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Committee on Environment
and Public Works Washington, D.C.

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HEARING ON S. 517, THE CONSUMER AND FUEL RETAILER CHOICE ACT

Wednesday, June 14, 2017

United States Senate

Committee on Environment and Public Works

Washington, D.C.

The committee met, pursuant to notice, at 10:05 a.m. in room 406, Dirksen Senate Office Building, the Honorable John Barrasso [chairman of the committee] presiding.

Present: Senators Barrasso, Carper, Inhofe, Boozman, Fischer, Moran, Rounds, Ernst, Sullivan, Cardin, Merkley, Gillibrand, Booker, Markey, Duckworth, and Harris.

Senator Barrasso. Before we start today's hearing, I would like to just say a few words about the shooting at the Congressional baseball practice this morning.

Our thoughts and prayers are with all the victims and with their families. Based on initial reports, the skill and the bravery of Congressman Scalise's security detail and the Capitol and local police prevented a much greater tragedy. It is a reminder that we should never take for granted the skill and dedication of those that protect all of us here in the Capitol, in our neighborhoods, and around the world.

Senator Carper.

Senator Carper. Some of us have played in the past in the congressional baseball games. I played in it for 10 years, and it is one of those rare opportunities for Democrats and Republicans to join together, not in conflict, not in vitriol, not in back-biting, but actually having fun together, and it is the kind of thing that we need to be doing more of rather than less.

I just want to join in the words of our Chairman. We don't say thanks enough to the Capitol Police and, frankly, to law enforcement officers probably in our own States. It is just a reminder for us to look for the opportunities to say thank you.

I think it was Maya Angelou who used to say people won't remember what we said, they won't remember what we do; they will

always remember the way we make them feel. And we need to make our law enforcement officers, including the ones right here, feel appreciated.

Thank you.

STATEMENT OF THE HONORABLE JOHN BARRASSO, A UNITED STATES
SENATOR FROM THE STATE OF WYOMING

Senator Barrasso. Thank you, Senator Carper.

I call this hearing to order.

Today the Committee is going to consider S. 517, the Consumer and Fuel Retailer Choice Act, introduced by Senator Fischer.

This bill would amend Section 211 of the Clean Air Act, which governs the regulation of fuels. Specifically, the bill would exempt fuels containing gasoline and more than 10 percent ethanol, fuels like E15, E20, and E30, from certain Clean Air Act requirements during the summer ozone season.

The Clean Air Act sets forth standards for fuel volatility to control emissions of volatile organic compounds that evaporate from gasoline. Volatile organic compounds, or VOCs, and nitrogen oxide, or NO_x, react in the presence of sunlight to create ground level ozone, or smog.

The Clean Air Act sets forth different standards for fuel volatility for different areas of the Country. In general, the Clean Air Act sets forth more stringent fuel volatility requirements in areas that are not in attainment with the National Ambient Air Quality Standards for ozone, and then less stringent fuel volatility requirements for areas that are in attainment for those standards.

So the principal question at today's hearing will be: What does the bill mean for air quality and for communities trying to comply with the Clean Air Act ozone standards? Another important question at today's hearing will be: Will this bill result in more corn ethanol production? And, if so, what are the impacts of additional corn ethanol production?

According to one of our witnesses, corn ethanol has accounted for about 87 percent of the biofuels used to meet the renewable fuel standard over the last 10 years. Yesterday, the Advanced Biofuels Association wrote that it has deep concerns that the legislation will be detrimental to the future of advanced biofuels in the United States.

I think we also need to ask what does the bill mean for consumers. In addition to exempting fuels like E15, E20, and E30 from certain Clean Air Act requirements, this bill would codify in statute the EPA's 2010 and 2011 decisions to approve E15 for use in model year 2001 and newer vehicles.

In Wyoming, folks want fuel with less, not more, ethanol. They have seen what ethanol does to small engines and boat engines. They worry what fuel with more ethanol will do to their car engines and who will be stuck paying the bill. Consumers, manufacturers, and others are deeply skeptical about EPA's decision to approve E15 for use in the 2001 and newer vehicles. Congress, I believe, should not codify it.

No one should be surprised that I don't support S. 517. But S. 517 deserves a full and fair hearing before this Committee.

I also can't end my remarks without mentioning another part of Section 211 of the Clean Air Act, specifically the renewable fuel standard. Now, I believe the renewable fuel standard is broken, and EPA is not in a position to fix it. The program is causing distortions in the marketplace and damage to the environment. I believe it needs to be fixed.

With that, I will now turn to the Ranking Member of the Committee for his remarks.

Senator Carper.

[The prepared statement of Senator Barrasso follows:]

STATEMENT OF THE HONORABLE THOMAS R. CARPER, A UNITED STATES
SENATOR FROM THE STATE OF DELAWARE

Senator Carper. So on this legislation we just mark you as undecided?

Senator Barrasso. But still your friend.

Senator Carper. I just hope you will still be Deb's friend too.

[Laughter.]

Senator Carper. Well, thanks, Mr. Chairman, for pulling this together, and to the Senator from Nebraska for offering this legislation. Giving us something to talk about, something important to talk about.

I want to thank all of our witnesses for joining us today, for sharing your perspectives with us.

Before I really get started, I want to take a moment or two just to remind folks how we got here in the first place. Not in this room, but on this subject.

In 2007, our Nation's energy future was not bright. If you will recall, U.S. consumption of gasoline and diesel was expected to grow exponentially, and the supply of oil to feed that growth was expected to be imported from other nations, many of which, frankly, didn't like us a whole lot.

That is why, in 2007, Congress took a number of steps to try to change our energy future, and in that year Congress

increased the fuel efficiency standards for cars, for trucks, for vans for the first time in over 30 years.

As someone who worked very hard with Senator Ted Stevens, with Senator Diane Feinstein, with our colleague, then Congressman Ed Markey, to help us find an agreement, I am very proud of this achievement. Our efforts laid the groundwork for future vehicle efficiency increases by the Obama Administration.

In 2007, Congress also amended the Clean Air Act to more than double the domestic biofuel mandate to 36 billion gallons by 2022. We included new incentives for advanced fuels that were intended to be better for the environment and were not derived from the food that we eat or the food our chickens and our cattle eat.

Since 2007, we have seen a dramatic change in the energy trend lines and our energy future looks better, brighter than it has in decades.

Today, thanks to the groundwork laid in 2007, consumers pay less at the pump, vehicles are cleaner and more efficient, and our Nation is no longer a net importer of oil.

I continue to believe that biofuels, if done correctly, can give us an environmentally friendly option, friendlier option to reduce our dependence on fossil fuels and our dependence on foreign energy production. However, we cannot ignore any

unintended consequences, be they economic or environmental, of increasing our biofuel mandate.

The bipartisan bill before us today assumes gasoline with ethanol blends greater than 10 percent contribute to ozone pollution no more or no less than gasoline blends with 10 percent ethanol and, therefore, the fuel should be treated the same under the Clean Air Act.

My first and foremost concern is making sure that assumption is correct, and I suspect that everybody feels that way. Representing a downwind State with ozone pollution problems, I want to make sure that passing this legislation will not increase ozone pollution that would make it more difficult for my State and other States that live at the end of America's tailpipe to reach attainment.

Along this line, States with extreme ozone concerns like my State, Delaware, have the authority to regulate the fuels sold within our borders, and I want to make sure this legislation does not inhibit States' rights to address ozone pollution.

My second concern is in regard to advanced biofuels. I have been told that this legislation would increase market access opportunities for higher blends of ethanol by allowing retailers to sell E15 and other higher ethanol fuel blends year-round. I just want to make sure that advanced biofuels, not

necessarily traditional corn ethanol, benefit from this increased market share.

My third and final concern is related to the volatility in the markets used by refineries complying with the renewable fuel standards, known as the Renewable Identification Number, RIN, market. In the past four years, spikes in the RIN market have negatively impacted merchant refineries around the Country like one in Delaware City, Delaware, and others along the East Coast. I am interest in learning today what, if any, impact this bill may have on the RIN market and what more we can do to add transparency and certainty to what is really an opaque market there.

I started with a little history lesson. Now let me conclude with just a touch more of history, and that is the history of how this legislation found its way before us today.

I understand that this legislation has come before our Committee as part of an agreement among Republican Senators with respect to Senate consideration of another bill, one that is not this Committee's jurisdiction. So I just want to make clear to my colleagues that I was not privy to that agreement, and at this time I have not committed to any action with respect to this legislation that may have been discussed among our Republican colleagues, nor have I made commitments regarding our Committee's possible consideration of this bill in the future.

Having said that, when you have a bill like this that is an important bill and purports to do and intends to do good things, and is offered, I think, in good intent and with bipartisan support, and I applaud the author of the bill for gathering that kind of support. This is the way we ought to move a bill, work a bill. And when there are differences of opinion, we ought to have a hearing and we ought to have people who can express well all the different opinions, and then we will make our decisions. So this is the right way to do things.

I am happy that we are here and look forward to learning as much as we can.

Thank you all.

[The prepared statement of Senator Carper follows:]

Senator Barrasso. Thank you, Senator Carper.

Senator Fischer.

STATEMENT OF THE HONORABLE DEB FISCHER, A UNITED STATES SENATOR
FROM THE STATE OF NEBRASKA

Senator Fischer. Chairman Barrasso and Ranking Member Carper, I thank you for convening today's legislative hearing to discuss bipartisan legislation that I introduced with Senators Donnelly and Grassley, and that is S. 517, the Consumer and Fuel Retailer Choice Act.

Thank you to my EPW colleagues, Senator Ernst and Rounds, Duckworth and Moran, for supporting this important legislation.

I would also like to thank the witness panel today for their willingness to share their time and experience with our Committee this morning.

When I first arrived in the United States Senate, I attended a meeting in Senator Klobuchar's office, and it was to discuss renewable energy and fuels; and several of my colleagues were there, Senator Durbin, Harkin, and Franken, to name a few. It was my first bipartisan meeting in the United States Senate. And in that meeting we lay the groundwork for including renewable in our Nation's "all of the above" energy strategy.

We made a strong connection. We all wanted to come together and work across the aisle to advance environmentally-friendly fuel options for American families.

