RENEWABLE FUELS ASSOCIATION

October 19, 2017

Attn: Docket ID EPA-HQ-OAR-2017-0091

The Honorable Scott Pruitt
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Re: Comments of the Renewable Fuels Association (RFA) in response to *Renewable Fuel Standard Program: Standards for 2018 and Biomass-based Diesel Volume for 2019; Availability of Supplemental Information and Request for Further Comment* (82 Federal Register 46174; October 4, 2017).

Dear Administrator Pruitt,

The Renewable Fuels Association (RFA) appreciates the opportunity to provide comments to the U.S. Environmental Protection Agency (EPA) relating to the EPA's Notice of Availability of Supplemental Information and Request for Further Comment ("Notice") regarding the proposed 2018 Renewable Volume Obligations (RVOs) under the Renewable Fuel Standard (RFS).

RFA is the leading trade association for America's ethanol industry. Its mission is to advance the development, production, and use of fuel ethanol by strengthening America's ethanol industry and raising awareness about the benefits of renewable fuels. Founded in 1981, RFA serves as the premier forum for industry leaders and supporters to discuss ethanol policy, regulation, and technical issues. RFA's 300-plus members are working to help America become cleaner, safer, more energy secure, and economically vibrant.

As expressed in our comments responding to Proposed Rule for 2018 RVOs, RFA was pleased that EPA correctly chose to exercise *only* its cellulosic waiver authority to reduce the cellulosic biofuel, advanced biofuel, and total renewable fuel volumes from their statutory levels. The Agency's proposal properly avoided attempts to inappropriately apply a general waiver on the basis of "inadequate domestic supply" or "severe harm" to the economy or environment.

Therefore, we were surprised and disappointed when EPA released the Notice on October 4, 2017, soliciting additional public comments on how EPA could use a general waiver, or other waiver authorities, to further reduce the 2018 RVOs below the levels proposed on July 21, 2017. As detailed in the attached comments, we see absolutely no legal or statutory basis for EPA to exercise

its general waiver authority in any of the ways contemplated in the Notice to further reduce the 2018 RVOs.

Further reductions of the 2018 RVOs beyond those already proposed threaten to undermine the significant progress the RFS has made to enhance our nation's energy security, boost the economy, clean our air, and provide consumers with more choices at the pump. Thus, we are urging EPA to immediately withdraw the Notice, refrain from pursuing the use of a general waiver to further reduce the 2018 RVOs, and expeditiously finalize the 2018 RVOs at the levels originally submitted to the White House Office of Management and Budget. RFA also respectfully encourages EPA to abandon the pursuit of other potential actions aimed at deflating prices for RIN credits (Renewable Identification Numbers) at the expense of implementing the RFS in a manner consistent with Congressional intent.

Sincerely,

Bob Dinneen
President & CEO

RFA RENEWABLE FUELS ASSOCIATION

COMMENTS OF THE

RENEWABLE FUELS ASSOCIATION

IN REGARD TO

Renewable Fuel Standard Program: Standards for 2018 and Biomass-based Diesel Volume for 2019; Availability of Supplemental Information and Request for Further Comment

DOCKET ID EPA-HQ-OAR-2017-0091

82 Federal Register 46174 (October 4, 2017)

I. Executive Summary

On July 21, 2017, EPA published a Proposed Rule for the 2018 Renewable Volume Obligations (RVOs) under the Renewable Fuel Standard (RFS). The proposal included reductions to the 2018 RVOs for cellulosic biofuel, advanced biofuel, and total renewable fuel compared to the RVO levels finalized for 2017. On its face, the proposal conflicted with what EPA itself has described as the "clear" and "fundamental" objective of the RFS: "To *increase* the use of renewable fuels in the U.S. transportation system *every year* in order to reduce greenhouse gases (GHGs) and increase energy security."[1]

RFA and many other stakeholders commented that the reductions proposed by EPA are unnecessary and unwarranted, and recommended that the Agency finalize 2018 RVOs consistent with the draft proposal originally submitted to the Office of Management and Budget (OMB) for inter-agency review.[2] However, while RFA's comments expressed concern with the proposed reductions, they also voiced our support for EPA's decision to use only its cellulosic biofuel waiver authority to lower 2018 RVOs from statutory levels. RFA was encouraged by the fact that EPA's proposal refrained from inappropriately attempting to use a general waiver to further reduce the 2018 blending requirements.

Thus, we were greatly concerned by EPA's publication on October 4, 2017, of a Notice of Availability of Supplemental Information and Request for Further Comment ("Notice"), which solicits comment on whether and how EPA could use a general waiver, or other waiver authorities, to further reduce the 2018 RVOs beyond the reductions already proposed.

Simply put, there is no legal or statutory basis for EPA to exercise its general waiver authority in any of the ways contemplated in the Notice to further reduce the proposed 2018 RVOs.

[1] 81 Fed. Reg. 34779 (emphasis added)

[2] See Comments of the Renewable Fuels Association in response to *Renewable Fuel Standard Program: Standards for 2018 and Biomass-Based Diesel Volume for 2019*; Proposed Rule (82 Fed. Reg. 34,206; July 21, 2017). Docket ID No. EPA-HQ-OAR-2017-0091-1776.

The domestic supply of renewable fuel available to obligated parties is more than adequate to meet the 2018 RVOs as specified in the initial draft Proposed Rule submitted to OMB. Further, there is no evidence whatsoever to support a claim that the 2018 RVOs may somehow cause "severe harm" to the economy of a state, a region, or the United States.

Therefore, we urge EPA to immediately withdraw the Notice, refrain from pursuing the use of a general waiver to further reduce the 2018 RVOs, and expeditiously finalize the 2018 RVOs at the levels originally submitted to OMB. RFA also respectfully encourages EPA to abandon the pursuit of other potential actions aimed at deflating prices for RIN credits (Renewable Identification Numbers) at the expense of implementing the RFS in a manner consistent with Congressional intent. The straightest and truest path to larger supplies of RINs (and lower RIN costs for obligated parties) is expanded renewable fuel production and use, as intended by the statute.

RFA's specific concerns with the Notice are described more fully in the following comments.

II. There is no reasonable basis for EPA to use its general waiver authority to further reduce the 2018 RVOs as contemplated in the Notice.

As EPA acknowledges in both the Proposed Rule and the subsequent Notice, Section 211(o)(7)(A) of the Clean Air Act narrowly stipulates that the Administrator may only use a general waiver in instances where 1) implementation of the RVOs would cause "severe harm" to the economy or environment of a state, a region, or the United States; or 2) there is "inadequate domestic supply" of available renewable fuels to meet the RVO requirements.

In comments on the proposal, RFA strongly supported EPA's decision to use only its cellulosic waiver authority in establishing the 2018 proposed RVOs. EPA did not find that there is an "inadequate domestic supply" of renewable fuel to meet the standards, nor could it. Similarly, EPA's proposal did not find that implementation of the proposed 2018 RVOs would cause "severe harm" to the economy or environment of a state, a region, or the United States. Such a finding would not be possible.

Clearly, the conditions necessary to effectuate a general waiver were absent from the marketplace when EPA published the Proposed Rule, and no new evidence is provided in the Notice to support the use of a general waiver on the basis of "inadequate domestic supply" or "severe harm."

a. There is no justification for using the general waiver authority to further reduce 2018 RVOs on the grounds of "inadequate domestic supply."

EPA's Notice asks for comment on whether the Agency should re-interpret "inadequate domestic supply" in such a way that only domestically produced renewable fuels would be considered in determinations of available supply. According to EPA's questionable logic, re-defining "domestic supply" to exclude imports would presumably reduce the amount of renewable fuel available to obligated parties to meet the RFS, thereby justifying the use of a general waiver. Not only would such a re-interpretation defy common sense and the accepted meaning of "supply," but

it would also run counter to both the statutory history of the RFS and the recent U.S. Court of Appeals decision affirming that imported biofuels are part of the domestic supply. Further, it is unlikely that excluding advanced biofuel imports from RVO calculations would have the desired effect of shutting imports out of the U.S. market. In sum, there is no rational justification for using the general waiver authority in this way.

i. The *origin* of the supply of renewable fuels available to obligated parties to meet annual RFS requirements is not a relevant factor in deciding whether a general waiver is warranted on the basis of "inadequate domestic supply."

