Summary Statement of Brent D. Yacobucci,
Energy and Minerals Section Research Manager, Congressional Research Service before

Committee on Energy and Commerce, Subcommittee on Environment; U.S. House of Representatives

Hearing on "Background on Renewable Identification Numbers under the Renewable Fuel Standard"

July 25, 2018

Good morning Chairman Shimkus, Ranking Member Tonko, and Members of the Subcommittee. My name is Brent Yacobucci. I am the Energy & Minerals Section Research Manager for the Resources, Science, and Industry Division of the Congressional Research Service. Congressional guidelines on objectivity and non-partisanship require that I confine my testimony to technical, professional, and non-advocate aspects of matters under consideration, and that I limit myself to questions within my field of expertise. Although I can discuss policy options and potential ramifications, the Service does not take a position on pending or proposed legislation.

The federal Renewable Fuel Standard (RFS) was established in the Energy Policy Act of 2005 (EPAct) and expanded in the Energy Independence and Security Act of 2007 (EISA). The RFS requires the use of renewable biofuels in transportation fuel—for 2018, the mandate is roughly 19.3 billion gallons. Within the larger mandate, there are sub-mandates for advanced biofuels (e.g., biomass-based diesel).

The RFS is a market-based program in which obligated parties (generally refiners and/or terminal operators) must submit credits to cover their obligations. These credits—Renewable Identification Numbers, or RINs—can be bought or sold like other commodities. In general, for each gallon of renewable fuel in the RFS program, one RIN is generated.

From the beginning of the RFS program, there have been concerns with RIN generation and the RIN market. In part to address concerns over errors and inaccuracies, when EPA finalized rules for the RFS as expanded by EISA (sometimes referred to as the "RFS2"), EPA also established a new transaction system. EPA maintains that obligated parties must exercise due diligence. Under this "buyer beware" system those purchasing RINs must certify their validity on their own. They are responsible for any invalid RINs they pass on to others or submit to EPA for compliance.

At times, RIN prices have been volatile. Most RINs are bought and sold through private contracts. There are also spot markets for RINs, and in 2013, spot prices for conventional ethanol RINs rose dramatically, before dropping even more rapidly. Stakeholders have identified various factors as potentially causing the price increase, including whether sufficient amounts of ethanol can be blended into gasoline to meet the RFS mandates and the extent to which non-obligated parties are speculating in RIN markets. Further, some stakeholders have suggested that a few actors could be actively working to manipulate RIN markets.

Concerns have been raised about the volatility of RIN prices on the secondary market, and the potential effects on the costs faced by blenders and refiners—particularly those without the infrastructure to blend—as well as the effects on consumer fuel prices. The complex interactions among the prices for various commodities makes such analysis difficult. Stakeholders have proposed various options to address some of these concerns, including:

- limiting the participation of non-obligated parties in the markets and the EPA Moderated Transaction System;
- establishing a price cap on RINs;
- requiring more public, real-time reporting of RIN trading data; and
- granting the Commodity Futures Trading Commission (CFTC) authority to regulate the RIN market similarly to agricultural commodities.

Each of these options could affect agricultural and biofuel producers, gasoline suppliers, blenders, and consumers. It is beyond the scope of this testimony to address the economic effects of various proposals.

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Good morning Chairman Shimkus, Ranking Member Tonko, and Members of the Subcommittee. My name is Brent Yacobucci. I am the Energy & Minerals Section Research Manager for the Resources, Science, and Industry Division of the Congressional Research Service. I have been asked to provide a background and overview of issues related to Renewable Identification Numbers, or RINs, the compliance mechanism for the federal Renewable Fuel Standard. Congressional guidelines on objectivity and non-partisanship require that I confine my testimony to technical, professional, and non-advocate aspects of matters under consideration, and that I limit myself to questions within my field of expertise. Although I can discuss policy options and potential ramifications, CRS does not take a position on pending or proposed legislation.

I have been with CRS for 19 years in various positions, providing analysis on alternative and conventional transportation fuels, vehicle design, and vehicle and fuels-related provisions of the Clean Air Act. I have a bachelor's degree in mechanical engineering from the Georgia Institute of Technology and a master's degree in public policy from The George Washington University. I am a member of the Society of Mechanical Engineers and the Society of Petroleum Engineers, although today I am representing only CRS.

