations of up to five volume percent (B5) to be sold as diesel fuel, with no separate labeling required at the pump. Biodiesel blends of up to 5% are therefore indistinguishable in this regard. In addition, NBB claims that nearly all manufacturers now warrant at least one of their current offerings for use with B20 blends. This is a significant factor in assessing the potential supply of biodiesel to vehicles in future years and has been a main focus of NBB's technical and outreach efforts for many years, and one of their true success stories. Using biodiesel blends above B5 in diesel engines may require changes in design, calibration, and/or maintenance practices.[122]

Even in instances where manufacturers warrant their engines to operate on B20 blends, they may have additional requirements to ensure the

[118] *http://biodiesel.org/using-biodiesel/finding-biodiesel/retail-locations/biodiesel-retailer-listings.*

[119] B20+ Station counts are from the Department of Energy Alternative Fuels Data Center Station Locator. Includes public, private, government, and utility owned stations.

[120] Information from Love's Web site: *http://www.loves.com/locateus/fuelpricesearch.aspx#* (Accessed 10/8/15).

[121] The largest heavy-duty diesel vehicle manufacturer in the U.S., Daimler, comprising roughly 40% of the market still does not warrant its engines for the use of biodiesel in concentrations greater than 5%.

[122] The vast majority of diesel fuel in the U.S. is consumed by heavy-duty vehicles and nonroad diesel engines. Only a very minor portion is consumed by light-duty diesel passenger vehicles.

quality of the biodiesel fuel being used and that additional engine maintenance will be performed. These requirements may make the use of biodiesel blends containing greater than 5% biodiesel challenging, while technically possible. For instance, Detroit Diesel, a large diesel engine manufacturer, implemented a formal, multifaceted B20 approval process for fleets seeking to use B20. The process involved an evaluation of biodiesel producers and marketers that are to provide biodiesel to the fleet in question, an assessment of biodiesel Certificate of Analysis for B100 and B20 blends (or fuel samples as needed), as well as a review of preventative maintenance practices at dispensing locations, including bulk tank cleaning intervals, dispensing filtration, water handling, and volume of fuel consumed at each location. In the B20 fleet approval process, Detroit Diesel also considered the particular vehicle application to ensure that fleet vehicles were not parked for too long as well as an assessment of the preventative maintenance intervals for engines to ensure that they are in-line with Detroit Diesel's published guidelines. Even in situations where approval to use B20 was granted, the approval did not provide blanket coverage for a geographically dispersed fleet; that is, a fleet that operated across several states was required to submit separate applications for each biodiesel producer, marketer, and dispenser supporting the fleet. Fleet operators that successfully completed the B20 approval process received a Statement of Warranty from Detroit Diesel's Director of Quality and were permitted to operate the fleet using B20. Ultimately Detroit Diesel cancelled the B20 fleet approval process citing biodiesel quality concerns.

Given the long life of diesel engines and the number of new engines not warranted for biodiesel blends above B5, turning over a significant portion of the fleet to engines designed and warranted for B20 is still many years off into the future. This means that in the near term the opportunity to sell B20 exclusively to vehicles warranted to run on these blends will likely be limited to centrally fueled fleets.[123] Increasing the supply of biodiesel, however, is not necessarily dependent on selling higher level biodiesel blends, as there is significant opportunity for expanding the use of biodiesel in lower level blends and for non-road applications. If the diesel pool contained 5% biodiesel nationwide consumption of biodiesel would reach approximately 2.9 billion gallons in 2016. Furthermore, in addition to their successful efforts with diesel vehicles and engines, NBB has had a significant market outreach effort to expand the use of biodiesel into heating oil applications (referred to as bioheat). While still a relatively small outlet for biodiesel consumption compared to diesel fuel, it is a growing market that affords significant additional opportunity for growth.

We received a number of comments on the NPRM related to the degree to which engine warranties may constrain biodiesel use in 2016; however no stakeholder provided any analyses demonstrating the fraction of in-use engines which are warranted for more than B5.[124] Instead, most biodiesel proponents stated only that most diesel engines being sold today are warranted for B20. Such warranties have not always existed, and the degree to which new diesel engines support B20 and higher blends may be over-stated. Detroit Diesel produces the engines for approximately 30% of the Class 8 trucks sold in the United States and currently does not support the use of biodiesel blends greater than B5 in their engines.[125] Thus, it is clear that some portion of the in-use fleet of diesel engine warranties do not approve the use of biodiesel blends greater than B5.[126] These engines represent a potential constraint on use of biodiesel, though we cannot quantify the level of constraint. Comments submitted by Growth Energy support this fact:

''. . . the transportation fleet and heating oil equipment pools still contain significant percentages that are not warranted or deemed compatible with levels of biodiesel above 5%.'' [127]

The National Biodiesel Board argued that regardless of whether manufacturers place limits on the use of biodiesel blends as a condition of honoring their engine warranties, many of these diesel engines can still safely use higher biodiesel blends than those cited in those warranties. Thus, said NBB, ''. . . the formally OEM recommended biodiesel level should not be construed or used as any sort of limitation for biodiesel volumes.'' We disagree, and believe that the OEM recommended biodiesel levels can have a significant impact on owner's willingness to use biodiesel blends. Despite anecdotal evidence regarding behavior of some diesel vehicle operators, it would be inappropriate for EPA to assume that diesel truck owners in general will knowingly use biodiesel blends at concentrations that exceed the limits cited in their engine warranties. It would be more prudent for EPA to assume that engine manufacturers are in the best position to judge which biodiesel blends are appropriate for use in their engines, and that engine owners will view their engine warranties in the same way. Evidence that some truck owners ignore the recommended limits on biodiesel concentrations when refueling their truck is not, we believe, a reasonable basis for assuming that engine warranties place no constraints on the use of higher biodiesel blends for the in-use truck fleet as a whole. Similarly, we do not believe that older engines with expired warranties can be assumed to have no constraints on biodiesel concentrations. Not only were older engines more likely to have been designed to operate on B5 or lower, but engine warranties continue to provide indications to truck owners of acceptable biodiesel concentrations even after they expire. Owner's manuals for those engines may also cite limits on biodiesel concentrations, and owner's manuals do not expire.[128]

vii. Biodiesel and Renewable Diesel Consumer Response

Consumer response to the availability of renewable diesel and low level biodiesel blends (B5 or less) has been generally positive, and this does not appear to be a significant impediment to growth in biodiesel and renewable diesel use. Because of its similarity to petroleum diesel, consumers who purchase renewable diesel are unlikely to notice any difference between renewable diesel and petroleum derived diesel fuel. Similarly, biodiesel blends up to B5 are unlikely to be noticed by consumers, especially since, as mentioned above, they may be sold without specific labeling. Consumer

[123] Although as stated above, some public retailers are choosing to sell only B11 or B20 blends and allowing the consumer the option of either going elsewhere or purchasing fuel for which their engines are not warranted.

[124] Such warranties apply to the engines, not the fuels, as pointed out by the National Biodiesel Board. Nevertheless, the engine warranties are contingent upon the use of approved fuels.

[125] Sales data received directly from the OEM.

[126] As noted above, FTC and ASTM specifications allow for biodiesel concentrations of up to five volume percent (B5) to be sold as diesel fuel, with no separate labeling required at the pump.

[127] ''Non-Ethanol Potential for RFS Compliance,'' Stratus Advisors, July 16, 2015. Submitted by Growth Energy.

[128] EPA is not aware of any comprehensive analysis of the diesel engine/vehicle warranties for the in use fleet with respect to biodiesel blends. EPA did not have the time or resources to conduct a detailed evaluation of warranty constraints over the range of engines and model years currently in service for purposes of this rulemaking. EPA encourages stakeholders to gather this type of information to inform future annual RFS rules.

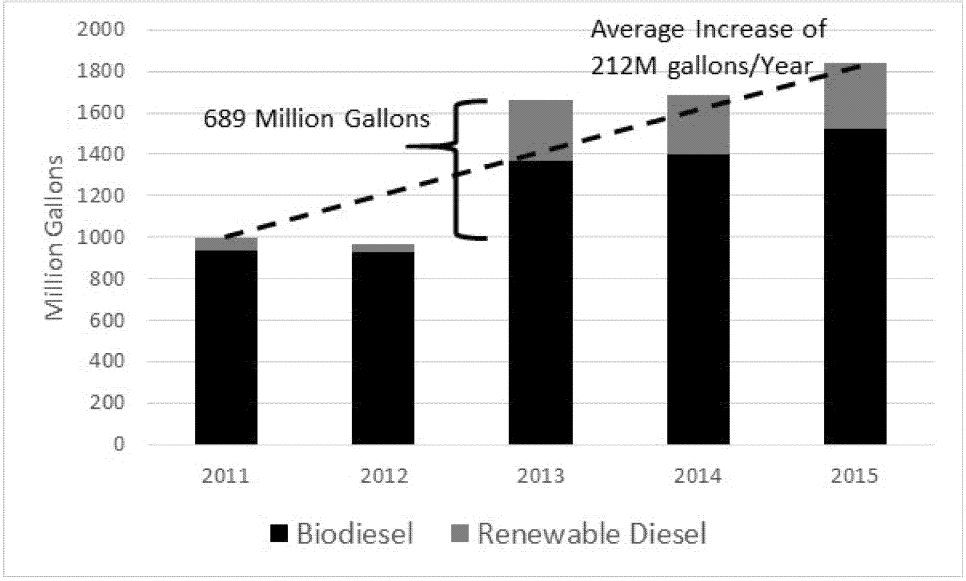
response to biodiesel blends is also likely aided by the fact that despite biodiesel having roughly 10 percent less energy content than diesel fuel, when blended at 5 percent the fuel economy impact of B5 relative to petroleum derived diesel is a decrease of only 0.5%, an imperceptible difference. Consumer response has been further aided by the lower prices that many wholesalers and retailers have been willing to provide to the consumers for the use of biodiesel blends. The economic incentives provided by the tax credit and the RIN have made it possible for some retailers to realize additional profits while selling biodiesel blends, while in many cases offering these blends at a lower price per gallon than diesel fuel that has not been blended with biodiesel.

viii. Projected Supply of Biodiesel and Renewable Diesel in 2016

Due to the large number of market segments where actions and investments may be needed to support the continued growth of biodiesel blends, it is difficult to isolate the specific constraint or group of constraints that will be the limiting factor or factors to the supply of biodiesel and renewable diesel in the United States in 2016. Not only are many of the potential constraints inter-related, but they are likely to vary over time. The challenges in identifying a single factor limiting the growth in the supply of biodiesel and renewable diesel in 2016 does not mean, however, that there are no constraints to the growth in supply.

A logical starting point in developing a projection of the available supply of biodiesel and renewable diesel in 2016 is a review of the volumes of these fuels supplied in previous years. In examining the data, both the absolute volumes of the supply of biodiesel and renewable diesel in previous years, as well as the rates of growth between years are relevant considerations. The volumes of biodiesel and renewable diesel (including both D4 and D6 biodiesel and renewable diesel) supplied each year from 2011 through 2015 are shown below.

Figure II.E.3.viii-1
Biodiesel and Renewable Supply by Year (2011-2015)



One way to use the historical data to project the available supply of biodiesel and renewable diesel in 2016 would be to start with the volume expected to be supplied in 2015 (1.84 billion gallons), the most recent year for which actual supply data are available and also the year with the largest supply of biodiesel and renewable diesel, and then assess how much the supply can be expected to increase in 2016 in light of the constraints discussed above. We could assume, for example, that past growth in the year or years leading up to 2015 reflects the rate at which biodiesel and renewable diesel constraints can reasonably be expected to be addressed and alleviated in the future. If this were the case, we could use either the largest observed annual supply increase (689 million gallons from 2012 to 2013) or the average supply increase (212 million gallons from 2011 to 2015) to calculate how much biodiesel and renewable diesel volumes could increase over 2015 levels in 2016. This would result in a projected supply of 2.53 billion gallons of biodiesel and renewable diesel if we used the highest observed annual growth rate, or 2.06 billion gallons of biodiesel and renewable diesel in 2016 if we used the average annual growth rate.

We recognize that the highest annual growth rate achieved in the past (or the average annual growth rate in the past) does not necessarily indicate the growth rate that can be achieved in the future. In the past biodiesel was available in fewer markets, allowing new investments to be targeted to have a maximum impact on volume. However, as the market becomes more saturated and biodiesel becomes available in an increasing number of markets, additional investments may tend to have less of an impact on volume, limiting the potential large increases in supply year over year. Much of the growth in biodiesel and renewable diesel supply in the past was enabled by addressing the existing constraints in ways that required relatively less investment than the challenges currently facing the market. In 2013 additional feedstock was available to be recovered from waste streams and there was still significant opportunity to distribute additional biodiesel blends containing 5% biodiesel or less. Future supply increases will likely require diverting potential biodiesel and renewable diesel feedstocks from

existing uses, revising production facilities to handle larger volumes of different feedstocks, potentially distributing the biodiesel to new terminal or bulk plants, and/or using biodiesel in blends greater than 5%. Thus, it may require greater investment for growth rates of biodiesel and renewable diesel in 2016 to equal the growth rate that occurred in 2013. However, any such conclusion would need to be tempered by the consideration of the extent to which legal and market forces were in place to drive future growth. This is especially true since the year with the historic maximum rate of growth was 2013—a year in which both tax incentives and RFS incentives were in place to incentivize growth. We believe the incentives provided by the standards in this final rule will be sufficient to enable this growth to occur, despite these challenges. However, to avoid volumes of biodiesel and renewable diesel from plateauing in the longer term, developments such as significant gains in oilseed productivity, the development of new oilseed crops, the approval from engine manufacturers to use B20 blends in all or nearly all diesel engines, and investments in renewable diesel production capacity may be necessary.

We received many comments on our NPRM that offered projections of the available biodiesel and renewable diesel supply in 2016. It was not always clear from reading the comments if the volume projections they offered represent their projection of the total supply of biodiesel and renewable diesel, as is relevant for determining the total renewable fuel supply in 2016, or if they represent a sub-set of the total biodiesel and renewable diesel availability (such as only BBD and not conventional biodiesel, only biodiesel and not renewable diesel, or the level at which they requested the BBD standard be set). Nevertheless, we have reviewed these comments and considered the volume projections offered and the supporting data provided in determining the supply of biodiesel and renewable diesel in the United States in 2016.

The National Biodiesel Board suggested that the volume of advanced biodiesel supplied to help meet the advanced biofuel volume requirement should be at least 2.7 billion gallons in 2016, based on the highest rate of D4 RIN generation achieved in a single month. They effectively assumed that the rate of RIN generation that occurred in December 2013 (220 million gallons) could be duplicated over a 12-month period, and that all of this product could be distributed and used in the United States in 2016. They stated that an additional 370–720 million gallons of biodiesel (550–1,080 million RINs) could be supplied from imported biodiesel. We disagree that these volumes can be supplied in 2016. We believe that using the highest production in a single month from the historical record is not a reasonable basis for projecting possible future supply over the course of an entire year for a number of reasons. Such an approach does not take into account the factors, described below, that allowed for that maximum single month production, including the expiring blenders tax credit and the inability to sustain that production level year-round. In addition, production inventories can be grown over a one-month time period in a manner that masks constraints in the fuel delivery infrastructure. As evidence, we note that the highest D4 RIN generation level in a single month (220 million gallons in December 2013) occurred immediately before one of the lowest monthly D4 RIN generation level that has occurred in the last several years (88 million gallons in January 2014). The average of those two months is the equivalent of about 1.85 billion gallons over the course of a year.

Moreover, the highest monthly D4 RIN generation level cited by the National Biodiesel Board included imports which have been highly variable and cannot be projected with reasonable certainty based on historical supply. The fact that the month used by NBB to project that 2.7 billion gallons of BBD could be supplied already includes a significant amount of imported volumes makes their estimate of additional imports particularly uncertain. The portion of the 1.85 billion gallon annual average RIN generation rate derived from annualizing December 2013 and January 2014 volumes that can be attributed to domestic production is 1.43 billion gallons, and even this number should be considered high because it does not account for exports of biodiesel and RINs retired because they were invalid or were otherwise not available for compliance. As a result of these factors, the actual demonstrated domestic supply (domestic production plus imports, less exports and corrections) of biodiesel and renewable diesel does not support an available supply of 3.1–3.4 billion gallons per year, as suggested by NBB.

In addition to the comments from NBB, we also received a number of other comments suggesting a higher supply of biodiesel may be available in 2016 than in previous years. Many commenters, such as the American Council on Renewable Energy, the American Soybean Association, the National Renders Association, John Deere, several state soybean associations, and others suggested that the BBD standard should require the use of at least 2 billion gallons in 2016. Other commenters, including Archer Daniels Midland, the California Biodiesel Alliance, Imperium Renewables, and others suggested that the BBD standard should require the use of 2.4 billion gallons in 2016. Since they were focused on the BBD standard, these numbers do not necessarily represent the commenters' views of the available supply of biodiesel and renewable diesel in 2016, but we believe they give a good indication of their views on the available supply. We also note that they are much more in line with the available supply volumes that we estimate below based on an extrapolation of growth rates from previous years.

Given the widely divergent comments and available data on the potential supply of biodiesel feedstocks, it is clear that there is a great deal of uncertainty in the degree to which those feedstock supplies can grow in 2016. A focus on potentially available feedstock supplies is insufficient as this is not the only factor to consider in assessing the potential volumes of biodiesel and renewable diesel in 2016. Neither biodiesel production capacity, nor the supply of oils, fats, and greases around the world, has ever been the sole constraint on biodiesel and renewable diesel supply to the U.S. Indeed, as discussed above, there are a number of constraints, ranging from competing demand for biodiesel and renewable diesel feedstocks to biodiesel and renewable diesel distribution infrastructure and engine compatibility, that we believe will constrain the supply of biodiesel and renewable diesel supply in 2016.

These constraints do not represent insurmountable barriers, but they do take time to overcome. The market has been making efforts to overcome these constraints in recent years as demonstrated by the fact that biodiesel and renewable diesel consumption in the U.S. has been steadily increasing. We agree with the biofuels industry that more opportunity for ongoing growth still exists, but we do believe that the constraints listed above will continue to be a factor in the rate of growth for 2016, but we also believe that existing biodiesel and renewable diesel production capacity should not be the basis for projecting achievable volumes

in 2016. Instead, we believe that the ongoing constraints listed above mean that the opportunity for growth 2016 is of a similar magnitude to that which we have experienced in recent years. For 2016 we are projecting the supply of biodiesel and renewable diesel for use in the United States could reasonably be as much as 2.5 billion gallons. We believe this value represents the maximum reasonably achievable volume of biodiesel and renewable diesel that can be supplied to the United States in 2016.

This volume of biodiesel and renewable diesel is approximately equal to the projected volume using the highest observed annual growth rate (2.53 billion gallons), and far higher than the projected volume using the average growth rate between 2011 and 2015 (2.06 billion gallons). We believe this is appropriate considering both the demonstrated ability of the market to respond to incentives for increased production, import, and use of biodiesel and renewable diesel, as demonstrated in 2013, and also the potential constraints to the continued growth of biodiesel and renewable diesel discussed above. These constraints, particularly the availability of qualifying feedstocks to processing facilities that can utilize them in light of competing demand for these feedstocks and the distribution infrastructure needed to increase the use of biodiesel and renewable diesel, may be more challenging to overcome in the future, but we believe growth in 2016 can still approach the record growth experienced in 2013. In 2013 increasing available supplies of feedstock, through means such as greater corn oil production rates at ethanol plants and increased recovery of waste fats and oils, and increasing biodiesel and renewable diesel distribution by adding biodiesel blending capacity at terminals and/or bulk plants in areas with large local demand for diesel fuel, were both relatively simple. For 2016 the RFS standard will necessitate similar and potentially even larger investments and actions to grow biodiesel and renewable diesel supply.

We recognize that the market may not necessarily respond to the final total renewable standard by supplying exactly 2.5 billion gallons of biodiesel and renewable diesel to the transportation fuels market in the United States, but may instead supply a slightly lower or higher volume of biodiesel and renewable diesel with corresponding changes in the supply of other types of renewable fuel. As a result, we believe there is less uncertainty with respect to achievability of the total volume requirement than there is concerning the projected 2.5 billion gallons of biodiesel and renewable diesel that we have used in deriving the final total renewable fuel volume requirement.

4. Projecting the Supply of Other Renewable Fuels

The RINs available for meeting the total renewable fuel standard include not only ethanol, biodiesel, and renewable diesel, but also RINs generated for a number of other renewable fuels. While the potential for each of these fuels is small relative to those covered above, the volumes must still be considered in assessing the total supply of renewable fuel in 2016. One such fuel is CNG/LNG derived from biogas when used as a transportation fuel. The potential for this fuel in 2016 is approximately 210 million gallons. This projection is discussed in more detail in Section IV, as this fuel generally qualifies as a cellulosic biofuel.

There also are some opportunities for moderate growth through the end of 2016 in a variety of other fuel types. Currently, the RFS regulations provide a RIN generating pathway for heating oil, naphtha, jet fuel, LPG, liquefied natural gas, renewable gasoline, butanol, and electricity. To date only heating oil, naphtha, and butanol have been produced to generate RINs, reaching a projected annual high of 23 mill gal based on data through September, 2015. Since these sources have not grown significantly over the last several years, we believe that the supply of other non-ethanol renewable fuels can reach about 25 million gallons in 2016.

5. Total Renewable Fuel Supply in 2016

The total volume of renewable fuel that can be supplied in 2016 is the combination of the estimated supply of each of the biofuel types described above: ethanol, biodiesel and renewable diesel, and other biofuels such as biogas, naphtha, and heating oil. Most of these biofuel types can be produced as either advanced biofuel or as conventional (D6) renewable fuel, depending on the feedstock and production process used. Our estimate of the supply of total renewable fuel shown in the table below includes contributions from both advanced biofuels and conventional renewable fuels.

TABLE II.E.5–1—VOLUMES USED TO DETERMINE TOTAL RENEWABLE FUEL SUPPLY IN 2016

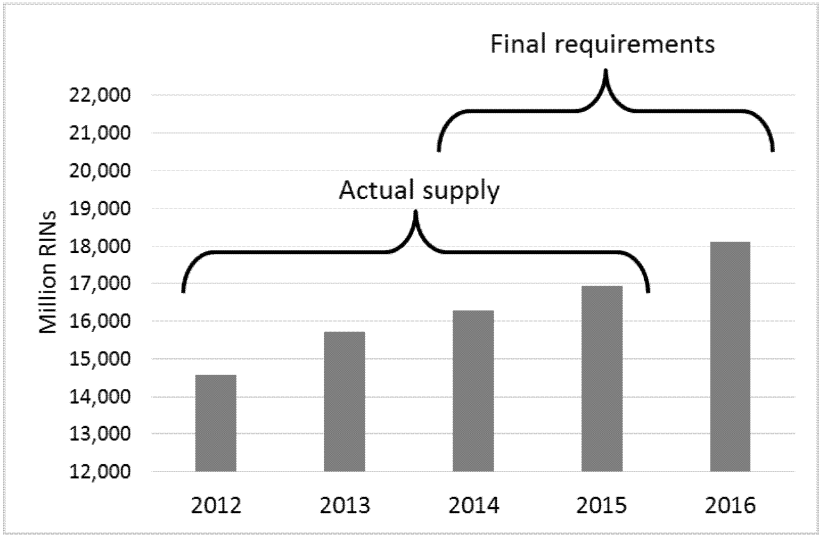
	Volume (million gallons)	Million RINs
Ethanol	14,128	14,128
Biodiesel and renewable diesel	2,500	3,750
Biogas	210	210
Other non-ethanol renewable fuels	25	25
Total	16,861	18,113

Based on this analysis, we are establishing a total renewable fuel volume requirement of 18.11 billion gallons for 2016. However, we note that the contributions from individual sources that are shown in Table II.E.5–1 were developed only for the purpose of determining a final volume requirement for 2016; they do not represent EPA's projection of precisely how the market will respond to the standards we set. We continue to believe, as we noted in the NPRM, that any estimate we make regarding particular fuel types is uncertain, but that overall the final volume requirement is attainable. The contributions from individual sources that we have used are illustrative of one way in which the volume requirement for total renewable fuel could be met. Actual market responses could vary widely, as described more fully in Section II.G.

The volumes of total renewable fuel that we are establishing for 2016 reflect our assessment of the maximum volumes that can reasonably be achieved, taking into account both the constraints on supply discussed previously and our judgment regarding the ability of the standards we set to result in marketplace changes in 2016.

As shown in Figure II.E.5–1, the volume requirements for 2016 would follow an upward trend consistent with that from previous years.

Figure II.E.5-1
Growth in Total Renewable Fuel[a]



[a] Values for 2012 and 2013 represent actual supply of renewable fuel in each year, not the applicable volume requirements.

F. Advanced Biofuel Volume Requirement for 2016

As described in Section II.B above, we are reducing volumes of total renewable fuel under both the cellulosic and the general waiver authority, and we are reducing volumes of advanced biofuel under the cellulosic waiver authority only. As noted in Section II.B, EPA has broad discretion in utilizing the cellulosic waiver authority, since Congress did not specify the circumstances under which it may or should be utilized nor the factors to consider in determining appropriate volume reductions. We are cognizant of the fact that increases in the statutory volume targets after 2015 are only in advanced biofuel, and that advanced biofuel provides relatively large GHG reductions in comparison to conventional renewable fuel. In light of these facts, our intention in utilizing the cellulosic waiver authority for 2016 is to place an emphasis on setting the 2016 advanced biofuel volume requirement at a level that is reasonably attainable taking into account uncertainties related to such factors as production, import, distribution and consumption constraints associated with these fuels.[129]

As described earlier, we are establishing a total renewable fuel volume requirement of 18.11 billion gallons for 2016. Our assessment of total renewable fuel is based on an estimate of 14.13 billion gallons of ethanol and 2.50 billion gallons of biodiesel and renewable diesel, in addition to smaller volumes of biogas and other types of renewable fuel.[130] Given that advanced biofuels are a subset of total renewable fuel, the 2016 volume requirement for advanced biofuels reflects our assessment of the portion of total ethanol and biodiesel, as well as other renewable fuels, that should be required as an advanced biofuel.

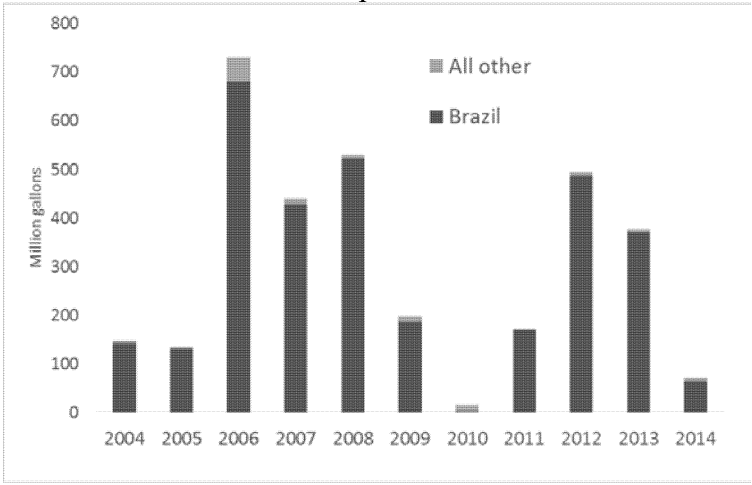
With regard to ethanol, the primary source of advanced biofuel is imported sugarcane ethanol.[131] As described in the NPRM, the supply of imported sugarcane ethanol continues to be highly uncertain and there is little indication that this uncertainty will change in 2016. For instance, both total ethanol imports and imports of Brazilian sugarcane ethanol have varied significantly since 2004, as shown in Figure II.F–1.

[129] Our approach in identifying ''reasonably attainable'' volumes of advanced biofuels using the cellulosic waiver authority is different than our approach under the general waiver authority of identifying the ''maximum reasonably achievable supply''. In exercising the cellulosic waiver authority in this rulemaking, we are not required, and do not intend, to necessarily identify the most likely ''maximum'' volumes of advanced biofuels that can be used in 2016. Although we generally seek in establishing the advanced biofuel volume requirement to require that available advanced biofuels backfill for shortfalls in cellulosic biofuels in 2016, our inquiry is not intended to be as exacting.

[130] This includes both advanced and conventional biodiesel and renewable diesel.

