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OVERSIGHT OF THE RENEWABLE FUEL STANDARD

HEARING

BEFORE THE

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS UNITED STATES SENATE

ONE HUNDRED FOURTEENTH CONGRESS

SECOND SESSION

FEBRUARY 24, 2016

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ONE HUNDRED FOURTEENTH CONGRESS
SECOND SESSION

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OVERSIGHT OF THE RENEWABLE FUEL STANDARD

WEDNESDAY, FEBRUARY 24, 2016

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
Washington, DC.

The committee met, pursuant to notice, at 10 a.m. in room 406, Dirksen Senate Office Building, Hon. James Inhofe (chairman of the committee) presiding.

Present: Senators Inhofe, Boxer, Vitter, Barrasso, Crapo, Wicker, Fischer, Rounds, Carper, Whitehouse, Merkley, Gillibrand, and Markey.

OPENING STATEMENT OF HON. JAMES M. INHOFE, U.S. SENATOR FROM THE STATE OF OKLAHOMA

Senator INHOFE. Our meeting will come to order.

The Renewable Fuel Standard is not necessarily a partisan issue; it is often a geographic issue, supported and opposed by Republicans and supported and opposed by Democrats all for different reasons. The Senate is currently considering energy legislation on the floor and, like we do at every opportunity, Senators on both sides of the aisle have proposed changes to the RFS, expanding ethanol use, eliminating ethanol use, and eliminating the mandate altogether. That is where I fall.

Since Congress enacted the RFS in 2005 and expanded it in 2007, the world has changed. America now produces more oil at home, imports less from abroad, consumes less gasoline, and emits less carbon from oil-based fuels. Most of the rationale originally justifying the RFS has disappeared. All we have left is an unstable program rooted in the EPA's waiving entire portions of annual requirements, allowing imported soybeans and ethanol from South America to count toward the RFS and regularly missing implementation deadlines.

This year, the EPA was so far behind schedule that they were forced to propose 3 years of volume requirements in a single package. The 2014 volumes were 730 days late, the 2015 were 365 days late, and the EPA's mismanagement of the RFS has been rife with frequent delays, litigation, and even fraud from imaginary biodiesel production. EPA has hurt every party involved, from corn producers to refiners.

Now, at the heart of today's discussion is the fact that it is time for Congress to revisit the RFS. In fact, Congress must revisit the RFS by 2022, when the tables in the Clean Air Act end, or U.S.

fuels policy will be left in the hands of the EPA, and I think we agree that is not good.

EPA mismanagement is compounded by concerns that the compliance market is not working properly. Biofuel production has not reached the levels that were expected when the program was created. In recent years, gasoline demand has leveled partially as a result of EPA's vehicle efficiency requirements, while the RFS has increased. Biofuels are more expensive than gasoline.

Oklahoma is full of gas stations advertising. Where is my sign here? You see this on almost every corner in Oklahoma as you go through, a sign saying that it is very clear what the people want in the State of Oklahoma. Yet, regardless of consumer demand, EPA is pushing increased ethanol brands like 15 percent and higher to levels that can corrode engines and void vehicle warranties. These are just a few of the reasons why I continue to oppose RFS, which I have done since it was expanded in 2007.

I am pleased to have both the EPA and the EIA here today, as they are uniquely positioned to provide us valuable insight into the implementation and future of the RFS. Our other witnesses will discuss the impact EPA's management has on program participants and the economy, and they will raise some potential ideas to fix this broken mandate.

Today's hearing is an opportunity to reassess the longevity of RFS, the achievability in the statute volumes, EPA's administration of the program, and the potential of ramifications to America's energy security and the environment. I look forward to this.

What time did we decide the vote was this morning?

Senator BOXER. Noon.

Senator INHOFE. Noon. OK. I was right?

Senator BOXER. I was wrong.

Senator INHOFE. Well, you have every right to be wrong.

Senator BOXER. I hate to say those words, I was wrong.

Senator INHOFE. All right. Well, we will recognize you since you are wrong.

Senator BOXER. Thanks a lot. Not on this subject.

OPENING STATEMENT OF HON. BARBARA BOXER, U.S. SENATOR FROM THE STATE OF CALIFORNIA

Senator BOXER. Congress created the Renewable Fuel Standard to promote a strong domestic renewable energy industry, reduce our dependence on foreign oil, and cut dangerous emissions of carbon pollution that cause climate change. These are exactly the types of goals our Country should be focused on, and the RFS is designed to accomplish these while also creating jobs.

A central focus of the program is to encourage the development of fuels such as cellulosic ethanol and advanced biofuels which can turn waste into fuel. By this measure, the program is on track to be successful. By 2022, the RFS program will reduce carbon pollution by 138 million metric tons, which is nearly the annual emissions of 27 million cars.

Now, some of my colleagues and others testifying today are going to criticize the RFS, as is their right. To those who claim that the RFS will raise gasoline and food prices, it is best to start with the facts.

First, the EPA has shown that complying with the RFS does not increase gas prices. Second, the price of corn today is roughly the same as it was in 2007, when the RFS was established. The critics making these claims want to repeal or undermine the RFS. Frankly, that will benefit the oil companies and I believe will hurt the American people.

The implementation of the RFS has not been perfect, I admit that, but the law is sound. Congress designed the RFS to be managed in a flexible common sense way. We gave EPA the authority to make certain adjustments when necessary.

As I have said before, legislative changes to the RFS are not needed, and I will do everything in my power to stop any legislation to modify or undermine this landmark law. We should first focus on making sure the law we have on the books works. That is why I am pleased that we are having this oversight hearing which gives us the opportunity to examine the program. I do believe in greater energy security, giving consumers a choice, and reducing carbon pollution.

Yesterday, in the lead story of The New York Times, it was reported that sea level rise is the highest it has been in 28 centuries. That is 2,800 years. So climate change is upon us and the RFS plays an important role in addressing the cause of that climate change, and that is why I believe we need to continue it and we need more biofuels in the marketplace. The U.S. should be a leader and should not fall behind other parts of the world like Brazil, China, Europe, which continue to invest heavily in production of biofuels.

Now, I do disagree with the EPA on this. I think that the biofuel targets EPA included in its final rule last year were low, were unnecessarily low. EPA should be setting stronger biofuels volume targets that drive investments and innovation and make progress toward cleaner advanced biofuels.

We now have a much better sense of what sustained support of renewable biofuels can do. For example, there are now multiple advanced cellulosic ethanol refineries in the United States that are producing fuel. One of these plants in Iowa is the largest cellulosic ethanol plant in the world and will produce fuel that has 90 percent less carbon emissions than gasoline. This is important progress, but much more could be done. So, moving forward, I urge EPA to set robust targets that result in increased investments in both biofuels production and the infrastructure necessary to bring these fuels to market.

Mr. Chairman, this is another glaring case where you and I come at it differently, but it is with great respect that I thank you for holding these hearings, and I look forward to hearing from our witnesses.

Senator INHOFE. Very good.

We will start with you, Ms. McCabe, and we will move on to Mr. Gruenspecht.

STATEMENT OF JANET MCCABE, ACTING ASSISTANT ADMINISTRATOR FOR AIR AND RADIATION, ENVIRONMENTAL PROTECTION AGENCY

Ms. MCCABE. Thank you very much, Chairman Inhofe, Ranking Member Boxer, and other members of the Committee. I am very pleased to be here this morning and have the opportunity to testify on the Renewable Fuel Standard program and on EPA's recent final rule setting the annual volume standards for 2014, 2015, and 2016, and the biomass-based diesel volume requirement for 2017.

The RFS program began in 2006 under the Energy Policy Act of 2005. The program's requirements were then modified by the Energy Independence and Security Act of 2007, EISA. The stated goals of that law include moving the United States toward "greater energy independence and security," and increasing "production of clean renewable fuels." The law established new volume targets for renewable fuels, reaching a total of 36 billion gallons by 2022, including 21 billion gallons of advanced biofuels.

The amended statute also included a number of new provisions, including greenhouse gas emission thresholds for qualifying biofuels. After an extensive notice and comment process, including working closely with our Federal partners at the USDA, the Department of Energy, and others, EPA finalized regulations to implement these requirements, and those regulations went into effect in July 2010.

The law requires EPA to issue annual standards for four different categories of renewable fuels: total fuel, advanced fuel, biomass-based diesel, and cellulosic fuel. These standards designate the percent of each biofuel category that producers and importers of gasoline and diesel must blend into transportation fuel, heating oil, and/or jet fuel. On November 30, 2015, we issued a final rule to establish the annual volume standards for cellulosic biofuel, biomass-based diesel, advanced biofuel, and total renewable fuel that apply for the years 2014, 2015, and 2016, and we also established the applicable volume of biomass-based diesel, which is also referred to as biodiesel, that will be required in 2017 in accordance with the requirements of the rule and the law. The Clean Air Act requires EPA to issue renewable fuel standards by November 30 of each year for the following year and 14 months in advance for biomass based diesel category.

With this final rule, EPA established volume requirements that will increase the amount of biofuel in the market over time, going beyond historic levels. The final standards provide for ambitious yet achievable growth, and strongly incentivize growth in advanced fuels that achieve substantial greenhouse gas reductions compared to the transportation fuels that they replace. When Congress passed the RFS provisions, it set annual targets for renewable fuel that increase every year through 2022. It also included tools, known as the waiver provisions, for EPA to use to adjust those statutory targets in specified circumstances, including where the statutorily prescribed volumes could not be met.

Biofuel use over the past decade has increased significantly, especially for ethanol and biodiesel, and recently we have seen important developments in the production of advanced renewable fuels, including cellulosic biofuels. This is encouraging because cellulosic

biofuels are the biofuels that have the lowest lifecycle greenhouse gas emissions. Most of the growth in the law's renewable fuel targets for 2015 and beyond comes from these advanced cellulosic biofuels. We are committing to doing what we can to encourage and support production and blending of such fuels to maximize reductions in greenhouse gases.

Our recently issued final rule seeks to ensure that the growth of renewable fuel production and use continues, consistent with congressional intent. It uses the waiver authorities in a judicious way to establish ambitious but responsible and achievable standards. The final rule addresses 3 years' worth of standards, and sets the volume requirement for biodiesel for a fourth year. For 2014 and 2015, we finalized standards at levels intended to reflect the actual amount of biofuel used domestically. For 2016, and for 2017 for biodiesel, the standards we have finalized through use of the waiver authorities provides for significant increases over past levels. Those final volumes for total and advanced fuels reflect our consideration of two essential factors: first, that the market can respond to ambitious volume targets; and second, that there are limits today to the volumes that can be supplied to consumers.

Many of our stakeholders, and indeed many in Congress, rightly want to know why some of the volume targets established in the statute cannot be reached. There are several reasons: slower than expected development of the cellulosic biofuel industry and the resulting shortfall in cellulosic biofuel supply, a decline in gasoline consumption rather than the growth projected in 2007, and constraints in supplying certain biofuels to consumers, ethanol at greater than 10 percent of gasoline, in particular.

Our final rulemaking includes a discussion of this last constraint, known as the "E10 blend wall." If gasoline demand is flat or trends downward, increasing the amount of ethanol used in the fuel pool will require significantly greater use of fuels with higher ethanol content, such as 15 percent ethanol, or E15, or blends of up to 85 percent ethanol, or E85, which can be used in flexible fuel vehicles.

EPA has taken steps to enable the use of higher-level ethanol blends, including granting partial waivers for the use of E15 in certain light-duty cars and trucks beginning with model year 2001. USDA has also put resources into expanding ethanol fueling infrastructure. At the same time, EPA recognizes that there are currently real limitations in the market to the increased use of these higher ethanol content fuels, including current near term limits on fueling infrastructure.

So our final rule balances those two dynamics. Our final volumes reflect substantial growth over past historic volumes and we believe these volumes are achievable and necessary and consistent with Congress's clear intent to drive renewable fuel up. We are also taking other steps within our administration of the RFS program to improve the quality, transparency, and efficiency of our petition review for new biofuels pathways that can count under the RFS program, and I can talk about those more in response to comments.

So we recognize that this is a challenging statute, that we have a particular job that Congress gave us to implement it, and intend to continue doing that in the best way we can, working with all interested stakeholders.

So thank you. I am sorry I went on a little bit too long. It is a complicated subject matter, but I thank you for being here today.

[The prepared statement of Ms. McCabe follows:]

Janet McCabe
Acting Assistant Administrator
Office of Air and Radiation
U.S. Environmental Protection Agency

Committee on Environment and Public Works
U.S. Senate
February 24, 2016

Statement

Chairman Inhofe, Ranking Member Boxer, and other members of the Committee, I appreciate the opportunity to testify on the Renewable Fuel Standard (RFS) program and the EPA's recent final rule setting the annual volume standards for 2014, 2015, and 2016, and the biomass-based diesel volume requirement for 2017.

The RFS program began in 2006 under the Energy Policy Act of 2005. The program's requirements were then modified by the Energy Independence and Security Act of 2007 (EISA). EISA's stated goals include moving the United States toward "greater energy independence and security," and increasing "production of clean renewable fuels." EISA established new volume targets for renewable fuel, reaching a total of 36 billion gallons by 2022, including 21 billion gallons of advanced biofuels. The amended statute also included a number of new provisions, including greenhouse gas emission thresholds for qualifying biofuels. After an extensive notice and comment process, including working closely with our federal partners at the U.S. Department of Agriculture (USDA) and U.S. Department of Energy (DOE), EPA finalized regulations to implement the EISA requirements. Those regulations went into effect in July 2010.

EISA requires EPA to issue annual standards for four different categories of renewable fuels: total, advanced, biomass-based diesel, and cellulosic. These standards designate the percentage of each biofuel category that producers and importers of gasoline and diesel must blend into transportation fuel, heating oil, and/or jet fuel. On November 30, 2015, we issued a final rule to establish the annual volume standards for cellulosic biofuel, biomass-based diesel, advanced biofuel, and total renewable fuel that apply for years 2014, 2015, and 2016. We also established the applicable volume of biomass-based diesel, commonly referred to as biodiesel that will be required in 2017. The Clean Air Act requires EPA to issue renewable fuel standards by November 30 of each year for the following year and 14 months in advance for the biomass-based diesel category.

With this final rule, EPA established volume requirements that will increase the amount of biofuel in the market over time, going beyond historic levels. The final standards provide for ambitious yet achievable growth—and strongly incentivize growth in advanced fuels that achieve substantial greenhouse gas (GHG) reductions compared to the transportation fuels they replace. When Congress passed the RFS provisions, it set annual targets for renewable fuel use that increase every year through 2022. It also included tools, known as the waiver provisions, for EPA to use to adjust the statutory targets in specified circumstances, including where the statutorily prescribed volumes could not be met.

Biofuel use over the past decade has increased significantly, especially for ethanol and biodiesel, and recently we have seen important developments in the production of advanced renewable fuels, including cellulosic biofuel production. This is encouraging, because cellulosic biofuels are the biofuels that have the lowest lifecycle GHG emissions. Most of the growth in EISA's renewable fuel targets for 2015 and beyond comes from these advanced cellulosic biofuels. We are committed to doing what we can to encourage and support production and blending of such fuels to maximize reductions in greenhouse gases.

Our recently issued final rule seeks to ensure that the growth of renewable fuel production and use continues – consistent with Congressional intent. It uses the waiver authorities, in a judicious way, to establish ambitious but responsible and achievable standards. The final rule addresses three years' worth of standards, and sets the volume requirement for biomass-based diesel for a fourth year. For 2014 and 2015, we finalized standards at levels intended to reflect the actual amount of biofuel used domestically. For 2016 – and for 2017 for biomass-based diesel – the standards we have finalized through use of waiver authorities provide for significant increases over past levels. The final 2016 volumes for total and advanced renewable fuels reflect our consideration of two essential factors: first, that the market can respond to ambitious volume targets, and second, that there are limits today to the volumes that can be supplied to consumers.

Many of our stakeholders, and indeed many in Congress, rightly want to know why some of the volume targets established in the statute cannot be reached. There are several reasons: slower than expected development of the cellulosic biofuel industry and the resulting shortfall in cellulosic biofuel supply, a decline in gasoline consumption rather than the growth projected in 2007, and constraints in supplying certain biofuels to consumers – ethanol at greater than 10 percent of gasoline, in particular. Our final rulemaking includes a discussion of this last constraint, known as the "E10 blend wall." If gasoline demand is flat or trends downward, increasing the amount of ethanol used in the fuel pool will require significantly greater use of fuels with higher ethanol content. Examples are blends of 15 percent ethanol in gasoline, or E15, and blends of up to 85 percent ethanol, or E85, which can be used in flexible fuel vehicles (FFVs). EPA has taken steps to enable the use of higher-level ethanol blends, including granting partial waivers for the use of E15 in certain light-duty cars and trucks beginning with model year 2001. USDA has also put resources into expanding ethanol fueling infrastructure. At the same time, EPA recognizes that there currently are real limitations in the market to the increased use of these higher ethanol content fuels, including current near term limits on fueling infrastructure.

Our final rule balances two dynamics: First, Congress's clear intent to increase use of renewable fuels over time to address climate change and increase energy security. And second, real-world circumstances, including slower than expected growth in the development of the cellulosic industry, and the E10 blend wall, which have slowed progress towards such goals. The standards we finalized for 2016 will continue to spur growth in renewable fuel use. Overall, this final rule requires that total renewable standards grow by more than 1.8 billion gallons from 2014 to 2016. That's 11 percent more biofuel than the market produced in 2014. The final 2016 standard for cellulosic biofuel – the fuel with the lowest carbon emissions– is nearly 200 million gallons, or 7 times more, than the market produced in 2014. For advanced biofuel, the 2016 standard is nearly 1 billion gallons, or 35 percent, higher than the actual 2014 volumes. In addition, the biodiesel standards also grow steadily over the next several years, increasing every year to reach 2 billion gallons by 2017. That's 23 percent higher than the actual 2014 volumes.

We believe that these volumes are achievable, and consistent with Congress' clear intent to drive renewable fuel use up, even as we use the authorities that Congress provided EPA to manage the program responsibly.

EPA has taken other steps to improve the administration of the RFS program. We have improved the quality, transparency, and efficiency of our petition review process for new biofuel pathways that can count under the RFS program. These improvements to our pathways review process are already making a difference. Since launching the new Efficient Producer process on September 30, 2014, EPA has approved over 50 petitions for efficient corn ethanol plants with an average review time of less than 2 months. Compared to our previous performance, we have reduced our processing time for similar petitions by 80%, and we are continuing to work toward shortening that time. Since announcing our streamlining initiative, we have approved six new pathways for second-generation biofuels.

Even as we finalize these standards and look towards 2017, it's important to remember that the RFS program is only one part of the overall picture for biofuels. Both USDA and DOE have programs supporting biofuels and biofuel infrastructure, and we work closely with them as we implement this statute.

EPA recognizes that both challenges and opportunities lie ahead for the renewable fuel sector. Introducing new fuels into the marketplace, especially cellulosic biofuels, is not an easy task. But that is the challenge that Congress took on with the RFS program, and we are committed to implementing the program in a way that responsibly pushes forward and grows renewable fuels over time, as Congress intended. And in doing so, we will continue to engage with our stakeholders and work in close consultation with USDA and DOE.

Again, I thank you for the opportunity to serve as a witness at this hearing.

Senator INHOFE. Thank you, Ms. McCabe.
Mr. Gruenspecht, you are recognized.

STATEMENT OF HOWARD GRUENSPECHT, DEPUTY ADMINISTRATOR, U.S. ENERGY INFORMATION ADMINISTRATION

Mr. GRUENSPECHT. Chairman Inhofe, Ranking Member Boxer, members of the Committee, I appreciate the opportunity to be before you today. The Energy Information Administration is a statistical and analytical agency within the Department of Energy. By law, EIA's data analyses and projections are independent, so my views should not be construed as representing those of the Department or any other Federal agency.

My testimony has eight main points. First, the RFS is not expected to come close to the legislated target of 36 billion gallons of renewable motor fuel use by 2022. All of EIA's referenced case projections since enactment of the present RFS targets in 2007 reflect a shortfall, which in 2022 reaches more than 18 billion credits in our current reference case. Virtually all of the shortfall involves cellulosic biofuels.

Second, substantial increase in biofuels use would require moving beyond the present low percentage blends of ethanol and biodiesel that account for nearly all current biofuels consumption.

Third, the hope that large volumes of liquid cellulosic biofuels would be available within a decade following adoption of the 2007 RFS targets has not been realized. The actual supply of liquid cellulosic biofuels was less than one-tenth of 1 percent of the legislated RFS target for biofuels in 2015. In mid–2014, EPA began issuing cellulosic RFS credits for compressed natural gas and liquid natural gas derived from landfills and other biogas recovery facilities that exist independently of the RFS programs. Cellulosic biogas, which, unlike liquid cellulosic biofuels, does not displace petroleum use, provided more than 97 percent of total cellulosic biofuels credits in 2015.

Fourth, ethanol faces demand, distribution, and regulatory challenges that make it difficult to increase its use as a motor fuel. Ethanol has three distinct roles in motor fuels markets: providing octane, adding to fuel volume, and providing energy content. Ethanol has achieved great success in the first two roles, where it is supported by factors independent of the RFS. While these two uses also provide some energy content, additional use of ethanol as an energy content source faces significantly higher economic hurdles, as illustrated in Figure 1 of my written testimony, and therefore depends more directly on the RFS.

Fifth, current EIA projections, shown in Figure 2, show a declining trend in motor gasoline use, as has already been touched on, a significant change from projections made prior to 2010. The current projections do not reflect proposed fuel economy standards for heavy-duty trucks, which, if finalized, would significantly reduce projected diesel fuel use. Reductions in projected gasoline use since 2007 mainly reflect higher fuel economy standards, slower economic growth, certainly in the late ops, possible changes in consumer behavior, and, until recently, higher gasoline prices. Lower gasoline demand has likely affected the timing of some current RFS compliance challenges, but unlike other factors in this testi-

mony it is not a major cause of past and projected shortfalls in biofuels use relative to legislated targets.

Sixth, actual and projected reliance on oil imports is significantly lower than it was when the expanded RFS program was enacted in 2007, shown in Figure 3 of the testimony, reflecting the combined effects of more robust domestic petroleum production and lower petroleum demand. Biofuels added in response to the RFS program have played only a small part in reducing past and, in our case, projected net import dependence, given the likelihood that ethanol would continue to be used as an octane and volume source independent of the RFS.

Seventh, the near and longer term costs of the RFS depend on the price of oil, the price of agricultural commodities used to produce biofuels, and future implementation decisions. All else equal, lower oil prices tend to raise the cost of RFS compliance. Again, ethanol is really used almost exclusively to provide octane and volume, and that is not really driven by the RFS. Biodiesel use is more directly driven by the RFS program and the availability of biodiesel tax credits, and there is some discussion of that in my written testimony.

And I guess my final point is that EIA remains actively engaged in matters related to the RFS, obviously not in a policy way. We provide data on biodiesel and ethanol production and ethanol blending. We provide information to EPA with short-term forecasts for motor fuels use and cellulosic biofuels production, and we also develop longer term projections.

So thank you again for the opportunity to testify.

[The prepared statement of Mr. Gruenspecht follows:]

STATEMENT OF HOWARD GRUENSPECHT

DEPUTY ADMINISTRATOR

ENERGY INFORMATION ADMINISTRATION

U.S. DEPARTMENT OF ENERGY

BEFORE THE

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

UNITED STATES SENATE

FEBRUARY 24, 2016

Chairman Inhofe, Ranking Member Boxer, and members of the committee, thank you for the opportunity to appear here today to discuss the Renewable Fuel Standard (RFS).

The Energy Information Administration (EIA) is the statistical and analytical agency within the U.S. Department of Energy. EIA collects, analyzes, and disseminates independent and impartial energy information to promote sound policymaking, efficient markets, and public understanding regarding energy and its interaction with the economy and the environment. By law, EIA's data, analyses, and forecasts are independent of approval by any other officer or employee of the United States Government, so the views expressed herein should not be construed as representing those of the Department of Energy or any other Federal agency. EIA is active in providing both data and analysis that bear directly on the RFS program.

The main points of my testimony are as follows:

1. **The RFS program is not expected to achieve the legislated target that calls for 36 billion gallons of renewable motor fuels use by 2022**. This is not a new or surprising finding – all of EIA's Annual Energy Outlook (AEO) Reference case projections since the present RFS targets were enacted in the Energy Independence and Security Act 2007 (EISA) have suggested such a shortfall. For example, AEO2010, which was developed and published in the second half of 2009, already projected a shortfall of over 10 billion RFS credits relative to the legislated target for 2022. In AEO2015, the shortfall is projected at more than 18 billion credits. Virtually all the projected shortfall is in the category of advanced biofuels, which includes cellulosic biofuels.

2. Substantially increased use of biofuels can only occur if they can be used in forms other than the low-percentage blends of ethanol and biodiesel that account for nearly all of their current use. There are four potential alternative pathways (1) Increased use of ethanol blends above 10% by volume, (2) Increased use of biodiesel blends above 5% by volume, (3) the advent of drop-in biofuels, such as renewable gasoline, diesel, or jet fuel that can be used as direct replacements for their petroleum-based counterparts, and (4) the development and use of new renewable fuel components, such as biobutanol, that might be more easily blended in increased volumes. To date, none of these options has achieved a significant market role.

3. The premise that advanced biofuels, particularly liquid cellulosic biofuels, would be available in significant quantities at reasonable costs within 5 to 10 years following adoption of the 2007 RFS targets has not been borne out. The supply of liquid cellulosic fuels (including primarily cellulosic ethanol and renewable fuel oil) in 2015 was 2.6 million ethanol-equivalent gallons, less than 0.1 percent of the 3 billion ethanol-equivalent gallon legislated target for that year. Renewable compressed natural gas and renewable liquefied natural gas, which were approved for the RFS program in mid-2014, are available in much greater quantity than cellulosic liquids; in 2015, their total supply was 126 million ethanol gallon equivalents. Unlike liquid cellulosic fuels, cellulosic biogas does not displace petroleum consumption and is mainly obtained from landfills and other biogas recovery facilities that exist independently of the RFS program.

4. Ethanol faces demand, distribution system, and regulatory challenges that make it difficult to increase its use as a motor fuel regardless of its source. Ethanol potentially has three distinct roles in motor fuels markets: (1) providing octane; (2) adding volume to motor fuel; and (3) providing energy content. Ethanol has achieved considerable market success in the first two roles, when blended into

gasoline up to 10% by volume (E10), where it is supported by market forces that are largely independent of RFS program requirements. While its use in these two roles also provides some energy content, additional use of ethanol as a source of energy content faces a significantly higher economic hurdle, as shown in Figure 1, and is therefore more directly dependent on the implementation of the RFS.

With the possible use of mid-level blends such as E15 and higher-percentage blends such as E85, where ethanol provides a larger proportion of the energy in each gallon of fuel, one important behavioral question is when consumers start to notice the impact of ethanol's lower energy content per gallon on the range provided by a tankful of fuel and factor that impact into their buying decisions. Experience in Brazil, where high-percentage ethanol fuels are widely sold, suggests that consumers consider energy-content pricing (top line in Figure 1) rather than simply buying the cheapest gallons. In fact, the range penalty associated with less energy-dense fuels may require that they be sold at a discount to their relative energy value to be attractive to most buyers.

Although the Environmental Protection Agency (EPA) has granted two partial waivers allowing the use of E15 in model year 2001 and newer light-duty vehicles, very few gasoline retailers currently sell E15. This situation may reflect concerns related to automobile warranties, potential liability for misfueling, infrastructure costs, consumer acceptance, and restrictions in franchise and other marketing agreements. Also, E15 does not qualify for the one pound Reid Vapor Pressure (RVP) waiver that was legislated for E10, so it would not be an environmentally compliant fuel for general use in summer months when made using the most prevalent summer gasoline blendstocks.

E85 is more widely available at retail fuel stations, but can only be used in designated flex-fuel vehicles (FFVs). In the *Annual Energy Outlook* 2015, EIA projects there will be about 16.3 million FFVs in use in 2016, about 7 percent of the overall light duty vehicle fleet. Manufacturers built flex fuel capability into these vehicles in order to receive credits towards compliance with fuel economy standards under provisions that are being phased out under the implementation of future Corporate Average Fuel Economy (CAFE) and greenhouse gas emissions standards promulgated by the National Highway Traffic and Safety Administration (NHTSA) and the EPA.

5. The projected declining trend in motor gasoline use in recent EIA AEOs, including AEO2015 (Figure 2) reflects a significant change from earlier projections of growth (AEO2007) or stasis (AEO2010). AEO2015 projections for diesel use do not reflect the recently proposed fuel economy and greenhouse gas standards for heavy duty trucks, which if finalized, would significantly reduce the projection for diesel fuel use. Changes in the projections for gasoline use since AEO2007 mainly reflect higher vehicle fuel economy standards adopted subsequent to its release, together with slower economic growth, higher gasoline prices, and possible changes in consumer behavior. Lower gasoline demand has likely affected the timing of some current RFS compliance challenges that are briefly discussed later in this testimony. However, in contrast to the issues raised in my previous points, it is not a cause of the persistent past and projected shortfall of the RFS program relative to its legislated targets.

6. Actual and projected reliance on oil imports (Figure 3) is significantly lower than it was when the expanded RFS program was enacted in 2007. Recent and projected reductions in net import dependence primarily reflect a combination of more robust domestic petroleum production and the effects of the significant lowering in petroleum demand and its projected growth, as discussed

previously. Biofuels volumes in response to the RFS program have played only a small part in reducing projected net import dependence given the expectation of continued use of ethanol as an octane and volume source independent of RFS program requirements.

7. The near-and longer-term costs of the RFS program will depend on the price of oil, the prices of agricultural commodities used to produce biofuels, and future RFS implementation decisions. Several different cost concepts are potentially relevant. All else equal, lower oil prices tend to raise the cost of RFS compliance. As noted above, current volumes of ethanol are applied almost exclusively as a source of octane and volume in E10 gasoline, uses that are largely independent of RFS implementation. As illustrated by Figure 1, ethanol is more expensive than gasoline on an energy-equivalent basis, so significant uses of ethanol beyond those uses would require leverage from the RFS program.

Current use of biodiesel is more directly influenced by the RFS program. In its November 2015 final RFS rule, EPA set the renewable volume obligation for biomass-based diesel (biodiesel plus renewable diesel) at 1.9 billion gallons for 2016 and 2 billion gallons for 2017; this volume obligation is calculated in biodiesel gallon equivalents rather than ethanol gallon equivalents. As shown in Figure 4, biodiesel is significantly more costly than petroleum-based diesel under recent market conditions. Between August 2015 and January 2016, the difference between the Gulf Coast spot market prices of biodiesel and petroleum-based diesel averaged $1.25 per gallon. Despite this, a combination of biodiesel tax credits (BTC) and the implementation of the RFS itself enable the blending of the biodiesel volumes required by the RFS program. The most common raw material for biodiesel production in the U.S. is soybean oil. Soybean oil prices, along with costs of other inputs required and the value of byproducts from the biodiesel production process, can be used to estimate the cost of soy-based biodiesel production.

Based on Chicago Mercantile Exchange soybean oil prices, the difference between biodiesel production cost and Gulf Coast diesel averaged $1.15 per gallon between August 2015 and January 2016. For the month of January 2016 alone, when oil prices fell markedly, the difference between biodiesel production cost and Gulf Coast diesel averaged $1.55 per gallon.

Assuming that the average premium for biodiesel relative to petroleum diesel in 2016 as a whole are the same as the differences calculated above for the 6-month period ending January 2016, the extra cost of using 1.9 billion gallons of biodiesel rather than cheaper petroleum-based diesel would range from $2.2 billion to $2.4 billion, or 1.0 to 1.1 cents per gallon of gasoline and diesel fuel based on the volume of gasoline and diesel consumption assumed in EPA's RFS rule for 2016. Costs would be higher to the extent that additional biodiesel is consumed to meet the advanced or total biofuels targets. This cost is borne by both gasoline and diesel consumers served by the refiners and blenders that are obligated parties under the RFS program, by the Treasury, and by taxpayers more generally when the cost of the BTC is considered.

While the RFS is likely a key driver of biodiesel use given current oil prices and biodiesel costs, it is possible that biodiesel use could be competitive with petroleum diesel prices independently of the RFS if oil prices were higher; alternatively, competitive parity with petroleum diesel independently of RFS obligations might also be attained through lower costs for biodiesel inputs.

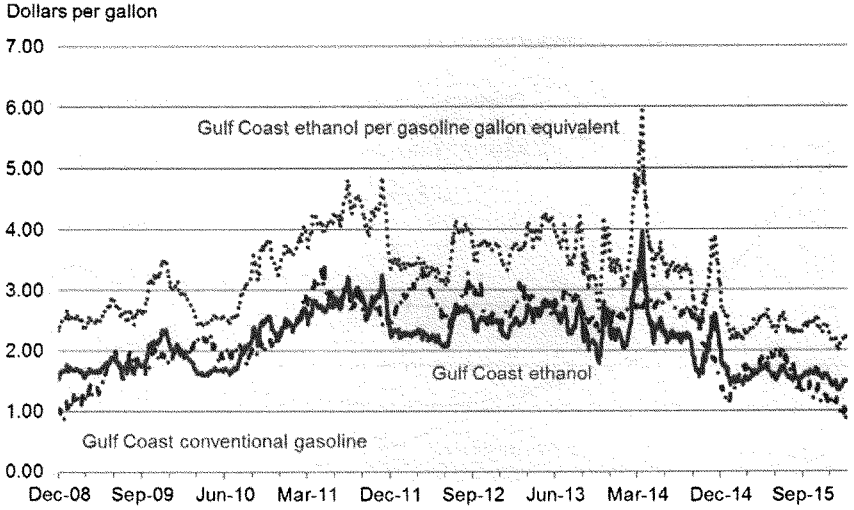
At the retail level, EIA expects diesel fuel prices to be most affected by the RFS program. Typical biodiesel blending yields only about one-third of blenders' RIN obligation under the RFS, a shortfall that diesel blenders make up by purchasing RINs. In contrast, at current levels of the RFS renewable volume obligation (RVO), E10 gasoline is close to RIN-neutral; blending an additional gallon of this fuel generates

roughly the same number of RINs that must be surrendered to meet the current RVO. Looking forward, however, the ramp up in the legislated targets through 2022, if confirmed through the EPA rulemaking process, would significantly increase the RVO for each gallon of motor fuel that is sold. In this setting, E10 gasoline would become more like diesel fuel is today in having an RVO that significantly exceeds the RINs generated by blending the fuel.

8. EIA remains actively engaged in matters related to the RFS program. We collect monthly data on biodiesel and ethanol production, as well as weekly and monthly data on ethanol blending. EIA also provides input to EPA on short-term forecasts for motor fuels use and cellulosic biofuels production, consistent with the statutory requirement for EIA to provide this information a month prior to the deadline for EPA to issue its annual rule implementing the RFS program for the following calendar year. Most recently, EIA provided information covering 2014 through 2016 for the EPA's final rule covering those three years. EIA also includes biofuels as part of its Annual Energy Outlook, Short-Term Energy Outlook, and has also published several Today in Energy and This Week in Petroleum articles on the subject. Later this spring, EIA will initiate monthly estimates of ethanol movements by rail in order to better understand the flow of ethanol from producing regions to blending terminals.

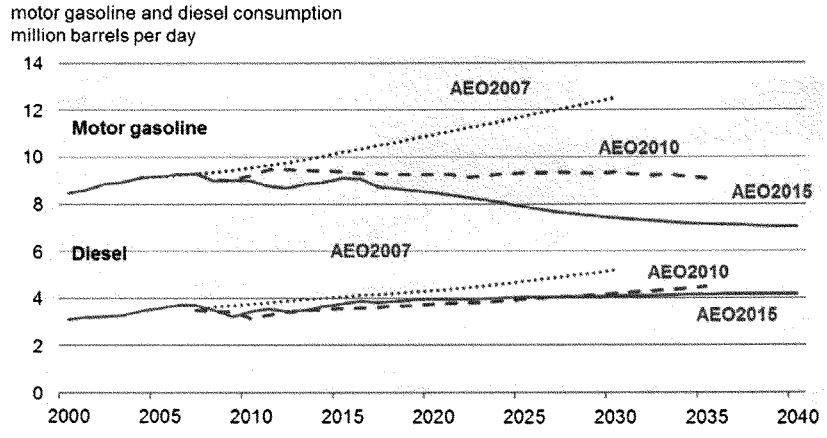
Thank you for the opportunity to testify before the Committee.

Figure 1: Ethanol and gasoline prices on the Gulf Coast



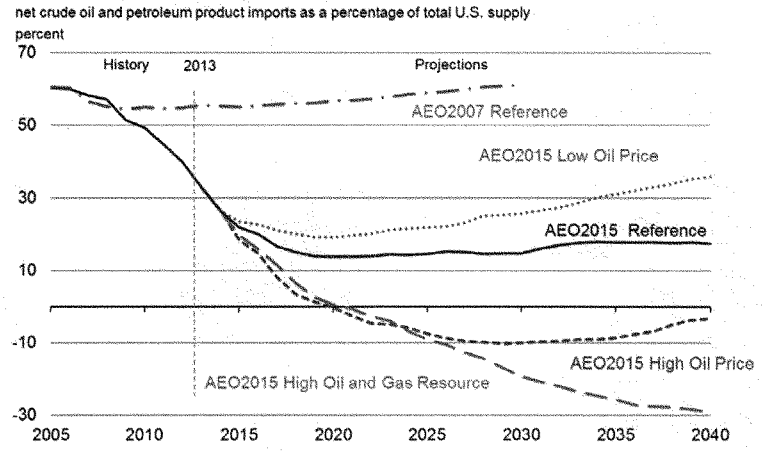
Note: 1 gallon of gasoline contains the energy of 1.5 gallons of ethanol
Source: Oil Price Information Service, Thomson Reuters

Figure 2: The gasoline and diesel demand outlook has changed significantly since the expanded RFS was passed, mainly due to efficiency policies and economic weakness; proposed new heavy-duty truck standards, if finalized, could lower future diesel use



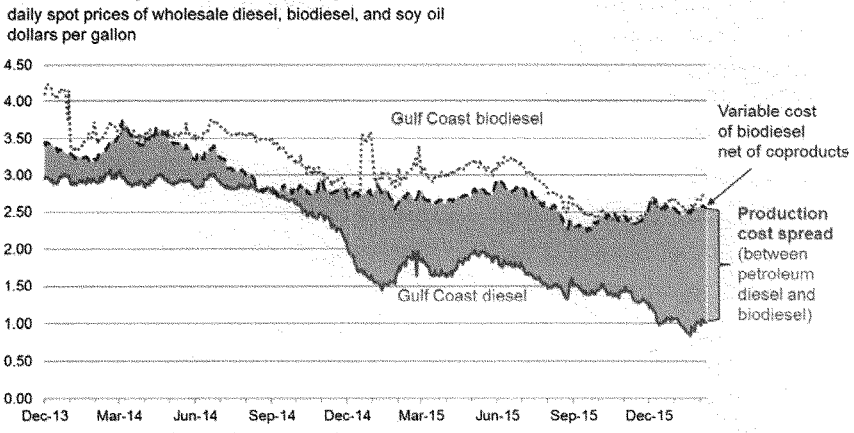
Sources: EIA Annual Energy Outlook 2007, Annual Energy Outlook 2010, Annual Energy Outlook 2015

Figure 3: Projected oil import dependence, an important motivation for adoption of the expanded RFS in 2007, has declined significantly with the advent of tight oil



Source: EIA, Annual Energy Outlook 2007 and Annual Energy Outlook 2015

Figure 4: As oil prices have declined, the gap between petroleum diesel and biodiesel production costs has grown



Sources: Oil Price Information Service, Argus, CME, Thomson Reuters, and Bloomberg

Senator INHOFE. Well, thank you very much, Mr. Gruenspecht.

Senator Boxer and I are going to try to get this meeting over with before the vote that comes up, so we are going to go ahead, and I would ask my colleagues to try to hold your questions to 5 minutes.

First of all, Ms. McCabe, you base your annual volume mandates on tables in the Clean Air Act that are listed out through 2022. Could you please explain what happens to the program after 2022? And isn't the RFS turned over completely to the EPA if it is not met at that time?

Ms. MCCABE. My understanding, Senator, is that Congress set those volumes through at least 2022 and did not provide for additional volumes afterwards.

Senator INHOFE. Is that yes, then?

Ms. MCCABE. Yes, EPA would continue to administer the program, implement the program, as Congress set it out through that time.

Senator INHOFE. OK. Now, the second question I am going to ask you to respond for the record. And I might add the last time we asked you to respond for the record was September 29th. That request was made by several of us, including Senators Boxer, Wicker, Fischer, and me, and we still haven't heard back. So I would like to have you make a note of that so we can hear back from you. And when I say we want to get the answer to the second question for the record, we would like to get that within 3 days, how is that?

Corn ethanol was grandfathered into the RFS even though it does not meet the greenhouse gas requirements for the program. Given the tendencies of this Administration to favor products that emit few or no greenhouse gases to advance its climate change agenda, when the RFS is turned over to the EPA, what role will corn ethanol play in the RFS, and would it continue to receive a 15 billion gallon mandate or would its place in the RFS diminish? Again, that will be for the record.

Third question, when you proposed the volume for 2014, you did it by the mandated deadline. Why did it take you 730 days to finalize those volumes?

Ms. MCCABE. You would like me to answer both questions?

Senator INHOFE. No, just the third question.

Ms. MCCABE. To explain the timing?

Senator INHOFE. Yes, why it took 730 days. Be very short.

Ms. MCCABE. So, as has been explained, this is a program that Congress intended to evolve over time. It is very complex because of the way ethanol feeds into the fuel system and the development of other fuels. I think Congress recognized, and we always knew, that there would come a time when there would come kind of a threshold moment in the program where the congressional mandates would require that increasing amounts of fuel beyond what is known as the E10 blend wall would come to pass, and the 2014–2015 has been the time when that milestone occurred. It provided significant challenges, as you know. There are very divergent views among the people who are affected by the RFS about how EPA should exercise the responsibility that Congress gave it, and that led to the 2014 rule being delayed.

Senator INHOFE. OK, that is fine, because I am running out of time here. So that is the reason for the 730 days delay.

Mr. Gruenspecht, how has the increased domestic supplies of crude oil, which we all recognize is out there, since the expansion of the RFS in 2007, and in more recent years, impacted the goal of energy security and energy independence?

Mr. GRUENSPECHT. Mr. Chairman, I think in 2005 one measure that is used is net import dependence on liquid fuels, and that was 60 percent. Now we are sort in the mid–20 percent range. That is a combination, again, of both the more domestic production and the increased fuel economy, lower demand.

Senator INHOFE. All right. The second question I have for you is in the latest RFS rule EPA projected the demand volumes for gasoline without ethanol and with higher blends of ethanol 15 to 85 percent. Now we are talking about the EPA at this time. They predict demand for ethanol-free gas would drop significantly in 2016, while demand for higher ethanol blends will increase. Now, do these projections align with the EIA projections of demand for these fuels? To what degree have EPA's past annual volume mandates aligned with the fuel demands projected submitted to them by the EIA? And I might add that I don't believe that is going to be very accurate in my State of Oklahoma.

Go ahead.

Mr. GRUENSPECHT. Well, that is a long and complex question. Projections of E85 and E15 are very difficult, I think. Looking at the data, we do know how much easier oil comes out of refineries, but the hard part is there can be blending further down the line. So it is hard to figure that out.

Senator INHOFE. All right, it is hard to figure that out. Let's use that for the record, then, because my time has almost expired. I do have one short question, and that is based on your current projection, is it possible that the RFS will be able to achieve the final targets of 36 billion gallons contained in the Clean Air Act by 2022, or could it be easier?

Mr. GRUENSPECHT. We certainly don't have that in our projections, as I noted in my testimony. We think the shortfall of about 18 billion gallons of credits in 2022.

Senator INHOFE. All right, thank you.

Senator BOXER.