Summary

The federal Renewable Fuel Standard (RFS) was established in the Energy Policy Act of 2005 (EPAct) and expanded in the Energy Independence and Security Act of 2007 (EISA). The RFS requires

the use of renewable biofuels in transportation fuel—for 2018, the mandate is roughly 19.3 billion gallons. Within the larger mandate, there are sub-mandates (sometimes referred to as "carve-outs") for advanced biofuels (e.g., biomass-based diesel and cellulosic fuels). In 2022, the RFS is scheduled to require the use of 36 billion gallons of renewable fuels, including 21 billion gallons of advanced biofuels, although it is unclear whether these targets will be adjusted. For example, although the Environmental Protection Agency (EPA) has established a standard of 19.3 billion gallons for 2018, the statute called for 26 billion gallons.

The RFS is a market-based program in which obligated parties (generally refiners and/or terminal operators) must submit credits to cover their obligations. These credits—Renewable Identification Numbers, or RINs—can be bought or sold like other commodities. In general, for each gallon of renewable fuel in the RFS program, one RIN is generated. Each RIN is a 38-digit number, with blocks of digits corresponding to various data, including the year the RIN was generated, the producer of the fuel, and the type of fuel. RINs are valid for use in the year they are generated and the following year.

From the beginning of the RFS program, there have been concerns with RIN generation and the RIN market. In part to address concerns over transposed digits, allegations of double-counting (intentional or unintentional) and other errors and inaccuracies, when EPA finalized rules for the RFS as expanded by EISA (sometimes referred to as the "RFS2"), EPA also established a new transaction system. All RIN transactions, including generation, sale or trade, and retirement, must be cleared through this system, called the EPA Moderated Transaction System (EMTS). From the beginning of the RFS2, EPA has maintained that obligated parties must exercise due diligence. Under this "buyer beware" system those purchasing or receiving RINs must certify their validity on their own, and they are responsible for any invalid RINs they pass on to other buyers or submit to EPA for compliance.

In 2011, EPA began issuing Notices of Violations (NOVs) to companies that the agency alleged fraudulently generated biodiesel RINs. In those cases, EPA and the Department of Justice initiated both civil and criminal proceedings. In part because of these RIN fraud cases, EPA established a system

whereby RINs can be certified by third parties registered with EPA. Under this quality assurance program (QAP), obligated parties have an "affirmative defense" if RINs are later found to be fraudulent—that is, obligated parties would not be liable for penalties under the Clean Air Act for the use of such RINs. However, such parties are required to purchase additional RINs to replace any invalidated RINs.

At times, RIN prices have been volatile. Most RINs are bought and sold through private contracts. However, there are also spot markets for RINs, and in 2013, spot prices for conventional ethanol RINs rose dramatically, before dropping even more rapidly. Stakeholders have identified various factors as potentially causing the price increase, including whether sufficient amounts of ethanol can be blended into gasoline to meet the RFS mandates and the extent to which non-obligated parties are speculating in RIN markets. Further, some stakeholders have suggested that a few actors could be actively working to manipulate RIN markets, although it is unclear how such manipulation would occur.

One complicating factor is that there are effectively two markets for RINs. In what can be thought of as the primary market, biofuel producers sell their products to gasoline refiners and blenders with RINs attached. These transactions are largely based on private contracts, and there may be little or no price discovery with these transactions. In the secondary market, RIN owners, some of which are not obligated parties under the RFS, may buy or sell excess RINs. The Oil Price Information Service (OPIS) and other private entities report secondary market prices, but it is unclear how much those prices reflect the overall market, or whether they present an upper bound to prices on any given day. OPIS data present prices, but do not report trading volumes. There is no "trading floor" or public exchange for RIN trading. EPA's EMTS requires price reporting, but those data are closely held by EPA because of concerns over the potential release of confidential business information (CBI). Further, it is unclear how useful any price data would be since, as noted before, it is presumed that most initial RIN transactions are part of a contract for renewable fuel with RINs attached. In those cases, there may be no direct way to uncouple the price of RINs from the price of the fuel itself.

Concerns have been raised about the volatility of RIN prices on the secondary market, and the potential effects on the costs faced by blenders and refiners—particularly those without the infrastructure to blend—as well as the effects on consumer fuel prices. The complex interactions among the prices for ethanol, crude oil, wholesale gasoline, RINs, and other commodities makes such analysis difficult. Stakeholders have proposed various options to address some of these concerns, including:

- limiting the participation of non-obligated parties in the markets and the EMTS;
- establishing a price cap on RINs;
- requiring more public, real-time reporting of RIN trading data; and
- granting the Commodity Futures Trading Commission (CFTC) authority to regulate the RIN market similarly to agricultural commodities.