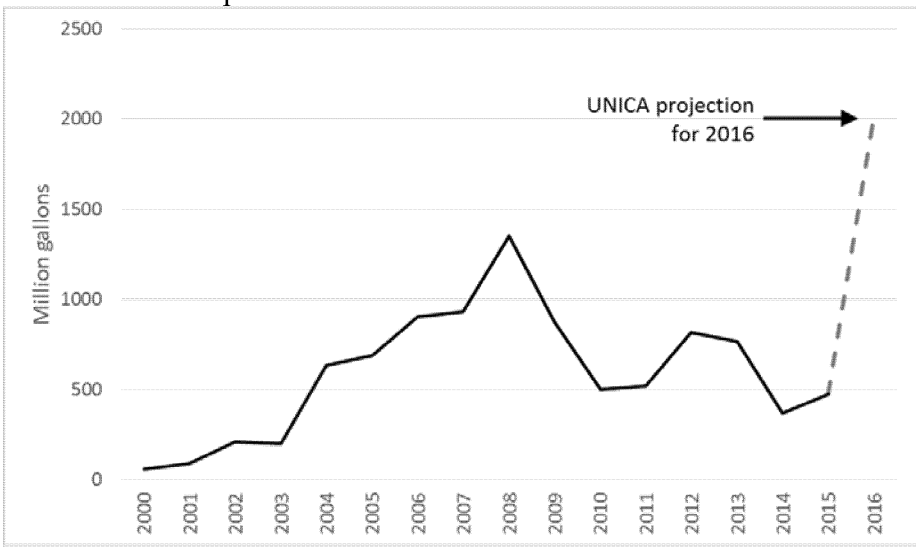
[131] In certain situations, advanced ethanol can also be produced from sorghum and food wastes.

Figure II.F-1
Historical Imports of Ethanol



The Brazilian Sugarcane Industry Association (UNICA) provided comments suggesting that 2 billion gallons of sugarcane ethanol could be supplied to the U.S. in 2016. After further investigation, we do not believe that this level of import is reasonably achievable in 2016. To begin with, exports of 2 billion gallons from Brazil to the U.S. would be significantly higher than total exports to all countries in all previous years, as shown below.

Figure II.F-2
Total Exports of Ethanol From Brazil to All Countries



Source: www.unicadata.com.br

In recent years, ethanol exports from Brazil to countries other than the U.S. averaged more than 300 million gallons each year. Brazil has recently increased ethanol exports to China and has also increased its own ethanol use requirements.[132] [133] If this were to continue in 2016, total exports from Brazil would need to reach 2.4 billion gallons in order to supply 2 billion gallons to the U.S. We do not believe that the information that UNICA provided supports this extremely high level of exports.

Although UNICA cites a variety of factors that can affect ethanol exports and which are beyond the control of Brazilian mills and the EPA, it nevertheless based its estimate of potential exports to the U.S. solely on a combination of Brazilian ethanol production capacity and opportunities created by the RFS program itself. We believe that UNICA has underestimated the uncertainty associated with other market factors, including the E10 blendwall in the U.S., changes in domestic demand for ethanol in Brazil, and competing world demand for sugar. With regard to sugar, it is true that Brazilian production has been declining for the last several years. However, between 2005 and 2015, Brazilian production of sugar has increased just as often as it has decreased, demonstrating that there is uncertainty with regard to worldwide demand for sugar. We

[132] ''Ethanol acts as lone bright spot amid China commodity gloom—Reuters,'' docket EPA–HQ–OAR–2015–0111.

[133] ''Brazil Hikes Ethanol Blend in Gasoline to 27%,'' DownstreamBusiness.com, March 12, 2015.

believe it would be imprudent to assume that the downward trend in sugar production in recent years will continue in 2016.

More importantly, while production of sugarcane has increased moderately in Brazil over the last several years, total gasoline consumption in Brazil also continues to climb.[134] This reduces the potential for substantial increases in exports of ethanol in 2016, as ethanol serves as a critical source of fuel supply in Brazil to offset shortages in petroleum. In fact, total consumption of petroleum in Brazil has increased at a rate of about 4.9% over the last several years, while the rate of sugarcane production has only grown at a rate of about 2.2%.[135]

Several stakeholders also pointed to the potential for so-called ''circle trade'' between the U.S. and Brazil as a reason to either reduce the applicable volume requirement for advanced biofuel in such a way as to limit imports of sugarcane ethanol, and/or to increase the required volume of BBD. In this circle trade, corn-based ethanol is exported from the U.S. to Brazil at the same time that sugarcane ethanol is exported from Brazil to the U.S. This has undoubtedly occurred in the past, though the circle trade volumes have represented only 21% of all ethanol imports and exports between the two countries that occurred between 2010 and 2014.[136] However, there has been a high degree of variability in sugarcane ethanol imports into the U.S., and also a high degree of variability in the export of corn ethanol to Brazil. In some years the U.S. exported more ethanol to Brazil than Brazil exported to the U.S., while in other years the opposite occurred. This indicates that there are a wide variety of factors driving imports and exports of ethanol, and ''circle trade'' does not appear to have been the major one in the past. Nevertheless, to the degree that circle trade increased in response to higher RFS volume requirements for advanced biofuel, the GHG benefits associated with the advanced biofuel volume requirement would be reduced.

As stated in the NPRM, the highest volume of Brazilian sugarcane ethanol that has ever been imported was 680 million gallons in 2006; in 2013 imports reached 435 million gallons.[137] However, in 2014 imports were only 64 million gallons, and the projected annual level of imports for 2015 is about 55 million gallons.[138] [139] Some sugarcane ethanol will likely be imported in 2016 in order to meet the requirements of California's Low Carbon Fuel Standard (LCFS), and all such imported sugarcane ethanol will qualify to meet the RFS standards. However, sugarcane ethanol volumes have also fallen off in recent years under California's program.[140] Given our assessment of UNICA's estimate of volumes it can export to the U.S. in 2016 as described previously, and our assessment of uncertainty in import volumes as evidenced by the highly variable historical supply, there is no indication (apart from UNICA's comments, discussed above) that imports of sugarcane ethanol in 2016 will be markedly different from historic levels. While the historical average level of ethanol imports over the last ten years is about 300 million gallons, the low levels of imports seen in 2014 and 2015 suggest that such volumes may not be available in 2016. Accordingly, for the purposes of determining the reasonably attainable volume of advanced biofuels, we believe it is reasonable to assume that a somewhat lower level of imports will occur than the historic average over the last ten years. Thus we estimate that about 200 million gallons of sugarcane ethanol will be available in 2016 for the purposes of determining the advanced biofuel volume requirement for 2016. However, actual imports of sugarcane ethanol could be higher or lower than this level as shown in the scenarios for how the market could respond in Section II.G.

With regard to advanced biodiesel and renewable diesel, past experience suggests that a high percentage of the supply of biodiesel and renewable diesel to the United States qualifies as advanced biofuel. In previous years biodiesel and renewable diesel produced in the United States has been almost exclusively advanced biofuel. It is also likely that some advanced biodiesel will be imported in 2016, as discussed in Section II.E.3.iii, however we believe that the volume of biodiesel imported from Argentina in 2016 is likely to be less than the several hundred million gallons suggested by some commenters (see Section II.E.3.iii for more detail on biodiesel and renewable diesel imports). Imports of conventional (D6) biodiesel and renewable diesel, however, have also increased in recent years, and are likely to continue to contribute to the supply of renewable fuel in the United States in 2016. By including a high percentage of the 2.5 billion gallon projected total supply of biodiesel and renewable diesel in the advanced biofuel category, consistent with past experience, we are incentivizing increased production and import of biodiesel and renewable diesel that is produced from feedstocks that qualify for advanced biofuel RINs in 2016, rather than conventional renewable fuel RINs, enhancing the GHG benefits of the RFS program.

The discussion of the many constraints on total biodiesel supply in Section II.E.3 above is also relevant in the determination of reasonably attainable volumes of advanced biodiesel. In this context, we believe that out of the total of 2.5 billion gallons of biodiesel and renewable diesel that we have determined can reasonably be assumed for purposes of establishing the total renewable fuel volume requirement, that 2.1 billion gallons could be advanced biofuel. While we expect domestically produced biodiesel and renewable diesel to remain the primary source of biodiesel and renewable diesel supplied to the United States in 2016, the potential constraints related to the distribution and use of biodiesel, discussed in Section II.E.3 above, may lead to an increasing demand for renewable diesel, which faces fewer potential constraints related to distribution and use than biodiesel. Much of the renewable diesel produced globally would qualify as conventional, rather than advanced biofuel, and we therefore expect that conventional renewable diesel will continue to be an important source of renewable fuel used in the United States in 2016. The volume of advanced biodiesel and renewable diesel which we are assuming for purposes of deriving the advanced biofuel standard for 2016 (2.1 billion gallons) would represent an increase of about 370 million gallons from that supplied in 2015, which is greater than the annual increase that occurred in the previous two years (91 million gallons from 2013 to 2014 and 104 million gallons from 2014 to 2015)

[134] ''Gasoline Demand in Brazil: an empirical analysis,'' Thaís Machada de Matos Vilela, Pontifical Catholic University of Rio de Janeiro, Figure 2.

[135] ''Brazilian sugarcane production and petroleum consumption,'' docket EPA–HQ–OAR–2015–0111.

[136] Between 2010 and 2014, circle trade represented about 21% of all ethanol imports and exports between the U.S. and Brazil. See ''Analysis of circle trade between the US and Brazil,'' docket EPA–HQ–OAR–2015–0111.

[137] Ethanol import data from EIA, representing imports directly from Brazil and indirectly through the Caribbean Basin Initiative (CBI) and the Central America Free Trade Agreement (CAFTA). *http://www.eia.gov/dnav/pet/pet_move_impcus_a2_nus_epooxe_im0_mbbl_m.htm.*

[138] Based on import data from EMTS.

[139] Notably, in response to the February 7, 2013 NPRM, UNICA projected that Brazil could supply 800 mill gal of sugarcane to the U.S. in 2014.

[140] ''Status Review of California's Low Carbon Fuel Standard,'' Institute of Transportation Studies, University of California Davis, April 2015.

but less than the highest annual increase that occurred in 2013 (about 560 million gallons from 2012 to 2013). This projected increase in the available volume of advanced biodiesel and renewable diesel accounts for the expected increased availability of feedstocks, such as soy oil, distillers corn oil, and waste oils, fats, and greases, that we expect will be available to biodiesel and renewable producers in 2016 (see Section II.E.3.i for a further discussion of feedstock availability). It also represents a significant increase from the highest levels of advanced biodiesel and renewable diesel supplied to date. We find this volume to be reasonably attainable for the reasons discussed in Section II.E.3.

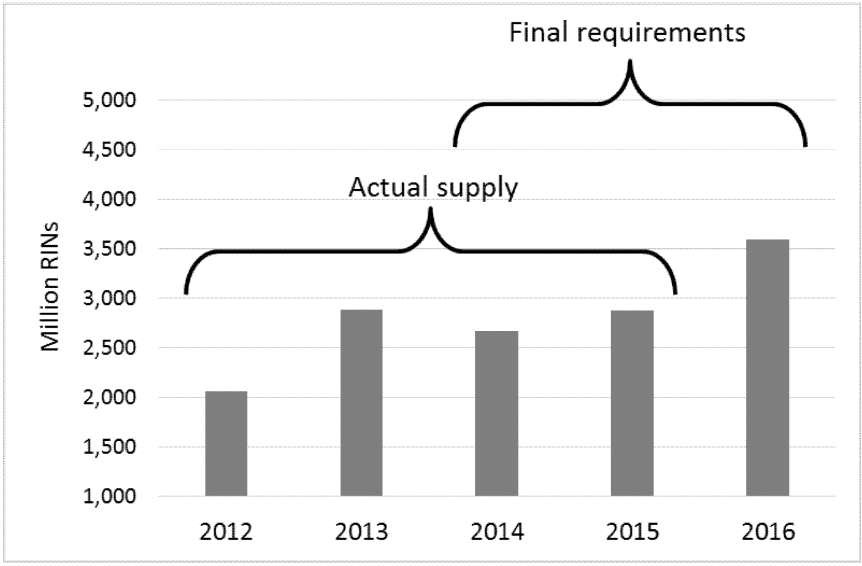
Due to the nested nature of the standards, all cellulosic biofuel qualifies to help meet the advanced biofuel volume requirement. As described in Section II.E.4, we have also estimated that about 25 million gallons of advanced biofuel other than ethanol, biodiesel, and renewable diesel can be supplied in 2016. We estimate that the combination of all these sources results in a reasonably attainable volume of advanced biofuel for 2016 of 3.61 billion gallons. This is the volume requirement that we are establishing for advanced biofuel for 2016. We note that the volumes actually used to satisfy this requirement may be different than those listed in Table II.F–1 below.

TABLE II.F–1—VOLUMES USED TO DETERMINE ADVANCED BIOFUEL SUPPLY IN 2016

	Volume (million gallons)	Million RINs
Cellulosic biofuel	230	230
Biodiesel and renewable diesel	2,100	3,150
Imported sugarcane ethanol	200	200
Other non-ethanol	25	25
Total	2,555	3,605

The volume of advanced biofuel that we are establishing for 2016 will require increases from current levels that are substantial yet attainable, taking into account the constraints on supply discussed previously, our judgment regarding the ability of the standards we set to result in marketplace changes, and the various uncertainties we have described. Figure II.F–3 shows that the advanced biofuel volume requirement for 2016 will be significantly higher than the actual supply of advanced biofuel in previous years.

Figure II.F-3
Growth in Advanced Biofuel[a]



[a] Values for 2012 and 2013 represent actual supply of renewable fuel in each year, not the applicable volume requirements.

G. Market Responses to the 2016 Advanced Biofuel and Total Renewable Fuel Volume Requirements

The transportation fuel market is dynamic and complex, and the RFS program is only one of many factors that determine the relative types and amounts of renewable fuel that will be used. Thus, while we set the applicable volume requirements for advanced biofuel and total renewable fuel, we cannot precisely predict how the market will choose to meet those requirements, as the RFS standards we set generally allow use of multiple fuel types for compliance. We can, however, delineate a range of possibilities, and doing so provides a means of demonstrating that the final volume requirements are attainable through multiple possible paths.

For our final 2016 total renewable fuel volume requirement of 18.11 billion gallons, there would be 1.05 billion ethanol-equivalent gallons needed beyond that supplied by E10, the BBD volume requirement of 1.9 billion physical gallons (equivalent to 2.85 billion D4 RINs as described in Section III.D.4), and that portion of the cellulosic biofuel volume which we would expect to be derived from non-ethanol biofuel (see Section IV.F).

TABLE II.G–1—BREAKDOWN OF RENEWABLE FUEL USE IN 2016 BASED ON FINAL VOLUMES

[Billion ethanol-equivalent gallons]

Total renewable fuel	18.11
Ethanol consumed as E10 [a]	−14.00
Non-ethanol cellulosic biofuel	−0.21
Biomass-based diesel [b]	−2.85
Additional renewable fuel that must be used	1.05

[a] Includes all sources of ethanol (cellulosic, advanced, and conventional).

[b] Represents the 1.90 billion physical gallons that is the minimum required under the BBD standard.

All of the constraints discussed in Section II.E.1 could play a role in determining how the market chooses to supply the additional 1.05 billion gallons needed. The options available to the market to fulfill the need for 1.05 billion gallons of renewable fuel include the following: [141]

- Increase the production and use of BBD above the final standard of 1.90 billion gallons [142]
- Increase import and use of sugarcane ethanol and/or domestic production and use of corn-ethanol, which would require a corresponding increase in E15 and/or E85
- Increase production and/or imports of conventional (D6) biodiesel and renewable diesel
- Increase the production of other non-ethanol biofuels, such as renewable heating oil, jet fuel, naphtha, butanol, and renewable fuels coprocessed with petroleum

In determining the amounts of each type of renewable fuel used to meet the total renewable fuel volume requirement, the market would also need to satisfy the final advanced biofuel standard of 3.61 billion gallons.

To illustrate the possible outcomes, we evaluated a number of scenarios with varying levels of E85/E15, E0, imported sugarcane ethanol, advanced biodiesel and renewable diesel, and conventional biodiesel and renewable diesel (likely to be made from palm oil). In doing so we sought to capture the range of possibilities for each individual source, based both on levels achieved in the past and how the market might respond to the final standards in 2016. Each of the rows in Table II.G–2 represent a scenario in which the final total renewable fuel and advanced biofuel volume requirements would be satisfied. While we cannot predict precisely how the market will respond to the standards we are setting, we believe that the market will respond, and will likely do so within the range of options shown in the table below. The flexibility afforded the market through the RFS program helps to make the standards we are finalizing today reasonably achievable.

TABLE II.G–2—VOLUME SCENARIOS ILLUSTRATING POSSIBLE COMPLIANCE WITH 3.61 BILL GAL ADVANCED BIOFUEL AND 18.11 BILL GAL TOTAL RENEWABLE FUEL

[Million gallons] [a] [b]

E85 [c]	E0	Total ethanol [d]	Sugarcane ethanol	Total biodiesel [e]	Minimum volume of advanced biodiesel [e]
200	100	14,122	100	2,502	2,170
200	100	14,122	300	2,502	2,037
200	300	14,102	0	2,516	2,237
200	300	14,102	100	2,516	2,170
200	300	14,102	300	2,516	2,037
200	300	14,102	495	2,516	1,907
400	100	14,255	0	2,414	2,237
400	100	14,255	100	2,414	2,170
400	100	14,255	300	2,414	2,037
400	100	14,255	495	2,414	1,907
400	300	14,234	100	2,427	2,170
400	300	14,234	300	2,427	2,037

[a] Assumes for the purposes of these scenarios that supply of other non-ethanol advanced biofuel (heating oil, naphtha, etc.) is 25 mill gal, and that the cellulosic biofuel final standard for 2016 is 230 mill gal, of which 20 mill gal is ethanol and the remainder is primarily biogas.

[b] Biomass-based diesel, conventional biodiesel, and total biodiesel are given as biodiesel-equivalent volumes, though some portion may be renewable diesel. Other categories are given as ethanol-equivalent volumes. Biodiesel-equivalent volumes can be converted to ethanol-equivalent volumes by multiplying by 1.5.

[c] Some higher ethanol blend volume here represented as E85 may alternatively be E15 (1 gal of E85 could be replaced with 12.8 gallons of E15)

[d] For the range of total ethanol shown in this table, the nationwide pool-wide average ethanol content would range from 10.07% to 10.18%. The majority of gasoline will contain 10% ethanol, and some gasoline will contain higher levels of ethanol such as E15 or E85. In comparison, the pool-wide average ethanol content in 2014 and 2015 (projected) was 9.97% and 10.01%, respectively. When the increase in ethanol use is combined with substantial increases in non-ethanol renewable fuels, the 2016 volume requirements are significantly higher than both 2014 and 2015.

[e] Includes supply from both domestic producers as well as imports.

The scenarios in the table above are not the only ways that the market could choose to meet the total renewable fuel and advanced biofuel volume requirements that we are finalizing today. Indeed, other combinations are possible, with volumes higher than the highest levels we have shown above or, in some cases, lower than the lowest levels we have shown. The scenarios above (and similar scenarios presented in the NPRM) cannot be treated as EPA's views on the only, or even most likely, ways that the market may respond to the final volume requirements for 2016, contrary to the views of some stakeholders who commented on the NPRM. Instead, the scenarios are merely

[141] Although obligated parties could draw down the bank of carryover RINs as an alternative means of compliance, as discussed elsewhere we believe that the incentives for obligated parties to retain their carryover RINs is sufficiently large that they will preferentially acquire and retire current-year RINs for compliance.

[142] We have determined in the context of deriving the advanced biofuel standard that 2.2 billion gallons are reasonably attainable. However, the market could operate such that larger volumes are made available.

illustrative of the various ways that it could play out. Our purpose in generating the list of scenarios above is only to illustrate a range of possibilities which demonstrate that the standards we are finalizing today are achievable despite the considerable increases relative to 2015.

Stakeholders who believed that the volume requirements we proposed in the NPRM were too high often described them as unprecedented or overly aggressive, implicitly treating the various legal and practical constraints to increased renewable fuel use as a barrier that cannot or should not be crossed. Some stakeholders said that any scenario in which a particular category of renewable fuel exceeded historical maximums or previously demonstrated production levels cannot be considered to be achievable. Based on this premise, such stakeholders dismissed all scenarios in the NPRM as being unachievable.

As described earlier, while we acknowledge that constraints on growth in renewable fuel supply are real, we do not believe that they create absolute barriers to growth in renewable fuel supply. Instead, the current constraints on growth in supply mean that each additional supply increment is likely to be more difficult to achieve than previous increments, and likely require more time to overcome than past constraints. The market most certainly can and will respond to the standards that we set by increasing supply, as has been demonstrated on other occasions. Growth in the biofuels market is also the primary objective of the statute, as we acknowledge throughout this action. However, the market is not unlimited in its ability to respond, and for this reason we have found it necessary to reduce the required volumes below the statutory targets.

The scenarios that we provided in the NPRM, and somewhat different scenarios presented above that reflect the final volume requirements, demonstrate that the market has various ways in which it could respond. The market can be expected to choose the lowest cost path to compliance for 2016, but some parties may choose paths that are intended to result in lower costs in the long term despite generating higher costs in the near term. For instance, regulated parties may respond to the standards we set with investments in production, distribution, and consumption infrastructure that is focused on longer term growth.

All of the volume levels in the scenarios shown above are within reach of a responsive market, though they may not all be equally likely. Below we discuss several of them to demonstrate that the final volume requirements for 2016 are achievable.

With regard to E85, according to EIA there will be about 16 million FFVs in the in-use fleet in 2016 with a total consumption capacity of about 14 billion gallons of E85.[143] However, since only about 2% of retail stations nationwide currently offer E85, only a minority of FFVs have easy access to E85. Under more favorable E85 pricing that could result from higher RIN prices, E85 sales volumes higher than those achieved in 2014 (about 150 million gallons) are certainly achievable. As described in Section II.E.2.iii we believe that 200 million gallons is the most likely maximum achievable volume of E85 in 2016. Even with some growth in the number of retail stations offering E85, however, E85 sales are unlikely to grow dramatically in 2016 due to the weak observed consumer response to E85 combined with the limited ability of the RIN mechanism under current conditions to reduce the retail price of E85 relative to E10 as described in Section II.E.2.ii. USDA's Biofuels Infrastructure Partnership grant program, an important program to expand ethanol retail infrastructure, could increase the number of E85 retail stations by perhaps as much as 400 in 2016 as discussed above, but such growth would still have a relatively small impact on total ethanol use.[144] As described in Section II.E.2.iii, under highly favorable though much less likely conditions related to growth in the number of E85 retail stations, retail pricing, and consumer response to that pricing, it is possible that E85 volumes as high as 400 million gallons could be reached in 2016.[145] Thus we have included scenarios in Table II.G–2 that include E85 volumes as high as 400 million gallons. Higher volumes of E85 sales in 2016 are very unlikely, but are possible if the market can overcome constraints associated with E85 pricing at retail and consumer responses to those prices.

As Table II.G–2 illustrates, the final standards could result in the consumption of as much as 2.5 billion gallons of biodiesel and renewable diesel, representing an increase of more than 600 million gallons over the projected 2015 supply of all D4 and D6 biodiesel and renewable diesel. While this would be a substantial increase, we believe that it is possible for the market to reach this level as discussed as in Section II.E.3. 2.5 billion gallons of biodiesel would represent about 4% of the nationwide pool of diesel fuel in 2016. Most diesel fuel could contain 5% biodiesel while still allowing some diesel fuel to contain no biodiesel to accommodate areas of the country where the distribution infrastructure is not yet established, as well as that used in northern states during the coldest months of the year. Also, B20 could be used in a number of centrally-fueled fleets composed of newer engines without violating manufacturer warranties, and additional volumes of biodiesel could be used in heating oil. In light of these additional volumes, it is possible that 2.5 billion gallons could be supplied in 2016.

We note that it would be inappropriate to construct a new scenario based on the highest volumes in each category that are shown in Table II.G–2 in order to argue for higher volume requirements than we are establishing today. Doing so would result in summing of values that we have determined are higher than the most likely maximum achievable volumes of the different fuel categories, resulting in a total volume that we believe would be extremely unlikely to be achievable. We have more confidence in the ability of the market to achieve 18.11 billion gallons of total renewable fuel through some combination of different types of renewable fuel than we have in the ability of the market to achieve a specific level of, say, biodiesel. Thus, for instance, while the highest biodiesel volume shown in Table II.G–2 is about 2.5 billion gallons, the market could choose a different level of total biodiesel and renewable diesel, offsetting the volumes with other fuels. The same is true for the highest level of E85 shown in Table II.G–2 of 400 million gallons, or the highest level of sugarcane ethanol of about 500 million gallons. In addition, the consumption of each fuel in Table II.G–2 is not independent of the consumption of the other fuels in the table. For example, greater domestic biodiesel production reduces the likelihood of large imports of biodiesel

[143] According to AEO2015, Table 42, total vehicle miles travelled by FFVs in 2016 will be about 7.95% of all light-duty gasoline-powered vehicles, equivalent to about 10.9 bill gal of E10 or 13.9 bill gal of E85.

[144] We acknowledge that the USDA program will increase the number of retail stations offering E15, potentially significantly. However, as described in Section II.E.2.iv, the impact on total ethanol supply in 2016 from increased use of E15 is likely to be considerably smaller than the impact on total ethanol supply from the use of E85. Thus some portion of the volumes of E85 shown in Table II.G–2 may instead be ethanol-equivalent volumes of E15.

[145] ''Correlating E85 consumption volumes with E85 price,'' memorandum from David Korotney to EPA Docket EPA–HQ–OAR–2015–0111.

because these two fuels compete against one another for access to feedstocks that can be used to make biodiesel in 2016 and for available distribution infrastructure and market share. The probability that the upper limits of all sources shown in Table II.G–2 could be achieved simultaneously is extremely unlikely.

As noted in the NPRM, the volume requirements that we are establishing today will likely result in RIN prices that are higher than historical levels. RIN price increases are an expected market response to a renewable fuel volume requirement that is higher than that in previous years and which is expected to require effort on the part of producers, distributors, blenders, and retailers to overcome constraints. While the RIN market mechanism provides incentives for the market to increase supply both in the near and long term, as stated earlier the RIN market mechanism is not without limitation, and the renewable fuel supply cannot be expected to increase proportionally at any RIN price. Particularly in the near term (specifically 2016), we do not believe that significantly higher RIN prices would likely compel the market to supply substantially higher volumes than we are finalizing today.

H. Treatment of Carryover RINs

We explained in the NPRM that we cannot precisely assess the volume of carryover RINs available for use in complying with the 2014, 2015, and 2016 standards, but that we estimated that approximately 1.8 billion would remain after compliance with the 2013 RFS standards. We proposed that the current bank of carryover RINs should be preserved as a compliance ''buffer'' and not intentionally drawn down by setting volume requirements at a level that is higher than can be satisfied through the production and use of physical gallons of fuel.[146] Many stakeholders provided comment on the topic of how EPA should consider carryover RINs as part of the standard-setting process. After considering these comments, we have decided for this rulemaking to treat carryover RINs in the manner proposed and not establish volume requirements that would be expected to require obligated parties to draw down the current bank of carryover RINs so as to achieve compliance.

1. Summary of Public Comments

Comments on this issue generally expressed two opposing points of view. Many commenters, including many obligated parties, contended that EPA should not assume a draw-down in the bank of carryover RINs in determining the appropriate level of volume requirements. On the other hand, other commenters including many renewable fuel providers urged EPA to rely on carryover RINs to push the standards higher than the levels of projected physical volumes and so minimize the extent to which statutory applicable volumes are reduced.

Representatives of obligated parties were nearly uniform in supporting EPA's proposal to not assume a draw-down in the current bank of carryover RINs in setting the 2014, 2015, and 2016 advanced biofuel and total renewable fuel standards. Virtually all of these commenters agreed that maintaining the bank of carryover RIN would provide them with needed compliance flexibility to address unforeseen events such as operational problems, market dislocations, supply limitations, or fraudulent RINs. Several commenters noted that if EPA were to rely on the use of carryover RINs to push for higher standards than reflected by actual renewable fuel supply, it would remove a flexibility that Congress had intended for obligated parties. Several commenters also noted that obligated parties vary in their ability to acquire RINs, with the result being that some obligated parties have a substantial number of carryover RINs, while others have few or none. They argued that setting the volume requirements with the expectation that all or a substantial number of carryover RINs would be used would make compliance even more difficult than it would otherwise be for those who must rely largely or totally on RIN purchases rather than on acquiring RINs through blending activities. Several commenters also argued that maintaining the bank of carryover RINs allows for better market trading liquidity and a cushion against future program uncertainty. They noted the importance of a relatively stable, liquid RIN market for achieving compliance with volume requirements, particularly where new and expanded avenues of supply are still being developed and built. In their view, carryover RINs have been important to maintaining a functioning market, and they cautioned EPA against reducing that pool at all or too much and thereby risking severe market disruption in the event of a drought or other unforeseen difficulties.

Commenters from the renewable fuel industry, on the other hand, urged EPA to assume a draw-down in the bank of carryover RINs in determining whether and to what extent to waive statutory volumes. They noted that EPA considered the availability of carryover RINs in previous decisions not to waive statutory volumes, and argued that EPA's proposed approach was inconsistent with this past practice. They pointed out that in order to comply with the statute's purpose to encourage growth in the use of renewable fuel in the transportation fuel supply, carryover RINs should be considered available for minimizing the extent to which statutory volume requirements are reduced. Some of these commenters further argued that the carryover RINs clearly are part of the renewable fuel ''supply'' available for compliance purposes, and therefore EPA must count them in determining whether there is an ''inadequate domestic supply'' for purposes of justifying use of the general waiver authority.