The bill before us today, the Consumer and Fuel Retailer Choice Act, is a renewable energy bill. It would extend the 1

pound Reid vapor pressure waiver, more commonly referred to as the RVP waiver, to E15. Extending the RVP waiver would allow this fuel to be sold year-round. Currently, it is illegal for E15 to be sold during the busy summer travel season, from June 1st to September 15th. Consumers who want to purchase it during that time, they can't buy it.

In 1990, the EPA granted a 1 pound RVP waiver to E10. However, this waiver does not apply to E15 during the summer, even though it has a lower RVP and burns more cleanly. As a result, fuel retailers are required to change fuel labels at the pumps before and after the summer season. This leads to increased costs, and it is also greater confusion for consumers.

E15 is a cleaner, higher octane fuel that has been approved by the EPA for use in passenger cars, light duty trucks, and medium duty passenger vehicles built after 2001. Currently, E15 is offered to consumers in 29 States, including Wyoming, South Dakota, Nebraska, Kansas, Oklahoma, Iowa, Arkansas, Illinois, Alabama, Mississippi, and West Virginia.

In Nebraska, we are known for supporting renewable fuel, so it might surprise you that Illinois, West Virginia, Minnesota, Texas, and many other States, well, they sell more E15 than my home State does.

The Consumer Fuel Retailer Choice Act would expand consumer choice and eliminate confusion at the pump. It does so by

ensuring a consistently labeled product is offered year-round, which would decrease the occurrence of misfuelings.

S. 517 will also provide relief for our retailers who have been forced to change fuel pump labels twice a year for a fuel that does not change.

Good business decisions rely on accurate information and stability. Providing the RVP waiver for E15 would ensure that retailers have the certainty they need to make sound business decisions that will lead to greater economic growth opportunities in our local communities.

We all want clean air and clean water, and renewable fuels help us protect our world for future generations. Renewable fuels reduce greenhouse gas impacts by an average of 43 percent over gasoline. E15 has lower evaporative emissions than E10. It is a more environmentally friendly burning fuel.

Mr. Chairman, I have letters of support from multiple stakeholders, including the National Association of Convenience Stores, E15 retailers, Prime the Pump, the National Corn Growers Association, and Nebraska agriculture leaders, and I would ask unanimous consent that these letters be included in the record.

Senator Barrasso. Without objection.

[The referenced information follows:]

Senator Fischer. Thank you, sir.

Renewable solutions are out there to fulfill our Nation's energy needs, and E15 is one of them. American families should be able to decide which fuel they put into their vehicles. Our bill would ensure retailers can offer consumers consistent choices at the pump year-round, with less confusion and red tape.

So I am looking forward to today's discussion and I thank my colleagues for joining me on this legislation.

And thank you, Mr. Chairman, for holding the hearing.

[The prepared statement of Senator Fischer follows:]

Senator Barrasso. Thank you very much, Senator Fischer.

We are now going to hear from our witnesses.

Joining us today is Brooke Coleman, who is the Executive Director of the Advanced Biofuels Business Council; Jonathan Lewis, who is the Senior Counsel at the Clean Air Task Force; Mike Lorenz, who is Executive Vice President of Sheetz; Todd Teske, who is the Chairman, President, and CEO of Briggs & Stratton; and Janet Yanowitz, who is the Principal Engineer at EcoEngineering.

I would like to remind the witnesses that your full testimony will be made part of the official hearing record, so please try to keep your statements to five minutes so that we may have time for questions. I look forward to hearing the testimony.

Let us begin with Mr. Coleman.

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

Mr. Coleman. Thank you. Good morning, Chairman Barrasso, Ranking Member Carper, and members of the Committee. My name is Brooke Coleman. I am the Executive Director of an organization called the Advanced Biofuels Business Council. I want to thank you for the opportunity to testify today. We represent worldwide leaders in the effort to develop and commercialize the next generation of advanced and cellulosic biofuels.

I have submitted a fairly lengthy written testimony that I will not read back to you, so I want to just hit on a couple of top-line points.

Our Council represents a wide variety of companies that produce a wide variety of innovative American products, whether it is biochemicals, biogas, biodiesel, cellulosic ethanol. But today's hearing is about ethanol, so I want to focus on the ethanol industry.

This is a very exciting time for the ethanol industry. We have built more than 200 ethanol biorefineries in this Country in little more than 25 or 30 years. We displaced the equivalent of Saudi Arabia, plus, it is probably a smaller OPEC country in terms of foreign oil dependence, and we now are innovating in cellulosic ethanol, which is the industry that I represent. In Iowa, there are commercial scale cellulosic biorefineries in

Galva, in Emmetsburg, we call it DSM, and then DuPont's facility, of course, in Nevada. Nebraska is home to the largest advanced enzyme facility in the Country.

But with a growing industry comes industry challenge, and one challenge that new technologies face, whether it is clean energy, renewable energy, or anything else, is regulatory readiness. In fuels, regulations in policy really matter, because we don't have the benefit of selling to a competitive free market; we have to ask the oil industry to use our product. Our fuels can only go as far as policy and regulations allow them to go.

We all want to get to the point where we have a free market, but we are not there yet.

S. 517 essentially cures a regulatory glitch. Vapor pressure in gasoline is controlled for evaporation, and evaporation contributes to smog. Ten percent ethanol blends are allowed a 1 pound waiver in the summer because our lower tailpipe emissions offset the small increased emissions from smog.

And I won't get into too much detail because Janet is going to do that, I believe, and she is the expert, but the glitch is that higher ethanol blends like E15, while being cleaner and actually lower vapor pressure, are not granted the same waiver.

So while S. 517 will increase the availability of what I think, and I think will be proven, to be a cleaner, cheaper, lower carbon American-made and renewable fuel, it is my job to focus on how important this would be for cellulosic ethanol. And I want to emphasize that a little bit now.

Cellulosic ethanol technology is commercially ready. The issue that we have right now is the market is saturated, and project finance, and I won't try to bore you, at least, but project finance, if you go to a bank or a lender and say you want to build a biorefinery, it is a back-to-front conversation. You don't go and you say I have all this fuel; can we find a place for it. No one is going to fund that. You go and you say this is guaranteed demand, this is our demand opportunity, this is our market access, and will you finance that.

You can't go and say, well, maybe if they fix the RVP thing, we will have a market opportunity. No one is going to fund that.

So what S. 517 essentially does is it provides market headroom for cellulosic ethanol right at the point where we need it, and roughly 20 companies -- I believe a letter was mentioned by the Chairman. There is a point where people who run trade associations, and that includes myself, should be sort of pushed to the side. Twenty company executives signed a letter saying they support S. 517 for the very reason that it will unlock

project finance in an industry that is very, very important and growing in this Country.

I think I am going to use the time left to discuss very, very clearly what this proposal is, and in some cases is not.

I have said that the proposal would allow cleaner, cheaper fuel to be available all year. That is true. It would undoubtedly accelerate the commercialization of the lowest carbon fuel in the world. Our fuels are anywhere from 80 to more than 100 percent better than gasoline from a carbon perspective. Think about that. Some of our fuels are carbon sinks. It would further reduce U.S. dependence on foreign oil and most importantly, perhaps, keep American fuel consumer dollars circulating in our Country and our States, instead of going overseas.

But just as important, here is what S. 517 does not do. It does not introduce a new fuel that is alien to consumers. We have used this, as Senator Fischer said, in 29 States. It does not replace current blends and, therefore, does not require small engine manufacturers to re-spec their engines, because E10 and E0 will still be available where it is available now. And it does not change current law in reformulated gasoline areas, which does not allow waivers of any kind, and it does not in any way change California law, where they have the special authority

to regulate their fuel statewide. They will be making their own decisions with regard to E15.

It is extremely rare, in my opinion, not sure if I have seen it in my 20 years doing biofuel work, to have the opportunity to do so much with such a small and simple regulatory fix.

Thank you for reviewing this proposal, and we humbly ask you to support S. 517. Thank you, and I look forward to your questions.

[The prepared statement of Mr. Coleman follows:]

Senator Barrasso. Thank you very much for your testimony.

Mr. Lewis.

STATEMENT OF JONATHAN LEWIS, SENIOR COUNSEL, CLEAN AIR TASK
FORCE

Mr. Lewis. Good morning. My name is Jonathan Lewis. I am Senior Counsel at the Clean Air Task Force, which is a nonprofit organization that works to help safeguard against the worst impacts of climate change by catalyzing the rapid global development and deployment of low carbon energy technologies through research and analysis, public advocacy leadership, and partnership with the private sector.

I want to thank the Committee for inviting me to testify today and for holding this hearing. Any efforts that could result in amendments to the Clean Air Act should proceed through regular order so that the potential consequences for public health and the environment are fully considered.

The Clean Air Task Force has several concerns about E15, but my comments today focus on two of them: the potential climate impact of additional ethanol production and the possibility that greater use of E15 will increase ozone formation.

Allowing E15 to be used year-round would expand the market for ethanol. Some, maybe most, of that new market space would be filled by corn ethanol. An unfortunate lesson from the renewable fuel standard is that creating a market for advanced,

low-carbon ethanol offers no guaranty that such fuels will be developed and deployed in significant volumes.

Ten years after Congress created a huge market for cellulosic biofuels, production levels for cellulosic ethanol remain miniscule. Meanwhile, corn ethanol continues to dominate the RFS program.

Increased corn ethanol production is bad for our climate. According to the Environmental Protection Agency's own data, the additional corn ethanol produced in response to the expansion of the RFS has higher lifecycle greenhouse gas emissions than gasoline.

The National Research Council looked at EPA lifecycle emissions data and reported that corn ethanol produced in 2012 or 2017 has "lifecycle GHG emissions higher than gasoline unless it is produced in a biorefinery that uses biomass as a heat source. Thus, according to EPA's own estimates, corn grain ethanol produced in 2011, which is almost exclusively made in biorefineries using natural gas as a heat source, is a higher emitter of GHG than gasoline."

The ethanol industry argues that EPA's data are flawed and that corn ethanol's lifecycle greenhouse gas emissions are significantly less than those of gasoline.

Nearly all the studies that reach this conclusion dramatically undercut the emissions from RFS-driven land use changes.

We need low carbon liquid fuels to de-carbonize the transportation sector. Biofuels can play a role in this effort, particularly with respect to aviation. But by expanding the use of E15 without first demonstrating the capacity to produce an adequate supply of climate-beneficial biofuels, this bill could undermine climate change mitigation efforts by encouraging additional production of corn ethanol.