In addition to RIN-specific proposals, a variety of policy options have been proposed for the RFS more broadly, including:

- limiting or expanding the volumes required under the RFS;
- expanding or limiting the fuel types that qualify; and
- eliminating the RFS entirely.

Each of these options could affect agricultural and biofuel producers, gasoline suppliers, blenders, and consumers. It is beyond the scope of this testimony to address the economic effects of various proposals.

RFS Introduction

The Energy Policy Act of 2005 (EPAct, P.L. 109-58) established the RFS, requiring the use of biofuels such as ethanol and biodiesel in the nation's fuel supply. The Energy Independence and Security Act of 2007 (EISA, P.L. 110-140) expanded this mandate.[1] Within the overall RFS mandate, there are

[1] For more information on the RFS, see CRS Report R43325, *The Renewable Fuel Standard (RFS): An Overview*, by Kelsi Bracmort.

sub-mandates for specific types of fuel, such as advanced biofuel, biomass-based diesel and cellulosic biofuels. In the early years of the program, the lion's share of the mandate was unspecified, and the vast majority was supplied by corn-based ethanol largely produced in the Midwest.

Each year, for each class of renewable fuel, EPA determines a percentage standard that all suppliers must meet. The standards are based on projected total U.S. gasoline and diesel demand for the coming year. For example, for 2018, the overall renewable fuel standard is 10.67%, the advanced biofuel standard is 2.37%, the biomass-based diesel standard is 1.74%, and the cellulosic biofuel standard is 0.159%.[2] For 2018, these percentages translate to roughly 19.3 billion gallons total of renewable fuel; 4.29 billion gallons of advanced biofuel; 2.1 billion gallons of biomass-based diesel; and 288 million gallons of cellulosic biofuel.[3] (See **Figure 1**)

The RFS mandate has been a major impetus to the development of U.S. biofuels industries, especially the ethanol and biodiesel industries. In 2005, the United States produced 3.9 billion gallons of ethanol and 0.1 billion gallons of biodiesel.[4] By 2013, production had increased to roughly 13.3 billion gallons of ethanol and nearly 2 billion gallons of biodiesel and renewable diesel.[5] In 2018, U.S. production is projected at roughly 16 billion gallons of ethanol and over 2 billion gallons of biomass-based diesel.[6]

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[2] Environmental Protection Agency (EPA), "Renewable Fuel Standard Program: Standards for 2018 and Biomass-Based Diesel Volume for 2019," 82 *Federal Register* 58491, December 12, 2017.

[3] Fuels vary by energy content. For example, biodiesel has roughly 1.5 times the energy content of ethanol. For biomass-based diesel, volume requirements are based on biodiesel-equivalent gallons; for all other standards, volumes are based on ethanol-equivalent gallons.