2. Updated Projection of Carryover RIN Volume

In the NPRM, EPA assessed the size of the RIN bank at approximately 1.8 billion carryover RINs. However, we have updated our assessment, and now believe that 1.74 billion is the maximum that might be available for possible use in complying with the standards for 2014, 2015 and 2016.[147] There is considerable uncertainty surrounding this number since there has not been a compliance demonstration since 2013 (for the 2012 RFS standards). As described in a memorandum to the docket, the 1.74 billion carryover RIN maximum value will effectively be reduced to an uncertain degree to satisfy deficit carry-forwards from 2012.[148] In addition, there have been enforcement actions in past years that have resulted in the retirement of RINs that were fraudulently generated and were therefore invalid, and parties who relied

[146] 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 a newer vintage RIN that is then held for use in the next year. For example, if the volume of the RIN bank is unchanged from 2013 to 2014, then all of the approximately 1.74 billion vintage 2013 carryover RINs must be used for compliance in 2014, or they will expire. However, the same volume of 2014 RINs can then be ''banked'' for use in the next year.

[147] As noted elsewhere, we do not believe that the collective bank of carryover RINs will be drawn down to achieve compliance with 2014, 2015, and 2016 standards, since carryover RINs from one year will likely be rolled over into new carryover RINs for the next; we are describing here the size of the collective RIN bank, RINs that could theoretically be used for compliance purposes with 2014, 2015 and 2016 standards, though we do not believe that they will be.

[148] ''Estimating Carryover RINs Available for Use in 2014,'' Dallas Burkholder, Office of Transportation and Air Quality, U.S. EPA. November 2015. EPA Air Docket EPA–HQ–OAR–2015–0111.

on those invalid RINs for compliance were required to acquire valid substitutes to true up their past compliance demonstrations. Future enforcement actions could have similar results, and require that obligated parties settle past enforcement-related obligations in addition to the 2014–2016 standards, thereby creating greater demand for RINs than what EPA has determined represents the maximum reasonably achievable in this time period. The result of such enforcement actions, therefore, could be an effective reduction in the size of the collective bank of carryover RINs to a level further below 1.74 billion RINs.

3. EPA's Decision and Response to Comments

EPA has decided to maintain the proposed approach, and not set the volume requirements in the final rule with the intention or expectation of drawing down the current bank of carryover RINs. While we have not assumed an intentional drawdown in the overall bank of carryover RINs owned by obligated parties collectively in establishing the volume standards for 2014, 2015, and 2016, we understand that some obligated parties may choose to sell or use all or part of their individual banks of carryover RINs during this time period. To the extent that they do so, other obligated parties would be in a position to bank carryover RINs by using available renewable fuel or purchasing RINs representing such fuel, with the expected net result being no effective change in the size of the overall bank of carryover RINs that is owned collectively by obligated parties.

In finalizing this approach, we carefully considered the many comments received, including on the role of carryover RINs under our waiver authorities and the policy implications of our decision. Our responses to major comments are summarized here, with additional detailed responses in the Response to Comments document in the docket.

i. Importance of Carryover RINs

We agree with the many commenters who noted the importance of carryover RINs to individual compliance flexibility and operability of the program as whole. We believe that carryover RINs are 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. As described in the 2007 rulemaking establishing the RFS regulatory program,[149] carryover RINs are intended to 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 affecting the supply of renewable fuel that is needed to meet the standards. Commenters have drawn our attention to operational problems, market dislocations, and fraudulent RINs as other types of unforeseen circumstances for which the availability of carryover RINs is important. Obligated parties make individual decisions about whether and how many RINs to acquire for their compliance management purposes, and a decision by EPA to effectively require the ''draw down'' of all or a substantial volume of individual carryover RIN banks by setting higher future volume requirements than can be satisfied with actual renewable fuel use would decrease their compliance options and increase their risk of noncompliance. An intentional drawdown of the carryover RIN bank under current circumstances would likely have long-term effects on the RFS program, as increasing standards are expected to make compliance more challenging and reduce the ability to generate new carryover RINs.

An adequate RIN bank also serves to make the RIN market liquid and to avoid the possible need for frequent standards adjustments. 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 will not function properly unless 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 long term success of the RFS program. Furthermore, many obligated parties lack the ability to generate certain types of RINs. With a functioning liquid RIN market this is not a problem because we expect that these obligated parties will be able to comply by securing these RINs on the open market. However, a significant drawdown of the carryover RIN bank leading to a scarcity of RINs may stop the market from functioning in an efficient manner, 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. (Here and elsewhere we use the term ''buffer'' as shorthand reference to all of the benefits that are provided by a sufficient bank of carryover RINs.)

The importance of carryover RINs to the RFS program and to obligated parties can be illustrated by comparing them to either currency or inventory, as they can be seen as functioning in both roles in the RFS program. First, carryover RINs, like all RINs, are a form of ''currency'' that can be traded and that ultimately are used to settle compliance accounts at the close of each RFS compliance year. Individual banks of carryover RINs can be analogized to a typical individual bank account in which money is deposited and withdrawn. It is commonly understood that in managing both personal and business finances, that a reserve fund should be maintained to cover unforeseen circumstances. Thus, it is generally considered unwise to budget spending every dollar that is earned in a paycheck, since unforeseen events such as illness, injury, or a downturn in business could impact future earnings, and it is prudent to assume that such an event will occur in the future and to plan for them. This type of planning is particularly important in situations where credit is either unavailable or restricted, since in such circumstances there may be very limited alternatives to a reserve account. The RFS compliance system is structured to provide only limited ''credit'' for compliance obligations. Parties may defer compliance for one calendar year, but are required to pay back the deficit in the next compliance year while also meeting the next year's requirements.[150] Parties may also seek forgiveness of their RFS debt by petitioning EPA pursuant to CAA section 211(o)(7)(A) for a waiver to account for ''inadequate domestic supply'' or severe economic or environmental harm, but there is no guarantee that such waivers will be provided, or that they will be granted in time to provide the relief needed, and since such waivers are only available to address widespread concerns. They are

[149] 72 FR 23900, May 1, 2007.

[150] See CAA section 211(o)(5)(D).

not likely to be available to address individual circumstances. Thus, we believe that there are very good reasons for the program to allow for the market as a whole to have a reasonable number of carryover RINs available, and there are incentives for individual parties to seek to establish and retain a reserve bank of carryover RINs that can be used to address expected market downturns as well as unforeseen circumstances that may hinder or prevent compliance. Furthermore, just as the economy as a whole is stronger and more resilient when many individuals have significant monetary savings, we believe the RFS program, too, is stronger and more resilient to market swings and unforeseen events when obligated parties, collectively, have a sufficient bank of carryover RINs. Excessive savings are generally not positive for an economy, since they suggest that investments in future growth are not being made; however, insufficient savings run the risk of a market collapse in the face of economic downturns. An appropriate amount of savings is the desired goal. In our judgement, maintaining the current volume of carryover RINs will provide an appropriate collective savings account for the RFS program to provide benefits similar to desired collective savings in the economy.

We also believe the carryover RIN bank for the RFS program can be analogized to the working inventory that any business needs to operate. In the case of businesses, these are the raw materials, parts, or cash on hand needed to keep production going for the next day, the next week, or the next several months until new supplies can be delivered during normal operations and to allow for potential disruptions in supply of necessary materials. Failure to maintain an adequate working inventory of supplies could shut down operations, cause contracts to go unfulfilled, and create a lack of confidence in the business by would-be purchasers of their products that could ultimately lead to business failure. This is why successful businesses maintain inventories of supplies that they will need to maintain continuous production, and to account for unexpected disruptions in supply.[151] This phenomenon, known as convenience yield, is also why they typically maintain multiple sources of supply, rather than relying on just one. Maintaining an inventory and alternative sources is particularly important in situations where product supply is limited, unreliable, or uncertain, since the inventory allows continued operations despite these circumstances. While in theory the working inventories can be drawn down, and might need to be when circumstances dictate, these working inventories are not drawn down in the course of normal business operations and instead are maintained year after year to serve their intended purpose. We believe we are in this same situation for the existing bank of carryover RINs. Although the RFS program is structured such that compliance with the percentage standards is determined on an annual average (rather than a per-gallon) basis, it is nevertheless logical and prudent for obligated parties to view RINs as an essential ingredient of their product, and to attempt to match their RIN holdings to production volumes on an ongoing basis. The availability of carryover RINs can help provide needed assurance to obligated parties during the compliance year that they will eventually be able to comply with the RFS standards, while still planning to do so through the acquisition of current-year RINs. While individual obligated parties may not have a bank of carryover RINs at present, the access to carryover RINs in the marketplace from other sources can serve the same function.

ii. Role of Carryover RINs Under the Waiver Authorities

Some commenters disagreed with the proposed approach, suggesting that carryover RINs must be considered as part of ''supply'' in determining if there is an ''inadequate domestic supply'' justifying a waiver pursuant to CAA section 211(o)(7)(A). We disagree with these comments. As noted in Section II.B., the term ''inadequate domestic supply'' is not defined in the statute. Similarly, CAA section 211(o)(5), which provides the statutory basis for the carryover RIN regulatory provisions, 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, but is silent on the relationship of these credits to the ''inadequate domestic supply'' reference in section 211(o)(7)(A). Therefore, EPA finds no guidance in the text of these key statutory provisions on whether or not carryover RINs should be deemed part of the ''supply'' referenced in CAA section 211(o)(7)(A). In light of the statute's silence on this matter, it is appropriate for EPA to interpret the term so as to best fulfill the statute's objectives, including the general objective that the program runs efficiently.

We believe that the word ''supply'' in the phrase ''inadequate domestic supply'' can logically be read to refer only to actual renewable fuel (and not carryover RINs), since the focus of the entire RFS program is on increasing the amount of renewable fuel used in the transportation sector. Commenters suggested that the word ''supply'' could perhaps be interpreted to include both renewable fuel and carryover RINs on the grounds that all such RINs can be used for compliance purposes. However, it is clear that the result of this latter interpretation would be a complete drawdown in the collective bank of carryover RINs in a relatively short time period. In any year where actual renewable fuel supply was below the statutory levels and there was a balance of carryover RINs, reducing if not eliminating that balance would be a condition of exercising the general waiver authority. Because we firmly believe that maintaining a significant bank of carryover RINs provides a substantial benefit to the RFS program, as described above, in our judgment it best serves the interests of the program to interpret the term ''supply'' in the term ''inadequate domestic supply'' to include only actual renewable fuel, and not carryover RINs.

Although we do not believe that carryover RINs should be considered as part of the ''supply'' of renewable fuel in the context of a finding of ''inadequate domestic supply'' under the general waiver authority, we do believe that the availability of carryover RINs is an important factor for EPA to consider in determining whether or not to use the general waiver authority, just as it is when EPA considers using its cellulosic waiver authority (as upheld in the *Monroe* case). Thus, while we do not take carryover RINs into consideration in determining whether we *can* exercise the general waiver authority, we do take them into consideration in determining whether we *should* exercise either the general waiver authority or the

[151] For example, the marketwide carryover inventory of corn from one crop year to the next is roughly 9–10% of annual harvest. EIA. ''Weekly U.S. Ending Stocks of Fuel Ethanol.'' October 21, 2015 (available at *http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=W_EPOOXE_SAE_NUS_MBBL&f=W*); EIA. ''Weekly U.S. Oxygenate Plant Production of Fuel Ethanol.'' October 21, 2015 (available at *http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=W_EPOOXE_YOP_NUS_MBBLD&f=W*). Similarly, the average amount of ethanol in inventory at any given time is approximately 5–6% of annual production. USDA. ''Grain Stocks.'' September 30, 2015 (available at *http://usda.mannlib.cornell.edu/usda/current/GraiStoc/GraiStoc-09-30-2015.pdf*); USDA. ''Crop Production Annual Summary.'' January 12, 2015 (available at *http://usda.mannlib.cornell.edu/usda/current/CropProdSu/CropProdSu-01-12-2015_revision.pdf*).

cellulosic waiver authority. The exercise of these waiver authorities is discretionary and with an overabundance of carryover RINs, EPA could decide not to waive the statutory volume targets, even where the supply of actual renewable fuel may be inadequate to allow compliance, since the carryover RINs would allow compliance and a drawdown in the carryover RIN bank would not result in a loss of the important ''buffer'' function provided by a sufficient bank of carryover RINs. However, when the size of the bank of carryover RINs is limited, EPA could reasonably decide to exercise its waiver authorities to match the RFS requirements to the volume of the renewable fuel supply in the year in question, with the intention of preserving the limited bank of carryover RINs for the overall benefit of the program.[152] That is the present situation; in light of the projected limited size of the current bank of carryover RINs, we have determined that the volume requirements for total renewable fuel should be set at the level of projected supply of renewable fuels, and not at higher levels that would be expected to require a drawdown in the overall bank of carryover RINs. Similarly, in exercising the cellulosic waiver authority, we are not setting the volume requirements for advanced biofuel with the intention or expectation of requiring a draw-down in the bank of carryover RINs. We believe that preserving the current collective bank of carryover RINs is appropriate to provide a program buffer that facilitates the effective operation of the RFS program, and that a draw-down of this collective bank of carryover RINs should be avoided in setting the volume requirements for 2014–2016.

We do not agree with those commenters who asserted that carryover RINs may never be a consideration in determining whether and by how much to reduce statutory volume requirements. In evaluating EPA's decision not to use the cellulosic waiver authority in 2013 to reduce advanced and total renewable fuel volumes, the D.C. Circuit in *Monroe* ruled that EPA reasonably concluded that the availability of carryover RINs was ''certainly relevant'' to its decision.[153] We also considered the availability of carryover RINs in our decision not to exercise the general waiver authority in responding to petitions seeking a waiver of RFS requirements based on the 2012 drought.[154]

Similarly, were EPA to receive a request to waive already-established standards during the compliance year, we believe that it would be appropriate for EPA to take into consideration the substantially different context involved. Although the situation is not presently before us, we believe that there could be a strong case for avoiding granting a waiver during the course of a compliance year if a waiver can be avoided through the use of carryover RINs. We would need to consider in that context whether it would be appropriate to revise an established standard in the midst of the compliance year if there is a compliance mechanism available to avert that result. Indeed, EPA believes that one benefit of preserving carryover RINs when setting standards in the first instance, is precisely so that they may be available to address unforeseen circumstances such as a downturn in wet gallon supply during the compliance year. EPA will evaluate all such actions on a case-by-case basis.

iii. Extent to Which the Current Bank of Carryover RINs Could Be Drawn Down Without Compromising the Beneficial Buffer They Provide

As discussed above, we believe that an appropriate bank of carryover RINs serves an important program function, but we also believe that in circumstances where there is an overabundance of carryover RINs, that EPA can and should consider their availability as a possible approach to avoid or minimize waivers of the statutory volume targets. In establishing the RFS regulatory program, we considered both the beneficial program impacts of carryover RINs (*e.g.,* compliance flexibility, liquidity in the RIN trading market, etc.) and the potential that a substantial volume of carryover RINs could undermine the legitimate need of biofuel producers for assurance that the products they produce will actually be sold and used during a given compliance year, which could occur if obligated parties preferentially satisfy their obligations with carryover RINs. Balancing these considerations, and taking into account the statutory provision that credits should only be valid to show compliance for 12 months after the date of generation, EPA specified by regulation that obligated parties may only satisfy 20 percent of their RVO in a given year with carryover RINs. This 20 percent value therefore sets a cap on the possible use of carryover RINs that increases in absolute terms over time as the volume of renewable fuel required through the RFS program grows. In the initial years of the RFS program, obligated parties were able to steadily build up an inventory of carryover RINs, as market demand for ethanol exceeded the RFS standards. However the absolute size of the carryover RIN bank has been decreasing in recent years, as compliance requirements have become more challenging, and the ability to over-comply and create carryover RINs has become increasingly difficult.

For example, we estimated that 3.5 billion excess RINs were generated in 2011—almost 500 million more than the 3.02 billion carryover RINs that could be used in 2012 as a result of the 20 percent cap.[155] For 2013, we estimated that 2.67 billion 2012 carryover RINs were available for compliance.[156] This represented 16 percent of that year's 16.55 billion gallon total renewable fuel applicable volume. After compliance with the 2013 standards, we estimate that the carryover RIN bank will include at most 1.74 billion RINs and probably something less than that as discussed above. If we use the availability of carryover RINs as a basis for setting the standards for 2014 and 2015 to the statutory volumes as some commenters suggest, instead of setting them at actual renewable fuel supply, then, assuming we entered the 2014 compliance year with 1.74 billion carryover RINs, the amount of carryover RINs available for 2016 would only be on the order of 0.1 billion RINs, insufficient to maintain the statutory volumes for 2016 and insufficient to provide the benefits of a program buffer as described in this section. If instead we do not require a drawdown in 2014 and 2015, then potentially 1.74 billion carryover RINs would still be available for 2016, representing just 8 percent of the statutory volume of 22.25 billion gallons and 10 percent of the 18.1 billion gallon total renewable volume requirement finalized today.[157] We believe that we

[152] In some years, the situation could fall between these extremes, where EPA may exercise its discretion in a manner that assumes a somewhat enlarged bank of carryover RINs would be drawn down to a limited degree.

[153] *Monroe* at 12. The court also quoted with approval EPA's explanation that ''carryover RINs are a valid compliance mechanism'' and a means for obligated parties to ''protect [] against *any* potential supply shortfalls that could limit the availability of RINs.'' *Id.* (emphasis added by the court).

[154] At the same time, as discussed elsewhere in this section, we do not agree with commenters who view our past actions as requiring that we always rely on the availability of carryover RINs as justification for avoiding waivers.

[155] See 77 FR 70752, 70759 (November 27, 2012).

[156] See 78 FR 49821 (August 15, 2013).

[157] As noted earlier, stocks of ethanol have averaged approximately 5–6 percent of annual production, and corn stocks, which vary by season, have rarely fallen below 9–10 percent of the annual harvest.

should not intentionally set the RFS standards for 2014–2016 so as to intentionally draw down this bank of carryover RINs.[158] This is not inconsistent with prior decisions, as some commenters have argued, since the bank of carryover RINs is substantially less, both in absolute numbers and as a percentage of the applicable standards, than was the case in prior actions when we noted the availability of carryover RINs as a factor in deciding not to waive statutory volume targets. We recognize that the volume of carryover RINs that should be preserved for programmatic purposes is not given to a precise determination, and is largely a matter of judgement. At this time, given the information presently available to us, we believe it best not to set the RFS standards for 2014–2016 so as to intentionally draw down the current carryover RIN bank in whole or in part. We expect to evaluate this issue each year in our annual standards rulemakings, and to learn from experience in implementing the program, particularly once compliance for 2013, 2014, 2015, and 2016 has been established.

iv. Whether Carryover RINs Will Be Used To Avoid Needed Investments

Some commenters felt that the availability of carryover RINs could result in obligated parties complying through retirement of carryover RINs rather than investing in infrastructure or other long-term efforts to increase biofuel supply. As noted above, we recognize the potential that too large a volume of carryover RINs could undermine the legitimate need of biofuel producers for assurance that the products they produce will actually be sold and used during a given compliance year, but we believe the current size of the carryover RIN bank is not sufficiently large to result in such problems. While we recognize that individual obligated parties may choose to comply in part through retiring carryover RINs (up to the 20 percent cap), we believe that, considering the importance of carryover RINs in providing compliance flexibility, obligated parties as a whole are unlikely to deplete the collective bank of carryover RINs simply to delay making investments in new infrastructure to increase the production and distribution of renewable fuel. Our thesis is supported by empirical evidence from 2013.

EPA acknowledged in setting the 2013 standards that 14.5 billion gallons of ethanol would be needed to meet the total statutory renewable fuel volume of 16.55 billion gallons, assuming that no biomass-based diesel was produced above the 1.28 billion gallons required by the biomass-based diesel standard. We also determined that that the total amount of ethanol the market could absorb as E10 in 2013 was 13.1 billion gallons, leaving a potential gap of 1.4 billion gallons. We then described how biomass-based diesel production in excess of the biomass-based diesel standard, increased production of other non-ethanol renewable fuels, and use of E85 could contribute to the needed gallons. We also pointed out that about 2.6 billion carryover RINs would be available in 2013, which was more than enough to cover the potential gap of 1.4 billion gallons if other approaches to compliance were not realized. We decided, therefore, that a waiver of the statutory applicable volume of total renewable fuel was not needed in 2013, since there were multiple approaches to compliance available in the marketplace. Following signature of the final rule, there was a dramatic increase in RIN prices, as parties bid them up in an attempt to acquire sufficient RINs for compliance.[159] We believe in general that high RIN prices provide an incentive to the renewable fuels market to increase renewable fuel production and import, as well as an incentive to invest in the infrastructure necessary to enable higher volumes of renewable fuels to be consumed.[160] This appears to have occurred in 2013, notwithstanding the availability of carryover RINs. For example, E85 sales volumes increased significantly relative to previous years, although due to infrastructure limitations the increase in E85 consumption was still relatively small in absolute terms. Instead, the market turned to biodiesel and renewable diesel; these fuels were used at record levels, far exceeding the biomass-based diesel standard, and even exceeding the volumes required to satisfy the advanced biofuel standard.[161] Excess biodiesel was used to fulfill a substantial portion of the shortfall in conventional biofuel necessary to meet the total renewable fuel standard. Not only did RIN prices spike, but they also all converged to the RIN prices for D4 BBD, indicating that obligated parties were willing to pay advanced biofuel and BBD prices for as many RINs as could be supplied rather than rely on carryover D6 RINs. Had obligated parties collectively acted in 2013 so as to delay the investments necessary to expand the infrastructure to produce and consume additional volumes of biofuel they would have blended ethanol as E10, blended the minimum biodiesel volume required to meet the BBD and advanced biofuel standards, and used carryover RINs to satisfy the balance of their obligations. Although we estimate that 800 million carryover RINs will ultimately be used for 2013 compliance, this is far short of the 1.4 billion RINs that could have been used had obligated parties placed little value on their retention and collectively drawn them down as an alternative to investing in the biofuel supply.[162] We believe the experience in 2013 supports our assessment that obligated parties as a whole are unlikely to draw down the current bank of carryover RINs (which is substantially smaller than it was in 2013) as an alternative to buying RINs representing current-year production.

v. Response to Other Comments

Some parties argued that we should not assume a draw-down in the bank of carryover RINs in setting the total renewable fuel volume requirements because obligated parties vary in their ability to acquire RINs, with the result being that some obligated parties have a substantial number of carryover RINs, while others have few or none. They argued that setting the volume requirements with the expectation that all or a substantial number of carryover RINs would be used would make compliance even more difficult than it would otherwise be for those who must rely largely or totally on RIN purchases rather than on acquiring RINs through blending activities. We acknowledge this argument and believe that our approach will make the RIN market more fluid and facilitate compliance by parties that choose to comply with RFS

[158] Although EPA has set the volume requirements for total renewable fuel in today's rule based on a determination of volumes we believe represent the maximum levels that are reasonably achievable, we acknowledge that this determination is difficult, and that it involves a considerable amount of judgement. If EPA has erred in assuming too much is possible, the collective bank of carryover RINs would be available to obligated parties to facilitate compliance. This can be seen as an additional potential benefit of retaining an adequate bank of carryover RINs.

[159] See Figure III.D.1–1.

[160] See ''A Preliminary Assessment of RIN Market Dynamics, RIN Prices, and Their Effects,'' Dallas Burkholder, Office of Transportation and Air Quality, U.S. EPA. May 14, 2015, EPA Air Docket EPA–HQ–OAR–2015–0111.

[161] See Section III.B of this preamble.

[162] We recognize that carryover RINs are held unevenly and that discussion of the collective behavior of obligated parties in the face of the 2013 RFS mandates greatly oversimplifies the dynamics likely at work. Nevertheless, we believe the experience provides useful information regarding market response as a whole to a situation with both ambitious RFS requirements and significant availability of carryover RINs.

requirements by purchasing separated RINs.

Some parties argued that setting the annual standards so as to intentionally draw down the carryover RIN bank would likely raise RIN prices to a higher degree than the proposed approach and provide increased incentive for expansion of production and delivery infrastructure of renewable fuels. While we acknowledge that higher RIN prices would likely occur from the suggested approach, we do not believe, for the reasons set forth in section II.E of this preamble, that there is an unlimited ability for higher RIN prices to result in increased biofuel supply. We believe we have set the total renewable fuel volume requirements today at the maximum reasonably achievable levels, taking into account the ability of the market to respond to higher standards. Furthermore, even if the commenter were correct, any benefits associated with increased biofuel supply in the short term would need to be balanced against the harmful effects of depletion of the bank of carryover RINs and instability of the RIN market it would cause. Given the importance we place on an adequate RIN bank to provide a needed compliance buffer, as discussed above, we do not choose to exercise our discretion under the general waiver authority to set volumes that require depletion of the bank of carryover RINs.

Some parties argued that our approach to carryover RINs in this rule is inconsistent with past practice, and therefore arbitrary. We disagree. While it is true that a consideration of the availability of carryover RINs factored into our decisions not to exercise statutory waiver authorities in the rule establishing 2013 RFS standards (where the issue arose in the context of deciding whether to use the cellulosic waiver authority), and in our decision to deny waiver requests based on the 2012 drought (where we considered whether to exercise the general waiver authority on the basis of claims of severe harm to the economy), the factual backgrounds for those decisions were vastly different than the situation today. In those cases there was an overabundance of carryover RINs. As noted above, the size of the carryover RIN bank is currently substantially lower, both in absolute terms and as a percentage of the 2016 total renewable fuel volume requirement finalized today. Furthermore, the program is currently facing very considerable challenges that will require new and relatively costly approaches to increasing renewable fuel supplies; we believe, therefore, that the need for a programmatic buffer is even more critical under current circumstances than in the past.

4. Summary

For all of these reasons, we have determined that under current circumstances, carryover RINs should not be counted on to avoid or minimize the need to reduce the 2014, 2015, and 2016 statutory volume targets. However, we note that we may or may not take a similar approach in future years; we will assess the situation on a case-by-case basis going forward, and take into account any lessons learned from implementing the rules applicable to 2014, 2015 and 2016.

I. Impacts of Final Standards on Costs

In this section we provide illustrative cost estimates for the final standards. By ''illustrative costs,'' EPA means that the cost estimates provided are not meant to be precise measures, nor do they attempt to capture the full impacts of the rule. These estimates are provided solely for the purpose of showing how the cost to produce a gallon of a ''representative'' renewable fuel compares to the cost of petroleum fuel. There are a significant number of caveats that must be considered when interpreting these cost estimates. First, as discussed by commenters, there are a number of different feedstocks that could be used to produce advanced fuels, and there is a significant amount of heterogeneity in the costs associated with these different feedstocks and fuels. Some 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.

Second, given time constraints associated with providing estimates for several annual standards in this rule, EPA did not quantitatively assess other direct and indirect costs or benefits of increased biofuel volumes such as infrastructure costs, investment, GHG reduction benefits, air quality impacts, or energy security benefits, which all are to some degree affected by the rule. While some of these impacts were analyzed in the 2010 final rulemaking which established the current RFS program, we have not fully analyzed these impacts for the 2014, 2015, and 2016 volume requirements being established today. We have framed the analyses we have performed for this final rule as ''illustrative'' so as not to give the impression of comprehensive estimates.

Third, a number of different scenarios could be considered the ''baseline'' for the assessment of the costs of this rule. One scenario would be the statutory volumes in which case this final rule would be reducing volumes, and reducing costs. For the purposes of showing illustrative overall costs of this rulemaking, we use the preceding year's standard as the baseline (*e.g.,* the baseline for the 2016 advanced standard is the final 2015 advanced standard, etc.), an approach consistent with past practices.

Fourth, the 2014 standards were not finalized prior to 2014 so it is difficult to estimate what their costs may have been. Market participants may have anticipated a higher final 2014 standard than the market would provide in the absence of the standard, which would contribute to the positive RIN prices witnessed in 2014. In contrast, the final 2014 standards represent reductions in both the advanced and conventional volumes compared to the 2013 standards, suggesting a reduction in costs for this final 2014 rule compared to the 2013 standards. Finally, the final 2014 standards are based on actual production levels in 2014, possibly suggesting that the 2014 standards we are finalizing are what would have happened in the marketplace absent a rulemaking. Viewed in this way, the standards would impose no cost. Given the complexity of this issue, we have not attempted to estimate the costs of the 2014 standards. This issue associated with estimating costs for the 2014 standards also arises with the 2015 standards to a degree. The final standards for 2015 are being set late in the 2015 calendar year, so it is not clear how much extra renewable fuels (and thus costs) the standards are requiring above what the marketplace would have supplied absent them.[163] In any case, we provide illustrative costs for the 2015 advanced biofuel standards and total renewable fuel standards in addition to those for 2016.