Senator BOXER. Thank you so much, Mr. Chairman.

Ms. McCabe, the biofuels industry said it can produce more biofuels than EPA provided for in the final rule issued on November 30th, 2015, and this final rule undercuts investments in biofuels, particularly in cellulosic biofuels. How do you answer that criticism?

Ms. MCCABE. Well, thank you, Senator Boxer. We actually think that the rule does what it is supposed to, which is to support the increased development and use of these fuels. We did look very carefully at what was going on in the industry. We spent a lot of time reaching out to individual companies to make sure we know what is going on. And as has been recognized, in certain parts of the industry there has been real challenges in getting those fuels into the market. The levels that we set represent significant, substantial growth over historic levels.

Senator BOXER. OK, so just because I have other questions, basically, you disagree with the industry. They tell you they can do more; you're saying no, you can't. Is that right?

Ms. MCCABE. Well, there are different parts of the industry and some are more robust than others, so we take all the information that we get and we try to do the best job——

Senator BOXER. Wait a minute. I am just saying you disagree with them.

Ms. MCCABE. With certain——

Senator BOXER. When they say that your final rule undercuts investments in biofuels, particularly cellulosic, you don't agree with it. That is all I am trying to establish.

Ms. MCCABE. That is right.

Senator BOXER. OK.

Ms. MCCABE. Yes.

Senator BOXER. Now, we have heard repeatedly that EPA and the Obama administration are interested in deploying low carbon technology, right? Cellulosic ethanol is the lowest carbon fuel in the world. Yet, companies that produce cellulosic ethanol have expressed concern that EPA's use of its waiver authority will limit, rather than expand, the use of this fuel in the future.

Do you agree that production of cellulosic ethanol is important for meeting our Nation's commitment to reduce carbon pollution? And what is EPA doing to expand the production of cellulosic ethanol moving forward?

Ms. MCCABE. I do agree that development of cellulosic fuels is absolutely critical and the most central part of Congress's intent when they put this law into effect. The EPA is not the only actor in the field of developing and changing our transportation fuel system. We have very specific responsibilities under the statute and we are doing several things. One is issuing volumes. That is my most important job as head of the Air Office, is to get those volumes out so that signal is there, that clear signal.

We also have the responsibility of approving new pathways. People come to us with innovative new fuels that are very carbon reducing, and we, in the recent year, have revamped our process for doing that so that we can move those applications through very expeditiously, including a category called efficient producer, so that we are able to push those pathways through. We work closely with the USDA and DOE on programs that they have to also help.

Senator BOXER. OK, I think we are getting lost here because I am very specific about the waiver authority, so let me ask it a different way.

Ms. MCCABE. OK.

Senator BOXER. How do you reconcile the statement that you made: "This final rule represents EPA's commitment and continued support for the steady growth in renewable fuel use," that is your statement, with EPA's decision to use a waiver to reduce the overall volume? You said yourself that is the most important thing you do, but you have given yourself a waiver below the level Congress intended. You could go down. So how do you reconcile on the one hand saying we are committed and the other talk about this waiver?

Ms. MCCABE. Senator, our review of the information that we had about what could be reasonably but ambitiously achieved in the years that we are supposed to set standards led us to conclude that the statutory volumes simply were not achievable if we were doing our job in a responsible way. So we used the authority that Congress provided to waive those standards, but only to the degree that we thought was absolutely necessary in order to continue to provide that signal for growth.

Senator BOXER. OK. I just think it is important to note that when you say something so unequivocally, and then the policy allows you to cut back the volumes, it is a mixed signal to folks out there who are making investments.

Is EPA on track to release the 2017 biofuel volumes in time to comply with the deadline in the law?

Ms. MCCABE. Yes, we are.

Senator BOXER. Good. And do you think that this loss of investor confidence that I talk about is a concern, and how do you plan to address it moving forward?

Ms. MCCABE. By meeting our deadlines, by continuing to send that strong clear signal that volumes should be growing as Congress intended, and by doing our job to keep approving new types of fuels to get into the system.

Senator BOXER. Well, thank you. I just hope that when we make a commitment, we don't undermine it with waivers and other things. Thank you.

Senator INHOFE. Thank you, Senator Boxer.

Senator ROUNDS. Thank you, Mr. Chairman.

Administrator McCabe, I have a copy of the Clean Air Act, and specifically the Renewable Fuel Standards post 2022, and I would like to focus on that. It says that the administrator shall promulgate rules establishing applicable volumes of advanced biofuel, cellulosic biofuel, and biomass-based diesel. I see no mention of corn ethanol.

Being from an ag State, where we have spent considerable resources developing this industry, based in large part on this Federal mandate, and a large sector of our economy depend upon this industry today, this seems to be of real concern to me and to a lot of folks in South Dakota and the upper Midwest.

I want to be very clear on something. In your opinion, does the Clean Air Act explicitly provide for corn ethanol to be a part of the RVO totals post 2022?

Ms. MCCABE. Well, Senator, you have noted a clear element of the law that Congress provided, which is it did not set a specific standard for corn ethanol. Corn ethanol is clearly a very important bio-based fuel that has been used and is increasingly used, and it helps, it is one of the fuels that helps fill up the standards and the targets that Congress set and that EPA then implements. I really cannot speak to what a future EPA would do in 2022 after the table that Congress put forth.

Senator ROUNDS. But you have significant volumes right now that we are not meeting today, correct? There are volume requirements that are out there today that the EPA has looked at and said, look, we are not going to meet these.

Ms. MCCABE. That is correct.

Senator ROUNDS. Even though the shortage has been running in terms of the bio products themselves, not necessarily in the corn ethanol portion of the mandate?

Ms. MCCABE. The concern and the reason that we felt that the waiver was appropriate was the ability to get those renewable fuels, whatever they are, into the transportation fleet and actually being used.

Senator ROUNDS. So even though we couldn't meet the volume requirements because the other products, and the other products would include those items which are still identified as biofuel, cellulosic biofuel and biomass-based diesel, those were all falling short of the goals even though you did have access to larger proportions and there could have been more corn ethanol produced to meet those volumes. Is that a fair statement, we could have produced more corn-based ethanol to help meet those volume requirements, and yet the EPA had indicated at this stage of the game you simply couldn't meet the total volume requirements because those other three weren't meeting their end?

Ms. MCCABE. Well, corn ethanol cannot meet the nested requirements for cellulosic and advanced biofuel because it doesn't meet those requirements.

Senator ROUNDS. Although it does a very good job in terms of meeting the volume guidelines and it does do a very good job of meeting and improving octane levels within a fuel.

Ms. MCCABE. But it has to be able to get into the vehicles and be used.

Senator ROUNDS. Right. So let me just move on, then.

Sir, just a question, Mr. Gruenspecht. Right now we have basically a time period from 2022 where there is no more mandate for the use of corn ethanol in the Federal programs, and yet at the same time, in your testimony, you identified that it is an excellent source for octane and it is an excellent source or it is a qualifying source for volume requirements. We have CAFE standards coming up in the year 2025, where we are going to have I think the average is 54, 55 miles per gallon that we are expecting. In order to reach that, there has been considerable discussion that I have been a party to that indicates that we are going to want higher octane ratings for fuel in order to meet those volumes.

Could you share a little bit of any background you may have or any discussion that you have been involved with, any information that you have indicating the need for octane boosters in order to meet new CAFE requirements by the year 2025, 3 years after the end of this mandated portion of the RFS for corn ethanol? I see a gap between 2022 and 2025.

Mr. GRUENSPECHT. We have really not been looking closely at that, I would say.

Senator ROUNDS. Do you think it maybe should be considered?

Mr. GRUENSPECHT. It is a possibility that there is talk about looking to higher compression, different fuel engines as, I want to not say as opposed to, but in conjunction with this notion of using biofuels as blends for gasoline, but we have not looked at it.

Senator ROUNDS. Sure. But in terms of higher compression engines, the need for a higher octane rating helps, doesn't it?

Mr. GRUENSPECHT. I am not an expert in that area, but I would believe that to be the case.

Senator ROUNDS. And I think in your opening testimony you indicated the need or at least the fact that corn ethanol was a very good source or a good source for octane improvement or an octane adder in the fuels that we use in vehicles today.

Mr. GRUENSPECHT. That is correct. Like when we phased out MTBE, I guess following the Energy Policy Act of 2005, there was a very large demand for ethanol to play a role in gasoline and, in fact, the use of ethanol was far in advance of the RFS requirements at that time. That need has kind of been filled, at least with respect to gasoline used in current types of engines.

Senator ROUNDS. And the next gap will be 2025 with new CAFE standards with higher mileage requirements.

Mr. GRUENSPECHT. Well, the CAFE standards, I believe, but those are really more suited for my colleague, but I believe they go up not in a step, but go up gradually over between now and 2025.

Senator ROUNDS. Thank you.

Thank you, Mr. Chairman.

Senator INHOFE. Thank you. Senator Carper.

Senator CARPER. Thanks.

Mr. Gruenspecht, have you ever testified before Congress before? Is this your first hearing?

Mr. GRUENSPECHT. No, no, no.

Senator CARPER. Do you remember your first hearing?

Mr. GRUENSPECHT. I do.

Senator CARPER. Who chaired that one?

Mr. GRUENSPECHT. Up on the fourth floor of a building on the other side of the dome.

Senator CARPER. Whose committee was it?

Mr. GRUENSPECHT. It was in front of you.

Senator CARPER. And Tom Ridge. Committee on Economic Stabilization.

Mr. GRUENSPECHT. Many miles.

Senator CARPER. It is great to see both of you again. Thanks for joining us.

I think it was 2005 when Congress and President George W. Bush got together and enacted the RFS legislation for a couple of reasons: one, to diversify our Nation's energy portfolio; second, to strengthen the economy, particularly the economy of rural communities, by encouraging certain agricultural commodities that contribute to biofuel production; and maybe a third would be to bolster the U.S. standing in emerging segments of the energy technology market; and a fourth would be to protect our environment. There are other objectives as well, but those are four pretty big ones.

How are we doing?

Ms. MCCABE. Well, I think the biofuel story has been a real success story in the United States. There has been tremendous growth in, as you say, rural America; lots of jobs created in economic opportunity there. We have seen American innovation come forward with interesting and innovative fuels, and they continue to do so. As we get increased amounts of these fuels into our transportation fleet, our emissions of greenhouse gases go down, and that is a very good thing.

Senator CARPER. Mr. Gruenspecht, how are we doing against those four? We like to use metrics around here, and we said the reason why we were enacting this legislation was to address at least these four issues. I just went through those. How are we doing in terms of meeting them?

Mr. GRUENSPECHT. Clearly, the use of biofuels has increased quite a bit. I think in the case of ethanol, it probably doesn't have that much to do with the RFS program. In terms of biodiesel, I think, as I said in my testimony, it probably does have more. Really, those are the two main sources of biofuels that we are using. Again, I have been taught never to assume what other people were thinking, but I think that maybe in 2007 people thought there would be a lot of cellulosic biofuels, and basically there aren't. Again, it turned out maybe to be more challenging than some people have thought.

Senator CARPER. That is probably an understatement. Thank you.

Ms. McCabe, do you believe that somehow RINs could be used as a vehicle to incentivize consumers to purchase E85 fuel?

Either of you could take a shot at it, but do you think we can somehow figure out how to use RINs as a way to help incentivize consumers to purchase E85 fuel? And, if so, could that result in real economic incentives to fuel retailers to install required infrastructure?

Ms. MCCABE. Look, consumers will buy fuel based on the things that they think about, which is price and fuel that works for their needs.

Senator CARPER. And convenience.

Ms. MCCABE. And convenience. That is right. So a lot of the work that we have done looking across the industry and what they are doing has been to examine how those fuels are getting into the marketplace and whether they are attracting people and whether they are buying them. The RINs are a device that Congress put in the law that EPA has implemented actually to make the system workable for the obligated parties so that everybody doesn't have to actually produce the liquid gallons themselves.

But I think that the system needs to work so that those fuels become attractive to people and Congress, in setting up the RFS, I think recognized that those fuels needed a boost along the way, and that was why they set up the program the way they did.

Senator CARPER. All right, thank you.

This could be a question for either of you. Later today I am going to be meeting with a lot of farmers from Delaware, and when you make your way, Mr. Gruenspecht, to Bethany Beach, one of the finest five star beaches in America, you drive through a place where we raise corn and soybeans and we raise a whole lot of chickens on DelMarVa Peninsula, as you know. I like to say we have, for every person in Delaware, 300 chickens. A lot of chickens. And they eat a lot of corn, and when the price for corn was going up, up, up, up, up, we heard a lot of pushback, a lot of pushback from our ag community, including some of the people I will be meeting with later today.

From your perspectives, has the RFS had any significant effect on the price of corn since its inception?

Ms. MCCABE. Well, I am not an expert on commodity prices; I think there are folks who have looked at that and people have different views about it, so I don't want to offer an expert opinion on it.

Senator CARPER. How about an inexpert opinion?

Ms. MCCABE. I have heard from some sources that they believe that prices have gone up to a certain extent on these commodities as a result of the RFS, but there are many factors, of course, that go into any commodity prices.

Senator CARPER. OK.

And a quick yes or no question, if I could, Mr. Chairman.

Is EPA on track to proposing an RFS rule for 2017?

Ms. MCCABE. We are. Yes.

Senator CARPER. Thank you. End of questions.

Senator INHOFE. Senator Wicker.

Senator WICKER. Thank you, Mr. Chairman. I must say I share the Chair's skepticism about this whole idea.

I appreciate the testimony of Mr. Howard Gruenspecht and would simply note what he said at the outset. He is here on behalf of an agency giving us data and analysis, and I think his testimony is very compelling about how wrong and mistaken Government can be over time. The testimony indicates that this RFS was based on an inaccurate premise, that the projections were wrong. RFS compliance is now going to cost a lot more than it was expected to be.

On page 5 of Mr. Gruenspecht's testimony it said earlier projections of growth were inaccurate; actual and projected reliance on all imports was lower. So I would simply submit that it is pretty compelling testimony that we surely are capable of getting it wrong here in the United States.

Ms. McCabe, let me just use my remaining 4 minutes to make this one point about small refiners and hardship exemptions. I have several small refiners in my State who are concerned about the impact of the Renewable Fuel Standard on their business and their ability to create jobs and support the families in their area. Small refiners are concerned that RFS, as it exists, has created an economically untenable situation for many companies.

In the original RFS rule, EPA encouraged qualified small refiners to seek a hardship exemption. EPA said this would appropriately address the needs of affected parties. However, EPA has begun to phaseout hardship relief without receiving feedback from small refineries, without public notice and comment, and without revising the regulation that articulates the hardship standard.

I ask unanimous consent, Mr. Chairman, that the following letter be submitted for the record. It refers to a company, the Hunt Southland Refining Company in Mississippi, that has twice petitioned for a hardship exemption but has heard nothing from EPA. If this company is unable to obtain such an exemption, many of its well-paying jobs will be put at risk.

On page 2 of the letter the author says to me as a Senator they hope that I and my colleagues will consider the following actions: review with the EPA its rule and the disproportionate impact it has on small refineries; No. 2, insist EPA utilize appropriate standards as articulated by Congress for hardship waivers; and, three,

review with EPA the correct parties who should be obligated for compliance under the Renewable Fuel Standard.

[The referenced information follows:]

Hunt

February 22, 2016

The Honorable Roger F. Wicker
555 Dirksen Senate Office Building
Washington, DC 20510

Dear Senator Wicker:

Thank you for allowing us to meet with your staff on February 11, 2016, concerning the impact of the Renewable Fuel Standard on small refineries and merchant refineries like ours. Congressional action to repeal or otherwise reform the burden placed on small refineries is imperative for the United States to retain a viable refining industry and to maintain energy independence.

Hunt Refining Company has operated a refinery in Tuscaloosa, Alabama, since 1946 with a current capacity of approximately 70,000 barrels per day employing approximately 470 people. Since 2003 Hunt has owned and operated a refinery in Sandersville, Mississippi, employing close to 100 people. Of that number, many are high-paying skilled operator jobs that allow the people of the area an excellent opportunity to provide for their families. Industries related to Hunt employ additional employees whose jobs depend on the supply of products from Hunt. We are very concerned that the Renewable Fuel Standard as it exists has created an economically untenable situation for Hunt and has put these jobs at risk.

Refiners, such as Hunt Refining, that do not have the requisite infrastructure to allow them to blend are required to purchase renewable identification numbers (RINs) to meet their renewable fuel obligations. The cost of RINs has skyrocketed in the last two years due to a number of structural problems with the rule, which has placed small refineries and merchant refineries in an impossible compliance situation. The cost of RINs for compliance is Hunt Refining Company's second highest cost behind crude oil; it severely impacts refinery operations, destroys profitability and has required the Company to defer capital projects that would enhance the profitability and operability of the refinery.

There are several problems with the Renewable Fuel Standard rule in our view:

1) Unfortunately, the rule is structured to create "winners" and "losers." The Renewable Fuel Standard was apparently modeled after other U.S. Environmental Protection Agency (EPA) programs requiring reductions in benzene and sulfur in fuels. Compliance under those programs could be achieved through the installation of control technology and equipment. However, compliance with the renewable fuels rule cannot be achieved with technology or equipment. Indeed, compliance can only be met through blending, if one has the requisite infrastructure or by purchasing RINs from those who have the ability to blend. As such, this EPA program has created "winners" and "losers." The winners are the large, vertically integrated refiners and blenders that own downstream blending and terminalling, and the losers are the small

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and merchant refiners that have to buy compliance from the large integrated refiners and blenders.

2) Prices of RINs have skyrocketed. Hunt is forced to purchase RINs on the open market where they are now trading at prices that are over 100 times that of two years ago. This has occurred because of the structural problems in the rule, particularly the "blendwall," and because the market allows third parties who have no obligation for compliance to buy and sell RINs. Simply put, Hunt's requirement for the purchase of RINs is approximately $40 million, depending on the price of RINs for each compliance year. Given that the 2014, 2015 and 2016 Renewable Volume Obligations (RVOs) were published together in December 2015, this created obligation dates for 2014 on August 1, 2016, for 2015 on December 1, 2016, and for 2016 on March 31, 2017. This places an obligation of approximately $120 million to be incurred by Hunt within an eight month period. The Company simply does not have the financial wherewithal to meet such an obligation, and, if forced to comply, Hunt Refining's entire viability would be threatened.

In the rule, EPA encouraged any producers of gasoline or diesel who qualified as small refiners or small refineries to seek a hardship exemption from the rule for two years. EPA stated that it believed that its approach to assessing disproportionate economic hardships for such small refiners and refineries would appropriately address the needs of the affected parties. Congress has very recently reiterated that the standard for relief is not profitability—it is disproportionate impact to the small refinery.

Hunt Refining petitioned for such a hardship exemption both in January of 2015 (for 2014) and January of 2016 (for 2015). The Company has heard nothing from EPA concerning either of these petitions. If Hunt is able to obtain such an exemption, it would remain viable while Congress and others work to repeal or reform the Renewable Fuel Standard and several hundred jobs will be saved for the time being. If EPA fails to grant Hunt Refining Company such an exemption, the Company will be put in a position that will push it further toward the eventual shutdown of its facilities. This will cost the states of Alabama and Mississippi many well-paying jobs, exacerbating the difficult economic times in the region.

We hope that you and your colleagues in the Senate will consider the following actions:

1) Review with EPA its rule and the disproportionate impact it has on small refineries.
2) Insist EPA utilize appropriate standards as articulated by Congress for hardship waivers.
3) Review with EPA the correct parties who should be obligated for compliance under the Renewable Fuel Standard.

We appreciate very much the opportunity to have discussed this important issue with your staff. We urge you to act expeditiously to address the chilling effects of this rule by repeal or significant reform. Failure to act endangers not only the viability of Hunt Refining Company but that of the industry and of the United States' energy independence.

Sincerely,

Mr. Tom Schmitt
President
Hunt Refining Company

Mr. David Carroll
Senior Vice President and General Counsel
Hunt Refining Company

Senator WICKER. So in the minute and a half we have left, Ms. McCabe, what about this? What about the seeming change in direction where the hardship exemption was encouraged at first and then we have had a hard time getting a follow-through?

Ms. MCCABE. Well, thank you for the question, Senator Wicker. Respectfully, I would describe it a little bit differently. When Congress passed the law, they exempted small refiners through 2011, and the law then sets up a process for EPA to consider hardship waivers in consultation with the Department of Energy, who has established, after an intensive study of this issue, a set of metrics that they evaluate for every hardship petition we receive.

We take these incredibly seriously; these are very serious petitions that we get from people, and we need to make sure that we are consulting with DOE, we are looking at those metrics, we are being fair. This is a competitive issue, and in the last year for which we issued waivers, which was 2013, we got, I think, 13 waivers and we granted half of them and denied half of them. And those reflect a very serious, very fact-based inquiry into each petition.

So I would not at all say that we have taken a position that we are phasing out those waivers; we take very one of them very, very seriously, and we will grant them if appropriate.

Senator WICKER. Well, I hope that is correct, and I would simply point out that what I am hearing is that there are companies that have applied and received no answer at all. So I hope you will address that.

Ms. MCCABE. The reason for that is we need to know the final volumes before we can actually evaluate the petitions. Nobody's compliance obligations began until that rule was finalized, so as soon as that rule was finalized, we began reviewing those petitions that were pending.

Senator WICKER. Thank you, ma'am.

Senator INHOFE. Thank you. Senator Merkley.

Senator MERKLEY. Thank you very much, Mr. Chair.

I want to go back to the cellulosic side of things. When I first came to the Senate, we had a Senator from North Dakota who said that North Dakota is the Saudi Arabia of wind energy, and a senator from Nevada saying Nevada is the Saudi Arabia of solar energy, and a county commissioner of Douglas County, from where I was born, saying Douglas County could be the Saudi Arabia of cellulosic ethanol and, indeed, because there is so force mass there.

But the cellulosic industry said the following: "EPA's 2 year delay in finalizing the rule created untenable uncertainty and shook investor confidence in the RFS program. Bio estimates that investment in the biofuel sector has experienced a $13.7 billion shortfall due to EPA's delays in proposed changes. Unfortunately, this final rule exacerbates the problem as EPA has acknowledged this delay allowed obligated parties to act as if the law did not exist. The delay increased carbon emissions by millions of tons over the past 2 years compared to what could have been achieved with required use of biofuel."

I have heard this ongoing frustration about the rulemaking process and the Senator from California, Barbara Boxer, was noting that the level was set at a level that the industry said was below

what they could meet, but that added to investors being very reluctant to get in; that the Administration wasn't ready to be aggressive in this area.

So I guess it is more of a comment. You have already answered the question from your perspective, but I will just add my concerns that this is a tool that has been underutilized and inconsistently applied in a way that has damaged the development of this industry.

You are welcome to comment if you would like, but not for too long, because I have something else I want to talk about.

Ms. MCCABE. No, just very quickly, Senator. I appreciate all the comments that you made. We don't like missing deadlines at all, and we are committed to having this program be back on track and keep it there so that those signals will be sent as they are intended to be.

Senator MERKLEY. So I want to thank you very much.

I want to switch subjects to the challenge we had in Portland, Oregon. The U.S. Forest Service decided to do an innovative study looking at samples of moss in the city because the moss draw all of their sustenance from the air; therefore, they are kind of like a little air monitor. And when they started analyzing the moss samples taken throughout the city, they found these hotspots for cadmium and arsenic.

It looks there is going to be a little hotspot on lead, though I am not sure that is as well-developed yet; they are still working on the data. But the graph on the cadmium was dramatic and it turns out these two hotspots correspond to two glass factories.

My understanding is that the EPA said they were exempt from regulation for arsenic and cadmium because they only produce their glass in batches, rather than having a continuous furnace. I must say citizens thought that seemed like a pretty arbitrary thing. You have a plant producing substantial quantities of pretty toxic substances for human health.

So one of the requests that Congressman Blumenauer, Senator Wyden and I have made is for the EPA to look at this very carefully and see if this is an oversight that needs to be remedied.

Ms. MCCABE. Yes, Senator. I am quite familiar with this situation. I have been in close contact with Regional Administrator McLerran over the last couple of weeks and really want to commend the agencies in Oregon for being so proactive on this issue. I hope you know that Oregon is a real leader in evaluating and taking action on toxic chemicals.

We are looking very closely at the rules that were last adopted in 2008, I think. We are also looking across the Country to see what other facilities are like this, and we will take appropriate actions.

Senator MERKLEY. I do appreciate Dennis McLerran's prompt response to the letter that Senator Wyden and I sent in which we are asking for full extensive cooperation. Can we count on the EPA to be a full partner in evaluating the health of the citizens impacted by this cadmium and this arsenic?

Ms. MCCABE. Well, there are other agencies in the Federal Government who are more expert in evaluating health impacts, including the ASTDR, who is working with the Health Department in Or-

egon, so we want to make sure we are offering support in the areas where we have clear expertise, and right now that is in air monitoring, in looking at these facilities, understanding their emissions better, understanding what control technologies might be available, looking at how these facilities are regulated. And we will work fully with the health agencies on the Federal level and with the environmental and health agencies in Oregon.

Senator MERKLEY. Thank you. I appreciate that commitment. I can't overState how much concern there is among the citizens who live in these zones of contamination that have been just recently identified, so in every possible way you can help, including encouraging other parts of the Federal Government to lend their expertise would be much appreciated.

But the other point, and I will just close with this, is that this is kind of a landmark event of utilizing moss as a cheap, inexpensive way to monitor the quality of air, so I would like to see the EPA look at this very closely because the tests that cost many hundreds of dollars with a monitor, or thousands of dollars, can be done for just a fraction of that by testing the moss, and I think this has just not been recognized before. I think this is something of a breakthrough. And if it turned up these two hotspots in Portland, then maybe this use of moss study should be something that we should undertake. I think the entire study was $20,000. It would be utilized in other urban zones. And I am imaging you are looking at that, but I want to encourage that.

Ms. MCCABE. Yes, sir, we really are. I have had exactly the same thought pattern as you have. Not all cities are as blessed with moss as Portland, but I definitely think it is something that we need to be looking into.

Senator MERKLEY. The Portland rain does well once again. Thank you.

Senator INHOFE. Thank you, Senator Merkley.

We are going to try to hold on to our 5 minute rule because we would like to get this over with before the vote takes place at noon.

Senator Vitter.

Senator VITTER. Thank you, Mr. Chair.

And thanks to both of you for your work and for being here today.

Ms. McCabe, traditionally, ethanol has cost less than unfinished gasoline, so that has been a significant market incentive to maximize ethanol in a blend. Recently, that has reversed. That is a big change and a lot of folks say ethanol costing more than unfinished gasoline is perhaps a new normal. How does that affect your assumptions that were used when writing the 2014–2016 rule, and will you be doing a new economic analysis for the 2017 rule that takes this into account?

Ms. MCCABE. Well, each time we do the volume standards, of course, our main goal is to satisfy Congress's intent to meet or come as close as we can meet responsibly to the statutory volumes that Congress put in place, and I think everybody understands that prices fluctuate over time, but Congress's mandate was pretty clear that we needed to do the best job we could to meet those mandates. So in 2010, when we did the initial rule, we did an exhaustive analysis and cost-benefit regulatory impact analysis, and when we

set the annual volumes those rulemakings are following that initial analysis. So it is very difficult for us to do an individual and exhaustive analysis looking at all those factors in setting the annual volumes rule and meet those statutory requirements and schedule.

Senator VITTER. So that means you wouldn't do a new analysis regarding this for the 2017 rule?

Ms. MCCABE. We wouldn't, but we will be looking at and getting information from Howard and his staff on projections about fuel use and fuel availability and all those sorts of things.

Senator VITTER. OK. This program has been plagued by a lot of difficulties, and the one I hear about the most is enormous uncertainty because of EPA's inability to issue RVOs on time. And you have been asked if you are on track for 2017; you said yes. Let me just ask it a slightly different way. Can you commit to issuing a final rule for 2017 RVOs on time?

Ms. MCCABE. It is my intent to issue that rule on time.

Senator VITTER. So you will commit to us that is going to happen on time, as opposed to the last several years?

Ms. MCCABE. I am making a personal commitment. I don't control the world. I can't predict unforeseen circumstances, but it is EPA's intent to meet that deadline.

Senator VITTER. OK. The 2016 rulemaking included some really aggressive assumptions about how much ethanol can be used in the fuel supply, so compared to that how much E0 was used in the U.S. last year and how much does the rule assume will be used this year?

Ms. MCCABE. We get differing views from different stakeholders about the way you characterize the volumes. Our understanding of the amount of E0 used is that it is a very, very small percentage of the fuel pool.

Senator VITTER. And what is assumed for E0 for the current rule?

Ms. MCCABE. I don't remember the exact number off the top of my head, Senator, but we will get it for you.

Senator VITTER. OK. EPA also assumed that at least 200 million gallons of E85 will be used this year; yet in previous years way, way less than that was used. Why do you believe that is going to change really overnight?

Ms. MCCABE. Well, we believe that there are a lot of efforts, including those supported by the USDA, to encourage and enhance the availability of E85 in the system, and we think our job under the statute is to set standards that encourage the development and increased use of these fuels, so that is the analysis that we use to get to that level.

Senator VITTER. You agree, though, that the forecast is way above anything historical?

Ms. MCCABE. We can all pick our own adjectives. I would agree that it is an increase, and that is what we understand our job to be under the statute.

Senator VITTER. What percentage increase are we talking about?

Ms. MCCABE. Let's see, for total renewable fuel it is——

Senator VITTER. I am talking about E85.

Ms. MCCABE. I will have to get you that.

Senator VITTER. OK, you can submit it to the record.

Ms. MCCABE. Yes.

Senator VITTER. I think that will bear out it is an enormous increase. And then in the rule EPA assumes more than 300 million gallons of E15 can be sold, yet I understand only a little more than 100 stations carry that. How do you expect that to happen?

Ms. MCCABE. Well, again, I think that the signals that are sent through the volumes that we establish in the rule are intended to push the market. I will say, too, that there is no formula, there is no exact delivery of precise numbers of volumes in any particular category that need to be produced and used in order to satisfy. The market will decide how to meet those mandates.

Senator VITTER. OK, thank you.

Senator INHOFE. Thank you, Senator Vitter. Senator Markey?

Senator MARKEY. Thank you, Mr. Chairman, very much.

There is no question that climate change is real, it is happening. We have to find alternative ways of providing for the transportation system in our Country. That is what the Renewable Fuel Standard was intended to accomplish. We still import 4.3 million barrels of oil a day; Saudi Arabia, Iraq, other countries in the Middle East. Very dangerous. This helps to contribute to the lowering of that standard. The beauty of the biofuels revolution is that it can happen anywhere. Back in the 19th century, Massachusetts was the energy capital of the United States when Herman Melville was writing by whale oil lamps about Captain Ahab in his pursuit of Moby Dick. But right now, in Massachusetts, we have scores of smaller companies all trying to find ways of inventing the new biofuels of the future because it is a technological revolution that is absolutely potentially revolutionary.

Under the RFS, EPA is tasked with reviewing and improving new pathways for feedstocks, technologies, and types of fuel. It is an important part of the program to ensure the carbon benefits of renewable fuels. It is not an easy task. If Congress increased the resources for the EPA, would it speed up the approval process and get more U.S. companies producing biofuels?

Ms. MCCABE. Well, actually, Senator, we undertook an effort in the Office of Transportation and Air Quality to relook at our process for reviewing those applications and greatly streamlined it. We are getting better at it. We were able to provide more clarity to applicants so that we could move the applications through very quickly and we are really doing that so we have this efficient producer category. So I think we are adequately resourced to keep these applications moving through.

Senator MARKEY. OK, great. With lower oil prices globally and in the marketplace here in the United States, American consumers are now moving toward larger vehicles, and they are actually driving more as well. So are you factoring that into your 2017 rulemaking?

Ms. MCCABE. Well, as I have said, our main job is to do the best we can to meet Congress's intent in terms of growing these volumes.

Senator MARKEY. I guess what I am asking you is that is going to drive the price of gasoline up again, the larger vehicles being purchased, the additional gasoline needed for those large vehicles, and the fact that people are driving more. So it is likely to drive

up the prices, so are you factoring in higher gasoline prices as a likelihood in terms of the equation which you create on the relative efficacy of producing biofuels?

Ms. MCCABE. Well, we look to sources like EIA to provide us with information about predicted gasoline use and different fuel use, so to the extent that those considerations come in to those projections of fuel use they would be folded into our consideration and the information we consider.

Senator MARKEY. So you don't make your own independent evaluation, it is an EIA determination as to whether or not the price of gasoline is likely to go up because of this increase in consumption?

Ms. MCCABE. Well, our job is to look at all the information that we can get and to consider what will happen in the fuel pool to make our best judgment about what fuels are available and what fuels will be used.

Senator MARKEY. And in terms of the relative benefits of the RFS compared to continued consumption of gasoline, gasoline is a mix of chemicals, including toxic aromatic hydrocarbons like benzene and toluene and silane, and once these compounds come out of a car's tailpipe they can cause serious heart and other diseases that impact the American people. Under the 1990 Clean Air Act amendments, the EPA has to take action to control the use of aromatic hydrocarbons in fuel. What has the EPA done about these toxic compounds?

Ms. MCCABE. This is a very serious issue, as you recognized, and gasoline is incredibly complicated chemically, so we pay a lot of attention to this. EPA rules have regulated benzene and particulate emissions from diesel fuel. These are major rules that help bring toxic emissions down. And we are continuing to look at other ways to reduce toxics emissions from transportation fuel.

Senator MARKEY. I would recommend that to you. These are very toxic chemicals that are mixed in with the gasoline. They are not mixed in with other renewable fuels alternatives, and I just think that is a factor that the Committee should understand in terms of the overall public health benefits for our Country, and I would ask you to take an additional look at that in terms of looking at the cost-benefit analysis, and I would ask the Committee, as well, to look at what the price is that our public health pays by having these very toxic chemicals be built into our gasoline formulas.

I thank you, Mr. Chairman.

Senator INHOFE. Thank you, Senator Markey. Senator Barrasso.

Senator BARRASSO. Thank you, Mr. Chairman.

Ms. McCabe, before I read my question on the Renewable Fuel Standard, I would just like to turn briefly to the EPA's so-called Clean Power Plan. Earlier this month, the U.S. Supreme Court granted what the Solicitor General described as an extraordinary and unprecedented request to stay the EPA's regulations. The Court's stay is in effect until the litigation over the EPA's regulation is resolved. So a week later Todd Stern, who is the Administration's Special Envoy for Climate Change, was asked whether the United States would still go ahead and sign the Paris climate agreement. Mr. Stern responded by saying, we're sticking to our plan to sign.

I find the Administration's decision on signing this Paris climate deal to be nothing short of reckless. It is like signing a loan for a luxury car after you have already been laid off, lost your job. Sure, it is possible you will be rehired, but there is a strong likelihood that you will be out of work when the bills come due.

So my question to you is, if the Court does strike down the EPA's so-called Clean Power Plan, how does the EPA intend to meet the United States' obligation under the Paris agreement?

Ms. MCCABE. Well, Senator, there are a number of programs that the United States had in mind in developing our commitment under the Paris agreement; the Clean Power Plan is not the only one. EPA is not the only actor in the space to reduce emissions of harmful greenhouse gases, and we are committed to continuing to work with all stakeholders to develop and implement those programs.

I would also point out that the evidence of the increasing use of renewable fuels and energy efficiency is very robust. Those types of energy are growing even without the extra push of the Clean Power Plan. So we see those trends going in the right direction.

Senator BARRASSO. So you are saying today to this Committee that you can meet, or the United States can meet the obligations without the Clean Power Plan?

Ms. MCCABE. I am saying that there are a number of programs already contemplated, and 2025 is many years away. I think everybody expected that there would continue to be efforts made to reduce carbon emissions across the wide range of opportunities.

Senator BARRASSO. So to meet the U.S. obligations, you do not need the Clean Power Plan. That is what you are saying? That is your testimony?

Ms. MCCABE. I am saying that there are many opportunities. I am also confident that the Clean Power Plan will ultimately be upheld and go into effect. But these are important goals and the United States is committed to meeting them.

Senator BARRASSO. Well, the EPA's own lawyer said this was an extraordinary and unprecedented stay request, so I am having trouble understanding your confidence that the Court will uphold the Clean Power Plan. There has been a change in the Court with the death of Justice Scalia. It just seems that the Administration is acting recklessly on the hope that who is elected president and what happens with a Supreme Court nominee, rather than just realizing and admitting that you can't keep the promises that you made in Paris, that the Administration has made in Paris, if the Court rules against the Clean Power Plan.

Ms. MCCABE. Well, the stay issued by the Court had no explanation; it was not a statement on the merits of the rule at all. Courts sometimes issue stays while litigation is going forward, and that is how we see this one.

Senator BARRASSO. That is not how you see it. The EPA's own lawyer, the U.S. solicitor general, called it extraordinary and unprecedented, so it is not a routine sort of a thing.

Ms. MCCABE. For the Supreme Court to step in, that was unprecedented. But there is no expression of any consideration of the merits of the Clean Power Plan; it is a procedural step.

Senator BARRASSO. Last September, over 50 organizations called on Congress to act and fix the Renewable Fuel Standard. These groups included many humanitarian organizations, government watchdog groups, environmental groups, food producers. I read your testimony. I noted that you didn't call on Congress to fix the Renewable Fuel Standard, even though the humanitarian groups did it, the government watchdog groups did it, environmental groups did it, food producers did it.

Is the Administration's position that Congress should ignore these groups and doesn't really need to fix the Renewable Fuel Standard?

Ms. MCCABE. Well, sir, our job is to implement the laws that Congress passes, and we live in a democracy where everybody can come forward and ask Congress to make various changes. We are doing what we are supposed to do, which is to implement the laws that you gave us.

Senator BARRASSO. So is it the EPA's position that the concerns from these humanitarian organizations like Oxfam, ActionAid have with the RFS are misplaced?

Ms. MCCABE. No, we recognize legitimate concerns raised by a variety of groups and we are happy to provide technical assistance as Congress might request on whether there are things that could be done to improve or change the RFS, and we would be happy to do that if Congress decides to go forward that way.

Senator BARRASSO. So, Mr. Gruenspecht, with regard to this specific issue, these humanitarian groups have argued that the RFS hurts millions of people in poverty in the United States and across the world by driving up food prices. You said that EIA remains actively engaged in matters related to this program. Would you be willing to examine the impact of the Renewable Fuel Standard has had on wholesale food prices, specifically prices of corn, soybeans, wheat, dairy, beef, pork, poultry?

Mr. GRUENSPECHT. I think that is a bit outside of our role, but we could certainly work with others in the U.S. Government on that. Department of Agriculture would have a role. It is really a function of both demand and supply, and there is clearly a supply side of this as well as a demand side. But there are definitely agricultural products being used for fuel that affects the demand for agricultural products. That, in part, is why some people like the thing and why other people don't like it.

Senator BARRASSO. Well, thank you. I would like to followup with you and work with you, because I think it would benefit all of us.

Thank you, Mr. Chairman.

Senator INHOFE. Thank you, Senator Barrasso. Senator Whitehouse.

Senator WHITEHOUSE. Thank you very much, Chairman.

A lot of the attention to the Renewable Fuel Standard involves the struggle between, as your colleague just said, the agricultural interests, for whom this is a new market and who are very positive about it, and the fossil fuel interests, for whom this is a competitor and who are not happy about it. Both big agriculture and big oil are extremely capable, really almost to a fault, of making their voices heard in Congress; they are two of the more enormous sumo wrestlers in our political struggles, and my concern is that EPA

look out for and protect some of the smaller interests that are involved with the Renewable Fuel Standard, one being biodiesel companies.

Until we have a proper price on carbon, they are not going to get a fair shot in the marketplace, so the Renewable Fuel Standard needs to support them. I think a true economy would show that was a valuable proposition, but under the present market failure they are stuck and it takes the Renewable Fuel Standard to help them.

The prospect for algae-derived fuels is, I think, a really interesting possibility. The Navy is already working its way into jet fuel contracts, and helping that industry to protect itself I think is one of the goals of the Renewable Fuel Standard. Advanced cellulosic, not just turning corn into ethanol, but looking at new things, is something that I think has a lot of potential. All of these are industries that big interests would like to see strangled in the crib, and yet they have enormous potential if they can get through their early stages.

So I hope that in the future (a) you will be punctual about getting these rules out on time, and (b) that you will take into consideration the period of innovation in those industries where we can potentially earn extraordinary social returns if they can move through their early stages and into a more robust economic picture, maybe even 1 day be able to stand up against the mighty sumos of fossil and ag.

The other thing I would like to ask you to be sure to pay attention to is the ocean State and offshore engine in a marine environment is at considerable greater risk of water contamination when ethanol levels in the fuel get up too high. Again, the big interests like agriculture and fossil fuels I don't think give a red hot damn about a fisherman and his motor offshore, but I do think it is important that there continue to be a supply chain that is available to the fishing community and people who are boaters to make sure that they are not put at risk by the harm that too much ethanol can do in a marine environment. It is a different environment than terrestrial engines, and I hope you would be aware of that as well as you proceed. Keep those things in mind.

Ms. MCCABE. Yes, we certainly do. And we definitely hear from that community expressing those concerns.

Senator WHITEHOUSE. Yes. If your engine goes out on the side of the road, you call AAA. If your engine goes out four miles out, you have a whole different set of problems.

Ms. MCCABE. Right. Right.

Senator WHITEHOUSE. OK, as long as you are paying attention to that, I appreciate it. And as long as you are keeping your eye on the little interests that could 1 day be big interests and not allow them to be overlooked and/or strangled in the crib by the big interests, that would be all I would ask of you.

Ms. MCCABE. I think our recent standard showed a very steady trajectory for biodiesel in particular, which is exactly the point that you are making.

Senator WHITEHOUSE. And for what it is worth, it is my understanding that under a four to four Supreme Court decision, the challenged regulation stands.

Ms. MCCABE. That is my understanding as well.

Senator WHITEHOUSE. So I think if the Court's membership doesn't change, that improves the standing of the Clean Power Plan considerably. And the one thing that I think would be reckless would be to undue the Clean Power Plan or fail to take alternative steps that can help reduce our dependence on carbon and the carbon pollution that is having such dire effects on so many lives right now. Thank you.

Senator INHOFE. Thank you, Senator Whitehouse. Senator Fischer.

Senator FISCHER. Thank you, Mr. Chairman. I appreciate your holding this hearing today.

Nebraskans, of course, certainly understand the importance of the Renewable Fuel Standard. Our State has answered the call to invest in the domestic renewable fuel production since the policy's inception. Nebraska is the largest ethanol producing State west of the Missouri River. We have 25 active ethanol plants, with an annual production capacity of over 2 billion gallons. These plants represent more than a $5 billion investment in the State and they provide direct employment for about 1,300 Nebraskans.

So at a time when we are seeing such innovation, we are seeing such growth potential for biofuels, I think it is extremely concerning that the EPA completely disregarded the law and congressional intent by issuing a final rule that lowers the mandated RVOs for 2014, 2015, and 2016. These RVOs are below the levels required by statute and it jeopardizes years of progress and investment in the biofuels industry.

It is important to provide certainty for all the parties concerned, and that is from producer to consumer. So the EPA's final rule puts at risk major investments and production capabilities. Ensuring the successful operation of the RFS is an important part of realizing greater domestic energy security.

Ms. McCabe, yesterday the University of Nebraska informed me that the Department of Energy awarded the University a $13 million grant to fund research focused on the benefits of using grain sorghum as a renewable fuel source and, additionally, last year the USDA announced the Biofuels Infrastructure Partnership, which will offer up to $100 million in competitive grants to State-led efforts to test and evaluate innovative approaches to marketing higher biofuels blends such as the E15s and the E85s.

In your testimony you discuss working closely with both the USDA and the DOE when you finalized the regulations that implement the RFS requirements, and earlier today you said that the Agency actions you felt provide a signal for growth. However, I don't think they do. I think when you set volumes below the statute, that does not encourage growth.