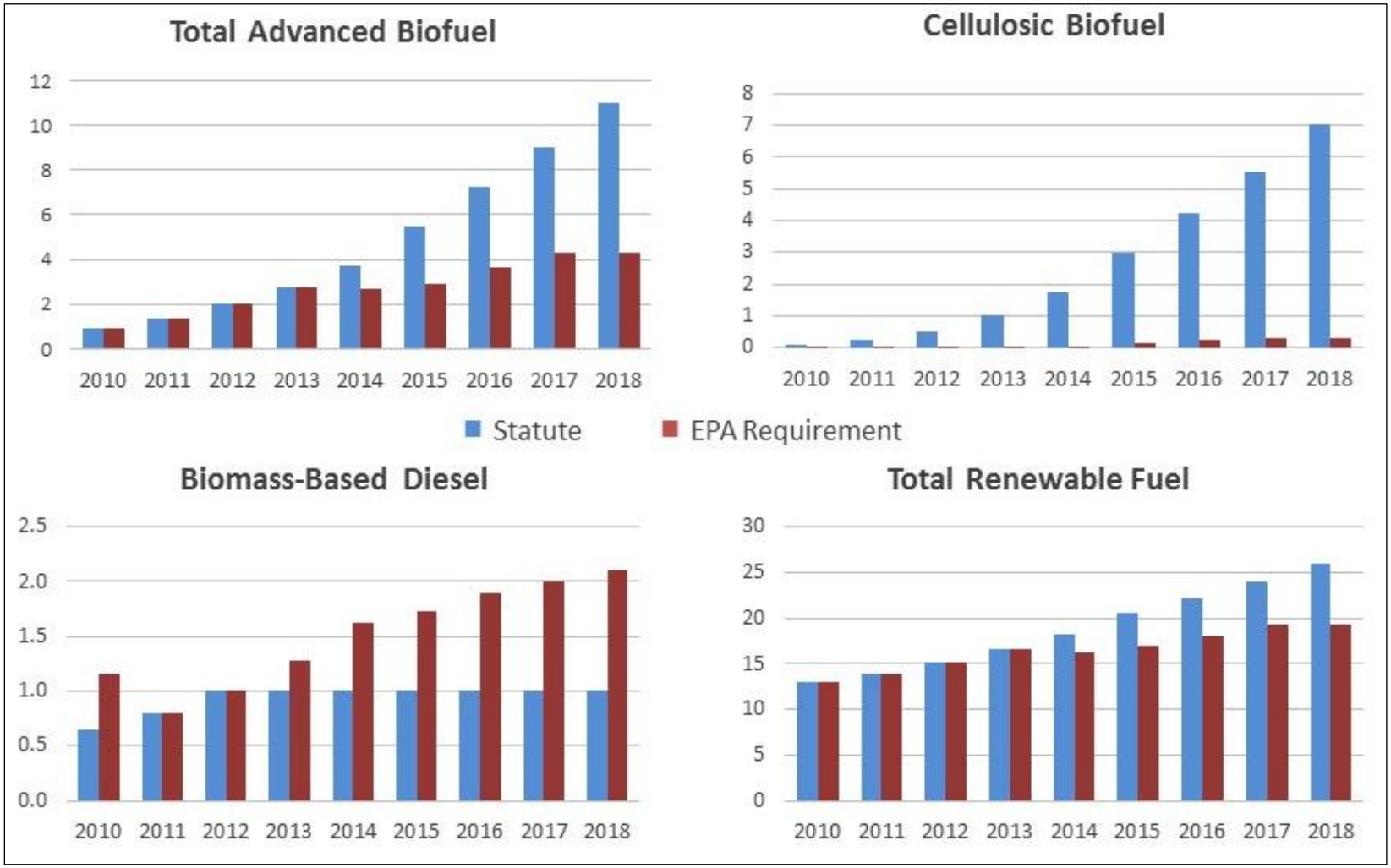
[4] Renewable Fuels Association (RFA), *Industry Statistics; Annual U.S. Fuel Ethanol Production*, Washington, DC, accessed July 20, 2018, http://www.ethanolrfa.org/resources/industry/statistics/#1454099788442-e48b2782-ea53; National Biodiesel Board (NBB), *U.S. Biodiesel Production*, Washington, DC, accessed July 20, 2018, http://biodiesel.org/docs/ffs-production/biodiesel-production-estimates-2005-2011.ppt?sfvrsn=10.

[5] RFA, op. cit., Annual U.S. Fuel Ethanol Production; NBB, *Production Statistics*, Washington, DC, DC, accessed July 20, 2018, http://biodiesel.org/production/production-statistics.

[6] RFA, op. cit., Monthly Ethanol Production; EPA, *2018 Renewable Fuel Standard Data*, Washington, DC, July 10, 2018, https://www.epa.gov/fuels-registration-reporting-and-compliance-help/2018-renewable-fuel-standard-data.

Figure 1. Annual Biofuel Mandates

Billions of Gallons



Source: P.L. 110-140; EPA annual RFS rulemaking documents.

Note: All volumes are ethanol-equivalent, except for biomass-based diesel, which is biodiesel equivalent.

Despite this growth, however, the biofuel mandate under the RFS has not met the volume targets initially established in EISA. For example, using its authority under the Clean Air Act, for 2018 EPA lowered the overall biofuel mandate from 26 billion gallons to 19.3 billion, and the cellulosic mandate from 7 billion gallons to 288 million.[7] A range of factors have contributed to this shortfall, including lower than expected commercial-scale production of cellulosic biofuels and limits on the ability of fuel suppliers to deliver—and vehicle owners to use—ethanol-gasoline blends of greater than 10% (E10). This latter limitation is frequently referred to as the "blend wall."[8]

Renewable Identification Numbers

Compliance with the RFS is measured using RINs. When qualifying biofuels are produced, each gallon is assigned a RIN. Until the biofuels are sold as fuel or blended into conventional fuels, the RINs are "attached" to the fuel. Once the biofuel has been blended or sold, the RINs are detached, and can then be bought and sold like other commodities. At the end of each year, fuel suppliers must multiply the above percentage standards by their total gasoline and diesel sales to calculate their renewable volume obligations (RVO), which indicate the total number of each type of RIN that the suppliers must submit to EPA. To the extent that a supplier has excess RINs, that supplier may sell them to others who may be short, or save them for use in the following year.