EPA is providing cost estimates for three illustrative scenarios—one, if the entire change in the advanced standards is met with soybean oil BBD; two, if the entire change in the advanced standards is met with sugarcane ethanol from Brazil; and three, if the entire change in the total renewable fuel volumes that can be satisfied with conventional biofuels (*i.e.,* non-advanced) is met with corn ethanol. While a variety of biofuels could help fulfill the advanced standard

[163] Because the 2015 proposal was out part way through the year, it is possible that market participants anticipated standards at least as high as those proposed.

beyond soybean oil BBD and sugarcane ethanol from Brazil, these two biofuels have been most widely used in the past. The same is true for corn ethanol vis-a-vis the non-advanced component of the total renewable fuel standard. We believe these scenarios provide illustrative costs of meeting the final standards. For this analysis, we estimate the per gallon costs of producing biodiesel, sugarcane ethanol, and corn ethanol relative to the petroleum fuel they replace at the wholesale level, then multiply these per gallon costs by the applicable volumes established in this rule for the advanced (for biodiesel and sugarcane ethanol) and non-advanced component of the total renewable fuel (for corn ethanol) categories. More background information on this section, including details of the data sources used and assumptions made for each of the scenarios, can be found in a memorandum submitted to the docket.[164]

Because we are focusing on the wholesale level in each of the three scenarios, these comparisons do not consider taxes, retail margins, and any other costs or transfers that occur at or after the point of blending (*i.e.,* transfers are payments within society and are not additional costs). Further, as mentioned above we do not attempt to estimate potential costs related to infrastructure expansion with increased biofuel volumes. In addition, because more ethanol gallons must be consumed to go the same distance as gasoline and more biomass-based diesel must be consumed to go the same distance as petroleum diesel due to each of the biofuels' lesser energy content, we consider the costs of ethanol and biomass-based diesel on an energy equivalent basis to their petroleum replacements (*i.e.,* per energy equivalent gallon (EEG)).

For our first illustrative cost scenario, we consider the costs of soybean-based biodiesel to meet the entire change in the advanced standards. The final 2014 standard is being set at the actual level of advanced biofuels produced in 2014, 2.67 billion gallons. The advanced biofuel volumes are being finalized for 2015 at 2.88 billion gallons and for 2016 at 3.61 billion gallons. Comparing the difference in costs between biomass-based diesel and petroleum-based diesel, we estimate a cost difference that ranges from $1.45 to $1.71/EEG in 2015 and from $1.00 to $2.46/EEG in 2016. Multiplying the per gallon cost estimates by the volume of fuel displaced by the advanced standard, on an energy equivalent basis, results in an overall annual cost of $203 to $240 million in 2015 and $480 to $1,182 million in 2016.

For our second illustrative cost scenario, we provide estimates of what the potential costs might be if all additional volumes used to meet the 2015 and 2016 advanced biofuel standards above the previous year's advanced biofuel standard are met with imported Brazilian sugarcane ethanol. Comparing the difference in costs between sugarcane ethanol and the wholesale gasoline price on a per gallon basis, we estimate cost differences that range from $0.89 to $2.05/EEG in 2015 and from $0.91 to $2.07/EEG in 2016. Taking the difference in per gallon costs for sugarcane ethanol and the wholesale gasoline price and multiplying that by the volume of petroleum displaced on an energy equivalent basis from the advanced standard results in an overall estimated annual cost of $186 to $431 million for 2015 and $656 to $1,493 million for 2016.

For the third illustrative cost scenario, we assess the difference in cost associated with a change in the implied volumes available for conventional (*i.e.,* non-advanced) biofuels for 2015 and 2016. We provide estimates of what the potential costs might be if corn ethanol is used to meet the entire conventional renewable fuel volumes. The implied 2014 volume allowance for conventional renewable fuel is 13.61 billion gallons, 14.05 billion gallons in 2015, and 14.50 billion gallons in 2016. If corn ethanol is used to meet the difference between the implied 2014 to 2015 and 2015 to 2016 conventional renewable fuel volume increases, an increase of 440 million gallons of corn ethanol would be required in 2015 and 450 million gallons in 2016. Comparing the difference in costs between corn ethanol and the wholesale gasoline price, we estimate a cost difference of $0.96 in 2015 and cost differences that range from $1.01 to $1.33/EEG in 2016. Taking the difference in per gallon costs between the corn ethanol and the wholesale gasoline price estimates and multiplying that by the volume of petroleum displaced on an energy equivalent basis by the conventional standard results in an overall estimated annual cost of $424 million for 2015 and $453 to $597 million for 2016.

An alternative way of looking at the illustrative costs in 2016, given the fact that this is a three year rule, is to consider a volume change relative to the 2014 proposed standard. The cost estimate for meeting the 2016 standard would range from $620 to $1,526 million if the entire advanced standard were to be met with soybean-based diesel. The cost estimates would range from $847 to $1,929 million if the entire advanced standard were met with sugarcane ethanol. The cost estimate for meeting the entire conventional standard in 2016 with corn ethanol would range from $895 to $1,181 million.

While it would be instructive to show not only the costs but also the potential benefits of the standards being finalized and understanding both would be an important consideration in any future reassessment of the RFS program, the short timeframe provided for the annual renewable fuel rule process does not allow sufficient time for EPA to conduct a comprehensive analysis of the benefits of the 2015 and 2016 standards and the statute does not require it. Moreover, as discussed in the final rule establishing the 1.28 billion gallon requirement for BBD in 2013, the costs and benefits of the RFS program as a whole are best assessed when the program is fully mature in 2022 and beyond.[165] We continue to believe that this is the case, as the annual standard-setting process encourages consideration of the program on a piecemeal (*i.e.,* year-to-year) basis, which may not reflect the long-term economic effects of the program. Therefore, for the purpose of this annual rulemaking, we have not quantified benefits for the 2015 and 2016 final standards. As noted, this approach pertains to this and other annual rulemakings, not to potential future assessments of the program. We do not have a quantified estimate of the GHG impacts for the single year (*e.g.,* 2015, 2016). When the RFS program is fully phased in, the program will result in considerable volumes of renewable fuels that will reduce GHG emissions in comparison to the fossil fuels which they replace. EPA estimated GHG, energy security, and air quality impacts and benefits for the 2010 RFS2 final rule for 2022.

EPA received numerous comments related to the costs of the proposed 2014, 2015, and 2016 renewable fuel volumes. One commenter believes that EPA overestimated the cost of additional biodiesel volumes. They claimed that ''the program has resulted in providing the public with an alternative fuel source at a lower cost,'' and provided documentation of a testimony in which a diesel fuel provider claims to use biodiesel because it's cheaper than diesel. The commenter further states that the price of the RIN offers discounts to the biofuel producer.

[164] ''Illustrative Costs Impact of the Final Annual RFS2 Standards, 2014–2017,'' Memorandum from Michael Shell and Michael Shelby to EPA Air Docket EPA–HQ–OAR–2015–0111.

[165] 77 FR 59477, September 27, 2012.

Per gallon, wholesale biodiesel prices have been and continue to be more expensive than petroleum diesel. For example, on October 22, 2015, the front month futures price for B100 Soy Methyl Ester (SME) Chicago is $2.32/gallon, while the front month futures price for New York Harbor (NYH) Ultra-Low Sulfur Diesel (ULSD) is $1.47/gallon.[166]

Regarding the RIN discount, EPA acknowledges that biofuel producers may receive discounts due to RIN values. However, the discount a producer may receive due to RIN payment is not a cost, or a benefit; it is a transfer. In our cost methodology, we attempt to calculate the real resource costs associated with using biofuels in comparison to the fossil fuels that they replace. We did not attempt to capture transfers as a result of RIN prices and tax credits, which we acknowledge have distributional impacts. We simply evaluated the cost to consumers by considering per energy equivalent gallon difference in wholesale costs of biofuels against their petroleum alternative given projected market prices.

Multiple commenters expressed concern over the fact that EPA did not perform a full incremental cost-benefit analysis for the annual renewable fuel volumes. API commented that EPA should provide a ''complete assessment of the rule's costs on obligated parties, consumers, and other affected parties, along with a comparison of those costs with the rule's benefits.'' As EPA has previously stated, the annual rulemaking schedule for setting renewable fuel volumes does not allow sufficient time to conduct a comprehensive benefit-cost analysis. For the 2010 RFS2 final rule, EPA performed a full benefit-cost analysis for 2022, when the program fully matures. For this rulemaking, EPA performed the illustrative cost analysis described above in an attempt to capture some of the impacts of the rule qualitatively. Another commenter acknowledged EPA's 2010 benefit-cost analysis and the time constraint facing the agency in propagating annual standards, but called on EPA to complete an incremental analysis of the full impacts of this rule.

We agree that performing an incremental cost-benefit analysis would be helpful to an extent, but we continue to believe that assessing the program as a whole, over its maturity, is most appropriate.

III. Final Biomass-Based Diesel Volumes for 2014–2017

In this section we discuss the final biomass-based diesel (BBD) applicable volumes for 2014 through 2017. It is important to note that the BBD volume requirement is nested within both the advanced biofuel and the total renewable fuel volume requirements; so that any ''excess'' BBD produced beyond the mandated BBD volume can be used to satisfy both these other applicable volume requirements. Therefore, in finalizing the applicable BBD volume for 2014–2017, we considered not only the volume for the BBD standard, which effectively guarantees a minimum amount, but also the advanced biofuel and total renewable fuel volume requirements, which historically have played a significant role in determining demand for BBD as well.

In finalizing an applicable BBD volume requirement for 2017, we are establishing the volume requirement but not the percent standard.

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 for calendar year 2012, which is 1.0 billion gallons. The statute does not, however, establish any other numeric criteria, or provide any guidance on how the EPA should weigh the importance of the often competing factors, and the overarching goals of the statute when the EPA sets the applicable volumes of BBD in years after those for which the statute specifies such volumes. In the period 2013–2022, the statute specifies increasing applicable volumes of cellulosic biofuel, advanced biofuel, and total renewable fuel, but provides no guidance, beyond the 1.0 billion gallon minimum, on the level at which BBD volumes should be set.

B. BBD Production and Compliance Through 2013

Due to the delayed issuance of the major regulatory revisions necessary to implement changes to the RFS program enacted through the Energy Independence and Security Act of 2007, EPA established a 2010 BBD standard that reflected volume requirements for both 2009 and 2010, and allowed RINs generated as early as 2008 to be used for compliance with that standard. Given the complexity associated with the 2010 BBD standard, we begin our review of implementation of the program with the 2011 compliance year. This review is required by the CAA, and also provides insight into the capabilities of the industry to produce, import, export, and distribute BBD. It also helps us to understand what factors, beyond the BBD standard, may incentivize the production and import of BBD. The number of BBD RINs generated, along with the number of RINs retired for reasons other than compliance with the annual BBD standards, are shown in Table III.B–1 below.

[166] *PFL Market Daily,* Progressive Fuels Limited. *http://www.progressivefuelslimited.com/Web_Data/pfldaily.pdf.*

TABLE III.B–1—BIOMASS-BASED RIN GENERATION AND STANDARDS IN 2011–2013

[Million gallons] [167]

	BBD RINs generated	Exported BBD (RINs)	BBD RINs retired, non-compliance reasons	Available BBD RINs	BBD standard (gallons)	BBD standard (RINs) [168]
2011	1,692	110	97	1,484	800	1,200
2012	1,737	193	80	1,465	1,000	1,500
2013	2,739	295	94	2,350	1,280	1,920

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 and 2013. 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, and favorable blending economics. In 2012 the available BBD RINs were slightly less than the BBD standard. There are many reasons this may have been the case, including the temporary lapse of the biodiesel tax credit at the end of 2011.[169]

While the total number of BBD RINs generated in 2013 was 2.74 billion (representing 1.79 billion gallons of BBD), it is also instructive to review the data on volumes that were produced domestically, imported, exported, and retired for reasons other than compliance. Total domestic production of BBD was 1.45 billion gallons (2.19 billion RINs), while imports resulted in an additional 0.34 billion gallons (0.55 billion RINs).[170] However, this volume was not entirely available for compliance purposes, since some of the BBD produced domestically was exported and some RINs had to be retired for purposes other than compliance. Based on EIA export data, we estimate that 0.196 billion gallons (0.295 billion RINs) of BBD were exported in 2013.[171] A corresponding number of BBD RINs will eventually be retired by exporters, as required by the RFS regulations, and therefore are not available for use by refiners and importers in satisfying their 2013 obligations.[172] Additionally, 0.094 billion BBD RINs were retired for reasons other than compliance, such as volume error corrections, contaminated or spoiled fuel, or fuel used for purposes other than transportation fuel, heating oil, or jet fuel. Based on this information, the actual amount of BBD available for compliance in 2013 totaled 2.36 billion RINs, representing approximately 1.55 billion gallons of BBD. This is 430 million more BBD RINs than were required for compliance with the BBD standard in 2013.

C. BBD Volumes for 2014

As we did for advanced and total renewable fuel in 2014 and 2015, we believe that it is appropriate to establish the 2014 and 2015 volume requirements of BBD to reflect actual supply (including a projection for the latter part of 2015 that is primarily based on supply in the earlier part of the year for which data is available). Therefore, we are finalizing a BBD applicable volume requirement of 1.63 billion gallons for 2014, which represents our estimate of actual BBD supply in 2014. We define supply for 2014 as the number of BBD RINs generated in 2014 that were available for compliance.[173] Supply would thus include RINs that were generated for renewable fuel produced or imported in 2014 as recorded in the EMTS, minus any RINs that have already been retired or would be expected to be retired to cover exports of renewable fuels or for any purpose other than compliance with the RFS percentage standards. RINs that have already been retired for such circumstances as RINs being invalid, spills, corrected and replaced RINs, etc. are recorded in EMTS on an ongoing basis. However, complete information on RINs that are retired to cover exports of renewable fuel and foreign generated renewable fuel that is exported to another country is not available through EMTS until after the 2014 compliance demonstration deadline. Since compliance cannot occur until the standards are set, we are using biodiesel export information from EIA for 2014 to estimate the number of 2014 BBD RINs that will be retired to satisfy obligations associated with exported BBD.

Actual supply of BBD in 2014 and the projected actual supply for 2015 is shown in Table III.C–1 below. Further details are provided in a memorandum to the docket.[174] Since EIA does not distinguish exports by D code, we assumed that all biodiesel exports represent D4 BBD. We expect that any errors introduced by this assumption will be very small.[175]

[167] Net BBD RINs Generated and BBD RINs Retired for Non-Compliance Reasons information from EMTS. Biodiesel Export information from EIA (*http://www.eia.gov/dnav/pet/pet_move_expc_a_EPOORDB_EEX_mbbl_a.htm*.)

[168] Each gallon of biodiesel generates 1.5 RINs due to its higher energy content per gallon than ethanol. Renewable diesel generates between 1.5 and 1.7 RINs per gallon.

[169] 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.

[170] ''2013 RIN Supply'', EPA Docket EPA–HQ–OAR–2015–0111.

Note that not all of the imported volumes generated BBD (D4) RINs. Some of this volume may have generated Renewable Fuel (D6) RINs or no RINs at all.

[171] U.S. Energy Information Administration (EIA). Annual export data for Biodiesel (2013). See *http://www.eia.gov/dnav/pet/pet_move_expc_a_EPOORDB_EEX_mbbl_a.htm* (last accessed October 27, 2015).

[172] EMTS includes data on RINs retired for export, but the values are incomplete as of this writing since the 2013 compliance deadline has not yet passed.

[173] Our focus on RINs generated in 2014 is consistent with our general approach to carryover RINs for this rulemaking, as described in Section II.H.

[174] ''2014 RIN Supply,'' EPA docket EPA–HQ–OAR–2015–0111.

[175] From 2011 through 2015 only 12 million gallons of conventional (D6) biodiesel and renewable diesel was produced in the United States. We believe it is unlikely that foreign-produced conventional (D6) biodiesel and renewable diesel was imported into the United States and consequently exported, especially as the biodiesel blenders tax credit has not applied to fuel produced outside the U.S. for use as a fuel outside the U.S. since 2008.

TABLE III.C–1—SUPPLY OF BIOMASS-BASED DIESEL IN 2014 AND 2015

2014	Domestic production and imports	Exports	BBD RINs retired, non-compliance reasons	Net supply
Million RINs	2,709	124	82	2,490
Million gallons	1,763	83	48	[176] 1,630
Projected Actual 2015				
Million RINs	2,888	145	92	2,650
Million gallons	1,880	97	54	1,730

Some commenters suggested the EPA was prohibited from increasing the biomass-based diesel standard above 1.28 billion for the 2014 through 2016 time period because obligated parties did not have notice of EPA's intention to increase the biomass-based diesel standard above this amount at the times EPA missed the statutory deadlines for establishing applicable BBD volume requirements for these years. We do not agree with these commenters and believe that obligated parties were on notice that the BBD volume requirements for these years could be higher than 1.28 billion gallons. First, while in the November 2013 NPRM we proposed 2014 and 2015 BBD volume requirements of 1.28 million gallons, we also requested comment on alternative approaches and higher volumes.[177] We noted in the NPRM that total biodiesel production by the end of 2013 could be as high as 1.7 billion gallons and that the facilities contributing to this production collectively had a capacity of well over 2 billion gallons.[178] Thus, stakeholders were certainly on notice by November 2013 that a final BBD volume requirement greater than 1.28 billion gallons was possible and could be used in deriving the final 2014 and 2015 BBD standards. Furthermore, they were provided with notice of the precise (for 2014) or approximate (for 2015) volume requirements being finalized today through the June 10, 2015 NPRM. Thus, we believe that parties had adequate notice that 2014 and 2015 BBD volume requirements as high as those in today's rule could be finalized. And, although our proposal for 2016 was also issued late, obligated parties will have had approximately six months from the date of the June 2015 NPRM before the start of the compliance year, plus 12 months during the compliance year, plus three months after the close of the compliance year to plan for compliance and acquire necessary RINs. Finally, to provide those parties who may need additional time to engage in RIN trading to obtain the right number and balance of RINs for 2014 and 2015 compliance, EPA is providing very extensive extensions of the normal compliance demonstration deadlines. For 2014, the deadline in today's rule is August 1, 2016, two months later than proposed and a full 8 months after signature of this rule. For 2015 the compliance demonstration deadline is December 1, 2016, or 12 months from signature of this rule. Since compliance can be achieved through acquisition of RINs in the marketplace, and does not require capital investments or actual renewable fuel blending, we believe that this amount of lead time for parties to come into compliance is adequate and reasonable.

These same industry commenters suggested that because EPA was late in issuing its final BBD applicable volume rules, some obligated parties might have relied on the proposed 1.28 billion gallon applicable volume requirement for 2014 and 2015, and would now face difficulty in meeting higher volume obligations. Although they did not identify any parties in this situation, there was one obligated party who asserted in separate comments that they had in fact relied on the November 2013 NPRM in planning 2014 compliance for all four of the renewable fuel standards, and requesting that in fairness EPA not now impose a higher obligation for that year. In reply we reiterate that parties were on notice through the November 2013 NPRM that EPA could finalize higher volume requirements than proposed. Indeed, it is the nature of proposed rules that EPA review comments and consider changes, so our doing so should not come as a surprise to anyone. In addition, the tables of applicable volumes in the statute have long provided notice with respect to advanced biofuel, total renewable fuel and cellulosic biofuel that volume requirements could be as high for those fuels as are specified there. We believe that once this commenter complies with the 2014 advanced biofuel and total renewable fuel volume requirements regarding which such extensive notice was available, that compliance with the 2014 BBD volume requirement will likely either be satisfied, or easily satisfied. Even if the party needs to adjust the types of advanced biofuel RINs they own to acquire sufficient BBD RINs to comply with the BBD standard, they will be able to sell the non-BBD advanced RINs for a nearly identical price to the BBD RINs they will need to purchase.[179] And as noted above, EPA is extending the compliance demonstration deadline for 2014 beyond what we proposed, allowing this party and any other similarly situated party sufficient time to engage in the needed RIN transactions.

Even if an obligated party faced compliance challenges for 2014, CAA section 211(o)(2)(5)(A)–(D) provides two additional compliance flexibility options that an obligated party may utilize if they are unable to meet any of the 2014 standards, including their 2014 BBD volume obligation with RINs generated in 2014. First, to the extent that any shortfall of BBD RINs might exist, an obligated party could utilize carryover BBD RINs (D4) to meet their compliance obligation. As we discussed

[176] While the actual physical volume of D4 BBD supplied in 2014 was 1.63 billion gallons, we have used a physical volume of 1.67 billion gallons in calculating the percentage standard for 2014 because the formula for calculating the BBD percentage standard in 40 CFR 80.1405(c) includes a factor of 1.5, presuming that all BBD is biodiesel. In reality, a significant portion of BBD in 2014 was renewable diesel (328 million gallons), which generally has an equivalence value of 1.7 rather than 1.5. The use of a physical volume of 1.67 billion gallons ensures that the applicable percentage standard for BBD accounts for the higher equivalence value of the volume of renewable diesel produced and imported in 2014 and results in a requirement for 2.49 billion RINs, consistent with supply.

[177] 78 FR 71732, 71734.

[178] 78 FR 71732, 71752.

[179] ''RIN Prices in 2015 (January–October)'' memorandum from Dallas Burkholder to docket EPA–HQ–OAR–2015–0111.

in Section II.H, carryover RINs were intended to provide flexibility for obligated parties in complying with the RFS standards in a variety of circumstances. Certainly, if an obligated party experiences a shortfall in complying with the BBD 2014 volume standard it would be an appropriate use of carryover RINs to meet compliance obligations. Based on available data in the EMTS system [180], we estimate that there are nearly 600 million carryover BBD RINs available for use in 2014. This number of BBD carryover RINs should be available for purchase on the RIN market (since if they are not used in 2014 they will expire), and together with available RINs generated in 2014 make up a substantial RIN pool from which obligated parties may acquire needed RINs. However, if an obligated party was either unable to purchase the necessary carryover RINs or current-year RINs to meet its compliance obligation, they could alternatively use the carry-forward deficit provision of CAA section 211(o)(2)(5)(D) to carry forward the deficit for one year on the condition that it be met the following year (assuming they did not carry a deficit into 2014).

We recognize that the same number of BBD RINs will likely be retired for compliance with the 2014 RFS standards whether we set the BBD volume requirement at 1.28 versus 1.63 billion RINs, because complying with the 2014 advanced and total renewable fuel standards will require retirement of 1.63 billion BBD RINs. However, in light of this fact, the ease with which RINs may be traded, as well as the availability of carryover RINs and the deficit carry-forward option, we are not persuaded that any obligated party will have more difficulty complying with a 1.63 billion gallon BBD volume requirement as compared to a 1.28 billion gallon BBD volume requirement. Therefore, we do not believe that sufficient justification has been presented by commenters for EPA to deviate from the proposed approach of setting the 2014 BBD volume requirement as equal to the actual 2014 BBD supply. In addition, we believe that lowering the proposed 2014 BBD volume requirement would send a potentially chilling message to investors in the BBD industry that would be contrary to the objectives of the CAA to incentivize the growth of renewable fuel volumes.

For all of these reasons, we believe that it is reasonable and appropriate to establish the 2014 BBD applicable volume requirement as equal to 1.63 billion gallons, the volume actually produced and imported in 2014 and which is available for compliance. This is consistent with the approach we are taking to establishing the total renewable fuel, advanced biofuel, and cellulosic biofuel standards in 2014. Since we are establishing the requirement for a time period that has already passed, and setting the requirement equal to the available supply of 2014 BBD RINs, we believe that our action will result in no impacts with respect to the factors listed under CAA section 211(o)(2)(B)(ii)(I)–(VI).

D. Determination of Applicable Volume of Biomass-Based Diesel for 2015–2017

The statute requires that, in determining the applicable volume of BBD, we review the implementation of the program in previous years. Based on the fact that the industry made more BBD available in 2011 and 2013 than volume requirements for those years, we conclude that the BBD standard is not the sole driver for the amount of BBD produced or imported into the United States.[181] We believe that the advanced biofuel and total renewable fuel standards are significant factors in the amount of biodiesel produced and imported into the United States. We also believe that the advanced and/or total renewable fuel standards can continue to drive BBD volume in 2015–2017. As described in more detail in Sections II.E and II.F, we are finalizing volumes of advanced biofuel and total renewable fuel for 2016 that require growth beyond the volumes supplied in 2014 and 2015 and this will continue to provide incentives for BBD volumes that exceed the BBD volume requirement.

However, we recognize that in addition to being a component of advanced biofuel and total renewable fuel, Congress also intended that BBD have its own specific standard. Given that the statute requires annual increases in advanced biofuel through 2022, it may be appropriate for BBD to play a specific and increasing role in supplying advanced biofuels to the market. While we generally believe that the advanced and total volume requirements are sufficient to incentivize continued growth in the production and consumption of BBD in most years, circumstances may arise that result in unfavorable market conditions for the production and consumption of BBD, as was the case in 2012. We believe there is value in providing some degree of certainty to BBD producers that there will be a market for the fuel they produce for circumstances such as this. Therefore, this final rule seeks to balance the goals of supporting the BBD industry and incentivizing the production of non-BBD advanced biofuels by providing a guaranteed, increasing market for BBD, while at the same time providing room under the advanced standard for other types of advanced biofuels, and thus incentivizing their growth as well. We have considered the ability of the advanced biofuel and total renewable fuel standards to incentivize an increasing volume of BBD, the implementation of the RFS program to date, and the statutory factors listed in CAA section 211(o)(2)(B) (discussed in further detail in Section III.E below). We have also consulted with USDA and DOE in establishing the final requirements.

1. Implication of Nested Standards

The BBD standard is nested within the advanced biofuel and total renewable fuel standards. This means that when an obligated party retires a BBD RIN (D4) to satisfy their BBD obligation, this RIN also counts towards meeting their advanced biofuel and total renewable fuel obligations. It also means that obligated parties may use BBD RINs in excess of their BBD obligations to satisfy their advanced biofuel and total renewable fuel obligations. Higher advanced biofuel and total renewable fuel standards, therefore, create demand for BBD, especially if there is an insufficient supply of other advanced or conventional renewable fuels to satisfy the standards, or if BBD RINs can be acquired at or below the price of other advanced or conventional biofuel RINs.

In reviewing the implementation of the RFS program to date, it is apparent that the advanced and/or total renewable fuel requirements were in fact helping grow the market for volumes of biodiesel above the BBD standard. Table III.D.1–1 below shows the number of BBD RINs generated and available for use towards demonstrating compliance [182] in each year from 2011–2013. Similar data for 2014 is shown in Table III.C–1. As can be seen from these tables, in 2011 and 2013 the number of BBD RINs available for use exceeded the volumes required to satisfy the BBD

[180] ''Estimating Carryover RINs Available for Use in 2014,'' memorandum from Dallas Burkholder to docket EPA–HQ–OAR–2015–0111.

[181] The blenders tax credit for biodiesel likely also incentivized additional biodiesel blending in these years.

[182] RINs available for use is number of RINs generated minus the number of RINs retired (or that we anticipate will be retired) for any reason other than a demonstration of annual compliance, such as RINs retired for exported biofuel, volume error corrections, enforcement actions, fuel used in applications other than transportation fuel, heating oil, or jet fuel, etc.

standard. Similarly the quantity of BBD RINs in 2014 far exceeded the 1.28 billion gallons volume requirement (1.92 billion BBD RINs) for BBD that EPA proposed in November 2013. In 2013 the number of advanced RINs generated from fuels other than BBD was not large enough to satisfy the implied standard for ''other advanced'' biofuel (advanced biofuel needed to satisfy the advanced biofuel standard after the BBD and cellulosic biofuel standards are met), and additional volumes of BBD filled the gap. In fact, the amount by which the available BBD RINs exceeded the 1.28 billion gallon BBD volume requirement (421 million RINs) was larger than the amount by which the non-BBD RINs fell short of satisfying the ''other advanced'' biofuel implied standard (285 million RINs), helping to fill a shortfall in meeting the total renewable fuel standard. Thus the advanced biofuel and total renewable fuel standards provided an incentive to support a BBD volume in the United States in excess of that required to satisfy the BBD standard.

In 2012 the available BBD RINs were slightly less than the BBD standard, despite the continued opportunity for BBD to contribute towards satisfying the advanced and total renewable fuel volume requirements. There are a number of reasons this may have been the case. The drought in 2012 resulted in reduced production of soy beans and other oilseed crops that provide feedstocks for the BBD industry. Compounding this effect was the lower corn harvest in 2012, which increased the demand for soy beans and other fats and oils in the animal feed market. The biodiesel tax credit, which had been in place since the end of 2010, expired at the end of 2011. Finally, and perhaps most significantly, the E10 blendwall had not yet been reached in 2012. This meant that meeting the advanced biofuel requirements through the use of advanced ethanol, primarily sugar cane ethanol, in E10 blends, rather than additional volumes of BBD was still a viable option. Indeed, in 2012 over 600 million RINs were generated for advanced ethanol. While we believe these circumstances are unlikely to be repeated in future years, this does demonstrate that the BBD standard can still have an impact despite the ability in some years for the advanced and total renewable fuel volume requirements to incentivize additional biodiesel and renewable diesel volumes beyond the BBD standard.