So could you please expand on this partnership that we are looking at, that you are looking at, on how lowering those mandated RVOs is going to signal to other Federal agencies, let alone the private industry and the producers out there, your commitment, the Agency's commitment to that research and development? And you can talk about the big guys in the room, whether it is oil or ag, but I am trying to represent Nebraskans. I am trying to represent family farms who have seen growth because of this. I am trying to

represent rural communities who are being affected by what I view as your arbitrary rulings here.

Ms. MCCABE. Thank you, Senator. Well, I certainly hope they are not arbitrary. We certainly lay out a lot of our thinking that led to those final numbers.

I hadn't heard about the University of Nebraska grant. That is great. I will just let you know that EPA has approved grain sorghum as an advanced biofuel, so we are doing our job to help move that along, so that is great.

Senator FISCHER. Good.

Ms. MCCABE. The way I would answer your question, Senator, and I appreciate that there are many people who believe that we should not have granted the waiver and we should have set the volumes at the statutory, but let me just tell you how much growth our volumes require.

So between 2014 and 2016 those volumes need to grow, of total renewable fuel, by 1.8 billion gallons, or 11 percent. That is significant growth. And our job, we believe, is to evaluate and make sure that the levels we set will be ambitious, but will not be impossible to achieve. And people certainly can disagree with us, and they have, but our evaluation was that going as high as the statutory volumes was just not achievable in a 1-year timeframe, which is the time period that Congress gave us to set these volumes.

Senator FISCHER. But isn't that sending the wrong message? I could name a number of instances where goals set by agencies are not met, and we don't see agencies going in and saying, where they are not going to be met, let's lower them. This is a case where that happened.

Ms. MCCABE. Well, Congress gave us that tool and told us set it at the statutory volume or, if you believe that certain conditions are met, use your waiver authority.

Senator FISCHER. Which projects, I think, a message of uncertainty.

Ms. MCCABE. Well, I hope not. We are clearly putting the numbers out there. We are back on track to do these in a timely way, and the industry, wherever they are in the industry, can see in our volumes continued and steady growth. It is not as much as Congress anticipated, but it is continued and steady growth, and I would say not insignificant given the challenges in the marketplace.

Senator FISCHER. Thank you.

Senator INHOFE. Thank you, Senator, and thank you for your patience.

We will now dismiss this panel and we would ask panel two to please come to the table.

We will now start with opening statements. I would ask each of our panelists to confine your opening remarks to the 5-minutes. We are trying to get all of this completed before the vote that is going to take place at noon.

Mr. Minsk, would you start?

STATEMENT OF RONALD E. MINSK

Mr. MINSK. Thank you. Good morning, Chairman Inhofe, Ranking Member Boxer, and members of the Committee. My name is

Ron Minsk, and I thank you for inviting me for the chance to talk about the Renewable Fuel Standard.

From 2013 to 2015 I was privileged to serve as a Special Assistant to the President for Energy and Environment at the White House, where I participated in the interagency review process for the Renewable Fuel Standard. Since leaving the White House, I have had the chance to reflect further on the difficult challenges confronting policymakers faced with the task of implementing RFS in a world and energy sector that has radically changed since the program was last amended, in 2007.

Managing the RFS program over the past 3 years has presented EPA with particularly difficult policy decisions. It is important for me to note that I believe the RFS has an important role to play in promoting the use of second generation biofuels, an important policy objective, especially when oil prices are low and there may be a natural tendency to pay less attention to our long-term energy future.

Additionally, given the constraints of the statute and the current rules, I believe that EPA found a reasonable middle ground in establishing the volumetric obligations for 2014, 2015, and 2016. There is no doubt that the program faces challenges stemming from the evolution of the crude oil markets that we have heard about, but I believe there are opportunities within the statute or by making modest changes to it that can substantially improve upon the operation of the program and help it to better achieve its goals of getting more renewable fuel into our fuel supply in the most efficient manner possible.

Between 2002 and 2015, ethanol consumption grew from 2 billion to 14 billion gallons due in part to the RFS and the United States consumed almost 2.1 billion gallons of biodiesel last year. These levels of consumption represent a measure of success for the RFS, but its success has not been uniform. It has largely failed to give advanced fuels and cellulosic ethanol into the market. It has also failed at getting meaningful volumes of blends of ethanol in excess of 10 percent into the market.

As a result, our main concern that we can continue to see high and volatile RIN prices as a consequence of trying to force the market through the blend wall and because of tightness in the RIN market that is resulting from high volumetric obligations and long-term uncertainty with the program.

While I am skeptical that as currently structured the program will substantially increase the volume of cellulosic or higher blends of ethanol in the fuel supply, I see three paths to reducing the cost of the RFS while still promoting the use of second generation fuels. First, EPA could set lower volumetric obligations for conventional renewable fuels below the blend wall, but EPA is unlikely to do so because it views that as inconsistent with the purpose of the statute.

Second, Congress could either lower volumetric mandates for conventional fuel or replace the volumetric mandate for conventional renewable fuel with a mandate that fuel be blended to a specified percentage of conventional renewable fuel that is below the blend wall. That approach can guaranty conventional ethanol producers of a substantial portion of the annual volume of 15 billion gallons

that the RFS established, but would eliminate most of the compliance costs associated with the current conventional fuel mandate.

A third alternative would be for EPA to change the point of obligation by rulemaking from importers and refiners to the terminal rack, a point in the supply chain to withdraw fuel gases before being distributed to retail outlets. Changing the point of obligation is clearly within EPA's existing legal authority and it can boast a mildly incentive to blend renewable fuel within the obligation to do so, substantially reducing the compliance cost of the program while preserving its goals of promoting renewable fuels.

EPA considered placing the obligation to blend at this point when setting up the program back in 2009 and 2010. It chose, however, to place the obligation on the relatively small number of refiners and importers, rather than what was thought was a large number of downstream blenders and terminals to simplify the program. EPA recognized the risks of this approach and indicated it would monitor the program over time and revisit this issue if necessary. Since then it has become clear that this approach has created poor incentives and undermined the purpose of the program. Moreover, it appears that moving the point of obligation might reduce the number of obligated parties and is not likely to increase it meaningfully.

EPA could lower the cost to improve the operation of the program by moving the obligation to blend from the refiner or the importer to the terminal rack. I believe that this represents the best opportunity for policymakers to address some of the difficult problems presented by the blend wall and move toward achieving the fundamental first order goal of the RFS, which is getting more renewable fuels into the market.

Thank you for the invitation to speak today and I am happy to answer any questions.

[The prepared statement of Mr. Minsk follows:]

Key Points From the Written Testimony for the Senate Committee on Environment and Public Works Hearing on the Renewable Fuel Standard

February 24, 2016

Ronald E. Minsk

Introduction:

- My name is Ron Minsk, and from 2013 until 2015, I was privileged to serve as Special Assistant to the President for Energy and Environment on the staff of the National Economic Council at the White House. In that capacity, I participated in the interagency review process for the Environmental Protection Agency's (EPA or the "Agency") Renewable Fuel Standard (RFS) program.

- In my view, the RFS promotes an important policy goal. However, as currently administered by EPA, the program is flawed and is not achieving its goals. The problem is that the program EPA developed in 2005 and 2010 does not reflect the evolution of the U.S. crude oil and fuel markets since that time.

- I believe that there are opportunities within the statute, or by making modest changes to the statute, which could substantially improve the operation of the program and help it to better achieve its goals of getting more renewable fuel into the United States' fuel supply in the most efficient manner possible.

The Problem:

- In my written statement, I explain some of the challenges we face in trying to bring more renewable fuel to market. I also review some of the problems associated with promoting the use of more E85 and biodiesel under the current program; and the failure of the RIN market to overcome these challenges and failures.

The Solution:

- This morning, I want to focus on 3 possible solutions to the problems.

- The first option would be for EPA to make adjustments to the rules governing the RFS program. Specifically, by moving the point of obligation from importers and refiners to the terminal rack, a point in the supply chain through which all fuel passes, from which motor fuel is distributed, and where motor fuel is taxed.

    - By taking this step EPA would increase the incentives for obligated parties to blend ethanol into the gasoline supply and reduce the costs of the program.

    - EPA has the legal authority to make this change to the program and could do so by the end of this year.

- The second option would be for EPA to establish lower Renewable Volumetric Obligations (RVOs) for conventional renewable in its annual rulemaking process in order to reduce the overall compliance costs of the RFS, without substantially reducing the volume of conventional renewable fuel that is blended into the fuel supply. In doing so, EPA also could continue to establish RVOs for advanced renewable fuels at levels in a manner similar to what they did in the recent final rule.

- The third option would be for Congress to amend the statute to accomplish a similar result as EPA lowering the RVO.

Conclusion:

- Under the current program structure, there is a misalignment between the parties obligated to ensure that blending occurs and the parties that are situated in the supply chain to blend.

- As EPA recognized in 2009, moving the point of obligation to blenders can better align the obligation and the ability to blend. Moreover, moving the point of obligation to the blender more evenly distributes the cost of obligation across the obligated parties and likely reduces cost of the program to consumers.

- Rather than incentivizing major obligated parties to hoard Renewable Identification Numbers (RINs) and withhold from infrastructure investments, obligated parties would now be able to compete on an even playing field as the RFS drafters envisioned. With all of the major parties competing for E85 market share, consumer prices have the best opportunity to be competitive with E10 and gain penetration into the market.

- Ultimately, moving the point of obligation represents the best chance for policymakers to get past the difficult problems presented by the blend wall and to achieve the fundamental goal of the program—getting more renewable fuel into the market.

Written Testimony for the
Senate Committee on Environment and Public Works Hearing on
the Renewable Fuel Standard

February 24, 2016

Ronald E. Minsk

Chairman Inhofe, Ranking Member Boxer, and Members of the Committee, good morning and thank you for this opportunity to discuss the Renewable Fuel Standard. My name is Ron Minsk, and from 2013 until 2015, I was privileged to serve as Special Assistant to the President for Energy and Environment on the staff of the National Economic Council at the White House. In that capacity, I participated in the interagency review process for the Environmental Protection Agency's (EPA or the "Agency") Renewable Fuel Standard (RFS) program. Since leaving the White House, I have had the opportunity to reflect further upon the difficult challenges confronting policymakers faced with the task of implementing a RFS statute in a world and energy sector that has radically changed since it was last amended in 2007.

Managing the RFS program over the past three years has presented EPA with intricate, and often intractable, policy decisions. I want to stress at the outset that I continue to believe that the RFS has an important role to play in promoting the use of second generation biofuels, which is an important policy objective, especially when oil prices are low and there may be a natural tendency to pay less attention to our long term energy future. Additionally, given the constraints of the statute and the current program rules, I believe that EPA found a reasonable middle ground in establishing Renewable Volumetric Obligations (RVOs) for 2014, 2015 and 2016. Having made those two observations, there is no doubt that the program faces many challenges stemming from the evolution of the U.S. crude oil and fuel markets since the RFS was enacted in 2005 and expanded in 2007. While these are complex challenges, I believe that the operation of the program could be substantially improved by utilizing opportunities within the statute or by making modest changes to it, all of which would help it to better achieve its first-order goal of getting more renewable fuel into the United States' fuel supply in the most efficient manner possible.

In 2002, the United States consumed approximately 2 billion gallons of ethanol.[1] By 2015, our consumption grew to approximately 14.4 billion gallons[2] due in part to the RFS, while an additional 850 million gallons of ethanol was exported.[3] The United States also consumed almost 2.1 billion gallons of biodiesel.[4] These demand levels represent a measure of success for the RFS.

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[1] Energy Information Administration, *Annual Energy Review 2011*, at Table 10.3 (2011).

[2] Environmental Protection Agency, 2015 Renewable Fuel Standard data, available at www.epa.gov/fuels-registration-reporting-and-compliance-help/2015-renewable-fuel-standard-data.

[3] Energy Information Administration, U.S. Exports of Ethanol Fuel, available at www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=M_EPOOXE_EEX_NUS-Z00_MBBL&f=M.

[4] Environmental Protection Agency, 2015 Renewable Fuel Standard data, available at www.epa.gov/fuels-registration-reporting-and-compliance-help/2015-renewable-fuel-standard-data.

But while the RFS has helped promoted the use of more conventional renewable fuel and biodiesel, its success has not been uniform. It has largely failed at increasing the volumes of advanced renewable fuel and cellulosic ethanol sold into the market. It has also failed to promote the use of blends of ethanol in excess of 10 percent at a level sufficient that would alleviate the legitimate concerns about the repercussions of moving the RFS mandate beyond the "blend wall." As a result, I remain concerned that we could continue to see high and volatile RIN prices as a consequence of trying to force the market through the blend wall, and about tightness in the RIN market resulting from high RVOs and long-term uncertainty about this program. While EPA has stated in the past that high RIN prices would incentivize the market to get beyond the blend wall, I am skeptical that, as currently structured, the program will substantially increase the volume of cellulosic or higher blends of ethanol in the fuel supply.

I believe that there are three separate ways to reduce the costs of the RFS while still promoting the use of conventional and advanced renewable fuels: first, EPA could set RVOs for conventional renewable fuel that are below the blend wall. While this might be desirable, absent legislation, EPA is unlikely to lower RVOs from their current volumes or to a level below the blend wall because it views doing so as inconsistent with the purpose of the statute, which is to grow renewable fuel volumes over time, not shrink them.

Second, Congress could address the problem, either by setting lower mandates for conventional renewable fuel, or by eliminating the RVO for conventional renewable and establishing, in addition to the existing RFS requirements for advanced renewable fuels, a separate mandate that all fuel be blended to include a specified percentage, perhaps 9.7 percent, of conventional renewable fuel, a level that is below the blend wall. That approach would guarantee corn farmers 90 percent of the annual volume of 15 billion gallons that the RFS established,[5] but would eliminate the compliance costs associated with the current conventional fuel mandate.

The third approach would be for EPA to make adjustments to the rules governing the RFS program. Specifically, by moving the point of obligation from importers and refiners to the terminal rack, a point in the supply chain through which all fuel passes, from which motor fuel is distributed, and where motor fuel is taxed. It is my belief that by taking this step EPA would increase the incentives for obligated parties to blend ethanol into the gasoline supply and reduce the costs of the program. EPA has the legal authority to make this change to the program and could do so by the end of this year.

1. BRINGING MORE RENEWABLE FUEL TO MARKET

While the original supporters of the RFS may have had varied motivations—from energy security to environmental stewardship—the primary first-order goal of the RFS today remains the same as it was in 2005 when it was enacted and 2007 when it was amended: to substantially increase the volume of renewable fuel blended into the transportation pool. This was the fundamental purpose of the statute and it remains its most pressing challenge. For the majority of that time, renewable fuel producers and obligated parties were part of a system that had manageable mandates and ample room within the nation's fuel supply to grow.

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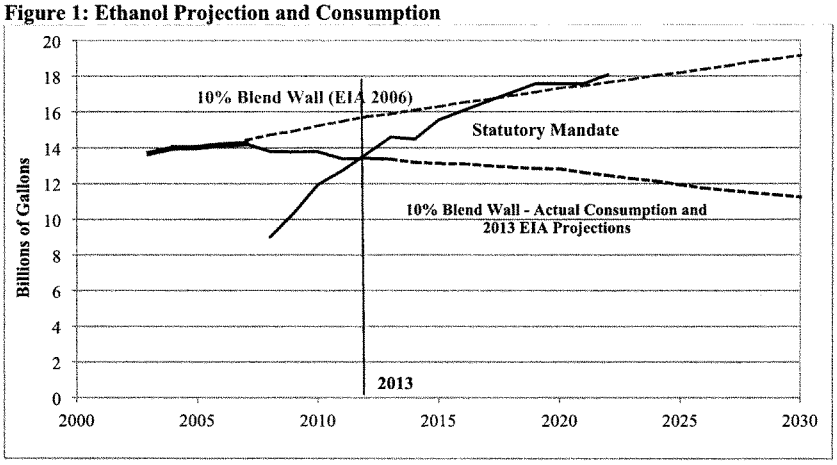
[5] Energy Information Administration, *Annual Energy Outlook 2015*, at Table 11 (2015).

When the 2007 amendments to the RFS were passed, they effectively mandated that the fuel supply absorb 15 billion gallons of conventional ethanol each year beginning in 2015,[6] a year in which EIA was forecasting gasoline demand of 163 billon gallons.[7] Had actual demand been near to EIAs forecast, the 15 billon gallons of conventional ethanol would have constituted 9.2 percent of the gas demand, allowing ample room for the supply to absorb the conventional ethanol without breaching the "blend wall." In fact, however, demand for gasoline grew slower than forecast, in part, because new vehicle fleet fuel economy improved by an average of 0.8 mpg/year between 2010 and 2014.[8] Initially, drivers drove less because they had less money due to the recession. As they started to drive more, they did so in cars that were increasingly efficient. The result was that demand for gasoline in 2015 was approximately 138.4 billion gallons, 25 billion gallons less than forecast when the RFS standards were enacted.[9] For the fuel supply to absorb 15 billion gallons ethanol, it would have to constitute about 10.8 percent of the fuel supply, a level the fuel supply could not easily accommodate because of the ethanol "blend wall."

Figure 1: Ethanol Projection and Consumption



Sources: *EIA Annual Energy Outlook*, 2007 and 2013.

Much of the U.S. infrastructure was designed to operate on fuel containing no more than 10 percent ethanol, which creates the "blend wall." Fueling infrastructure, including underground storage tanks at gasoline stations and gasoline pumps were, until recent years, generally designed

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6 42 USC 7545(o)(2)(B)(i).

7 Department of Energy, *Annual Energy Outlook,* at Table 11 (2007).

8 University of Michigan Transportation Research Institute, *Monthly Monitoring of Vehicle Fuel Economy and Emissions*, available at www.umich.edu/%7Eumtriswt/EDI_sales-weighted-mpg.html.

9 *Renewable Fuel Standard Program: Standards for 2014, 2015, and 2016 and Biomass-Based Diesel Volume for 2017*, 80 Fed. Reg. 77420, 77511 (Dec. 14, 2015).

and certified to accommodate no more than 10 percent ethanol.[10] Similarly, vehicles also were generally designed to operate on fuel containing no more than 10 percent ethanol until a few years ago.[11] A small portion of the fleet, perhaps about 17 million vehicles, are flexible fuel vehicles that can operate on fuel containing up to 85 percent ethanol.[12] The blend wall can be estimated at about 10 percent of the fuel consumed plus the additional volume of ethanol contained in the higher blends of ethanol sold including E15, on which many new cars can operate, E85, on which flexible fuel vehicles can operate, and other blends in between these levels. As the volume of the fuel sold as higher blends designed to operate in flexible fuel or other vehicles grows, the blend wall grows to reflect the additional space in the total fuel supply for ethanol.

As has been ably and more thoroughly discussed in other papers, and in the preamble to EPA's rule, the real test of the program's functionality began in late 2012 and early 2013. Prior to then, there was ample room in the fuel supply to accommodate the statutory mandates without approaching the blend wall. Moreover, over much of that time period, ethanol cost less than gasoline blendstock,[13] meaning that it cost less to produce finished gasoline containing up to 10 percent ethanol than clear gasoline, and consumers were largely oblivious to the small penalty in fuel economy due to the lower energy content of the ethanol. By the end of 2012, however, the market recognized that the fuel supply could no longer accommodate the mandated ethanol.

The combination of reduced demand for fuel, the effective limit on ethanol blend rates, and limited infrastructure for higher ethanol blends shocked the market for Renewable Identification Numbers ("RINs")—the primary means of compliance with the RFS. Whereas the price of RINs had been *de minimis* through 2012, the RIN price rose to nearly $1 by March 2013 and climbed to well over $1 by that summer. The cause for the rapid rise in compliance costs can be seen in the RIN supply curve in Figure 2. In this figure, the supply curve for RINs for conventional renewable fuel is the vertical difference between the ethanol supply curve and the ethanol demand curve when the supply curve is above the demand curve. When demand for ethanol exceeds supply, the price of RINs is zero, so long as ethanol is the low cost source of octane. In that case, the price of RINs is *de minimis* until the RVO exceeds the blend wall because when the mandate is below the blend wall, it is not difficult to blend an incremental gallon of ethanol into the fuel supply. However, once ethanol has been blended into the fuel supply at the level of the blend wall, it becomes substantially more expensive to separate a RIN from ethanol because it is substantially more difficult to blend an incremental gallon of ethanol into the fuel supply. Because it is harder to blend the incremental gallon of ethanol into the fuel supply at that point,

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[10] K. Moriarty and J. Yanowitz, *E15 and Infrastructure,* National Renewable Energy Laboratory, May, 2015.

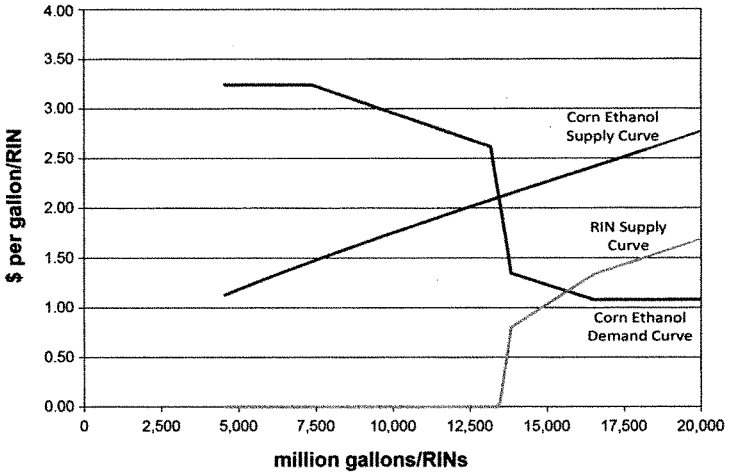
[11] *See Regarding Fuels and Fuel Additives. Gasohol; Marketability*, 44 Fed. Reg. 20777 (April 6, 1977). While EPA and DOE have certified that vehicles manufactured after 2001 can operate on E15, vehicle manufacturers have generally declined to confirm that the cars they manufactured can reliably be operated on that fuel. I believe that many drivers would prefer to not use in their vehicle a fuel that the manufacturer of their vehicle has not approved for use in the vehicle, even if the government has indicated its approval, given that drivers, and not the government, would incur the cost of repairing vehicles that are damaged by that fuel.

[12] Department of Energy, Alternative Fuels Data Center, *Flexible Fuel Vehicles*, available at www.afdc.energy.gov/vehicles/flexible_fuel.html.

[13] United States Department of Agriculture, Economic Research Service, U.S. Bioenergy Statistics, Table 14, available at www.ers.usda.gov/data-products/us-bioenergy-statistics.aspx.

the demand for ethanol falls sharply. With the statute mandating continued growth in renewable volumes, it was not clear how the obligated parties could meet their obligations to blend specified volumes of conventional renewable fuel into the fuel supply absent fundamental changes to the program or a more rapid increase in the ability of higher ethanol blends (e.g., E85) to break into the market.

Figure 2: Example of RIN Supply Curve in 2013



Source: Bruce A. Babcock, Marcelo Moreira, and Yixing Peng, *Biofuel Taxes, Subsidies, and Mandates: Impacts On US and Brazilian Markets,* Center for Agricultural and Rural Development, Iowa State University (2013).

Faced with this transformative shift in the market, EPA acknowledged the difficult problem of the ethanol blend wall by proposing to lower the total renewable fuel mandate in the final rule establishing RVOs for 2013,[14] and subsequently proposed lower the total renewable fuel mandate, which had the effect of lowering the conventional renewable fuel RVO, in the proposed rule establishing RVOs for 2014.[15] Predictably, this decision generated significant debate amongst stakeholders and resulted in a significant delay prior to the issuance of the 2014 – 2016 rule.

EPA's recent rule had to address the issue of how best to use the program's capabilities and/or market forces to break through the blend wall and bring more renewable fuel into the market. In the rule, EPA has taken the view that increases in the price of RINs—rather than being indicative of a programmatic failure—actually can function to incentivize the type of infrastructure

[14] *Regulation of Fuels and Fuel Additives: 2013 Renewable Fuel Standards, Final Rule,* 78 Fed. Reg. 49794, 49823 (Aug. 15, 2013).

[15] *2014 Standards for the Renewable Fuel Standard Program, Proposed Rule,* 78 Fed. Reg. 71732, 71734 (Nov. 29, 2013).

investment necessary to make higher ethanol blends available in a cost-competitive way to consumers. As I discuss in the next section in greater detail, however, I believe that there are more cost-effective methods available to address this problem.

2. PROBLEMS IN E-85 AND BIODIESEL MARKET PENETRATION

Before focusing on potential solutions, I would like to explain what informs my thinking on the issue of E85 and biodiesel market penetration. As others have pointed out, in the simplest of terms, the RFS is designed to increase the cost of fuel with little to no renewable content and use that incremental cost to reduce the cost of renewable fuels, with a preference for renewable fuels with a low-carbon content. Stated differently, it could be thought of as a tax on fuel with relatively higher carbon content that is used to subsidize fuel with relatively lower carbon content. Thus, as EPA describes in last year's proposed rule, a functional market system for the program would be designed to pass the benefits of generating RIN credits from the renewable fuel producer, to the blender, and then to the retail customer.[16] As Christopher Knittel, Ben Meiselman, and James Stock state in their June 2015 paper on this topic, "[i]n theory, RIN prices provide incentives to consumers to use fuels with a high renewable content and to biofuels producers to produce those fuels[.]"[17]

As I stated previously, the early years of the RFS are not especially instructive in evaluating the functionality and effectiveness of this system because there was ample room in the fuel supply to comfortably accommodate the RFS's RVOs within the then current fuel supply and with the then current automotive fleet. However, with the challenges that began in late 2012 and early 2013 as the market recognized that the fuel supply could not accommodate the statutory obligations without breaching the blend wall, the question of how this system was working to incentivize the use of higher ethanol blends increasingly animated the interagency review process. If the market was functioning as expected, and RIN prices were rising—making higher ethanol blends more valuable—why were we not seeing the expected rise in E85 market penetration?

In their June 2015 paper, Knittel et al. analyzed the behavior of the RINs market from January 2013 to March 2015 and described their most troubling finding as follows:

> To us, the most intriguing and challenging finding here is the near absence of pass-through of RIN prices to retail E85 prices. While RIN prices might be passed through at some retail outlets at some times, this is not the case on average using national prices. The goal of the RFS program is to expand the use of low-carbon domestic biofuels, and the key economic mechanism to induce consumers to purchase high-renewables blends is the incentives provided by RIN prices. If the RIN price savings inherent in blends with high biofuels content are not passed on to the consumer, then this key mechanism of the RFS is not functioning properly.[18]

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[16] *Renewable Fuel Standard Program: Standards for 2014, 2015, and 2016 and Biomass-Based Diesel Volume for 2017, Proposed Rule,* 80 Fed. Reg. 33100, 33119 (June 10, 2015) (hereinafter, the "2015 Proposed Rule").

[17] *See* Christopher R. Knittel, Ben S. Meiselman, and James H. Stock, *The Pass-Through of RIN Prices to Wholesale and Retail Fuels under the Renewable Fuel Standard*, National Bureau of Economic Research (June 2015), *available at*: www.nber.org/papers/w21343.

[18] *See id.*

In the final rule, EPA reached the same conclusion. In the preamble to the rule, EPA stated that:

> [We] examined available data in an attempt to determine whether or not higher RIN prices resulted in lower E85 prices at retail, and whether lower E85 retail prices lead to substantial increases in E85 sales, as economic theory would suggest would be the case when FFV owners receive better value for purchasing E85 rather than E10. Our analysis suggests that the market was not sufficiently responsive to higher RIN prices to drive large increases in E85 sales volumes in the period of time at question. For instance, we found that between January 2013 and July 2015 only 44% of the RIN value was passed on to E85 customers in the form of lower E85 retail prices . . . . . We also found that while sales volumes of E85 did increase as the price discount for E85 relative to E10 increased, these sales increases were both less dramatic than many have assumed, and perhaps more importantly, did not increase sharply when the price discount exceeded energy parity, as others . . . have assumed. While we did not investigate all factors that might slow retail response to changing RIN prices, our observations lead us to conclude that if EPA were to increase the total renewable fuel volume requirement significantly, we would expect to see sharply higher RIN prices, but sales volumes of E85 would be expected to see only modest increases that would be insufficient to enable the market to reach the statutory targets.[19]

Another data point used to evaluate the functionality of the current system is to look at whether the high RIN prices in early 2013 did indeed incentivize any additional build-out of E85 infrastructure in those areas of the country where E85 is most readily available. Tellingly, what happened in Minnesota, the state with most stations selling E85,[20] tracked Knittel et al.'s findings—as RIN prices rose in early 2013, the number of stations selling E-85 declined.[21] As depicted in Figure 3, the number of stations selling E85 at the end of 2015 in Minnesota was 15 percent lower than at the end of 2013.[22] Likewise, the volume of E85 sales also declined over that same time period. Reviewing this data leads me to concur with Knittel et al.'s conclusion that the RINs market is simply not functioning as it should, or as EPA has been assuming it would. [23]

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[19] *Renewable Fuel Standard Program: Standards for 2014, 2015, and 2016 and Biomass-Based Diesel Volume for 2017*, 80 Fed. Reg. 77,420, 77,459 (Dec. 14, 2015).

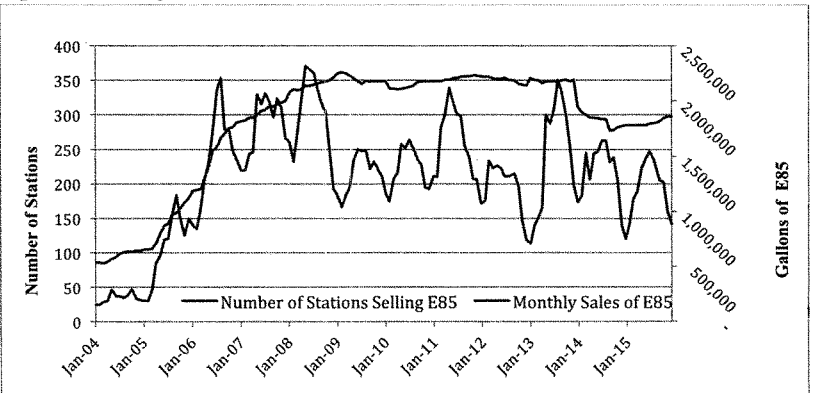
[20] Department of Energy, Alternative Fuel Data Center, *E85 Fueling Station Locations by State*, available at www.afdc.energy.gov/data/10367.

[21] The number of stations carrying E85 in Minnesota declined from 350 in 2013 to 293 at the end of 2104, and has declined by another 8 stations since then. *2015 Minnesota E85 + Mid-B lends Station Report*, Minnesota Department of Commerce, June, 2015, available at mn.gov/commerce/energy/images/2015-05may-e85.pdf.

[22] Minnesota Department of Commerce, *Minnesota E85 + Mid-Blends Station Report* (2015).

[23] The issue of properly aligned incentives and the need for infrastructure also exists for biodiesel blending. In order to blend biodiesel, a terminal needs to add significant infrastructure, including: receipt and offloading equipment, dedicated storage tanks, heat traced transfer lines, rack injection meters, and rack automation control systems.[23] The installation of terminal injection projects can cost millions of dollars,[23] and terminal owner-operators need the support and long-term financial commitment of all rack customers to proceed with the necessary capital investments. Because not all customers are in need of RIN's under the current rules, critical consensus for investing may never mature. This can delay or foreclose the necessary investments in biodiesel infrastructure. This would not happen if all users of the terminal were obligated parties.

Figure 3: Monthly E85 Stations and Sales in Minnesota



Source: Minnesota E85 + Mid-Blends Station Report, Minnesota Department of Commerce (2004 - 2015)

3. REDUCING THE COST OF THE RFS

As I described above, there are three general approaches to help lower the cost of complying with the RFS while still adhering to its primary goal of increasing the volume of renewable fuel blended into the United States' fuel supply: EPA could establish lower RVOs for conventional renewable fuels, Congress could convert the mandate for conventional renewable fuels from one that requires a particular volume to one that requires a concentration of conventional renewable fuel in the fuel supply that is below the blend wall, or EPA could change the program rules to better align the obligation to blend renewable fuel into the fuel supply with the ability to blend renewable fuel into the fuel supply.

a. Establishing Lower Renewable Volume Obligations By Rule

EPA could establish lower RVOs for conventional renewable in its annual rulemaking process in order to reduce the overall compliance costs of the RFS, without substantially reducing the volume of conventional renewable fuel that is blended into the fuel supply. In doing so, EPA also could continue to establish RVOs for advanced renewable fuels at levels in a manner similar to what they did in the recent final rule.

The current fuel supply can accommodate nearly the entire conventional RVO with relatively little trouble. In the final rule, EPA estimated that gasoline consumption in 2016 will be 139.96 billion gallons and effectively mandated that that fuel supply absorb approximately 14.15 billon gallons of conventional ethanol, reflecting about 10.1 percent of the total demand for gasoline.[24]

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[24] *Renewable Fuel Standard Program: Standards for 2014, 2015, and 2016 and Biomass-Based Diesel Volume for 2017*, 80 Fed. Reg. 77,420, 77,511 (Dec. 14, 2015).

Because of the ability of the fuel supply to easily absorb ethanol until it reaches 10 percent of the fuel supply, the cost of mandating an RVO the allows for a concentration of conventional ethanol of less than 10 percent is modest, as depicted in the supply curve for ethanol in Figure 1. We experienced this when the RVO was below the blend wall through the end of 2012, and the price of RINs for conventional fuel averaged just a few pennies through the end of 2012. Therefore, establishing RVOs for conventional renewable fuel below the blend wall, which is reflected as the inflection point in the RIN supply curve in Figure 1, would reduce RFS compliance costs substantially. Moreover, setting an RVO for conventional renewable fuel at 9.7 percent, for example, would still effectively mandate that the fuel supply absorb 13.58 billon gallons of conventional renewable fuel. Such an RVO would guarantee the producers of conventional renewable fuel over 90 percent of the volumes that were mandated by the statute, while lowering compliance costs associated with this particular mandate.

The mandates for advanced and cellulosic renewable fuels would still push the overall concentration of ethanol in the fuel supply above the blend wall. However, because the entire conventional renewable fuel RVO could be accommodated in the supply without breaching the blend wall, the higher RIN costs would be limited to the RINs for the advanced fuels, where the volumes are low for now, which would result in lower compliance costs. Stated more simply, the market would continue to incur higher RINs costs for advanced fuels, which are the types of fuels that the statute itself favored, but would substantially reduce the compliance costs for conventional renewable fuel, whose use the statue placed less emphasis in over time.

EPA, however, is unlikely to reduce the RVOs below the blend wall because it believes that reducing the RVOs from one year to the next is inconsistent with the purpose of the statute, and EPA is not going to back away from its commitment to try and increase the RVOs to the statutory levels over the next several years.

b. Amending the Statute

Congress could amend the statute in a manner to accomplish a similar result as EPA lowering the RVO. Moreover, because Congress has more latitude to amend the statute than EPA has to manage the RFS program under the current statue, it would be a less cumbersome result.

Rather than reducing the mandated volumes for conventional renewable fuel, Congress could entirely eliminate the conventional renewable fuel requirement from the current RFS program. In its place, Congress could mandate that all fuel be blended to include 9.7 percent ethanol. Compliance with this requirement would be separate and apart from the existing RFS requirements. All blenders would be subject to audit and substantial fines for failure to meet this blending requirement. The system could accommodate a statutory requirement that all fuel contain 9.7 percent conventional renewable fuel, for instance, at little cost, because that would be at a point to the left of the inflection point in the RIN supply curve in Figure 1. Moreover, based on current EIA forecasts, the fuel supply would still be required to absorb 13.4 billion of gallons of ethanol in 2017, representing 90 percent of the current mandate, but without any of the transaction costs associated with the conventional renewable fuel mandate in the RFS.[25]

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[25] Department of Energy, *Annual Energy Outlook,* at Table 11 (2015).

Congress also could acknowledge that some consumers prefer fuel with lower concentrations of ethanol for vehicle performance or other reasons. It could accommodate them by allowing the sale of fuel with lower concentrations of ethanol, subject to an excise tax that would be inversely related to the amount of ethanol in the fuel. Finally, Congress also could exempt from the requirement gasoline sold at marinas and dispensed directly into marine vessels or fuel sold in containers of less than one gallon for use in small engines, for which there is evidence that ethanol creates greater risks of engine problems than in automobiles.[26]

This approach would reduce compliance costs and provide a clearer requirement moving forward, because the RVO would not have to be recalculated each year and would not be subject to the natural uncertainty of that process. Moreover, there would be no question as to its legality if incorporated into the statute.

c. Changing the Point of Obligation By Regulation

A third alternative would be for EPA to change the point of obligation by rulemaking. Changing the point of obligation is clearly within EPA's existing legal authority,[27] could both better align the incentive to blend renewable fuel with the obligation to do so and substantially reduce the compliance cost of the program, while preserving the goals of promoting the use of advanced renewable fuels.

i. *Background*

The issue of the appropriate point of obligation has been understood as a critical choice in the structure of the RFS since the inception of the program. Where the compliance obligation falls within the fuel supply chain has a tremendous impact on the RFS' ability to allocate costs, award benefits, incentivize changes in the market, and achieve the goals set out by Congress in the statute. Before discussing why this issue is critically important moving forward, it is important to review the history of EPA's deliberations on this subject and understand how EPA arrived at placing the point of obligation on refiners and importers (*i.e.*, the parties who produce and supply fuel to the rack at fuel terminals) versus blenders (*i.e.*, those parties actually blending the renewable fuel into gasoline and diesel).

In the initial phase of the RFS—from 2005-2007—EPA largely based its decision on point of obligation on ease of administration. As EPA explained, "[w]hen the RFS1 regulations were drafted, the obligations were placed on the relatively small number of refiners and importers rather than on the relatively large number of downstream blenders and terminals in order to minimize the number of regulated parties and keep the program simple."[28]

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[26] *See Partial Grant of Clean Air Act Waiver Application Submitted by Growth Energy To Increase the Allowable Ethanol Content of Gasoline to 15 Percent; Decision of the Administrator,* Notice of Decision Granting a Partial Waiver, 76 Fed. Reg. 4,662 (Jan. 26, 2011).

[27] *See* 42 USC 7545(o)(2)(A)(iii) "the regulations promulgated under this clause shall contain compliance provisions applicable to refineries, blenders, and importers, as appropriate . . . ."

[28] *Regulation of Fuels and Fuel Additives: Changes to Renewable Fuel Standard Program; Final Rule,* 75 Fed. Reg. 14670, 14722 (March 26, 2010) (hereinafter, the "RFS2 Final Rule").

In 2009, with the amended program placing increased renewable mandates onto the system, EPA once again considered the issue of whether to place the point of obligation on refiners who provide fuels to the market for further distribution at the rack or on the blenders who actually put the renewable fuel into the system. In doing so, EPA considered a new issue—the disparity in compliance burden between major integrated refiners who possess blending operations (which generate RINs) and refiners who are primarily focused on refining and do not generate their own RINs. EPA framed the issue in its 2009 proposed rule as follows:

> The result is that in some cases there are significant disparities between obligated parties in terms of opportunities to acquire RINs. If those that have excess RINs are reluctant to sell them, those who are seeking RINs may be forced to market a disproportionate share of E85 in order to gain access to the RINs they need for compliance. If obligated parties seeking RINs cannot acquire a sufficient number, they can only carry a deficit into the following year, after which they would be in noncompliance if they could not acquire sufficient RINs. The result might be a much higher price for RINs (and fuel) in the marketplace than would be expected under a more liquid market. Given the change in circumstances brought about through EISA, it may be appropriate to consider a change in the way that obligated parties are defined to more evenly align a party's access to RINs with that party's obligations under the RFS2 program.[29]

In addition to describing the problem, EPA also considered a potential solution—moving the point of obligation from refiners to blenders—specifically recognizing the impact of the blend wall on the viability of the RFS. EPA described the issue as follows:

> Given the change in circumstances brought about through EISA, it may be appropriate to consider a change in the way that obligated parties are defined to more evenly align a party's access to RINs with that party's obligations under the RFS2 program. The most straightforward approach would be to eliminate [unfinished gasoline] from the list of fuels that are subject to the standard, such that a party's RVO would be based only on the non-renewable volume of finished gasoline or diesel that he produces or imports. Parties that blend ethanol into [unfinished gasoline] to make finished gasoline would thus be obligated parties, and their RVOs would be based upon the volume of [unfinished gasoline] prior to ethanol blending. Traditional refiners that convert crude oil into transportation fuels would only have an RVO to the degree that they produced finished gasoline or diesel[.] Since essentially all gasoline is expected to be E10 within the next few years...this approach would effectively shift the obligation for all gasoline from refiners and importers to ethanol blenders (who in many cases are still the refiners)....a variation of this approach would be to move the obligations for all gasoline and diesel downstream to parties who supply finished transportation fuels to retail outlets or to wholesale purchaser-consumer facilities.
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> This variation would have the additional effect of more closely aligning obligations and access to RINs for parties that blend biodiesel and renewable diesel into petroleum-based

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[29] *Regulation of Fuels and Fuel Additives: Changes to Renewable Fuel Standard Program; Proposed Rule*, 74 Fed. Reg. 24904, 24963 (May 26, 2009) (hereinafter, the "RFS2 Proposed Rule").

> diesel…it would have certain advantages. Currently, blenders that are not obligated parties are profiting from the sale of RINs they acquire through splash blending of ethanol. By eliminating [unfinished gasoline] from the list of obligated fuels, these blenders would become directly responsible for ensuring that the volume requirements of the RFS program are met, and the cost of meeting the standard would be more evenly distributed among parties that blend renewable fuel into gasoline. With obligations placed more closely to the points in the distribution system where RINs are made available, the overall market prices for RINs may be lowered and consequently the cost of the program to consumers may be reduced. [30]

Despite its recognition of this issue, in the 2010 final rule, EPA elected not to change the point of obligation. Once again, EPA cited administrative considerations ("a change in the designation of obligated parties would result in a significant change in the number of obligated parties and the movement of RINs, changes that could disrupt the operation of the RFS program during the transition from RFS1 to RFS2.") but the Agency did acknowledge that it remained concerned about this issue and that it would revisit the issue of point of obligation if necessary. As EPA stated, "[w]e will continue to evaluate the functionality of the RIN market. Should we determine that the RIN market is not operating as intended, driving up prices for obligated parties and fuel prices for consumers, we will consider revisiting this provision in future regulatory efforts."[31]

In the preamble to the recent final rule, EPA noted that commenters suggested that EPA "change the RFS program's point of obligation from its current focus on producers and importers of gasoline and diesel," and acknowledged that the idea can "play a role in improving incentives provided by the RFS program to overcome challenges that limit the potential for increased volumes of renewable fuels." The Agency concluded that such a change was "beyond the scope of this rulemaking," but stated that it would "continue to actively monitor the functioning of the market, assess all relevant data, and review our options as necessary."[32]

ii. *EPA Should Revisit the Point of Obligation*

Based on my review of the data and my experience and knowledge gleaned from meeting with a wide and diverse range of stakeholder groups, it is apparent to me that the current RIN market dictates EPA revisiting the RFS' point of obligation. Before elaborating further on this point, it is important to state clearly my view that EPA has ample authority to address the point of obligation in the current rulemaking. The statute grants EPA the authority to promulgate regulations that "contain compliance provisions applicable to refineries, blenders, and importers, as appropriate."[33] Moreover, as just discussed above in the previous subsection, EPA itself considered establishing the point of obligation at the blender in both the EPA's proposed and final rules governing the program in 2009 and 2010. Thus, it is clear that the Agency has the statutory authority to address the issue.

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[30] *See id.*

[31] *See* RFS2 Final Rule at 14722.

[32] *Renewable Fuel Standard Program: Standards for 2014, 2015, and 2016 and Biomass-Based Diesel Volume for 2017, Final Rule*, 80 Fed. Reg. 77420, 77431 (Dec. 14, 2015).

[33] 42 USC 7545(o)(2)(A)(iii); *see also* discussion above of EPA's consideration of this issue in the proposed and final rules establishing the RFS2 program.