In response to comments from oil industry trade associations on the 2018 RVO Proposed Rule, EPA's Notice solicits feedback on whether only domestically produced renewable fuel volumes should be considered in determining the adequacy of supply to meet annual RVOs. In attempting to justify this concept, EPA cites comments from the oil industry associations that suggest biofuel imports "may…have an impact on the energy independence and security status of the U.S."[3] It is somewhat ironic that the industry cited by EPA on the energy security impacts of biofuel imports sent nearly $250 billion out of the U.S. economy in 2016 to import some 3.7 billion barrels of crude oil and petroleum products—more than 150 times the volume of 2016 U.S. biofuel imports.[4]

In any case, the origin of the supply of renewable fuels available to obligated parties to meet RFS requirements is not a relevant factor for determining the adequacy of supply and setting annual RVOs. The law establishing the expanded RFS, the recent U.S. Court of Appeals decision, and the accepted meaning of "supply" all underscore the fact that imported renewable fuels are in fact part of the "domestic supply." Just as imported televisions or T-shirts sold at U.S. big box retail stores are considered part of the domestic supply of televisions or T-shirts available to American consumers, so too are imported biofuels considered part of the domestic supply available to obligated parties.

1. The Energy Independence and Security Act (EISA) of 2007 does not preclude the use of imported renewable fuels to meet annual RFS volumetric requirements.

EPA's Notice states "[i]ncreasing the energy independence and security of the U.S."[5] is a central objective of the RFS and suggests that biofuel imports may undermine this goal. In reality, the main objective of the Energy Independence and Security Act's (EISA) expanded RFS provision was to "…replace or reduce the quantity of fossil fuel present in a transportation fuel" with annually increasing volumes of renewable fuel, without regard to their origin.[6] Nowhere in the adopted

[3] 82 Fed. Reg. 46177 (citing comments from the American Petroleum Institute and American Fuel and Petrochemical Manufacturers).
[4] U.S. Energy Information Administration. "U.S. Imports of Crude Oil and Petroleum Products." https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=MTTIMUS1&f=A
[5] 82 Fed. Reg. 46177
[6] PUBLIC LAW 110–140 (DEC. 19, 2007) at 1521

legislation is there any preclusion of the use of imported renewable fuels to satisfy this policy objective. Had Congress intended that the RFS requirements be satisfied only with domestically produced renewable fuels, it most certainly would have specified that intention.

Instead, various passages of EISA underscore that Congress quite obviously intended that imported biofuels would qualify as renewable fuels under the RFS. For example, provisions dealing with compliance demonstrations and credit generation direct the EPA Administrator to "issue regulations…applying to any person that refines, blends, or ***imports*** additional renewable fuels specified by the Administrator."[7] Further, EISA directs the Administrator to undertake certain studies that examine, among many other factors, the impacts of the "annual volume of ***imported*** renewable fuels" used for RFS compliance.[8] Clearly, Congress intended for imported renewable fuels to count toward compliance with annual RFS requirements.

2. As recently affirmed by the U.S. Court of Appeals for the D.C. Circuit in *Americans for Clean Energy, et al. v. the Environmental Protection Agency*, the terms "domestic supply" include renewable fuel imports.

In *Americans for Clean Energy, et al. v. the Environmental Protection Agency*, the U.S. Court of Appeals for the D.C. Circuit established that "…'supply' as used in the 'inadequate domestic supply' provision refers to the 'amount' of renewable fuel that is 'available for use' by refiners, blenders, and ***importers*** in meeting the statutory volume requirements."[9] In this context, it is inarguable that renewable fuel produced in a foreign country and imported into the U.S. is part of the "amount" of renewable fuel that is "available for use" by obligated parties under the RFS. The fact that the court decision repeatedly references supply "available for use" by "importers" further affirms that imported renewable fuels are part of the domestic supply available for RFS compliance.

Notably, the court decision does not focus specifically on the term "domestic" in isolation because it is already well understood that the term simply refers to the *place* where the "supply" — which is constituted of both foreign- and domestically produced renewable fuel—is available to obligated parties. And as even EPA concedes, the "common understanding" of the term "supply" is "an amount of a resource or product that is available for use by the person or place at issue."[10] In this case, the place where the "product" (i.e., imported biofuel) is "available for use" is the domestic market. In fact, the court goes one step further and states that its "…interpretation of supply allows EPA to consider the amount of renewable fuel available through import."[11]

The court decision further directs EPA not to conflate "availability" of renewable fuels with the "cost" of available renewable fuels. That is, every gallon of renewable fuel produced outside of the U.S. could technically be "available" to obligated parties if they paid the price necessary to lure

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[7] *Id.* at 1526 (emphasis added)
[8] *Id.* at 1529 (emphasis added)
[9] *Americans for Clean Energy, et al. v. the Environmental Protection Agency,* D.C. Circuit. No. 16-1005 (July 28, 2017), at 30. (emphasis added)
[10] 80 Fed. Reg. 77435
[11] *Americans for Clean Energy, et al. v. the Environmental Protection Agency,* D.C. Circuit. No. 16-1005 (July 28, 2017), at 33.

the fuel to the U.S. market. Indeed, the court decision states plainly that any consideration by EPA of the "pricing of renewable fuel" in determining the adequacy of supply "exceeds EPA's statutory authority."[12] As pointed out by the court, the "inadequate domestic supply" provision is meant to focus narrowly on the adequacy of supply and is not meant to address cost, pricing, or economic effects. According to the court, "[t]o the extent that application of the statutory volume requirements may lead to negative economic effects, we note that such effects could be addressed through other provisions of the statute."[13] (i.e., a general waiver based on "severe harm" to the economy).

Finally, the court notes that "…the Renewable Fuel Program's increasing requirements are designed to force the market to create ways to produce and use greater and greater volumes of renewable fuel each year."[14] Without question, one of the ways created by the market to use greater and greater volumes of renewable fuel was to import some amount of advanced biofuels to add to the supply available domestically to obligated parties.

III. There is no evidence whatsoever to support a finding that implementation of the originally proposed 2018 RVOs would cause severe harm to the economy or environment of a state, a region, or the United States.

Aside from "inadequate domestic supply," the only other statutory basis for granting a general waiver is a finding that implementation of the required RFS volumes would result in "severe harm" to the economy or environment of a state, a region or the United States. Such a proposed finding by EPA—which would require separate public notice and comment[15]—is not possible given current market dynamics and the high standard of proof established by Congress (and reinforced by EPA in previous denials of "severe harm" waiver requests).[16] Still, EPA's Notice, again citing comments from oil industry associations, states, "…several stakeholders suggest[ed] that EPA should reduce volumes on the basis of severe economic harm."[17]

There is absolutely no basis for a finding by EPA that the 2018 required volumes of renewable fuel, as proposed, would somehow cause "severe harm" to the economy or environment. Congress established—and EPA has correctly reinforced—a narrow and rigid standard for proving required volumes under the RFS will cause "severe harm." In denying a waiver request from the Governor of the State of Texas in 2008, EPA properly interpreted the statute's general waiver provisions to require petitioners to prove that the source of "severe harm" is the "…RFS program *itself...",* not other precipitating or related factors.[18] The EPA notice denying the Texas waiver request also established "…a high threshold for the nature and degree of harm by requiring a determination of *severe* harm."[19] In recognition of the plain meaning of the statute, EPA further established that

[12] *Id.* at 29-30.
[13] *Id.* at 34.
[14] *Id.* at 31.
[15] 73 Fed. Reg. 47183 ("EPA *will not* grant a waiver *without such notice and comment*…"
[16] See 73 Fed. Reg. 47168 (Aug. 13, 2008); and 77 Fed. Reg. 70752 (Nov. 27, 2012)
[17] 82 Fed. Reg. 46179
[18] 73 Fed. Reg. 47169 (emphasis added)
[19] *Id.* (emphasis added)

petitioners must demonstrate that the "*economy* of a state, a region, or the United States"—not a narrow sub-sector or specific industry—will be severely harmed. Using the same criteria that guided the denial of the 2008 waiver request, EPA subsequently denied general waiver requests claiming "severe harm" in 2012 and 2014.[20]

Given the unambiguous meaning of the statutory "severe harm" provisions, and in light of EPA's straightforward interpretation of those provisions in previous waiver request denials, it would be irrational for commenters to claim that the 2018 proposed RVOs would somehow cause severe harm to the economy or environment in 2018. No evidence of "severe harm" resulting from RFS implementation has been presented to the EPA because such evidence does not exist.