A RIN is a unique 38-character number that is issued (in accordance with EPA guidelines)[9] by the biofuel producer or importer at the point of biofuel production or the port of importation. Each qualifying gallon of renewable fuel has its own unique RIN. RINs are generally assigned by batches of renewable fuel production. (See box below.) Under the RFS2 RIN formulation, Code D identifies which of the four

[7] EPA, 82 *Federal Register* 58488, December 12, 2017.

[8] For more information on the blend wall, see CRS Report R40445, *Intermediate-Level Blends of Ethanol in Gasoline, and the Ethanol "Blend Wall"*, by Kelsi Bracmort.

[9] EPA, "Regulation of Fuels and Fuel Additives: Changes to Renewable Fuel Standard Program; Final Rule," 75 *Federal Register* 14685, March 26, 2010.

RFS categories—total, advanced, cellulosic, or biodiesel—the biofuel satisfies. (For a schematic representation of different fuels' D codes, see **Figure 2**.)

Any party that owns RINs at any point during the year (including domestic and foreign producers; refiners and blenders; exporters and importers of renewable fuels; and RIN traders) must register with the EPA and follow RIN record-keeping and reporting guidelines. RINs can only be generated if it can be established that the feedstock from which the fuel was made meets EISA's definitions of renewable biomass (including land-use restrictions), and if the fuel meets EISA's lifecycle greenhouse gas emission limits. The feedstock affirmation and record-keeping requirements apply to RINs generated by both domestic renewable fuel producers and RIN-generating foreign renewable fuel producers or importers.[10]

RIN Codes

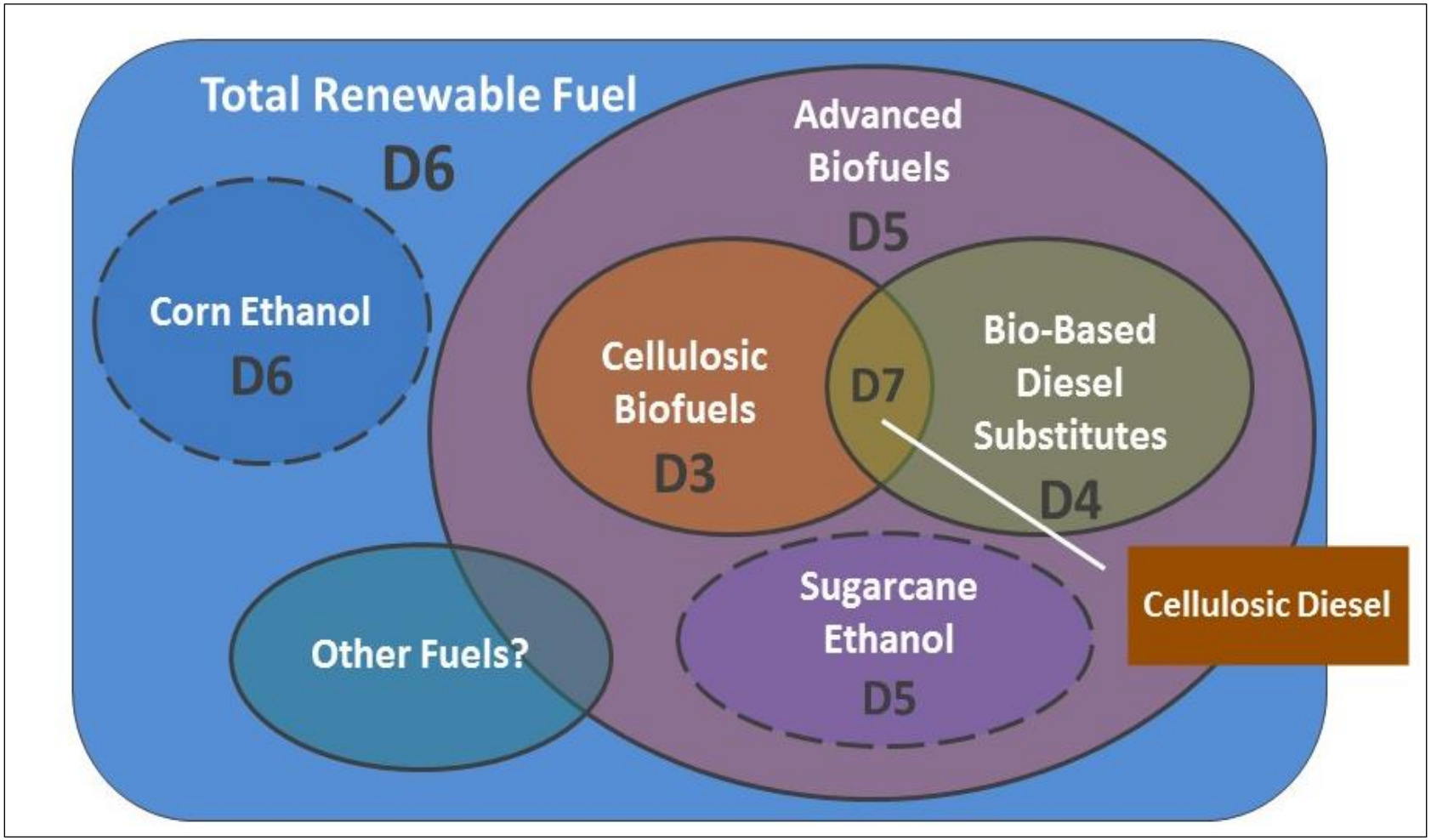
RIN=KYYYYCCCCFFFFFBBBBBRRDSSSSSSSSEEEEEEEE
Where
K = code distinguishing RINs still assigned to a gallon from RINs already separated
YYYY = the calendar year of production or import
CCCC = the company ID
FFFFF = the company plant or facility ID
BBBBB = the batch number
RR = the biofuel energy equivalence value
D = the renewable fuel category
SSSSSSSS = the start number for this batch of biofuel
EEEEEEEE= the end number for this batch of biofuel