The current point of obligation is a significant factor inhibiting greater amounts of E85, and perhaps biodiesel, from reaching the market due primarily to the lack of properly aligned incentives and the resulting shortfall in blending infrastructure expansion. Reaching this conclusion only requires extending the reasoning acknowledged above by EPA in 2009, namely: a portion of obligated parties, refiners with large marketing operations, are almost immediately "long" on RINs at the beginning of every compliance period, a position that occurs because when they market more fuel than they refine, they generate more RINs through blending than they need for their own compliance obligations.

Having several large obligated parties structurally long on RINs has important implications for the operation of the RFS program. First, blending high concentrations of ethanol at wholesale distribution facilities at scale often requires modifications to the infrastructure.[34] At many distribution facilities, however, obligated parties long on RINs are the largest customers, and are in a position to effectively block installation of infrastructure to promote large scale E85 blending. Once the RIN-long party has met its own RVO, it has little incentive to participate financially in the expansion of blending infrastructure to allow for higher level blends (E85 and E15) or additional advanced renewable fuels (B5-B20) because they already have the RINs they need and do not want additional blending to lower the value of their excess RINs.

Second, under the current program structure, these parties also may not even have an incentive to blend to the blend wall. Because they have the RINs that they need, and the availability of fewer RINs can keep RIN prices higher, generation of fewer RINs could help them maximize their return on existing blending (E10) and, contrarily, have a direct disincentive to facilitate expansion of infrastructure and blending (B5, E85), because meeting the mandate level decreases RIN profits generated from being a RIN-long party. This is especially clear when the industry confronts the blend wall and additional capital or marketing is required to generate the RINs necessary to meet EPA's goals of increasing renewable fuels consumption and making the RFS program successful. Conversely, the RIN-short refiners supply fuels to the market, but do not market fuel and therefore do not participate in any significant way in blending of renewable fuels, thus lacking access to, or control over, RIN generating blending infrastructure.

Ironically, the current structure, which puts the point of obligation on refiners instead of where the actual compliance is achieved at the point of blending, provides the least incentive to those who are best situated to undertake the blending that the RFS seeks to motivate and imposes the greatest obligation on the parties who are most poorly situated to increasing the volumes of renewable fuel that is blended into the fuel supply. Whether RIN-long refiners sell these RINs or bank them, these parties are not incentivized to invest significantly in biodiesel, advanced fuels, or E-85 infrastructure that would enable more renewable fuel to reach the market. They can remain relatively content to hold their long position. They are so competitively advantaged that they do not have to discount fuels to incentivize higher-level blends and thus protect their RIN windfall. In fact, they are actually incentivized to forestall more renewable fuel from entering

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[34] *See, e.g.*, Michael Leister, *Biofuels Blending Infrastructure*, SAE Government and Industry Conference, May 13, 2008; *Daniel Measurement and Control Application Guide, An Introduction to Blending Ethanol*, available at www2.emersonprocess.com/siteadmincenter/PM%20Daniel%20Documents/Ethanol_Blending.pdf; Robert Jagunich, *Biofuels Mid-Stream Infrastructure Requirements*, California Energy Commission, Apr. 14, 2009.

the market, thus protecting hydrocarbon volumes being sold and keeping the RIN price as high as possible.

Other obligated parties, in turn, are inherently short on RINs—*i.e.*, they do not have blending operations and therefore have no direct access to RINs—and are faced with ever-increasing compliance costs. In the past, EPA had taken the view that the parties facing growing costs for RINs would be incentivized to build new infrastructure or to invest in blending operations. To me, it was inappropriate to presume this as a path to compliance, as it was akin to telling a product's manufacturer that it also must become its distributor as part of an effort to sell a competing product. Effectively, that view essentially expected RIN pricing to become so severe that it would reverse the last 20 years of de-integration in the refinery industry. In the final rule, EPA backed away from that position, stating that:

> We do not believe the statute should be interpreted to require that refiners and importers change the nature of their businesses so as to comply with RFS requirements, as this would be a far-reaching result that Congress can be expected to have clearly specified if it was intended. For example, to the extent that commenters imply that refiners should be required to build or purchase renewable fuel production facilities, take ownership of retail stations, produce or sell cars capable of using high-ethanol blends, or plant cropland to provide feedstock for increased renewable fuel production, we would disagree. Rather, if other parties engaged in these activities fail to adjust those activities to allow the statutory volume targets to be met, we believe the result is an inadequate domestic supply.[35]

EPA hopes that higher RIN prices will incentivize the consumption of more E85. In the final rule, EPA acknowledged, however, that:

> [i]f higher RIN prices, which would likely result from a higher total renewable fuel standard, are to lead to substantial increases in E85 consumption, two independent events must occur. First, the higher RIN prices must lead to lower E85 retail prices. If this does not happen consumers would have no incentive to purchase additional volumes of E85 as a result of higher RIN prices. Second, FFV owners must respond to these lower prices by purchasing E85 instead of E10 when E85 is available. Authors such as Babcock and Pouliot, who have written about the ability for RINs to drive significant increases in E85 sales volumes, optimistically assume that RIN prices are passed through to E85 prices and that consumers are highly responsive to E85 prices.[36]

But as discussed above, EPA has acknowledged that a substantial portion of the value of the RIN is not being used to reduce the cost of E85 at the pump, with "only 44% of the RIN value [being] passed on to E85 customers in the form of lower E85 retail prices."[37] EPA acknowledged that:

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[35] *Renewable Fuel Standard Program: Standards for 2014, 2015, and 2016 and Biomass-Based Diesel Volume for 2017*, 80 Fed. Reg. 77,420, 77,459 (Dec. 14, 2015).

[36] *Id.*

[37] *Id.*

> While economic theory . . . support[s] the idea that RINs can serve as a mechanism to increase the production, distribution, and consumption of renewable fuels, it is important to note that this result is dependent on the marketplace working both efficiently and quickly. In reality, there is a timing component associated with each of the steps outlined above. Renewable fuel producers and investors must see a sustained, profitable market for renewable fuels before they will be willing to invest in the construction of additional fuel production capacity, which may take years to construct and bring online. Fuel blenders and distributors must see sustained profit opportunities before they are willing to invest in new infrastructure to increase their capacity to blend and distribute renewable fuels. Market competition must increase before fuel blenders and distributors are willing to pass along all of the reduced effective price of renewable fuel (in essence, the value of RINs) to consumers at retail. New fueling infrastructure will need to be built to facilitate the growth in sales of fuels containing an increasing percentage of renewable fuel. And as exposure to renewable fuels increases, it will take some time for consumers to learn to identify value in fuel blends containing higher proportions of renewable fuels, as well as their vehicle's ability to handle these fuel blends and where they are available for purchase.[38]

Part of the challenge is that at the moment, there is not obvious good value for consumers purchasing E85. We can observe this by looking again at data reported by the State of Minnesota. Table 1 reports the monthly average price of E10 and E85 in Minnesota. When the price of E85 is adjusted to account for the fact that it contains, on average about 25 percent less energy per gallon, the price often exceeds the price of gasoline, and did exceed it on average for the year, even as the average price of a RIN for conventional fuel was 54 cents over 2015.[39] This demonstrates the challenge faced by the ethanol industry. Even with the value of the RIN incorporated into the price of E85, E85 is selling at a premium price over gasoline, and because of its lower energy content, consumers using E85 have to go to the service station one additional time each month to fill their fuel tanks.[40]

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[38] *Id.*

[39] Clearview Energy Partners, *A Framework for Year Eight*, at 38 (Jan. 15, 2016).

[40] Assumes that a car is driven 12,000 miles per year at 25 mpg using E10 or 18.75 mpg using E85, and purchases 15 gallons of fuel each trip to the service station.

Table 1: Prices of E10 and E85 in Minnesota During 2015

	Price of E10	Price of E85	Energy Content Adjusted Price of E85	Premium for E85 Above E10
Jan	$1.96	$1.64	$2.16	$0.20
Feb	$2.16	$1.70	$2.24	$0.08
Mar	$2.38	$1.78	$2.34	-$0.04
Apr	$2.31	$1.74	$2.29	-$0.02
May	$2.54	$1.89	$2.49	-$0.05
Jun	$2.65	$1.99	$2.62	-$0.03
Jul	$2.69	$1.99	$2.62	-$0.07
Aug	$2.56	$1.94	$2.55	-$0.01
Sept	$2.29	$1.81	$2.38	$0.09
Oct	$2.39	$1.91	$2.51	$0.12
Nov	$2.13	$1.79	$2.36	$0.23
Dec	$1.88	$1.61	$2.12	$0.24
Annual Average				$0.06

Source: 2015 Minnesota E85 + Mid-Blends Station Report, Minnesota Department of Commerce

Moreover, because Minnesota has more E85 stations than any other state, and there is a greater opportunity for pump-on-pump competition in Minnesota than elsewhere, there is a greater likelihood that a larger portion of the value of the RIN is being passed through to the retail customer in Minnesota. It seems likely that in other states, a smaller portion of the value of the RIN is being passed through to the retail price, and that E85 provides even less value than it does to drivers in Minnesota.

If E85 is not providing good value for consumers, there is little reason for them to purchase it. And if consumers are not going to purchase E85, then none of the things that EPA identified as necessary for RINs to serve as a mechanism to increase the production, distribution, and consumption of renewable fuels will occur:

- New retail fueling infrastructure will not be built because there is not demand for the fuel;
- Fuel blenders and distributors will not pass along the value of the RIN to the retail level because there is not sufficient retail competition to force them to do so;
- Fuel blenders and distributors also will not see larger profits through larger sales of higher blends, so they will have no incentive to invest in new infrastructure to increase their capacity to blend and distribute renewable fuels; and,
- Renewable fuel producers and investors will not see the sustained, profitable market for renewable fuels required to justify investment in additional fuel production capacity.

Finally, EPA also needs to consider the operating and export incentives created with a high RIN price. If a refiner cannot generate RINs, the only options the RIN-short refiners have other than paying high RIN prices to RIN-long parties who are disincentivized to meet the mandated volumes -- are curtailing production or exporting. If they do either, the fuel supply in the United States shrinks, and there is both less competition for the advantaged refiners and less opportunity for renewable blending. It will make meeting the RVO targets that much more difficult and likely increase the domestic cost of fuel without incentivizing the blending of renewable fuels to the degree that EPA seeks to require.

Ironically, we need not wreak havoc to realign the incentives in the market. We need only place the obligation where it will evenly apply the burden and let the market work. If EPA moves the point of obligation to the owner of the hydrocarbon fuel just before blending, it will assure that every person controlling the blending will be fully incentivized to maximize the blending of renewable fuels into the fuel supply because they will need RINs in proportion to the fuel they blend and not in proportion to the fuel that they produce.

iii. No Real Administrative Advantage to Refiners

Finally, with respect to ease of administration, it seems possible that nearly every party that would be an obligated party if the point of obligation was moved to the rack is already an obligated party. All RIN related transactions must be executed via the EPA Moderated Transaction System (EMTS), which requires transactional, quarterly, and annual reports for all registered users.[41] According to EPA's recently released EMTS data, over 80 percent of RINs are separated by currently obligated parties.[42]

This observation is consistent with data that Valero reported in comments to the EPA docket in the final rule establishing RVOs for 2014 – 2016 last fall.[43] In its submission to EPA, Valero stated that EPA has indicated that there currently are about 200 parties obligated under the RFS. Valero collected and analyzed data to determine how many parties it believes would be obligated if the point of obligation was moved to the terminal rack. Its analysis identified about 107 parties that post prices at fuel terminals who would be obligated if the point of obligation was moved.[44] This analysis would not include parties that blend fuel at a terminal but do not sell to the public or post a price. However, it seems unlikely that the number of parties that blend fuel at a terminal but do not sell to the public or post a price would be so large as to represent a meaningful departure from the number of currently obligated parties. Therefore, to the extent that EPA was concerned years ago about establishing a point of obligation that would substantially increase the number of obligated parties, it may no longer need to be concerned. Finally, according to Valero's analysis, nearly all of the 107 obligated parties are already registered with EPA under the RFS, because they are either refiners or importers as well as blenders.

I have attached a copy of the analysis that Valero reported to EPA to my testimony as Appendix 1. In an effort to allow other stakeholders to reach their own conclusions about the data, I asked Valero for a list of the parties that it identified as obligated parties if the point of obligation is moved. I have attached that information to my testimony as Appendix 2.

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[41] *See* 40 CFR 80.1451.

[42] According to 2014 EPA EMTS data report on July 10, 2015: 11,536,302,607 of 14,052,892,893 total D6 RINs were separated by obligated parties. 82.1% of all D6 RINs separated in 2014 were done by obligated parties. 84.3% when only considering blenders and obligated parties as described in the ideal EPA sequence. Greater than 11.5 billion RINs were separated by obligated parties as compared to just 2.1 billion by blenders. www.epa.gov/otaq/fuels/rfsdata/2014emts.htm.

[43] Comment submitted by Richard J. Walsh, Senior Vice President, Deputy General Counsel litigation and Regulatory Law, Valero to the Environmental Protection Agency (Oct. 16, 2015) available at www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2015-0111-3530.

[44] *Id.*

Although we may not know today exactly how many obligated parties there would be if the point of obligation was moved, it is clear from the available analyses that the number would be manageable and in keeping with the reach of other EPA programs. To help achieve the program's goals, EPA should update its analysis from 2010, propose a change in obligated party as part of the next RFS rulemaking and accept public comment on the proposal.

* * *

Under the current program structure, there is a misalignment between the parties obligated to ensure that blending occurs and the parties that are situated in the supply chain to blend. As EPA recognized in 2009, moving the point of obligation to blenders can better align the obligation and the ability to blend. Moreover, moving the point of obligation to the blender more evenly distributes the cost of obligation across the obligated parties and likely reduces cost of the program to consumers. Rather than incentivizing major obligated parties to hoard RINs and withhold from infrastructure investments, obligated parties would now be able to compete on an even playing field as the RFS drafters envisioned. With all of the major parties competing for E85 market share, retail E85 prices have the best opportunity to be competitive with E10 and gain penetration into the market. Ultimately, this represents the best chance for policymakers to get past the difficult problems presented by the blend wall and to achieve the fundamental goal of the program—getting more renewable fuel into the market.

Appendix 1

RE: Supplement to Valero Comments on Proposed Renewable Fuel Standards for 2014, 2015 and 2016 and Biomass-Based Diesel Volume

Available in EPA Docket No. EPA-HQ-OAR-2015-0111

Richard J. Walsh
Senior Vice President
and Deputy General Counsel
Litigation and Regulatory Law

October 16, 2015

Via Federal Express No. 7747-5828-9186

EPA Docket Center
U.S. Environmental Protection Agency
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Mail code 28221T
Washington, DC 20460

Attn: Docket ID No. EPA- HQ-OAR-2015-0111

RE: Supplement to Valero Comments on Proposed Renewable Fuel Standards for 2014, 2015 and 2016 and Biomass-Based Diesel Volume

On July 27, 2015, Valero submitted comments on the Proposed Renewable Fuel Standards ("RFS") for 2014, 2015 and 2016 urging EPA to revise the RFS to move the point of obligation to the owner of the fuel at the wholesale rack. When EPA considered revising the structure of the RFS in 2010, EPA argued that at that time "a change in the designation of obligated parties would result in a significant change in the number of obligated parties and the movement of RINs, changes that could disrupt the operation of the RFS program during the transition from RFS1 to RFS2." To address this concern in support of the submitted comments, Valero completed analysis regarding the administrative burden that might result from a change in the point of obligation. As described below, Valero's analysis finds that the change will result in no additional administrative burden because the change will not increase the number of obligated parties under the RFS. An analysis of information available in the Oil Price Information Service ("OPIS") and EPA's list of RFS registered parties shows that the number of directly obligated parties is expected to decrease if the point of obligation is moved to the wholesale rack.

As background, Valero summarizes the comment submitted in July as follows:

> The current problems with the RFS, as outlined below, can largely be resolved by shifting the RFS compliance obligation to the owner of the fuel immediately prior to blending at the rack, ensuring that all parties would have an equal incentive to maximize the generation of additional RINs. The infrastructure that is needed to increase market penetration of renewable fuels is downstream of refiners. As long as those downstream of refiners do not have compliance obligations, there will be few market opportunities for investments in downstream infrastructure. By moving the obligation closest to the place where blending occurs and where renewable fuel is purchased and delivered, EPA would incent blenders to maximize blending and marketing of renewable fuel. No party would have a surplus of RINs by virtue of their downstream position alone, while all parties would be equally obligated and, most importantly, fully incented to push renewable fuels into the market.

Valero's comments explain that the action to correct the flaw in the RFS system is simple and will not create unreasonable additional administrative burden on regulated parties:

> The regulatory change necessary to correct the flaw is simple. To move the point of obligation to the rack is a straightforward edit to the definition of obligated party. The change places insignificant additional administrative burden on regulated parties. Further, even if some degree of additional administrative effort is involved in moving the obligation to blenders, it is not reasonable to compromise a program design that will more effectively achieve the goals of the statute for the sake of administrative convenience.

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Analysis of Potential Administrative Burden Based on Increase in Number of Obligated Parties

As a follow-up to the comments submitted in July, Valero completed analysis of the potential additional administrative burden that might be imposed on regulated parties by the recommended change in the point of obligation. Valero offers the results of this analysis for EPA consideration in the development of the final rule. Valero recognizes that this information is being submitted after the close of the comment period for the proposed rule. However, in light of the enormous benefits associated with a rule change, it is important for EPA to recognize the change will not create additional administrative burden for the agency nor industry. The information provided herein is information that EPA can obtain on its own and the analysis is well within EPA's ability to undertake for evaluating options to resolve the RFS structural flaws. Nonetheless, Valero offers the information to provide EPA support for making the appropriate changes to ensure the success of the RFS program.

The purpose of the analysis was to quantify the number of obligated parties under a revised RFS by identifying the entities that post wholesale rack prices for gasoline and diesel fuels at all terminals in the United States. In meetings with Valero, EPA indicated that there are approximately 200 obligated parties and raised d a concern that moving the point of obligation to the owner of the hydrocarbon immediately prior to sale at the wholesale rack may significantly increase the number of obligated parties. Utilizing wholesale rack pricing data gathered from OPIS, Valero identified potential obligated parties by reviewing the entities who supply gasoline and diesel fuel for sale at wholesale rack terminals as reported in the OPIS Wholesale Rack Pricing Report. The analysis quantified the number of unique "Parties" posting wholesale rack prices at all US terminals and then cross-referenced the parties with EPA's most recent Title 40 CFR Part 80 registration.

The wholesale rack data set included all published finished product price information by posting party for both Branded and Unbranded products, excluding Avgas, Jet Fuel, and LPG's. The analysis consolidated posted products by product group and product type. The Product Groups included; "Gas or Diesel" and "Alternative Fuels". The product group "Gas or Diesel" included all gasoline's (E0 to E15) and all diesel fuels (Motor Vehicle, Non-road, Locomotive, or Marine (MV-NRLM)), including all blends containing biomass based diesel's (B0 to B98). As the purpose of the analysis was to quantify the number of obligated parties under a revised RFS, whereby the obligated party would be the owner of the hydrocarbon immediately prior to sale at the wholesale rack, the entities posting products for sale within the product group "Gas or Diesel" were considered obligated parties for this analysis.

Finding: Rule Revision Will Reduce Number of Obligated Parties

Based on the analysis of the OPIS data, Valero found 107 posting entities; 100 were registered with EPA under the RFS. For 7, direct registration was not found, however they might be exempt, registered under a parent company, or could potentially be RFS non-compliant. (See Appendix) This number is significantly fewer than the number assumed by EPA in its prior discussions. Thus, the analysis indicates that placing the compliance obligation on the owner of the gasoline or diesel fuel immediately before sale at the rack will result in fewer obligated parties than the current RFS structure.

EPA Registration Status	Est of Current Obligated Parties* (per EPA meetings)	Obligated Party at the Rack** (per OPIS rack posting detail)	Favorable Variance
EPA Registered	200	100	(100)
EPA Registration Unknown	-	7	7
Grand Total	200	107	(93)

* Number of currently Obligated Parties as referenced during meetings with EPA

** Obligated Party count based on the number of parties posting rack prices for all finished Gas and Diesel products as published by OPIS
- Finished Gas and Diesel products = Gasoline (includes E0-15), Diesel (includes all MV-NRLM and B0-98)
- Excluded materials = E85, Ethanol, and Biodiesel (B99 and B100)

Data Source: OPIS - All Published Terminals, All Published Finished Product Posting (excluding Avgas, JetFuel, and LPG)

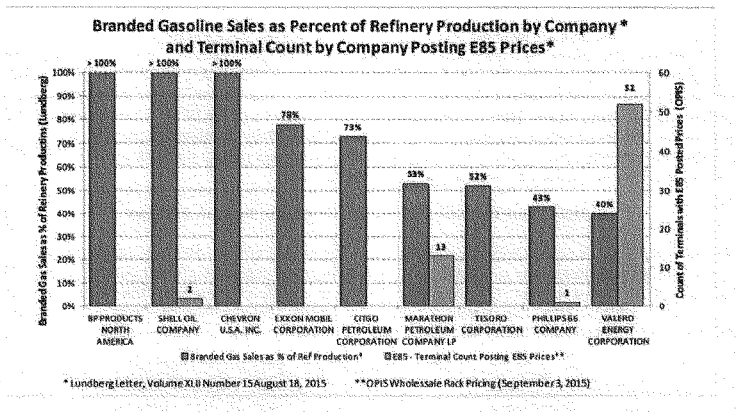
Due to the smaller than anticipated number of unique parties identified in the Rack Posting Analysis, Valero contacted OPIS to confirm the results. OPIS provided a list of 123 "Active Rack Suppliers" posting gas and diesel prices. OPIS refers to any entity posting a rack price as a "rack supplier." After accounting for duplications created by suppliers posting both branded and unbranded prices, OPIS indicated the count of unique supplier's was approximately 110.

When looking at the number of directly obligated parties resulting from moving the point of obligation to the owner of the hydrocarbon immediately prior to sale at the wholesale rack, both the posted price analysis and OPIS supplier validation methodologies yielded similar results and both reflected a significant decrease in the number of directly obligated parties.

Finding: RIN-Long Obligated Parties are Not Offering E85

The analysis yielded additional information regarding obligated parties under the current RFS that supports Valero's comments submitted to EPA in July. Valero's comments, and the comments of others, describe the fact that RIN-long obligated parties do not have any incentive to provide E85. The analysis of the OPIS data confirms that RIN-long obligated parties are not pricing E85.

The data described in the table below identifies the number of terminals at which each company posts E85 prices. EPA already knows that the companies shown below with branded sales that are greater than 70% of their refinery production are also companies that are RIN-long.



This finding confirms that the current point of obligation of the RFS does not incent RIN-long obligated parties to invest in infrastructure to blend additional biofuels, particularly those which would break the E10 blendwall. As can be seen above, the high RIN prices in 2013, 2014, and 2015 did not caused RIN-long obligated parties to offer E85. Further, most RIN-long obligated parties benefit from disproportional obligations under the RFS current point of obligation. In the short term, these parties have no need to make investments to meet increasing RVOs and they enjoy windfall profits from selling high priced RINs to structurally short parties. In the long term, this dysfunction in the RFS creates instability and risk to RFS program and results in failure of program to achieve its goals. The ultimate collapse of the RFS program will benefit RIN-long parties, particularly if it occurs after reducing competition in the market from RIN-short parties.

Conclusion

The two findings from the analysis are important for EPA's consideration of how to remove the constraints on the RFS program. Contrary to EPA's assumptions in 2010, changing the point of obligation to the owner of the hydrocarbon immediately prior to sale at the wholesale rack will not increase the number of obligated parties. Thus, EPA's concern about the additional administrative burden is unfounded; there will be no additional administrative burden on the agency nor parties that are not already participating in the RFS program. Not only will a correction to the regulatory structural flaw allow better market penetration of renewable fuels by ensuring that all relevant parties have the incentive to push renewable fuels to the market, a correction is necessary to provide stability in the RFS program and to prevent the ultimate collapse of the RFS program. The findings support Valero's comments submitted in July. We urge EPA to consider these findings as further support for those comments.

Sincerely,

Richard J. Walsh

cc: Benjamin Hengst
Julia McAllister
Janet McCabe
Chris Grundler
Gina McCarthy

EPA Docket Center
U.S. Environmental Protection Agency
October 16, 2015

Appendix: EPA Registration Unknown – Detail by Product Type

- 9 parties who posted a rack price could not be directly linked to an existing EPA registration
  - 7 parties posted Gas, Diesel, or both
  - 2 parties posted Ethanol, Biodiesel, or both
- Registration Unknown indicates no direct link to an EPA Company Name and EPA ID Number
- Parties may operate outside of the programs implementation jurisdiction (i.e. AK), are currently violating the regulations (i.e. posting ethanol with RINs), or are likely registered under parent company

Registration Status	EPA Company Name	Product Type GAS	DSL	ETH	BIO
Registration Unknown	9987 - ACORN (UNKNOWN EPA ID - B20 posting - Fountain, CO)		1		
	9989 – DANSK WLS (UNKNOWN EPA ID - ULSD & B20 posting - El Paso, TX)		1		
	9991 – DEADRIVER (UNKNOWN EPA ID - ULSD & HSD posting - Bangor, ME)		3		
	9992 – DWNTOERTH (UNKNOWN EPA ID - Bio posting ONLY - 3 locations in GA)				3
	9993 – PERTOLUBE (UNKNOWN EPA ID - HSD posting - Philadelphia, PA)		1		
	9994 – PFI (UNKNOWN EPA ID - Gas & Diesel posting - Albany, NY)	1	1		
	9995 – PIASA (UNKNOWN EPA ID - Ethanol w/ RINs posting - Columbia, MO)			1	1
	9996 – USA (UNKNOWN EPA ID - Gas & Diesel posting Anchorage, AK)	1	1		
	9997 – WESTMORE (UNKNOWN EPA ID - ULSD posting - Mt Vernon, NY)		1		

Appendix 2

List of Entities that Valero Identified as Obligated Parties if
Point of Obligation Mover to Fuel Distribution Terminal
EPA Docket No. EPA- HQ-OAR-2015-0

List of Entities that Valero Identified As Obligated Parties With New Point of Obligation

To identify the approximate number of obligated parties if EPA moved the point of obligation to the owner of fuel as it passed across the rack at fuel terminals, Valero obtained OPIS posted price data for all gasoline and diesel fuel suppliers who post gasoline and diesel fuel prices at all fuel terminals across the nation. Valero then reviewed the list to eliminate duplicate names and identified 107 unique entities. terminals across the nation.

Valero then obtained a list of all external fuel suppliers from OPIS. The list contained 123 supplier codes, which represented 94 unique suppliers, as some suppliers had more than one code.

After comparing the two lists, Valero concluded that the list of suppliers that posted prices was the more inclusive list, because it included not only suppliers of gasoline and diesel, but also suppliers of only B5-98 who did not appear on the list of active suppliers.

In the list following this explanation, Column 4 identifies the 107 companies that Valero identified from OPIS data as posting prices for fuel at fuel terminals. Column 5 identifies the 94 unique companies that Valero identified as being on OPIS's list of active fuel suppliers.

OPIS Posted Price Data vs. OPIS External Supplier Code Mapping Comparison (All)

- Maps the OPIS Posted Price Data by Unique Entity to (vs.) the OPIS External Supplier Code. This reflects the number of entities posting prices vs. the OPIS External supplier list grouped by the EPA registered entity
- OPIS Gas and Diesel Posted Price entity count yielded 107 unique entities.
- OPIS Active Supplier List = 123 Supplier Codes, which mapped to 94 EPA ID/Company Names

Sum of Unique Party Count		Source		
EPA ID	Company Name	External Supplier Co	IS Price Data Snaps	IS Active Supplier List
3000	WESTERN PETROLEUM COMPANY	WESTERN	1.00	1.00
3052	VITOL INC	VITOL	1.00	1.00
3053	WESTERN REFINING COMPANY	WSTRN. REF	1.00	1.00
3054	G.P.&W. INC DBA CENTER OIL CO	CENTER	1.00	1.00
3072	NOBLE AMERICAS CORP	NOBLE	1.00	1.00
3074	COFFEYVILLE RESOURCES REFINING	COFFEYVILL	1.00	1.00
3110	HWRT OIL COMPANY, LLC	HARTFORD	1.00	
		HWRT INC		1.00
3120	GOLDEN GATE/SET PETROLEUM PARTNERS OF NEVADA	GOLDNGATE	1.00	
3135	NEW ENGLAND PETROLEUM LIMITED PARTNERSHIP	NEWENGLND	1.00	1.00
3136	BENCHMARK BIODIESEL, INC.	BENCHMRK	1.00	
3364	GENERAL BIODIESEL SEATTLE, LLC	BIOBLEND	1.00	
3670	WESTERN BIODIESEL INC	WESTRNBIO	1.00	
3671	NELLA OIL COMPANY, LLC	FLYERS	1.00	1.00
3700	JUBITZ CORPORATION	JBCO	1.00	
3825	ST. PAUL PARK REFINING CO. LLC	SPPREFCO	1.00	1.00
3994	SINCLAIR WYOMING REFINING COMPANY	WYOMING	1.00	1.00
4006	VALERO ENERGY CORPORATION	DIAMSHVAL	0.33	
		DIAMSHVALB		0.33
		VALERO	0.33	0.33
		VALERO B		0.33
		VALERO B	0.33	
4037	IRVING OIL CORPORATION	IRVING	0.50	0.50
		IRVING B		0.50
		IRVING B	0.50	
4043	BIG WEST OIL LLC	BIGWEST	1.00	1.00
4044	CITGO PETROLEUM CORPORATION	CITGO		0.67
		MYSTIK	0.33	0.33
		CITGO B	0.33	
		CITGO U	0.33	
4047	SINCLAIR OIL CORPORATION	SINCLAIR		0.50
		SINCLAIR B	0.50	0.50
		SINCLAIR U	0.50	
4068	TESORO CORPORATION	TESORO	0.33	0.33
		TESORO B		0.33
		TSORO-XOM	0.33	0.33
		TESORO B	0.33	
4071	FLINT HILLS RESOURCES, LLC	FLNT HLS	1.00	1.00
4074	AMERICAN REFINING GROUP INC	AMER.REF.	1.00	1.00
4077	APEX OIL COMPANY, INC.	APEX OIL	1.00	1.00
4080	HUNT REFINING COMPANY	HUNT		1.00
		HUNT U	1.00	
4088	PETRO-DIAMOND INCORPORATED	PESRM		1.00
		PETRO DIA	1.00	
4092	GLOBAL COMPANIES LLC	GLOBAL	0.50	0.50
		GLOBALXOM	0.50	
		GLOBALXOMB		0.50
4101	SPRAGUE OPERATING RESOURCES LLC	SPRAGUE	1.00	1.00
4118	COASTAL REFINING & MARKETING	COASTAL B		1.00
		COASTAL B	1.00	
4123	PETROLEUM PRODUCTS CORP	PYRAMID	1.00	1.00
4127	TRANSMONTAIGNE PRODUCT SERVICES INC.	TPSI		1.00
		TRANSMONT	1.00	
4133	HUSKY MARKETING AND SUPPLY COMPANY	HUSKY	1.00	1.00
4140	BUCKEYE ENERGY SERVICES LLC	BUCKEYE	1.00	1.00
4268	MARATHON PETROLEUM COMPANY LP	MARATHON		0.33
		MARATHON B	0.33	0.33
		MARATHON U	0.33	
		MPC2	0.33	0.33
4295	MOTIVA ENTERPRISES LLC	MOTIVA B		1.00
		MOTIVA B	1.00	
4320	BP PRODUCTS NORTH AMERICA	BP OIL		0.50
		BP OIL B		0.50
		BP OIL B	0.50	
		BP OIL U	0.50	
4343	EXXON MOBIL CORPORATION	EXXN MOB B	0.50	0.33
		EXXN MOB U	0.50	0.33
		XOM		0.33
4348	IDEMITSU APOLLO CORP	IDEMITSU A	1.00	
		IDEMITSU APOLLO		1.00
4384	ALON USA	ALON		0.50

4384	ALON USA	ALON B		0.50
		ALON B	0.50	
		ALON U	0.50	
4433	PBF HOLDING COMPANY LLC	PBFNERGY	1.00	1.00
4448	KINDER MORGAN TRANSMIX CO LLC	KINDER MGN	1.00	1.00
4502	ALLIED ENERGY COMPANY LLC	ALLIED EN	1.00	1.00
4517	MUSKET CORPORATION	MUSKET	1.00	1.00
4528	PHILLIPS 66 COMPANY	PSX	0.50	0.50
		PSX B		0.50
		PSX B	0.50	
4535	PRO PETROLEUM INC	PROPETRO	1.00	1.00
4588	SUNCOR ENERGY (USA) INC	SNCOR-SHLB	0.50	0.50
		SUNCOR U	0.50	0.50
4614	SPRINGFIELD TERMINALS INC	SPRINGTER	1.00	1.00
4647	ERGON REFINING INC	ERGON	1.00	1.00
4648	MCCALL OIL & CHEMICAL CORP	MCCALL	1.00	1.00
4651	LEONARD E BELCHER INCORPORATED	LE BELCHR	1.00	1.00
4658	PARKER OIL COMPANY,INC.	PARKER	1.00	1.00
4661	DUCK ISLAND TERMINAL INC	DUCK ISLND	1.00	1.00
4664	FUTUREFUEL CHEMICAL COMPANY	FUTURE FL	1.00	1.00
4759	CARSON OIL	CARSONOIL	1.00	
4858	ENTERPRISE PRODUCTS OPERATING LLC	ENTERPRS		1.00
		ENTERPRS U	1.00	
4925	PETROCOM ENERGY GROUP, LLC	PETROCOM	1.00	1.00
4969	INLAND FUEL TERMINALS INC	IFT		1.00
		INLAND	1.00	
4980	BAYSIDE FUEL OIL DEPOT CORP	BAYSIDE	1.00	1.00
4982	BAY BIODIESEL LLC	BAYBIO	1.00	
4993	AMERIGREEN ENERGY INC	AMERGREEN	1.00	1.00
5008	UNITED REFINING COMPANY	UEPT	0.50	0.50
		UNITED RF	0.50	0.50
5036	COUNTRYMARK REFINING AND LOGISTICS,LLC	CNRTYMARK		1.00
		CNTRYMARK	1.00	
5038	KERN OIL & REFINING CO	KERN		1.00
		KERN OIL	1.00	
5042	LINCOLN OIL COMPANY INC	LINCOIL		1.00
5051	MURPHY OIL USA INC	MURPHY		1.00
		MURPHY U	1.00	
5053	HOLLYFRONTIER REFINING & MARKETING LLC	HLYFRNTR	0.50	0.50
		NAVAPHIL B	0.50	0.50
5064	PLACID REFINING COMPANY	PLACID	1.00	1.00
5081	US OIL & REFINING CO	U.S. OIL	0.50	
		US OIL		0.50
		USOIL&REF	0.50	0.50
5086	CHEVRON U.S.A. INC.	CHEVRON		0.33
		CHEVRON U		0.33
		TEXACO B		0.33
		CHEVRON B	0.33	
		CHEVRON U	0.33	
		TEXACO B	0.33	
5093	CHS INC	CENEX		0.67
		CENEXUFM	0.33	0.33
		CENEX B	0.33	
		CENEX U	0.33	
5105	SUNOCO, INC. (R&M)	SUN R&M	1.00	1.00
5112	SHELL OIL COMPANY	SHELL B		0.33
		SHELL U		0.33
		SHELL-TSO	0.33	0.33
		SHELL B	0.33	
		SHELL U	0.33	
5132	SOUTHERN STATES COOPERATIVE	SOSTATES B	0.50	0.50
		SOSTATES U	0.50	0.50
5135	HARTLAND FUEL PRODUCTS LLC	HARTLAND	1.00	1.00
5146	SAPP BROTHERS PETROLEUM INC	SAPP BROS		1.00
5177	COLONIAL OIL INDUSTRIES INC	COLONIAL	1.00	1.00
5187	NIC HOLDING CORP	NORTHVILLE	1.00	1.00
5190	J.D. STREET & COMPANY INC	JDSTREETT	1.00	1.00
5207	GULF OIL LIMITED PARTNERSHIP	GRTISLENG	0.33	0.33
		GULF OIL	0.33	0.33
		PWI-GULF	0.33	0.33
5257	TRI-GAS & OIL CO INC	TRIGAS U	1.00	
5285	ATLAS OIL COMPANY	ATLAS OIL	1.00	
5753	RENEWABLE FUEL CORP	RENEWABLE	1.00	1.00
5786	LION OIL COMPANY	LION		1.00
		LION OIL	1.00	
5921	NOCO ENERGY CORP	NOCO	1.00	1.00
5957	TARGA SOUND TERMINAL LLC.	TRGASOUND	1.00	
5963	DELEK REFINING LTD	DELEK	1.00	1.00
5969	PHILADELPHIA ENERGY SOLUTIONS REFINING AND MARKET	PDI		1.00
		PESRM	1.00	
5977	HUGUENOT FUELS INC.	HUGUENOT	1.00	1.00

6037	CALUMET MONTANA REFINING, LLC	CALUMETMT	1.00	1.00
6071	CALUMET SAN ANTONIO REFINING, LLC	CALUMET	1.00	1.00
6113	SOYMET ENERGY LLC	SOYMET	1.00	
6129	SEQUENTIAL PACIFIC BIODIESEL	SQPB	1.00	
6200	DIRECT FUELS LLC	DIR FUELS	1.00	
6211	SUNOCO LLC	SUNOCO B		1.00
		SUNOCO B	1.00	
6250	NGL CRUDE LOGISTICS, LLC	NGLCRLOG	1.00	1.00
6262	DAKOTA PRAIRIE REFINING, LLC	DAKOTA		1.00
7029	ESSO STANDARD OIL CO (PR)	ESSO OIL		1.00
7080	SUPERIOR PLUS ENERGY SERVICES, INC.	GRIFFITH	0.50	1.00
		SUPERIORPL	0.50	
7321	DENNIS K. BURKE INC	DKBURKE	1.00	1.00
7340	OAKBORO OIL CO., INC.	OAKBORO	1.00	
7738	SUMA ENERGY LLC	SUMA	1.00	
9894	MAPLES GAS COMPANY INC	MAPLES	1.00	1.00
9916	GROWMARK INC	GROWMARK	1.00	1.00
9987	9987 - ACORN (UNKNOWN EPA ID - B20 posting - Fountain, I	ACORN	1.00	
9989	9989 – DANSK WLS (UNKNOWN EPA ID - ULSD & B20 postin	DANSK WLS	1.00	1.00
9991	9991 – DEADRIVER (UNKNOWN EPA ID - ULSD & HSD postin	DEADRIVER	1.00	1.00
9993	9993 – PERTOLUBE (UNKNOWN EPA ID - HSD posting - Phila	PETROLUBE	1.00	1.00
9994	9994 – PFI (UNKNOWN EPA ID - Gas & Diesel posting - Alban	PFI	1.00	1.00
9996	9996 – USA (UNKNOWN EPA ID - Gas & Diesel posting Anch	USA	1.00	
9997	9997 – WESTMORE (UNKNOWN EPA ID - ULSD posting - Mt	WESTMORE	1.00	
9998	9998 – WILSONS (UNKNOWN EPA ID - Canadian rack posting	WILSONS		1.00
Grand Total			107.00	94.00

Senator INHOFE. Thank you, Mr. Minsk.
Mr. Pugliaresi.

STATEMENT OF LUCIAN PUGLIARESI, PRESIDENT, ENERGY POLICY RESEARCH FOUNDATION, INC.

Mr. PUGLIARESI. Chairman Inhofe, Ranking Member Boxer, thank you so much for the opportunity to talk about our research on this very important issue.

Energy Policy Research Foundation, of which I am the President, has been around since 1944. We do independent research on a large number of issues affecting petroleum markets and energy.

I think we have really nailed the issue of the shift in our energy security. In fact, our net imports are now down to 4 million barrels a day, about four and a half, and three-quarters of those actually come from Canada. So what I would like to do is go to the basic problem of the blend wall and what happens to gasoline prices as we cross the blend wall.

If you model a range of likely compliance cost alternatives, which become quite narrow, from 2017 to 2022, and we adopt the RFS mandate as mandated by statute, our calculations show that our real obligations would increase gasoline prices from 30 to 50 cents a gallon. By the way, this is right off the CBO numbers. They have gone up substantially because the gasoline prices, I would point out, came down.

So the fundamental problem with the program is not ethanol, it is not the use of biofuels; it is the mandate. Gasoline blenders for years have needed ethanol for octane and all the things we have talked about today.

The uncertainties and cost price risk include not only operational impediments such as minimal and consumer resistant adoption of more flexible fuel vehicles, but a range of binding constraints that restrict routine adjustments to market signals; changes in corn prices, biodiesel costs, technical limitations on volumes of advanced biofuels consumer demand. So the real issue here is the availability of lower cost compliance options become very narrow after we cross 10 percent biofuels into the gasoline pool.

So how can we reform the program? I think if you think about the RFS program, it is really two programs. We have blend stock produced from ethanol, which is working, well integrated into our U.S. fuel system and everything else. In fact, E10 today is sold in every State, and more than 90 percent of U.S. gasoline contains up to 10 percent ethanol.

Corn ethanol is now a mature industry. Actually, in 2015 the Country exported over 850 million gallons of corn ethanol. By 2020, 2022, renewable fuel associations think they can get up to 2 billion gallons. So many of the remaining technologies in the biofuel industry are uneconomic either because they are too costly to produce or technically constrained by blending volumes below 10 percent.

So this leads me to think about how we proceed. As we look back on the U.S. energy legislation policies, even going back to the 1970's, we cannot be stunned by this sort of disappointment. In an attempt to either promote the development of alternatives to petroleum or to insulate consumers from price volatility, we often lost a lot of productive responses. Price controls created enormous prob-

lem with smaller refiners and took us years to reform the program. If you remember the policies implemented under the Power Plant Industry Fuel Use Act, for years we prohibited the use of natural gas in the utility sector; we were only permitted to use coal.

So I think that one of the issues we want to sort of confront here is how do we deal with these kind of conflicting concerns over more biofuels and the potential to increase the price of gasoline. So there is a much larger concern for the Congress I think to address here, and that is the risk to economic recovery. Lower gasoline prices are yielding annual savings to the U.S. economy of $129 billion, about $1,000 per household. These savings to consumers are essential to expanding economic growth.

Chairman Inhofe and Senator Boxer, both your States are getting a lot of pain in the petroleum sector. We have had enormous reductions in the capital expenditures in the petroleum sector, and historically how we sort of recover from these areas is that the benefit to consumers of these savings from lower oil prices help to generate economic growth in the economy. So the concern we have going forward is we have the pain. Let's make sure, as we implement this program, that we also give the consumers the opportunity to get the gain.

[The prepared statement of Mr. Pugliaresi follows:]

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Testimony

before

U.S. Senate Committee on Environment and Public Works

"Oversight of the Renewable Fuel Standard"

February 24, 2016

10:00 AM

Dirksen Senate Office Building (Room 406)

Submitted by:

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Washington, D.C.
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Chairman Inhofe, Ranking Member Boxer and members of the Senate Committee on Environment and Public Works, I want thank you for the opportunity to testify on the Renewable Fuel Standard (RFS) and the U.S. Environmental Protection Agency's (EPA) management of this program.

I am president of the Energy Policy Research Foundation, Inc. (EPRINC). EPRINC was founded in 1944 and is a not-for-profit organization that studies energy economics with special emphasis on petroleum and the downstream product markets. EPRINC researches and publishes reports on all aspects of the petroleum markets which are made available free of charge to interested organizations and individuals. We are recognized internationally for providing objective analysis of energy issues.