TABLE III–D.1–1—BIOMASS-BASED DIESEL AND ADVANCED BIOFUEL RIN GENERATION AND STANDARDS

[Million gallons]

	Available BBD (RINs)	BBD standard (RINs)	Available non-biodiesel advanced biofuel	''Other'' advanced biofuel allowed
2011	1,484	1,200	225	150
2012	1,465	1,500	597	500
2013	2,360	1,920	552	830

The prices paid for advanced biofuel and BBD RINs beginning in early 2013 through 2015 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, we would expect the price of BBD RINs to exceed that of advanced and conventional renewable RINs.[183] If, however, BBD RINs are being used by obligated parties to satisfy their advanced biofuel and/or total renewable fuel obligations, above and beyond the BBD standard, we would expect the prices of conventional renewable fuel, advanced biofuel, and BBD RINs to converge. When examining RIN prices data from 2011 through 2014, shown in Figure III.D.1–1 below, we see that until January 2013 there is a consistent price differential between the price of BBD and the relatively cheaper other advanced biofuel and conventional renewable fuel RINs. Beginning in 2013 the price of BBD RINs and other advanced biofuel RINs converge, and remain at a similar price throughout 2015. This is more evidence that suggests that the advanced biofuel standard and/or total renewable fuel standard is capable of incentivizing increased BBD volumes beyond the BBD standard, and that it in fact operated in this manner in 2013.[184]

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

[184] 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).

Figure III.D.1-1
RIN Prices: July 2011 – July 2014

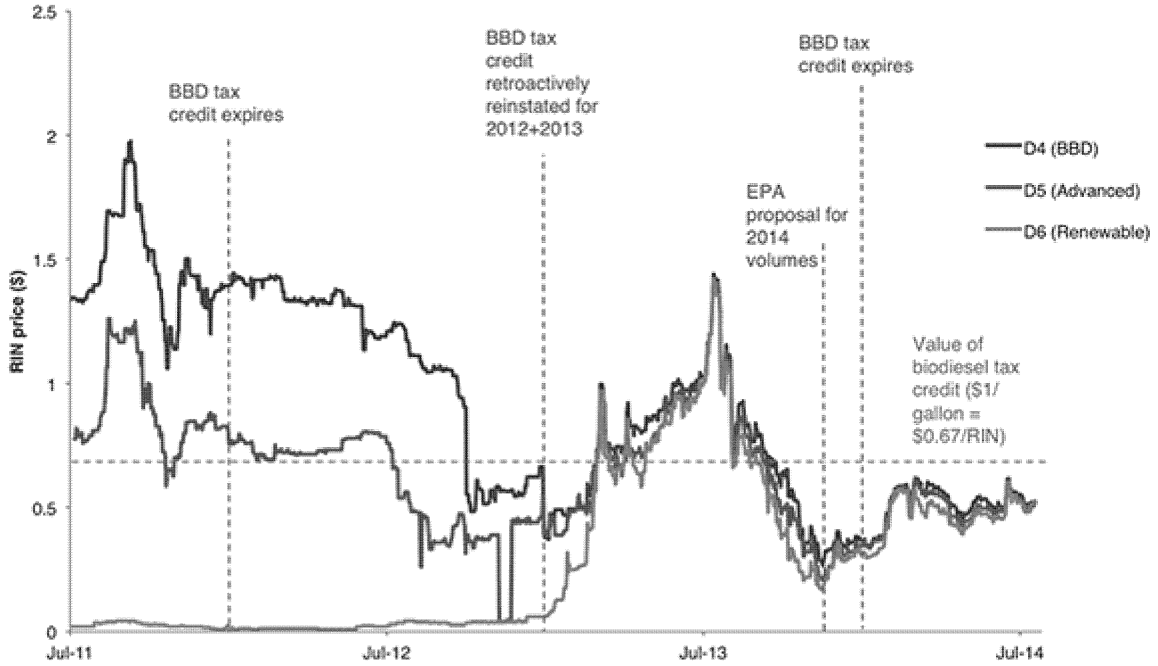


Image from ICCT. Available online: http://www.theicct.org/blogs/staff/does-biodiesel-really-need-tax-credit

2. Biomass-Based Diesel as a Fraction of Advanced Biofuel

In establishing the BBD and cellulosic standards as nested within the advanced biofuel standard, Congress clearly intended to support development of BBD and cellulosic biofuels, while also providing an incentive for the growth of other non-specified types of advanced biofuels. That is, the advanced biofuel standard provides an opportunity for other advanced biofuels (advanced biofuels that do not qualify as cellulosic biofuel or BBD) to be used to satisfy the advanced biofuel standard after the cellulosic biofuel and BBD standards have been met. Indeed, since Congress specifically directed growth in BBD only through 2012, leaving development of volume targets for BBD to EPA for later years while also specifying substantial growth in the cellulosic and general advanced categories, we believe that Congress clearly intended for EPA to evaluate in setting BBD volume requirements after 2012 the appropriate rate of participation of BBD within the advanced biofuel standard.

The unspecified advanced biofuel volume in the statutory tables in CAA section 211(o)(2)B)(i) starts at 0.25 billion gallons in 2013 and grows to 3.5 billion gallons in 2022. The actual size of the unspecified volume of advanced biofuel in any given year is, however, heavily dependent on EPA actions. Increasing the BBD standard above 1 billion gallons, as we did in 2013, reduced the potential market for other advanced biofuels to contribute towards meeting the advanced biofuel standard in that year. Conversely, reducing the cellulosic biofuel standard while simultaneously maintaining the advanced biofuel standard (or reducing it by a lesser amount), as we have done each year since 2010, increases the potential market for all advanced biofuels, including BBD. While each year's volume requirements are established in consideration of the volumes of various types of biofuels expected to be reasonably attainable in that year, we are also cognizant that the annual standards send messages to the market that can influence the direction of research and investment.

When viewed in a long-term perspective, BBD can be seen as competing for research and development dollars with other types of advanced biofuels for participation as advanced biofuels in the RFS program. In addition to the long-term impact of our action in establishing the BBD volume requirements, there is also the potential for short-term impacts during the compliance years in question. Although we are setting the advanced standard at a level that reflects growth in volumes that is reasonably attainable, we are not setting the standard at the maximum theoretical level that reflects the highest potential for domestic production plus import. As described in Section II.F, there is substantial uncertainty, especially regarding import volumes, that cautions against such an approach. Therefore, by setting the BBD volume requirement at a level lower than the advanced biofuel volume requirement (and lower than the expected production of BBD to satisfy the advanced biofuel requirement), we are allowing the potential for some competition between BBD and other advanced biofuels (including imported advanced biofuels) to satisfy the advanced biofuel volume standard. We believe that this competition will also help to encourage, over the long term, the development and production of a variety of advanced biofuels. However, in the short term it could also result in lower cost advanced biofuels.

BBD, like all non-cellulosic advanced biofuels, must, by definition, achieve lifecycle greenhouse gas reductions of at least 50% relative to the petroleum fuels it displaces. Thus, the environmental benefits of BBD are comparable to those of other non-cellulosic advanced biofuels. Increasing the portion of the advanced standard that comprises a guaranteed market for BBD would over time likely reduce competition among advanced biofuels and could dis-incentivize research and development of advanced biofuels that are potentially more economical or environmentally preferable (including for non-GHG

related reasons) than BBD. Having a more limited assortment of biofuels participate in the RFS program would also reduce the potential energy security benefits of the program, since energy security is enhanced through fuel diversity. Thus, we believe that the long term success of the RFS program, as envisioned by Congress, is best served by growth in a variety of advanced biofuels. We intend, therefore that the standards we set today provide a signal to the market to move forward with research, development, and commercialization of a variety of types of advanced biofuels beyond just BBD.

We received comments that the consideration of competition within the advanced biofuel pool between BBD and other advanced biofuels, and the potential for lower compliance costs cited in our proposed rule, are not included in the list of factors in 42 U.S.C. 7545(o)(2)(B)(ii)(V) that EPA is to consider in establishing the volume requirement for BBD. EPA respectfully disagrees. Three of the factors specified in the statute are indeed related to the considerations discussed above. The ''impact of the use of renewable fuels on the cost to consumers of transportation fuel and on the cost to transport goods'' referenced in CAA section 211(o)(2)(B)(ii)(V) is relevant, since we believe a diverse advanced biofuel pool will potentially result in decreased costs associated with the use of advanced biofuels and, consequently, decreased costs to consumers. Similarly, the ''impact of the production and use of renewable fuels on the environment'' referenced in CAA section 211(o)(2)(B)(ii)((I) is relevant, since we believe that incentivizing research and development in a variety of advanced biofuels could lead to the development of biofuels that have more benign effects on the environment than those that are currently available. As noted above, ''the impact of renewable fuels on the energy security of the United States'' referenced in CAA section 211(o)(2)(B)(ii)(II) is relevant, since we believe that incentivizing the development of a diverse array of biofuels will increase energy security Finally, we note that the list of factors specified in the statute is not exclusive; that is EPA is not precluded from considering additional factors that advance the statutory objectives when it sets applicable volumes for years not specified in the statute.

3. Ensuring Growth in Biomass-Based Diesel and Other Advanced Biofuel

While a single-minded focus on the ability of the advanced and total renewable fuel standards to incentivize increasing production of advanced biofuels other than BBD would suggest that a flat or even decreasing BBD volume requirement may be the optimal solution, this is not the only consideration. Despite many of these same issues being present in 2013, EPA decided to increase the BBD standard in 2013 to 1.28 billion gallons. EPA's decision to establish this higher BBD volume for 2013 was made against the backdrop of the BBD industry having increased production from about 400 million gallons in 2010 to about 1 billion gallons in 2011.[185] EPA was not completely confident in the ability of the BBD industry to further increase production without an increased BBD standard. While BBD production had performed well in 2011 and the early part of 2012, the biodiesel industry had gone through a period of instability in 2009 and 2010.[186]

During the development of the 2013 standards rulemaking, we were also concerned that production of cellulosic biofuel, also nested within the advanced biofuel requirement, was lagging significantly behind the statutory volume target. The shortfall in cellulosic biofuel volume meant that either other sources of advanced biofuel would be necessary to fulfill the specified volumes in the statute for advanced biofuel, or that EPA would need to waive a portion of the advanced biofuel volume target. It is in this context that we determined that raising the BBD requirement to 1.28 billion gallons was appropriate. Most importantly, an applicable volume requirement of 1.28 billion gallons was expected to encourage continued investment and innovation in the BBD industry, providing necessary assurances to the industry to increase production for 2013 while also serving the long term goal of the RFS statute to increase volumes of advanced biofuels over time.[187]

Although the BBD industry has performed well in 2013 and in subsequent years, we believe that continued appropriate increases in the BBD volume requirement will help provide stability to the BBD industry and encourage continued growth. This industry is currently the single largest contributor to the advanced biofuel pool, one that to date has been largely responsible for providing the growth in advanced biofuels envisioned by Congress. Nevertheless, there has been variability in the number of biodiesel facilities in production over the last few years, as well as the percent utilization of individual facilities, both of which contribute uncertainty in the rate of production in the near future, and which can be mitigated to some degree with an increase in the BBD applicable volume.[188] Increasing the BBD volume requirement should help to provide market conditions that allow these BBD production facilities to operate with greater certainty. This result is consistent with the goals of the Act to increase the production and use of advanced biofuels.

4. Final BBD Volume for 2015

In the June 10, 2015 NPRM we proposed a 1.7 billion gallon BBD volume requirement for 2015, anticipating that the growth over actual levels observed in the first part of the year was possible despite late issuance of the proposal. The market responded as we anticipated and, indeed, slightly exceeded our expectations. During the first nine months of 2015 for which data are now available, 2.05 billion BBD RINs, representing 1.34 billion gallons of biodiesel and renewable diesel, were generated. When this rate of production is extrapolated to the end of the year, and taking into account the heightened end-of-year production we expect, based on past experience, as well as expected RIN corrections and retirements due to exports, we now estimate an actual BBD volume of 1.73 billion gallons for 2015.[189] We do not anticipate that this final rule can influence the market in any way for the remaining month of 2015. Therefore, we are finalizing a 1.73 billion gallon volume requirement for 2015.[190]

[185] 77 FR 59461 col. 1, September 27, 2012.

[186] Regulations of Fuels and Fuel Additives: 2013 BBD Renewable Fuel Volume; Final Rule. 77 FR 59458, 59460–59461. *http://www2.epa.gov/renewable-fuel-standard-program/regulations-and-volume-standards-under-renewable-fuel-standard* (last accessed October 22, 2015).

[187] 77 FR 59458, 59462 and 59483.

[188] EIA's Monthly Biodiesel Production Reports since 2009 indicate that there were significant biodiesel facility closures during the 2009 and 2010 calendar years. Throughout 2013 the number of biodiesel plants operating fluctuated between 110–116 and at the end of 2013, EIA's monthly production report, noted there were 115 plants operational. During 2014 the number of operating biodiesel plants in the U.S. was lower than in 2013, fluctuating between 89–100 facilities, finishing up the year at 99 operating biodiesel plants. Overall industry-wide utilization rates increased during the 2009–2013 period from 25% in 2009 to approximate 46% in 2011 and 2012 and to more than 60% in 2013 and 2014. These data suggest a stabilizing trend in the industry, but with some continued fluctuations. See *http://www.eia.gov/biofuels/biodiesel/production/* for copies of monthly reports (last accessed October 22, 2015).

[189] ''Projection of annual renewable fuel supply in 2015,'' memorandum from David Korotney to docket EPA–HQ–OAR–2015–0111.

[190] Some commenters suggested that EPA should set the 2015 final BBD volume requirement at 1.28 billion gallons, for the same reasons they asserted that the 2014 volume requirement should be set at

Continued

5. Final Volumes for 2016–2017

With the considerations discussed in sections III.D.1–3 in mind, as well as our analysis of the factors specified in the statute and described below, and in coordination with the Departments of Agriculture and Energy, we are finalizing the applicable volume of BBD at 1.9 billion gallons for 2016 and 2.0 billion gallons for 2017. These volumes are higher than the 1.8 and 1.9 billion gallons proposed for 2016 and 2017, and reflect the fact that we are finalizing an increase in the advanced biofuel requirement for 2016, from the 3.4 billion gallons we proposed, to 3.61 billion gallons in the final rule. We have decided to dedicate a portion of this increase to BBD, and leave the remainder as unspecified advanced biofuel, and thus available for any advanced biofuel to fill, for the same reasons reflected in the proposal and this final rule for establishing the BBD volume requirements: To provide additional support for the BBD industry while allowing room within the advanced biofuel volume requirement for the participation of non-BBD advanced fuels.

We believe this final rule strikes the appropriate balance between providing a market environment where the development of other advanced biofuels is incentivized, while also realizing the benefits associated with increasing the required volume of BBD. Given our final volumes for advanced biofuel in these years, setting the BBD standard in this manner continues to allow a considerable portion of the advanced biofuel volume to be satisfied by either additional gallons of BBD or by other unspecified types of qualifying advanced biofuels (see Table III.D.4–1 below). While we have not yet determined the applicable volume of total advanced biofuel for 2017, we anticipate the continued growth in the advanced biofuel standard such that the advanced standard will provide an incentive for both increasing volumes of BBD and other advanced biofuels. We believe maintaining this unspecified or other advanced biofuel volume will provide the incentive for development and growth in other types of advanced biofuels. At the same time, allowing the portion of the advanced biofuel volume requirement that is dedicated to BBD to increase concurrently with the increase in the overall advanced biofuel volume requirement will contribute to market certainty for both the BBD industry and the renewable fuels program in general.

TABLE III–D.5–1—FINAL BIOMASS-BASED DIESEL, CELLULOSIC BIOFUEL, AND ADVANCED BIOFUEL STANDARDS: 2015–2017

	BBD (billion gallons)	BBD (billion RINs)	Cellulosic biofuel (billion RINs)	Advanced biofuel (billion RINs)	Unspecified advanced (billion RINs)
2015	1.73	2.65	0.123	2.88	0.107
2016	1.90	2.85	0.230	3.61	0.530
2017	2.00	3.00	TBD	TBD	TBD

EPA received comments on our proposed rule providing data suggesting that sufficient BBD feedstocks, production facilities, and fuel distribution infrastructure existed to produce, import, and consume volumes of BBD in 2016–2017 that exceed the volume requirements established in this rule.[191] Some commenters specifically cited the potential for large volumes of imported BBD to displace domestically produced BBD if the BBD volume requirements were not increased. These commenters argued that EPA should increase the BBD standard in 2016–2017 in light of the fact that the potential volume of BBD exceeds the proposed BBD volume requirements for each of these years. EPA agrees with the commenters that the potential available volume of BBD in 2016 and 2017 exceeds the BBD volume requirements we are finalizing in this rule, and have considered multiple scenarios where additional volumes of BBD are used to comply with the advanced and total renewable fuel standards.[192] As discussed above, however, we do not believe it is in the best interest of the RFS program to set the BBD volume requirement at the maximum available volume of BBD. Doing so would reduce the opportunity for other advanced biofuels to compete for market share within the context of the advanced biofuel standard, and would send market signals that would hinder the long term development of these fuels. Our review of the history of the RFS program strongly suggests that the advanced and total renewable fuel standards can provide sufficient incentives for the production and use of increased volumes of BBD beyond levels required to satisfy the BBD standard.

EPA also received comments stating that increasing the BBD volume requirement to reflect actual BBD available volumes would have the advantage of helping to ensure that BBD, rather than imported sugar cane ethanol, would be used to satisfy the advanced standard. The commenters claimed that this was preferable because BBD does not contribute to the renewable fuel consumption challenges associated with the E10 blendwall, and because BBD is generally produced in the United States, while sugar cane ethanol is almost exclusively an imported product. They claimed that requiring additional volumes of a domestic product rather than an imported one would have positive impacts on the economy of the United States and aid rural economic development, and that these benefits justified a higher BBD standard.

EPA acknowledges that if we were to increase the BBD volume standard we would increase the guaranteed market for BBD, and reduce the likelihood that significant volumes of sugar cane ethanol would be imported to satisfy the advanced and total renewable fuels standards. We do not agree, however, that this is a necessary step to promote the viability and growth of the BBD industry. In reviewing the history of the program, as shown above, EPA notes that BBD production, import, and consumption has been strong and increasing each year since 2011. In particular, we note that in 2013 BBD volumes rose sharply, and ethanol imports simultaneously fell and have stayed low.[193]

that level. We disagree, for the same reasons noted earlier with respect to the 2014 BBD requirement.

[191] For a further discussion of EPA's assessment of BBD feedstock availability, production capacity, and fuel distribution limitations see ''Memorandum to docket: Final Statutory Factors Assessment for 2016–2017 BBD Applicable Volumes'' EPA–HQ–OAR–2015–0111.

[192] See Section II.G for a list of potential compliance scenarios.

[193] The reduction in ethanol imports was likely due to a combination of factors including poor

The data EPA has presented in the preceding sections strongly suggests that despite the ongoing potential for competition from sugar cane ethanol and biodiesel imports, the BBD industry, supported by the advanced and total renewable fuel standards, has achieved and can continue to achieve production volumes beyond levels needed to satisfy the BBD volume requirement. Given the constraints on ethanol use associated with the E10 blendwall even if sugar cane ethanol imports were to increase, it is still likely that there would be a strong market for BBD to help satisfy the total renewable fuel requirements. Finally, in light of the broad programmatic objective of the RFS program to increase the content of biofuels in U.S. transportation fuel, we believe that it would be counterproductive to design the standards in such a way as to intentionally discourage or disincentivize the import of foreign biofuels.

In finalizing these standards for BBD for 2014–2017 EPA has taken into account the statutory requirements found in CAA section 211(o)(2)(B)(ii), including coordination with the Departments of Energy and Agriculture, review of the implementation of the renewable fuels program to date, and analysis of the statutory factors specified in CAA section 211(o)(2)(B)(ii)(I)–(VI). Of particular relevance in our review of the implementation of the renewable fuels program to date were the circumstances and context that led us to increase the BBD standard from 1.0 billion gallons in 2012 to 1.28 billion gallons for 2013, and the biofuel industry's successful performance in 2013. We have also reviewed the statutory factors in the context that the BBD volume requirement is nested within the advanced biofuels and total renewable fuels volume requirements. This discussion of the statutory factors is found in Section III.E., below.

In deciding to finalize the applicable volume of 1.9 billion gallons of BBD for 2016, with an additional 100 million gallon increase for 2017 to 2.0 billion gallons, we considered not only the short-term impacts, but also the potential long-term impacts of our action on the RFS program. We took into account the competitive impacts such an increase in the BBD volume requirement would likely have on other advanced biofuel producers already in the marketplace as well as on potential new market entrants. This increase in the BBD volumes through 2017 should result in ongoing investment and growth for BBD, while also providing for continued investment and growth in other advanced biofuels.

Raising the guaranteed BBD volume beyond the volumes in this rule so that it approaches the maximum possible volume of BBD could result in a less competitive advanced biofuels market, increasing RIN prices, and a less efficient market-driven renewable fuels program. Our decision today to finalize the BBD volumes for 2016–2017 at 1.90 and 2.0 billion gallons per year respectively, would not be expected to lead to such an adverse result. We believe that the final BBD volume increases for 2016–2017 will both contribute to market stability for the renewable fuels program and continue to promote a growing and competitive advanced biofuels marketplace, one which encourages the growth and development of diverse biofuels along with additional volumes of BBD beyond the volumes required by the BBD standard.

E. Consideration of Statutory Factors for 2014–2017

In this section we discuss our considerations of the statutory factors set forth in CAA section 211(o)(2)(B)(ii)(I)–(VI). As discussed earlier in Section III.D.1, the BBD volume requirement is nested within the advanced biofuel requirement and the advanced biofuel requirement is, in turn, nested within the total renewable fuel volume requirement. This means that any BBD produced beyond the mandated BBD volume can be used to satisfy both these other applicable volume requirements. The result is that in considering the statutory factors we must consider the potential impacts of increasing BBD in comparison to other advanced biofuels.[194] For a given advanced biofuel standard, greater or lesser applicable volumes of BBD do not change the amount of advanced biofuel used to displace petroleum fuels; rather, increasing the BBD applicable volume may result in the displacement of other types of advanced biofuels that could have been used to meet the advanced biofuels volume requirement.

1. Assessment for 2014 and 2015 Biomass-Based Diesel Applicable Volume

Given the fact that the 2014 compliance year has passed, we believe that our action in setting the 2014 BBD volume requirement will result in no real-world impacts, including no impacts with respect to the factors listed under CAA section 211(o)(2)(B)(ii)(I)–(VI). For example, there is no longer any ability for other advanced biofuels to compete with BBD for a greater share of the advanced biofuel pool in 2014, so there would be no marginal benefit in terms of incentivizing production of such fuels in setting a lower volume requirement than the volume of BBD that was actually produced and imported and available for compliance in 2014. Setting the applicable volume at a higher level than was actually produced and available for compliance would require a draw-down in the bank of carryover RINs, which EPA does not consider prudent for the reasons discussed in Section II.H of this preamble. In light of these considerations, we are finalizing the 2014 applicable volume for BBD as equal to the volume actually produced and imported, which is available for compliance. We believe this approach is also appropriate for the 2015 BBD standard. While there is still one month remaining in 2015, we believe it is similarly appropriate to set the biomass-based diesel standard for 2015 at the level of BBD that we project will actually be produced and imported and available for compliance in 2015 given that the primary benefits of allowing for opportunity for non-BBD fuels in the context of the advanced biofuel standard is not applicable for the 11 months of 2015 that have passed, and this rule is being issued too late to significantly influence production and use of BBD and advanced biofuel in the remainder of 2015.

2. Primary and Supplementary Statutory Factors Assessment for 2016 and 2017 Biomass-Based Diesel Applicable Volumes

EPA's primary assessment of the statutory factors for 2016 is that because the final advanced biofuel volume requirement for 2016 reflects the advanced biofuel volumes (including BBD) that can be reasonably attained, and because the BBD requirement is

sugar cane harvests, increased demand for sugar cane ethanol in the countries where it was produced, increased competition for sugar cane ethanol imports from other countries, and challenges relating to increasing the consumption of ethanol beyond E10 in the U.S. See ethanol import volumes, as reported by EIA, at: *http://www.eia.gov/dnav/pet/pet_move_impcus_a2_nus_epooxe_im0_mbbl_a.htm*.

[194] While excess BBD production could also displace conventional biofuel 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 biofuels under the total renewable standard, but rather other advanced biofuels. See Table II.G–2, ''Volume Scenarios Illustrating Possible Compliance with 3.61 Bill Gal Advanced Biofuel and 18.11 Bill Gal Bill Gal Total Renewable Fuel''.

nested within the advanced biofuel volume requirement, we expect that the 2016 advanced volume requirement will largely determine the level of BBD production and imports; the same volume of BBD will likely be produced and imported regardless of the BBD volume that we require for 2016.

This assessment is based, in part, on our review of the RFS program implementation to date, as discussed in Sections III.B and III.D. Since our decision on the BBD volume requirement for 2016 is not expected to impact the volume of BBD which is produced and imported during this time period, we do not expect our decision to result in a difference in the factors we are required to consider pursuant to CAA section 211(o)(2)(B)(ii)(I)–(VI). However, we note that our principal approach of setting BBD volume requirements at a higher level in 2016, while still at a volume level lower than anticipated overall production and consumption of BBD, is consistent with our evaluation of statutory factors in sections 211(o)(2)(B)(ii) (I), (II) and (III), since we believe that our decision on the BBD volume requirement can have a positive impact on the future development and marketing of other advanced biofuels and can also result in potential environmental and energy security benefits, while still sending a supportive signal to potential BBD investors, consistent with the objectives of the Act to support the continued growth in production and use of renewable fuels.

Similarly for 2017, even though we are finalizing only the 2017 BBD volume requirement at this time and not the 2017 advanced biofuel requirement, we believe this same primary assessment is appropriate since we anticipate that the 2017 advanced biofuel requirement will be set to reflect ambitious but reasonably attainable volumes in the use of all advanced biofuels and that the advanced biofuel volume standard will be expected to drive BBD production and use.

As an additional supplementary assessment, we have considered the potential impacts of modifying the applicable volume of BBD from the final levels of 1.90 billion gallons in 2016, and 2.0 billion gallons in 2017, based on the assumption that in guaranteeing BBD volumes at any given level there could be greater use of BBD and a corresponding decrease in the use of other types of advanced biofuels. However, setting a higher or lower BBD volume requirement than the final levels would only be expected to impact BBD volumes on the margin, protecting to varying degrees this advanced biofuel from being outcompeted by other advanced biofuels. In this supplementary assessment we have considered the statutory factors found in CAA section 211(2)(B)(ii), and as described in a memorandum to the docket,[195] our final assessment does not appear, based on available information, to provide a good reason for setting a higher or lower volume standard for BBD than 1.90 billion gallons in 2016, and 2.0 billion gallons in 2017.

The EPA received numerous comments pertaining to the consideration of the statutory factors for the 2016–2017 BBD volume requirement. Following are responses to a number of key issues raised by NBB. Additional comments and EPA responses can be found in the Response to Comment document that accompanies this final rule.

NBB stated that we improperly based our consideration of the statutory factors on a comparison of BBD to other advanced biofuels, rather than to diesel fuel. They asserted that BBD would not compete with other advanced biofuels because EPA proposed to set the advanced biofuel volume at maximally achievable levels, and that no competition would be present if all available advanced biofuels had to be used. They suggested that setting the BBD standard at a higher level than proposed would actually result in BBD competing against diesel fuel, and therefore, EPA should analyze the impacts of displacing diesel fuel with BBD. We disagree. In setting the advanced biofuel volume requirement, we have assumed reasonably attainable volumes in BBD and other advanced biofuels. After determining that it is in the interest of the program, as described in Sections III.D.1–D.3, to set the BBD volume requirement at a level below anticipated BBD production and imports, so as to provide continued incentives for research and development of alternative advanced biofuels, it is apparent that excess BBD above the BBD volume requirement will compete with other advanced biofuels, rather than diesel. The only way for EPA's action on the BBD volume requirement to result in a direct displacement of petroleum-based fuels, rather than other advanced biofuels, would be if the BBD volume requirement were set larger than the total renewable fuel requirement. However, since BBD is a type of advanced biofuel, and advanced biofuel is a type of renewable fuel, the BBD volume requirement could never be larger than the advanced requirement and the advanced biofuel requirement could never be larger than the total renewable fuel requirement. Thus, EPA continues to believe that it is appropriate to evaluate the impact of its action in setting the BBD volume requirements by evaluating the impact of using BBD as compared to other advanced biofuels to determine what increment of the advanced biofuel standard that is not guaranteed to BBD.

NBB also asserted that our analysis of the desirability of setting the BBD volume requirement in a manner that would promote the development and use of a diverse array of advanced biofuels is prohibited by statute. We disagree with these comments and continue to believe that the statutory volumes of renewable fuel established by Congress in CAA section 211(o)(2)(B) provide an opportunity for other advanced biofuels (advanced biofuels that do not qualify as cellulosic biofuel or BBD) to be used to satisfy the advanced biofuel standard after the cellulosic biofuel and BBD standards have been met. Ensuring that a diversity of renewable biofuels are produced is consistent with CAA section 211(o)(2)(A)(i),which requires that the EPA ''ensure that transportation fuel sold, or introduced into commerce in the United States . . . contains at least the applicable volume of renewable fuel, advanced biofuels, cellulosic biofuel, and biomass-based diesel . . .''. Because the BBD standard is nested within the advanced biofuel and total renewable fuel standards, when an obligated party retires a BBD RIN (D4) to satisfy their obligation, this RIN also counts towards meeting their advanced biofuel and total renewable fuel obligations. It also means that obligated parties may use BBD RINs in excess of their BBD obligations to satisfy their advanced biofuel and total renewable fuel obligations. To the extent that obligated parties are required to achieve compliance with the overall advanced biofuel standard using higher volumes of BBD D4 RINs, they forgo the use of other biofuels considered advanced biofuels to meet the advanced biofuel requirement. Therefore, the higher the BBD volume standard is, the lower the opportunity for other non-BBD advanced biofuels to compete for market share within the context of the advanced biofuel standard. When viewed in a long-term perspective, BBD can be seen as competing for research and development dollars with other types of advanced biofuels for participation as advanced biofuels in the RFS program.