EPA Moderated Transaction System (EMTS) and the Quality Assurance Program (QAP)

All RIN transactions, including generation, trade/sale/transfer, separation, and retirement, must be cleared through the EMTS.[11] When biofuels change ownership (e.g., are sold by a producer to a blender), any attached RINs are also transferred. The Code K status of the RIN is changed at separation (generally after the fuel is sold from a biofuel producer to an obligated party).

[10] 40 C.F.R. § 80.1451.
[11] 40 C.F.R. § 80.1452.

Figure 2. Renewable Fuel Classification (Not to Scale)



Source: CRS.

As noted by EPA in the rule establishing the RFS2 and the EMTS, EPA views the EMTS solely as a "screening" system, and all due diligence remains the duty of obligated parties.[12] Under this "buyer beware" system those purchasing or receiving RINs must certify their validity on their own, and they are responsible for any fraudulent RINs they pass on to other buyers or submit to EPA for compliance.

Given several cases of fraud in the biodiesel RIN market, in 2014 EPA established a voluntary Quality Assurance Program (QAP), whereby third-party verifiers—certified by EPA—audit the supply and value chains of biofuel/RIN producers. If a verified RIN is later invalidated, obligated parties have an affirmative defense against civil and/or criminal penalties.[13] However, any invalidated RINs must be replaced, and EPA's rules specify who is responsible for that replacement.[14]

Beyond monitoring the EMTS, EPA generally takes a "hands-off" approach and does not directly regulate the primary or secondary markets for RINs. Further, the Commodity Futures Trading Commission (CFTC), which regulates the trade of other commodities, has no jurisdiction over RINs, although it consults with EPA on RIN-related issues from time-to-time.[15]

RIN Markets

As noted above, initial trading of biofuels with attached RINs is generally conducted through private contracts between biofuel producers and gasoline refiners/blenders. After this initial trade, RINs may be detached and sold/traded multiple times. Further, a party who made the initial purchase may choose to sell the batch of biofuel with RINs still attached. Either way, obligated parties, as well as non-

[12] EPA, 75 *Federal Register* 14732, March 26, 2010.

[13] Title II of the Clean Air Act, which regulates fuels and vehicles, contains no criminal penalties. To the extent that the Justice Department has initiated criminal proceedings for actions related to civil violations of Title II, these have generally been for other fraud-related crimes such as wire fraud.

[14] U.S. Environmental Protection Agency, *EPA Issues Final Rule to Establish a Voluntary Quality Assurance Program for Verifying the Validity of Renewable Identification Numbers Under the RFS Program*, EPA-420-F014-042, Washington, DC, June 2014, https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100JPPM.pdf.

[15] EPA and CFTC, *Memorandum of Understanding Between the Environmental Protection Agency and the Commodity Futures Trading Commission on the Sharing of Information Available to EPA Related to the Functioning of Renewable Fuel and Related Markets*, Washington, DC, March 15, 2016, https://www.epa.gov/sites/production/files/2016-03/documents/epa-cftc-mou-2016-03-16.pdf.