EPRINC has undertaken research and analysis on ethanol's role in the transportation fuels sector since 2006, including a major workshop with the Energy Information Administration (EIA) as far back as 2008. From assessments starting in 2006, we have concluded that the principal drawback and risk factor of the program is not the use of ethanol (and other biofuels) as a blendstock for gasoline and diesel fuel, but the statutory mandate which requires ever-larger blending volumes without regard to market conditions, costs or technical constraints. Our assessments conclude that the price risks to consumers from higher transportation fuel costs rise considerably as blending of biofuels exceeds 10 percent of the gasoline pool, which is commonly referred to as the blendwall.

My testimony today includes (i) a brief historical background on the biofuel mandate, (ii) why the initial rationale for setting biofuel mandates is no longer relevant in light of the North American Petroleum Renaissance, (iii) an assessment of the price risks from biofuel blending requirements under the RFS, and (iv) the importance of moving forward with reforming the program in a manner that recognizes the full integration of corn ethanol as an important blendstock in the production of gasoline and proceeding with a more cost-effective policy for bringing advanced biofuels into the transportation fuels sector. Of special concern is how to proceed with the program without creating risks of price spikes in transportation fuels for American consumers.

Introduction

Biofuels have long been used as blending components in U.S. transportation fuels to meet a wide variety of fuel specification and environmental requirements.[1] Prior to the recent resurgence in domestic oil and natural gas production, concerns about the U.S.' increasing dependence on imported oil led to the passage of both the Energy Policy Act of 2005 (EPAct05) and the Energy Independence and Security Act of 2007 (EISA). These laws established a broad program to blend renewable fuels into the domestic transportation fuel (gasoline and diesel) pools. These minimum volumes of ethanol and biomass-based diesel (biodiesel) were mandated to rise each year through 2022. At the time that the legislation was enacted, the blending requirements were viewed as being well below the bounds where they would create adverse operational effects. Furthermore, the RFS program was supposed to provide a cost effective program to reduce petroleum imports as well as provide environmental benefits from a lower carbon fuel.[2]

EISA requires an increasingly aggressive program each year for blending biofuels with petroleum based transportation fuels. Specifically, ethanol is blended into gasoline, and biodiesel is blended into diesel. These volumetric targets began in 2006 at a total of 260,000 barrels/day (4 billion gallons per year), and are mandated to rise to 2.35 million barrels/day (MBD) or 36 BGY in 2022 (see Figure 1). Under the statute, EIA is required to estimate gasoline and diesel consumption ahead of time, and then set percentage targets for renewable fuels for refiners to blend into transportation fuels. However, EPA has not issued the volumetric requirements on a timely basis in recent years as the introduction of higher volumes of biofuels into transportation

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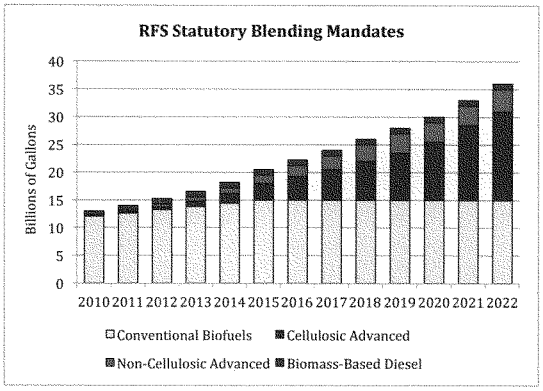
[1] For a full discussion of fuel specifications, cost considerations, and regulatory requirements for manufacturing gasoline, see Pugliaresi, L., & Pyziur, M. (June 2015). ***Gasoline Blending An EPRINC Primer***. http://eprinc.org/wp-content/uploads/2015/06/Updated-Gasoline-Primer-2015.pdf

[2] There is considerable debate on whether ethanol provides substantial environmental benefits from reduced GHG emissions When new land is brought into production lifecycle GHG emissions can increase. When these so-called indirect land use effects are ignored, ethanol can sometimes lower GHG emissions, but it can also add to deterioration in local air pollution. See Christopher W. Tessum, Jason D. Hill, and Julian D. Marshall, ***Life cycle air quality impacts of conventional and alternative light-duty transportation in the United States***. Proceedings of the National Academy of Sciences. See www.pnas.org/content/111/52/18490.full.pdf+html. December 30, 2014.

fuels has come against technical and cost constraints. A major problem with the program is that meeting the volumetric targets is likely to become

Figure 1



increasingly difficult (and costly) because of technological constraints and consumer resistance to ethanol blends into the gasoline pool at percentages higher than 10%; this limitation is commonly known as the "blendwall." A large percentage of the gasoline-powered fleet cannot accept fuel with more than 10% ethanol without damaging engines and U.S. law generally has prohibited such higher blends. Diesel-powered vehicles also have constraints on the amount of biodiesel that can be blended into the petroleum-derived counterpart. Generally, manufacturers recommend to not exceed 5% biodiesel/diesel blends.

The RFS program is administered by requiring all refiners and importers (collectively known under the legislation as Obligated Parties) to document that they have acquired RINs (renewable identification numbers). In turn, these RINs are then acquired from biofuel producers by Obligated Parties registered with EPA, usually, when biofuels are blended into gasoline or diesel. In recent years, the biofuel mandate, or RFS, could be met with ethanol blends below 10% of the

gasoline pool. Refiners and other Obligated Parties could, however, blend above their mandated requirement and then retain those extra RINs for sale to Obligated Parties who had not met their volumetric mandates or bank them for use in the following year.

In recent years, EPA has struggled with the program and has been consistently late in setting the blending requirements for so-called obligated parties. EPA's latest biofuel blending requirements recognizes that the statutory mandates for "advanced biofuel" and "total renewable fuel" cannot be achieved in 2014, 2015, and 2016. Accordingly, the agency exercised its discretion under two waiver provisions of the enabling statute to reduce the applicable volumes. The volumetric levels established reflect EPA's view that the final rule (a) cannot have an impact on the amount of renewable fuel used in the past (2014 and most of 2015); and (b) should address constraints on the supply of renewable fuels. These constraints relate to (i) limitations in production or importation of these fuels, and (ii) difficulties supplying such fuels to vehicles that can consume them. However, EPA makes clear that the final volumetric requirements are intended to incentivize significant growth in renewable fuel use beyond what would occur in the absence of such requirements. EPA states, "the final volumes recognize the ability of the market to respond to the standards we set while staying within the limits of feasibility."

EPA goes on to say that while there is little or no legislative history accompanying the authorizing statute, it is reasonable to assume that, by setting such ambitious standards, Congress intended to drive substantial market changes in a relatively short period of time. Congress did not explicitly indicate the sort of changes that were necessary to reach the mandate of 36 billion gallons by 2022. However, the EPA states that there is various possible approaches to expanding use of renewable fuels significantly, including:

- *Increase the use of E15*
- *Increase the use of E85 in flex-fuel vehicles*
- *Increase production and/or importation of non-ethanol biofuels (e.g. biodiesel, renewable diesel, renewable gasoline, and butanol) for use in conventional vehicles and engines*
- *Increase the use of biogas in CNG vehicles*
- *Increase the use of renewable jet fuel and heating oil*

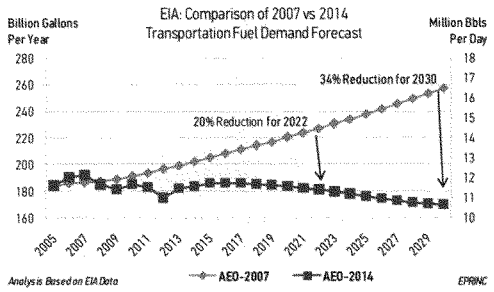
- *Increase the use of cellulosic and other non-food based feedstocks, and cooperative development of new technology vehicles and engines optimized for new fuels*

EPA further explains that in the near term, it expects that increases in E85 and biodiesel will dominate efforts to increase the use of renewable fuels, with smaller roles played by other renewable fuels such as E15 and several non-ethanol renewable fuels. In the longer term, EPA believes that sustained increases in volume requirements are necessary to provide the certainty of a guaranteed future market for investors in new products and technology. Accordingly, EPA repeatedly states that it will set the standards, consistent with Congressional intent, to increase the use of renewable fuel over time. Moreover, it will only use its statutory waiver authority to the degree necessary to maintain a viable and workable program.

Changing Market Conditions

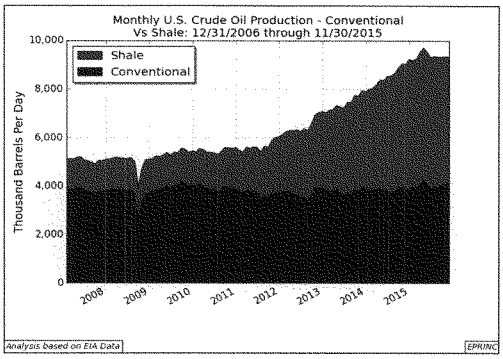
There are two fundamental shifts in U.S. petroleum outlook that have changed dramatically since EISA became law. The first is U.S. consumption of transportation fuels has declined instead of increased, and EIA forecasts that demand for these fuels will continue this decline in the coming years. The reductions are considerable. In 2014, U.S. gasoline consumption was approximately 8.9 million barrels/day (MBD), 4% less than the U.S. record high consumed in 2007. These new expectations are shown in Figure 2 and were clearly not a future considered by the Congress when setting the blending requirements in 2007.

Figure 2



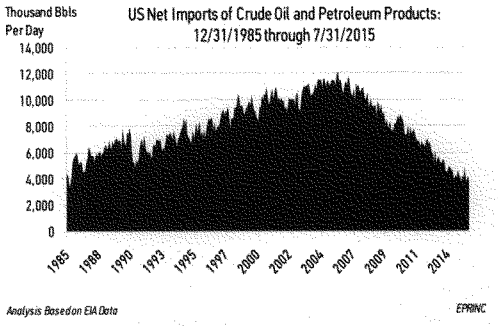
The other important change from 2007 is the remarkable expansion of domestic oil production from the technological revolution in exploration and production of crude oil from unconventional petroleum resources. The surge in crude oil production in the U.S., rising from 5 MBD in 2008 to over 9.5 MBD by mid-2015 (shown in Figure 3), has been a remarkable achievement of technological innovation and risk-taking in a province most analysts had suspected was undergoing permanent decline.

Figure 3



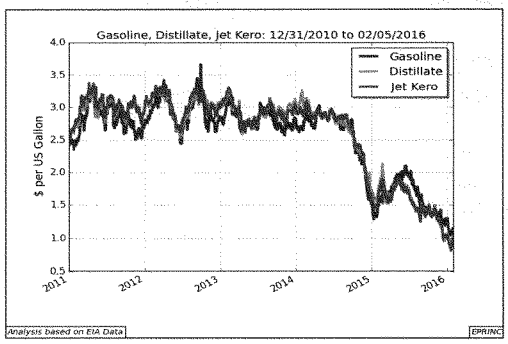
The U.S. now sits alongside Russia and Saudi Arabia as one of the world's largest producers of both oil and natural gas. These domestic unconventional petroleum developments are altering flows in world crude oil trade, shifting long-term price expectations, and challenging the long-held conventional wisdom on U.S. energy policy that was promulgated in an era of scarcity. After being written off as a petroleum province in permanent decline, the surge in U.S. production has not only reduced U.S. net imports, it has also been a major force in bringing down world oil prices. Most remarkable has been the decline in U.S. net imports of crude oil and petroleum produces from an average high of 11.4 MBD in 2005 to 4.3 MBD in 2014 (see Figure 4). Notably in this new environment, nearly 75% of the 4.3 MBD of U.S. net imports are provided by Canada.

Figure 4



Although a large array of forces are at play in driving down world oil prices, a major contributor to the recent fall in prices has been the rapid acceleration of American crude oil production. Figures 5 shows the consequences of the price collapse in wholesale prices of gasoline, distillate (diesel) and jet fuel.

Figure 5
Recent Price Changes in Transportations Fuels



These lower prices have provided enormous savings to consumers and throughout the national economy.

Price Risks to Consumers

A key feature of the biofuel program is that as Obligated Parties are required to increase mandated biofuels above the blendwall, it becomes more likely that the mandates in the RFS will limit compliance options to a narrower set of high-cost strategies with subsequent, elevated risks of price spikes in the cost of transportation fuels. The compliance program in the RFS operates under a general rule where Obligated Parties must fulfill each category of the RVO as well as the overall mandate. The RFS consists of categories corresponding to the different biofuel types. Compliance is complete when sufficient credits are obtained for each category, and sum to a targeted, required amount. RIN credits that are obtained in excess from blending the more advanced, expensive biofuels can be applied to fulfill compliance in the less advanced biofuel categories. However, the reverse is not allowed: excess credits from a less advanced biofuel cannot be applied to fulfill requirements in a more advanced biofuel category. For example, any renewable fuel that meets the requirement for cellulosic biofuels or biomass-based diesel (BBD) is also valid for meeting the advanced biofuels requirement. Thus, if any combination of cellulosic biofuels or BBD were to exceed their individual mandates, the surplus volume would count against the advanced biofuels mandate, thereby reducing the potential need for imported sugar-cane ethanol or other fuels to meet the unspecified portion of the advanced biofuels mandate.

Furthermore, any renewable fuel that meets the requirement for advanced biofuels is also valid for meeting the overall total renewable fuel requirement (which grows to 36 BGY by 2022). As a result, any combination of cellulosic biofuels, BBD, or imported sugarcane ethanol that exceeds the advanced biofuel mandate would reduce the potential need for corn-derived ethanol to meet the overall mandate.

The program does not permit covering the advanced requirements by using larger volumes of E85 or other corn-based biofuels. So Obligated Parties must meet both the overall RVO and also the individual categories, with the exception that exceeding the targets in the more advanced

categories can be pushed to down to cover a lower category. By selecting a likely least-cost compliance, the RFS mandate fulfillment is initially done with those biofuel sources that exhibit some combination of lower cost and/or ease of implementation. To date, this has been primarily done through corn-based ethanol.

As discussed above, there are also specific biodiesel and cellulosic biofuel requirements. Once the blendwall is crossed, E10 is no longer an alternative for meeting the RFS mandate and Obligated Parties must seek other options to meet the provisions of the biofuel program. Refiners can meet part of their overall RVO targets by using more E85 or E15, but these may not be available due to high consumer resistance. At that point Obligated Parties must seek some combination of higher volumes of biodiesel and cellulosic ethanol, export production which was originally targeted for domestic markets, or cut production. Refined products manufactured in the U.S. and sold into foreign markets do not require biofuel blending or RIN purchases. Looking forward, least-cost RFS compliance strategies, are made with considerable uncertainty, and present substantial risks for price escalation for transportation fuels. Transportation fuels are essentially commodities with little perceptible branding distinctiveness. Therefore, their prices reflect their costs of production. If a combination in part or all of the following occurs,

- *gasoline demand decreases in excess of EIA/EPA forecasts,*
- *corn or soy bean costs rise,*
- *crude feedstock prices decline,*
- *E85 consumer purchase resistance remains, or*
- *E0 sales rise (or EPA underestimates the size of the E0 market),*

RFS compliance will substantially raise both gasoline and diesel prices. For consumers, the costs are uncertain and present high price risks because the biofuel mandate prohibits a range of low-cost measures to meet domestic gasoline and diesel demand once the blendwall is crossed.

Ultimately, EPA's decision on where to set the volumetric targets contributes to the price risk for transportation fuels.[3] Many proponents of the mandate recommend that Obligated Parties

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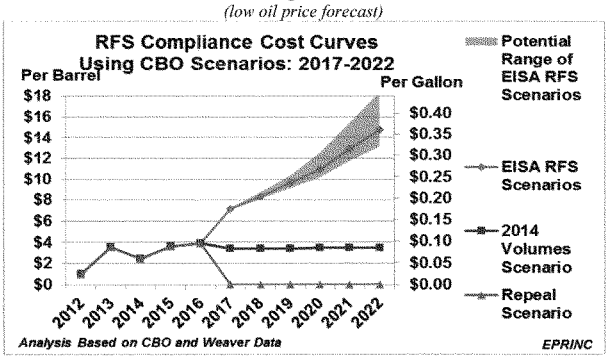
[3] *EPRINC estimates direct compliance estimates using a static analysis. However, if the RFS program moves prices up substantially, demand will fall, requiring larger percentages of biofuels blended into gasoline and diesel fuels, further aggravating prices.*

meet the RVO by increasing sales of E85. The only vehicles that can use E85 are so-called FFVs (flex fuel vehicles). Such an alternative requires considerable investment by gas station owners and other participants in the E85 value chain. Other alternative fuel technologies (CNG, LPG, among others) are options, but these have also remained limited due to cost considerations, logistics constraints, and consumer resistance. For E10, there were no changes required to existing vehicles, and filling stations require minimal adjustments in the form of certain seal, gasket, and filter replacements. Adoption of E10 impacted terminals the most, requiring new tanks, and delivery, rack, and blending equipment. E85 requires significant changes not only to terminals but also to filling stations and vehicles. Both E85 and biodiesel are very high cost strategies for meeting RVOs that exceed the blendwall.

Modeling a range of likely compliance cost alternatives from 2017 to 2022 and viewing the scenario with the adoption of the RFS mandate as outlined in EISA, EPRINC's calculations forecasts that RVO obligations would increase gasoline prices from approximately 30 cents to 50 cents a gallon (shown in Figure 6) above prices that would prevail in a market without volumetric mandates. This cost

Figure 6
(low oil price forecast)



escalation is higher than in our earlier forecasts because we are entering into a market with lower gasoline prices, and in a low gasoline price environment for transportation fuels, volumetric mandates that exceed the blendwall are likely to be more costly. Only the Repeal Scenario would prevent the mandates from increasing gasoline prices, and even holding mandated volumes at 2014 would yield an increase of approximately 10 cents a gallon. Other than the cost of crude oil, EPA's RVO targets will now be the primary factor in setting the price of gasoline.

EPRINC's assessment demonstrates that the RIN compliance program of the RFS creates substantial long-term costs, risks, and uncertainties to consumers and Obligated Parties. These technical constraints and cost risks have been and continue to be largely borne by U.S. motorists and companies reliant upon the nation's two primary transportation fuels: gasoline and diesel. The cost risks to the program escalate substantially as blending volumes exceed the 10% of the gasoline pool and are exacerbated by low gasoline prices. EPA has previously recognized these risks, and it has used its authority to set mandated blending volumes below targets established by the original statutes. Although this recognition by EPA that the blendwall, as well as other parts of the program, present technical constraints, the agency has nevertheless stated that it intends to continue to raise annual volumetric targets and undertake an ambitious effort to do so.

The fundamental problem with the program is that the mandate for biofuel blending severely restricts, and sometimes eliminates lower cost compliance options among Obligated Parties to changes in either the cost of biofuels or the cost of complying with the regulation. Compliance options narrow considerably as:

- mandated volumes exceed 10% of the gasoline pool;
- larger volumes are required for blending biofuel into diesel; and
- expanded volumes are required for so-called advanced biofuels.

These uncertainties and cost/price risks include not only operational impediments such as the minimal and consumer-resistant adoption of more FFVs (that actually use E85), but a range of binding constraints that restrict routine adjustments to market signals (changes in corn prices, biodiesel costs, technical limitations on volumes of advanced biofuels, consumer demand, etc.). The availability of lower cost compliance options become so challenging under some EPA

mandated high volumetric scenarios that Obligated Parties only alternative is to reduce supply to motorists and further increase prices.

Program Reform

The U.S. biofuel program is now really two programs, blendstock produced from corn ethanol, which is a well-integrated (nearly all U.S. gasoline is E10) blending component for the production of gasoline (at levels of 10% and below), and everything else. Today, E10 is sold in every state and more than 95% of U.S. gasoline contains up to 10% ethanol to boost octane and meet air quality requirements. Corn ethanol is a mature and competitive industry. In 2015 the U.S. ethanol industry was sufficiently competitive to export over 800 million gallons to international markets, and even in a regulatory environment free of mandates would still provide roughly the same volume of blendstock consumed by the petroleum industry as has prevailed in recent years. Ethanol producers would unlikely see any substantial reduction in sales volume below 10% of U.S. gasoline demand even in a full repeal scenario. Ethanol is an important and critical blendstock for the production of gasoline. The problem with the program is not ethanol, but the mandate which prohibits normal market adjustments to price fluctuations and poses ongoing price risks to consumers.

Many of the remaining technologies in the biofuel industry are uneconomic either because they are too costly to produce or are technically constrained by blending volumes above 10 percent. Given the maturity of the domestic ethanol industry it can clearly prosper without a mandate. The question is finding an appropriate implementation strategy for the more expensive cellulosic and other advanced biofuels. Traditionally, government programs have not sought to mandate costly or unproven technologies into the marketplace over concerns that consumers would face rising prices. We should now recognize that we are in an era of energy abundance and that other strategies, e.g., research support or tax credits, are a more cost effective policy to protect consumers instead of mandates.

As we look back on U.S. energy legislation policies since the 1970s, we cannot help but be stunned by the systematic failure to predict the future and the unintended consequences of U.S. energy policy. Often these policies, in an attempt to either promote the development of

alternatives to petroleum or to insulate consumers from price volatility, prevented more productive responses from both consumers and producers. Price controls implemented in response to a 6 month Arab oil embargo in 1973 resulted in over ten years of sustained misallocation of resources, limited the cost-effective development of U.S. petroleum resources, and brought about the proliferation of dozens of small inefficient refiners. In the late 1970s, in response to concerns we were running out of natural gas, we banned its use in electric power generation throughout the national economy. These policies were implemented through the Powerplant and Industrial Fuel Use Act of 1978, which encouraged the use of coal, nuclear energy, and other alternative fuels under the assumption that natural gas production was in permanent decline. We no longer have a government run Synfuels Corporation (initiated in the late 1970s) because it became too costly in the 1980s. I am sure it is lost on none of us how peculiar and counter-productive these programs seem today and these experiences of the past should provide guidance in reforming mandates for biofuel blending into transportation fuels.

Finally, there is a much larger concern for the Congress to address, and that is the risk to economic recovery. Lower gasoline prices are yielding annual savings for the U.S. economy of $129 billion, or an estimated $1000 per year per household. These savings to consumers are essential for expanding economic growth, particularly in light of the enormous losses we are seeing from rapid cuts in capital investment in domestic oil and gas development. The oil producing regions of the U.S. are experiencing enormous pain from the decline in oil and gas development. Historically, this pain has been compensated by savings to consumers and subsequent economic expansion. Great care should be taken to ensure that these savings are not lost through a regulatory program that increases gasoline prices (which was never an expected outcome of the program when Congress established the RFS). At a minimum we should only proceed if we have a clear understanding of both the incremental benefits of the program and economic risks associated with higher gasoline prices.

Senator INHOFE. Thank you, Mr. Pugliaresi.
Mr. COLEMAN.

STATEMENT OF BROOKE COLEMAN, EXECUTIVE DIRECTOR, ADVANCED BIOFUELS BUSINESS COUNCIL

Mr. COLEMAN. Good morning, Chairman Inhofe, Ranking Member Boxer, and members of the Committee. My name is Brooke Coleman. I am the Executive Director of the Advanced Biofuels Business Council. The Council represents worldwide leaders in the effort to develop and commercialize the next generation of advanced and cellulosic biofuels. I have submitted lengthy written testimony and you will be thrilled to know that I am not going to rehash it here, but I want to start with a general observation about the Renewable Fuel Standard.

I think it is safe to say that the RFS is a political lightning rod. The question is why. There are those who say the RFS doesn't work. But I think if you look at the trajectory of the biofuels industry and who is being forced to change, you will have your answer.

In just 10 years, the biofuel industry has emerged to create hundreds of thousands of jobs and displaced the need for billions of gallons of petroleum imports annually. If you look at perhaps the most criticized biofuel, ethanol, you will find that it also happens to be the most disruptive to the status quo. The ethanol industry now supports hundreds of thousands of U.S. jobs in more than two dozen States and now threatens to bring consumer choice to the pump. The ethanol industry is a target for a reason.

And now we are innovating. The United States is now home to the largest cellulosic ethanol plant in the world, DuPont's facility in Nevada, Iowa, as Senator Boxer pointed out. DSM's facility in Emmetsburg, Iowa will produce enough renewable electricity as a co-product to power itself and the grain ethanol facility next door. Quad County's first generation ethanol plant in Galva, Iowa now produces cellulosic ethanol from corn fiber using a technology that also reduces energy inputs. Quad County's fuel is 126 percent better than gasoline from a carbon perspective, a carbon sink.

But disrupting monopolies does not come easily. Our adversaries have enough money to buy voices and fill the airwaves with allegations about the RFS. But is anything they are saying actually true? There are allegations about corn ethanol and food prices, but corn prices are lower today than when the RFS was passed and food industry profits are soaring. Higher ethanol blends like E15 will ruin cars, they say, except that the Department of Energy found no problems with E15 or E20 in 86 cars tested for 120,000 miles each.

Oil ran a commercial during the World Series claiming that ethanol is worse for climate than gasoline, except the USEPA, the California Resources Board, and the national labs all agree that they are wrong.

On the issue of pump prices, don't take my word for it. Former Shell Oil President John Hofmeister recently stated, "We need a competitor for oil. We need to open the market to replacement fuels. Competition will drive transportation fuel prices down structurally and sustainably." This is exactly what is happening with the RFS.

Energy economist Phil Verleger, who advised oil, Presidents Ford and Carter, recently said the U.S. renewable fuels program translates to consumers paying between 50 cents and $1.50 less for a gallon of gasoline by adding the equivalent of Ecuador to an extremely tight world liquid fuel markets.

If there is one thing we should all agree on, it is this: Having one option to power cars and trucks runs contrary to the fundamental premise of competition that underpins our economic system, and if we do not control that resource it leaves us vulnerable to foreign cartels often working against us. And that is where I would like to close, by putting the RFS into context of recent trends in global oil markets.

There are those who want policymakers to believe that times have changed, that we don't need the RFS anymore because of the U.S. oil boom and low gas prices. But really nothing has changed. When we got hit with record high oil prices in 2008, Americans transferred nearly $1 trillion to OPEC countries in just six to 8 months paying for motor fuel, a predicament that threw the Country into recession. Now Saudi Arabia and certain OPEC countries are hitting us with the other end of the stick by openly colluding to make oil so cheap that U.S. shale and deep water drillers cannot compete. And I know the effects of what the Saudis are doing are hitting home in Oklahoma as well, and it is working.

U.S. oil rig counts have fallen off a cliff; U.S. tight oil and deep water drilling operations are going belly up, putting Americans out of work. It is nice to pay $1.50 for gas, but what is actually happening is foreign oil cartels are using their market position to snuff out competition and repossess the U.S. fuel energy sector. Ironically, that is exactly what the oil industry hates about the RFS, that it threatens their choke hold over the American consumer at the pump.

If I could leave you with one thought, it is this: Congress made a commitment and investors have spent billions in private capital to answer the call to create these fuels. The RFS corrects a noncompetitive marketplace and is on the cusp of giving Americans a choice at the pump. It also happens to be the best advanced biofuels policy in the world.

What we do not need is for Congress to change a good law. What we do need is help convincing the Obama administration to block out the noise and administer the program as designed and on schedule.

We appreciate and believe Ms. McCabe when she says that EPA is committed to deploying advanced biofuels, but there are things we must do in the next RFS rule to make this vision a reality.

Thank you for the privilege of speaking before you today. I look forward to your questions.

[The prepared statement of Mr. Coleman follows:]

Written Testimony of:

Mr. Brooke Coleman
Executive Director, Advanced Biofuels Business Council

Senate Committee on Environment and Public Works
United States Senate

Oversight of the Renewable Fuel Standard

February 24, 2016

Good morning Chairman Inhofe, Ranking Member Boxer, and members of the committee. My name is Brooke Coleman and I am the Executive Director of the Advanced Biofuels Business Council (ABBC).

The Advanced Biofuels Business Council represents worldwide leaders in the effort to develop and commercialize next generation, advanced and cellulosic biofuels, ranging from cellulosic ethanol made from switchgrass, wood chips and agricultural waste to advanced biofuels made from sustainable energy crops, municipal solid waste and algae. Our members include those operating production facilities, those augmenting conventional biofuel plants with "bolt on" or efficiency technologies, and those developing and deploying the technologies necessary to make advanced biofuel production a commercial reality.

We are honored to be here today to help accurately assess the impacts of the federal Renewable Fuel Standard (RFS) now ten years into the program. My primary role today is to talk about the continued development of the advanced biofuels industry. However, we would also like to provide context for the ongoing discourse about the rationale for federal policy support for biofuels.

1. <u>Oil dependence is still a problem, and recent trends are not changing the big picture</u>

If there was a central underpinning of Congressional support for the RFS ten years ago – and again when it was amended in 2007 – it was bipartisan support for reducing U.S. dependence on foreign oil. Between 2000 and 2012, the cumulative total of U.S. spending on imports of goods and services exceeded U.S. export earnings by $7.1 trillion dollars – U.S. trade deficits in crude oil and refined petroleum products were $2.87 trillion during this period, or 40.5 percent of the cumulative deficit in all goods and services (petroleum accounted for 55 percent of the trade deficit in 2012).[1]

One argument made against the RFS is the United States no longer has a serious issue with foreign oil dependence due to recent trends in U.S. and global oil markets. However, it would be a mistake to confuse the short-term economic benefits of recent increases in U.S. oil production and decreases in gasoline prices with long-term energy security for the following reasons:

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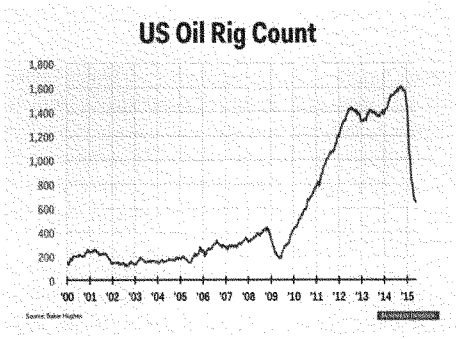
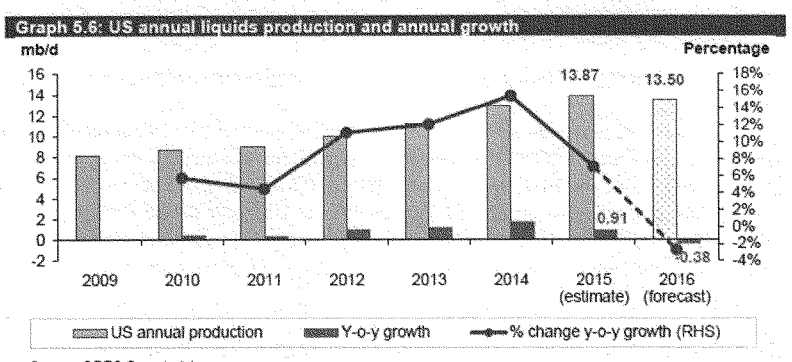
[1] U.S. Department of Commerce, Bureau of Economic Analysis, International Data, pulled October 2015. See http://www.bea.gov/international/index.htm.

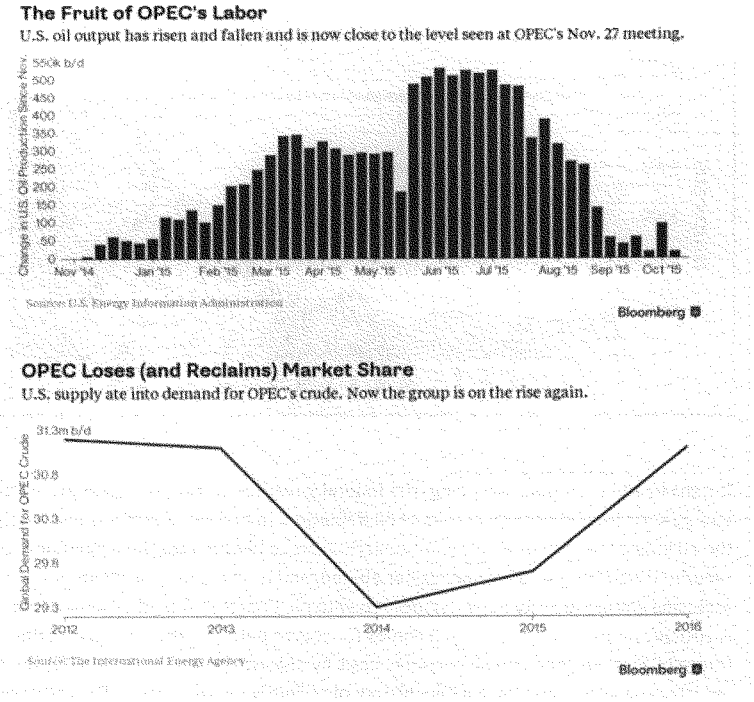
- **Low gasoline prices are occurring primarily because controlling interests in the Organization of the Petroleum Exporting Countries (OPEC) are using their market power to snuff out the U.S. oil boom.** Certain members of OPEC decided in late 2014 to allow global crude oil prices to slip in part to snuff out competition and reclaim market control. In simple terms, colluding to lower the price of oil changes the economics on U.S. oil production, which cannot compete with today's oil prices. A recent Bloomberg report entitled "OPEC Is About to Crush the U.S. Oil Boom" notes that the strategy is working.[2] In just 12 months, OPEC has knocked U.S. oil production back significantly. OPEC's September report openly acknowledges the effort and its effects: ""In North America there are signs that US production has started to respond to reduced investment and activity. Indeed, all eyes are on how quickly US production falls."[3] In essence, policymakers would be unwise to be lulled into a false sense of security by low gasoline prices and a U.S. oil boom now paralyzed by OPEC.



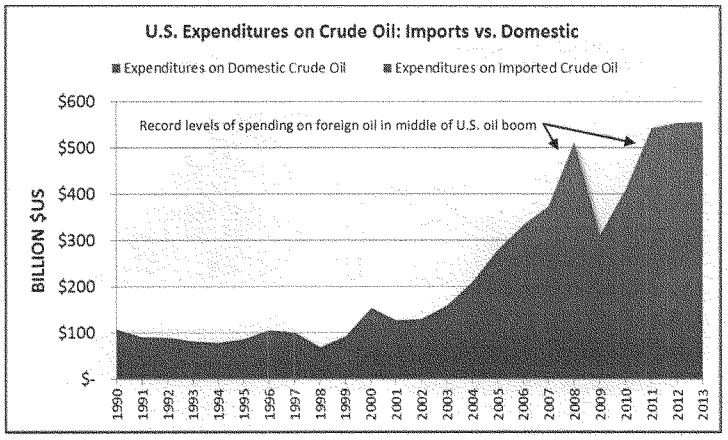


Source: OPEC Secretariat.

[2] See: http://www.bloomberg.com/news/articles/2015-10-20/after-year-of-pain-opec-close-to-halting-u-s-oil-in-its-tracks.
[3] See: http://www.opec.org/opec_web/static_files_project/media/downloads/publications/MOMR_September_2015.pdf



- **Even if a significant percentage of "new" U.S. oil production survives OPEC's predatory strategy, a scenario that is looking increasingly unlikely, the vulnerability of the U.S. economy to foreign oil dependence is all about price.** Even if U.S. oil production stabilizes, OPEC will reduce output at some point and crude oil prices will increase sharply. If the U.S. continues to consume far more oil than it produces (inevitable) and oil prices increase (inevitable), consumers will continue to spend enormous sums of money on foreign oil and the U.S. economy will continue to suffer at the hands of its dependence on foreign oil. The problem was evident from 2007-2013. U.S. consumers were spending more and more money buying oil from U.S. producers as U.S. production increased, but consumers were also spending more a more money on foreign oil because oil prices were so high and increasing at the same time. The magnitude of the economic drain can be staggering. Americans transferred nearly $1 trillion to OPEC members during the oil price spike of 2008, in just 6-8 months. The figure below demonstrates how increasing U.S. oil production does not necessarily protect the U.S. economy and consumers from unsustainable and dangerous levels spending on foreign oil.



- **Recent headlines notwithstanding, the federal government cannot assess accurately the energy security and economic risks of oil depletion.** In making arguments against the RFS, the oil industry and their assets want policymakers to believe that the economic and national security threat from oil dependence has abated, and is no longer a problem. But when assessing energy security risk as associated with oil, Congress should be aware that: (1) there is virtually no transparency when it comes to "source data" for the myriad of claims about future oil markets made on an everyday basis by analysts in the sector; and, (2) the oil industry and its analysts have a long history of seriously overestimating the vastness of its claimed reserves.

    - With regard to transparency, Russia (one of the world's largest conventional oil producers) declared all oil data a state secret in 2004. Neither Saudi Arabia nor Venezuela share data publicly when they make claims about future capacity. This is a concern in part because "there are political and financial pressures to misreport figures."[4] OPEC member quotas are based on reported reserves; the higher the reserve, the higher the quota relative to other members. OPEC members also face the challenge of attracting investment, from both government and outside sources. As reported in a recent peer-reviewed article in *Science*, "there are fears that Saudi oil reserves (and others) may have been over-estimated by at least 40%," and, "[a]t best Saudi reserves are seen as near maturity," given that 7 million barrels of sea water are being injected in the main field on a daily basis to increase flow.[5] The oil industry and OPEC also has the incentive of exaggerating reserves to weaken political

[4] Chapman, I., *The end of Peak Oil? Why this topic is still relevant despite recent denials*, Energy Policy (2013). http://dx.doi.org/10.1016/j.enpol.2013.05.010 at p. 3.
[5] See Chapman, I., *The end of Peak Oil? Why this topic is still relevant despite recent denials*, Energy Policy (2013). http://dx.doi.org/10.1016/j.enpol.2013.05.010 at p. 4.

and market interest in developing alternatives. OPEC first admitted its focus on alternative fuels in 2006, when it openly admitted that its price setting is designed partially to deter their use.[6] The U.S. Energy Information Administration (EIA) issues monthly oil price forecasts, but openly admits that its forecasts come with large uncertainty. For example, EIA's January 2016 report states, "EIA recognizes that there is still high uncertainty in the crude oil price outlook. For example, EIA's forecast for the average WTI price in April 2016 is $37/b, while the market expects WTI prices to range from $25/b to $56/b (at the 95% confidence interval) based on the recent prices of futures and options contracts for April 2016 delivery."[7]

- With regard to overestimation, recent statements about game changing oil reserves should be regarded carefully because we have heard similar claims in the past about Alaska and the Gulf of Mexico. In 2002, the U.S. Geological Survey estimated that the National Petroleum Reserve-Alaska contained 10.6 billion barrels (mean estimate) of oil. In late 2010, USGS revised their estimate to 896 million barrels – a downward adjustment of roughly 90 percent.[8] When BP discovered the Thunder Horse field in the Gulf of Mexico in 1999, they estimated that the reserve contained more than a billion barrels of oil. The discovery fundamentally changed projections about U.S. oil capacity and was credited with changing the global price of oil. BP and partners built the largest oil platform in the Gulf. However, oil extraction was delayed by more than 3 years due to technical difficulties, and according to a consultant for oil exploration, "Thunder Horse hasn't reached anywhere near its expected potential."[9] Tight oil plays (e.g. the Bakken) face similar challenges. As noted in an April 2013 article in *Science*, "data on reserves of many unconventional sources are now regarded as optimistic, compounded by thermodynamic inefficiencies in the processes, often relying on high energy inputs, will ultimately limit the net gain to provide fuel quantities well below predicted figures."[10] As a point of reference, the 4.3 billion barrels of technically recoverable tight oil from the Bakken (as estimated by the U.S. Geological Survey) is less than one year's worth of crude oil consumption by U.S. refineries. And investors are running away from tight oil in the current marketplace, due to the aforementioned market conditions imposed by OPEC.

2. <u>The United States is not going to "free market" its way out of its foreign oil dependence problem or emerge as the global leader in advanced biofuel development without aggressive policies to attract investment</u>

In a competitive marketplace, the increasing cost and scarcity of crude oil in recent years would play to the benefit of alternatives such as advanced biofuels. That is, the declining production

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[6] See http://www.foxnews.com/story/0,2933,222840,00.html

[7] See http://www.eia.gov/todayinenergy/detail.cfm?id=24532.

[8] See http://www.newsminer.com/news/alaska_news/oil-estimates-slashed-for-national-petroleum-reserve-alaska/article_999d982e-5823-59c2-82f7-8b6bb65d8fd6.html.

[9] See http://www.theoildrum.com/node/6415.

[10] Chapman, I., *The end of Peak Oil? Why this topic is still relevant despite recent denials*, Energy Policy (2013). http://dx.doi.org/10.1016/j.enpol.2013.05.010.

cost of biofuels would attract investment over the increasing cost and scarcity of petroleum, and new alternative fuel products would emerge to replace petroleum. In essence, free markets reward innovation. However, U.S. and global liquid fuel markets are not free markets. As discussed, they are distorted by the price-controlling behavior of OPEC, driven by policy as opposed to price, and are dominated by highly-consolidated and vertically integrated incumbent oil companies that continue to receive the large majority of federal subsidies to the U.S. fuel energy sector. While many of these policies lie outside of the jurisdiction of these committees, the RFS must be assessed in its proper context – as a fuel energy policy designed to address problems in motor fuel markets – to be properly understood.

For example, the largest leaseholder in the Bakken told the Senate Finance Committee in 2012 that "[w]ithout the current capital [federal tax] provisions in place ... that let us keep our own money ... we would not have been able to fail over and over again, which is what it took to advance the technology needed to produce the Bakken and numerous other [tight oil/fracking] resource plays across America."[11] It is critical to point out that cellulosic biofuel producers and "tight oil" producers have something in common; they are both endeavoring to supply the country and world markets with what the Energy Information Administration (EIA) terms "unconventional fuel." While facing similar technology risk, the cellulosic biofuels industry does not receive the same tax treatment as companies like Continental Resources (from the perspective of value or duration).

More broadly, the fossil fuels industry enjoys the benefit of a number of unique federal tax allowances – unavailable to renewable fuels – that de-risk and lower the cost of the ongoing development of oil and gas resources relative to other sources of liquid fuel. For example, a recent study estimates that fossil fuels received 70 percent of U.S. federal energy subsidies between 2002 and 2008, to the tune of more than $70 billion during this time period. [12] This number does not include the loopholes in oil and gas laws that, according to the Government Accountability Office (GAO), allowed petroleum companies to forego paying $53 billion in royalty payments, over just four years, for extracting natural resources from lands owned by the American taxpayer. The federal government also helps incumbent industries develop new technologies. According to a recent Congressional Research Service report, [f]or the period from 1948 through 2012, 11.6% of Department of Energy R&D spending went to renewables, 9.7 % to efficiency, 25% to fossil energy, and 49.3% to nuclear.[13] According to a recent report, "energy innovation has driven America's growth since before the 13 colonies came together to form the United States, and government support has driven that innovation for nearly as long."[14] Governmental support drove investment in coal, timber, engine innovations, land settlement for resource extraction and other forms of innovation in the 19th and 20th centuries, and domestic energy consumption and GDP have tracked closely for at least 200 years.[15] Given the importance of energy security, we believe that the federal government's engagement in domestic energy development is appropriate, and there is a clear case for making advanced biofuels a focal point of that effort going forward.

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[11] http://www.finance.senate.gov/imo/media/doc/Hamm%20Testimony1.pdf, p. 2.
[12] See http://www.elistore.org/Data/products/d19_07.pdf.
[13] See http://www.fas.org/sgp/crs/misc/RS22858.pdf
[14] See note 2, at p. 11.
[15] *Id.*

3. RFS opponents are using similarly misleading arguments to try to convince the Obama Administration and U.S. EPA to arrest or slow down implementation of the program

In recent years, the public discourse around U.S. EPA's annual rulemakings has been substantial on all sides. Until November 2015, EPA had not finalized a rule since 2013 (for the 2013 compliance year). This is no longer the case. The agency published and finalized a multiyear 2014-2016 rule in November 2015, and expects to complete the 2017 rule by the end of November, as required by statute.