We are also concerned by E15's potential impact on ozone formation. Ozone forms in VOCs and NO_x, and mix in the atmosphere in the presence of sunlight. Ozone is particularly dangerous during summer months, when sunlight is more abundant and when hotter temperatures can worsen the incidents and severity of diseases that are aggravated by ozone pollution, such as asthma and emphysema.

Adding ethanol to gasoline affects the emissions of both VOCs and NO_x. E15 is slightly less volatile than E10, so a switch from E10 to E15 might result in a slight reduction in VOC emissions.

NO_x formation is more straightforward. If the amount of ethanol blended into gasoline is increased, the oxygen content of the fuel also increases. Higher oxygen levels typically

result in hotter combustion temperatures, which in turn typically result in higher NOx formation.

Modern light duty engines, especially those that have been built since 2007, have computerized fuel injection systems that work with a through-way catalyst to limit the release of NOx from the tailpipe. Older cars that do not have this emission control technology, as well as newer cars in which the emission controls may have degraded, are less effective at capturing the additional NOx that is created when they burn E15.

The potential additional NOx emissions are important because, according to a May 2017 study by EPA, ozone formation in most parts of the Country is much more sensitive to changes in NOx emissions than it is to changes in VOC emissions. The EPA analysis finds that in most cities the impact of NOx reductions on ozone formation is up to five times greater than the impact of comparable VOC reductions. In non-urban areas, EPA found that NOx reductions are over 10 times more impactful than VOC reductions.

Small increases in ozone due to increased NOx emissions from summertime use of E15 might be enough to push or keep some areas over the ozone standard, triggering adverse health impacts and additional control requirements. We have identified 31 potentially impacted areas, including 5 areas in California; 3 areas in Arizona, Wisconsin, Michigan, Indiana, Pennsylvania,

and Ohio; and most of the major cities in the northeast United States.

Before legislation that allows the sale of E15 during summer ozone season is considered, we urge that more research be conducted to better understand how the use of E15 affects NOx emissions from a wide range of engine types, engine model years, and engine usage patterns. In other words, we should look before we leap. The last thing that areas that are otherwise on the verge of meeting their ozone targets need is the introduction of additional NOx into their airsheds.

Thank you.

[The prepared statement of Mr. Lewis follows:]

Senator Barrasso. Thank you very much for your testimony.

Mr. Lorenz.

STATEMENT OF MIKE LORENZ, EXECUTIVE VICE PRESIDENT, SHEETZ INC.

Mr. Lorenz. Chairman Barrasso, Ranking Member Carper, members of the Committee on the Environment and Public Works, thank you for the opportunity to testify today in strong support of legislation that allows fuel retailers across the Country to sell a fuel product approved by the Federal Government year-round, just like every other transportation fuel on the market.

My name is Mike Lorenz. I am the Executive Vice President of Petroleum Supply at Sheetz, a family-owned convenience store chain based in Altoona, Pennsylvania, with 550 stores in six States. I have spent the last 17 years of my career with Sheetz managing our fuel supply strategy. Prior to joining Sheetz, I worked 22 years at Mobil Oil.

For more than 60 years, our mission at Sheetz has been to meet the needs of the customer on the go; offer them a variety of high quality products and let them choose. We don't create customer demand; we work hard to satisfy it. Their purchases, much like votes, show us which products they prefer strongly.

Recently, we expanded our fuel options, providing customers with the ability to purchase a 15 percent blend of ethanol, known as E15, at more than 190 of our stores, and we are adding more stores each month. We did this on a voluntary basis because we believe that providing more fuel options such as E15,

which is lower cost, higher performing, and better for the environment, is what our customers want.

So far, I can tell you that offering E15 at our stores is working. Consumers are purchasing it because it is three to ten cents a gallon less than regular gasoline and is 88 octane instead of 87.

That is what motivates fuel purchases: cost and performance. They don't care about fuel volatility, ethanol concentration, or the public policy behind renewable fuels. And after millions of E15 transactions by thousands of customers purchasing millions of gallons and driving millions of miles, one thing is clear: we have not had a single customer complaint or any cases of misfueling.

But this has been a major challenge, not being able to sell E15 in the summer to the same customers that we sell to the rest of the year. In addition to lost sales during the summer, relabeling will cost retailers roughly \$2 million this year, and possibly \$5 million next year.

The inconsistency creates confusion and undermines the integrity of this product, and could also lead to potential misfueling. Frankly, we think this problem is nothing more than a technicality that can be easily fixed.

This legislation fully addresses this issue, simply providing E15 the same vapor pressure treatment that is given

regular gasoline, and ultimately lets the consumer choose what fuel works best for them.

I want to thank Senators Fischer, Ernst, Rounds, Moran, and Duckworth for their leadership on this issue and their support of S. 517, the Consumer and Fuel Retailer Choice Act.

Sheetz is not selling E15 because of ethanol producers. We sell it because there is consumer demand for the fuel. We don't support this legislation because it is backed by corn farmers; rather, we support this legislation because it allows us to sell a legal fuel to customers that want to buy it year-round.

We still offer other fuels, including E10, a fuel specifically warranted for small engines, marine, off-road, and motorcycle engines. We believe adding a lower cost, higher performing fuel to our offer allows Sheetz to provide superior selection and service to those who visit our stores.

I want to again thank the Committee for this opportunity to appear today. I want to close by saying that this bill is simply about fixing a regulation that is almost 30 years old, and prevents retailers like Sheetz from offering a legal fuel year-round, just as we do with regular gasoline.

I would be happy to answer questions.

[The prepared statement of Mr. Lorenz follows:]

Senator Barrasso. Thank you very much for your testimony.
We appreciate you being here today.

Mr. Teske.

STATEMENT OF TODD TESKE, CHAIRMAN, PRESIDENT & CEO, BRIGGS &
STRATTON CORPORATION

Mr. Teske. Chairman Barrasso, Senator Carper, distinguished members of the Committee, thank you for inviting me here today to discuss the renewable fuel standard and the Consumer Fuel and Retailer Choice Act on behalf of Briggs & Stratton.

My name is Todd Teske. I am Chairman, President, and CEO of Briggs & Stratton. Today I hope to offer insight to our experience with the renewable fuel standard and specifically S. 517. I have provided more detailed written testimony, which I would ask to be included in the record.

Briggs & Stratton is a 109-year-old U.S. manufacturer headquartered in Milwaukee, Wisconsin. We have U.S. manufacturing sites in New York, Georgia, Alabama, Missouri, Kentucky, Wisconsin, and Nebraska. Briggs & Stratton is the world's largest producer of small air-cooled gasoline engines for outdoor power equipment, and we are a leading designer, manufacturer, and marketer of power generation, lawn and garden, turf care, and jobsite products. If you have a garage, you probably have a Briggs & Stratton product in it right now.

We have 5,500 employees worldwide, with approximately 5,100 of them right here in the U.S. We take pride in producing over

85 percent of our products and 72 percent of our sales here in the U.S.

Briggs & Stratton has a longstanding commitment protecting our environment. Since 1995, we have reduced our emissions by 75 percent. In 2007, we pledged with the Department of Energy to reduce our energy consumption by 25 percent over 10 years, and I am pleased to say that we were able to achieve that goal.

Keeping our commitment to the environment in mind, I believe that the environmental goals underpinning the RFS and E15 were laudable. However, it has since become apparent that these goals are unlikely to ever be met and, more importantly, may have significant unintended consequences for consumers.

I would like to briefly outline several concerns I have with the RFS and the increased availability of E15.

Extensive research has shown that the use of E15 in small non-road engines can have harmful and costly consequences, and the EPA has confirmed these findings. We have conducted our own studies that show that as the level in gasoline increases, the level of alcohol increases as well. Alcohol contains inherent properties that cause problems with engines.

By definition, E15 would have an alcohol content of 0 to 15 percent, which would result in great difficulty in engines meeting both emissions and performance requirements.

Furthermore, the Department of Energy's testing of E15 in non-

road engines found that small engines experienced a variety of difficulties with higher ethanol blends. More than half of the engines tested behaved poorly or erratically, according to the DOE's report, which caused the EPA to exclude small engines from the E15 waiver. This exclusion, however, has not led to decreased problems due to consumer misfueling.

The EPA has issued a mandatory warning label for pumps that distribute E15. While we appreciate this preventative effort, research has shown that warning labels are not effective in preventing misfueling, and consumers continue to use E15 despite the risks.

Behavioral studies have shown that consumers at the pump overwhelmingly favor the lowest priced fuel. In the 1970s and 1980s, the U.S. made the transition from leaded to unleaded gasoline, and new cars were designed with different fuel tanks that were incompatible with older, leaded gasoline pumps. It was found that even with this physical obstruction in place, consumers would still opt for the lowest priced fuel option in their car. If a physical obstacle could not deter consumers from using the correct gasoline, can we assume that a sticker is going to prevent misfueling?

At Briggs & Stratton, we have partnered with other small engine manufacturers and retailers across the Country to educate consumers on proper fueling. Together, we created the "Look

Before You Pump" campaign to assist consumers when purchasing new small engine products. While we are happy to do our part to educate the public on the negative impact ethanol can have on our products, we do not believe that we should solely be responsible for this effort. It is going to take a concerted effort with industry and Government to fully educate the public on the risks of misfueling with ethanol.

Lastly, small engines and outdoor power equipment are not designed, warranted, or EPA approved to operate on gasoline containing more than 10 percent ethanol. This is why we fully support the development of advanced biofuels as a solution. Biofuels from other feedstock are drop-in fuels. Drop-in fuels, by definition, meet existing gasoline specifications, are not ready to drop in to infrastructure, minimizing compatibility issues. We have conducted extensive testing with a drop-in isobutanol blended gasoline, which demonstrated evidence that such fuels can provide the performance and operational criteria necessary without demonstrating any negative effects.

I strongly support further research into these alternative fuels that are effective and do not damage our products. The Consumer Fuel and Retailer Choice Act would allow retailers across the Country to sell E15 year-round. Under this legislation, it is highly likely that consumers would misfuel small engines with even more frequency. Misfueling would lead

to significant economic harm for consumers as these small engines fail. Reliance on warning labels would do little to prevent misfueling, despite our best efforts at education and prevention, and we believe the risk of misfueling would be substantial, and damage to our products would be irreversible. This puts us at risk to lose decades of trust from consumers and negatively impact our reputation.