Far from harming the economy or environment, the RFS is providing substantial economic and environmental benefits to American consumers. It is absurd to suggest that the RFS and ethanol are somehow harming the economy when ethanol is priced below gasoline and remains the lowest-cost source of octane available on the market (on October 19, 2017, nearby ethanol futures prices were trading at $0.25 per gallon, or 15 percent, below nearby gasoline blendstock futures).[21]

Many of RFS program's macro-level benefits to the economy were documented in an economic modeling study soon to be published in *American Journal of Agricultural Economics (AJAE)* (Attachment A).[22] According to the study, "…the current RFS program considerably benefits the agriculture sector, but also leads to overall welfare gains for the United States." In 2015, the welfare gain resulting from the RFS included a $17.8 billion savings on gasoline expenses, a 200-million-barrel reduction in crude oil imports, and $14.1 billion in value added to the agriculture sector.

Further, claims that RIN costs are somehow inflicting harm on the economy—through higher retail gas prices—have been thoroughly debunked by numerous economic studies (including analyses by EPA).[23] These studies generally show that RIN costs are reflected in the refiner's "crack spread"; that is, RIN costs are mostly or entirely recovered through slightly higher selling prices for wholesale gasoline blendstock. The marginal RIN cost that is reflected in the refiner's selling price of wholesale gasoline blendstock is then equally offset when the gasoline is blended with ethanol because the blender's effective cost of ethanol is reduced by the value of the RIN. Thus, the refiner's cost of RINs is passed on to the wholesale level, but not to the retail level. In this way, the net effect of RINs on retail gas prices is zero.

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[20] See, 77 Fed. Reg. 70752 (Nov. 27, 2012); and 80 Fed. Reg. 77428

[21] CME Group. RBOB Gasoline and Ethanol Futures Quotes. Oct. 19, 2017.

[22] G. Moschini, H. Lapan, and H. Kim. "The Renewable Fuel Standard in Competitive Equilibrium: Market and Welfare Effects." Center for Agricultural and Rural Development, Iowa State University. Working Paper 17-WP 575 (June 2017).

[23] See, e.g., D. Burkholder (EPA), "A Preliminary Assessment of RIN Market Dynamics, RIN Prices, and Their Effects," May 2015; Knittel, Meiselman, and Stock, "The Pass-Through of RIN Prices to Wholesale and Retail Fuels under the Renewable Fuel Standard," June 2015; Lade and Bushnell, "Fuel Subsidy Pass-Through and Market Structure: Evidence from the Renewable Fuel Standard," December 2016; Pouliot, Smith and Stock, "RIN Pass-Through at Gasoline Terminals," February 2017.

Most recently, a statistical analysis by Informa Economics (Attachment A) examined whether any relationship exists between RIN prices and retail gas prices. The study concluded that "…changes in RIN prices did not 'cause' the changes that occurred in retail gasoline prices in 2013, and this has continued to be the case through the summer of 2017."

IV. EPA should reject proposals that would eliminate the Exporter RVO and allow RINs separated from exported renewable fuels to count toward compliance with annual RFS requirements.

It has been reported recently that EPA may be considering proposals that would eliminate the Exporter RVO, thereby allowing RINs separated from exported fuels to be eligible for compliance with annual RFS requirements. Such a scheme would be antithetical to the letter and spirit of the Renewable Fuels Standard and would serve as an impediment to further expansion of renewable fuel production and use in the United States.

Currently, exporters of denatured fuel ethanol generate an RVO equal to the export volume. Exporters detach and retire RINs from those exported volumes because, as EPA explained in the final rules promulgating the original RFS, "…the program is intended to require a specific volume of renewable fuel to be *consumed in the U.S.*"[24] To ensure the RFS regulations reflected the Congressional intent, EPA decided that "…RINs associated with that exported renewable fuel must be removed from circulation."[25]

Obviously, exported gallons of renewable fuel, by definition, are not available "to be consumed in the U.S." Thus, allowing exports to count toward RFS compliance would completely undermine the intent of the RFS, artificially increase the supply of RINs, and create a disincentive to invest in the domestic renewable fuel technologies and infrastructure the RFS was designed to encourage.

The justification offered by proponents of this rumored change—that not retiring RINs for export volumes would further encourage exports and result in further economic growth to the U.S. biofuels industry—masks the true intent of the proposal: to flood the existing RIN market with millions of additional RINs and sharply drive down RIN prices. Domestic producers of renewable fuels benefit when the RINs have more than a nominal value. A sudden glut of RINs from exported volumes, when the market already has over a billion surplus RINs in circulation, will sharply reduce the value of biofuel blending and hinder further investment in domestic biofuels production.

Apart from the detrimental economic impact on RIN prices, the rumored proposal would frustrate the purpose and text of the Renewable Fuels Standard. The statute specifically mandates that "*transportation fuel* sold or *introduced into commerce in the United States (except in noncontiguous States or territories)*, on an annual average basis, contain[] at least the applicable volume of renewable fuel, advanced biofuel, cellulosic biofuel, and biomass-based diesel…."[26] As a result of this statutory

[24] 72 Fed. Reg. 23936 (emphasis added).
[25] *Id.*
[26] 42 C.F.R. 7545(o)(2)(A)(i).

mandate, only renewable fuels that are part of transportation fuel used in the United States are eligible to generate RINs.

Proponents of the rumored rule change erroneously try to equate "transportation fuel" and "renewable fuel" to argue that Sec. 211(o) of the Clean Air Act prohibits Export Renewable Volume Obligations (ERVOs). The two are fundamentally different. "Transportation fuel," is defined as "fuel for use in motor vehicles, motor vehicle engines, nonroad vehicles, or nonroad engines (except for oceangoing vessels)," meaning diesel and gasoline.[27] In contrast, the term "renewable fuel" means fuel that is produced from renewable biomass and that is used to replace or reduce the quantity of fossil fuel present in a transportation fuel.[28] In other words, ethanol is not fuel "for use" in motor vehicles; it is only a fuel "for use" when blended with gasoline. Since ethanol is generally exported prior to being blended with gasoline, such fuel is not being sold or introduced into commerce within the United States, and is therefore ineligible to keep any generated RINs.

This interpretation is also consistent with the way EPA determines actual volumes of renewable fuel: by taking the total number of RINs generated and subtracting RINs retired for non-compliance reasons, spills, *or exports*.[29] If EPA were to decide otherwise, and fail to strip the RINs from exported fuel, it would have a significant negative repercussion to the very entities suggesting this change – EPA would have to assume the exported ethanol was available to refiners, blenders and importers in setting annual renewable fuels targets. And this would be contrary to the understanding of obligated parties, who agreed at the time of the RFS2 Final Rule, that exported volumes should have their RINs retired.[30]

Moreover, allowing RINs for exports likely would be challenged as an "export subsidy" under WTO and/or result in a biofuels trade war as other countries act to protect their industries from subsidized U.S. ethanol.

EPA must abandon any notion of allowing RINs generated on exported gallons of renewable fuel to count toward meeting RFS compliance obligations.

V. The larger RIN supplies (and lower RIN prices) apparently sought by EPA could be more readily achieved if the Agency eliminated unnecessary regulatory barriers to expanded ethanol production and use.