The focal point of the oil industry's attempt to escape their obligations under the RFS administratively (i.e. via EPA rules) is to cast their willful non-compliance with the law as involuntary (i.e. because of the so-called blend wall) and in the interest of protecting consumers (i.e. because higher RFS credit prices are a "cost of compliance" that will be passed on to consumers). This testimony discusses the vast majority of these arguments in more detail in Addendum A & B attached below, but there are a few claims worth mentioning here:

- ***The so-called blend wall is nothing more than a line drawn in the sand by the oil industry to mark the point at which they no longer want to blend more ethanol***

The genesis of the blend wall argument is very simple: "U.S. refueling infrastructure and vehicles can only handle up to 10 percent blends of ethanol, and so the RFS (which calls for more ethanol volume than that) is unworkable." The argument usually breaks down into one of three claims: (1) the cars cannot use higher renewable fuel blends; (2) U.S. refueling infrastructure cannot deliver higher renewable fuel blends; (3) higher blends are not priced low enough to drive demand.

All three of these claims are untrue. For example, it is not uncommon for RFS critics to say that higher ethanol blends (like E15) ruin engines. However, the most comprehensive vehicle testing ever conducted – by the U.S. Department of Energy – showed no issues in 86 vehicles driven 120,000 miles each on both E15 (15% ethanol blends) and E20 (20% ethanol blends).[16] E15 is now available in many states across the country, without reports of engine failures. It is not uncommon for RFS critics to say that there are not enough pumps or vehicles to facilitate compliance with the RFS. However, obligated parties have a number of choices to meet their biofuel blending targets, including blending more E15 (15% ethanol by content; a high-octane premium fuel approved by EPA for use in two-thirds of the vehicles on the road today), E85 (85% ethanol by content), biodiesel (most engines are warrantied to handle higher biodiesel blends), and/or more renewable diesel. With specific regard to E85, there are enough "flex fuel" vehicles on the road today to consume at least 3 billion additional gallons of ethanol – a number that would vastly exceed the RFS statute for ethanol – if, according to independent analysis, price per mile costs aligned with E10.[17]

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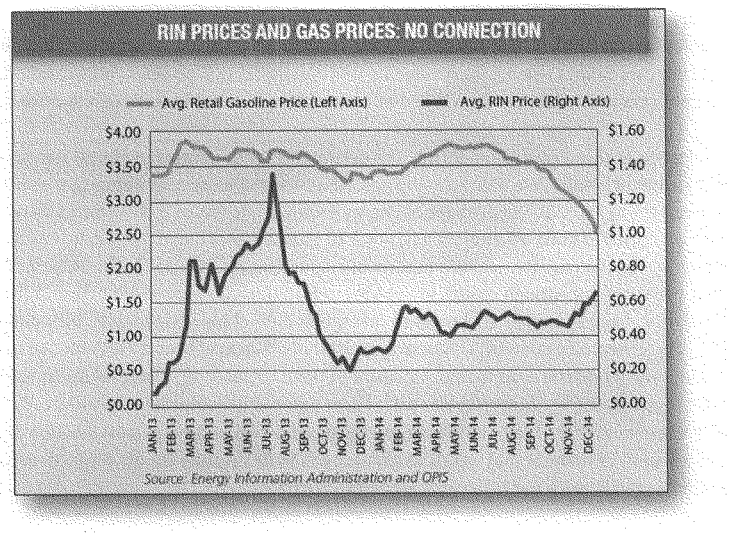
[16] See http://energy.gov/articles/getting-it-right-accurate-testing-and-assessments-critical-deploying-next-generation-auto
[17] See http://www.card.iastate.edu/publications/dbs/pdffiles/13pb15.pdf

Finally, some economists argue that E85 pricing is the issue when it comes to the achievability of RFS goals – i.e. that E85 has *not* been priced to facilitate compliance/consumption and therefore the RFS volumes must be waived. In reality, independent retailers (constituting ~ 50% of gas stations) tend to price E85 to sell while gas stations controlled by the oil majors are more reluctant to do so.[18] This raises questions with regard to whether oil majors are using their market power to price E85 to fail (while gouging consumers in the process). In either case, there is enough fuel distribution capacity and interest among independents to drive the consumption necessary to meet the RFS, and policymakers should be comfortable with a program that rewards independent marketers for selling more renewable fuel.

- ***The oil industry can avoid utilizing liquid renewable fuel gallons all together by purchasing RFS (RIN) credits on the open market, but this voluntary compliance cost does not increase gas prices.***

Attachment B below discusses the RIN/gas price relationship in detail. However, it is easy to see from the figure below that no correlation exists between higher RIN prices and gas prices. This is due, in part, to the fact that those obligated parties choosing to comply with the RFS via RIN credits are usually buying RINs from oil companies holding more than enough RINs to satisfy their obligations under the RFS. Put another way, the ethanol industry cannot detach and sell RINs – only the oil industry has the power to detach and sell RINs on the free market (for profit) under the RFS.



[18] http://ajw-inc.com/are-market-distortions-depressing-consumer-demand-for-e85/#post/0

- ***Unfortunately, the Obama Administration did modify the agency's position on certain key RFS administrative issues in the face of pressure from obligated parties***

Facing concerns about higher RIN credit prices and the so-called blend wall, U.S. EPA essentially changed its approach to administering the RFS in two primary areas: (1) the agency broadened its waiver authority by reinterpreting the word "supply" in the waiver provision "inadequate domestic supply" to mean supply-to-consumer, which is a reversal of EPA's prior interpretation of the word "supply" to mean supply of renewable fuel to obligated party; and, (2) the agency is proposing to not count "carryover RINs" (i.e. RINs accumulated by obligated parties from year-to-year) toward compliance when it comes to maintaining the statute. The problems associated with U.S. EPA's change of position are documented in the Council's comments to U.S. EPA (see footnote).[19] But the key issues are: (1) midstream methodological rule changes, of any type, discourage investment in current and future federal energy policy because energy investments are made into non-competitive markets and are therefore driven by policy and can be stranded by policy change; (2) waiving the RFS for issues related to "supply to consumer" or distribution-capacity gives obligated parties too much power over the RFS, because the oil industry controls fuel distribution; (3) failing to account for carryover RINs is the equivalent of ignoring available RFS compliance fuel, because RINs are only produced when a gallon of RFS-eligible renewable fuel is produced. Notably, distribution-related waivers were expressly rejected by Congress during the RFS legislative process.

Because the shift to distribution waivers was catalyzed by concerns about conventional biofuel RINs and use, the controversy is often connected to first generation ethanol. But the primary effect will be on advanced ethanol. The underlying value of the RFS (and RINs) for innovators is it provides a reasonable expectation of demand/market against the backdrop of openly collusive market control behavior that would otherwise drive innovators away from motor fuel markets. Looking at the problem from an investor perspective, deals to finance second generation biofuel projects are driven by the availability of a market; or, in the case of motor fuels, by bringing an off-take agreement with those who distribute motor fuels to the consumer (in almost all cases, the oil industry). The RIN drives off-take because obligated parties know that they can profit from compliance if they acquire RINs via off-take but will have to pay for RINs on the open market if they refuse to sign offtake agreements. To illustrate, nearly 40 leading developers of cellulosic biofuel wrote a letter to President Obama in October 2013, stating:

> "The RFS is engineered to address challenges like the oil industry's historic and current refusal to blend more renewable fuels. Investors in next generation biofuels understand how the RFS and RIN values work to introduce market access for advanced biofuels. As such, any perceived unwillingness on the part of RFS administrators to allow the program to work would send a clear signal to the advanced biofuel marketplace that the RFS may not be allowed to change market behavior as promised. This mere possibility increases investment risk, which in turn decreases the effective deployment of advanced biofuels."[20]

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[19] See http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2015-0111-3528.
[20] See http://www.reuters.com/article/bio-aec-wh-letter-idUSnBw296398a+100+BSW20131029

It cannot be overstated that the best solution to the administrative concerns associated with the RFS is not re-legislation. The RFS is good law, and is well-designed to work. The issue related to distribution waivers is already in federal court. The advanced biofuels industry continues to work with EPA staff to ensure that all reasonable means are taken to promote advanced biofuels from within the current framework of the law. We remain confident that we can resolve administrative problems with administrative solutions without the need for Congressional intervention.

- ***Warnings about the delta between the RFS targets set forth in 2007 and actual production of advanced biofuels (in particular) are a red herring omitting the fact that the RFS is an adjustable mandate***

RFS critics frequently point out that while the conventional biofuels industry has produced more than enough renewable fuel to comply with the RFS from year-to-year, the advanced biofuels industry has not produced sufficient volumes to meet the targets set forth by Congress in 2007. Critics say the cumulative difference between the statute and actual production means that the program is unworkable and must be re-legislated.

In reality, the targets set forth by Congress in 2007 were ambitious by design – so that investors would invest in advanced biofuels without the fear that success could strand investment from an exceeded mandate (i.e. if the advanced biofuel blending requirement is 1 billion gallons in a given year and 2 billion gallons are produced, half of capacity would run the risk of not being purchased by oil companies otherwise disinterested in using renewable fuels). Knowing that the targets were ambitious, Congress also gave U.S. EPA the authority to waive the year-to-year blending requirements if RFS-eligible renewable fuel is not available or is too expensive. And this is exactly what U.S. EPA has done in multiple years. In fact, the point of controversy in 2015 was U.S. EPA's decision to waive RFS requirement when the renewable fuel gallons *were* available and cost competitive for reasons related to the oil industry's unwillingness to secure and blend renewable fuel. If anything, U.S. EPA has aired on the side of caution when it comes to waiving the RFS based on the concerns expressed by the oil industry. It is even more illogical to see some economic entities modeling the impacts of the RFS as a rigid rather than waivable mandate. Modeling the impacts of the RFS as if EPA is not doing (and has not done) its job may produce provocative results, but it does little to inform the debate about the program.

4. **The RFS has a clear record of success when it comes to achieving its economic and environmental objectives in the face of a perpetually uncertain and non-competitive global oil marketplace.**

Any objective analysis of the RFS shows that the program has met or exceeded expectations when it comes to the primary objectives set forth by Congress in passing the law.

- ***Petroleum Dependence and Gas Prices***

While motor fuel prices are temporarily low as a result of OPEC's decision to weaken competition in the global oil marketplace, most of the last ten years have been marked by historically high oil prices. The primary reason for higher prices is the reduced availability of cheap crude oil supply relative to increased demand, and the market response (both direct and via speculation) to this dynamic. The RFS has driven the development of a new alternative fuel industry during a period of very high economic vulnerability and fuel prices in the United States. Speaking to this dynamic, energy economist Philip K. Verleger (who served as an advisor on energy issues to both the Ford and Carter administrations) recently said, "the U.S. renewable fuels program has cut annual consumer expenditures in 2013 between $700 billion and $2.6 trillion ... [t]his translates to consumers paying between $0.50 and $1.50 per gallon less for gasoline."[21] Mr. Verleger notes that the RFS put the equivalent of Ecuador's world oil output on the market during a period of extreme tightness:

> Had Congress not raised the renewable fuels requirement, commercial crude oil inventories at the end of August [2013] would have dropped to 5.2 million barrels, a level two hundred million barrels lower than at any time since 1990 ... [t]he lower stocks would almost certainly have pushed prices higher. Crude oil today might easily sell at prices as high as or higher than in 2008. Preliminary econometric tests suggest the price at the end of August would have been $150 per barrel."

Renewable fuels reduce gas prices in two ways: (1) the predominant fuel used to date to meet the RFS is ethanol, which has been $.60 to $1.00 cheaper per gallon than wholesale gasoline for the bulk of the time that the RFS has been in place; and, (2) by adding supply to very tight oil markets, which reduces the impact of both perceived and real disruptions to supply and curtails speculative engagement by the markets. One would have to stand basic economics on its head to argue that reducing the use of renewable fuels will not exacerbate petroleum dependence and increase gas prices.

- ***Economic Development and Job Creation***

Given the inherent uncertainties with analyzing the economic impact of any industry, the most effective way to assess the job and economic development impacts of the RFS is to consider multiple reports conducted by different entities. It is clear, however, that the RFS triggered the development of a robust, homegrown renewable energy industry. For example, a recent RFS footprint analysis conducted by Fuels America concluded that the RFS now creates $184.5 billion of economic output, 852,056 jobs, and $46.2 billion in wages and $14.5 billion in taxes each year in the United States.[22] A recent assessment published by the Oak Ridge National Laboratory found that the RFS is producing significant positive economic effects ("the net global economic effects of the RFS2 policy are positive with an increase of 0.8% in U.S. gross domestic product (GDP) in 2022...[well in

[21] See http://www.pkverlegerllc.com/assets/documents/130923_Commentary.pdf.
[22] See http://www.fuelsamerica.org/pages/fuels_america_releases_new_footprint_anaylsis

excess of $100 billion]" stemming from the fact that the RFS is reduces crude oil prices, decreases crude oil imports, increases gross domestic product (GDP), and is having only minimal impact on global food markets and land use.[23] Roughly half of the projected economic benefits will stem from advanced biofuel production. The economic picture is even more robust in certain states. The RFS supports more than 70,000 jobs and $5 billion in wages in Iowa, 60,000 jobs and $3.7 billion in wages in California, 39,000 jobs and $3.9 billion in wages in Ohio, and more than 28,000 jobs in Kentucky (e.g.) and other states not commonly associated with the biofuels industry.[24]

While much of the economic footprint of the RFS stems from the production and use of first generation biofuels, the advanced biofuels industry is deploying commercially today. And the scale of opportunity is enormous. According to the Sandia National Laboratory, the U.S. could produce 75 billion gallons per year of cellulosic biofuels (one subset of the advanced biofuel industry, and 4.5 times the amount of cellulosic biofuel required by the RFS) without displacing food and feed crops.[25] This would be enough cellulosic biofuel alone to displace more than half of gasoline demand. A Bloomberg analysis released in 2012 looked at eight select regions to assess the potential for next generation ethanol production.[26] The study found that eight regions -- Argentina, Australia, Brazil, China, EU-27, India, Mexico and the United States – could displace up to 50 percent of their demand for gasoline by 2030 making ethanol from a very small percentage of its each region's agricultural residue supply. The economic opportunity, with specific regard to advanced biofuel production, is robust. First, roughly half of the economic benefits discussed in the Oak Ridge paper above are from advanced biofuels. An RFS study by Bio-Economic Research Associates (commissioned by BIO) concluded that compliance with the advanced biofuels requirement of the RFS will create roughly 800,000 direct and indirect jobs.[27]

The cellulosic biofuels industry is acutely aware of public criticism about our rate of deployment. But we would encourage the committees to focus closely on the clear visual and data-statistical evidence of real progress in our industry. From an RFS perspective, the production capacity of the broader advanced biofuels industry (i.e. all types of fuel qualifying as advanced biofuel under the RFS) exceeded the 2013 statutory target of 2.75 billion gallons established by Congress via RFS2.[28] U.S. EPA relied on the administrative flexibility provided to the agency by Congress to allow more bio-/renewable diesel and less cellulosic biofuel to be used to meet the 2013 standard. But delay should not be interpreted to mean failure when it comes to the commercial deployment of the most carbon-reductive, innovative fuels in the world. The ABBC's website (AdvancedBiofuels.org) details roughly two dozen advanced/cellulosic biofuel projects in the United States and abroad. And there are numerous U.S. commercial facilities now in commissioning or production phases, including:

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[23] See http://www.future-science.com/doi/abs/10.4155/bfs.12.60?journalCode=bfs.
[24] http://fuelsamerica.guerrillaeconomics.net/; http://www.fuelsamerica.org/pages/fuels_america_releases_new_footprint_anaylsis
[25] See https://share.sandia.gov/news/resources/news_releases/biofuels-can-provide-viable-sustainable-solution-to-reducing-petroleum-dependence-say-sandia-researchers/.
[26] See http://www.novozymes.com/en/sustainability/benefits-for-the-world/biobased-economy/white-papers-on-biofuels/Documents/Next-Generation%20Ethanol%20Economy_Executive%20Summary.pdf
[27] See U.S. Economic Impact of Advanced Biofuels Production: Perspectives to 2030, Bio-Economic Research Associates.
[28] See http://www.epa.gov/otaq/fuels/rfsdata/2013emts.htm

- Quad County/Syngenta Cellerate (Galva, IA): Quad County Corn Processors and Syngenta formed a joint venture to produce 2 million gallons of cellulosic ethanol (from corn fiber) at their first generation ethanol plant in Iowa and license the technology elsewhere. The facility is producing and selling cellulosic ethanol today that reduces carbon emissions by more than 100 percent in comparison to gasoline, and uses a technology that also decreases energy use while increasing the production of valuable co-products like corn oil.

- DuPont (Nevada, IA): DuPont just held a grand opening for its ~ $225 million cellulosic ethanol facility in Nevada, Iowa. The 30 million gallon per year capacity plant is the largest cellulosic ethanol plant in the world, and will use corn stover biomass (an agricultural "waste" stream) secured from up to 500 farmers within a 30-mile radius around the facility. The project created 1000 construction jobs and will maintain 85 permanent jobs.

- Abengoa (Hugoton, KS): The global renewable energy company has completed construction of a 25 million gallon per year plant in southwest Kansas that will produce ethanol and renewable electricity from agricultural waste. The company has contracted with local farmers to secure the roughly 1,100 dry tons per day of waste feedstock needed to run the plant, and is in position to replicate its successes quickly via its other ethanol plants.

- POET/DSM (Emmetsburg, IA): Project Liberty – a joint venture between POET and Royal DSM – will make ethanol from corn cobs, leaves, husk and stalk that pass through the combine during corn harvest. The 25 million gallon per year plant will produce enough renewable electricity, as a co-product, to power itself and the POET grain ethanol plant next door. POET owns and operates 27 first generation ethanol facilities; most of which are candidates to deploy the cellulosic biofuel production technologies developed in Emmetsburg very quickly.

- Novozymes (Blair, NE): Novozymes, an advanced bio-products and sustainable agriculture company, operates the largest industrial bio-enzymes production facility in the United States in Blair, NE. The facility produces enzymes for conventional and advanced biofuels.

- **Climate Change Emissions**

The vast majority of independent analysis (not directly or indirectly industry funded) confirms that most types of first and second generation biofuels reduce climate change emissions, in many cases by very large amounts, including analysis conducted by U.S. EPA, the California Air Resources Board, the U.S. Department of Energy and top energy labs such as Argonne and Oak Ridge National Laboratories.

For example, the latest peer-reviewed analysis coming out of the U.S. Argonne National Laboratory shows that all types of ethanol – the type of renewable fuel usually scrutinized for its GHG emissions – have significantly lower lifecycle greenhouse gas emissions than petroleum, even with penalty for indirect land use change. Advanced ethanol, in particular, is: (a) vastly more carbon reductive than petroleum; (b) vastly more carbon reductive than the baseline used to analyze the RFS

– 2005 gasoline; and, (c) significantly more carbon reductive than technologies often regarded to be the most innovative (electric drive, hydrogen).

Latest Well-to-Wheels Greenhouse Gas Emissions Reduction Relative to Average Petroleum Gasoline

WTW GHG emission reductions	Corn	Sugarcane	Corn stover	Switchgrass	Miscanthus
Including LUC emissions	19–48% (34%)	40–62% (51%)	90–103% (96%)	77–97% (88%)	101–115% (108%)
Excluding LUC emissions	29–57% (44%)	66–71% (68%)	89–102% (94%)	79–98% (89%)	88–102% (95%)

Source: Argonne National Laboratory[29]

The carbon benefits of increasing the use of renewable fuels are actually even greater when you take into account the fact that renewable fuels replace marginal (rather than average) gallons of petroleum. To illustrate, Petrobras chief Jose Sergio Gabrielli has declared that "the era of cheap oil is over." This means that oil companies are shifting very quickly to an increasing reliance on more expensive and riskier "unconventional" fuels – including tight oil (e.g. the Bakken), deep water (e.g. Gulf of Mexico, Deep Water Horizon) and Canadian tar sands (e.g. Keystone) – to meet the global demand for fuel energy.[30] These fuels are more carbon intensive than the "2005 average petroleum" legislated by Congress in 2007, and replacing RFS renewable fuel gallons with marginal petroleum gallons will result in backsliding with regard to both raw GHG emissions and the Obama Administration's commitment to cut carbon emissions to "protect the health of our children and move our economy toward American-made clean energy sources that will create good jobs and lower home energy bills."[31]

There are a number of recent studies that have looked at the real world "marginal" impact of increasing the use of renewable fuels. For example, a 2014 analysis conducted by Life Cycle Associates in California concluded that today's corn ethanol – assessed by EPA in 2010 to be 21 percent better than 2005 petroleum with regard to lifecycle GHG emissions – is 32 percent better than 2012 average petroleum and 37-40 percent better than petroleum derived from tar sands and fracking. The report notes that using less renewable fuel will increase the use of these unconventional types of oil:

> The majority of unconventional fuel sources emit significantly more GHG emissions than both biofuels and conventional fossil fuel sources ... [t]he biggest future impacts on the U.S. oil slate are expected to come from oil sands and fracking production ... significant quantities of marginal oil would be fed into U.S. refineries, generating corresponding emissions

[29] See http://iopscience.iop.org/1748-9326/7/4/045905/pdf/1748-9326_7_4_045905.pdf
[30] See http://www.eia.gov/forecasts/aeo/MT_liquidfuels.cfm#crude_oil
[31] See http://www.whitehouse.gov/the-press-office/2013/06/25/fact-sheet-president-obama-s-climate-action-plan

penalties that would be further aggravated in the absence of renewable fuel alternatives."

Source: Life Cycle Associates, January 2014

These findings are consistent with recent (lower resolution) assessments by federal agencies. For example, a recent report released by the Congressional Research Service (CRS) found that Canadian oil sands are 14-20 percent more carbon intensive than the 2005 EPA baseline.[32] As such, it is an inescapable reality that any proposal to reduce renewable fuel blending is a proposal to increase U.S. consumption of high carbon intensity, unconventional oil.

5. Conclusion: Congress should not legislate on the RFS and allow the program to deliver on its economic and environmental record and promise

We are often asked by members of Congress if there are ways to accelerate the deployment of the advanced biofuels industry. We would like to respectfully suggest the following:

- **A Stronger Commitment to No Backsliding/Policy Certainty Would Help Attract Project Finance to U.S. Advanced Biofuel Markets**

The U.S. has a number of well-designed policies in place that are driving innovation in the biofuels sector, including but not limited to the RFS, several important tax provisions currently being considered for extension (e.g. the second generation biofuel producer credit, the special depreciation allowance for second generation biofuel plant properties, etc.) and the critical energy title programs in the farm bill. The issue around these policies is not their design; but rather, their dependability as related to legislated permanence (i.e. the perpetual risk of expiration) and funding (i.e. the perpetual risk that they are de-funded). By contrast, federal government support for the fossil fuels industry – primarily through the federal tax code but also indirectly via infrastructure and other policies – is almost always permanent. This clear inequity has the practical effect of increasing the risk of investing in renewable versus fossil energy, which in turn drives the development of clean energy overseas to countries with more durable policy commitments (e.g. China, Brazil, etc.). Ironically, policy risk is often more perceptive than substantive and incumbents leverage this investment reality to create a perpetual cloud of uncertainty around landmark biofuel programs. As such, it is absolutely critical to our industry to protect landmark programs – RFS and farm bill energy title among them – at both the messaging and substantive levels. Changing the rules in the middle of the game for any of these policies – however framed politically – has the practical effect of spooking investors and making the U.S. less competitive globally. Ultimately, it will also be critical to reform the federal tax code to, at minimum, remove the inequities that distort investment markets.

- **Transparency in RFS RIN Trading Markets Would Help Reduce Unnatural Volatility in RIN Markets and Put the RFS on a More Stable Path Going Forward**

[32] See http://www.fas.org/sgp/crs/misc/R42537.pdf

The RFS is designed to drive investment in advanced biofuels and more renewable fuel blending (including infrastructural development). The primary driver of additional biofuel market access within the RFS is the RIN. A RIN is an identification number generated when a gallon of RFS-qualifying renewable fuel is produced. The RIN is attached to the renewable fuel gallon at the point of sale to obligated parties (i.e. oil companies), but can be separated (from the liquid gallon) by obligated parties and sold for whatever price the market will bear. The primary value of the RIN program, other than facilitating compliance accounting and some level of compliance flexibility, is its ability to increase market access for renewable fuels. That is, when an oil company refuses to blend more liquid biofuel, they can buy a RIN on the open market instead. If a significant number of oil companies refuse to blend liquid gallons and seek RINs on the open market, RIN trading and values will increase as a result of their affirmative non-compliance. Higher RIN prices should not be considered a bug in the RFS; they actually provide an extra incentive for other obligated parties to blend liquid renewable fuel gallons, because they acquire a valuable and saleable RIN free of charge with each gallon of renewable fuel purchased. In essence, higher RIN values reward good behavior and facilitate the objectives of the RFS.

Some oil companies and refiners are trying to miscast higher RIN prices as a potential cause for higher gas prices. The Babcock analysis discussed above – which was not funded by industry – clearly shows that higher RIN prices do not increase gas prices primarily because: (a) RINs enter the marketplace free-of-charge with each gallon of renewable fuel; (b) RIN values are created by trading among obligated parties, so it is often the oil industry itself on the profit side of the RIN transaction;[33] and, (c) higher RIN prices actually *reduce* the cost of a gallon of renewable fuel at the wholesale level, which erases the threat of higher gas prices at the retail level.

That said, the current RIN trading marketplace lacks transparency to the point in which it is difficult for traders and obligated parties to make trades based on dependable, real-time information. While it is not clear what percentage of the 2013 spike in D6 RIN prices came as a result of the lack of transparency in RIN markets – either through hoarding from (blind) "shortage mentality" or other strategies – it is clear that a non-transparent RIN marketplace could be a liability for the program, and in turn, a point of uncertainty for advanced biofuel investing. We believe that federal agencies (e.g. EPA in collaboration with the CFTC) could set up an electronic trading platform – similar to those used in other commodity markets – to ensure that RIN positions and trades are disclosed in real time. We believe this can be done expeditiously and would have an immediate calming effect in the marketplace with regard to RIN volatility and predictability.

- **Market Access to Allow Fair Competition**

There are a number of incongruencies between the goal of increasing the production of advanced biofuels and the regulations that largely dictate outcomes in U.S. liquid fuel markets. It is a basic economic notion that emerging advanced bio-based fuels need a market (i.e. demand) to deploy at commercial scale. And yet, EPA has yet to resolve a number of roadblocks for the increased use of renewable fuels in gasoline.

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[33] See http://www.ethanolrfa.org/exchange/entry/what-do-big-oils-quarterly-earnings-say-about-the-real-impact-of-rins-on-u/

For example, EPA has thus far refused to address regulatory inconsistencies with regard to vapor pressure for E15 that are contributing to the slower than necessary deployment of the fuel. There is no real substantive issue that supports treating E10 and E15 differently with regard to vapor pressure, but the practical effect is gasoline retailers cannot offer E15 year round as *an additional* option at the pump (i.e. if consumers do not want to use it, they do not have to). This discourages the utilization of pump infrastructure for marketing and selling of E15. Another very simple and inexpensive way to further promote the goals of the RFS is to incent the production of Flex Fuel Vehicles (FFVs). Ensuring – one way or another – that every new car manufactured in the U.S. is an FFV would cost consumers next to nothing, but would open up new frontiers for the advanced ethanol industry. This is just one example applicable to ethanol, but it is important to understand that all petroleum alternatives currently face the challenge of having to go through their competitors to reach consumers. Regulatory agencies must be careful not to make market access more challenging.

It is both an exciting and challenging time for the cellulosic biofuels industry and the advanced biofuel industry as a whole. The technology is commercial ready and the industry is deploying at commercial scale. We are embarking on the process of securing efficiencies that can only be achieved via commercialization (i.e. the "experience curve") and economies of scale. When the corn ethanol industry started building plants, their production costs exceeded their feedstock costs by a large margin. However, corn ethanol producers have reduced their production costs by roughly 60 percent since the first commercial plants were built in the 1980s. Likewise, some solar companies have seen a similar 60-70% production cost reduction in just the last ten years, as capacity has increased significantly. The U.S. is in position to lead the world when it comes to the development of advanced, low carbon biofuels. And yet, we face as much policy uncertainty as we ever have before, almost always generated by fabricated claims about renewable fuels and the RFS. Incumbents in the fuel energy space are going after our tax provisions, our farm bill programs, and of course, the RFS. It is important to understand that this is happening because of the effectiveness, rather than ineffectiveness, of these programs to drive consumer choice at the pump.

We very much appreciate the opportunity today to highlight the fact that advanced biofuels are emerging, that renewable fuels are creating jobs and driving pump prices down, and efforts to undercut biofuel programs are occurring because these programs are working, not vice-versa.

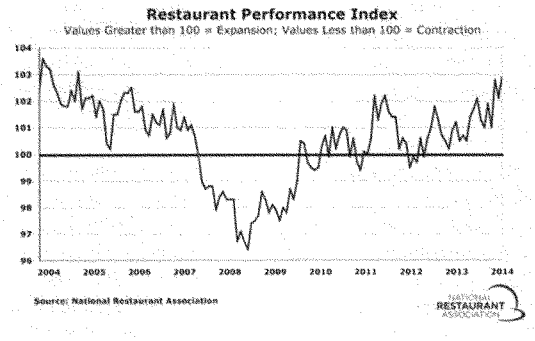
Thank you for the privilege of speaking before you today. I look forward to your questions. We have attached some information below to shed light on much of the misinformation associated with implementation of the RFS. Thank you.

ATTACHED:
Attachment A: Easy Answers to a Number of Complex Allegations Made Against Biofuels
Attachment B: Further Analysis of Gas Price Impact of the RFS

Attachment A
Easy Answers to a Number of Complex Allegations Made Against Biofuels

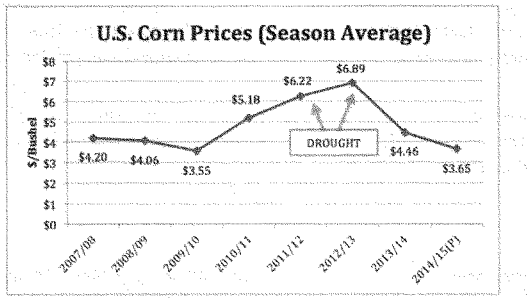
1. "Restaurants and the broader food industry are hurting as a result of the RFS."

The restaurant industry is not hurting. Chain restaurants, which are outspoken against the RFS, are actually posting some of the best returns in a decade (with the RFS in place).

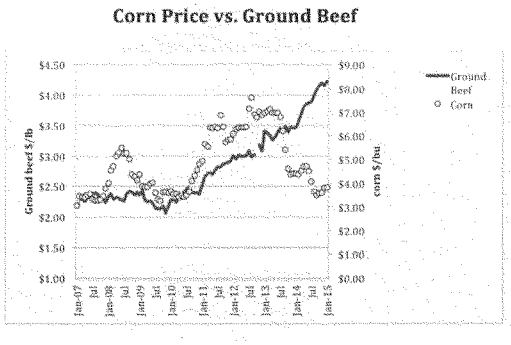


2. "Biofuel programs increase feed prices and hurt the livestock industry."

Corn prices today are lower than corn prices on the day that President Bush signed RFS2 in December 2007. And it does not appear that livestock is suffering. The gross farm value of livestock, dairy and poultry production has increased from an average of $123 billion per year before passage of the RFS to roughly $148 billion per year since 2008. The average profit margin for livestock and poultry values over purchased feed costs has increased by nearly $6 billion per year on average.

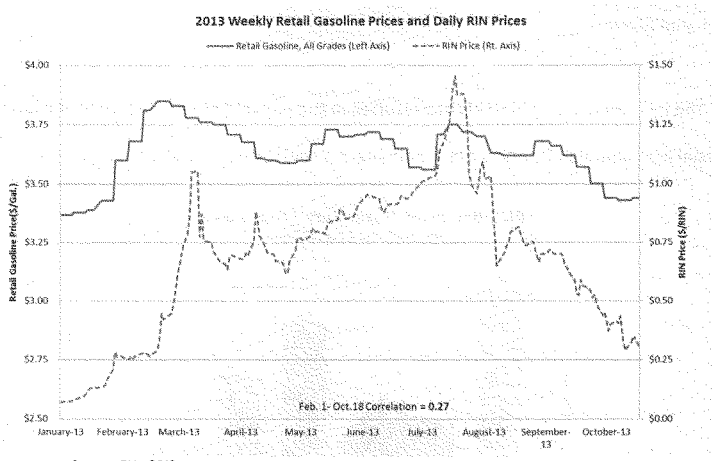


If livestock products like beef are so affected by the RFS and corn prices, why then is the price of beef not coming down with corn prices?



3. The 2013 RFS-RIN price spike showed that the RFS is a liability when it comes to gas prices

Higher RIN prices do not increase gas prices. Many oil companies are now on record on earnings calls attesting to the fact that they are the ones *profiting* from higher RIN values, because they get the RIN for free when they buy a gallon of renewable fuel and can sell it to other obligated parties.[34]

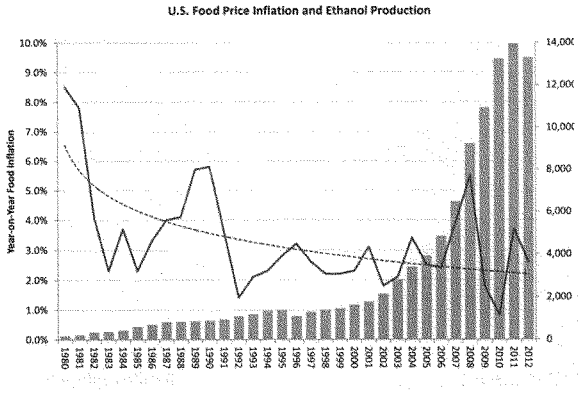


Source: EIA, OPIS

[34] See: http://www.fuelsamerica.org/blog/entry/something-funny-about-those-oil-company-profits

4. "Biofuels have increased food prices in the grocery aisle."

Grocery aisle food prices are not increasing, and they are decreasing *against* increases in ethanol use.

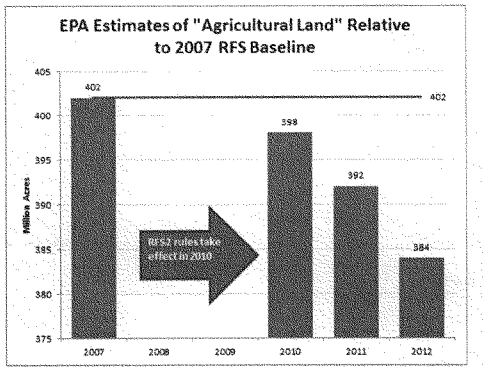


5. "E15 is a threat to boaters and small engines."

E15 is an option at the pump, as opposed to the new baseline fuel, and small engines and boats are not approved to use E15. Boaters and small engine users can simply fill up with other fuel to avoid higher ethanol blends.

6. "The increased use of biofuels has resulted in the plowing of virgin and pristine land."

The national agricultural footprint is not expanding, it's contracting due to efficiency gains.



Update: Total cropland was 336 million acres in 2013 and 340 million acres in 2014 (USDA, 2015)

There is always some regional variation with regard to agricultural land use, but recent allegations about prairie conversion are misleading:

- Critics of the RFS point to reduced acreage in the Conservation Reserve Program (CRP), but acreage in the program went down commensurate with the funding cut in the 2008 farm bill.
- Allegations about "15 million more corn acres planted" are true, but should be considered relative to the more than 20 million acres of wheat taken out of production during the same period. Crops are generally rotating, not expanding.
- Wheat acres dropped more than corn acres increased in the specific states that the Associated Press claimed were using pristine lands for corn ethanol production.

7. "Biofuels do not decrease climate change emissions."

The vast majority of independent analysis (not funded by or associated with the oil industry) confirms that most types of first and second generation biofuels reduce climate change emissions, including analysis conducted by U.S. EPA, the California Air Resources Board, the U.S. Department of Energy and top energy labs such as Argonne and Oak Ridge.

Latest Well-to-Wheels Greenhouse Gas Emissions Reduction Relative to Average Petroleum Gasoline

WTW GHG emission reductions	Corn	Sugarcane	Corn stover	Switchgrass	Miscanthus
Including LUC emissions	19–48% (34%)	40–62% (51%)	90–103% (96%)	77–97% (88%)	101–115% (108%)
Excluding LUC emissions	29–57% (44%)	66–71% (68%)	89–102% (94%)	79–98% (89%)	88–102% (95%)

Source: DOE Argonne National Laboratory[35]

There are very few studies claiming that biofuels increase carbon emissions. These studies are often oil industry funded or associated with a group funded by the oil industry, and/or rely on questionable assumptions unsupported by the mainstream scientific community.

For example, the "Science" analysis used in recent oil industry television commercials is one conducted in 2008 by an analyst then affiliated with the German Marshall Fund and now affiliated with the World Resources Institute – both oil industry funded groups. The analysis drives a large land use carbon penalty by assuming in the modeling that the U.S. uses *double* the corn ethanol ever required by the RFS. The work is not part of the conversation anymore when it comes to accurate carbon accounting – as higher resolution, independent work has essentially debunked the report.

[35] See http://iopscience.iop.org/1748-9326/7/4/045905/pdf/1748-9326_7_4_045905.pdf

Attachment B
Further Analysis of Gas Price Impact of the RFS

The focal point of the oil industry's attempt to escape their obligations under the RFS is to cast their willful non-compliance with the law as involuntary (i.e. because of the blend wall) and in the interest of protecting consumers (i.e. because higher RIN prices are a "cost of compliance" that will be passed on to consumers). These arguments are not based in fact.

With regard to the ability to blend more renewable fuels, obligated parties can blend more E15 (15% ethanol by content; a high-octane premium fuel approved by EPA for use in two-thirds of the vehicles on the road today), E85 (85% ethanol by content), biodiesel (most engines are warrantied to handle higher biodiesel blends), and/or more renewable diesel. With specific regard to E85, there are enough "flex fuel" vehicles on the road to consume at least 3 billion additional gallons of ethanol if, according to independent analysis, price per mile costs aligned with E10.[36] As discussed, market conditions and higher D6 RIN prices (which happened as a result of the oil industry's affirmative decision not to blend more E85 and E15 notwithstanding the lower price of ethanol) combined to allow E85 prices to be significantly below the wholesale cost of gasoline (including the energy density adjustment). If the underlying question at hand relates to the cost of enforcing the RFS as designed, which we suspect it is, the administration should be reaffirming its commitment to the RFS to save consumers money.

EPA now acknowledges that high RIN prices do not increase gas prices. In a recent memorandum on the subject, EPA states that "the RIN market seems to be functioning generally as expected; providing an incentive for the continued growth of renewable fuels in the transportation fuel market *without causing overall increases to the retail price of transportation fuel."*[37]

As discussed in the EPA memorandum, the RFS basically imposes two realities on the marketplace: (1) the potential cost of paying for RINs if obligated parties choose not to blend more renewable fuel; and, (2) the cost or savings of the qualifying renewable fuel required by the program. Looking at RINs first, higher RIN prices are not costing the American consumer money because RINs enter the marketplace free of charge. For example, a D6 "conventional renewable fuel" RIN is generated with every gallon of renewable fuel produced, and cannot be separated for sale by the renewable fuel producer. RINs are separated for sale *by obligated parties*, so the profit from sale (or cost incurred from purchase) exists within the oil industry. This is why so many oil companies are now on record on earnings calls attesting to the fact that they were the ones *profiting* from higher RIN values in 2013.[38] It is also the reason why no correlation could be found between gas prices and RIN prices during the critical period in 2013 when RIN prices appeared to cause the Obama Administration to change its stance on the RFS. See next page.

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[36] See http://www.card.iastate.edu/publications/dbs/pdffiles/13pb15.pdf

[37] Burkholder, Dallas. "A Preliminary Assessment of RIN Market Dynamics, RIN Prices, and Their Effects," U.S. EPA-Office of Transportation and Air Quality (May 14, 2015). Available at: http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2015-0111-0062

[38] For summary of oil companies RIN profits, see: http://www.fuelsamerica.org/blog/entry/something-funny-about-those-oil-company-profits.

Examples of Oil Industry Earnings Call Statements Regarding RINs

American Petroleum Institute — The Mirage: Says its members are getting hit by high RIN prices, the costs of which are being passed through to consumers at a rate of $14 billion per year

- **"RIN prices are near an all-time high … the RFS is a grave economic threat and must be stopped immediately."**
  - Jack Gerard, testimony to Energy and Commerce Committee, July 2013

BP — Says it has profited from RIN trading

- **"We're net long RINs. We've been able to trade into this spike recently and done quite well out of it. I'm very pleased about that."** (http://www.reuters.com/article/2013/07/30/bp-rins-idUSL1N0G00XG20130730)

ExxonMobil — Says that the obligation to purchase RINs has not affected its earnings

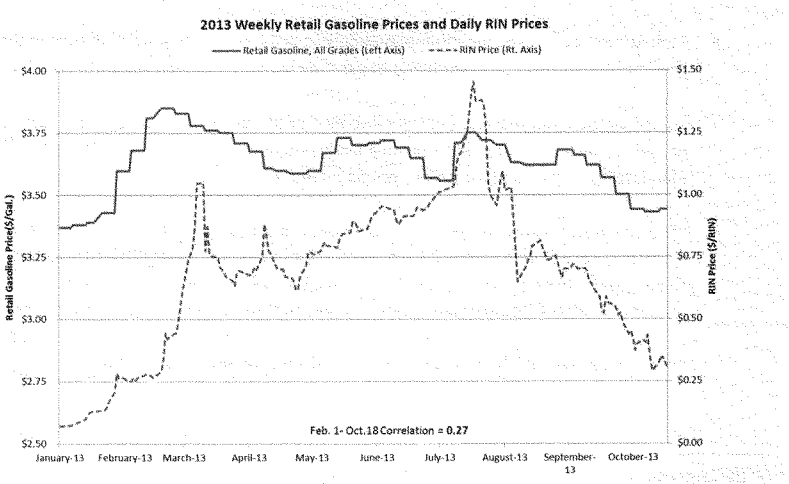
- **"No, not at all."**
  - David Rosenthal, Vice President of Investor Relations & Secretary, when asked by an analyst if RINs had any material impact on ExxonMobil's quarterly financial performance (ExxonMobil 2nd Quarter Earnings Call. 8-1-2013)

Murphy Oil — Says it has profited from higher RIN prices

- Murphy reported the increase in its refining/marketing income in the quarter was **"…primarily due to better results for ethanol production operations and higher sales prices for ethanol renewable identification numbers (RINs) in the current period. …Profit from ethanol RIN sales was higher in 2013 due to significantly stronger sales prices for these credits."** (http://online.wsj.com/article/PR-CO-20130731-916461.html)

Oil Industry Economist — Philip K. Verleger says renewable fuels have saved consumers at least hundreds of billions

- **"The US renewable fuels program has cut annual consumer expenditures in 2013 between $700 billion and $2.6 trillion. This translates to consumers paying between $0.50 and $1.50 per gallon less for gasoline."** (http://www.pkverlegerllc.com/assets/documents/130923_Commentary1.pdf)



Source: EIA, OPIS

With regard to the cost of the qualifying fuel, higher RIN prices have the practical effect of increasing the available supply of affordable liquid fuel during a period of tightness in the global supply of petroleum. As discussed, energy economist Philip K. Verleger (who served as an advisor on energy issues to both the Ford and Carter administrations) recently said, "the U.S. renewable fuels program has cut annual consumer expenditures in 2013 between $700 billion and $2.6 trillion ... [t]his translates to consumers paying between $0.50 and $1.50 per gallon less for gasoline."[39] Verleger adds:

> Just as only Richard Nixon could ironically break the US taboo on trading with China, only George W. Bush could have successfully introduced measures to drive down crude prices. These prices today are between **$15 and $40 per barrel lower** than they would be had Congress not endorsed his proposals to boost ethanol production and blending with gasoline. Today, the Bush measures ***add the equivalent of Ecuador's crude oil output to the world market at a time of extreme tightness***." - Oil economist Philip K. Verleger, Jr. (September 23, 2013)

Other assessments have reached a similar conclusion.[40] The most comprehensive is a paper published by former EPA contractor Bruce A. Babcock and Sebastien Pouliet from the Center for Agricultural and Rural Development (CARD), with support from the National Science Foundation, which seeks to "to provide a transparent economic analysis of the impact on consumer fuel prices from mandates that increase the consumption of ethanol;" or, more specifically, "to estimate the impact of RIN prices on the pump price of fuel."[41] CARD has developed a model to predict a range of different market impacts occurring as a result of the RFS. Among other findings, the paper concluded that:

- "... feasible increases in the ethanol mandate in 2014 will cause a small *decline* in the price of E10 [the predominant blend of gasoline in the market today]."