[195] ''Memorandum to docket: Final Statutory Factors Assessment for 2016–2017 BBD Applicable Volumes''.

Finally, NBB stated that the EPA previously found statutory factors supported greater annual increases in BBD volume requirement for 2013 and the statutory factors analysis developed to justify the 2016 and 2017 BBD volume requirements contradicts the analysis EPA put forward in 2013. We disagree. As in 2013, we have determined that incremental increases in the 2016 and 2017 BBD volume requirement are appropriate to provide continued support to the BBD industry. We did this in 2013, acknowledging the important role the industry thus far had played in providing advanced biofuels to the marketplace, and in furthering the GHG reduction objectives of the statute. We did not in 2013, and are not today, setting the BBD volume requirement at the maximum potential production volume of BBD.

IV. Final Cellulosic Biofuel Volume for 2014–2016

In the past several years the cellulosic biofuel industry has made significant progress towards commercial scale production. Quad County Corn Processors produced the first cellulosic biofuel RINs from corn kernel fiber at a corn ethanol plant in 2014. In addition, in 2014 two large scale cellulosic ethanol facilities owned and operated by Abengoa and Poet completed construction. EPA also determined that compressed natural gas (CNG) and liquefied natural gas (LNG) produced from biogas from landfills, municipal waste-water treatment facility digesters, agricultural digesters, and separated municipal solid waste (MSW) digesters are eligible to generate cellulosic RINs. This determination led to a significant increase in cellulosic RIN generation beginning in late 2014, as fuel that previously had been qualified to generate advanced biofuel RINs could now generate cellulosic RINs. Efforts continue to be made at facilities across the country to reduce both capital costs and production costs associated with cellulosic biofuel production through technology advances and the development of best practices gained through operating experience. EPA also continues to support the ongoing development of cellulosic biofuels through actions such as the evaluation of new pathways with the potential to generate cellulosic biofuel RINs. This section describes the available supply of cellulosic biofuel RINs in 2014, the volumes that we project will be produced or imported in 2015 and 2016, and some of the uncertainties associated with these volumes projections.

In this rule we are finalizing the proposed approach of using a slightly different methodology to determine the projected available volume of cellulosic biofuel for each of the three years. Our approach to each of these years can broadly be described as one that seeks to use actual production volumes where they are available (such as for all of 2014 and the first nine months of 2015) and to project production volumes from likely production facilities for future months in which actual production volumes are not available. In order to project the volume of cellulosic biofuel production in 2015 and 2016 we considered the Energy Information Administration's projections of cellulosic biofuel production,[196] data reported to EPA through the EPA Moderated Transaction System (EMTS) and information we collected regarding individual facilities that have produced or have the potential to produce qualifying volumes for consumption as transportation fuel, heating oil, or jet fuel in the U.S. in 2015 or 2016. New cellulosic biofuel production facilities projected to be brought online in the United States over the next few years are expected to continue to increase the production capacity of the cellulosic industry. Operational experience gained at the first few commercial scale cellulosic biofuel production facilities should also lead to increasing production of cellulosic biofuel from existing production facilities as they ramp up to production rates at or near their nameplate capacity over the next few years. The following section discusses the companies EPA reviewed in the process of projecting qualifying cellulosic biofuel production in the United States in 2015 and 2016. Information on these companies forms the basis for our production projections of cellulosic biofuel that will be produced for use as transportation fuel, heating oil, or jet fuel in the United States in these years (see Table IV–1 below).

TABLE IV–1—FINAL CELLULOSIC BIOFUEL STANDARDS

Year	Volume (million gallons)
2014	[a] 33
2015	123
2016	230

[a] Based on the number of cellulosic biofuel RINs generated in 2014 minus RINs retired for reasons other than compliance with the RFS standard. We assumed no exports of cellulosic biofuel (data from EMTS).

[196] ''EIA projections of transportation fuel for 2015 and 2016'', letter from Adam Sieminski, EIA Administrator to Gina McCarthy, EPA Administrator September 16, 2015.

A. Statutory Requirements

The volumes of renewable fuel to be used under the RFS program each year (absent an adjustment or waiver by EPA) are specified in CAA section 211(o)(2). The volumes of cellulosic biofuel specified in the statute for 2014, 2015, and 2016 are shown in Table IV.A–1 below. The statute provides that if EPA determines, based on EIA's estimate, that the projected volume of cellulosic biofuel production in a given year is less than the statutory volume, then EPA is to reduce the applicable volume of cellulosic biofuel to the projected volume available during that calendar year.[197]

TABLE IV.A–1—STATUTORY VOLUMES OF CELLULOSIC BIOFUEL

Year	Volume (million gallons)
2014	1,750
2015	3,000
2016	4,250

In addition, if EPA reduces the required volume of cellulosic biofuel below the level specified in the statute, the Act also indicates that we may reduce the applicable volumes of advanced biofuels and total renewable fuel by the same or a lesser volume, and we are required to make cellulosic waiver credits available. Our consideration of the 2014, 2015, and 2016 volume requirements for advanced biofuels and total renewable fuel is presented in Section II.

B. Cellulosic Biofuel Industry Assessment

In order to project cellulosic biofuel production for 2015 and 2016 we have tracked the progress of several dozen potential cellulosic biofuel production facilities. As we did in establishing the 2013 annual volumes, we have focused on facilities with the potential to produce commercial scale volumes of cellulosic biofuel rather than small R&D or pilot-scale facilities. We did so because the 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 standards for 2015–2016. The volume of cellulosic biofuel produced

[197] On January 25, 2013, the United States Court of Appeals for the District of Columbia Circuit issued its decision concerning a challenge to the 2012 cellulosic biofuel standard. In this decision the Court stated that in projecting potentially available volumes of cellulosic biofuel EPA must apply a ''neutral methodology'' aimed at providing a prediction of ''what will actually happen.'' *API* v. *EPA,* 706 F 3d 474 (D.C. Cir. January 25, 2013).

from R&D and pilot scale facilities is quite small in relation to that expected from the commercial scale facilities. R&D and demonstration scale facilities have also generally not generated RINs for any fuel they have produced in the past as their focus is on developing and demonstrating the technology, not producing commercial volumes.

From this list of commercial scale facilities we used information from EMTS and publically available information, and information provided by representatives of potential cellulosic biofuel producers, to make a determination of which facilities are most likely to produce cellulosic biofuel and generate cellulosic biofuel RINs in 2015 and 2016. 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 2015 and 2016. Both in our discussions with representatives of each company [198] 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.

Our approach for each of the three years is discussed in more detail in Sections IV.D–IV.F below. The remainder of this Section discusses the current status of the companies and facilities EPA expects may be in a position to produce commercial scale volumes of cellulosic biofuel by the end of 2016. This information forms the basis for our final standards for cellulosic biofuel for the final three months of 2015, and all of 2016.

1. Potential Domestic Producers

There are a number of companies and facilities [199] located in the United States 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 by the end of 2016. The financial incentive provided by cellulosic biofuel RINs, combined with the fact that all these facilities intend to produce fuel on a commercial scale for domestic consumption using approved pathways, gives us a high degree of confidence that cellulosic biofuel RINs will be generated for any fuel produced. In order to generate RINs, each of these facilities must be registered 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. Many of the companies and facilities have already successfully completed facility registration, and some have successfully generated RINs. A brief description of each of the companies that EPA believes may produce commercial scale volumes of RIN generating cellulosic biofuel by the end of 2016 can be found in a memorandum to the docket for this final rule.[200] These descriptions are based on a review of the publicly available information and information provided to EPA in conversations with company representatives. The key data for each of these companies used in our projection of the potentially available volume of cellulosic biofuel in 2015 and 2016 is summarized in Table IV.B.3–1 below.

2. Potential Foreign Sources of Cellulosic Biofuel

In addition to the potential sources of cellulosic biofuel located in the United States, there are several foreign cellulosic biofuel companies that may produce cellulosic biofuel in the remainder of 2015 or 2016. These include facilities owned and operated by Beta Renewables, Enerkem, Ensyn, GranBio, and Raizen. All of these facilities use fuel production pathways that have been approved by EPA for cellulosic RIN generation provided eligible sources of renewable feedstock are used. These companies would therefore be eligible to register these facilities under the RFS program and generate RINs for any qualifying fuel imported into the United States. While these facilities may be able to generate RINs for any volumes of cellulosic biofuel they import into the United States, demand for the cellulosic biofuels they produce is expected to be high in local markets.

EPA is charged with projecting the volume of cellulosic biofuel that will be produced or imported into the United States. For the purposes of this final rule we have considered all of the companies who have registered foreign facilities under the RFS program to be potential sources of cellulosic biofuel in the remainder of 2015 and 2016. 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 United States, cellulosic biofuel imports from facilities not currently registered to generate cellulosic biofuel RINs are highly unlikely in 2015 and 2016. We have therefore only considered foreign cellulosic biofuel production from facilities that are currently registered in our projection of available volume of cellulosic biofuel in 2015 and 2016. Two foreign facilities that have registered as cellulosic biofuel producers have already generated cellulosic biofuel RINs for fuel exported to the United States; projected volumes from each of these facilities are included in our projection of available volumes for 2015 and 2016. One facility has registered as a cellulosic biofuel producer, but has not yet generated any cellulosic RINs. EPA contacted representatives of this facility and received confirmation that they intended to export cellulosic biofuel to the United States in 2016. EPA has therefore included potential volumes from this facility in our 2016 volume production projections.

3. Summary of Volume Projections for Individual Companies

The information we have gathered on cellulosic biofuel producers, described above, along with the production estimates from EIA and data collected through EMTS, forms the basis for our projected volumes of cellulosic biofuel production for each facility in 2015 and 2016. As discussed above, we have focused on commercial scale cellulosic biofuel production facilities.

By 2016 there are a number of cellulosic biofuel production facilities that have the potential to produce fuel at commercial scale. Each of these facilities is discussed in a memorandum to the docket,[201] and the relevant information used to project a likely production range for each company is summarized in Table IV.B.3–1 below.[202]

[198] In determining appropriate volumes for CNG/LNG producers we did not contact individual producers but rather relied primarily on discussions with industry associations, and information on likely production facilities that are already registered under the RFS program. In some cases where further information was needed we did speak with individual companies.

[199] 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.

[200] ''Cellulosic Biofuel Producer Company Descriptions (November 2015)'', memorandum from Dallas Burkholder to EPA Air Docket EPA–HQ–OAR–2015–0111.

[201] ''Cellulosic Biofuel Producer Company Descriptions (November 2015)'', memorandum from Dallas Burkholder to EPA Air Docket EPA–HQ–OAR–2015–0111.

[202] For the purpose of the preamble discussion we have grouped together all facilities expected to

TABLE IV.B.3—PROJECTED PRODUCERS OF CELLULOSIC BIOFUEL BY 2016

Company name	Location	Feedstock	Fuel	Facility capacity (MGY) [203]	Construction start date	First production [204]
Abengoa	Hugoton, KS	Corn Stover	Ethanol	25	September 2011	4Q 2015.
Cool Planet	Alexandria, LA	Wood Waste	Gasoline	1	2Q 2015	Late 2016.
CNG/LNG Producers [205]	Various	Biogas	CNG/LNG	Various	N/A	August 2014.
DuPont	Nevada, IA	Corn Stover	Ethanol	30	November 2012	4Q 2015.
Edeniq	Various	Corn Kernel Fiber	Ethanol	Various	Various	Various.
Ensyn	Renfrew, ON	Wood Waste	Heating Oil	3	N/A	2014.
GranBio	São Miguel dos Campos, Brazil.	Sugarcane bagasse	Ethanol	21	Mid 2012	September 2014.
INEOS Bio	Vero Beach, FL	Vegetative Waste	Ethanol	8	February 2011	1Q 2016.
Poet	Emmetsburg, IA	Corn Stover	Ethanol	24	March 2012	4Q 2015.
QCCP	Galva, IA	Corn Kernel Fiber	Ethanol	2	Late 2013	October 2014.

C. Projection From the Energy Information Administration

Section 211(o)(3)(A) of the Clean Air Act requires EIA to ''. . . provide to the Administrator of the Environmental Protection Agency an estimate, with respect to the following calendar year, of the volumes of transportation fuel, biomass-based diesel, and cellulosic biofuel projected to be sold or introduced into commerce in the United States.'' EIA provided these estimates to us on September 16, 2015.[206] With regard to cellulosic biofuel, the EIA estimated that the available volume in 2015 would be 3 million gallons and in 2016 would be 10 million gallons. A summary of the commercial scale plants they considered is shown below in Table IV.C–1.

TABLE IV.C–1—LIST OF CELLULOSIC BIOFUEL PLANTS CONSIDERED IN EIA'S PROJECTIONS

Year online	Company	Location	Product
2013	INEOS Bio	Vero Beach, FL	Ethanol.
2014	Quad County	Galva, IA	Ethanol.
2015	Abengoa	Hugoton, KS	Ethanol.
2015	POET	Emmetsburg, IA	Ethanol.
2016	DuPont	Nevada, IA	Ethanol.

EIA indicated in their letter that they did not include estimates for cellulosic biofuel produced from biogas from landfills, municipal wastewater treatment facilities, separated MSW digesters, or agricultural digesters or those producing renewable heating oil, which represent approximately 90% of our projected cellulosic biofuel volume for 2016. When limiting the scope of our projection to the companies assessed by EIA, we note that while our volume projections are not identical, they are very similar. EPA projects approximately 4 million gallons of liquid cellulosic biofuel will be produced in 2015 (approximately 2 million gallons has been produced through September 2015, and we project an additional 2 million gallons will be produced through the end of 2015). This projection includes renewable heating oil (up to 1 million gallons) which was not considered in EIA's projection. For 2016 EPA projects 23 million gallons of liquid cellulosic biofuel will be produced. Of this 23 million gallons, up to 3 million gallons is expected to come from renewable heating oil, and up to 2 million gallons is expected to come from imported cellulosic biofuel. Neither of these sources are included in EIA's projection. EIA did not provide detail on the basis of their projections other than the list of expected producers shown above, so we cannot say precisely why EPA and EIA's projections differ. We further note that if we used EIA's projections for liquid cellulosic biofuel production without modification to reflect other data and our judgement the impact on the cellulosic biofuel standard overall for 2016 would be less than 5%.

D. Cellulosic Biofuel Volume for 2014

EPA is charged with projecting the available volume of cellulosic biofuel for each year, and to reduce the applicable volume of cellulosic biofuel to the level projected to be available for years in which the projected available volume falls below the cellulosic biofuel applicable volume target specified in the CAA section 211(o)(2). EPA believes that for any historical time period, the required projection is best calculated as the sum of the cellulosic biofuel RINs (D3) and the cellulosic diesel RINs (D7) generated, adjusted for RINs that are retired for purposes other than compliance with the annual standards. EPA publishes the number of cellulosic

produce cellulosic CNG/LNG. The individual facilities included in our assessment are listed in ''November 2015 Assessment of Cellulosic Biofuel Production from Biogas (2015–2016)'', memorandum from Dallas Burkholder to EPA Air Docket EPA–HQ–OAR–2015–0111.

[203] The Facility Capacity is generally equal to the nameplate capacity provided to EPA by company representatives or found in publicly available information. If the facility has completed registration and the total permitted capacity is lower than the nameplate capacity then this lower volume is used as the facility capacity. For companies generating RINs for CNG/LNG derived from biogas the Facility Capacity is equal to the lower of the annualized rate of production of CNG/LNG from the facility 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).

[204] 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.

[205] For more information on these facilities see ''November 2015 Assessment of Cellulosic Biofuel Production from Biogas (2015–2016)'', memorandum from Dallas Burkholder to EPA Air Docket EPA–HQ–OAR–2015–0111.

[206] Letter from Adam Sieminski, EIA Administrator to Gina McCarthy, EPA Administrator September 16, 2015.

biofuel and cellulosic diesel RINs generated on a month-by-month basis on our Web site.[207] The number of cellulosic biofuel and cellulosic diesel RINs generated for each month of 2014 can be found in Table IV.D–1 below. From this total, we subtract the number of cellulosic biofuel and cellulosic diesel RINs retired for reasons other than compliance with the annual standards, as these RINs are not available to obligated parties.[208] In calculating the number of cellulosic biofuel RINs available for compliance with the annual standards for 2014 we have assumed that there were no exports of cellulosic biofuel.[209] In this final rule, we are establishing the cellulosic biofuel requirement for 2014 at 33 million gallons. We believe this number, calculated by subtracting the total number of cellulosic biofuel RINs (D3 and D7) retired for reasons other than compliance with the annual standards from the total number of cellulosic biofuel RINs generated in 2014 (D3 and D7), represents the total available supply of cellulosic biofuel RINs for 2014.

TABLE IV.D–1—CELLULOSIC BIOFUEL RIN GENERATION IN 2014 [210]

	Cellulosic biofuel (D3)	Cellulosic diesel (D7)
January 2014	58,415	0
February 2014	7,072	0
March 2014	6,624	472
April 2014	643	10,950
May 2014	0	0
June 2014	0	0
July 2014	4,156	1,248
August 2014	3,492,106	5,532
September 2014	7,555,432	17,073
October 2014	7,047,762	24,030
November 2014	6,325,080	0
December 2014	8,863,270	0
Total	33,360,560	59,305
RINs retired for reasons other than compliance with the annual standards	348,973	4,997
RINs Available	33,011,587	54,308
Available Cellulosic RINs (D3 and D7)	33,065,895	

E. Cellulosic Biofuel Volume for 2015

To project the volume of cellulosic biofuel in 2015, EPA has relied on a combination of production information reported to EPA through EMTS for months in which we have data available and facility or company specific estimates of likely production for months for which EMTS data is not available. For months in which information on the production of cellulosic biofuel is available we have used the methodology discussed in Section IV.D, subtracting the number of RINs retired for reasons other than compliance in 2015 from the total number of RINs produced in 2015 that are eligible to be used towards satisfying the cellulosic biofuel standard (D3 and D7 RINs). Since the time of the NPRM, data have become available for cellulosic RIN generations in April–September of 2015. This data has been used in our projection of available cellulosic biofuel volume for this final rule. We have again assumed that no cellulosic biofuel was exported in the first nine months of 2015. Data on the number of cellulosic biofuel RINs generated and retired for purposes other than compliance with the 2015 RVO from January 2015 through September 2015 are shown in Table IV.E–1 below.

TABLE IV.E–1—CELLULOSIC BIOFUEL RIN GENERATION AND RETIREMENTS

[January 2015–September 2015]

	Cellulosic biofuel (D3)	Cellulosic diesel (D7)
January 2015	4,108,477	0
February 2015	7,950,318	0
March 2015	7,803,420	0
April 2015	7,831,248	0
May 2015	9,341,048	173,731
June 2015	12,506,549	0
July 2015	12,999,815	0
August 2015	13,805,608	53,303
September 2015	12,316,744	0

[207] *http://www2.epa.gov/fuels-registration-reporting-and-compliance-help/2014-renewable-fuel-standard-data.*

[208] In 2014 Cellulosic Biofuel and Cellulosic Diesel RINs were retired for Remedial Actions and Invalid RINs.

[209] The vast majority of cellulosic biofuel RINs generated in 2014 (approximately 32 or the 33 million RINs) were for CNG or LNG. These fuels require verification that the CNG/LNG was used as transportation fuel in the United States in order for RINs to be generated.

[210] All numbers from EPA Web site: *http://www.epa.gov/otaq/fuels/rfsdata/index.htm.* Accessed February 9, 2015.

TABLE IV.E–1—CELLULOSIC BIOFUEL RIN GENERATION AND RETIREMENTS—Continued
[January 2015–September 2015]

	Cellulosic biofuel (D3)	Cellulosic diesel (D7)
Total	88,663,227	227,034
RINs retired for reasons other than compliance	716,177	22,702
RINs Available	87,947,050	204,332
Total Available Cellulosic RINs (D3 and D7)	88,151,382	

For months in which information is unavailable EPA has generally used the projection methodology described in the proposed rule, with one change based on comments received on the NPRM. Consistent with our proposed rule, our projection methodology starts with estimating a range of potential production volumes for each company for the portion of 2015 where production data is not available.[211] EPA has established a range of potential production volumes for each company such that it is possible, but unlikely, that the actual production will be above or below the range. We believe that it is more appropriate to project a range of potential production volumes rather than a single point estimate due to the highly uncertain and variable nature of biofuel production at cellulosic biofuel facilities, especially those in the early stages of production. The projected production ranges for each facility are used to generate a single point estimate for the total production of cellulosic biofuel from all companies in 2015 for the months in which actual production volumes through EMTS are not available (October–December 2015).

In establishing a range for each company, we began by determining an appropriate low end of the range. The low end of the range for each company is designed to represent the volume of fuel EPA believes each company would produce if they are unable to begin fuel production on their expected start-up date and/or if they experience challenges that result in reduced production volumes or a longer than expected ramp-up period. In this final rule EPA has set the low end of the production range for each company based on the volume of RIN-generating cellulosic biofuel the company has produced in the most recent 12 months for which data is available. Because we are not attempting to determine a low end of a likely production range for a full year, but rather only the months in 2015 for which data are not available, this number is then multiplied by a scaling factor[212] to appropriately scale this annual production volume for use as the low end of the range over the last three of months of 2015 for which actual production data is unavailable.

This approach provides us with an objective methodology for calculating the low end of the potential production range for each company that we believe is appropriate in light of the history of start-up delays and missed production targets in the cellulosic biofuel industry. If a company has not yet begun producing RIN-generating volumes of cellulosic biofuel, our experience suggests that they may experience challenges in progressing toward commercial-scale production that would result in the delay of the production of cellulosic biofuel. We acknowledge that in the majority of cases cellulosic companies that have begun producing fuel and are currently in the start-up and ramp-up phases of production will increase their production of cellulosic biofuel from one year to the next as they work towards production rates at or near the facility capacity. Fuel production by these companies may, however, be interrupted, either intentionally or unexpectedly, and these interruptions may hinder the ability of these companies to increase biofuel production year over year. Several commenters also noted low market prices for cellulosic biofuel as an additional reason that fuel production may be reduced or suspended until such a time as the market for the fuel produced improves. We will account for the likelihood of increasing production in developing the high end of each company's production range. Finally, there may be cases in which information is available that suggests a company is unlikely to meet the production volumes achieved in the previous 12 months for which data is available, due to technical, financial, or legal difficulties. We do not believe this is the case with any of the companies projected to produce cellulosic biofuel in 2015.

It is important to note that the low end of the range does not necessarily represent a worst-case scenario. The worst-case scenario for any of these facilities for the months in which we are projecting production is no production, as it is always possible that extreme circumstances or natural disasters may result in extended delays, facility damages, or facility closures. While not denying such a possibility, we nevertheless believe it is generally appropriate to use the production over the previous 12 months as the low end of the range, with exceptions made where available information indicates that such production may be unlikely. In situations where a company has not produced any cellulosic biofuel in the previous 12 months, we believe it is appropriate to use zero as the low end of the projected production range given the many uncertainties and challenges associated with the commissioning and start-up of a new cellulosic biofuel production facility we have observed to date.

To determine the high end of the range of expected production volumes for each company we considered a variety of factors, including the expected start-up date and ramp-up period, facility capacity, and fuel off-take agreements. As a starting point, EPA calculated a production volume using the expected start-up date, facility capacity, and a benchmark of a six-month straight-line ramp-up period representing an optimistic ramp-up scenario.[213] We then compared the

[211] For the purposes of projecting RIN generation from CNG/LNG projections were made for parent companies, generally representing multiple facilities. For more detail see ''November 2015 Assessment of Cellulosic Biofuel Production from Biogas (2015–2016)'', memorandum from Dallas Burkholder to EPA Air Docket EPA–HQ–OAR–2015–0111.

[212] The scaling factor is 0.25; equal to the 3 months for which production data is being projected divided by 12.

[213] We did not assume a six-month straight-line ramp-up period in determining the high end of the projected production range for CNG/LNG producers. This is because these facilities generally have a history of CNG/LNG production prior to producing RINs, and therefore do not face many of the start-up and scale-up challenges that impact new facilities. For further information on the methodology used to project cellulosic RIN

Continued

volume calculated using this methodology to the company's own expectations for the period in which we are projecting production where they were available. In cases where the company projection for any given year exceeds our benchmark volume we used the benchmark volume, rather than the company estimate, as the high end of the range for that company. If the production estimate EPA received from a company was lower than the volume calculated using the projected start-up date, facility capacity, and six month straight-line ramp-up period, EPA used the company production targets instead.

EPA received comments from biofuels producers stating that production projections we receive from companies should be used as the basis for the mean value of any projected production range. They argue that EPA should defer to the technical expertise of the cellulosic biofuel manufacturers who provide these projections, and that it is inappropriate to base the low end of the range on previous production data. EPA understands that the volume projections provided by companies included in our projection are intended to represent the companies' expectations for production, rather than the high end of a potential production range. We also acknowledge the technical expertise of these companies and the significant amount of investment that has gone into the development of these biofuel production processes as they have progressed from R&D through demonstration and pilot scale in preparation for the first commercial scale facilities. While acknowledging these facts, we do not believe it would be appropriate to ignore the history of the cellulosic biofuel industry. Each year since 2010, EPA has gathered information, including volume production projections, from companies with the potential to produce cellulosic biofuel. Each of these companies supported these projections with successful pilot and demonstration scale facilities as well as other supporting documentation. In each of these cases the companies were unable to meet their own volume projections, and in many cases were unable to produce any RIN-generating cellulosic biofuel.

The inability of cellulosic biofuel producers in previous years to achieve their projection production targets does not provide a sufficient basis for completely discounting production of cellulosic biofuel in future years, either for these same facilities that were previously unable to achieve their target projections or from new facilities expected to start-up in 2015 or 2016. Each of these companies is an individual case, with their own production technologies, construction and operations staffs, and financial situations, and we do not believe it is appropriate to dismiss all future potential cellulosic biofuel production because of the failure of several facilities to successfully operate at commercial scale. We do believe it strongly suggests that we should view the individual company projections as something other than the most likely outcomes. In order to take a ''neutral aim at accuracy'' in projecting cellulosic biofuel production volumes, as directed by the United States Court of Appeals for the D.C. Circuit, we have decided to treat these company projections as the high end of a potential production range unless this volume exceeds the volume calculated using our six-month straight-line ramp-up period methodology, suggesting that these company projections are unreasonably high. We will continue to monitor the progress and experience of the cellulosic biofuel industry and may adjust our approach as appropriate in light of additional experience.

EPA also received comments claiming that the proposed cellulosic biofuel volumes were unreasonably high. These commenters generally claimed that in light of the inability of cellulosic biofuel companies to achieve their projected production volumes, start-up dates, and ramp-up schedules in previous years the only reasonable basis for projecting future production volumes was historical production data. They suggested that EPA should project future production volumes based solely on available cellulosic RIN generation data from previous months. EPA believes this would be inconsistent with our charge to project available cellulosic biofuel volume by taking a neutral aim at accuracy. Adopting such an approach would effectively mean ignoring the potential for facilities that have not generated RINs during the historical time period used for the basis of our future projection to contribute significant volumes in the future. This would not only be inconsistent with our expectations for an industry that has shown substantial growth over the last several years, but also with congressional intent to provide incentives for the rapid expansion of the cellulosic biofuel industry. Most importantly, a comparison of the results of the method suggested by these commenters for the cellulosic biofuel standard in 2015 (90 million ethanol-equivalent gallons) and those proposed by EPA (106 million ethanol-equivalent gallons) to the volume that would be expected to be produced in 2015 using a conservative extrapolation of the monthly average cellulosic biofuel RIN generation observed in the first nine months of 2015 over the remaining three months (118 million gallons) shows this suggested method to be inappropriately conservative.