The additional cuts to the 2018 RVOs suggested by the Notice and the reported proposals to eliminate Exporter RVOs both are clearly aimed at boosting RIN stocks, lowering RIN prices, and easing compliance for obligated parties. However, the most straightforward method for growing

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[27] *See* 42 U.S.C. 7545(o)(1)(L); 75 Fed. Reg. 14720 ("The sum of all highway and nonroad gasoline and diesel fuel produced or imported within a calendar year will be the basis on which the RVOs are calculated.").
[28] 42 U.S.C. 7545(o)(2)(J)
[29] *See Ams. for Clean Energy v. EPA*, 864 F.3d 691, 717 (D.C. Cir. 2017) (citing Final Rule, 80 Fed. Reg. at 77,440).
[30] EPA, Regulation of Fuels and Fuel Additives: Renewable Fuel Standard Program, Summary and Analysis of Comments, EPA420-R-07-006 (April 2007) at 2-11,2-12 (comments of ExxonMobil).

RIN supplies is to further expand renewable fuel production and domestic consumption, which is in fact the objective of the RFS as adopted by Congress. As expressed in previous comments to the EPA, the Agency could take a number of steps to eliminate regulatory burdens that are constraining renewable fuel production and use and leading to elevated RIN prices.

EPA's Proposed Rule pointed out that the "slower-than-expected development of the cellulosic biofuel industry" has hampered progress toward meeting the RFS cellulosic and advanced volumetric requirements envisioned by Congress.[31] While a number of complex factors have created barriers to more rapid development of cellulosic biofuels, EPA's handling of certain regulatory provisions has itself been an obstacle to increased cellulosic biofuel production. RFA continues to believe EPA can and should take the actions described below to remove unnecessary barriers to broader commercialization of cellulosic biofuels.

b. Eliminate the EPA-imposed regulatory barrier to E15 and other mid-level ethanol blends. Amend 40 CFR 80.27(d)(2) to establish regulatory parity in the Reid vapor pressure (RVP) volatility limits for *all* fuel blends containing more than 9% ethanol.

EPA's disparate volatility limits for various ethanol blends during the summer ozone control season continue to serve as the single largest impediment to growth in renewable fuel consumption. The maximum volatility limit for gasoline during the high ozone season was established at 9.0 pounds per square inch (psi) Reid vapor pressure (RVP), with EPA having the authority to set more stringent limits under certain circumstances (e.g., for non-attainment areas). However, in a 1987 rulemaking, EPA allowed blends containing a *minimum* of 10% ethanol to exceed RVP limits by 1.0 psi.[32] In 1989, EPA provided an interim RVP allowance that was 1.0 psi higher "for gasoline-ethanol blends commonly known as gasohol."[33] EPA explained that "[s]uch blends must contain *at least* 9% ethanol (by volume) and their maximum ethanol content may not exceed any applicable waiver conditions under section 211(f)(4)."[34]

In a later rulemaking, EPA asserted that the 1.0 psi waiver only applies to blends containing "between 9 and 10 per cent ethanol (by volume)," presumably because 10% ethanol blends (E10) was the only fuel at that time to which a waiver had been granted under 211(f)(4).[35] The 1.0 psi RVP waiver effectively raised the maximum RVP limit for E10 to 10.0 psi in "conventional gasoline" areas where more restrictive RVP limits did not apply.

According to EPA, the purpose of the original 1.0 psi waiver provision was "to facilitate the participation of ethanol in the transportation fuel industry while also limiting gasoline volatility

[31] 82 Fed. Reg. 34207
[32] 52 Fed. Reg. 31305
[33] 54 Fed. Reg. 11868, 11879
[34] 52 Fed. Reg. 31274, 31305 (emphasis added)
[35] 56 Fed. Reg. 64704, 64708

resulting from ethanol blending."[36] It was also recognized that "…gasoline and ethanol are mixed after the refining process has been completed. … [T]o require ethanol to meet a nine pound RVP would require the creation of a production and distribution network for sub-nine pound RVP gasoline. The cost of producing and distributing this type of fuel would be prohibitive to the petroleum industry and would likely result in the termination of the availability of ethanol in the marketplace."[37] The Agency also concluded, after extensive air quality modeling, that the 1.0 psi waiver would not result in increased ozone formation because reductions in exhaust hydrocarbons and carbon monoxide would offset the impact of potentially higher evaporative emissions.

The same conditions that led EPA to provide the original 1.0 psi interim RVP waiver in 1989 (i.e., the need to facilitate ethanol's participation in the marketplace, a lack of appropriate sub-RVP gasoline blendstock, and no adverse air quality impact) were again present when the Agency approved E15 blends for use in MY2001 and newer vehicles in 2011. Yet, this time EPA failed to extend the 1.0 psi waiver to E15, meaning the fuel is subject to a 9.0 psi RVP maximum in conventional gasoline markets during the summer ozone control season while the RVP limit for E10 remains at 10.0 psi.

This disparity in RVP limits for E10 and E15 has been a substantial barrier to growth in renewable fuel consumption. EPA's current RVP provisions are "outdated, unnecessary, or ineffective." Retailers who have chosen not to offer E15 consistently cite EPA's unbalanced application of the 1.0 psi waiver as the primary factor in their decision.[38] Meanwhile, the retail gas station owners in conventional gasoline areas who *have* made the investment to offer E15 are faced with a hopeless decision every spring: stop selling E15 during the summer volatility control season, or secure the appropriate low-RVP gasoline blendstock. For most retailers, neither of those options are economically acceptable business decisions. Indeed, some retailers who initially invested in E15 dispensing equipment have subsequently stopped offering the fuel, largely because of the RVP barrier.[39] In letters to former Administrators Lisa Jackson and Gina McCarthy, RFA has repeatedly asked that EPA remove this arcane barrier to renewable fuel expansion and we have proposed several potential solutions to this dilemma.[40] We again call upon EPA to act immediately on one of the pathways described below to resolve this barrier.

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[36] U.S. EPA. June 2011. "Regulation to Mitigate the Misfueling of Vehicles and Engines with Gasoline Containing Greater Than Ten Volume Percent Ethanol and Modification to the Reformulated and Conventional Gasoline Programs, Summary of Public Comments and Supplemental Response to Comments," at 82.

[37] S. Rep. No. 101-228, at 110 (1989)(Conf. Rep.); reprinted at 5 Leg. Hist. at 8450 (1993).

[38] See, for example, Truitt, Gary. Hoosier Ag Today. "A New Approach to Promoting Ethanol Discussed at Indiana Forum." May 11, 2017. ("Matt Nichols, with the fuel retailer Thornton's, told the forum *they will not put E-15 into a station unless they can sell it all year* (emphasis added))." https://www.hoosieragtoday.com/a-new-approach-to-promoting-ethanol-discussed-at-indiana-forum/

[39] See, for example, Lawhorn, Chad. *Lawrence Journal-World.* "In sign of times, Lawrence gas station owner pulls back a bit on alternative fuels; reports show summer gas prices likely to be higher." May 3, 2017. http://www2.ljworld.com/weblogs/town_talk/2017/may/3/in-sign-of-times-lawrence-gas-station-ow/

[40] Robert Dinneen, President & CEO, Renewable Fuels Association to the Honorable Lisa Jackson, Administrator, U.S. Environmental Protection Agency. May 14, 2010. Available at: http://ethanolrfa.org/wp-content/uploads/2015/09/RFA-Letter-to-Jackson-re-E15-and-RVP-5-14-10.pdf; Robert Dinneen, President & CEO, Renewable Fuels Association to the Honorable Lisa Jackson, Administrator, U.S. Environmental Protection Agency.

i. **Apply the existing 1.0 psi Reid vapor pressure (RVP) volatility waiver for E10 (9-10% ethanol by volume) to all fuel blends containing more than 9% ethanol by volume.**

We believe EPA can and should utilize the same rationale and regulatory authority it used in 1987 to allow blends containing "a minimum of 10% ethanol" to exceed RVP limits by 1.0 psi, which it relied upon again in 1989 to grant the interim 1.0 psi waiver.