- "... one of the costs that does not need to be considered is an increase in the pump price of fuel, because we show that the most likely outcome from increasing ethanol mandates is a drop in pump prices, not an increase."

- "The oil industry continues to rely on their own commissioned study (NERA 2012) that predicts gasoline producers will have no choice but to cut domestic sales of gasoline to reduce their obligations under the RFS ... [t]he study's conclusions – that expansion of ethanol mandates would cause severe damage to the economy – are simply not credible unless EPA were to ignore set mandates at such a high level that they literally could not be met regardless of the level of investment in new fueling infrastructure."

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[39] See http://www.pkverlegerllc.com/assets/documents/130923_Commentary.pdf.
[40] See, for example, Cui, J., H. Lapan, G. Moschini, and J. Cooper. (2010). "Welfare impacts of Alternative Biofuel and Energy Policies." American Journal of Agricultural Economics 93(5): 1235-1256.
[41] See http://www.card.iastate.edu/publications/dbs/pdffiles/14pb18.pdf at p. 5.

- "Our results should reassure those in Congress and the Administration who are worried that following the RFS commitment to expanding the use of renewable fuels will result in sharply higher fuel prices for consumers."

- "The reason the oil industry and much of the livestock industry have joined forces against biofuels is one of simple industry economics: their industries would benefit from cheap corn and reduced competition from ethanol."

There are numerous other examples of detailed analysis of the effect of RIN prices on gas prices:

- Irwin & Good of the University of Illinois examined 2012-2013 prices for CBOB, ethanol and D6 RINs to determine the impact of rising RIN prices on retail gasoline prices.[42] They found that "the basic zero sum nature of relationships in the supply chain and recent price trends for CBOB blendstock and ethanol suggests that the impact, if any, has likely been small, at most a few cents."

- In a May 2015 update to a 2014 study, Informa Economics (Attachment 4) concluded that, "Changes in prices of renewable identification numbers (RINs) did not cause changes in retail gasoline prices from 2013 through the first quarter of 2015."[43]

- Analysis by economists at Iowa State University found that "the most likely outcome from increasing ethanol mandates is a drop in pump prices, not an increase."[44] Further, they concluded, "Many in the oil industry have used the specter of higher pump prices to argue against increased mandates. ...These findings show that concern about the consumer price of fuel do not justify a reduction in feasible ethanol mandates."

- Retired Yale and Calgary professor Philip Verleger conducted an economic study that concluded the "RIN price impact on retail prices is small and transient."[45] He found that competition in the gasoline supply chain tends to diminish any price increases when refiners or blenders tried to embed the RIN price into E10 prices.

- EIA confirmed the absence of any connection between RIN prices and retail gasoline prices, stating: "To date, there is no evidence that retail gasoline prices have been affected by high RIN prices. While the cost of refined gasoline blendstock can be affected by high RIN prices, the increased cost to gasoline blenders is almost exactly offset in 2013 by their increased

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[42] Irwin, S. & D. Good (Mar. 2013), "High Gasoline and Ethanol RINs Prices: Is There a Connection?" Link: http://farmdocdaily.illinois.edu/2013/03/high-gasoline-ethanol-rins-prices.html

[43] Informa Economics, Inc. (May 2015), "Analysis of Whether the Prices of Renewable Fuel Standard RINs Have Affected Retail Gasoline Prices." Link: http://ethanolrfa.3cdn.net/f1c5dfa9ac9743e9f8_csm6bcb8e.pdf

[44] Pouliot, S. and B.A. Babcock (Jan. 2014). Center for Agricultural and Rural Development (CARD); Iowa State University. "Impact of Increased Ethanol Mandates on Prices at the Pump." CARD Policy Brief 14-PB 18. Link: http://www.card.iastate.edu/publications/synopsis.aspx?id=1218

[45] Verleger, P.K., Jr. (Jan. 2014), "The Renewable Fuel Standard: How Markets Can Knock Down Walls." Link: http://www.pkverlegerllc.com/publications/papers/the-renewable-fuel-standard-how-markets-can-knock-down-walls-january-2014-1162/

revenue generated from the sales of RINs separated when they blend ethanol into gasoline."[46]

- A former member of President Obama's Council of Economic Advisers, who took part in the interagency review of the original 2014 RVO proposal, recently found that "...the price of E10 does not vary with RIN prices..." and that RIN prices actually serve to "...decreas[e] the price of fuels with high renewable content (like E85)."[47]

On the critical issue of cost, irrespective of its statutory relevance with regard to EPA's proposal, it is clear that the RFS is engineered to achieve its objectives without increasing pump prices in the immediate term. The program is already creating – and will continue to facilitate – more systemic consumer benefits via its profound impact on reducing foreign oil dependence. Weakening the RFS, on the other hand, will cost consumers at the pump by tightening global liquid fuel supplies, reducing the availability of a cost reductive renewable fuel and exacerbating the impact of speculation.

[46] Presentation by Mindi Farber-DeAnda, EIA Office of Petroleum, Natural Gas, and Biofuels Analysis to Advanced Biofuels Association (Nov. 20, 2013). Washington, D.C.

[47] Stock, James H. (April 2015). Columbia SIPA Center on Global Energy Policy. "The Renewable Fuel Standard: A Path Forward." Available at: http://energypolicy.columbia.edu/sites/default/files/energy/Renewable%20Fuel%20Standard_A%20Path%20Forward_April%202015.pdf

Senator INHOFE. Wow.

All right, Mr. Pugliaresi, if the RFS were to go away, which I would like to see happen, how much corn-based ethanol do you expect refiners would use, if they didn't have the mandate?

Mr. PUGLIARESI. Parts of the petroleum industry have used ethanol for 35 years. It is a very important integrated blend stock.

Senator INHOFE. I said how much, though.

Mr. PUGLIARESI. I think we would say close to 10 percent.

Senator INHOFE. All right. And what role in the domestic and international market do you see for corn ethanol without mandates or subsidies?

Mr. PUGLIARESI. As I said, the U.S. corn ethanol is a mature industry, it is cost effective, and I believe they will continue to be a force of exports for the U.S. as well.

Senator INHOFE. OK, exports. Very good.

Mr. Minsk, you worked on this issue in the Obama administration and have been very clear that the program is dysfunctional. Am I correct in that?

Mr. MINSK. I wouldn't say that the program is dysfunctional. I think that there are certainly opportunities to improve it.

Senator INHOFE. I misread your statement, then. I understand that. But still it is not working the way you would like to see it work. How is that?

Mr. MINSK. I think that there are certainly opportunities to improve its operation, yes.

Senator INHOFE. Right. OK. One of your ideas to fix the RFS is to make blenders obligated parties. If we did this, there would be thousands of obligated parties. Does it make sense to give the EPA additional enforcement responsibilities when they can't currently manage the program?

Mr. MINSK. So the idea is not to make thousands of blenders obligated parties. The idea is to move the point of obligation to the terminal rack, the distribution point from which trucks pick up the fuel and deliver it to retail stations; not the retailers themselves.

And Valero, which is an obligated party, submitted documentation to EPA that is in the docket this past fall, analysis which I put as an appendix to my testimony, that showed that there they identified I think about 107 companies that would be obligated parties. And while that is not a complete list, it is probably a pretty good list. You can see it is attached to the testimony.

So, again, it is not the individual stations that may blend if they have a blender pump, but it is the distribution facility, which is where much of the blending happens, which is what I have identified as a better point of obligation.

Senator INHOFE. Well, thank you. Senator Boxer.

Senator BOXER. Thanks, Senator.

Mr. Coleman, Mr. Pugliaresi says that now that U.S. oil production has increased it is time to change the RFS, and my chairman believes that as well. What is your response to this view?

Mr. COLEMAN. Well, unfortunately, the increase in oil production is going to prove to be a temporary achievement because essentially what is going on is the Saudis collaborating with Russia, to a degree Iran, Iraq are slamming down the price of oil to destroy this progress.

Senator BOXER. So you are saying it is a short-term phenomenon?

Mr. COLEMAN. It is a short-term phenomenon.

Senator BOXER. We shouldn't act hastily when just a few years ago or a couple years ago we were saying, oh, my God, we have to become more self-sufficient.

Mr. COLEMAN. And I think putting it in the context of EIA forecasts, there are EIA forecasts we all pay attention to. One of them is not what is going to happen in oil markets because they don't have a mind-reader. So when Russia and the Saudis decide that they are done pounding on these U.S. enterprises, they are going to shut the spigots down, increase price, double or triple the price of gasoline, and there is not a thing we can do about it if we don't have alternatives.

Senator BOXER. Well, we have lived through that before, haven't we?

Mr. COLEMAN. We have.

Senator BOXER. Mr. Coleman, since its start, has the RFS program led to any increase in the price consumers pay for gasoline at the pump? Will the RFS increase gas prices if we continue to increase renewable fuel production as called for by Congress?

Mr. COLEMAN. No. There has been no gas price increase. With all due respect to the modeler next to me, what they did is they modeled a scenario that would never happen. They modeled a scenario where EPA basically acted completely irresponsibility and hammered statutory volumes into the marketplace as if the statute is rigid and not adjustable. So from our perspective, that is not a model worth listening to.

EPA has come out and said it does not increase gas prices. The White House has gas prices do not increase gas prices. So we are adding supply to a tight marketplace, and that brings down gas prices and creates competition.

Senator BOXER. Good point.

Mr. Pugliaresi, my sense is you represent the oil companies basically, is that accurate?

Mr. PUGLIARESI. I absolutely don't.

Senator BOXER. OK.

Mr. PUGLIARESI. Actually, our largest sponsors in the last couple years were the Defense Department.

Senator BOXER. But isn't it true that your organization originally was called the Petroleum Industry Research Foundation?

Mr. PUGLIARESI. It was. Oddly enough, the board thought that all the interesting petroleum issues had been solved and wanted to do a broader——

Senator BOXER. But I think it is important that people understand this because Media Matters points out the various huge grants you have received from big oil.

Mr. PUGLIARESI. That is incorrect.

Senator BOXER. You didn't receive $168,000?

Mr. PUGLIARESI. We receive independent funding from the petroleum industry, even foundation money, but the largest support in the last few years came from the Department of Defense.

Senator BOXER. OK. Well, I want the record to show that there is a Media Matters article. I would ask unanimous consent to place it in the record.

Senator INHOFE. Without objection.

[The referenced information was not received at time of print.]

Senator BOXER. Thank you.

Mr. Minsk, my final question is to you. Do you think it is important that we do what we can to get that carbon out of the air so we can try our best to reduce the ravages of climate change?

Mr. MINSK. Absolutely I do, and I think that the RFS has an opportunity to do that. Part of what I think is important about my proposal is I think that if we implement this, it actually has a better chance of getting higher blends into the market at a lower cost, and that creates room for the fuels that are going to be created by the RFS. So I am not sitting here trying to disassemble it; I am trying to figure out how to make it better.

Senator BOXER. I appreciate that completely.

Mr. MINSK. So that is the whole purpose behind this proposal.

Senator BOXER. I appreciate that very much.

Thank you, Mr. Chairman.

Senator INHOFE. Thank you, Senator.

I thank our witnesses for appearing. I thank you for your patience.

We are dismissed to go vote.

[Whereupon, at 11:53 a.m. the committee was adjourned.]

[Additional material submitted for the record follows.]

February 24, 2016

Honorable Jim Inhofe
Chairman
Committee on Environment & Public Works
United States Senate
Washington, DC 20510

Honorable Barbara Boxer
Ranking Member
Committee on Environment & Public Works
United States Senate
Washington, DC 20510

RE: Committee Hearing on Oversight of the Renewable Fuel Standard

Dear Chairman Inhofe and Ranking Member Boxer:

The American Cleaning Institute® (ACI) welcomes the committee's oversight of the Renewable Fuel Standard (RFS) program. ACI is the trade associate representing the $30 billion U.S. cleaning products market. ACI members include the formulators of soaps, detergents, and general cleaning products used in household, commercial, industrial and institutional settings as well as companies that supply ingredients, including oleochemical manufactures, and finished packaging. ACI and its members are dedicated to improving health and quality of life through sustainable cleaning products and practices, and its mission is to support the sustainability of the cleaning products industry through research, education, outreach and science-based advocacy.

The U.S. oleochemical industry has been disadvantaged by federal biofuel subsidies in the form of tax credits and guaranteed markets under the RFS. Oleochemicals are chemicals made from animal fats, an agricultural commodity, and seed oils including fatty alcohols and fatty acids that have wide ingredient application in industrial and consumer products (See Attachment A). Oleochemicals are the original "green chemistry" and the domestic oleochemical industry provides direct and indirect employment for an estimated 25,000 people.

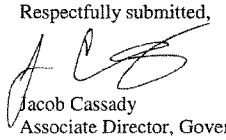
ACI has respectfully requested (via comments on proposed fuel volumes) EPA to use its discretionary authority to lower the volume requirement for biomass-based diesel, or, alternatively, to exclude animal fats as a feedstock option. The RFS program continues to divert large quantities of animal fats to the biofuels market. The domestic oleochemical industry is critically disadvantaged by this because the supply of animal fats is finite and inelastic. The latitude to reduce these volumes is provided by statute, which indicates EPA's ability to reduce the applicable volume of advanced biofuel and total renewable fuel if it is determined that the projected volume of cellulosic biofuel production for that year falls short. This will prevent an overreliance on certain fuels over others, especially biomass-based biodiesel, which uses the same animal fats as feedstock.

Agency mandates should not choose winners and losers. EPA has a responsibility to equally protect all industries that rely on animal fats to produce goods. Biofuel production consumes a significant amount of the total supply of animal fats and current policies threaten not only the price but the availability of animal fats for oleochemical production. Since 2006, under the combined policies of

the RFS2 and tax incentives for biofuels, the price of animal fats has increased 116 percent. EPA should limit the percentage of animal fat supply that can be used in the production of biofuels or eliminate animal fats as a feedstock option. It is unfair to place such a heavy burden on a source that is as inelastic as animal fats.

Thank you for your examination the EPA's management of this program and for your attention and consideration of these comments. I may be reached at (202) 662-2514 or via electronic mail at jcassady@cleaninginstitute.org.

Respectfully submitted,



Jacob Cassady
Associate Director, Government Affairs

cc: Members of the U.S. Senate Committee on Environment and Public Works

Attachment A

Representative Oleochemical Uses

Daily toiletry care
Soap (liquid/bar)
Toothpaste
Shaving Cream
Moisturizing body Cream
Mouthwash
Cosmetic creams
Shampoo
Hair conditioner
Make-up
Body washes
Hand lotions
Nail Care products

Other Uses:
Tires
Various rubber products
Pharmaceuticals
Building materials - foams
Lubricants
Mattresses
Automobiles - car dashboards
Inks
Paints
Textile fiber finishing
Fragrances (carriers)
Adhesives
Resins
Plastics
Water treatment materials
Paper Processing
Hydraulic Fluids
Corrosion inhibitors
Dairies - food processing
Agriculture-dispersing agent

Clothing Care
Detergents
Fabric softener
Stain removers

Cleaning/homes/buildings
Hard surface cleaners & sanitizers
Dish detergent (hand/machine)
Glass cleaner
Candles
Air fresheners

AMERICANS for TAX REFORM

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February 24, 2016

Dear Senate Committee on Environment and Public Works Chairman Inhofe:

On behalf of Americans for Tax Reform (ATR), and millions of taxpayers nationwide, we write to thank you for holding an oversight hearing on the Renewable Fuel Standard (RFS). The RFS is a failed government mandate that harms businesses and consumers, and brings uncertainty to U.S. fuel markets.

The RFS produces a number of unintended consequences that harm almost all sectors of the economy, and saddles American taxpayers and businesses with increasingly higher fuel costs. The RFS also reduces fuel efficiency, as ethanol has a much lower energy density than gasoline.

The RFS is burdensome and unrealistic for most small business owners. Gas stations are almost entirely individually owned and operated (about 95%). Most gas stations make only a few pennies per gallon so their margins are quite thin. We cannot afford to send more small businesses into bankruptcy and to destroy more jobs.

Increasing RFS requirements will create more net harm to the environment than simply using fossil fuels. Ethanol requires fertilizer, pesticides, and large quantities of water. A great deal of energy is expended to create the corn, and then distill the ethanol for fuel purposes. Numerous independent studies have concluded that it is more harmful to use more land, fertilizers, pesticides, and water to grow more corn and more energy intensive to then turn that corn into ethanol that it would be to simply refine more petroleum. The Organization for Economic Cooperation and Development concluded, "The overall environmental impacts of ethanol and biodiesel can very easily exceed those of petrol and mineral diesel."

Increases to the RFS benefit only EPA bureaucrats and rent-seekers. The RFS imposes higher costs on consumers and small businesses, kills jobs, and harms both the economy and the environment. We should end the RFS and let consumers and the marketplace determine how much ethanol should be blended with fuel.

Sincerely,

Grover G. Norquist
President
Americans for Tax Reform

growth energy™
America's Ethanol Supporters

777 North Capitol Street, NE, Suite 805, Washington, D.C. 20002
PHONE 202.545.4000 FAX 202.545.4001 GrowthEnergy.org

February 23, 2016

The Honorable Jim Inhofe
Chairman
Committee on Environment and Public Works
United States Senate
Washington, DC 20510

The Honorable Barbara Boxer
Ranking Member
Committee on Environment and Public Works
United States Senate
Washington, DC 20510

Dear Chairman Inhofe and Ranking Member Boxer:

While not able to testify in person today, we appreciate the opportunity to submit our comments on today's hearing examining the Renewable Fuel Standard (RFS) for the record.

Growth Energy is the leading ethanol trade association, representing 90 ethanol producing biorefineries and 90 associated companies in the ethanol production value chain. The ethanol industry is critical to our nation's efforts to achieve energy independence, national security, and economic growth. Last year the ethanol industry added nearly $44 billion to the U.S. Gross Domestic Product (GDP), saved American consumers billions at the pump, reduced greenhouse gas and tailpipe emissions, and supported more than 350,000 jobs here in the United States.

While today's hearing appears to focus on ways to change the RFS, we do not agree with that premise. We are hopeful that today's hearing will highlight the success that the RFS has had in reducing our dangerous dependence on foreign oil, creating American jobs and revitalizing our rural economy, providing consumers increased motor fuel choices while saving them money at the pump and improving our nation's environment.

Despite millions of dollars spent by those obligated to comply with this policy to skew the facts, the real data do not support moving away from this important policy; rather, the data suggests that we should continue this policy as is without changes and shows the policy is a resounding success. In addition to the economic benefits outlined earlier, ethanol now represents nearly 10 percent of our nation's fuel and is poised to contribute even more. Ethanol is a clean, homegrown renewable fuel that lowers greenhouse gas emissions (an average of 34% compared to gasoline according to Argonne National Lab), reduces harmful air toxics like carbon monoxide, benzene and toluene, and has helped to reduce particulate matter and ozone across the country.

When Congress approved the RFS, it established a fifteen year program for the purpose of blending more renewable fuel into our vehicle transportation fuel system and our industry answered the call. We have produced billions of gallons of renewable fuel, have employed thousands of American workers and revitalized rural America based on the certainty of this program. From the outset, the RFS always envisioned ethanol blends that would exceed 10 percent even with assumed increases in gasoline demand. We responded by petitioning EPA to allow 15 percent ethanol into our gasoline supply over five years

ago. After working with the Department of Energy's Oak Ridge National Laboratory to test 86 vehicles for 120,000 miles each, EPA approved E15 for all 2001 and newer passenger vehicles. Today, E15 is approved for 84 percent of the cars on the road. E15 has been offered to consumers for over four years without a single reported problem and because ethanol is consistently less expensive than gasoline, E15 has usually been offered for 5 and 10 cents less than regular gasoline.

We have also heard from several retailers that E15 now represents roughly over 50 percent of their fuel sales. NASCAR is scheduled to surpass 10 million miles on E15, experiencing an increase in horsepower and no loss in mileage. However, the world's largest oil companies are unwilling to allow higher ethanol blends such as E15 into the consumer marketplace, threatening the success of the RFS. After utilizing every tool at their disposal to avoid complying with the clear objectives of the RFS, they then claim the program is broken. The reality is they are refusing to blend additional biofuels into the motor fuel supply chain to protect their market share, profits and maintain their 90 percent monopoly over our fuel system.

We were very appreciative that EPA significantly improved their final rule for renewable volume obligations (RVO) for 2014, 2015 and 2016. However, we remain concerned that EPA is not appropriately using the waiver authority provided in the statute by redefining the program as one based on demand rather than the ability to supply our fuel system. The intent of the RFS has always been to drive innovation and investment in the production and marketing of more renewable fuel.

When the RFS was enacted, it provided the obligated parties, at their request, a mechanism to ensure flexibility for those who might not be able to blend adequate amounts of biofuel into their motor fuel supply. The Renewable Identification Number became both a compliance tool for EPA and an alternative market to physical blending of biofuels. Now these same parties that wanted flexibility and a mechanism to operate in lieu of blending biofuels to meet their volume obligations are falsely claiming that increasing RIN prices cause consumer gasoline prices to increase. In addition to our RIN analysis that found no impact on consumer gasoline prices, the EPA itself just released an in-depth study (Dallas Burkholder Memo to the Docket 5/14/2015) to show: "While RIN prices were significantly higher in 2013 than in previous years, we did not see, nor would we expect to see, a corresponding net increase in the overall retail price of transportation fuels across the entire fuel pool. This is because the RIN price, rather than acting as an additional cost, generally acts as a transfer payment between parties that blend renewable fuels and obligated parties who produce or import petroleum-based fuels and are required to obtain RINs for compliance purposes."

Again, it is unfortunate that we do not have to opportunity to appear today, but we are happy to provide the committee significant information and data on ethanol, E15 and the success of the RFS at any time. We appreciate the opportunity to submit our brief comments today.

Sincerely,

Tom Buis

Tom Buis
Co-Chairman, Growth Energy

777 North Capitol Street, NE, Suite 805, Washington, D.C. 20002
PHONE 202.545.4000 FAX 202.545.4001

July 27, 2015

Ms. Gina McCarthy
Administrator
Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460

Re: Renewable Fuel Standard Program: Standards for 2014, 2015, and 2016 and Biomass-Based Diesel Volume for 2017
[Docket No. EPA—HQ—OAR—2015—0111; FRL—9927—28—OAR]

Dear Administrator McCarthy:

The below-signed trade associations representing fuel marketers who blend renewable fuels into petroleum blendstock to produced finished transportation fuel ("blenders") submit the attached document for the Environmental Protection Agency ("EPA") to consider with respect to the above-referenced rulemaking. It has come to our attention that certain stakeholders are advocating that EPA revise the Renewable Fuel Standard ("RFS") regulations in a manner that would make blenders "obligated parties" rather than refiners and importers. EPA should reject this effort.

For the reasons articulated in the attached letter, this position exhibits a misunderstanding of how the RFS works. Were EPA to revise the RFS regulations in this manner, blenders would be subject to obligations that they would not necessarily be capable of satisfying. It would effectively turn the RFS into a voluntary program. This would disrupt the renewable fuels market and increase EPA's burdens in implementing the RFS. These consequences would hinder the achievement of the RFS's objectives.

Thank you for your consideration.

NACS National Association of Convenience Stores

NATSO Representing America's Travel Plazas and Truckstops

PMAA

SIGMA

Attachment:

March 27, 2014

Christopher Grundler
Director, Office of Transportation and Air Quality
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

Dear Mr. Grundler

The below-signed trade associations represent independent marketers who blend renewable fuels into petroleum blendstock to produce finished transportation fuel (hereinafter referred to as "blenders"). They all urge the Environmental Protection Agency ("EPA" or the "Agency") to reject a recent petition to revise the Renewable Fuel Standard ("RFS" or the "Program") regulations in a manner that would make blenders – rather than refiners and importers – "obligated parties."[1]

For the reasons articulated below, the petition exhibits a misunderstanding of how the Program works. If the petition is granted, blenders would be subject to obligations that they would not necessarily be capable of satisfying. This would disrupt the renewable fuels market and increase the Agency's burdens in implementing the RFS. These consequences would hinder the achievement of the Program's objectives.

I. SUMMARY

- In enacting the RFS, Congress sought to displace traditional fuel from unstable sources with domestically-produced renewable substitutes. These objectives can be achieved only if renewable fuels are price-competitive with petroleum-based fuel. Thus, regulations implementing the RFS should be designed to achieve the

[1] "Petition to Revise The Renewable Fuel Standard Regulations," Letter from David W. DeBruin, Counsel, Monroe Energy LLC, to Gina McCarthy, Administrator, U.S. EPA (Jan. 27, 2014); *see also* Brief for Petitioner at 6, Monroe Energy LLC v. EPA, No. 14-1014, (D.C. Cir. filed Jan. 28, 2014).

Program's objectives while imposing the minimum amount of burdens and disruptions on the entities that bring renewable fuels to market. Every incremental increase in such burdens results in an associated increase in the cost of renewable fuels.

- Making blenders obligated parties would inject substantial disruptions into the renewable fuels market and impose significant burdens on its participants. It is appropriate to make refiners and importers obligated parties because those entities control how product is introduced into commerce. Blenders, conversely, do not have such control because they are fundamentally *buyers* of refined products. Thus, if they were classified as obligated parties, their ability to satisfy their obligations would be dictated by their upstream counterparts. This anti-competitive result would lead to upward pressure on the retail price of motor fuel.
- Notwithstanding petitioner's statements to the contrary, the rationale for placing compliance obligations on refiners and importers remains valid. To change the regulatory scheme now would substantially disrupt the motor fuels market, impose unfair and inefficient obligations upon blenders, increase the Program's complexity and the Agency's administrative and enforcement burdens, and generally hinder the achievement of the Program's objectives.

II. THE RFS'S OBJECTIVES

The objectives of the RFS are to displace traditional fuel from unstable sources with domestically-produced renewable substitutes.

When the RFS was enacted in 2005 and expanded in 2007, domestic oil production was in the midst of a decades-long decline while demand for transportation fuels was rising. This situation generated concerns that the growing gap between domestic supply and demand would be filled by oil imports. The nations that were capable of filling this gap through increased exports to the United States were generally members of the Organization of Petroleum Exporting Countries ("OPEC").

Biofuels were considered a viable source of domestic liquid fuels that could be increased to counter dependence on oil imports. Biofuels' proponents anticipated environmental, economic, and energy security benefits to flow from increased use of biofuels. Thus, Congress in 2005 created the first federal biofuels mandate in the Environmental Policy Act ("EPAct") with the RFS. Two years later, Congress expanded the RFS in the Energy Independence and Security Act of 2007 ("EISA"). EISA expanded the RFS's biofuels targets from 7.5 billion gallons by 2012 to 36 billion gallons by 2022.

In enacting EISA, it was the sense of Congress that "the production of transportation fuels from renewable energy would help the United States meet rapidly growing domestic and global energy demands, reduce the dependence of the United States on energy imported from volatile regions of the world that are politically unstable, stabilize the cost and availability of energy, and safeguard the economy and security of the United States."[2]

III. MAKING BLENDERS OBLIGATED PARTIES WOULD HINDER THE ACHIEVEMENT OF THE RFS'S OBJECTIVES

A. The Importance of an Efficient, Well-Functioning and Competitive Marketplace for Renewable Motor Fuels

Achieving the RFS's objectives requires an efficient, well-functioning and competitive marketplace for renewable motor fuels. If these prerequisites do not exist, renewable fuels will not be priced competitively with petroleum based fuels. Although the RFS contains a number of mandates, the Program does not mandate that consumers purchase anything. As operators of retail motor fuel outlets with large street-side price display signs for consumers to view without leaving their vehicles, members of the below-signed trade associations are well aware that consumers make purchasing decisions based on price. Indeed, statistics establish that consumers will drive well out of their way to purchase the cheapest fuel available.

Imposing unnecessary burdens and disruptions on the market for renewable motor fuels will increase regulated entities' costs, and ultimately the price consumers pay. If the cost of renewable fuels is greater than the cost of petroleum-based fuels, consumers will not buy renewable fuels and the RFS will not achieve its objectives. It follows that RFS regulations should be designed to achieve the Program's objectives while imposing the minimum amount of burdens and disruptions on the entities that bring renewable fuels to market. Every incremental increase in such burdens will lead to an associated increase in the cost of renewable fuels.

The Program's objectives can only be achieved inasmuch as consumers want to purchase the fuels that the Program incentivizes. For example, one objective of the RFS is to enhance U.S. "energy security," *i.e.*, generate adequate supply of product that is priced competitively with petroleum. In this regard, the RFS contributes to U.S. energy security inasmuch as it decreases U.S. reliance on

[2] EISA Section 806(a)(4); Note: 42 U.S.C. § 17285.

foreign fuels (through the enhanced use of ethanol in gasoline and diesel fuels) and thus helps moderate the impact of global price fluctuations on the U.S. energy market. Consumers at this juncture, however, have shown little demand for gasoline blends with greater than 10 volume percent ethanol. This lack of consumer demand imposes a ceiling on the degree to which the RFS can enhance U.S. energy security.

The "blend wall" is analogous to the potential pitfalls of injecting additional disruptions into the motor fuels market. Such disruptions will inevitably lead to higher prices for the renewable fuels that the Program seeks to incentivize. Such higher prices will diminish renewable fuels' market infiltration, which – like the blend wall – will hinder achievement of the Program's objectives.

B. Making Blenders Obligated Parties Would Disrupt the Marketplace

i. Most product today is blended at the rack

The terminal "rack," *i.e.*, the point at a petroleum storage terminal[3] from which gasoline and diesel fuel are transferred from storage into transport trucks for delivery to retail motor fuel outlets, is the proverbial "heart" that pumps renewable fuel into the marketplace. Because ethanol cannot be shipped via pipeline, most ethanol today is blended with gasoline at the rack rather than at the refinery.

Regardless of which actor in the chain of commerce is an "obligated party," the RFS is effectuated through transactions that are consummated at the rack, and activities that are conducted at the rack. Because of this fact, most obligated parties prefer to introduce product into commerce at the rack.

In so doing, there are several ways that obligated parties can satisfy their RFS obligations:

- Blend gasoline and/or diesel fuel with ethanol prior to selling the fuel. Such blending will enable the obligated party to separate renewable identification numbers ("RINs") from the renewable fuel, and use the RINs to satisfy their renewable volume obligations ("RVOs") under the Program.
- Sell neat (straight) gasoline and/or diesel fuel to a blender, and contractually obligate the blender to separate RINs after blending such gasoline and/or diesel fuel and remit them back to the obligated

[3] Refined product is shipped via pipeline to such terminals.

party. The RINs can then be used to satisfy the obligated party's RVOs.

- Sell neat gasoline and/or diesel fuel to a purchaser, and simply acquire RINs through the secondary market in order to satisfy their RVOs.

ii. Refiners and importers should be obligated parties because they introduce product into commerce

Unlike blenders, refiners and importers have control over how much refined product is introduced into the stream of commerce, and the manner in which such product is introduced. As described above, the RFS affords refiners and importers multiple ways to accumulate sufficient RINs to satisfy their obligations. This includes generating RINs directly through blending operations, or acquiring RINs in the open market.

Blenders on the other hand are fundamentally buyers. They can only buy – and blend – what refiners and importers are willing to sell to them. Thus, if blenders were obligated parties, they would not have the same ability to satisfy their RVOs that refiners and importers currently have because blenders do not control how refined product is introduced into commerce. More specifically, blenders would be unable to acquire RINs directly if the market encouraged refiners and importers to blend product prior to sale and sell any superfluous RINs in the open market. In this scenario, blenders would not be capable of satisfying their obligations other than through the purchase of RINs on the open market.

In other words, whereas obligated parties today can determine for themselves how to meet their obligations, blenders' ability to satisfy their obligations would be dictated by their upstream counterparts.

This would severely disrupt the retail motor fuels market, imposing upward pressure on the price consumers pay for renewable fuels. At the very least, making blenders obligated parties would increase their costs of selling renewable fuels. Such costs are ultimately absorbed by the consumer. Beyond this, however, it would diminish competition in the retail motor fuels market. Refiners would undoubtedly offer more favorable terms to marketers that sold the refiners' respective branded product. Those blenders and marketers that currently trade in unbranded product would have to sell branded product or risk being left without a product to sell on a cost-competitive basis. This would diminish the diversity of renewable fuel supply, and impose upward pressure on the retail price of renewable motor fuel.

iii. Refiners and importers should be obligated parties because it facilitates easier administration of the Program

Making refiners and importers obligated parties facilitates easier administration of the RFS because there are so few of them relative to downstream blenders. The fewer parties that are obligated to demonstrate compliance with the RFS, the less burdensome it is for the Agency to administer and enforce the Program. There are many more downstream blenders operating today than there are obligated parties. What's more, to the extent Program regulations would continue the exemption for smaller obligated parties,[4] administering this exemption would be particularly straining for EPA since so many blenders today are small businesses.

Increasing the Agency's administrative workload in this manner would add to the Program's complexity, and would not be conducive to achieving the RFS's objectives.

iv. Any regulatory approach to making blenders obligated parties would substantially disrupt the motor fuels market and the implementation of the RFS

There are two primary approaches the Agency could take were it to grant the petition. Either of these approaches would substantially disrupt the motor fuels market and the implementation of the RFS.

1) *Changing the definition of "obligated parties"*

The first approach the Agency could take in granting the petition would be to simply change the definition of "obligated parties" in 40 CFR 80.1406 to cover "blenders" rather than refiners and importers.[5] An "ethanol blender" is defined as any person who owns, leases, operates, controls, or supervises an ethanol blending plant.[6] An "ethanol blending plant" is defined as any refinery at which gasoline is produced solely through the addition of ethanol to gasoline, and at which the quality or quantity of gasoline is not altered in any other manner.[7] A "refinery" is defined to include any facility, including a plant or tanker truck, at which blendstock is added to gasoline or diesel fuel.

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[4] *See generally* 40 C.F.R. 80.1126(b); *see also* 40 C.F.R. 80.1426(c)(3).
[5] *See* 42 U.S.C. 7545(o)(3)(B)(ii)(I) (directing EPA to designate as obligated parties "refineries, blenders, and importers, as appropriate.")
[6] 40 C.F.R. 80.2(v); *see also* 40 C.F.R. 80.1401 (stating that the definitions of section 80.2 apply for the purposes of the RFS regulations).
[7] 40 C.F.R. 80.2(u).

EPA could simply redefine the term "obligated party" to cover solely "ethanol blenders." This would generally cover those actors who today are considered "blenders." As a practical matter, however, those who blend today would simply cease their blending operations because there would be no incentive to continue. In fact, there would be a strong *disincentive* to continue, since blending would require the entity to assume the burdens of being an obligated party. Rather than *encouraging* the introduction of renewable fuels into the market, this revised RFS would *discourage* introduction of renewable fuels into the market.

This approach would effectively amount to a repeal of the RFS.

2) *Eliminate RBOB and CBOB from the list of fuels that are subject to the RFS*

Another approach the Agency could take would be to eliminate reformulated gasoline blendstock for oxygenate blendstock ("RBOB") and conventional gasoline blendstock for oxygenate blending ("CBOB") from the list of fuels that are subject to the RFS, such that a party's RVO would be based only on the non-renewable volume of finished gasoline or diesel that the party produces or imports. Parties that blend ethanol into RBOB and CBOB to make finished gasoline would thus be obligated parties, and their RVOs would be based upon the volume of RBOB and CBOB prior to ethanol blending.

There are a number of flaws to this approach. First, as discussed above, it would impose an unfair burden on blenders because blenders – who do not introduce product into commerce – would not have control over their ability to satisfy their newfound obligations. This unfair burden would lead to an increase in the retail price of renewable fuels, which would hinder the achievement of the Program's objectives.

Second, it would substantially disrupt the motor fuels market. Not only would it increase the number of obligated parties, but it would result in a significant change in the movement of RINs. Newly obligated parties would be forced to implement new systems for determining and reporting compliance. This increase in input costs would inevitably lead to an increase in the retail price of renewable fuel. Indeed, making blenders obligated parties would effectively turn the Program on its head, and eliminate the investments and market adjustments that have been predicated upon the current definition of obligated party.

Finally, it would impose real administrative and enforcement burdens on the Agency, since the number of obligated parties would increase likely by a factor

of ten. Such added complexity would hinder the achievement of the Program's objectives.

IV. THE RIN TRADING SYSTEM'S PURPOSE

A. The RIN System was Designed at the Request of Obligated Parties as a Method of Demonstrating Compliance that Imposed Minimal Logistical Burdens

In evaluating the petition, it is important to remember that the RIN system to which petitioner objects was established at the request of obligated parties – including refiners – as a method of demonstrating compliance with the Program without imposing excessive logistical burdens. The system affords obligated parties the flexibility to demonstrate compliance by *either* acquiring the required volumes of renewable fuels (together with their associated RINs), *or* by acquiring the RINs without the associated fuel.

The system affords obligated parties further flexibility. Under certain conditions, obligated parties may carry an RVO deficit into the next calendar year. Conversely, if an obligated party acquires more RINs than it needs to meet its RVOs, it can transfer the excess to another party or retain them for compliance with its RVOs the following year. These flexibilities reduce the costs to obligated parties of meeting their RVOs. The flexibilities are made possible by the RIN system to which the petitioner now objects. In addition, to further minimize compliance burdens, the Agency worked with obligated parties to develop a centralized, electronic data transaction system, the EPA Moderated Transaction System ("EMTS") to support real time submission of RIN transactions.

B. Petitioner Misstates Various Justifications for Current RIN System

i. *The rationale for placing compliance obligations on refiners and importers remains valid*

The petitioner takes the Agency's statements out of context to insinuate that EPA's original rationale for making refiners and importers obligated parties is no longer valid. As stated in the petition:

> *In 2010, however, EPA determined, in its rulemaking implementing the second version of the RFS program, that 'the rationale . . . for*

> *placing the obligation on just the upstream refiners and importers is no longer valid.'"*[8]

A review of the entire EPA statement that the petitioner quotes above reveals something much different. In fact, the Agency was simply stating that a greater quantity of gasoline would be blended with ethanol under the RFS2 than was the case under the RFS1, and thus to the extent any provisions in the final RFS1 rules were premised upon a lesser quantity of gasoline being blended with renewable fuels, that rationale was naturally "no longer valid":

> *When the RFS1 regulations were drafted, the obligations were placed on the relatively small number of refiners and importers rather than on the relatively large number of downstream blenders and terminals in order to minimize the number of regulated parties and keep the program simple. However, with the expanded RFS2 mandates, essentially all downstream blenders and terminals are now regulated parties under RFS2 since essentially all gasoline will be blended with ethanol. Thus the rationale in RFS1 for placing the obligation on just the upstream refiners and importers is no longer valid.*[9]

The RFS1 regulations were narrow enough in scope that by making refiners and importers obligated parties, certain downstream blenders and terminals may not have been implicated by the rules at all. Thus, one of the original virtues of making refiners and importers obligated parties was that there would be certain segments of the market that did not face augmented obligations. This was no longer true under the RFS2 regulations, since virtually all gasoline in the country was to be blended with ethanol under that Program. The rules would necessarily impact downstream blenders and terminals that were not necessarily implicated under the RFS1.

In other words, the statement that petitioner quotes was simply saying that the final rules would implicate downstream terminals and blenders that may not have been implicated under the RFS1 rules. It is inaccurate for the petitioner to suggest that the statement undercuts the Agency's entire rationale for making refiners and importers obligated parties.

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[8] Petition at pg. 4.
[9] 75 Fed. Reg. 14722 (March 26, 2010).

The petitioner's misreading of the Agency's statements is apparent by analyzing the first proposed rule implementing the RFS1 under EPAct. As the Agency said in the preamble to that proposal:

> *In implementing [EPAct's] renewable fuels requirement, our primary goal is to design a requirement that is simple, flexible, and enforceable. If the program were to include renewable fuels in the volume of gasoline used to determine the renewable fuel obligation, then every blender that blends ethanol downstream from the refinery or importer would be subject to the renewable fuel obligation for the volume of ethanol that they blend. There are currently approximately 1,200 such ethanol blenders. Of these blenders, only those who blend ethanol into [reformulated gasoline blendstock for oxygenate blending, or RBOB] are regulated parties under current fuels regulations. Designating all of these ethanol blenders as obligated parties under the RFS program would greatly expand the number of regulated parties* ***and increase the complexity of the RFS program beyond that which is necessary to carry out the renewable fuels mandate under [EPAct].***"[10]

The overarching rationale underlying the statement that the petitioner quotes remains valid today: Having "the relatively small number of refiners and importers" be obligated parties "rather than the relatively large number of downstream blenders and terminals" serves to "minimize the number of regulated parties and keep the program simple."[11] Although the downstream parties are regulated today, their burdens would be larger if they were obligated parties. Indeed, "the designation of ethanol blenders as obligated parties would . . . greatly expand[] the number of regulated parties and increase[] the complexity of the RFS program beyond that which [is] necessary to carry out the renewable fuels mandate under CAA section 211(o)."[12] This is not arbitrary decision-making; it is

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[10] 71 Fed. Reg. 55573 (Sept. 22, 2006) (emphasis added).
[11] 75 Fed. Reg. 14722 (March 26, 2010).
[12] 74 Fed. Reg. 24963 (May 26, 2009).

a rational approach that furthers the Agency's longtime goals of implementing a Program that is "simple, flexible, and enforceable."[13]

ii. *The fact that petitioner chooses to bring its product to market in a particular manner does not render its classification as an obligated party arbitrary and capricious.*

The petitioner is a subsidiary of Delta Air Lines which, after receipt of $30 million in state government assistance for job creation and infrastructure improvement, purchased a refinery in Trainer, Pennsylvania (just outside of Philadelphia) in 2012 (two years after the RFS2 rules were finalized) for $150 million as a way to hedge against jet fuel costs.[14] The facility had historically been geared to the gasoline market in the Northeast, but as consumption dropped and light crude oil costs rose faster than other types of crude oil, the plant struggled. Around the time that the petitioner purchased the facility, another refinery in the Philadelphia region – Sunoco's Marcus Hook – had recently shut down. Prior to purchasing the Trainer facility, Delta had never owned or run a refinery.[15]

As part of the agreement to purchase the refinery from Phillips 66, the petitioner agreed to swap the refinery's gasoline, diesel, and other products in exchange for jet fuel produced elsewhere by Phillips 66 and British Petroleum. In reporting its second-quarter earnings in 2013, Phillips 66 said it benefitted from selling RINs that it generated from blending renewable fuel with the refined product it acquired from the petitioner.[16] The petitioner, it was reported late last year, was on track to spend more money purchasing sufficient RINs to meet its RVOs than it paid for the refinery in the first place.[17]

In asking the Agency for relief from its very predictable obligations, the petitioner claims that forcing it to satisfy its annual RVOs contradicts a fundamental purpose of the RFS:

> *EPA recognized at the time [that the RFS2 rules were finalized] that high RIN prices could result if the market approached the blendwall, and that high prices can affect refiners and*

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[13] 71 Fed. Reg. 55573 (Sept. 22, 2006).
[14] CNBC.com, *Delta's jet fuel gamble is starting to pay off* (Dec. 6, 2013), available at: http://www.cnbc.com/id/101253932.
[15] The New York Times, *Delta Buys Refinery to Get Control of Fuel Costs* (Apr. 30 2012), available at: http://www.nytimes.com/2012/05/01/business/delta-air-lines-to-buy-refinery.html?_r=0.
[16] Fuelfix.com, *Airline joins battle over biofuels* (Dec. 1 2013), available at: http://fuelfix.com/blog/2013/12/01/airline-joins-battle-over-biofuels/
[17] *Id.*

> *importers differently depending on whether they are affiliated with blenders. Refiners and importers affiliated with blenders can obtain most, if not all, of the RINs they need for compliance without incurring any cash cost, simply by receiving those RINs from their affiliated blenders. Refiners and importers without blending capabilities, by contrast, must acquire RINs on a secondary market, and they incur significant cash costs to do so. A differential impact on obligated parties is inconsistent with a fundamental purpose of RINs, which is to allow refine and importers to comply with the RFS requirement regardless of whether they themselves blend fuel or are affiliated with blenders. RINs are intended to be a competitively neutral means of compliance.*[18]

When the RFS2 rules were finalized, market actors responded by evolving their business models in accordance with their new regulatory burdens. Some obligated parties invested in blending capabilities to ease their compliance burden; others did not but instead contractually required blender-purchasers to remit RINs that were detached through blending back to the obligated parties.