We believe our range of projected production volumes for each company represents the range of what is likely to actually happen for each company. A brief overview of each of the companies we believe will produce cellulosic biofuel and make it commercially available in 2015 or 2016 can be found in a memorandum to the docket.[214] In the case of cellulosic biofuel produced from CNG/LNG we have discussed the production potential from these facilities as a group rather than individually. EPA believes it is appropriate to discuss these facilities as a group since they are utilizing a proven production technology and face many of the same challenges related to demonstrating that the fuel they produce is used as transportation fuel and therefore eligible to generate RINs under the RFS program.[215]

After establishing a projected production range for each facility (or group of facilities for CNG/LNG producers), we must then determine a method for using these projected production ranges to project the volume of cellulosic biofuel most likely to be produced by the cellulosic biofuel industry as a whole in 2015. As discussed above, the high and the low end of the range for each company represents values such that it is possible but unlikely that actual volumes would fall outside of those ranges. At present, data do not exist to allow EPA to develop a unique production probability distribution for each company based on the available information, as some commenters suggested. Even if EPA were able to undertake such a task there is no evidence that the distributions we developed would necessarily be more accurate than a standardized distribution curve as the cellulosic biofuel industry is still in its infancy and there is a high degree of uncertainty

generation from CNG/LNG producers see ''November 2015 Assessment of Cellulosic Biofuel Production from Biogas (2015–2016)'', memorandum from Dallas Burkholder to EPA Air Docket EPA–HQ–OAR–2015–0111.

[214] ''Cellulosic Biofuel Producer Company Descriptions (November 2015)'', memorandum from Dallas Burkholder to EPA Air Docket EPA–HQ–OAR–2015–0111.

[215] For individual company information see ''November 2015 Cellulosic Biofuel Individual Company Projections for 2014–2016 (CBI)'', memorandum from Dallas Burkholder to EPA Air Docket EPA–HQ–OAR–2015–0111.

associated with many of the factors that will impact production at each individual facility. This is supported by the poor accuracy of the individual company estimates in previous years, which were made by individuals with significant technical expertise and knowledge of each individual company and technology.

Rather than attempting to develop a unique probability distribution curve that represents likely cellulosic biofuel production for each company, EPA has instead separated the list of potential cellulosic biofuel producers into several groups with similar characteristics and projected the likely production from each of these groups. In our proposed rule we separated all of the potential cellulosic biofuel producers into two groups; those who have already achieved consistent commercial-scale production and those who have not. EPA received comments on our proposed rule that biogas producers should be treated differently than liquid biofuel producers since there was very little technology risk associated with the production and collection of biogas. We believe these comments are valid, and that the available data support using a percentile value to projected production from biogas facilities that differs from the value used for liquid biofuel producers. For this final rule we have used the 50th and 75th percentile values within the projected ranges to project likely cellulosic biofuel production from new and consistently producing facilities producing CNG/LNG from biogas.[216]

We continue to believe that grouping the potential cellulosic biofuel producers using the criteria of whether or not they have achieved consistent commercial-scale production is appropriate for the purposes of projecting a likely production volume. While each of these groupings contains a diverse set of companies with their own production technologies and challenges, we believe there is sufficient commonality in the challenges related to the funding, construction, commissioning, and start-up of commercial-scale cellulosic biofuel facilities to justify aggregating these company projections into a single group for the purposes of projecting the most likely production volume of cellulosic biofuel. The challenges new production facilities face are also significantly different than those of facilities ramping up production volumes to the facility capacity and maintaining consistent production.

After separating the companies into these four groups (liquid cellulosic biofuel producers with and without consistent production and biogas producers with and without consistent production) we then summed the low and high ends of each of the ranges for each individual company (or group of companies for CNG/LNG producers) within the group to calculate an aggregate projected production range for each group of companies. The ranges for each group of companies are shown in Tables IV.E–2 through IV.E–4 below.

TABLE IV.E–2—2015 PRODUCTION RANGES FOR LIQUID CELLULOSIC BIOFUEL PRODUCERS WITHOUT CONSISTENT COMMERCIAL SCALE PRODUCTION

[Million gallons]

	Low end of the range	High end of the range
Abengoa	0	1
CoolPlanet	0	0
DuPont	0	1
Poet	0	1
Total	[a] 0	[a] 3

[a] Rounded to the nearest million gallons.

TABLE IV.E–3—2015 PRODUCTION RANGES FOR LIQUID CELLULOSIC BIOFUEL PRODUCERS WITH CONSISTENT COMMERCIAL SCALE PRODUCTION

[Million gallons]

	Low end of the range	High end of the range
Ensyn	[b] X	0.5
Quad County Corn Processors	[b] X	0.5
Total	[a] 0	[a] 1

[a] Rounded to the nearest million gallons.
[b] The low end of the range for each individual company is based on actual production volumes and is therefore withheld to protect information claimed to be confidential business information.

TABLE IV.E–4—2015 PRODUCTION RANGES FOR CNG/LNG PRODUCED FROM BIOGAS

[Million gallons]

	Low end of the range [a]	High end of the range [a]
CNG/LNG Producers (New Facilities)	0	0
CNG/LNG Producers (Currently generating RINs)	27	35

[a] Rounded to the nearest million gallons.

[216] For more information see ''November 2015 Assessment of Cellulosic Biofuel Production from Biogas (2015–2016)'', memorandum from Dallas Burkholder to EPA Air Docket EPA–HQ–OAR–2015–0111. Using these percentile values and the ranges from the NPRM results in a production projection much closer to the actual production of cellulosic biofuel in 2015.

Because the cellulosic biofuel industry is still in its infancy and it is therefore not possible to predict with any degree of certainty the precise production volume each individual company will achieve, we believe that it would not be appropriate to choose a specific value within the projected range for each individual company/source. We believe it is more appropriate to identify a specific value within the aggregated ranges from Tables IV.E–2 and IV.E–4 that best reflects the likely production volume for each group of companies. For liquid cellulosic biofuel producers that have not yet achieved consistent commercial-scale production (Table IV.E–2) we are finalizing the use of the 25th percentile of the projected production range. This does not mean, as some commenters suggested, that we expect these facilities to operate at 25% of their nameplate, but rather that we expect that this group of facilities will produce a volume of cellulosic biofuel at the 25th percentile of the projected range. We note again that the high end of the range for each company, which were used to calculate the high end of the range for the group of companies, is significantly lower than the nameplate capacity of each facility, in some cases dramatically so, based on the expected start-up date of the facility. We believe this volume is appropriate as, in addition to the uncertainties listed above, there is also significant technology risk as these facilities attempt to operate their technologies at commercial scale. In the early years of the cellulosic biofuel industry several companies, including Cello Energy, Range Fuels, and KiOR experienced significant technical difficulties in scaling up their technologies and were able to produce little, if any, volumes of cellulosic biofuels. More recently, facilities owned and operated by Abengoa and Poet-DSM have also experienced unexpected challenges that resulted in commercial scale production being delayed. It is necessary to consider this history when projecting production volumes from companies who have not yet achieved consistent production at commercial scale.[217]

For the group of liquid cellulosic biofuel producers that have achieved consistent commercial-scale production (Table IV.E–3) we are projecting the available volume produced by these facilities at the mid-point (50th percentile) of the projected range. We believe that this point accounts for the uncertainty related to the scale-up of production from the volume produced in the previous 12 months (through September 2015) as well as other uncertainties related to the generation of RINs such as documenting that the fuel is used as transportation fuel, heating oil, or jet fuel. As stated above, this does not mean that we anticipate that each of these facilities within each group will produce at the 50th percentile of the projected range over the final 3 months of 2015, but rather that as a group the 50th percentile is a realistic projections for this group of companies. We believe this methodology accounts for the fact that some individual company may be able to deliver the volume of cellulosic biofuel they expect and produce at or near the high end of the range, while others may experience challenges and produce closer to the low end of the range.

Finally, EPA has projected production for companies generating cellulosic biofuel RINs from biogas at the 50th percentile for those facilities that have not yet generated cellulosic biofuel RINs and at the 75th percentile for those facilities that have achieved consistent commercial scale production. In our proposed rule we projected volumes from these facilities at the 25th and 50th percentile of the projected production ranges respectively, consistent with the way we projected likely production from liquid cellulosic biofuel producers. We received comments that our methodology under-estimated the potential for the generation of cellulosic RINs from biogas, with some commenters claiming that the mature state of the technology required to produce and/or collect biogas and clean it to pipeline quality justified a using a higher percentile to projected production from these facilities. In our proposed rule EPA noted the differences in the status of the technologies used to produce liquid cellulosic biofuels and cellulosic biofuel from biogas. We nevertheless proposed to use the same percentiles for both liquid cellulosic biofuels and cellulosic biofuel from biogas due to uncertainties related to the ability of the biogas production facilities to demonstrate the use of the biogas as transportation fuel and a lack of RIN generation data to compare to previous projections on the part of many of the biogas facilities. After reviewing the fuel production and RIN generation history of these facilities, and with these comments in mind, EPA has decided to use higher percentile values to project likely production from cellulosic biogas producers as compared to liquid cellulosic biofuel producers.[218] The projected volume of cellulosic RINS generated for CNG/LNG from biogas are shown in Table IV.E–5 below.

TABLE IV.E–5—PROJECTED VOLUME OF CELLULOSIC BIOFUEL IN 2015 FOR MONTHS WITHOUT PRODUCTION DATA

[Million gallons] [a]

	Low end of the range	High end of the range	Percentile	Projected volume [b]
Liquid Cellulosic Biofuel Producers Without Consistent Commercial Scale Production	0	3	25th	1
Liquid Cellulosic Biofuel Producers With Consistent Commercial Scale Production	0.5	1	50th	1
CNG/LNG Produced From Biogas Without Consistent Commercial Scale Production	0	0	50th	0
CNG/LNG Produced From Biogas With Consistent Commercial Scale Production	27	35	75th	33

[217] While ''new'' CNG/LNG facilities may not face the same challenges related to start-up and scale-up there is uncertainty related to RIN generation from facilities that have not yet begun generating RINs. RIN generation from these facilities may be delayed or reduced if they are unable to verify that all or a portion of the CNG/LNG they produce is used as transportation fuel, or if they decide to sell the CNG/LNG they produce into non-transportation markets. These uncertainties can significantly impact the number of RINs generated by a CNG/LNG producer, and we therefore believe that projecting production from these ''new'' facilities at the 50th percentile of the range is appropriate.

[218] ''November 2015 Assessment of Cellulosic Biofuel Production from Biogas (2015–2016)'', memorandum from Dallas Burkholder to EPA Air Docket EPA–HQ–OAR–2015–0111.

TABLE IV.E–5—PROJECTED VOLUME OF CELLULOSIC BIOFUEL IN 2015 FOR MONTHS WITHOUT PRODUCTION DATA—Continued

[Million gallons] [a]

	Low end of the range	High end of the range	Percentile	Projected volume [b]
Total	N/A	N/A	N/A	35

[a] The projections in this table are for October 2015–December 2015. The low end of the range is equal to the number of RINs produced by the companies over the most recent 12 months for which data is available multiplied by a factor of 0.25 (since it is only a projection for 3 months of the year). The high end of the range is based on projected production for the final 3 months of 2015.
[b] Rounded to the nearest million gallons.

As noted in our proposed rule, EPA anticipates that if the same methodology is used in future years that as cellulosic biofuel companies successfully achieve commercial scale production, application of this methodology will appropriately generate increasing volume projections, both for the individual companies and for the industry as a whole. This will happen in two ways. First, as companies successfully produce cellulosic biofuel the low end of the range (which is based on the most recent 12 months of production for which data are available) will increase. Second, we would use the higher percentile values for all companies who have achieved consistent commercial-scale production. If merited by the available data, we will also consider using a higher (or lower) percentile for both new facilities and facilities that have already achieved consistent commercial-scale production. As new pathways for the production of cellulosic biofuel are approved, we will also consider volumes produced using these pathways in our projections.[219]

The final step in projecting the potentially available volume of cellulosic biofuel in 2015 is to combine the volumes of cellulosic biofuel actually produced in months for which data is available with the projected production volumes for the remaining months of 2015. This is shown in Table IV.E–6 below. For 2015 we are finalizing a cellulosic biofuel standard of 123 million gallons.

TABLE IV.E–6—PROJECTED AVAILABLE CELLULOSIC BIOFUEL IN 2015

Cellulosic Biofuel Production (January 2015–September 2015)	88 Million Gallons.
Projected Cellulosic Biofuel Production (October 2015–December 2015)	35 Million Gallons.
Projected Available Volume of Cellulosic Biofuel in 2015	123 Million Gallons.

F. Cellulosic Biofuel Volume for 2016

To project the volume of potentially available cellulosic biofuel in 2016 we are using a methodology very similar to the methodology used for projecting cellulosic biofuel production in 2015 for months in which actual production data are not available. The only difference is that in 2016 a scaling factor is not used in calculating the low end of the projected ranges, as we are projecting production over the entire year rather than for only 3 months. For 2016 we separated the list of potential producers of cellulosic biofuel into four groups according to whether they are producing liquid cellulosic biofuel or CNG/LNG from biogas and the production history of the facilities (See Table IV.F–1 through Table IV.F–3). 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 production data over the last 12 months for which data is available. This is the same approach used to establish the low end of the range for each of the potential cellulosic biofuel producers in 2015.

To calculate the high end of the projected production range for each group of companies we considered each company individually (with the exception of the CNG/LNG producers) and used the same methodology in 2016 as for the months in 2015 for which actual past production data was not available (this methodology is covered in further detail in Section IV.E above). The high end of the range for each company within each group was added together to calculate the high end of the projected production range for that group.

After defining likely production ranges for each group of companies we projected a likely production volume from each group of companies for 2016. We used the same percentile values to projected a production volume within the established ranges 2016 as we did in 2015; the 50th and 25th percentiles respectively for liquid cellulosic biofuel producers with and without a history of consistent cellulosic biofuel production, and the 75th and 50th percentiles respectively for producers of CNG/LNG from biogas with and without a history of consistent commercial scale production. These percentile values are discussed in more detail in Section IV.E above.

[219] We disagree with commenters who stated that EPA should anticipate the approval of new pathways and include production from these pathways in our projections. Assuming the approval of new pathways, and the subsequent registration and production from new facilities using these pathways, is highly uncertain and inconsistent with our attempt at neutral projections, particularly for pathways that have not yet been proposed.

TABLE IV.F–1—2016 PRODUCTION RANGES FOR LIQUID CELLULOSIC BIOFUEL PRODUCERS WITHOUT CONSISTENT COMMERCIAL SCALE PRODUCTION

[Million gallons]

	Low end of the range [a]	High end of the range [a]
Abengoa	0	22
CoolPlanet	0	0
DuPont	0	26
Edeniq	0	5
GranBio	0	2
Ineos Bio	0	6
Poet	0	15
Aggregate Range	0	76
Projected Production (25th Percentile of Range)	19	

[a] Rounded to the nearest million gallons.

TABLE IV.F–2—2016 PRODUCTION RANGES FOR LIQUID CELLULOSIC BIOFUEL PRODUCERS WITH CONSISTENT COMMERCIAL SCALE PRODUCTION

[Million gallons]

	Low end of the Range [a]	High end of the Range [a]
Ensyn	[b] X	3
Quad County Corn Processors	[b] X	2
Aggregate Range	2	5
Projected Production (50th Percentile of Range)	4	

[a] Rounded to the nearest million gallons.
[b] The low end of the range for each individual company is based on actual production volumes and is therefore withheld to protect information claimed to be confidential business information.

TABLE IV.F–3—2016 PRODUCTION RANGES FOR CNG/LNG PRODUCED FROM BIOGAS

[Million gallons]

	Low end of the range [a]	High end of the range [a]
CNG/LNG Producers (New Facilities)	0	63
CNG/LNG Producers (Currently generating RINs)	107	197

[a] Rounded to the nearest million gallons.

The final step in projecting the potentially available volume of cellulosic biofuel in 2016 is to combine the volumes of cellulosic biofuel projected to be produced from each of the four groups discussed above (shown in Table IV.F–4 below). For 2016 we are finalizing a cellulosic biofuel volume requirement of 230 million gallons.

TABLE IV.F–4—PROJECTED VOLUME OF CELLULOSIC BIOFUEL IN 2016

[Million gallons]

	Low end of the range [a]	High end of the range [a]	Percentile	Projected volume [a]
Liquid Cellulosic Biofuel Producers; New Facilities	0	76	25th	19
Liquid Cellulosic Biofuel Producer; Consistent Production	2	5	50th	4
CNG/LNG Producers; New Facilities	0	63	50th	32
CNG/LNG Producers; Consistent Production	107	197	75th	175
Total	N/A	N/A	N/A	230

[a] Volumes rounded to the nearest million gallons.

G. Rescission of the 2011 Cellulosic Biofuel Standards

On January 25, 2013, the United States Court of Appeals for the District of Columbia Circuit issued its decision concerning a challenge to the 2012 cellulosic biofuel standard.[220] The Court found that in establishing the applicable

[220] *API* v. *EPA,* 706 F 3d 474 (D.C. Cir. January 25, 2013).

volume of cellulosic biofuel for 2012, EPA had used a methodology in which ''the risk of overestimation [was] set deliberately to outweigh the risk of underestimation.'' The Court held EPA's action to be inconsistent with the statute because EPA had failed to apply a ''neutral methodology'' aimed at providing a prediction of ''what will actually happen,'' as required by the statute. As a result of this ruling, the Court vacated the 2012 cellulosic biofuel standard, and we removed the 2012 requirement from the regulations in a previous action. Industry had also challenged the 2011 cellulosic biofuel standard by, first, filing a petition for reconsideration of that standard, and then seeking judicial review of our denial of the petition for reconsideration. This matter was still pending at the time of the D.C. Circuit's ruling on the 2012 cellulosic biofuel standard. Since we used essentially the same methodology to develop the 2011 cellulosic biofuel standard as we did to develop the 2012 standard, we requested, and the Court granted, a partial voluntary remand to enable us to reconsider our denial of the petition for reconsideration of the 2011 cellulosic biofuel standard. Given the Court's ruling that the methodology EPA used in developing the 2012 cellulosic biofuel standard was flawed, we are rescinding the 2011 cellulosic biofuel applicable standard and will refund the money paid by obligated parties to purchase cellulosic waiver credits to comply with the standard. The only comments received on this issue were supportive of this action.

V. Percentage Standards

A. Background

The renewable fuel standards are expressed as volume percentages and are used by each obligated party to determine their Renewable Volume Obligations (RVO). 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 gasoline and diesel produced or imported. The percentage standards are set so that if every obligated party meets the percentages, then the amount of renewable fuel, cellulosic biofuel, biomass-based diesel (BBD), and advanced biofuel used will meet the applicable volumes established in this rule on a nationwide basis.

Sections II, III, and IV provide our rationale and basis for the final volumes for advanced biofuel and total renewable fuel, BBD, and cellulosic biofuel, respectively. The volumes to be used to determine the four final percentage standards are shown in Table V.A–1.

TABLE V.A–1—FINAL VOLUMES FOR USE IN SETTING THE APPLICABLE PERCENTAGE STANDARDS

	2014	2015	2016
Cellulosic biofuel (million gallons)	33	123	230
Biomass-based diesel (billion gallons)[a]	1.63	1.73	1.90
Advanced biofuel (billion gallons)	2.67	2.88	3.61
Renewable fuel (billion gallons)	16.28	16.93	18.11

[a] Represents physical volume.

B. Calculation of Standards

1. How Are the Standards Calculated?

The following formulas are used to calculate the four percentage standards applicable to producers and importers of gasoline and diesel (see 40 CFR 80.1405):

$$Std_{CB,i} = 100\% \times \frac{RFV_{CB,i}}{(G_i - RG_i) + (GS_i - RGS_i) - GE_i + (D_i - RD_i) + (DS_i - RDS_i) - DE_i}$$

$$Std_{BBD,i} = 100\% \times \frac{RFV_{BBD,i} \times 1.5}{(G_i - RG_i) + (GS_i - RGS_i) - GE_i + (D_i - RD_i) + (DS_i - RDS_i) - DE_i}$$

$$Std_{AB,i} = 100\% \times \frac{RFV_{AB,i}}{(G_i - RG_i) + (GS_i - RGS_i) - GE_i + (D_i - RD_i) + (DS_i - RDS_i) - DE_i}$$

$$Std_{RF,i} = 100\% \times \frac{RFV_{RF,i}}{(G_i - RG_i) + (GS_i - RGS_i) - GE_i + (D_i - RD_i) + (DS_i - RDS_i) - DE_i}$$

Where

$Std_{CB,i}$ = The cellulosic biofuel standard for year i, in percent.

$Std_{BBD,i}$ = The biomass-based diesel standard (ethanol-equivalent basis) for year i, in percent.

$Std_{AB,i}$ = The advanced biofuel standard for year i, in percent.

$Std_{RF,i}$ = The renewable fuel standard for year i, in percent.

$RFV_{CB,i}$ = Annual volume of cellulosic biofuel required by section 211(o) of the Clean Air Act for year i, in gallons.

$RFV_{BBD,i}$ = Annual volume of biomass-based diesel required by section 211(o) of the Clean Air Act for year i, in gallons.

$RFV_{AB,i}$ = Annual volume of advanced biofuel required by section 211(o) of the Clean Air Act for year i, in gallons.

$RFV_{RF,i}$ = Annual volume of renewable fuel required by section 211(o) of the Clean Air Act for year i, in gallons.

G_i = Amount of gasoline projected to be used in the 48 contiguous states and Hawaii, in year i, in gallons.

D_i = Amount of diesel projected to be used in the 48 contiguous states and Hawaii, in year i, in gallons. This value excludes diesel used in ocean-going vessels.

RG_i = Amount of renewable fuel blended into gasoline that is projected to be consumed in the 48 contiguous states and Hawaii, in year i, in gallons.

RD_i = Amount of renewable fuel blended into diesel that is projected to be consumed in the 48 contiguous states and Hawaii, in year i, in gallons.

GS_i = Amount of gasoline projected to be used in Alaska or a U.S. territory in year i if the state or territory opts-in, in gallons.

RGS_i = Amount of renewable fuel blended into gasoline that is projected to be consumed in Alaska or a U.S. territory in year i if the state or territory opts-in, in gallons.

DS_i = Amount of diesel projected to be used in Alaska or a U.S. territory in year i if the state or territory opts-in, in gallons.

RDS_i = Amount of renewable fuel blended into diesel that is projected to be consumed in Alaska or a U.S. territory in year i if the state or territory opts-in, in gallons.

GE_i = Amount of gasoline projected to be produced by exempt small refineries and small refiners in year i, in gallons, in any year they are exempt per §§ 80.1441 and 80.1442, respectively.

DE_i = Amount of diesel projected to be produced by exempt small refineries and small refiners in year i, in gallons, in any year they are exempt per §§ 80.1441 and 80.1442, respectively.

The formulas used in deriving the annual percentage standards 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 provided by EIA include ethanol and biodiesel used in transportation fuel, which are subtracted out as indicated in the equations above. Production of other transportation fuels, such as natural gas, propane, and electricity from fossil fuels, is not currently subject to the standards, and volumes of such fuels are not used in calculating the annual 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 standards, as well as to determine the annual volume obligations of an individual gasoline or diesel producer or importer.

2. Small Refineries and Small Refiners

In CAA section 211(o)(9), enacted as part of the Energy Policy Act of 2005, and amended by the Energy Independence and Security Act of 2007, Congress provided a temporary exemption to small refineries [221] through December 31, 2010. Congress provided that small refineries could receive a temporary extension of the exemption based on an EPA determination of ''disproportionate economic hardship'' on a case-by-case basis in response to small refinery petitions.[222]

EPA, in consultation with the Department of Energy, evaluates the structural impacts petitioning refineries would likely face in achieving

[221] A small refinery, as defined by the statute, is a *refinery* with an average daily crude throughput of 75,000 barrels or less (see 40 CFR 80.1441). As this is a facility-based definition, not company-based as SBA's small *refiner* definition is, it follows that not all small refiners' facilities meet the definition of a small refinery. A small refiner that meets the parameters of 40 CFR 80.1442 may also be eligible for an exemption.

[222] For 2011 and 2012 13 small refineries were granted an extension to the statutory exemption based on the findings of a Department of Energy investigation into the disproportionate economic hardship experienced by small refineries.

compliance with the RFS requirements and how compliance would affect their ability to remain competitive and profitable. A disproportionate economic hardship exists where a refinery faces a high cost of compliance relative to the industry average and where compliance would significantly impair its operations. The U.S. Courts of Appeal for the Eighth and D.C. Circuits [223] have upheld this approach, finding it reasonable for DOE and EPA to conclude that the relative costs of compliance alone cannot demonstrate disproportionate economic hardship because all refineries face a direct cost associated with participation in the RFS program.[224]

EPA has granted some exemptions pursuant to this process in the past, and has granted exemptions for three small refineries for 2014. The final applicable percentage standards for 2014 reflect the fact that the gasoline and diesel volumes associated with these three small refineries have been exempted, as provided in the formulas described in the preceding section. However, at this time, no exemptions have been approved for 2015 or 2016, and therefore we have calculated the percentage standards for these years without an adjustment for exempted volumes. As stated in the final rule establishing the 2011 standards, ''EPA believes the Act is best interpreted to require issuance of a single annual standard in November that is applicable in the following calendar year, thereby providing advance notice and certainty to obligated parties regarding their regulatory requirements. Periodic revisions to the standards to reflect waivers issued to small refineries or refiners would be inconsistent with the statutory text, and would introduce an undesirable level of uncertainty for obligated parties.'' [225] Thus, any additional exemptions for small refineries that are issued after today will not affect the 2014, 2015, or 2016 standards.

3. Final Standards

As specified in the RFS2 final rule,[226] 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. In order to ensure that demand for the required physical volume of BBD will be created in each year, the calculation of the BBD standard provides that the applicable physical volume be multiplied by 1.5. The net result is a BBD gallon being worth 1.0 gallon toward the BBD standard, but worth 1.5 gallons toward the other standards.

The levels of the percentage standards would be reduced if Alaska or a U.S. territory chooses to participate in the RFS program, as gasoline and diesel produced in or imported into that state or territory would then be subject to the standard. Neither Alaska nor any U.S. territory has chosen to participate in the RFS program at this time, and thus the value of the related terms in the calculation of the standards is zero.

The values of the variables described above are shown in Table V.B.3–1.[227]

TABLE V.B.3–1—VALUES FOR TERMS IN CALCULATION OF THE FINAL STANDARDS [228]

[Billion gallons]

Term	2014	2015	2016
RFV_{CB}	0.033	0.123	0.230
RFV_{BBD}	[a] 1.66	[b] 1.77	1.90
RFV_{AB}	2.67	2.88	3.61
RFV_{RF}	16.28	16.93	18.11
G	136.48	139.38	139.96
D	55.67	54.05	55.26
RG	13.42	13.81	13.85
RD	1.55	1.76	2.05
GS	0.00	0.00	0.00
RGS	0.00	0.00	0.00
DS	0.00	0.00	0.00
RDS	0.00	0.00	0.00
GE	0.01	0.00	0.00
DE	0.03	0.00	0.00

[a] Represents the biodiesel-equivalent volume of actual 2014 supply, which was 2.49 bill D4 RINs. Actual physical volume was 1.63 billion physical gallons, composed of 1.35 bill gal of biodiesel and 0.28 bill gal renewable diesel.

[b] Represents the biodiesel-equivalent volume of actual 2015 supply, which was 2.65 bill D4 RINs. Actual physical volume was 1.73 billion physical gallons, composed of 1.45 bill gal of biodiesel and 0.28 bill gal renewable diesel.

Using the volumes shown in Table V.B.3–1, we have calculated the final percentage standards for 2014, 2015, and 2016 as shown in Table V.B.3–2.

[223] *Lion Oil Company* v. *EPA,* 792 F.3d 978; 2015 U.S. App. LEXIS 11725 (8th Cir. 2015); *Monroe Energy, LLC* v. *EPA,* 750 F.3d 909; 409 U.S. App. DC 413 (D.C. Cir. 2014).

[224] EPA has also found in its recent analyses of the RIN market that in a competitive market typical of the gasoline and diesel marketplace, the cost of RFS compliance (RINs) is passed along to consumers and recovered by refiners through the prices of the gasoline blendstocks they sell. Consequentially, not only are the costs of the RFS program automatically normalized across the industry based on production volume, but these costs are passed on to consumers.

[225] See 75 FR 76804 (December 9, 2010).

[226] 75 FR 14716, March 26, 2010.

[227] To determine the 49-state values for gasoline and diesel, the amounts of these fuels used in Alaska is subtracted from the totals provided by DOE. The Alaska fractions are determined from the June 24, 2015 EIA State Energy Data System (SEDS), Energy Consumption Estimates.

[228] Details of volumes and calculations are available in the docket.

TABLE V.B.3–2—FINAL PERCENTAGE STANDARDS

	2014 (%)	2015 (%)	2016 (%)
Cellulosic biofuel	0.019	0.069	0.128
Biomass-based diesel	1.41	1.49	1.59
Advanced biofuel	1.51	1.62	2.01
Renewable fuel	9.19	9.52	10.10

VI. Amendments to Regulations

We are finalizing several revisions to the RFS regulations, which are described below. The first revision relates to the definition of terms in Table 1 to 40 CFR 80.1426, which describes approved biofuel production pathways. The second set of revisions addresses annual compliance reporting and associated attest reporting deadlines.