Section 211(h)(4) of the Clean Air Act provides EPA with the authority to extend the 1.0 psi waiver to E15 fuels. Although the text of Section 211(h)(4) may be somewhat ambiguous with regard to whether "10 percent" is a maximum or minimum, or a precise numerical requirement, the legislative language, legislative history and Congressional intent all support EPA's extension of the RVP waiver to E15. Congress, in authorizing the 1.0 psi RVP waiver in Section 211(h)(4), determined that ethanol fuels should have preferential treatment over E0 with regard to evaporative emissions. Furthermore, EPA would be acting arbitrarily and inconsistently if it were to take the position that E10 and E15, which both have comparable evaporative emission profiles (the RVP of E15 is actually slightly lower than the RVP of E10), should be subject to two different RVP standards.

However, in order to fully level the playing field between E10 and E15, EPA must not only amend its regulations at 40 CFR 80.27 but also revise its E15 Partial Waiver issued under the authority of Section 211(f) to clarify that the RVP of E15 is limited to 10.0 psi. Although EPA has previously indicated[41] that it considers the provisions separate, Section 211(h)(4) and 211(f)(4) exist within the same statutory scheme and are mutually reinforcing to the point of almost being circular. The Section 211(f)(4) waiver is explicitly referenced in Section 211(h)(4) and effectively sets the ceiling for the volume of ethanol in a blend eligible for the 1.0 psi RVP waiver. Likewise, the Section 211(h)(4) waiver impacts Section 211(f)(4) by providing implicit Congressional consent for the additional evaporative vehicle emissions that would result from using an ethanol blend of at least 10 percent that has a RVP 1.0 psi higher than otherwise allowed in the certification test fuel.

ii. **Alternatively, EPA could promulgate rules requiring a 1.0 psi reduction in the maximum allowable RVP of conventional gasoline blendstock during the summer ozone control season.**

While we continue to believe EPA has the authority to extend the existing 1.0 psi waiver to all blends containing more than 9% ethanol, alternative approaches to resolving this barrier have also been suggested. One such alternative solution proposed by both RFA and the Alliance of Automobile Manufacturers, which is cited by EPA in a recent proposed rulemaking[42], would be to adopt rules that universally reduce the maximum allowable volatility of all conventional gasoline

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March 27, 2012. Available at: http://www.ethanolrfa.org/wp-content/uploads/2015/10/RFA-Letter-to-EPA-Administrator-Jackon-on-E15-and-RVP.pdf; Robert Dinneen, President & CEO, Renewable Fuels Association to the Honorable Gina McCarthy, Administrator, U.S. Environmental Protection Agency. September 5, 2014. Available at: http://bff.738.myftpupload.com/wp-content/uploads/2015/09/RFA-Letter-to-EPA-on-Fuel-Volatility-Regulations-and-E15.pdf

[41] 76 Fed. Reg. 4765

[42] 81 Fed. Reg. 80851

blendstock by 1.0 psi during the summer RVP control season (i.e., limit the volatility of CBOB gasoline blendstock to 8.0 psi).[43] This would effectively render the existing 1.0 psi waiver irrelevant and put all ethanol blends on evening footing.

iii. As another alternative, EPA could revisit its interpretation of "substantially similar."

Section 211(f)(1) of the Clean Air Act prohibits introducing into the market for the first time a new fuel or fuel additive that is "not substantially similar to any fuel or fuel additive utilized in . . .certification," absent a waiver pursuant to section 211(f)(4). [44] The same provision also makes it unlawful to "increase the concentration in use" of certain fuel additives—but, again, only those that are "not substantially similar to any . . . fuel additive utilized in . . . certification."[45]

Until 2017, ethanol-blended fuels were not substantially similar to a certification fuel additive, because the gasoline certification fuel contained no ethanol, and EPA's original waiver for E10 was limited to that "specified concentration" of ethanol. Beginning this year, however, the gasoline emissions certification fuel now contains 10 percent ethanol.[46] Because ethanol is a "fuel additive utilized in . . . certification," section 211(f)(1) arguably no longer limits ethanol blending in market fuel. Whatever range of interpretations it may allow, the term "substantially similar" cannot reasonably be interpreted to exclude fuel additives that are identical to those used in certification. At the very least, now that vehicle emissions certification fuel contains 10 percent ethanol, EPA should revisit its outdated rule interpreting "substantially similar" for purposes of section 211(f)(1). To the extent EPA wishes to impose controls on ethanol in market fuel, it may still utilize its authority under 211(c) to do so.

c. EPA's administration of the Cellulosic Waiver Credit program should be modified to better align with the goals of the statute

EPA is required by Clean Air Act section 211(o)(7)(D)(ii) to issue cellulosic waiver credits (CWCs) whenever it acts to waive any part of the RFS cellulosic biofuel volumetric standard pursuant to its authorities and obligations under section 211(o)(7)(D)(i). The purpose of the CWC is to allow obligated parties a means of complying with their cellulosic biofuel blending requirements even in the event that the actual physical availability of cellulosic biofuels and D3 RINs is lower than the standard finalized by EPA.

One of the key questions raised by stakeholders in recent years is how much authority EPA has to control the number of CWCs issued in any given year. While section 211(o)(7)(D)(iii) clearly specifies that the number of CWCs made available may not exceed the applicable volume of

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[43] See, Robert Dinneen, President & CEO, Renewable Fuels Association to Christopher Grundler, Director, Office of Transportation and Air Quality, U.S. Environmental Protection Agency. December 8, 2015. Available at: http://www.ethanolrfa.org/wp-content/uploads/2016/01/Request-for-EPA-Action-to-Reduce-RVP-Cap-of-Summer-Conventional-Gasoline_RFA_2015-12-08.pdf

[44] 42 U.S.C. §7545(f)(1).

[45] *Id.*

[46] *Control of Air Pollution From Motor Vehicles: Tier 3 Motor Vehicle Emission and Fuel Standards*, 79 Fed. Reg. 23414, 23810 (Apr. 28, 2014), *codified at* 40 C.F.R. § 1065.710(b)(2).

cellulosic biofuel (i.e., the cellulosic biofuel RVO for that calendar year), it clearly *does not* establish a minimum number of CWCs that must be made available by EPA. Congressional intent would suggest that EPA should only issue an amount of CWCs that would be equal to the difference between the final cellulosic biofuel standard and the amount of physical cellulosic biofuels and D3 RINs available to comply with the standard. In other words, the CWC was intended to narrowly serve as a means of offsetting any shortfall in the availability of cellulosic biofuels and D3 RINs to meet annual standards.

Unfortunately, EPA has interpreted the statute as allowing the Agency to issue an amount of CWCs that is "equal to" the cellulosic biofuel RVO for that year.[47] Thus, EPA's administration of the CWC program allows obligated parties to secure CWCs in lieu of securing available physical cellulosic biofuel gallons and/or D3 RINs. This potentially results in an oversupply of compliance instruments (D3 RINs and CWCs), which devalues physical cellulosic biofuel gallons and D3 RINs.

In essence, obligated parties are not truly required to secure physical gallons and/or D3 RINs and can instead comply with the cellulosic biofuel requirements by securing CWCs from EPA. For instance, the 2015 cellulosic biofuel RVO was 123 million gallons and actual D3 RIN generation was 142 million RINs.[48] This means D3 RIN generation was 15 percent greater than the annual D3 RIN requirement in 2015. Yet, even with an oversupply of D3 RINs to meet the 2015 cellulosic biofuel RVO, obligated parties chose to purchase 13 million CWCs rather than securing 13 million RINs to demonstrate compliance. "Stranding" D3 RINs in this way results in an artificially inflated supply of compliance instruments, devalues the RINs, and discourages investment in cellulosic biofuels.