For these reasons, Briggs & Stratton opposes S. 517 as currently written. We encourage the Committee to work together in a bipartisan way to draft new legislation that protects consumers. We recommend that any reform legislation rescind the partial waiver for E15 and establish gasoline blended with up to 10 percent ethanol as the general purpose domestic fuel. I also encourage the Committee to pursue policies that encourage research into the next generation of renewable fuels that are safe, proven, and for all types of engines.

Mr. Chairman, Senator Carper, thank you for this opportunity to testify today. I appreciate the Committee looking into the complicated issues dealing with the RFS, and I would be happy to answer any questions you might have.

[The prepared statement of Mr. Teske follows:]

Senator Barrasso. Thank you so much for your testimony.

Ms. Yanowitz.

STATEMENT OF JANET YANOWITZ, P.E., PH.D., PRINCIPAL ENGINEER,
ECOENGINEERING INC.

Ms. Yanowitz. Chairman Barrasso, Ranking Member Carper, and distinguished Committee members, thank you for the opportunity to speak here today. It is an honor. I am an engineer that has worked on the emissions from biofuels for almost two decades.

Today you are evaluating whether to allow E15, a fuel which is 15 percent ethanol and 85 percent petroleum, to have the same 1 PSI waiver currently permitted for E10. At this time, virtually all the fuel sold in the U.S. is E10, and extending the 1 PSI waiver to all ethanol fuels will encourage the use of E15 in place of E10. I will be discussing the air emissions impact of this change.

As any scientist who has spent time on vehicle emissions will tell you, the issue is complicated and different vehicles can behave quite differently. However, for those of you who are listening for the bottom line, replacing E10 with E15 would be a small change with minimal emissions impacts, according to the best available emissions test data.

On average, the total tailpipe organic emissions and the ozone forming potential of those organics will be expected to decrease or stay the same, and nitrogen oxide, or NO_x, which also impact the ozone formation, are expected to be unchanged.

Ethanol and aldehyde emissions will likely increase and carbon monoxide and benzene will decrease.

This analysis is based on studies reported in the peer-reviewed scientific literature and by the coalition of petroleum and automobile companies that make up the Coordinating Research Council, or CRC. More information on these studies is included in my written submittal, but I will quickly describe the most significant so you get a feeling for the size of the studies and the results.

In 2008, a team comprised of scientists from three national laboratories conducted emissions testing on 16 vehicles using E0, E10, E15, and E20. They found that increasing the ethanol content resulted in no significant effect on NOx or organic tailpipe emissions, although the acid aldehyde emissions increased. Similar results on three vehicles were reported by Karavalakis and his colleagues at UC Riverside. The CRC also reported that increased ethanol content up to 20 percent ethanol reduced CO emissions, although the same study reported an increase in NOx emissions with higher ethanol content.

An analysis of the 12 2001 newer vehicles included in another DOE study found that non-methane hydrocarbons, carbon monoxide and NOx trended slightly lower with higher ethanol contents. In another study conducted by a subcontractor to NREL, non-methane hydrocarbons and carbon monoxide emissions

were either equal or lower for six vehicles aged and then emissions tested on E15 versus E0, and NO_x emissions were unchanged.

The total amount of organics emitted provides a rough gage of the overall forming potential of the emissions, but not all organics are equally prone to reacting to form ozone. Thus, studies which considered the reactivity of the specific organics released are more accurate at determining the ozone forming potential of the emissions. The UC Riverside team did this analysis for emissions from two 2012 model year vehicles and found that the ozone reactivity for emissions from E15 were less than those from E10.

In addition to tailpipe emissions, vehicles emit additional organic compounds to the atmosphere via evaporation. There have been no significant studies comparing evaporation emissions of E15 to E10, but two studies made with E20 and E10 show mixed results, suggesting that increases in evaporative emissions between vehicles using E10 and E15 of the same vapor pressure are small or non-existent.

In another study, limited data from the testing of four vehicles using E0 and E15 showed no significant differences between the two fuels in evaporative emissions.

In conclusion, the available emissions test data indicates that replacing E10 with an E15 of the same vapor pressure will

cause a slight decrease in emissions of ozone-forming organic compounds and carbon monoxide, and no change in NOx.

Thank you.

[The prepared statement of Ms. Yanowitz follows:]

Senator Barrasso. Well, thank you all for your testimony. We appreciate you all being here today.

Mr. Teske, let me start with you.

Earlier this week, the National Marine Manufacturers Association, the American Sports Fishing Association, Boat USA, Center for Sports Fishing Policy, Marine Retailers Association of the Americas, Theodore Roosevelt Conservation Partnership sent the Committee a letter expressing concerns about how E15 can contribute to engine failure. I don't know if you have seen that letter.

Mr. Teske. I have.

Senator Barrasso. Do you share the concerns of these groups?

Mr. Teske. We do, because ethanol or alcohol does a couple different things to an engine; it doesn't matter whether it is a marine engine or a small lawnmower engine. Basically, it will fail over time if you put E15 in them, in a relatively short period of time. And in many cases, it has to do with the fact that enleanment, which means that the engine will run hotter, will start to distort the components in the engines. So it is no different, really, between any of the engines you mentioned, with marine or our engines at Briggs & Stratton.

Senator Barrasso. Thank you.

Dr. Yanowitz, I have a couple of studies here that you have put forth in terms of performance, compatibility and environmental impacts of ethanol. Were they funded by the ethanol industry? I am looking at the March 2012 study prepared for the Renewable Fuels Association, funded by the Renewable Fuels Association in May 2015, prepared --

Ms. Yanowitz. Seems like you have answered your question. Yes, they were.

Senator Barrasso. Okay, thank you.

Mr. Lewis, in your testimony you explained that E15, when compared to E10, may produce lower emissions of the VOCs, but likely to produce higher emissions of NOx. So what does that mean in terms of ozone formation?

Mr. Lewis. There are some studies that show slightly higher NOx emissions. It is not a large effect, but it is something that we are concerned about because, as I mentioned earlier, in the vast majority of areas of the Country where ozone is a problem, a slight change in NOx emissions or change in NOx emissions is going to have a much more significant impact on ozone formation than a change in VOC emissions.

None of the studies that we have looked at have looked at the full range of different vehicle types, the vintage of those vehicles or the miles that they are driven, and consider what NOx impacts from those vehicles might be on ozone formation, but

it is definitely an area of concern for us given the direction that NOx formation has on ozone.

Senator Barrasso. We had talked earlier in my opening comments about NOx emissions and the potential to push regions of the Country which are currently in attainment with the National Ambient Air Quality Standards for ozone pushing them into non-attainment, Mr. Lewis. So do you believe that these additional potential NOx emissions have the potential to prevent regions of the Country which are currently in non-attainment from getting into attainment, as we look at the impact of that? And which regions of the Country might be most vulnerable?

Mr. Lewis. In our written testimony, we identified 31 regions around the Country that are either just above or just below the 2008 ozone standard and the 2015 ozone standard, and in those areas they are making heroic efforts to bring down ozone levels to attain those standards, and slight changes in ozone levels make a significant difference in whether or not they are going to attain. So the areas that we mentioned, there are five of them in California; there are three in Arizona, Wisconsin, Michigan, Indiana, Pennsylvania, and Ohio; Illinois, Maryland, West Virginia, and Nevada each have two of these areas; and they include most of the major cities in the eastern United States.

Senator Barrasso. So it seems more related to the cities.

Mr. Lewis. It is a significant concern for cities, particularly since many of the east coast cities are downwind from ozone producing areas. So even if they take significant efforts at home, it won't necessarily solve the problem.

Senator Barrasso. And I think you mentioned that there are a number of other impacts on air, water, land quality. Could you expand on that a little bit?

Mr. Lewis. Yes. In addition to the climate concerns that I outlined in my opening statement, we are very concerned about the impact on water quality. Farm runoff is a significant problem, particularly from corn production, and that has led to water pollution and degraded water habitats in streams, rivers, the Chesapeake Bay and the Gulf of Mexico.

We are also concerned about habitat loss. Between 2008 and 2012, studies have found that 7 million acres of range land, wetland, native prairie lands have been converted into crop production, and soybeans and particularly corn have accounted for most of the plantings on that cleared land.

Senator Barrasso. Thank you. Thank you for your response.

Senator Carper.

Senator Carper. So, we were talking, like a sidebar conversation here, and said this really is a good panel, and this is an issue about which people have some real serious differences. But this is the kind of panel we need to help us.

And one of the things that I always look to a panel of this nature on an issue that is contentious, bipartisan, but contentious, is to help us find a path to a smart public policy. And I think at the end of the day we want to make sure that what we are doing, if we are going to move from E10 to E15, the effect on the environment, what it does for customers, what it does in terms of reducing our demand on foreign oil. There are a lot of factors out here, and there are some aspects that would suggest that this is a good thing, and then there are others we have to be concerned about.

I flagged in my statement a concern that may not be shared by others, but it deals with something called the Renewable Identification Number, RIN, and volatility in the RINs market. We don't have time to explain well the concern, but the concern is related to the volatility in the market used by refineries to comply with the renewable fuel standard, and it is known as the Renewable Identification Number, the RIN market.

In the past four years or so, the RIN market had spikes, the RIN market goes up, it goes down, and those spikes in the RIN market have negatively impacted a number of refineries. We call them merchant refineries because they are not connected to a service station, gasoline stations across the Country. But I am interested in knowing, and maybe I will just come to you, Mr. Coleman.

What impact will this bill have on RIN markets? We think they are too opaque. We need more certainty. We need more predictability. We need less volatility. Otherwise, some of these refineries are going to be driven out of business, and that would be a great tragedy.

Please.

Mr. Coleman. Thank you, Senator Carper. So the RIN markets are essentially renewable fuel standard credit markets, and the oil industry buys credits when it cannot put more renewable fuel into the marketplace. So, in other words, RIN prices go up when demand for those credits increases when the usability of renewable fuel, in this case ethanol, is restricted. What we are asking for is an alleviation on the restriction to use ethanol. It will provide a place for the ethanol to go and RIN prices will come down.

The last point, of course, is that we are at 15 billion gallons. We are at the capped amount for corn ethanol, and we should see alleviation in those credit prices.

Senator Carper. All right. Someone mentioned, I think, isobutanol, and we have had a real interest in biobutanol in the State of Delaware. DuPont has worked on this forever and along with, I think, BP and I think the Navy. They have a partnership and share views, markets and provided the products to markets in maybe Great Britain. I think I understood one of the panelists

to say isobutanol does not have the problems that the corn ethanol has. Would you clarify that for us, isobutanol versus biobutanol versus corn ethanol? Again, this was with respect to small engines.