A. Changes to the Algal Biofuel Pathways

In the March 2010 RFS rule (75 FR 14670), EPA established two pathways for biofuels derived from algal oil to generate D-Code 4 (Biomass-Based Diesel) or 5 (Advanced) RINs. The analyses supporting the pathways approved in the March 2010 RFS rule assumed that algae would be grown photosynthetically (*i.e.,* using predominantly sunlight and CO_2 as inputs) and harvested for their oil.[229] Biofuel produced with algae grown through other means is likely to have different lifecycle GHG emissions impacts. EPA proposed and is now finalizing changes to our regulations that clarify that the existing algal oil pathways adopted as part of the March 2010 RFS rule apply only to oil from algae grown photosynthetically. Specifically, we are finalizing the proposed replacement of ''algal oil'' as a feedstock in Table 1 to 40 CFR 80.1426 with ''oil from algae grown photosynthetically.'' We are also finalizing the proposed definition for ''algae grown photosynthetically'' to 40 CFR 80.1401. EPA did not propose or seek comment on adding a regulatory definition of ''algae.''

EPA received several comments in support of these clarifications. EPA also received several comments that suggested these clarifications were not necessary and urged the agency to clarify a number of issues related to the production of algal biofuel using different pathway configurations. Comments also requested the agency expand the interpretation of algae to include all autotrophic microorganisms. These issues are beyond the scope of this rulemaking, which is limited to the proposed regulatory amendments discussed above that clarify the existing algal oil pathways. Companies wishing to produce biofuels from algae grown with a non-photosynthetic stage of growth must apply to EPA for approval of their pathway pursuant to 40 CFR 80.1416.

B. Annual Compliance Reporting and Attest Engagement Deadlines Under the RFS Program

Based on the comments received and the discussion below, the EPA is finalizing the annual compliance reporting and attest engagement deadlines described in Table VI.B–1. In summary, the EPA is modifying for purposes of the final rule the proposed changes to the 2013 compliance reporting deadline for obligated parties and exporters, and the 2014 and 2015 compliance reporting deadlines for obligated parties. The EPA is also modifying for purposes of the final rule the proposed changes to the 2013 attest engagement reporting deadline for RIN generators, the 2014 attest engagement reporting deadline for RIN generators and third-party auditors, and the 2015 attest engagement reporting deadline for obligated parties. The EPA is finalizing all other compliance and attest engagement reporting deadlines.

Commenters on the proposed due dates for the 2013, 2014, and 2015 RFS annual compliance and attest engagement reports generally supported the EPA's approach to staggering the deadlines between compliance years. However, as one commenter noted, the time between the deadline for 2015 RFS attest engagement reports for obligated parties conflicts with 2016 RFS annual compliance and attest reporting deadlines for obligated parties. The commenter argued that obligated parties rely upon the results of the prior compliance year's attest engagement reports to correct vital information that is needed to accurately determine an obligated party's RVO and RIN balance. Since the proposed deadlines for 2015 attest engagement reporting occurred after the 2016 annual compliance reporting deadline, obligated parties would have been unable to utilize the 2015 attest engagement report to ensure timely, accurate 2016 annual compliance reports. The result of this conflict would have been the unnecessary resubmission of 2016 annual compliance reports by obligated parties to address issues identified in the 2015 attest engagement reports. Additionally, certified public accountants (CPAs) and certified internal auditors (CIAs) would not have been able to rely upon the 2015 attest engagement report for the 2016 attest engagement procedures since the proposed deadlines for 2015 and 2016 attest engagements reports were the same. The commenter noted that six months was too much time between the 2014 and 2015 annual compliance reporting deadlines for obligated parties. (It should be noted that the proposed 2014 and 2015 RFS annual compliance deadlines for obligated parties was only five months apart, not six months.)

While we recognize the concerns raised, due to constraints on the EPA's reporting systems and staff, we are unable to accommodate a faster annual compliance reporting schedule. Additionally, we have concerns that obligated parties may have difficulty complying with a more compressed RFS reporting schedule. Obligated parties have several other EPA fuel program registration and reporting requirements that become effective in 2016 and 2017. These requirements were primarily finalized in the Tier 3 rulemaking and include the registration of all oxygenate blenders (*e.g.,* terminals), the submission of applications for test methods under the Performance Based Analytical Test Method Approach program, and compliance with the new Tier 3 gasoline sulfur standards.

Concerning obligated parties' attest engagement reporting deadlines, we believe we can move forward the 2015 RFS attest engagement reporting deadline for obligated parties to more appropriately sequence 2015 and 2016 annual compliance and attest engagement reporting deadlines. However, we recognize that there is a limited number of CPAs and CIAs that conduct most of the attest engagement reporting across all of EPA's fuels programs for obligated parties. We are

[229] See 75 FR 14696 (March 26, 2010).

concerned that these CPAs and CIAs would become overburdened if we compressed the attest engagement reporting deadlines too much. Although we value the timely submission of information, we believe compressing the 2013 and 2014 attest engagement reporting deadlines would unnecessarily increase compliance costs for many obligated parties.

The EPA is also finalizing an adjustment to the proposed 2013 compliance and attest reporting deadlines to accommodate the 60-day effective date provision of the Congressional Review Act (CRA). As discussed further in Section IX.K in the final rule, this action is deemed a ''major rule'' as defined by 5 U.S.C 804(2) and therefore subject to the 60-day effective date provision of the CRA. This CRA provision impacts our proposed dates for the 2013 compliance deadline and attest engagement reporting deadline. Therefore, for the 2013 compliance year, we are finalizing the compliance deadline and attest engagement reporting deadline for obligated parties and exporters to be March 1, 2016 or 60 days from publication in the **Federal Register** of a final rule establishing standards for 2014, whichever date is later.

Although these changes are necessary due to the CRA provision, we believe this extension will provide obligated parties additional time to consider the impact of the final 2014 standards on the manner in which they should comply with 2013 requirements, and to engage in RIN trading transactions for purposes of their 2013 compliance demonstration that will best position them for compliance with 2014 requirements. Additional detail can located in Table VI.B–1 below and Section 9.2 in the Response to Comment document.

We have also decided to provide an additional two-month extension, beyond that which was proposed, for the 2014 obligated party compliance demonstration deadline, The final deadline is August 1, 2016. We received comment suggesting that some parties may have placed undue reliance in their planning for 2014 compliance on proposed levels from November, 2013. Although we believe such parties had adequate notice that the final standards could be higher than proposed, as noted elsewhere in this preamble, we believe that extending the 2014 compliance demonstration deadline will make it easier for them to come into compliance. For example, extending the 2014 obligated party compliance deadline by an additional two months will allow additional time for such parties to engage in necessary RIN transactions. Together with the additional time provided for the 2013 compliance demonstration (which could help certain parties better position themselves for 2014 compliance), and the fact that compliance can be achieved through acquisition of RINs, without the need for capital investments or actual renewable fuel blending, we believe that the final 2014 compliance demonstration deadline is reasonable.

For obligated parties, we are also finalizing the 2013 and 2014 attest engagement reporting deadlines as proposed. However, we are changing the 2015 attest engagement reporting deadline for obligated parties from June 1, 2017 to March 1, 2017. We believe this helps address comments concerned with having the 2015 and 2016 RFS attest engagement reporting deadlines fall on the same day and should allow obligated parties some time to adjust 2016 annual compliance reports based on issues identified in the 2015 attest engagement report.

For RIN generators we are changing the 2013 and 2014 attest engagement reporting deadlines from January 31, 2016 to March 1, 2016. We are also changing the 2014 attest engagement reporting deadline for independent third-party auditors from January 31, 2016 to March 1, 2016. These changes are a result of the 60-day effective date provision of the CRA discussed above.

We are finalizing all other annual compliance and attest engagement reporting deadlines for 2013, 2014, and 2015 for other responsible parties as proposed. The revised annual compliance and attest reporting deadlines for all regulated party categories for the 2013, 2014, and 2015 compliance years are shown below in Table VI.B–1. For the 2016 and subsequent compliance years, the deadlines will be back on track with annual compliance demonstration reports due March 31 and attest engagement reports due June 1 of the year following the compliance year.

TABLE VI.B–1—ANNUAL COMPLIANCE AND ATTEST ENGAGEMENT REPORTING DEADLINES BY REGULATED PARTY CATEGORY FOR THE 2013, 2014, AND 2015 COMPLIANCE YEARS [230]

Regulated party category	Revised annual compliance deadline	Revised attest engagement reporting deadline
2013 Compliance Year		
RIN-generating renewable fuel producers and importers; other parties owning RINs.	N/A.	March 1, 2016.
Independent third-party auditors	N/A	N/A
Renewable fuel exporters	March 1, 2016	June 1, 2016.
Obligated parties	March 1, 2016	June 1, 2016.
2014 Compliance Year		
RIN-generating renewable fuel producers and importers; other parties owning RINs.	N/A	March 1, 2016.
Independent third-party auditors	N/A	March 1, 2016.
Renewable fuel exporters	Partial report: March 31, 2015	Partial report: June 1, 2015.
January–September 16, 2014	Full report: March 1, 2016	Full report: June 1, 2016.
September 17–December 31, 2014	March 31, 2015	June 1, 2015.
Obligated parties	August 1, 2016	December 1, 2016.
2015 Compliance Year		
RIN-generating renewable fuel producers and importers; other parties owning RINs.	N/A	June 1, 2016.
Independent third-party auditors	N/A	June 1, 2016.
Renewable fuel exporters	March 31, 2016	June 1, 2016.

TABLE VI.B–1—ANNUAL COMPLIANCE AND ATTEST ENGAGEMENT REPORTING DEADLINES BY REGULATED PARTY CATEGORY FOR THE 2013, 2014, AND 2015 COMPLIANCE YEARS [230]—Continued

Regulated party category	Revised annual compliance deadline	Revised attest engagement reporting deadline
Obligated parties	December 1, 2016	March 1, 2017.

VII. Assessment of Aggregate Compliance

A. Assessment of the Domestic Aggregate Compliance Approach

The RFS2 regulations contain a provision for renewable fuel producers who use planted crops and crop residue from U.S. agricultural land that relieves them of the individual recordkeeping and reporting requirements concerning the specific land from which their feedstocks were harvested. To enable this approach, EPA established a baseline number of acres for U.S. agricultural land in 2007 (the year of EISA enactment) and determined that as long as this baseline number of acres was not exceeded, it was unlikely that new land outside of the 2007 baseline would be devoted to crop production based on historical trends and economic considerations. We therefore provided that renewable fuel producers using planted crops or crop residue from the U.S. as feedstock in renewable fuel production need not comply with the individual recordkeeping and reporting requirements related to documenting that their feedstocks are renewable biomass, unless EPA determines through one of its annual evaluations that the 2007 baseline acreage of 402 million acres agricultural land has been exceeded.

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

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

USDA and EPA concur that the ACEP–WRE and ACEP–ALE represent a continuation in basic objectives and goals of the original WRP and GRP, although the ACEP–ALE is a bit more expansive that the GRP with respect to eligible land. Therefore it was assumed in this rulemaking that acreage enrolled in the easement programs would represent a reasonable proxy of WRP and GRP acreage. Both Agencies have committed to conduct a more detailed analysis of the new programs for the 2017 RFS Annual Volume Regulation.

Based on data provided by the USDA Farm Service Agency (FSA) and Natural Resources Conservation Service (NRCS), we have estimated that U.S. agricultural land reached approximately 380 million acres in 2013, and thus did not exceed the 2007 baseline acreage. This acreage estimate is based on the same methodology used to set the 2007 baseline acreage for U.S. agricultural land in the RFS2 final rulemaking. Specifically, we started with FSA crop history data for 2013, from which we derived a total estimated acreage of 379,717,296 acres. We then subtracted the amount of land estimated to be participating in the Grasslands Reserve Program (GRP) and Wetlands Reserve Program (WRP) by the end of Fiscal Year 2013, 144,619 acres, to yield an estimate of approximately 380 million acres of U.S. agricultural land in 2013. Note that these programs were still in place in 2013. The USDA data used to make this derivation can be found in the docket to this rule.

Similarly, we have estimated that U.S. agricultural land reached approximately 378 million acres in 2014, and thus did not exceed the 2007 baseline acreage. This acreage estimate is based on the same methodology used to set the 2007 baseline acreage for U.S. agricultural land in the RFS2 final rulemaking, with GRP and WRP data substitution as noted above. Specifically, we started with FSA crop history data for 2014, from which we derived a total estimated acreage of 377,829,781 acres. We then subtracted the amount of land estimated to be participating in the Agriculture Land Easement (ACEP–ALE) and Wetlands Reserve (ACEP–WRE) by the end of Fiscal Year 2014, 143,834 acres, to yield an estimate of approximately 378 million acres of U.S. agricultural land in 2014. The USDA data used to make this derivation can be found in the docket to this rule.

Finally, we have estimated that U.S. agricultural land reached approximately 379 million acres in 2015, and thus did not exceed the 2007 baseline acreage. This acreage estimate is based on the same methodology used to set the 2007 baseline acreage for U.S. agricultural land in the RFS2 final rulemaking, with GRP and WRP data substitution as noted above. Specifically, we started with FSA crop history data for 2015, from which we derived a total estimated acreage of 379,236,620 acres. We then subtracted the Agriculture Land Easement (ACEP–ALE) and Wetlands Reserve (ACEP–WRE) enrolled acres by the end of Fiscal Year 2015, 84,133 acres, to yield an estimate of approximately 379 million acres of U.S. agricultural land in 2015. The USDA data used to make this estimation can be found in the docket to this rule.

B. Assessment of the Canadian Aggregate Compliance Approach

On March 15, 2011, EPA issued a notice of receipt of and solicited public comment on a petition for EPA to authorize the use of an aggregate approach for compliance with the

[230] For all March 1, 2016 dates listed in this table, the actual regulatory deadline is either March 1, 2016 or 60 days from publication in the **Federal Register** of this final rule, whichever date is later.

Renewable Fuel Standard renewable biomass requirements, submitted by the Government of Canada. The petition requested that EPA determine that an aggregate compliance approach will provide reasonable assurance that planted crops and crop residue from Canada meet the definition of renewable biomass. After thorough consideration of the petition, all supporting documentation provided and the public comments received, EPA determined that the criteria for approval of the petition were satisfied and approved the use of an aggregate compliance approach to renewable biomass verification for planted crops and crop residue grown in Canada.

The Government of Canada utilized several types of land use data to demonstrate that the land included in their 124 million acre baseline is cropland, pastureland or land equivalent to U.S. Conservation Reserve Program land that was cleared or cultivated prior to December 19, 2007, and was actively managed or fallow and non-forested on that date (and is therefore RFS2 qualifying land). The total agricultural land in Canada in 2013 is estimated at 119.8 million acres. This total agricultural land area includes 96.3 million acres of cropland and summer fallow, 13.7 million acres of pastureland and 9.8 million acres of agricultural land under conservation practices. This acreage estimate is based on the same methodology used to set the 2007 baseline acreage for Canadian agricultural land in the RFS2 response to petition. The trigger point for further evaluation of the data for subsequent years, provided by Canada, is 121 million acres. The data used to make this calculation can be found in the docket to this rule.

The total agricultural land in Canada in 2014 is estimated at 119.5 million acres. This total agricultural land area includes 96 million acres of cropland and summer fallow, 13.7 million acres of pastureland and 9.8 million acres of agricultural land under conservation practices. This acreage estimate is based on the same methodology used to set the 2007 baseline acreage for Canadian agricultural land in the RFS2 response to petition. The data used to make this calculation can be found in the docket to this rule.

The total agricultural land in Canada in 2015 is estimated at 118.6 million acres. This total agricultural land area includes 94.9 million acres of cropland and summer fallow, 13.9 million acres of pastureland and 9.8 million acres of agricultural land under conservation practices. This acreage estimate is based on the same methodology used to set the 2007 baseline acreage for Canadian agricultural land in the RFS2 response to petition. The data used to make this calculation can be found in the docket to this rule.

VIII. Public Participation

Many interested parties participated in the rulemaking process that culminates with this final rule. This process provided opportunity for submitting written public comments following the proposal that we published on June 10, 2015 (80 FR 33100), and we also held a public hearing on June 25, 2015, at which many parties provided both verbal and written testimony. All comments received, both verbal and written, are available in EPA docket EPA–HQ–OAR–2015–0111 and we considered these comments in developing the final rule. Public comments and EPA responses are discussed throughout this preamble and in the accompanying RTC document, which is available in the docket for this action.

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 the potential costs associated with this action. This analysis is presented in Section II.I of this preamble.

B. Paperwork Reduction Act (PRA)

This action does not impose any new information collection burden under the PRA. OMB has previously approved the information collection activities contained in the existing regulations and has assigned OMB control numbers 2060–0637 and 2060–0640. The final standards would not impose new or different reporting requirements on regulated parties than already exist for the RFS program.

C. 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 as refiners with 1,500 employees or less company-wide. The impacts of the RFS program as a whole on small entities were addressed in the March 26, 2010, RFS2 rulemaking (75 FR 14670), which was a rule that implemented the entire program required by the Energy Independence and Security Act of 2007 (EISA 2007). As such, the Small Business Regulatory Enforcement Fairness Act (SBREFA) panel process that took place prior to the 2010 rule was also for the entire RFS program and looked at impacts on small refiners through 2022.

For the SBREFA process for the March 26, 2010, RFS2 rulemaking, 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. The analysis included a cost-to-sales ratio test, a ratio of the estimated annualized compliance costs to the value of sales per company, for gasoline and/or diesel small refiners subject to the standards. 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).

We have determined that this final rule will not impose any additional requirements on small entities beyond those already analyzed, since the impacts of this final rule are not greater or fundamentally different than those already considered in the analysis for the March 26, 2010, rule assuming full implementation of the RFS program. As shown above in Tables I–1 and I.A–1 (and discussed further in Sections II and IV), this rule finalizes the 2014, 2015, and 2016 volume requirements for cellulosic biofuel, advanced biofuel, and total renewable fuel at levels significantly below the statutory volume targets. This exercise of EPA's waiver authorities 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 biomass-based diesel standard, we are finalizing an increase in the volume requirements for 2014–2016 over the statutory minimum value of 1 billion gallons. However, this is a nested standard within the advanced biofuel category, for which we are finalizing significant reductions from the statutory volume targets. As discussed in Section III, we are setting the biomass-based diesel 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 finalized in this action is a reduction in burden as compared to implementation of the statutory volume targets, as was assumed in the March 26, 2010, analysis.

For this final rule, EPA has conducted a screening analysis 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 will not be significant. EPA has reviewed and assessed the available information, which suggests that obligated parties, including small entities, are generally able to recover the purchase cost of the RINs necessary for compliance through higher sales prices of the petroleum products they sell than would be expected in the absence of the RFS program.[231] [232] Even if we were to assume that the cost of RINs were not recovered by obligated parties, and we used the maximum values of the illustrative costs discussed in Section II.I, the gasoline and diesel fuel volume projections from the October 2015 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 less than 1% of the value of their sales.

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% RIN rollover allowance (up to 20% 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 March 26, 2010, final rule, we discussed other potential small entity flexibilities that had been suggested by the SBREFA panel or through comments, but we did not adopt them, in part because we had serious concerns regarding our authority to do so.

Additionally, as we realize that there may be cases in which a small entity experiences hardship beyond the level of assistance afforded by the program flexibilities, the program provides hardship relief provisions for small entities (small refiners), as well as for small refineries.[233] As required by the statute, the RFS regulations include a hardship relief provision (at 40 CFR 80.1441(e)(2)) which allows for a small refinery [234] to petition for an extension of its small refinery exemption at any time based on a showing that compliance with the requirements of the RFS program would result in the refinery experiencing a ''disproportionate economic hardship.'' EPA regulations provide similar relief to small refiners that are not eligible for small refinery relief. A small refiner may petition for a small refiner exemption based on a similar showing that compliance with the requirements of the RFS program would result in the refiner experiencing a ''disproportionate economic hardship'' (see 40 CFR 80.1442(h)). EPA evaluates these petitions on a case-by-case basis and may approve such petitions if it finds that a disproportionate economic hardship exists. In evaluating such petitions, EPA consults with the U.S. Department of Energy, and takes the findings of DOE's 2011 Small Refinery Study and other economic factors into consideration. For the 2013 RFS standards, the EPA successfully implemented these provisions by evaluating 16 petitions for exemptions from small refineries (one was later withdrawn).

Given that this final rule would not impose additional requirements on small entities, would decrease burden via a reduction in required volumes as compared to statutory volume targets, would not change the compliance flexibilities currently offered to small entities under the RFS program (including the small refinery hardship provisions we continue to successfully implement), and available information shows that the impact on small entities from implementation of this rule will not be significant, we have therefore concluded that this action would have no net regulatory burden for directly regulated small entities.

D. Unfunded Mandates Reform Act (UMRA)

This action contains a federal mandate under UMRA, 2 U.S.C. 1531–1538, that may result in expenditures of $100 million or more for state, local and tribal governments, in the aggregate, or the private sector in any one year. Accordingly, the EPA has prepared a written statement required under section 202 of UMRA. The statement is included in the docket for this action, and discussed above in Section II.I. This action implements mandates specifically and explicitly set forth in CAA section 211(o) and, as described in Section II.I, we believe that this action represents the least costly, most cost-effective approach to achieve the statutory requirements of the rule.

This action is not subject to the requirements of section 203 of UMRA because it contains no regulatory requirements that might significantly or uniquely affect small governments.

E. 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.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

This action does not have tribal implications as specified in Executive Order 13175. This final rule will be implemented at the Federal level and affects transportation fuel refiners, blenders, marketers, distributors, importers, exporters, and renewable fuel producers and importers. Tribal

[231] For a further discussion of the ability of obligated parties to recover the cost of RINs see ''A Preliminary Assessment of RIN Market Dynamics, RIN Prices, and Their Effects,'' Dallas Burkholder, Office of Transportation and Air Quality, US EPA. May 14, 2015, EPA Air Docket EPA–HQ–OAR–2015–0111.

[232] Knittel, Christopher R., Ben S. Meiselman, and James H. Stock. ''The Passthrough of RIN Prices to Wholesale and Retail Fuels Under the Renewable Fuel Standard.'' Working Paper 21343. NBER Working Paper Series. Available online *http://www.nber.org/papers/w21343.pdf.*

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

[234] A small refinery, as defined by the statute, is a *refinery* with an average daily crude throughput of 75,000 barrels or less. As this is a facility-based definition, not company-based as SBA's small *refiner* definition is, it follows that not all small refiners' facilities meet the definition of a small refinery.

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.

G. 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.

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

This action is not a ''significant energy action'' because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. This action establishes the required renewable fuel content of the transportation fuel supply for 2014, 2015, and 2016, consistent with the CAA and waiver authorities provided therein. The RFS program and this rule are designed to achieve positive effects on the nation's transportation fuel supply, by increasing energy independence and lowering lifecycle greenhouse gas emissions of transportation fuel.

I. National Technology Transfer and Advancement Act (NTTAA)

This rulemaking does not involve technical standards.

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations, and Low-Income Populations

The EPA believes that this action will not have potential disproportionately high and adverse human health or environmental effects on minority, low-income, or indigenous populations. This final rule does not affect the level of protection provided to human health or the environment by applicable air quality standards. This action does not relax the control measures on sources regulated by the RFS regulations and therefore will not cause emissions increases from these sources.

K. Congressional Review Act (CRA)

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

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 final rule come from sections 114, 208, and 301(a) of the Clean Air Act, 42 U.S.C. 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: November 30, 2015.

Gina McCarthy,

Administrator.

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

PART 80—REGULATION OF FUELS AND FUEL ADDITIVES

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

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

Subpart M—[Amended]

■ 2. Section 80.1401 is amended by adding in alphabetical order the definition for ''Algae grown photosynthetically'' to read as follows:

§ 80.1401 Definitions.

* * * * *

Algae grown photosynthetically are algae that are grown such that their energy and carbon are predominantly derived from photosynthesis.

* * * * *

■ 3. Section 80.1405 is amended by:

■ a. Removing and reserving paragraph (a)(2)(i); and

■ b. Adding paragraphs (a)(5) through (7).

The additions read as follows:

§ 80.1405 What are the Renewable Fuel Standards?

(a) * * *

(5) *Renewable Fuel Standards for 2014.*

(i) The value of the cellulosic biofuel standard for 2014 shall be 0.019 percent.

(ii) The value of the biomass-based diesel standard for 2014 shall be 1.41 percent.

(iii) The value of the advanced biofuel standard for 2014 shall be 1.51 percent.

(iv) The value of the renewable fuel standard for 2014 shall be 9.19 percent.

(6) *Renewable Fuel Standards for 2015.*

(i) The value of the cellulosic biofuel standard for 2015 shall be 0.069 percent.

(ii) The value of the biomass-based diesel standard for 2015 shall be 1.49 percent.

(iii) The value of the advanced biofuel standard for 2015 shall be 1.62 percent.

(iv) The value of the renewable fuel standard for 2015 shall be 9.52 percent.

(7) *Renewable Fuel Standards for 2016.*

(i) The value of the cellulosic biofuel standard for 2016 shall be 0.128 percent.

(ii) The value of the biomass-based diesel standard for 2016 shall be 1.59 percent.

(iii) The value of the advanced biofuel standard for 2016 shall be 2.01 percent.

(iv) The value of the renewable fuel standard for 2016 shall be 10.10 percent.

* * * * *

■ 4. Section 80.1426, paragraph (f)(1) is amended by revising entries F and H in Table 1 to § 80.1426 to read as follows:

§ 80.1426 How are RINs generated and assigned to batches of renewable fuel by renewable fuel producers or importers?

* * * * *

(f) * * *

(1) * * *

TABLE 1 TO § 80.1426—APPLICABLE D CODES FOR EACH FUEL PATHWAY FOR USE IN GENERATING RINS

	Fuel type	Feedstock	Production process requirements	D-Code
*	*	*	*	*
F	Biodiesel, renewable diesel, jet fuel and heating oil.	Soy bean oil; Oil from annual covercrops; Oil from algae grown photosynthetically; Biogenic waste oils/fats/greases; Non-food grade corn oil; Camelina sativa oil.	One of the following: Trans-Esterification Hydrotreating Excluding processes that co-process renewable biomass and petroleum.	4
*	*	*	*	*
H	Biodiesel, renewable diesel, jet fuel and heating oil.	Soy bean oil; Oil from annual covercrops; Oil from algae grown photosynthetically; Biogenic waste oils/fats/greases; Non-food grade corn oil; Camelina sativa oil.	One of the following: Trans-Esterification Hydrotreating Includes only processes that co-process renewable biomass and petroleum.	5
*	*	*	*	*

* * * * *

■ 5. Section 80.1451 is amended by revising paragraph (a)(1)(xiv) to read as follows:

§ 80.1451 What are the reporting requirements under the RFS program?

(a) * * *

(1) * * *

(xiv)(A) For the 2013 compliance year, annual compliance reports shall be submitted no later than March 1, 2016 or 60 days from publication in the **Federal Register** of a final rule establishing 2014 RFS standards, whichever date is later.

(B) For obligated parties, for the 2014 compliance year, annual compliance reports shall be submitted no later August 1, 2016.

(C) For exporters of renewable fuel, for the 2014 compliance period from January 1, 2014, through September 16, 2014, full annual compliance reports (containing the information specified in paragraphs (a)(1)(i), (ii), (vi), (viii), and (x) of this section) for that period shall be submitted no later than March 1, 2016 or 60 days from publication in the **Federal Register** of a final rule establishing 2014 RFS standards, whichever date is later.

(D) For obligated parties, for the 2015 compliance year, annual compliance reports shall be submitted no later than December 1, 2016.

* * * * *

■ 6. Section 80.1464 is amended by:

■ a. Revising paragraph (g); and

■ b. Adding paragraph (i)(3).

The addition and revision read as follows:

§ 80.1464 What are the attest engagement requirements under the RFS program?

* * * * *

(g)(1) For obligated parties and exporters of renewable fuel, for the 2013 compliance year, reports required under this section shall be submitted to the EPA no later than June 1, 2016.

(2) For RIN-generating renewable fuel producers, RIN-generating importers of renewable fuel, and other parties owning RINs, for the 2013 compliance year, reports required under this section shall be submitted to the EPA no later than March 1, 2016 or 60 days from publication in the **Federal Register** of a final rule establishing 2014 RFS standards, whichever date is later.

(3) For obligated parties, for the 2014 compliance year, reports required under this section shall be submitted to the EPA no later than December 1, 2016.

(4) For exporters of renewable fuel, for the 2014 compliance period from January 1, 2014, through September 16, 2014, full reports for that period required under this section shall be submitted no later than June 1, 2016.

(5) For RIN-generating renewable fuel producers, RIN-generating importers of renewable fuel, and other parties owning RINs, for the 2014 compliance year, reports required under this section shall be submitted to the EPA no later than March 1, 2016 or 60 days from publication in the **Federal Register** of a final rule establishing 2014 RFS standards, whichever date is later.

(6) For obligated parties, for the 2015 compliance year, reports required under this section shall be submitted to the EPA no later than March 1, 2017.

* * * * *

(i) * * *

(3) *Reporting requirements.* For the 2014 compliance year, reports required under this paragraph (i) shall be submitted to the EPA no later than March 1, 2016 or 60 days from publication in the **Federal Register** of a final rule establishing 2014 RFS standards, whichever date is later. For the 2015 compliance year and each subsequent year, reports required under this paragraph (i) shall be submitted pursuant to paragraph (d) of this section.

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