RFA and other stakeholders[49] have repeatedly raised this concern with EPA and proposed a simple solution: EPA should only issue an amount of CWCs annually that coincides with any shortfall in the availability of physical gallons of cellulosic biofuels and RINs to meet the final standards. For example, if the combination of actual production of cellulosic biofuel and available RINs exceeds the final cellulosic biofuel RVO in a given year (as it did in the 2015 example above), EPA should not issue any CWCs at all. Ensuring that the maximum volume of CWCs issued corresponds with the shortfall in physical gallons or RINs needed to meet the RVO would sharpen the incentive for obligated parties to secure offtake of actual cellulosic biofuel gallons, which is inarguably the purpose of the statute.

d. EPA should ensure that grain ethanol producers using Efficient Producer Pathways to generate D6 RINs are able to simultaneously generate D3 RINs for cellulosic ethanol derived in situ from corn kernel fiber

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[47] See CFR §80.1456, accessed at 75 Fed. Reg. 14892. U.S. EPA states that "[t]he total cellulosic biofuel waiver credits available will be equal to the reduced cellulosic biofuel volume established by EPA for the compliance year."
[48] U.S. Environmental Protection Agency. "Public Data for the Renewable Fuel Standard," accessed Aug. 28, 2017. https://www.epa.gov/fuels-registration-reporting-and-compliance-help/public-data-renewable-fuel-standard
[49] See memorandum from RFA and Advanced Biofuels Business Council. "Issuance of Cellulosic Biofuel Waiver Credits as part of the RFS." Jan. 7, 2015. Submitted to Christopher Grundler, Director of EPA Office of Transportation and Air Quality, Jan. 16, 2015.

Roughly 40 percent of existing corn ethanol plants have applied for, and received EPA approval of, conventional renewable fuel (D6) RIN generation pathways for new or expanded ethanol production capacity (i.e., above "grandfathered" limits). Many of these facilities have utilized EPA's Efficient Producer Pathway Petition (EP3) process, which was intended to reduce the administrative burden and reduce the wait time associated with applying for a new pathway.

RFA was recently made aware that several ethanol plants considering adoption of corn kernel fiber cellulosic ethanol technologies have been advised by EPA that they would not be able to use their approved EP3 pathway to generate D6 RINs while concurrently generating D3 RINs for corn fiber cellulosic ethanol produced in situ. This preclusion apparently stems from EPA's rigid interpretation of the EP3 approval letters and the Agency's belief that current lifecycle GHG accounting methods and verification practices are unable to appropriately allocate energy use and emissions to both ethanol streams (i.e., corn starch and in situ corn kernel fiber).

This decision by EPA is discouraging innovation in the biofuels industry and undermining investments in "bolt-on" technologies to expand cellulosic ethanol production. We strongly encourage EPA to rectify this situation as soon as possible so that ethanol plants can simultaneously generate D3 RINs for cellulosic ethanol and utilize EP3 pathways to generate D6 RINs. As we recommended in our comments responding to EPA's solicitation for comments in response to Executive Order 13777, the simplest way to remedy this situation would be to revise EPA's "baseline" lifecycle GHG analysis of corn ethanol.[50] This would make the EP3 program no longer necessary or relevant since an updated analysis would surely show *all* dry mill corn ethanol (e.g. whether grandfathered or not) reduces GHG emissions by far more than 20 percent relative to 2005-era petroleum.

e. The registration process and required RIN accounting methods for producers of cellulosic ethanol from corn kernel fiber should be streamlined and simplified

EPA's onerous registration requirements and the lack of clarity on acceptable methods for quantifying volumes of cellulosic biofuel from corn fiber versus non-cellulosic biofuel (i.e., starch) is creating an unnecessary barrier to broader adoption of cellulosic biofuel technologies.

The proposal's projection of 2018 cellulosic biofuel production excludes potential cellulosic biofuel output from companies that have not yet registered with the Agency. EPA notes that "none of these companies have successfully registered a facility to generate cellulosic RINs using their technology."[51] The Agency suggests that "[i]f the outstanding technical issues related to these processes are resolved prior to the final rule, EPA anticipates including production projections from these technologies in our projection of cellulosic biofuel production for 2018."[52]

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[50] Renewable Fuels Association. "Comments on Executive Order (EO) 13777, 'Enforcing the Regulatory Reform Agenda.' (EPA-HQ-OA-2017-0190; 82 Fed. Reg. 17793)." May 15, 2017. http://www.ethanolrfa.org/wp-content/uploads/2017/05/EO-13777-comments_RFA.pdf

[51] 82 Fed. Reg. 34216

[52] *Id.*

We strongly encourage EPA to simplify and streamline the process for registering corn kernel fiber pathways, much like the Agency did with its EP3 process for corn ethanol producers seeking D6 RIN generation for volumes above their grandfathered limits. Further, we believe the Agency should issue more detailed guidance on acceptable methodologies for RIN generation and accounting when multiple feedstocks (i.e., corn starch and corn fiber) are processed simultaneously to generate multiple fuel types (i.e., conventional and cellulosic) and RIN D-codes.

ATTACHMENT A

Analysis of Whether the Prices of Renewable Fuel Standard RINs Have Affected Retail Gasoline Prices

Prepared for the Renewable Fuels Association
October 2017

Informa Agribusiness Consulting

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Key Findings

- Changes in the prices of renewable identification numbers (RINs) did not cause changes in retail gasoline prices from 2013 through the summer of 2017.
- Retail gasoline prices were driven primarily by movements in crude oil prices and secondarily by changes in the spread between domestic and international crude oil prices and the level of vehicle miles driven in the US, which varies seasonally.

Background and Introduction

The Renewable Fuel Standard, which requires gasoline sold in the US to contain at least certain minimum volumes of biofuel, was established in the Energy Policy Act of 2005. Two years later, the Energy Independence and Security Act of 2007 significantly expanded the previous volumetric requirements, and the revised Renewable Fuel Standard (known as RFS2) was allocated among specific categories of renewable fuels.

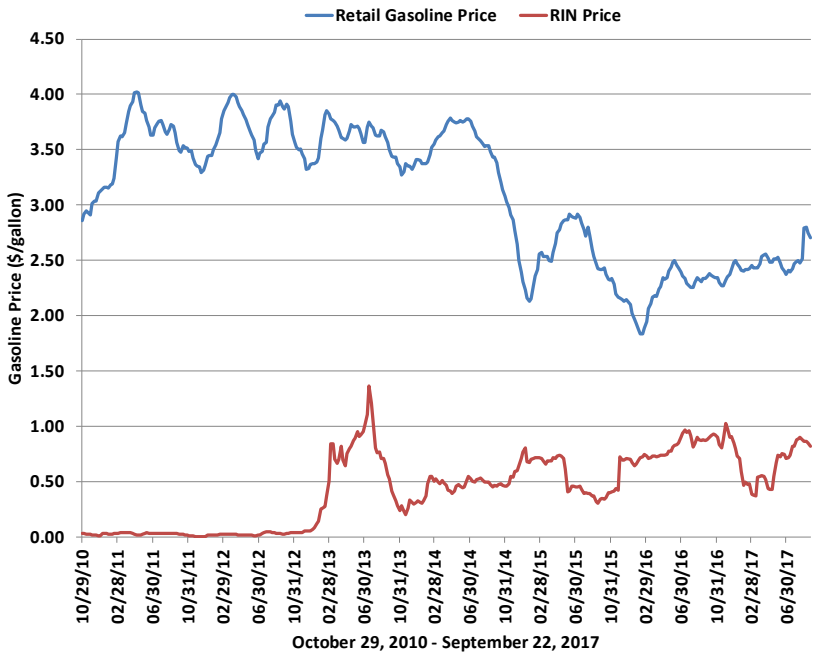
A system of renewable identification numbers was designed by the EPA for compliance with RFS2. A RIN is a 38-digit code representing a specific volume of renewable fuel. RINs are generated by a producer or importer of renewable fuel. Once the fuel is blended, the separated RINs can be used by obligated parties (mainly refiners) for compliance purposes, held in inventory for future compliance or traded to other companies.

In early 2013, market participants began to realize that ethanol usage could fall well short of levels needed to meet RFS2 in the future, and prices of conventional ethanol RINs (known as “D6” RINs) rose to levels that were multiples of prices that had been experienced previously, spiking to nearly $1.50 during July 2013. This was partly a result of the 2012 drought, which reduced the size of the corn crop and led to record-high corn prices. Some ethanol plants were idled in late 2012 and early 2013, as market prices for ethanol were not sufficient to allow producers to offset higher production costs.