Mr. Teske. Correct. Yes, that is correct, Senator. We have done extensive testing on isobutanol, and it has characteristics that are much more like gasoline, so it is much more like a drop-in fuel.

Senator Carper. I understand it travels better in pipelines.

Mr. Teske. Yes.

Senator Carper. It passes better with gasoline and it has better energy density, I think.

Mr. Teske. Yes, correct. So you can use existing infrastructure along the way, all the way from pipelines all the way to convenience stores. And then when you ultimately use it in small engines, it has the same characteristics as gasoline, so it performs very well in our engines.

Senator Carper. We have been talking about this for a long time. In terms of market, making an impact on the markets, having this stuff being sold commercially in this Country, other countries, what is going on? Anybody. This is for anybody.

Mr. Coleman?

Mr. Coleman. Yes. Look, the way you get isobutanol is you basically cook the biofuel more, so you inject more energy in the production process, and you can actually make it look more like gasoline. We support the production of those fuels. To date, those fuels are more expensive than ethanol. Ethanol is the lowest cost solution. And I am a little bit confused about the Briggs component of this because Brazil uses two times as much ethanol as we do and that company sells small engines into Brazil, to my knowledge, without problem. So other countries are ahead of us. They certainly have small engines in Brazil, so that is one confusion that we have.

Senator Carper. All right, my time has expired. Thank you so much.

Senator Barrasso. Thank you, Senator Carper.

Senator Inhofe.

Senator Inhofe. Thank you, Mr. Chairman.

I am going to do something a little bit different. I have questions for our witnesses, but I also have a statement I want to start with. I appreciate the opportunity that this hearing brings for us to address the wider issue of renewable fuel standards.

I understand the supporters of the bill believe that the Reid vapor pressure issue should be a separate consideration from RFS, but I can't separate the two as this bill provides

another win for ethanol at the expense of other forms of energy. The bill is more than a mere technical fix, more than mere regulatory reform. The bill would expand the waiver to E15 and beyond.

If we are to revisit the provision of the Clean Air Act, which was intentional, we must also look at the many other issues that have arisen since the mandate was created. Congress enacted the RFS in 2005 and expanded it in 2007. I opposed both efforts. The world of liquid fuels has changed since then and we produce more oil here, import less and consume less gasoline and emit fewer emissions from oil-based fuels. Most of the rationale originally justifying the RFS has disappeared. All we have left is an unstable program rooted in EPA waiving entire portions of annual requirements, allowing imported soybeans and ethanol from South America to count towards RFS in regularly missed deadlines.

The mismanagement of the RFS has hurt every party involved. Oklahomans understand that the RFS is a bad deal. Our pork producers, our cattlemen understand that to drive feed prices up, Oklahoma drivers understand the ethanol blends add wear and tear on their engines. Oklahoma gas stations across the State advertise gasoline without ethanol.

There we go. I took those myself.

[Laughter.]

Senator Inhofe. Unfortunately, it is going to get harder for Oklahomans to burn clean gas because the RFS only gets worse from here.

Yet, regardless of demand and other concerns, the previous EPA pushed increased ethanol blends to levels that can corrode engines and void vehicle warranties. These are just a few of the reasons why I continue to oppose the RFS, which I have done since its creation in 2005. And because of these concerns and those addressed by the Chairman, I believe any discussion of a waiver under the Clean Air Act should not be made in a vacuum. I welcome the opportunity to explore these concerns.

Now, Mr. Teske, back when I enjoyed life, I was a builder and developer along the coast in south Texas. Texas didn't have options for the small engines out there. They were surprised to find out in Oklahoma we don't have that problem. In fact, it is hard to find anything with an ethanol blend where you actually have the small engines in our lake areas. And I have to remind people sometimes that Oklahoma has more miles of freshwater shoreline than any of the 50 States, and we know what we are doing there. But down in Texas they don't have that option.

Now, here is what I hear from the guys down there. You are in the engine business, so you are in a position to understand this. They are upset because of the effects on their warranties. They will go ahead and be using the blends that

they are required to use because there is no option along the coast in their small engines. Then, when something happens, they come back against the manufacturer, that would be you, and have a lawsuit in many cases as a result, when in fact it was really just the blend that caused it.

Is this all new to you or is this something you have been aware of?

Mr. Teske. It is certainly not new to us. We warrant up to E10, and our engines are fine running up to E10. But the issue is that when there is misfueling there are opportunities for dealers to determine how much ethanol is in the fuel. There are testing kits and other things that are out there, which is why they oftentimes will do that test and then reject the warranty claim along the way. So what happens is the consumer is left with a damaged product.

Senator, if I could just clarify one thing in Brazil. The comment was made on Brazil. Brazil has a different type of ethanol; it has a sugar cane based ethanol. You have to remember that when you are talking about performance of a small engine, we are talking about a tradeoff that happens between emissions regulations and performance. Well, down in Brazil it is different. So it is sugar cane based. And I can tell you we have a pretty good carburetor business down in Brazil because of the fact that they get replaced all the time.

But to your original question, yes. This is not --

Senator Inhofe. And I was aware of the situation down there. That was going to be my next question to ask you, so I appreciate it. But I don't want my time to completely expire.

I have been with this issue probably longer than anyone at this table has, with the whole ethanol issue, and I remember when Al Gore invented it all.

[Laughter.]

Senator Inhofe. Well, I am serious about that. He did it with the idea that this is better for the environment and all that, and I think, Mr. Lewis, if I judge from your statement, it sounds to me like Al Gore was wrong. Do you think he was?

Mr. Lewis. Yes, we do. We don't think much of ethanol.

Senator Barrasso. Thank you, Senator Inhofe.

Senator Merkley.

Senator Merkley. Thank you, Mr. Chairman. The Ranking Member noted this was a good exploration of public policy, and, Mr. Chairman, I would just like to ask you the question are we holding this hearing in order to gain the diverse perspectives and develop better public policy in this area?

Senator Barrasso. Well, that is the goal.

Senator Merkley. Thank you.

I just want to note that I think this is extremely valuable. We have heard that these fuels create a carbon sink,

and we have heard that they create more global warming gases. We have heard they damage engines; we have heard that they don't damage engines. We have heard that there is no misfueling problem and that there is a misfueling problem.

Just as we are having this exploration, it is incredibly important that we have this type of public process on any bill having a significant impact in America, and that is why I want to encourage my colleagues, all my colleagues on this Committee, Democratic and Republican, to insist that before a health care bill goes to the Floor of the Senate, that it gets a full public hearing.

The current plan we have heard from the Republican leadership is to put that bill on the Floor with no hearing, and that would be an extraordinary violation of due process, would shortchange American citizens, who have every right to see this bill and to comment on it; it would certainly shortchange the legislative process, in which all 100 Senators should be able to see that bill, weigh in with their constituents, hear their constituents' responses, test the ideas against the testimony of experts and against the opinions of their colleagues; and something affecting hundred millions of Americans should absolutely not be considered in the Senate without a hearing of this type and a chance to mark up the bill.

I hope my colleagues of both parties will agree and fight for that principle of legislative deliberation.

Now I want to turn to my first question to Mr. Coleman.

You referred to the fact that often you can create a biofuel that is a carbon sink, in which case it means it captures more carbon dioxide than it emits. Can you expand on that? Why is there such a big contrast between that point of view and the point of view expressed by another individual on the panel that says you are going to increase global warming gases?

Mr. Coleman. So, to clarify the witness to my left, Jonathan, he is making that claim about corn ethanol, and I will talk about that in a minute.

The carbon sink fuel cellulosic ethanol, the cellulosic ethanol that is coming out of the first round of commercial biorefineries, as I said, is anywhere from 85 to sort of 126 percent better than gasoline. What that essentially means is that in the process of making the fuel, as it absorbs CO₂ and sunlight, there is more CO₂ and energy going in from a carbon perspective than is emitted when that fuel is burned. And this is an independently certified pathway, and it is pretty extraordinary because a lot of the fuels that are regarded to be the most innovative, like electric drive, hydrogen fuel cells, etcetera, do not approach this level of carbon reductions. And

if we are concerned about climate change, there is an opportunity with these high-end fuels to actually pull down on our carbon inventories.

On the corn ethanol side, and I don't represent that industry, I have to say that notwithstanding the fact that Jonathan and I are from the same town in Boston, we don't agree on this. If you look at the agencies that actually say corn ethanol is reductive, they include USDA, EPA, notwithstanding his statement, Department of Energy.

Sixty-five percent of the credits under the low carbon fuel standard in California are actually produced by the corn ethanol industry, and what the organization did was they cherry-picked data out of EPA data and changed the system boundary around what EPA did on corn ethanol to come up with their conclusion. And that is not the conclusion, by the way, that EPA actually had, which is that corn ethanol reduces carbon emissions.

Senator Merkley. And you are speaking lifecycle to lifecycle?

Mr. Coleman. Inclusive of indirect land use change, yes.

Senator Merkley. And, Mr. Lewis, you came to a different conclusion. If you could just, in one or two sentences, what is the huge difference here in your calculations?

Mr. Lewis. The difference is that the analysis that EPA published, the analysis that Brooke is referring to, looks at a

future hypothetical production scenario that begins in 2022 and assumes production technologies that have not been adopted by the industry. The analysis that we are looking at, that EPA also did, looked at current production technologies and found that there was a higher GHG emissions than from gasoline.

Senator Merkley. Mr. Coleman, you are shaking your head. What is the difference?

Mr. Coleman. I am shaking my head because in order for EPA to measure the carbon impact of biofuels, they had to go out into the future, because they wanted to do land use change. And to check land use change, you have to shock a model out into the future with a high level of biofuels. What EPA then said was, if we are going to go out into the future system boundary-wise, we are going to credit biorefining efficiency that we see every single year out into the future. It is either the future or the present.

What this organization did was they went out into the future on land use change and went to the present on biorefinery. So they picked the negatives out of the future and then picked the negatives out of the present, put them together and said, well, that is not as good. That is why there are system boundaries when you do scientific analysis, and that is a distorted outcome.

Senator Merkley. Thank you both.

Senator Barrasso. Senator Fischer.

Senator Fischer. Thank you, Mr. Chairman.