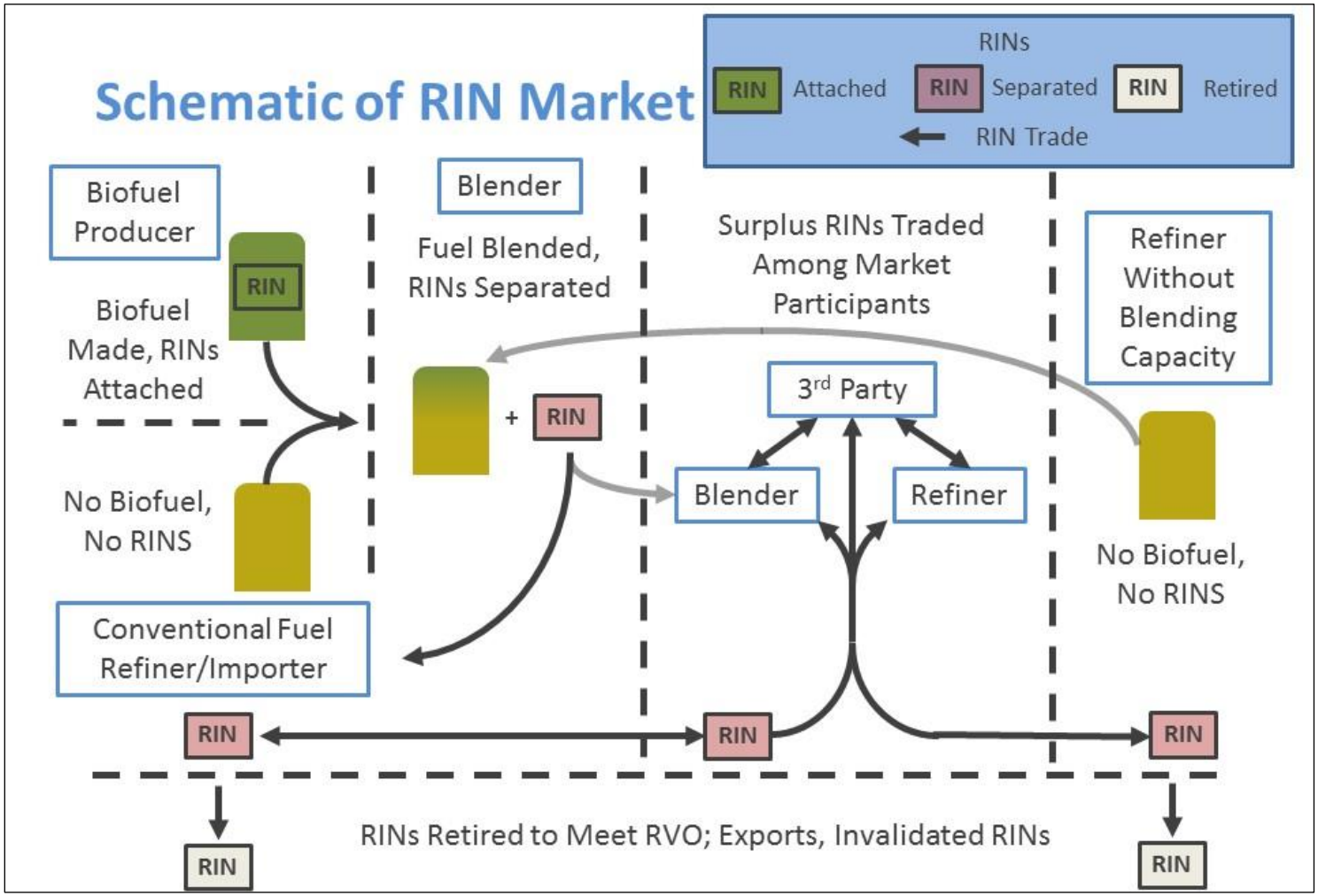
obligated third parties ("traders") may buy or sell RINs, as long as any such transactions are reported in EMTS. **Figure 3** presents a highly simplified schematic of the primary and secondary market for RINs.

EPA maintains a publicly available spreadsheet of all EMTS participants.[16] This is part of a larger list of all parties that have obligations and/or reporting requirements under the fuels provisions of the Clean Air Act. Non-obligated parties are referred to as "RIN owners." However, there is no easy way from the spreadsheet to determine whether a RIN owner is a subsidiary of a larger company that may or may not be an obligated party, or whether that RIN owner is solely trading RINs on the secondary market.

Just as there is limited information on the participants in RIN markets, there is little public data on the volume or price of RIN trades. Private companies such as the Oil Price Information Service (OPIS) and Argus Media conduct surveys of traders to acquire price data. However, it is unclear whether these daily prices reflect the entire market or only a segment of it. Further, while OPIS and others report prices, they do not report trading volumes, so there is limited ability for observers to analyze market factors such as the liquidity of the market or its overall value.