During the late summer and early fall of 2013, RIN prices dropped precipitously. In November 2013, the EPA proposed substantial cuts to the volumes required in 2014 for all RFS2 standards except the one for biomass-based diesel. The general structure of the proposal had become known to industry and the press in advance of the official release. Conventional ethanol RIN prices also reached a bottom in November 2013.

Conventional ethanol RIN prices then rebounded and rose to an average of $0.70 during the first quarter of 2015. On the other hand, gasoline prices fell by one-third between the week of July 4, 2014, and the end of the first quarter of 2015 (Exhibit 1). This was driven by a substantial drop in oil prices. Since that time, both RIN and retail gasoline prices have been volatile, but they have stayed within broad ranges.

Exhibit 1: Weekly Retail Gasoline and Conventional Ethanol (D6) RIN Prices



Sources: DOE-EIA (Gasoline Prices), OPIS (RIN Prices)

In the past, some commentators speculated that RIN prices might have driven retail gasoline prices higher. While such speculation has ebbed since the RIN price spike of mid-2013, such allegations still are in the public discourse from time to time. During and shortly after the initial price spike, difficulties in conducting near-real-time analysis were compounded by limited historical data, as RINs for the different categories of biofuels under RFS2 had only traded since 2010.

Now that additional time has passed, the Renewable Fuels Association ("RFA") commissioned Informa's Agribusiness Consulting Group ("Informa") to conduct an analysis of whether the RIN prices changes have been driving gasoline prices for US consumers, or if not, to determine the main factors that actually have caused retail gasoline price changes.

Informa conducted its analysis in two phases. First, Informa used a statistical method to determine whether changes in RIN prices "caused" (i.e., were a significant driver of) changes in retail gasoline prices. Second, a streamlined statistical regression "explaining" gasoline price movements was developed. If it were concluded in the first phase that changes in RIN prices have "caused" changes in gasoline prices, they would be considered as an explanatory variable in the regression developed during the second phase.

Causality Analysis

In order to test whether or not changes in RIN prices "caused" changes in retail gasoline prices, a statistical method called a Granger causality analysis was utilized. Weekly

average D6 RIN prices reported by OPIS for the period spanning from October 29, 2010, to September 22, 2017, were paired with weekly average retail gasoline prices reported by the Energy Information Administration ("EIA") for the same time period. Prior to use in the Granger models, the data were differenced, and thus the resulting models were built using the weekly change in RIN prices compared to the weekly change in gasoline prices.

Of primary interest was the question: Did changes in RIN prices cause gasoline prices to change? In the past, the discussion centered around whether higher RIN prices caused higher retail gasoline prices. However, as can be seen in Exhibit 1, retail gasoline prices fell dramatically after the summer of 2014, whereas RIN prices were relatively steady through the summer and fall of 2014 before trending moderately higher (with considerable volatility) through 2017.

To test the question of causation, a two-stage process was utilized. First, an initial model was developed that specified the current change in gasoline price as a function of the previous week's change in the price of gasoline. Next, a secondary model was constructed identical to the first, except that the previous week's change in the RIN value was added as an explanatory variable.

The idea behind the Granger causality analysis is simple: If the second model (containing the lagged RIN variable) is superior to the initial model, then this means that the previous week's RIN price has some explanatory power relative to the current week's gasoline price. If this is found to be the case, then it can be asserted that gasoline price changes are "caused" to some extent by changes in the RIN price. The term "caused" is used loosely here, since it does not imply that the RIN price was the only factor affecting gasoline prices. In the context of this analysis, the term "caused" would simply refer to the presence of some connection between the change in the RIN price and subsequent changes in gasoline prices.

To determine if one model is superior to another, it is appropriate to look at the size of the error terms associated with each model (i.e., the difference between the actual prices observed and the prices that would have been predicted by the model). If the errors from one model are significantly smaller than those of the other, this implies that the model has superior predictive power, and thus, is a better representation of reality.

Granger causality analysis compares the sum of squared errors associated with the model containing the RIN variable with same statistic for the model that does not contain the RIN variable. Exhibit 2 provides the results of the Granger causality analysis. The P-values reported in the table measure the probability that the errors from the unrestricted model (the one containing RIN values) are the same as the errors from the restricted model (no RIN value). There is an 98.5% probability these model errors are not significantly different, leading to the conclusion that changes in RIN prices do not appear to cause changes in gasoline prices.

Exhibit 2: Results of the Granger Causality Test

	---- P Values -----
RIN Price Causes Gas Price	**0.985**
Gas Price Causes RIN Price	**0.481**
	---- Significant at 5% Level? -----
RIN Price Causes Gas Price	**N**
Gas Price Causes RIN Price	**N**

P-values are the probability that the sum of squared errors in the unrestricted model is not different from the sum of squared errors in the restricted model.

It is worth noting that as an auxiliary part of this analysis, a second set of models was prepared that reversed the flow of causality, in order to examine whether or not changes in the gasoline price caused changes in RIN values. In the reverse case, there is a 48% probability that there is no difference between the models, and though this is much lower than for the RIN-to-gasoline case – implying that there is a higher probability from a statistical perspective that changes in gasoline prices "caused" changes in RIN prices – this is not considered strong enough to make this conclusion.

In summary, the evidence from the Granger causality work leads to the conclusion that changes in RIN prices have not caused changes in retail gasoline prices (or vice-versa). To any extent that the two are related, it is not a direct causal relationship.

Gasoline Price Drivers

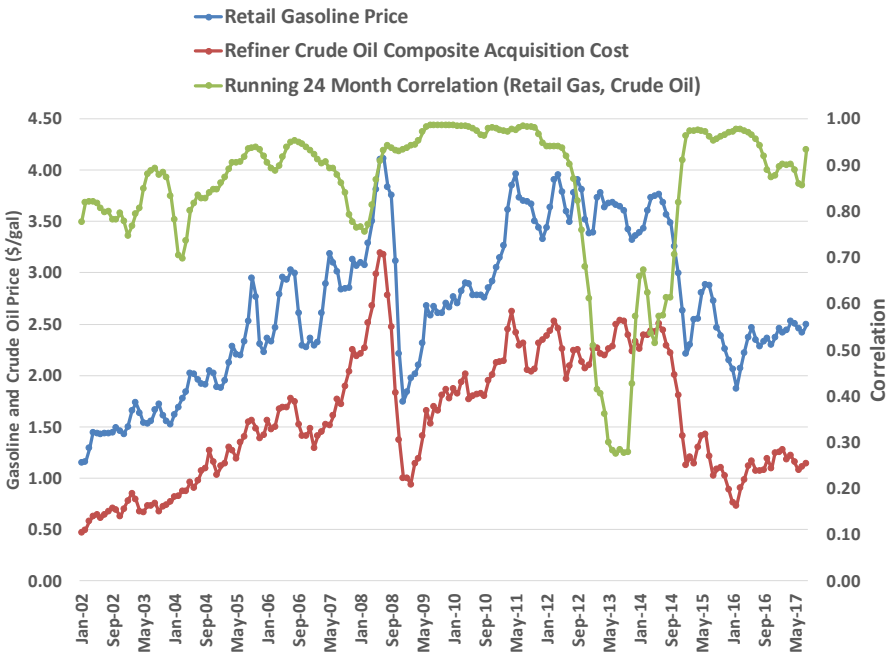
Given the results of the analysis above, a second question naturally arises: What does drive retail gasoline prices? Accordingly, the second phase of the analysis examines the key factors that do "explain" retail gasoline price movements. It should be remembered that RINs were created only in the aftermath of the establishment of the Renewable Fuel Standard in 2005, and the differentiation of RINs by biofuel category did not take effect until 2010, whereas gasoline prices have been volatile for decades.

The primary driver of retail gasoline prices is crude oil prices, as crude oil is the primary input to gasoline production. Historically, the running 24-month correlation between crude oil[1] and retail gasoline prices has generally been between 0.80 and 0.99, which indicates a very strong relationship, given that a coefficient of 1.00 would indicate perfect positive correlation (Exhibit 3).

[1] For each month illustrated, the correlation between crude oil and retail gasoline prices during the previous 24 months was examined. Refinery composite crude oil acquisition cost data was utilized to represent crude oil costs for US refineries, as this reflects a weighted US average of imported and domestic crude oil used to produce gasoline.