As a cattle rancher, I just can't let my dear friend, Senator Inhofe's, comments pass without me weighing in on what ranchers think about ethanol and ethanol plants and byproducts. As a cattle rancher, we have mother cows on our ranch. We live in the Nebraska Sand Hills, and we use, as our neighbors use, the byproducts from ethanol plants. We are also very fortunate in Nebraska, we bypass Texas, to my dear friends from Texas, with Cattle on Feed, and we do so because of those byproducts from ethanol plants. So there is a direct benefit to cattle ranchers, people in the livestock industry, and I wanted to point that out.

Before I begin my line of questioning, I would also like to bring to the Committee's attention two surveys that were conducted by Quadrant Strategies that illustrate consumers' knowledge and confidence about the different types of gasoline available to purchase. The first survey found that 96 percent of motorcyclists say it is easy to figure out the type of gasoline to put in their engines. The second survey found that 94 percent of boat owners are confident that they know the right gasoline to use in their boats. And I too put my faith in consumers who can pick out the right kind of gasoline to put in their engines.

Mr. Chairman, I would ask unanimous consent to place these two surveys into the record.

Senator Barrasso. Without objection. I would note also that about 89 percent of all drivers consider themselves in the best one-third of all drivers.

[Laughter.]

Senator Fischer. There again, Mr. Chairman, I am sure that Nebraska rated higher.

[Laughter.]

[The referenced information follows:]

Senator Fischer. Mr. Lorenz, I would like to thank you for being here today. In your testimony you discussed how this bill would alleviate what I think you and I both agree is kind of nonsensical regulatory barriers that prevent consumers from choosing the fuel that they want to use in their vehicles during the summer months. Can you please explain to me the process your stores must undertake to comply with this barrier during the current summer fueling season?

Mr. Lorenz. Absolutely, Senator. So we currently have, as I mentioned, 190 stores, and that has continued to grow, with an average of five dispensers per store. So before June 1st this year we had to replace almost 2,000 stickers or labels on all those dispensers; five dispensers, 190 stores, both sides.

Senator Fischer. And do you believe that the current treatment of E15 limits consumer choice?

Mr. Lorenz. Absolutely. Here you have a product that is perfectly fine for eight and a half months out of the year, but for an antiquated regulation you can't sell it for three and a half months out of the year. I know of no other product on the market that falls into that category.

Senator Fischer. I thank you for your support of the bill and for consumer choice. So thank you.

I assume that you talk to other E15 retailers around the Country on a fairly regular basis. Do they share your views with this regulatory issue?

Mr. Lorenz. Oh, absolutely. All the same.

Senator Fischer. And we hear a lot in this debate on the impact this would have on small engines, off-road engines. Can you tell me what percentage of fuel sold nationwide goes into these engines?

Mr. Lorenz. I know the combination between small engines, boats, and motorcycles is about three percent. Well, let's say E0 would be three percent.

But I think just to add, if I may, Senator, our customers consist of homeowners, motorcyclists, boat owners, and we have no incidents, having sold this product for almost two years, we have no problems with misfueling. To your point about the surveys, people know what to put in their boat, car, small engine, motorcycle.

Senator Fischer. As follow-up, do you believe consumers can continue to correctly choose the right fuel for their engines?

Mr. Lorenz. Absolutely. You know, for eight and a half months out of the year, again, we assume they can, and now for this reason we are saying for three and a half months out of the

year there is this concern that they are not going to be able to select the right choice. So it doesn't make any sense to me.

Senator Fischer. I agree with you.

Are you concerned about any liability on misfueling?

Mr. Lorenz. We guaranty all the gas that we sell, so if there was a problem caused by the fuel that we sold you, we are going to make it right and fix it.

Senator Fischer Good. Thank you, sir.

Thank you, Mr. Chairman.

Senator Barrasso. Thank you very much for your questions.

It seems that there were a number of Democrats who were here, and none of them are back right now, Senator Carper, so with that I am going to head back to the Republican side for questions and turn to Senator Rounds.

Senator Rounds. Thank you, Mr. Chairman. Just a couple of thoughts.

Mr. Lorenz, the corn ethanol industry in South Dakota has a huge amount of support within our population.

Before I go on, I guess I would like to submit to the record a letter of support for S. 517 from the South Dakota Corn Growers.

Senator Barrasso. Without objection.

[The referenced information follows:]

Senator Rounds. Thank you, Mr. Chairman.

The corn ethanol industry in South Dakota employs literally tens of thousands of South Dakotans, and it really is a pillar of our State's economy. We have the capability of producing nearly a billion gallons of this product per year. As the market for ethanol increases, the market for corn will grow, and that means more jobs and increased revenue for corn farmers, many of whom work on their own family-owned farms.

There is a byproduct, the dry distillers grain and the wet distillers grain, which I think you find in the upper Midwest we all recognize as being a very high quality food product for livestock. We call it, in some cases, Dakota gold, and we market it not only in South Dakota, but to dairy farmers throughout the Country. California even brings it in, so it is a high quality product. And the more ethanol we produce, the more of the byproducts we also have available as well. So it isn't necessarily a matter of losing food production to the production of alcohol.

I am just curious, Mr. Lorenz, when you look at this particular legislation that is in front of us, where we go from 10 to 15, don't you think that what we are really doing is just taking out a whole lot of red tape so we can sell basically the same or very similar product throughout the year?

Mr. Lorenz. Absolutely. Like I have said before, we have the ability to sell this product for eight and a half months out of the year, and it is purely, in our view, a technicality and an antiquated regulation that doesn't allow us to sell it during the summertime.

Senator Rounds. Between E10 or 10 percent blend of an ethanol with gasoline versus a 15 percent blend, would there be a change in price? Would you expect a change in price?

Mr. Lorenz. We currently offer E15, so I just want to make it clear that in all the stores that we have E15, we also sell E10. So you have a choice, and this is what it is all about for us, is giving the consumer a choice. So we typically sell that from 3 to 5 cents a gallon, currently 5 cents a gallon less than 87. So it is not only more affordable; it is higher octane and cleaner burning, which appeals to the consumer.

Senator Rounds. And I think that is important to point out. I think it is fair to say that most people, I think, would assume that if you have a higher octane fuel, you have a better fuel. Would that be fair to say as not only a belief, but perhaps found in fact?

Mr. Lorenz. The consumer equates higher octane with better performance, which is true. And they also equate that with higher price. The thing about E15 is it is actually breaking down the consumer's paradigm on fuel on two levels, because you

have a fuel that is not only cheaper, but also cleaner burning. And typically a consumer would expect to pay more for a fuel that is higher octane and more environmentally friendly, and that is not the case with E15.

Senator Rounds. Ms. Yanowitz, I am just curious. The last statement in your testimony you say, "Data indicates that replacing E10 with an E15 of the same vapor pressure will cause a slight decrease in emissions of ozone-forming organic compounds and carbon monoxide." Can you elaborate on that statement?

And I would just like you to answer one other question for me as well, and that is I am really curious, I always thought that alcohol was alcohol and, by definition, would have a similar formula. Can you share any thoughts? And I know that Mr. Teske had suggested the change in ethanol from a sugar cane base versus a corn base. Is there actually differences in terms of the chemical compounds between the two of them?

Ms. Yanowitz. You are quite right, ethanol is ethanol wherever it is, but in Brazil they use some hydrous ethanol that has water in it, and there could be differences in emissions, for example,

Senator Rounds. Okay. When we talk about the value, the ability to determine octane, and for this, Brooke, if you wouldn't mind, I like a higher octane in my vehicles, and I try

to buy it. I buy E20 and E30. I have a flex fuel vehicle that is set up to do that, and I will buy E20 and E30 fuel blends, and part of what I like about it is the fact that I can get a higher octane rating, which I have always assumed was a better product, and it costs me less money as a consumer.

I am just curious. Long-term, when we get to the CAFE standards coming in in the year 2025, in that neighborhood, isn't it going to be a valuable item to be able to have a resource such as an alcohol product, regardless of where it is made, to be able to increase the actual octane ratings at a lower price than what it would be if we had a different type of a product, another chemical than we would have to put in to the existing petroleum products to bring that octane rating up? And aren't we really moving towards advanced fuels when we add something that feeds into that octane rating?

Mr. Coleman. We are. So modern vehicles, and I think the autos have to make their own decisions about which way they are going to go over the next not just five years, but 10, 20 years. But you can tune a modern engine to take advantage of the higher octane and ethanol, and create much greater efficiencies as long as that octane is there and as long as it is clean enough to comply with the Clean Air Act; and the only solution in that lane is ethanol and alcohol. So where we want to go is to give, as Mike said, consumers a choice at the pump. But imagine a

scenario where the higher ethanol blends are actually cheaper, higher octane and create efficiencies from an internal combustion engine that really get to where everybody wants to go.

Senator Rounds. Thank you.

Thank you, Mr. Chairman.

Senator Barrasso. Thank you, Senator Rounds.

Senator Ernst.

Senator Ernst. Thank you, Mr. Chairman. And thanks to all of the witnesses here today. This really, truly, Chairman, is one of the most exciting panels that I have seen so far. This is really great and a wonderful topic for the folks in the Midwest that actually do grow corn. I want to echo sentiments about the DDGs, the distillers grains that are used as feedstock. Those that know ethanol production know that very little is wasted from that original kernel of corn when it enters into that plant; it is all used for the benefit of our livestock and our growers.

So removing this unnecessary impediment for retailers and consumers alike is a crucial step towards expanded acceptance of biofuels nationwide and will help pave the way for advanced biofuels. I would like to enter for the record two letters from different groups expressing their support for this legislation,

along with a survey conducted earlier this month of small engine machine owners.

Senator Barrasso. Without objection.

Senator Ernst. Okay. Thank you, Mr. Chair. I appreciate it.

[The referenced information follows:]

Senator Ernst. And it has been an interesting discussion because a lot of what I have heard today is talking about misfueling.

Mr. Lorenz, you brought up a great point: most folks know what product to use. I am a motorcyclist. I know exactly what I can put into my motorcycle and what I can't.

Mr. Teske, you had mentioned misfueling with small engines. Does Briggs & Stratton offer a two cycle oil-gasoline small engine?

Mr. Teske. We do not.

Senator Ernst. You do not.

Mr. Teske. We do not.

Senator Ernst. Okay. Do you know of other manufacturers that might?

Mr. Teske. Yes.