[16] EPA, *Registered Companies and Facilities in Part 80 Fuel Programs*, Washington, DC, updated July 20, 2018, https://www.epa.gov/fuels-registration-reporting-and-compliance-help/registered-companies-and-facilities-part-80-fuel.

Figure 3. Simplified Schematic of RIN Trading



Source: CRS

Notes: This is a simplification of the operation of RIN transfers and trading. In many cases, different entities are owned by the same company, and the specific arrangements can vary widely based on corporate structure.

Stakeholder Concerns

A variety of concerns related to RINs have been raised by various stakeholders. These include the transparency of the market, potential market manipulation, and the effects of high and/or volatile RIN prices on various stakeholders.

Transparency

As noted above, there is limited public information on RIN markets. EPA maintains that much of the data submitted to the EMTS is confidential business information, and thus not publicly available. Further, it is unclear whether reported spot prices accurately reflect the value of most or all RINs at any given time.

Speculation vs. Manipulation

Some stakeholders have questioned whether third party traders are "manipulating" the RIN markets. However, it is unclear what form that manipulation might take, and whether third party traders are instead speculating on price shifts in order to make a profit. While the latter may be necessary for a dynamic market (if all participants agreed on the trajectory of prices, third parties would have no reason to participate), the former could artificially shift prices and potentially raise costs for some obligated parties. Concerns about manipulation are connected with the above concerns over transparency; it is difficult to ascertain who is participating in the markets and what actions the participants may be taking at any time.

Volatility and High Prices

Over the past few years, RIN spot prices have been volatile, often seeing increases toward the end of a year and drops after the start of a year. Prices have also been responsive to EPA's release of proposed and final rules, agency actions to expand or shrink annual RIN obligations, and potential congressional action. This volatility may benefit some stakeholders while disadvantaging others—for example, rising prices benefit a refiner with a RIN surplus, while the same rising prices will harm a refiner facing an

annual deficit. However, a surplus in times of falling prices may be detrimental. This is particularly true near the end of a RIN's life—RINs are only valid for the year in which they were generated and the following year. Thus, if a stakeholder has an excess of expiring RINs, it may look to sell those expiring RINs at whatever price it can. Determining how rising and falling prices affect individual stakeholders, and industries as a whole, requires more complex analysis than can be provided here.

Legislative Policy Options

Stakeholders have proposed various options to address their concerns over RINs and RIN prices. Four proposals include: 1) limiting the participation of non-obligated parties in the markets and the EMTS; 2) establishing a price cap on RINs; 3) requiring more public, real-time reporting of RIN trading data; and 4) granting the CFTC authority to regulate the RIN market.

The first proposal, limiting third party participation, could possibly limit the volatility in the system. Third party traders may participate in the market precisely because they are seeking volatility and the opportunity to profit from that volatility. However, these same third parties may also act to make the market more liquid, giving obligated parties more chances to secure the RINs they need for compliance.

The second proposal, a cap on prices, could potentially decrease volatility in the market. It would certainly establish an upper bound on prices, and the lower the cap the less room there would be for prices to move. However, more certainty on price could deter third party traders seeking volatility. A cap on prices would also limit biofuel production if the cap were below the level needed to make biofuels competitive. This may be particularly true for advanced and cellulosic biofuels with limited commercial scale production and currently high production costs.

Requiring more public data would increase the transparency of the RIN market. However, much of the EMTS data currently reported to EPA is considered confidential business information. Policymakers may look to balance the desire for more transparency with the needs of industry to keep some information private.

Currently, the CFTC consults with EPA on issues related to the RIN market. Requiring CFTC to take a more active role in regulating the market could lead to greater transparency, but could also raise compliance costs, depending on the specifics of the policy.

Each of these options could affect agricultural and biofuel producers, gasoline suppliers, blenders, and consumers. It is beyond the scope of this testimony to address the economic effects of various proposals.

Conclusion

The RFS is a complex program with many moving parts. Among them, RINs and the RIN market are particularly complicated. The current system was established to address concerns with the earlier system, but has raised concerns of its own. These include the transparency of the system, the role of third parties, and the economic effects of the system, as well as the goals, structure, and design of the overall program. The RFS affects the entire U.S. motor fuel supply, and any changes to the program could affect consumers, refiners, blenders, biofuel producers, farmers, and others. I thank the Subcommittee for its time, and I am happy to answer any questions you have.