Exhibit 3: Monthly Retail Gasoline and Crude Oil Price Relationship

(January 2002 – August 2017)



Sources: EIA (Prices); Informa (Analysis)

This relationship began to show signs of weakening starting in the spring of 2012. One of the key factors behind the weakening has been the divergence between international and domestic crude oil prices and the heightened volatility of the spread between these prices[2]. This divergence was mainly attributable to growing crude oil stocks at inland locations – especially the delivery point for NYMEX crude oil futures at Cushing, Oklahoma – as a result of a combination of increased domestic oil production from shale plays such as North Dakota's Bakken formation and lagging infrastructure construction to move the oil to consumption centers. The oil-price spread has narrowed significantly, particularly since 2014, as infrastructure came online to facilitate movements of crude oil to the Gulf Coast.

Another relatively recent development is that the US has emerged as a significant exporter of gasoline. Brent crude oil serves as an international benchmark and influences the pricing of gasoline in international markets. Consequently, the previously wide and still volatile spread between Brent crude oil prices and US oil prices has also added a layer of complexity to US gasoline-pricing dynamics.

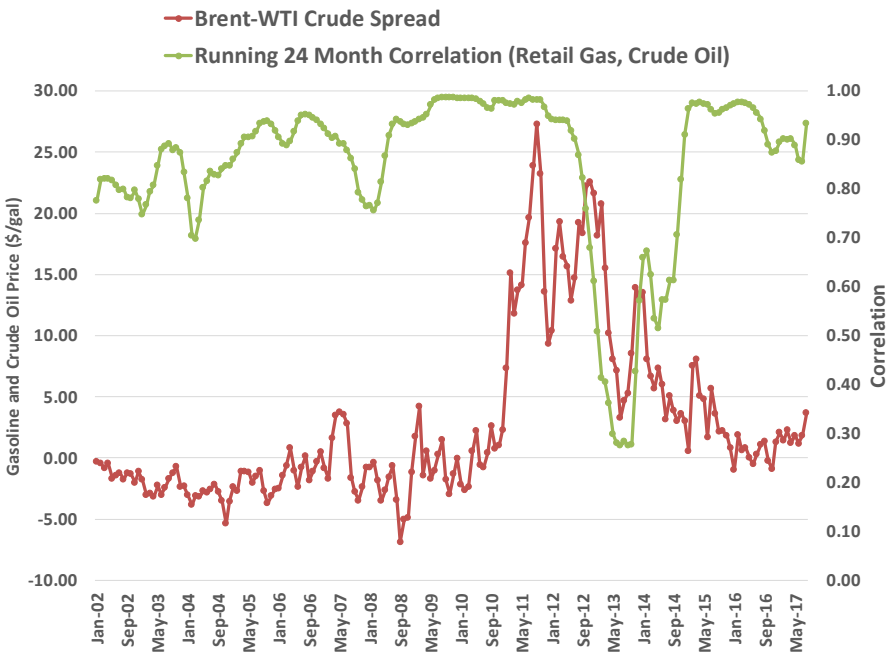
As illustrated in Exhibit 4, the weakening relationship between crude oil and retail gasoline prices followed the growing spread between US West Texas Intermediate (WTI) and

[2] Brent crude oil prices were utilized to represent prices in the international market, and WTI prices were utilized to represent prices in the domestic market.

Brent crude oil prices between 2011 and 2014[3]. It is notable that this weakening price relationship preceded the increase in RIN prices that occurred starting in early 2013. Additionally, since 2015 the correlation between crude oil and retail gasoline prices has returned to previous high levels.

Exhibit 4: Monthly Brent-to-WTI Crude Oil Price Spread vs. Retail Gasoline and Crude Oil Price Correlation

(January 2002 – August 2017)



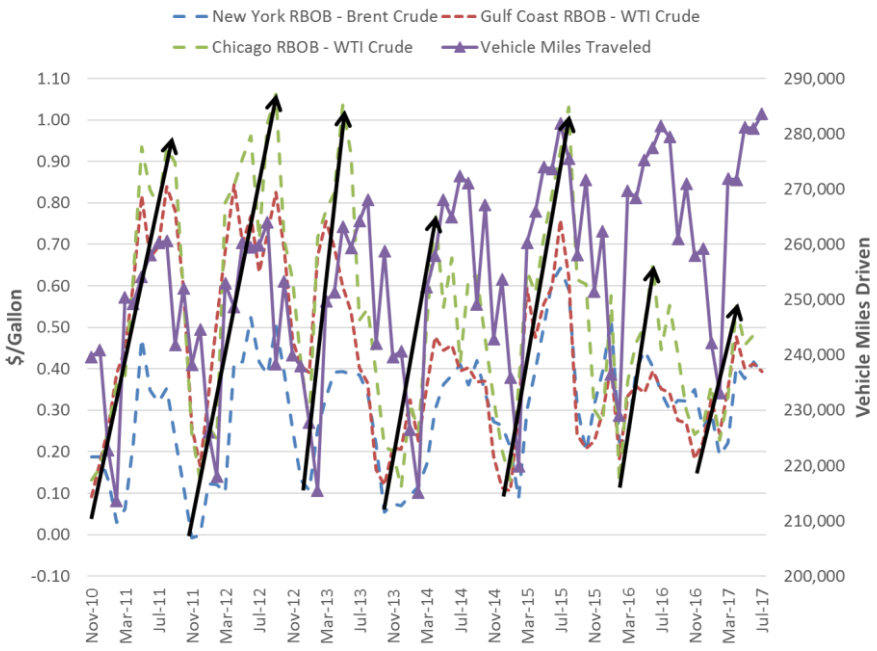
Sources: EIA (Prices); Informa (Analysis)

Another factor affecting retail gasoline prices is seasonal demand. There is a distinct seasonal pattern to gasoline prices and crack spreads (i.e., the margins refiners earn by processing crude oil into transportation fuels, in this case gasoline). Gasoline prices and crack spreads tend to slump during the last quarter of the calendar year, particularly November and December, and then strengthen considerably through the first quarter of the year and remain strong through the summertime driving season (see Exhibit 5). A key factor behind this trend is the increase in vehicle miles driven during the summer months, which is anticipated by the markets and prepared for by refiners.

[3] It is notable that the chart uses a 24-month correlation, and thus there is a lag between when the Brent-WTI price spread begins to expand and when the correlation between crude oil and retail gasoline prices appears to weaken in the chart.

Exhibit 5: Seasonal Crack Spreads and Vehicle Miles Driven

(November 2010 – July 2017)



Sources: EIA (crude oil prices), OPIS (RBOB prices), US Department of Transportation (vehicle miles traveled), and Informa (analysis)

The relative role of each of the above factors in explaining movements in retail gasoline prices was estimated econometrically[4], and results are presented in Exhibit 6. A majority of the movement in gasoline prices can be explained by changes in crude oil prices. A $0.10/gallon increase in crude oil prices ($4.20/barrel) has resulted in a roughly $0.09/gallon increase in retail gasoline prices, all else being held equal. In the model, variables for the Brent-WTI crude oil price spread and vehicle miles driven were also statistically significant, and they improved model performance somewhat. Together these variables explain 96% of the historical retail gasoline price movements (as indicated by the adjusted R-squared statistic).

Exhibit 6: Retail Gas Price Model

Dependent Variable = U.S. Retail Gasoline Price

Explanatory Variable	Coefficient	Statistically Significant at 5% Level
Intercept	-0.157	
Refiner Crude Oil Composite Acquisition Cost	0.922	Yes
Brent - WTI Crude Oil Price Spread	0.018	Yes
Vehicle Miles Driven	5.628 * 10^-6	Yes
Adjusted R-Squared = .956		

Source: Informa

[4] Monthly data from April 2008 – July 2017 was utilized within this regression.

Conclusions

Based on statistical analysis, it can be concluded that changes in RIN prices did not "cause" the changes that occurred in retail gasoline prices in 2013, and this has continued to be the case through the summer of 2017.