Senator Ernst. And do you think those consumers can adequately blend that oil and fuel together to properly run their small engines?

Mr. Teske. Yes. But manufacturers have also taken to doing it for them. So there are opportunities where, because there have been failures. I know of lots of failures where people had not properly blended, and ultimately there has been a market now for premixed fuel along the way, too, and that market wouldn't exist if everyone knew how to blend.

Senator Ernst. Do you think that there are consumers at the gas pump or pulling into a station that might fuel their vehicles with diesel when those engines aren't diesel engines?

Mr. Teske. I don't believe so, no. Not that I am aware of.

Senator Ernst. You don't believe so. But we heard other testimony where there is lots of misfueling out there; even if there are barriers provided, other people will try and fuel their cars with the wrong products. To me, that is not trusting the consumer to know their products and what to use in their own vehicles. I think there is a level of trust.

Mr. Lorenz, you said you don't see those misfuels. Is that correct?

Mr. Lorenz. That is absolutely correct. We just, like I said, two years selling E15 and we have had no incidents of misfueling.

Senator Ernst. Okay.

Mr. Lorenz. Or problems with vehicles.

Senator Ernst. Mr. Teske?

Mr. Teske. Senator, if I may. It is generally not the convenience store owner that is going to hear about it; it is going to be us, and specifically through retailers. So we have talked to a number of our retailers. Fuel-related issues are becoming more prevalent.

Senator Ernst. I would say --

Mr. Teske. Up to 40 percent of the returns at a major retailer has to do with fuel-related type issues, and it is just very frustrating because they have identified that a lot of it has to do with ethanol. They put out a promotional campaign that said ditch the ethanol, which we are not advocating to ditch the ethanol.

Senator Ernst. Certainly, I hope you don't.

Mr. Teske. But they did, and ultimately were threatened by a number of different constituents because ultimately ethanol is a problem in small engines. So we warrant up to E10 --

Senator Ernst. Okay. And I understand. I use small engines. I am a motorcyclist, so I do understand, and I hope that most consumers understand the products that they use. But there is an argument here that consumers don't understand what product is right for their small engines, or even for their vehicles, and I think that is a bad argument; that we should discontinue the use of a product simply because consumers don't know what is the recommended product for their own particular engine. So I think we need to trust our consumers.

I would like to go back to Mr. Lorenz. You have E15 products that are offered at your convenience stores. What were the barriers to entry for selling that E15?

Mr. Lorenz. Actually, one of the barriers was this very issue. This was a concern of ours. We still made the business decision to go ahead because we thought that this product was compelling enough of a value proposition to the consumer. This, though, is a severe barrier to actually offering this; worse than actually what we expected. Because we knew this was going to be a problem going in, but what we found is it has really tended to undermine the integrity of the product during the summertime, because relabeling, the consumer really doesn't know what is going on. That doesn't happen with any other fuel, and it is extremely detrimental.

Senator Ernst. Again, I think if it is an okay product to sell any other time during the year, and limiting that opportunity during the summer, again, goes back to availability of product that is approved for sale, but also trusting the consumer and the consumer knowing what is the right product or the best product for them to choose. I think that is somewhat of the underlying issue that we are seeing today.

So I do thank you.

I am out of time, but I want to thank you, Mr. Chair. This has been a great discussion.

Senator Barrasso. Thank you, Senator Ernst.

Senator Duckworth.

Senator Duckworth. Thank you, Mr. Chairman, and also the Ranking Member for convening this very important conversation.

I am a proud cosponsor of the bipartisan Consumer and Fuel Retailer Choice Act because it will solve this regulatory burden without weakening the Clean Air Act.

My bottom line is simple: the renewable fuel standard is a win-win. It creates good jobs in Illinois, across the Midwest, all around the Country, and it helps to cut our Nation's dangerous dependence on foreign oil and reducing greenhouse gas emissions.

Mr. Coleman, many of us support the RFS because it is spurring growth in advanced biofuels. Can you share with us how adopting the waiver that exists for E10 fuels and applying it to E15 will help the advanced biofuels industry grow and create good paying jobs?

Mr. Coleman. Yes. Thank you, Senator Duckworth. I talked a little bit about this, but I would be happy to expand on it.

Senator Duckworth. Please.

Mr. Coleman. Again, the investment in our industry, we are at the point now where we have developed the technology at pilot scale; we have developed the technology at demo scale; and at this point we need money to build plants. And for a very long period nobody was lending money of any type over the great recession five, six years ago, or longer. We are now at a point

where the economy is healthier, but the conversations we are having with investors are will there be demand; is there headspace in the marketplace? And this will fundamentally change that conversation because together with the renewable fuel standard, which provides a greater incentive at this point for cellulosic ethanol, which is good news, actually, for corn ethanol production because it is feedstock diversification, that will change the conversation. We will have the ability to unlock a lot of project finance, which means new refineries, new bolt-on lower carbon; and basically you will have an ethanol industry that gets to the next level from an innovation standpoint.

Senator Duckworth. How much conventional gasoline could we potentially replace once you get to that point?

Mr. Coleman. Well, the upside for cellulosic ethanol alone, according to NREL and some other reports, is tens of billions of gallons from agricultural waste alone, without disrupting food and feed markets. So that is obviously a study, so that is a ceiling analysis. But if this technology were to commercialize in scale in a similar way that corn ethanol did, which is very quickly, we are talking about billions of gallons of displacement of foreign oil working together with other technologies to get energy independent.

Senator Duckworth. Thank you.

Dr. Yanowitz, I understand that you have worked extensively with the master renewable energy laboratory and studied the impact of ethanol on vapor pressure specifically. I am wondering if you could characterize your opinion on the environmental impacts of ethanol more broadly. Can you share your thoughts, for example, of ethanol's impact on greenhouse gas emissions?

Ms. Yanowitz. I am really a one-trick pony.

[Laughter.]

Ms. Yanowitz. I can't speak to greenhouse gases. I can tell you about ozone. I don't expect there will be any impact on ozone. I expect it will reduce PM emissions. I expect it will be a benefit to air quality, as opposed to greenhouse gas emissions.

Senator Duckworth. Wonderful. Thank you.

Mr. Chairman, I would like to request unanimous consent to submit three letters into the record that support the passing of S. 517, a letter from the Renewable Fuel Association, a letter from 28 members of the advanced and cellulosic industry, and also a letter from the National Corn Growers Association.

Senator Barrasso. Without objection.

Senator Duckworth. Thank you.

[The referenced information follows:]

Senator Duckworth. I would also like to submit an analysis of greenhouse gas benefits associated with this bill.

Senator Barrasso. Without objection.

Senator Duckworth. Thank you.

[The referenced information follows:]

Senator Duckworth. Mr. Lorenz, you indicated in your testimony that Sheetz sells E15 because there is a consumer demand for the fuel, not because of any required mandate. If true, this means that consumers are losing money because E15 is often less expensive than alternative fuels, and gas stations are spending more to comply with labeling burdens that deliver little value to consumers during those summer months.

Is this assessment correct, and can you share how this labeling conundrum is challenging the market?

Mr. Lorenz. Well, I mean, I think it is preventing current retailers from entering into the market and offering E15. It is also affecting retailers that are offering E15 today and the fact that it is difficult to actually grow sales, because we have seen where sales have been growing, then the summer comes along and we have to relabel all of our dispensers, and the sales don't return or the customers don't return after the summer. And I think it has to do with they are just confused as to what the product is because, like I said, there is no other product or no other gasoline fuel that we have to relabel. So they don't know anything about our VP or waivers or anything like that. We actually created a brochure to explain that, but they don't really care. I mean, the consumer just wants to buy their gas and go; they don't want a lesson on gasoline 101 or renewable fuel standards, or anything else.

Senator Duckworth. So this is a burden, especially on those gas station owners who are small businessmen who are trying to just retain their market share and provide a service.

Mr. Lorenz. Oh, absolutely. I mean, I think that we look at it from the standpoint that this is an advantage, that we are offering a new product, giving that consumer choice of a product that is cleaner burning, cheaper; and that is what they want. If you look at the consumer, as a retailer, we speak for the consumer. And what they want, the gasoline product is highly price-sensitive. They want something that is cheaper and higher performance, and that is what E15 gives you.

Senator Duckworth. Thank you.

I yield back, Mr. Chairman.

Senator Barrasso. Thank you, Senator Duckworth.

Senator Boozman.

Senator Boozman. Thank you, Mr. Chairman.

Mr. Teske, I think you gave the statistic that 40 percent of the warranty was fuel-related.

Mr. Teske. Up to 40 percent of the returns to one of the major retailers that we deal a lot with has to do with fuel-related issues.

Senator Boozman. I have heard that also from the retailers. Also, when you visit with the mechanics, the mom-and-pop shops that services equipment, the reality is I think

they would say the same thing; maybe even more so. So we do have a problem in that regard when you look at the return rate, when you look at the people that are actually dealing with the products, so it is something that we have to deal with. You mentioned in your testimony, I believe, you referenced the transition from leaded to unleaded gasoline in the 1970s and 1980s, and during this period new fuel tanks were designed to ensure consumers were not at risk of misfueling. Can you explain why this is preferable to labeling?

Mr. Teske. Having a physical barrier will prevent someone from misfueling. So the whole idea was, back then, is that if there is a physical barrier, you really can't do it. Now, people were trying to circumvent that, but you had to be mindful of what you were doing.

So we don't have that same luxury here. This has to do with a label on a pump, a pump that can be really confusing. And Senator Ernst said we should trust consumers. Consumers are also economic animals, and they believe, and we have studies, as well, that show they basically trust the convenience store not to sell them something that won't work in their product.

So think about a convenience store today. You will have separate pumps for diesel. You will have separate pumps for E85. In my neighborhood, we now have 88, they are calling it unleaded 88, which is E15. It is within the same pump

configuration as what has always been there and, in fact, it is cheaper. So what they will oftentimes do is they will migrate to that cheapest product that is out there because they want to save money. I don't blame them for wanting to save money, but they will have more cost in the long-term because ultimately that engine is going to fail.

So, ultimately, we don't think a label is going to make a difference. We think that it is useful, but it is not going to prevent misfueling from occurring.

Senator Boozman. So in the case of diesel, you simply can't stick it in your -- I think probably most of us, certainly I have tried to do that, when I am daydreaming or whatever. That is just something that most of the audience, I think, has experienced also.