The petitioner is apparently not requiring parties to which it is selling product to remit RINs back to the petitioner once the product is blended. Indeed, as noted above, the experienced refining company Phillips 66 has reported that it is profiting from the sale of RINs it is acquiring through product purchased from the petitioner's refinery. This is the result of a contract into which the petitioner voluntarily entered. It was a business decision.

By choosing to conduct its business in this manner, the petitioner is avoiding various cash costs that its competitors incur. Indeed, as with lunch, there's no such thing as a free ethanol blending plant. Such facilities cost money that the petitioner has not had to pay.

Rather than take their refined product and market it downstream, as many of its competitors do, the petitioner has chosen to trade such product for jet fuel. This also is a business decision. The petitioner is (presumably) reaping rewards through the sale of refined product with (apparently) no obligation on the part of the purchaser to remit RINs back to the petitioner. As these arrangements have

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[18] Petition at pg. 2.

been historically structured, there is a premium for the sale of such product relative to product for which detached RINs must ultimately be remitted to the refiner. (Without this premium, the selling party receives less money for the product than it should, and the purchasing party makes more money than it should.)

While the petitioner's predicament is unfortunate, it is not the result of a flawed Program. The Program affords the petitioner – and all obligated parties – ample opportunity to meet its RVOs because the petitioner controls how its product is introduced into the stream of commerce.

Ironically, the dire scenario that the petitioner fallaciously claims it is confronting *would befall* downstream blenders if they were to become obligated parties since, because they do not introduce product into commerce, they would not control their own ability to meet their RVOs.

V. CONCLUSION: IT IS NOT "APPROPRIATE" FOR EPA TO RECONSIDER ITS DEFINITION OF OBLIGATED PARTIES.

For the reasons discussed above, were EPA to designate blenders as "obligated parties" under the RFS, it would substantially disrupt the motor fuels market, impose unfair and inefficient obligations upon blenders, increase the Program's complexity and the Agency's administrative and enforcement burdens, and generally hinder the achievement of the Program's objectives. Such a dramatic policy shift is not "appropriate."[19]

NACS

NACS is an international trade association composed of more than 2,200 retail member companies and more that 1,600 supplier companies doing business in nearly 50 countries. The convenience and petroleum retailing industry has become a fixture in American society and a critical component of the nation's economy. In 2012, the convenience store industry employed more than 1.84 million (1.82m in 2011) workers and generated $700.3 billion in total sales, representing approximately 4.5 percent of the United States' GDP – or one of every 22 dollars spent – in 2012.

SIGMA

SIGMA represents a diverse membership of approximately 260 independent chain retailers and marketers of motor fuel. Ninety-two percent of SIGMA's membership are involved in gasoline retailing, 66 percent are involved in wholesaling, 36 percent transport product, 25 percent have bulk plant operations, and 15 percent operate terminals. Member retail outlets come in many forms, including travel plazas, traditional "gas stations," convenience stores with gas pumps, cardlocks, and unattended public fueling locations. Some members sell gasoline over the Internet, many are involved in fleet cards, and a few are leaders in mobile refueling.

PMAA PETROLEUM MARKETERS ASSOCIATION OF AMERICA

PMAA member associations represent 8,000 independent petroleum marketing companies who represent wholesaler and retailers of gasoline, diesel, heating oil, lubricants and renewable fuels. PMAA marketers own 60,000 retail fuel outlets such as gas stations, convenience stores and truck stops. Additionally, these companies supply motor fuels to 40,000 independently owned retail outlets and heating oil to seven million homes and businesses. They sell their product under either their own private brand or the trademark of their supplier.

REPRESENTING AMERICA'S TRAVEL PLAZAS AND TRUCKSTOPS NATSO

NATSO is the national trade association representing travel plaza and truck stop owners and operators. It is estimated the highway travel plaza and truck stop industry sell about 90 percent of all diesel fuel sold at retail in the United States. NATSO currently represents nearly 1300 travel plaza and truck stop locations nationwide, with the membership comprised of both large chain businesses and independent owner operators. About 80 percent of NATSO members' facilities are located within one-quarter mile of the Interstate Highway System, serving Interstate travelers exiting the highway and serving as the "home away from home" for our nation's professional truck drivers. Many NATSO members have invested significant financial resources in blending operations, primarily focused on blending biodiesel into diesel fuel.

[19] *See* 42 U.S.C. 7545(o)(3)(B)(ii)(I) (directing EPA to designate as obligated parties "refineries, blenders, and importers, as appropriate.")

February 23, 2016

The Honorable James M. Inhofe
Chairman
Senate Committee on Environment and Public Works

The Honorable Barbara Boxer
Ranking Minority Member
Senate Committee on Environment and Public Works

Dear Mr. Chairman and Madam Ranking Member:

The signatories of this letter represent the overwhelming majority of sales of motor fuels to consumers in the United States. All of these groups urge you to reject proposals to alter the Renewable Fuels Standard (RFS) in a manner which would make entities which neither manufacture nor import motor fuels in the United States the "obligated party" as that term is used in the RFS.

These groups' reasons for objecting to such proposals are set forth in the comments which are attached to this letter. As noted in these comments, non-manufacturers and importers have no control over the composition of the petroleum products with which renewable fuels must be blended in order to be sold as motor fuels. In stark contrast, manufacturers and importers of motor fuels have control over not only the composition of the products they sell, but also the terms upon which they sell them. These facts indicate that it is the manufacturers and importers of motor fuels which are in the best position to achieve the requirements of the RFS.

The undersigned appreciate your interest in this issue and would be happy to provide any additional information which you or your staffs might require.

Sincerely,

National Association of Convenience Stores
NATSO, Representing America's Travel Centers and Truckstops
Petroleum Marketers Association of America
Society of Independent Gasoline Marketers of America

NACS National Association of Convenience Stores

NATSO Representing America's Travel Plazas and Truckstops

PMAA

SIGMA

Attachment.

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Written Statement of Anne Steckel
Vice President of Federal Affairs, National Biodiesel Board

Senate Committee on Environment and Public Works
United States Senate
Oversight of the Renewable Fuel Standard
February 24, 2016

Chairman Inhofe, Ranking Member Boxer, and other members of the Committee, I appreciate the opportunity to provide a written statement regarding the Renewable Fuel Standard (RFS) and the EPA's recent action setting annual volume standards.

Our comments today will focus on our continued efforts to grow the Biomass-based Diesel and Advanced Biofuel categories of the RFS. Biomass-based Diesel – commonly referred to as "biodiesel" – includes both biodiesel and renewable diesel, and qualifies as an Advanced Biofuel under the program.

In creating the RFS, Congress and the Administration of President George W. Bush sought to substantially increase domestic renewable fuel production in an effort to reduce our dependence on petroleum, to create jobs and economic activity in a new American energy industry, and to reduce harmful emissions. The law particularly sought to promote the development of Advanced Biofuels – those reducing greenhouse gas emissions by at least 50 percent.

To date, biodiesel is the first and only EPA-designated Advanced Biofuel under the program to reach commercial-scale production nationwide. Since the RFS was created, biodiesel has grown from a niche fuel to a commercial-scale industry with a record U.S. market of nearly 2.1 billion gallons last year, all made from an increasingly diverse mix of resources including recycled cooking oil, soybean oil and animal fats. Biodiesel's growth is proving that Advanced Biofuels are achieving the goals of the RFS.

Those goals are as compelling today as they were when Congress initially created the RFS with overwhelming bipartisan support in 2005. While most of us appreciate the low prices we are currently seeing at the fuel pump, we should not be lured into complacency. All of us know that oil prices rise and fall, often under the influence of nations and cartels that do not have our best interests at heart. We understand that fuel prices will rise again in the not too distant future, and Americans expect our elected officials to work on solutions. We must continue to develop and incentivize alternative fuels to protect American consumers from these price fluctuations, and to ensure that our economy is not overly dependent on a single, globally traded commodity. Doing so requires consistent, long-term policy.

We also must continue to develop new fuels that reduce harmful pollutants, including carbon emissions, which are creating costly public health problems along with tremendous burdens on public

infrastructure. And we must incentivize new technologies that create the jobs of the future and keep the United States at the forefront of advances in the energy sector.

The RFS is working to do all of those things in a cost-effective way that helps consumers.

The National Biodiesel Board has worked closely with the EPA, including EPA Administrator Gina McCarthy, Acting Assistant Administrator Janet McCabe, and their very capable team led by Director Christopher Grundler. We appreciate the EPA's hard work to get the annual process of establishing volume standards back on track from a timing perspective. We look forward to working with the EPA this year to continue to increase the volumes of domestically produced biodiesel, renewable diesel and other advanced biofuels.

Specifically we will be working with the Administration to grow the Biomass-based Diesel program from the 2.0 billion gallons established for 2017, and the Advanced Biofuels program from the 3.61 billion ethanol-equivalent gallons the EPA set for 2016.

The evidence clearly shows that stable, growing biodiesel volumes will help achieve the goals of Congress and the EPA. We believe biodiesel is the cleanest fuel available on a commercial-scale today. According to EPA calculations, which were recently corroborated by similar findings from the California Air Resources Board, biodiesel reduces greenhouse gas emissions by 57 percent to 86 percent when compared to petroleum diesel. It is without question the most successful Advanced Biofuel to date under the RFS, and it has delivered the vast majority of Advanced Biofuel under the program.

Additionally, thanks to the market dynamics of the RFS, biodiesel blends are often available on the market at prices lower than petroleum diesel. Fleets across the country, including the U.S. Navy, confirm this.

Yet in the most recent rulemaking, the EPA finalized a 2.0 billon gallon program for Biomass-based Diesel for 2017. That is slightly less than the 2.1 billion gallons of biodiesel actually delivered under the RFS in 2015, and significantly less than the more than 3 billion gallons of registered biodiesel production capacity in the U.S.

We can do more and we should do more, particularly in a 60-billion-gallon diesel market that continues to grow.

After careful review of industry production capacity, feedstock availability and other factors, NBB will continue to urge the EPA to fulfill the intent of Congress and move forward in the growth of Advanced Biofuels and specifically the Biomass-based Diesel program in a meaningful way that drives investment and production.

Of note, we believe the EPA has significantly underestimated the volume of imports that are already making their way into the U.S. Biodiesel imports to the U.S. have grown sharply in recent years. In 2015 alone more than 650 million gallons of biodiesel and renewable diesel were imported to the United States, up from less than 100 million gallons in 2012. We expect that trend to continue. The EPA's decision to streamline feedstock certification for Argentinian biodiesel, in particular, is widely expected

to result in significant new volumes of Argentinian biodiesel coming to the U.S. Additionally we anticipate that already mature or growing biodiesel markets from Asia and the European Union will continue to ship product to the U.S. at increasing levels in the coming years.

We believe more robust volume targets are warranted to help accommodate growing imports while at the same time incentivizing domestic production. Clearly, the intent of Congress in developing the RFS – and expanding it under the Energy Independence and Security Act of 2007 – was to generate more domestic production of renewable fuels in the diesel markets and to move toward Advanced Biofuels.

While the final EPA volumes established last year were a step in the right direction, NBB believes the agency was still far from fulfilling the intent of Congress. We believe the EPA must provide for meaningful annual increases to effectuate the statute's requirements and goals.

About NBB: NBB is the national trade association representing the biodiesel and renewable diesel industry as the coordinating body for research and development in the United States. It was founded in 1992, and represents fuel producers, feedstock organizations, fuel marketers and distributors, technology providers and other related businesses.

Biodiesel/Renewable Diesel Background: Biodiesel, renewable diesel, and renewable aviation fuels are renewable, low-carbon diesel and jet fuel replacements. The EPA has determined, based on the lifecycle and greenhouse gas emissions requirements established under the Energy Independence and Security Act (EISA) (P.L. 110-140), that these fuels qualify as Advanced Biofuels under the RFS – in that when compared to petroleum diesel, they reduce greenhouse gas emissions by at least 50 percent. There are over 200 biodiesel and renewable diesel plants registered with the EPA, representing a combined production capacity in excess of 3 billion gallons.

I appreciate the opportunity to submit comments. If you have any questions or comments, please do not hesitate to contact me at 202.737.8801.

Sincerely,

Anne Steckel
Vice President of Federal Affairs
National Biodiesel Board

THE GEORGE WASHINGTON UNIVERSITY

WASHINGTON, DC

Prepared Statement for the Record

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Hearing on

Oversight of the Renewable Fuel Standard

Environment and Public Works Committee

United States Senate

February 24, 2016

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Introduction

Thank you Chairman Inhofe, Ranking Member Boxer, and Members of the Committee for inviting me to submit for the record my research on the effects of the Renewable Fuel Standard (RFS) and prospects for reform. I am Senior Policy Analyst at the George Washington University Regulatory Studies Center, where I analyze the effects of regulation on public welfare. My research focuses especially on the effects of regulations governing the energy and environment sphere, including the Environmental Protection Agency's RFS rules.

I appreciate the Committee's interest in evaluating the RFS program and determining whether there are opportunities for Congress to improve it. My prepared statement includes the following points:

- The statute that created the RFS program was enacted over a decade ago, and since that time new information has become available about the effects of mandated biofuel production.
- Due to falling domestic demand for gasoline and delays in the development of cellulosic ethanol, the statutory biofuel production levels outlined in the Energy Independence and Security Act of 2007 put the RFS program on an unsustainable trajectory.
- New information and research on the environmental effects of the RFS program indicate that mandated biofuel production may not reduce greenhouse gas emissions relative to gasoline. In addition, biofuel production produces criteria pollutants and damages water systems from crop fertilizer runoff. These environmental effects are significant and negative.

The Renewable Fuel Standard Program

In 2005, Congress passed the Energy Policy Act (EPAct), which, as amended in 2007, requires the Environmental Protection Agency (EPA) to issue regulations mandating the production and use of biofuels such as corn ethanol, cellulosic ethanol, and biomass-based diesel. As a part of the RFS program, the EPA sets biofuel blending targets that require refiners to blend specific amounts of renewable fuels into transportation fuel, such as gasoline and diesel. The RFS program was created to reduce U.S. dependence on both foreign oil and domestic gasoline consumption. To that end, EPA regulations currently mandate the production of 18.11 billion gallons of total renewable fuel in 2016.

In its recent final rule, EPA set minimum standards for the production of biodiesel and cellulosic biofuel, which also count toward the agency's total renewable fuel standards. Although it is the largest type of domestic biofuel, corn ethanol is only one component of the overall total renewable fuel standards promulgated by EPA. The agency also sets advanced biofuel standards,

which can be met by the production of three main fuel sources: biodiesel, imported sugarcane ethanol, and cellulosic biofuel.

The total renewable fuel standards prescribed for 2015 and 2016 must be met through a combination of corn ethanol and advanced biofuels (cellulosic and biodiesel). Historical levels of mandated biofuel production can be seen in the table below.

EPA-Regulated Renewable Fuel Standards

	2010	2011	2012	2013	2014	2015	2016
Ethanol *(billion gallons)*	12.0	12.6	13.2	13.8	13.61	14.05	14.5
Biodiesel *(billion gallons)*	0.65[a]	0.8	1.0	1.28	1.63	1.73	1.9
Cellulosic biofuel *(million gallons)*	6.5	6	10.45	6	33	123	230
Advanced biofuel *(billion gallons)*	0.95	1.35	2.0	2.75	2.67	2.88	3.61
Total[b]	**12.95**	**13.95**	**15.2**	**16.55**	**16.28**	**16.93**	**18.11**

All gallon values are ethanol-equivalent on an energy content basis, except for biodiesel which is actual

[a] The rule implementing the 2010 RFS combined the 2009 and 2010 biomass-based diesel requirements and applied them to 2010.

[b] The totals listed at the bottom are the sum of the ethanol and advanced biofuel totals. The standards set by EPA are a minimum, and the advanced biofuel minimum can be reached by either increases in biodiesel, cellulosic biofuel, or other advanced biofuel production above the minimum standards ascribed by EPA.

While the stated goals of the RFS are to reduce crude oil imports and increase the use of renewable fuels, an implicit purpose of the RFS program is to benefit the environment by moving away from fuels that result in substantial net carbon emissions (e.g. gasoline and diesel). According to EPA, the RFS program "was created to promote substantial, sustained growth in biofuel production and consumption" resulting in "reductions in greenhouse gas emissions, enhanced energy security, economic development, and technological innovation."[l] However, while crude oil imports and gasoline demand have decreased, it is less clear whether the increased production of biofuels has actually reduced emissions or benefitted the environment.

The literature is mixed on the environmental effects of biofuel production, with many estimates indicating that the production of ethanol and biodiesel may significantly increase emissions, specifically of the greenhouse gases carbon dioxide (CO_2) and nitrous oxide (N_2O) and criteria

[l] Environmental Protection Agency. 2013. "2014 Standards for the Renewable Fuel Standard Program." *78 Federal Register*: 71731.

pollutants such as particulate matter. The following sections examine the statutory authority underpinning the RFS program, explain the unsustainable trajectory of increased biofuel production, and review the recent research on the environmental impacts of the RFS program.

Statutory Authority

Under the Clean Air Act (CAA), as amended by the EPAct of 2005 and the Energy Independence and Security Act of 2007 (EISA), EPA sets the annual volume of biofuel required to meet its renewable fuel standard. Section 211(o)(2)(B) of the CAA specifies annual biofuel targets for EPA's RFS; the volume requirements for 2016, both from the statute and EPA's rule, finalized in December 2015, are outlined in the table below.

	Previous volume requirements (*2013*)	Statutory applicable volume requirements (*2016*)	Current volume requirements (*2016*)
Biomass-based diesel	1.28 billion gallons	≥1.0 billion gallons	1.9 billion gallons
Cellulosic biofuel	6 million gallons	4.25 billion gallons	230 million gallons
Advanced biofuel	2.75 billion gallons	7.25 billion gallons	3.61 billion gallons
Total renewable fuel	**16.55 billion gallons**	**22.25 billion gallons**	**18.11 billion gallons**

Note: Cellulosic biofuel and biomass-based biodiesel are nested within the "advanced biofuel" category, which is itself nested within the "renewable fuel" category.

EPA's recent final rule increases the overall volume requirements for renewable fuels from 16.55 billion gallons in 2013 to 18.11 billion gallons in 2016, an increase of 1.56 billion gallons. Cellulosic biofuel and biomass-based diesel (biodiesel) are both advanced biofuels which are nested within the "renewable fuel" category. EPA's final rule set volume requirements for these advanced biofuels at 3.61 billion gallons in 2016, an 860 million gallon increase over the last standards promulgated by the agency for 2013.

However, these increases fall short of the statutory applicable volumes for 2016 outlined in the table above. For all but one fuel type, EPA set the volume requirement below the statutory level. Although mandated cellulosic biofuel production is proposed to increase by a factor of 38, the 230 million gallons proposed for 2016 are still only about 5% of the levels set in the CAA. The targets for all advanced biofuels (a category which includes both cellulosic biofuel and biodiesel) are half of the statutory volume levels, and the final standards for total renewable fuels are 4.14 billion gallons shy of the volume levels specified in the CAA.

RFS Program's Unsustainable Trajectory

EPA does have some discretion to set applicable volume requirements below those specified in the statute, under certain conditions. EPA has exercised its cellulosic waiver authority under CAA section 211(o)(7)(D)(i) and the general waiver authority under CAA section 211(o)(7)(A) to mandate less cellulosic biofuel and total renewable fuel than Congress specified in the EISA.

Obstacles to an Increased Biofuel Mandate

Most recently, EPA opted to exercise its waiver authority because there was in 2014 (and will continue to be in 2015 and 2016) an insufficient supply of total renewable fuels and advanced biofuels to meet the statutory mandate. There are a few reasons for this supply shortage. As EPA explained in its 2015 proposed rule:

> For non-ethanol renewable fuels, the primary supply constraint at present is the projected shortfall in domestic production or importation of qualifying volumes. For ethanol blends, there are both legal and practical constraints on the amount of ethanol that can be supplied to the vehicles that can use it, notwithstanding the considerable volumes that can be produced and/or imported.[2]

For the advanced biofuels, the primary constraint is growth in the cellulosic biofuel market. While Congress set ambitious targets for cellulosic production in 2014, actual production was 33 million gallons, less than 2% of the statutory volume requirements for 2014. Due to the high costs of producing cellulosic and the technological barriers facing the industry, it is likely that cellulosic production will continue to fall short of statutory levels for the foreseeable future. Increased production of biodiesel, although it currently surpasses the minimum volumes prescribed in the statute, is not sufficient to make up for the shortfall of cellulosic ethanol. Because both of these fuels are nested within the "advanced biofuels" category, EPA must reduce both the cellulosic volume requirements and the advanced biofuel volume requirements as a result of these supply shortages.

Ethanol faces a different set of obstacles. While the U.S. has the capacity and ability to either import or produce more ethanol, more ethanol cannot feasibly be blended into gasoline. Legally, only flex fuel vehicles (FFVs) can use fuel with ethanol concentrations greater than 15%, and these vehicles only constitute about 6% of all light-duty cars and trucks.[3] Practically, non-flex-fuel vehicles cannot use fuel with ethanol concentrations greater than 10%, which is termed the "blendwall." While the authorizing statute requires more ethanol to be blended into

[2] Environmental Protection Agency. 2015. "Renewable Fuel Standard Program: Standards for 2014, 2015, and 2016 and Biomass-Based Diesel Volume for 2017." *80 Federal Register*: 33121.

[3] Environmental Protection Agency. 2015. "Renewable Fuel Standard Program: Standards for 2014, 2015, and 2016 and Biomass-Based Diesel Volume for 2017." *80 Federal Register*: 33120.

transportation fuel each year until 2022, the only way this is possible is if demand for gasoline increases significantly in the near term. This creates a ceiling on the practical growth of ethanol as a transportation fuel. In its most recent RFS proposal, EPA was very cognizant of the fact the blendwall makes it infeasible to significantly increase the volume requirements for ethanol.[4]

Gasoline Demand

One purpose of the RFS program is to reduce gasoline consumption. However, domestic demand for gasoline has not kept pace with Congress's and EPA's expectations. While Congress and EPA expected gasoline consumption to continue increasing, actual demand dropped from a high of 142 billion gallons of gasoline in 2007, when the EISA was passed, to 136 billion in 2014.[5] As EPA explained:

> The decrease in total gasoline consumption in recent years which resulted in a corresponding and proportional decrease in the maximum amount of ethanol that can be consumed if all gasoline was E10, the limited number and geographic distribution of retail stations that offer higher ethanol blends such as E15 and E85, the number of FFVs that have access to E85, as well as other market factors, combine to place significant restrictions on the volume of ethanol that can be supplied to vehicles at the present time.[6]

This is particularly important because two of the primary goals of the RFS are 1) to increase use of renewable fuels and 2) to reduce crude oil imports. However, these goals are at least partially at odds: most of the biofuels produced to comply with the RFS are not drop-in fuels, which could act as perfect substitutes for gasoline or diesel. Instead, biofuels such as corn ethanol and biodiesel must be blended into existing fuel stock, and in some cases cannot legally exceed certain concentrations in fuel (for instance, 10% for ethanol,[7] and 5% for biodiesel). Paradoxically, without more gasoline/crude oil, it will be difficult—both legally and practically—to increase the use of renewable fuels. In its proposed rule, EPA explained that:

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[4] However, EPA's position seems to have shifted between its June 2015 proposed rule and its December 2015 final rule, in which EPA stated "Our final rule includes volumes of renewable fuel that will require either ethanol use at levels significantly beyond the level of the E10 blendwall, or significantly greater use of non-ethanol renewable fuels, such as biodiesel and renewable diesel, than has occurred to date, depending on how the market responds to the standards we set." 80 FR 77423

[5] U.S. Energy Information Administration. "Petroleum & Other Liquids: U.S. Product Supplied of Finished Motor Gasoline." Accessed January 10, 2016. *Data converted from barrel units to gallons.* http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=MGFUPUS1&f=A

[6] Environmental Protection Agency. 2015. "Renewable Fuel Standard Program: Standards for 2014, 2015, and 2016 and Biomass-Based Diesel Volume for 2017." *80 Federal Register*: 33109-10.

[7] 10% ethanol is the legal maximum for most vehicles, but some 2001 and newer light-duty vehicles are permitted to use fuels with concentrations of up to 15% ethanol. Flex-fuel vehicles are the only vehicles that can legally use fuel with ethanol concentrations greater than 15%.

> since the majority of renewable fuel today is currently consumed as 10 percent ethanol blends, changes in demand for gasoline can have a significant impact on the ability of the marketplace to blend fixed volumes of renewable fuels.[8]

It is becoming increasingly difficult to increase the production of renewable fuels while demand for gasoline is decreasing. At the same time, the price of gasoline has decreased due to supply curve shifts, which changes the economic calculus for renewable fuels. These constraints certainly justify EPA's use of its waiver authorities to prescribe lower volume requirements than those listed in the statute. Because the RFS program is on an unsustainable trajectory, Congress should consider reevaluating the statutory volume requirements established in the 2007 EISA and consider other approaches that would be more feasible and better for the environment.

Environmental Effects of Biofuel Production

In the decade since Congress created the Renewable Fuels Program, information has emerged that affects our understanding of the true effects of mandating the production of large quantities of biofuels. Availability of recent data and the proliferation of new third-party analyses provide Congress with a key opportunity to revisit the assumptions about environmental effects and demand for gasoline that underpinned its initiation of the RFS program.

Greenhouse Gases

There has been significant development in the relevant literature on the environmental impacts of renewable fuel production since Congress passed the EISA and EPA first analyzed the impacts of the RFS program. Recent research indicates that the environmental benefit of the RFS is extremely modest[9] at best and, at worst, could result in a significant increase in CO_2 emissions over gasoline.[10] Overall, the post-2007 literature largely reinforces this worst-case scenario, although estimates differ as to the extent of the environmental damage posed by biofuel mandates. A number of factors influence the extent of any potential environmental damage as a result of the RFS.

First, increased biofuel production causes land use changes (LUC) that result in the release of soil organic carbon. Increased demand for corn and soy provides farmers with an incentive to produce more crop and convert unused lands into cropland, which releases a significant amount of soil organic carbon and foregoes future carbon sequestration and storage. This increase in

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[8] Environmental Protection Agency. 2015. "Renewable Fuel Standard Program: Standards for 2014, 2015, and 2016 and Biomass-Based Diesel Volume for 2017." *80 Federal Register*: 33109.

[9] Chen et al. 2014. "Alternative transportation fuel standards: Welfare effects and climate benefits" *Journal of Environmental Economics and Management* 67: 241–257

[10] Searchinger et al. 2008. "Use of U.S. Croplands for Biofuels Increases Greenhouse Gases Through Emissions from Land-Use Change." *Science*. Vol. 319 no. 5867 pp. 1238-1240

release of CO_2 may, depending on tillage practices and land type, outweigh any potential CO_2 savings from combusting ethanol.

For example, in 2008, Searchinger et al. found that that biofuels increase carbon emissions by 93% compared to gasoline when the effects of LUC are considered.[11] Fargione et al. find that diverting domestic grassland and abandoned cropland in the Midwest to ethanol production incurs between 69 and 134 megagrams (Mg) of CO_2 per hectare, requiring a payback period of between 48 and 93 years to repay the initial carbon debt.[12] While LUC in the literature is primarily described as it relates to corn ethanol, researchers have also found that the carbon emissions from LUC are 34% greater per megajoule for soybean-based biodiesel.[13] This is particularly troubling as shortfalls in cellulosic capacity mean that EPA will continue to rely on increases in biodiesel production to meet Congress' ambitious advanced biofuel targets.

In addition, these effects are not limited to the United States: changes in worldwide agricultural markets as a result of biofuel mandates may also lead to international land use change (or *indirect* land use change, "ILUC"), which occurs when other countries alter growing habits to replace crops that were previously imported from the U.S. When taking ILUC into account, Chakravorty and Hubert find that international emissions may increase by 33%, in comparison to a modest 1% reduction in domestic emissions.[14] Bento et al. find that the RFS "unambiguously" increases carbon emissions, offsetting more than 70% of the intended emissions savings.[15] Other research finds that, when considering ILUC, the environmental benefit of the RFS is very modest at best.[16,17]

EPA considered both potential LUC and ILUC in its 2010 analysis of RFS by weighing factors such as tilling practices, irrigation, crop yields over time, and supply and demand for agricultural

[11] Searchinger et al. 2008. "Use of U.S. Croplands for Biofuels Increases Greenhouse Gases Through Emissions from Land-Use Change." *Science*. Vol. 319 no. 5867 pp. 1238-1240

[12] Fargione et al. 2008. "Land Clearing and the Biofuel Carbon Debt." *Science* 29: 1235-1238

[13] Chen, Huang, and Khanna. "Land Use and Greenhouse Gas Implications of Biofuels: Role of Technology and Policy." Paper prepared for presentation at the Agricultural & Applied Economics Association's 2011 AAEA & NAREA Joint Annual Meeting, Pittsburgh, Pennsylvania, July 24- 26, 2011. http://ageconsearch.umn.edu/bitstream/103216/2/CCE_for_AAEA2011.pdf

[14] Ujjayant Chakravorty and Marie-Hélène Hubert. 2012. "Global Impacts of the Biofuel Mandate under a Carbon Tax." American Journal of Agricultural Economics

[15] Bento, Klotz, and Landry. "Are there Carbon Savings from US Biofuel Policies? The Critical Importance of Accounting for Leakage in Land and Fuel Markets" (2012; forthcoming 2015 in Energy Journal)

[16] Oliver and Khanna. 2015. "Implementing the Renewable Fuel Standard with the Renewable Portfolio Standard in the US: Implications for Policy Costs and Greenhouse Gas Emissions."

[17] Chen, Huang, and Khanna. "Land Use and Greenhouse Gas Implications of Biofuels: Role of Technology and Policy." Paper prepared for presentation at the Agricultural & Applied Economics Association's 2011 AAEA & NAREA Joint Annual Meeting, Pittsburgh, Pennsylvania, July 24- 26, 2011.

products.[18] However, EPA estimated that production of ethanol results in 34 grams of CO_2 per megajoule, which recent evidence suggests is on the very low-end of plausible values for carbon emissions.[19] Even if EPA's lower estimate is accurate, recent research finds that emissions as little as 27g/MJ are "enough to cancel out the benefits that corn ethanol has on global warming,"[20] meaning that EPA may have seriously underestimated the potential climate costs of implementing the RFS program.

Second, fertilizer input for the production of crops used to produce biofuels results in emissions of N_2O, a greenhouse gas that contributes to climate change. A 2012 analysis found that the necessary fertilizer input for the increased production of corn and rapeseed leads to N_2O emissions that matched or exceeded the corresponding cooling achieved by the reduction in CO_2 emissions resulting from fossil fuel replacement.[21]

One additional result of increased fertilizer usage—especially for corn ethanol—is water pollution. Increased fertilizer runoff damages ecosystems, harms biodiversity, and is contributing to the Gulf of Mexico's "Dead Zone."[22] This damage is most pronounced when acreage is diverted from another crop to corn production, which relies heavily on nitrogen fertilization and requires more irrigation than displaced crops, such as cotton.

Third, increased demand for and consumption of oil from across the globe could displace any domestic reductions resulting from the RFS, which could offset any domestic environmental benefit. EPA estimates that the largest benefit of the RFS program is a "monopsony" benefit. That is, because the U.S. is such a major consumer of international crude oil, reduced crude oil imports as a result of RFS can reduce the price of crude oil, and any remaining barrels of crude oil imported will be imported into the U.S. at a lower price. However, this lower price has a rebound effect on international gasoline demand, offsetting any reductions effected at the

[18] Environmental Protection Agency. 2010. "Renewable Fuel Standard Program (RFS2) Regulatory Impact Analysis." §2.4.4 - §2.4.5.

[19] Plevin, O'Hare, Jones, Torn and Gibbs. 2010. "Greenhouse Gas Emissions from Biofuels' Indirect Land Use Change are Uncertain but May Be Much Greater than Previously Estimated." *Environmental Science & Technology* 44: 8015–8021

[20] Hertel, Golub, Jones, O'Hare, Plevin and Kammen. 2010. "Effects of US Maize Ethanol on Global Land Use and Greenhouse Gas Emissions: Estimating Market-mediated Responses." *BioScience* 60 (3): 223.

[21] Smith, Mosier, Crutzen and Winiwarter. 2012. "The role of N2O derived from crop-based biofuels, and from agriculture in general, in Earth's climate." *Philosophical Transactions of the Royal Society* 367: 1169–1174

[22] Welch, H.L., Green, C.T., Rebich, R.A., Barlow, J.R.B., and Hicks, M.B., 2010, Unintended consequences of biofuels production—The effects of large-scale crop conversion on water quality and quantity: U.S. Geological Survey Open-File Report 2010–1229, 6 p.

domestic level. This rebound effect could offset more than 60% of the intended emissions savings of the RFS program.[23]

Criteria Pollutants

Particulate matter (PM) is a criteria pollutant regulated under the Clean Air Act. PM is "principally characterized as discrete particles that exist in the condensed (liquid or solid) phase spanning several orders of magnitude in size," primarily PM_{10} (less than or equal to 10 micrometers, μm) and $PM_{2.5}$ (less than or equal to 2.5 μm),[24] and is associated with certain undesirable health effects such as premature mortality. In its 2009 RFS2 proposal EPA estimated that in 2022, PM_{10} and $PM_{2.5}$ emissions would have increased by a combined 64,626 annual tons as a result of the RFS program.[25] EPA's initial regulatory impact analysis also indicates that biofuel production causes increased emissions of particulate matter.[26]

In January 2013, EPA released estimates of PM costs per ton by emissions sector, and valued the reduction of one ton of area source $PM_{2.5}$ at between $320,000 and $710,000.[27,28] Based on EPA's per-ton damage estimates, the quantified air quality disbenefits of ethanol production through 2015 for $PM_{2.5}$ alone could be as large as $93 billion.[29]

Biodiesel production also incurs PM costs. In its 2012 rulemaking mandating the production of 1.28 billion gallons of biomass-based diesel, EPA valued the PM disbenefits of its rule at between $0.17 – $0.19/gallon.[30] Using EPA's estimate, the total PM costs of the rule were $841 million in 2015, and will reach $1.2 billion in 2016.

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[23] Bento, Antonio M., Richard Klotz, and Joel R. Landry. "Are there carbon savings from US biofuel policies? Accounting for leakage in land and fuel markets." *Presentation at the agricultural & applied economics association AAEA & NAREA joint annual meeting*. 2011. Forthcoming in Energy Journal 2015.

[24] Environmental Protection Agency. 2009. "Proposed Rule: Regulation of Fuels and Fuel Additives: Changes to Renewable Fuel Standard Program." *74 Federal Register:* 25064.

[25] Environmental Protection Agency. 2009. "Proposed Rule: Regulation of Fuels and Fuel Additives: Changes to Renewable Fuel Standard Program." *74 Federal Register:* 25060, Table VII.A–1.

[26] Environmental Protection Agency. 2012."Regulation of Fuels and Fuel Additives: 2013 Biomass-Based Diesel Renewable Fuel Volume." *77 Federal Register*: 59480-82.

[27] Environmental Protection Agency. 2013. "Technical Support Document Estimating the Benefit per Ton of Reducing PM2.5 Precursors from 17 Sectors." 13, Table 5. http://www.epa.gov/air/benmap/models/Source_Apportionment_BPT_TSD_1_31_13.pdf

[28] There is no corresponding per-ton damage valuation for PM_{10}. However, since all particulate matter that is less than 2.5 μm is also less than 10 μm, valuing increases of both $PM_{2.5}$ and PM_{10} may result in double-counting. This estimate measures only changes in PM2.5 and values those according to EPA's estimate. To see the methodology used, view the attached Appendix.

[29] See the attached Appendix for more information on how these quantities and values were calculated.

[30] Environmental Protection Agency. 2012b. "Regulation of Fuels and Fuel Additives: 2013 Biomass-Based Diesel Renewable Fuel Volume." 77 *Federal Register*: Table VI.B.2.b-3.

Cost of Particulate Matter Increases from Ethanol Production ($PM_{2.5}$ Only)					
Year	Ethanol consumption	PM2.5 emissions (tons)	Lower-bound	Base Case	Upper-bound
2006	5,481,210,000	6,541.37	($2,093,237,558)	($3,368,804,194)	($4,644,370,831)
2007	6,885,690,000	8,217.50	($2,629,599,106)	($4,232,011,062)	($5,834,423,017)
2008	9,683,352,000	11,556.27	($3,698,007,573)	($5,951,480,938)	($8,204,954,303)
2009	11,036,592,000	13,171.25	($4,214,800,908)	($6,783,195,211)	($9,351,589,514)
2010	12,858,497,000	15,345.54	($4,910,574,281)	($7,902,955,483)	($10,895,336,686)
2011	12,893,315,000	15,387.10	($4,923,871,043)	($7,924,354,960)	($10,924,838,877)
2012	12,881,879,000	15,373.45	($4,919,503,711)	($7,917,326,285)	($10,915,148,859)
2013	13,215,621,000	15,771.74	($5,046,957,556)	($8,122,447,316)	($11,197,937,077)
2014	13,443,976,000	16,044.27	($5,134,164,808)	($8,262,796,488)	($11,391,428,168)
*2015**	*11,610,910,000*	*13,856.65*	*($4,434,129,123)*	*($7,136,176,557)*	*($9,838,223,992)*
Total	**109,991,042,000**	**131,265.14**	($42,004,845,666)	($67,601,548,494)	($93,198,251,322)

*Data for 2015 are incomplete, and as of 2/11/2016 include consumption only through October, 2015. Actual yearly total will be higher than listed.

Particulate Matter Costs of Biodiesel Production			
Year	PM damages/gallon*	Gallons biodiesel produced	Damages
2012	$(0.18)	991,000,000	$(178,380,000)
2013	$(0.18)	1,359,000,000	$(244,620,000)
2014	$(0.18)	1,270,000,000	$(228,600,000)
2015	$(0.18)	1,054,000,000	$(189,720,000)
2016	$(0.18)	*1,900,000,000**	*$(342,000,000)**
Total		6,574,000,000	$(1,183,320,000)

*Projected production/damages based on EPA's 2015 final rule mandating the production of 1.9 billion gallons of biomass-based diesel in 2016

Conclusion

The past decade has provided evidence that the Energy Policy Act of 2005 and the Energy Independence and Security Act of 2007 set unrealistic volume requirements that bind EPA to an unsustainable regulatory approach. As EPA stated in its June 2015 proposed rule:

> Over the past few years, we have seen analysis concluding that the ambitious statutory targets in the Clean Air Act exceed real world conditions. Despite significant efforts by the U.S. Departments of Agriculture (USDA) and Energy (DOE) to promote the use of renewable fuels, real-world limitations, such as the slower than expected development of the cellulosic biofuel industry, less growth in gasoline use than was expected when Congress enacted these provisions in

> 2007, and constraints in supplying certain biofuels to consumers, have made the timeline laid out by Congress extremely difficult to achieve.[31]

In addition, a wealth of new information has become available on the environmental effect of renewable fuel production since Congress authorized the EISA in 2007. This literature broadly finds that meeting the volume requirements in the statute or in EPA's regulations may increase greenhouse gas emissions, in addition to polluting waterways. This information is particularly pertinent because Congress in 2007 surely did not intend its RFS program to cause significant environmental damage. While EPA is constrained in its ability to respond to these unintended consequences, Congress is not.

Over the past ten years, the RFS program has created new costs for families and businesses by artificially inflating the market for agricultural commodities like corn and soy. Given the evidence gained from implementation of the RFS program, Congress should consider reevaluating the goals of the program and attempt to determine whether the RFS is meeting its stated goals.

[31] Environmental Protection Agency. 2015. "Renewable Fuel Standard Program: Standards for 2014, 2015, and 2016 and Biomass-Based Diesel Volume for 2017." *80 Federal Register*: 33101.

Appendix

Valuing the Costs of Particulate Matter Emissions from Corn Ethanol

We can calculate the PM effects per gallon of ethanol by dividing the number tons of PM emissions that EPA anticipated in its initial analysis by the expected increase in ethanol production by 2022 over the RFS1 baseline (12 billion gallons). This yields a value of 4.19E-06 tons of PM_{10} and 1.19E-06 tons of $PM_{2.5}$ per gallon of ethanol. These values can then be multiplied by the historical number of gallons of ethanol produced, and multiplied again by the EPA's per-ton cost values for $PM_{2.5}$.

There is no corresponding per-ton damage valuation for PM_{10}. However, since all particulate matter that is less than 2.5 μm is also less than 10 μm, valuing increases of both $PM_{2.5}$ and PM_{10} may result in double-counting. Two options present themselves: count only changes in PM_{10} and monetize the effects using $PM_{2.5}$ values, or count only changes in $PM_{2.5}$ and monetize them accordingly. The first option risks either over- or under-counting if PM_{10} values in fact differ significantly from $PM_{2.5}$ values. The second option poses a definite risk of under-counting, as PM_{10} particles larger than 2.5 μm are ignored completely. While neither approach is perfect, this submitted statement used the second approach to conservatively quantify the effects of increased $PM_{2.5}$ as a result of the RFS program.

An estimate that counts only changes in PM_{10} monetized using $PM_{2.5}$ values is presented here.

Cost of Particulate Matter Increases Resulting from Ethanol Production (PM_{10} Only)

Year	Ethanol consumption	PM_{10} emissions (tons)	$PM_{2.5}$ emissions (tons)	Lower-bound	Base Case	Upper-bound
2006	5,481,210,000	22,977.69	6,541.37	($7,352,860,508)	($11,833,509,880)	($16,314,159,252)
2007	6,885,690,000	28,865.39	8,217.50	($9,236,923,612)	($14,865,673,938)	($20,494,424,264)
2008	9,683,352,000	40,593.42	11,556.27	($12,989,893,930)	($20,905,610,543)	($28,821,327,156)
2009	11,036,592,000	46,266.31	13,171.25	($14,805,220,282)	($23,827,151,391)	($32,849,082,500)
2010	12,858,497,000	53,903.89	15,345.54	($17,249,245,109)	($27,760,503,847)	($38,271,762,585)
2011	12,893,315,000	54,049.85	15,387.10	($17,295,952,295)	($27,835,673,225)	($38,375,394,155)
2012	12,881,879,000	54,001.91	15,373.45	($17,280,611,283)	($27,810,983,783)	($38,341,356,283)
2013	13,215,621,000	55,400.98	15,771.74	($17,728,315,051)	($28,531,507,035)	($39,334,699,019)
2014	13,443,976,000	56,358.27	16,044.27	($18,034,645,671)	($29,024,507,878)	($40,014,370,084)
*2015**	*11,610,910,000*	*48,673.90*	*13,856.65*	*($15,575,648,735)*	*($25,067,059,682)*	*($34,558,470,630)*
Total	**109,991,042,000**	**461,091.61**	**131,265.14**	($147,549,316,475)	($237,462,181,202)	($327,375,045,929)

This estimate risks either over- or under-counting if PM_{10} values differ significantly from $PM_{2.5}$ values. In this case, ethanol consumption since passage of the EPAct accounts for at least $147.5 billion in environmental disbenefits from increased criteria pollution, and as much as $327 billion.