Mr. Coleman, you mentioned cellulosic ethanol. Corn ethanol was supposed to be the bridge as we got into cellulosic ethanol, which makes a lot of sense. Tell me about its progress. This is something we have heard about for a decade now, over a decade, that it was going to be and do, and we are all looking forward to that, but tell me what the sticking points are, why are not there yet, and really foresee into the future, be a futurist for me and tell me what the difference is that is going to be a few years from now or 10 years from now as we make that transition.

Mr. Coleman. Sure. Thank you, Senator, for the question. So essentially cellulosic ethanol became part of national energy policy in 2007 with RFS-2. The rules were completed by EPA in 2010 and, as you know, by then we were mired in a global recession where we couldn't get any lent money, essentially, to build. So there was a delay. President Obama --

Senator Boozman. But it really went back even before that, in the sense of the --

Mr. Coleman. Well, as I had mentioned earlier in my testimony, doing the stuff in the lab and actually convincing the oil industry to buy it are two different things, and the RFS-2 was really the first time that we had a law that would require the oil industry to buy it in a non-competitive marketplace. The good news is it is no longer a future issue. As Senator Ernst knows and Senator Fischer knows, we now have enzyme facilities up and running, cellulosic ethanol commercial facilities up and running, three of them in Iowa. So what you will see over the next couple years is what we --

Senator Boozman. So it is cost-effective now?

Mr. Coleman. It is cost-effective. You have to remember that ethanol replaces some of the most expensive components of gasoline. It is an octane enhancer. And I am sure Mike or others could expand on this. But we are not replacing conventional gasoline; we are replacing benzene, alkylates. And

some of these things are \$5.00 a gallon, which is why you are seeing savings. So we will see commercial learning curve achievements over the next four or five years if we can get demand, and that is why this bill is so important.

Senator Boozman. Okay.

Thank you, Mr. Chairman.

Senator Barrasso. Thank you, Senator Boozman.

Senator Markey.

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

Mr. Coleman, in Massachusetts and in many other States across the Country we use reformulated gasoline that is designed to burn more cleanly and reduce smog forming and toxic pollutants. Could you comment on the impact of this bill on reformulated gasoline areas like Massachusetts?

Mr. Coleman. Appreciate the question, Senator Markey. This does not affect RFG zones at all. Ethanol waivers are not allowed in RFG zones. Essentially, the oil industry produces sub-vapor pressure-based gasoline, so this is really a conventional gasoline law.

Senator Markey. In order to create a higher octane fuel that allows engines to run more efficiently, petroleum refiners add benzene-based aromatic hydrocarbons known as BTEX. But there is a major problem with BTEX, and its combustion byproducts are carcinogenic and neurotoxic and a major source of

toxins in urban areas. Maybe instead of BTEX it should have been BTOX they are called.

The good news is that ethanol is an even better octane booster than BTEX, and it is cheaper, as well.

Could increasing usage of E15 reduce America's exposure to BTEX?

Mr. Coleman. Yes. In order to comply with the Clean Air Act, you can't have too much octane or too much of these components, so when you add more ethanol, by definition you have to take some stuff out of the blend to make sure that it complies with fuel specs. So what comes out is the most toxic and often expensive octane enhancers, as you describe, and replacing them with something that is renewable and American made.

Senator Markey. Dr. Yanowitz, could you discuss some of the dangers to human health associated with BTEX, benzene, toluene, xylene?

Ms. Yanowitz. I am certainly not an expert on, again, this topic, but benzene is a well known carcinogen, and removing any petroleum from the mix will reduce the amount of this carcinogen in the air.

Senator Markey. And in your expert opinion, would it be possible for refiners to replace the BTEX in gasoline with

ethanol and deliver consumers a high octane premium gasoline that costs the same as regular?

Ms. Yanowitz. They can certainly remove some of the benzene by replacing it with ethanol.

Senator Markey. Mr. Lewis, have you looked at the impact of air toxics from BTEX in gasoline, and is the Clean Air Task Force concerned about these pollutants?

Mr. Lewis. We are concerned about those pollutants.

Senator Markey. You are concerned?

Mr. Lewis. Certainly.

Senator Markey. What is the concern?

Mr. Lewis. With respect to BTEX?

Senator Markey. Yes.

Mr. Lewis. We are concerned about the carcinogen effects of BTEX. We are also concerned about the toxic impacts of aldehydes. And there is mixed impacts from ethanol on both fronts.

Senator Markey. Mr. Coleman, in your testimony you note that all types of ethanol have lower lifecycle carbon emissions than gasoline, even after accounting for changes in land use. Is this because more and more of the oil we are extracting today is coming from hard-to-reach sources like deep ocean drilling, shale, and tar sands?

Mr. Coleman. That is part of it. You know, essentially we know more now than we did 10 years ago, and the more recent analysis reflects efficiencies on the biorefining side for all fuels. It also reflects more knowledge on land use. But you make a good point. These fuels should not be analyzed in a vacuum. So if you take ethanol out or add it back in, you are either replacing it or displacing something, and that something is not average petroleum. There is no big tank in the middle of the Country where it is all mixed together. What is actually being replaced is marginal petroleum. The era of light sweet crude is over and, as you can see, the oil companies are looking in deepwater, fracked oil, heavy oil from Venezuela, and we are displacing the marginal gallon of oil, which is significantly more carbon intensive, and that is particularly the case with regard to tar sands.

Senator Markey. And I know that some of the other Senators have already asked questions on the share of this growing advanced biofuel industry and the impact on climate change. Since that has already been covered, I won't go over that same territory.

I was the chairman of the Select Committee on Energy Independence and Global Warming back in 2007, when we created that new law with regard to cellulosic, and in the law it said that by 2022 our national goal was 16 billion gallons of

cellulosic biofuels. And, of course, that was December of 2007 when that law was signed into law by George Bush. 2008, the biggest recession since the Great Depression. 2009 it continued. The capital markets were very skittish about the investment that would have to be made, so it was an unfortunate worst case scenario for the cellulosic industry in terms of getting off the ground to meet these goals. And the goals have been lowered, but it still offers tremendous promise for the future and it is starting to really pick up some momentum right now. So that is our great hope.

Thank you, Mr. Chairman.

Senator Barrasso. Thank you very much.

Senator Carper.

Senator Carper. Thanks very much.

When I got out of the Navy near the end of the Vietnam War, I moved from California to Delaware to get an MBA, and I remember one of the courses I took was marketing. And the professor brought into our class one day not a glass, but he brought in a container from margarine, and he said what do I have here? And we said, well, that is a container for margarine. And he said, people buy this for different reasons. He said some people buy this margarine because of the price. Some other people buy margarine because of the taste. Some of them buy the margarine because of its, I don't know, its health

benefits for them, or lack thereof. He said some people buy the margarine because this container is recyclable. Some people buy it because they like the way it looks and they want to use it for storing things. But he said people buy it for a lot of different reasons.

And sitting here I was reminded today of a little bit of that. People buy ethanol for fuel for their vehicles for different reasons. Some people think it is good for the environment. There is reason to believe maybe that is true. Others think that is not the case. Some folks buy it because they think there is better value, lower cost, and we actually have higher performance because of the octane. Some people buy it because they like the idea that we want to reduce our reliance on foreign oil.

I have a concern. I will go to Todd and the concern that he has raised about the impact on their business and their customers and so forth. I think we have to follow the Golden Rule, put ourselves in their shoes; how would we wanted to be treated here. I think that is important for us to keep in mind.

For me, a real consideration of this legislation deals with the RIN market and trying to decrease volatility in the RIN market. There is a saying, you have heard it: All politics is local. One of Ed Markey's great mentors, Tip O'Neill, used to say that, so a half dozen or so refineries, mostly on the east

coast, for which this spiking up and down, volatility in the RIN market, is threatening to put them out of business. And we are anxious to see if there is some way to address, either in this legislation or other legislation, the way to reduce the volatility in the RIN market.

Could you just explain, Mr. Coleman, for us or describe how many more RINs, just roughly how many more RINs we are talking about that might become available if a bill like this were to become law and what more could we do to make the RIN market more transparent?

Mr. Coleman. Well, my view on this, although there are different kinds of RINs and, as you know, we have gotten to the point where the conventional biofuel RIN, which is predominantly corn ethanol, which is the one of concern for refineries, we are no longer increasing the requirement for that RIN. So pressure is going to come off of that RIN. Now, it takes a little while for that fuel to flow out, but the more that fuel does flow out, the less pressure there will be on credit markets. Where this will really generate results is the production of D3 cellulosic RINs because suddenly you are changing the discussion.

So I guess I would summarize a relatively complicated issue by saying the degree to which we facilitate a shift to using more renewable fuel and ethanol, it pushes the market away from putting pressure on RIN markets, which is what creates that

volatility more towards usability of the fuel, which takes pressure off those RIN markets. And it also moves it towards D3 RINs and away from the RINs that have been an issue for your refineries.

Senator Carper. All right, thanks.

Mr. Chairman, I said at the beginning this is a good panel, and it is one if I wanted to find some consensus on this issue, this is probably a good place to start. I think I have some reservations about the legislation that is before us. I know others do as well. But for me, in deciding where to go, one of the issues we have to address as part of it is the one I have raised here today.

Thank you all for coming. Thank you for your thoughtful testimonies. We are just very grateful to you. Thank you.

Senator Barrasso. Thank you, Senator Carper.

Mr. Lewis, anything you would like to add? You have been sitting here mostly quietly for a little while.

Mr. Lewis. Thank you. I would like to respond to the point that Mr. Coleman made that we cherry-pick data. I just want to point out that the National Research Council took the same exact approach that we did in determining whether or not EPA's greenhouse gas emissions analysis for corn ethanol was accurate.

And I would just like to leave off by saying there are important unanswered questions about the extent to which expanded use of E15 will impact corn ethanol production levels and ozone formation, and we think that those questions should be studied and answered before any further consideration of this bill occurs.

Thank you.

Senator Barrasso. Well, thank you.

I want to thank all of you. I thought it was a very productive discussion. We obviously had a lot of people here attending the hearing and a very busy day here on Capitol Hill. Members are going to be able to submit questions for the record. The hearing record is going to stay open for two weeks, so please, if you get written questions, respond quickly.

I want to thank all of the witnesses for your testimony today.

Thank you, Senator Carper.

The hearing is adjourned.

[Whereupon, at 11:50 a.m. the committee was adjourned.]