

TESTIMONY OF
MS. EMILY SKOR
BEFORE THE
**SUBCOMMITTEE ON
THE ENVIRONMENT**
HOUSE COMMITTEE
ON ENERGY & COMMERCE

High Octane Fuels and
High Efficiency Vehicles:
Challenges and Opportunities

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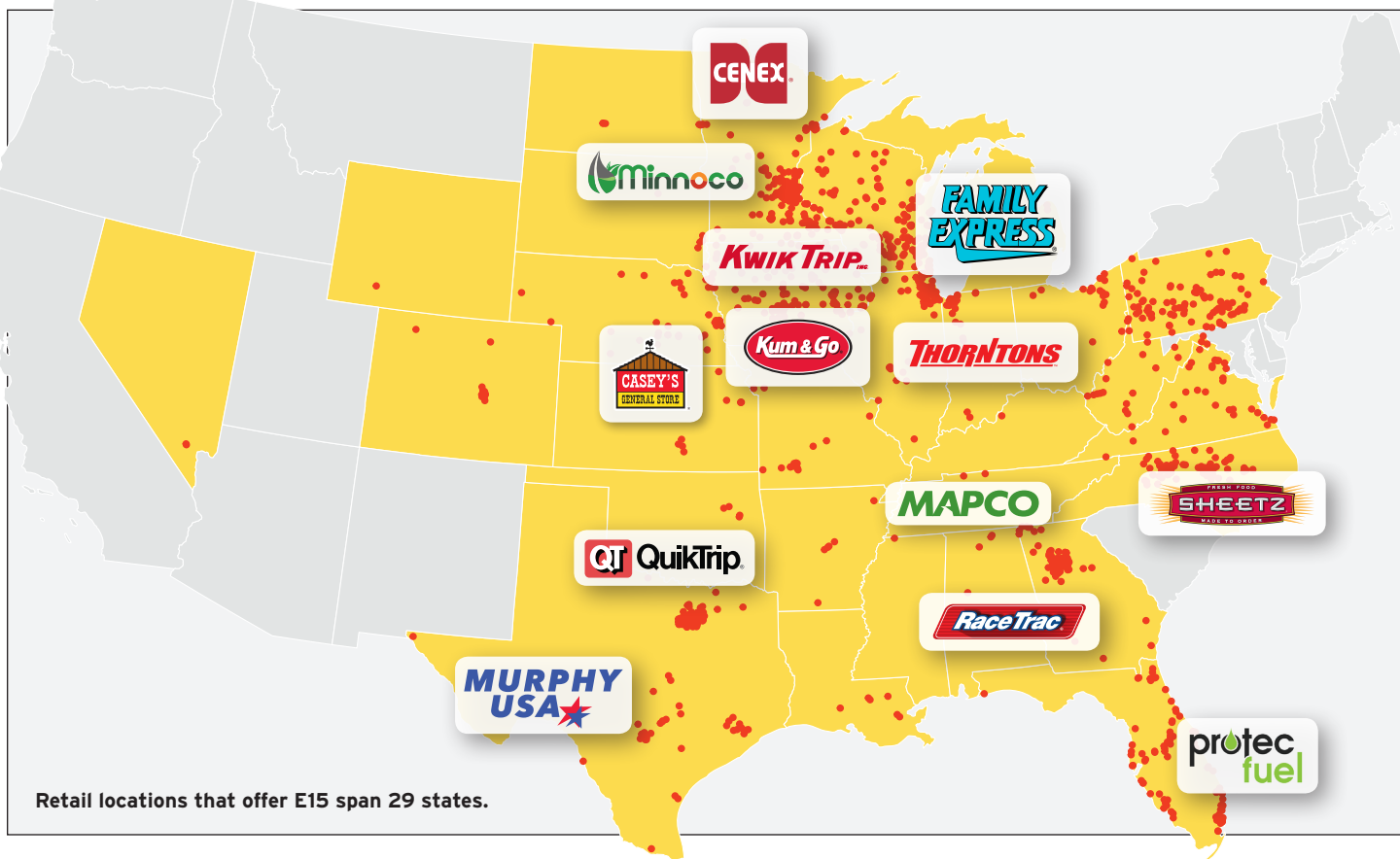
Chairman Shimkus, Ranking Member Tonko:

Thank you for the opportunity to appear today to discuss **the importance of ethanol and the Renewable Fuel Standard (RFS)** and their contributions to high-octane fuels and future fuel economy standards for vehicles.



My name is Emily Skor, and I am the CEO of Growth Energy. Growth Energy is the leading trade association for the ethanol industry, and we are proud to represent 89 producers, 78 companies involved in the ethanol supply chain, and tens of thousands of ethanol supporters around the country. We are working to bring consumers better choices at the fuel pump, grow America's economy, and improve the environment for future generations. Our growing membership base now represents nearly half of all American ethanol plants along with many of the largest and most prominent fuel retailers in the country. In 2016 alone, our industry contributed over \$44 billion to the nation's Gross domestic product (GDP) and supported 360,000 American jobs.

Ethanol is a homegrown biofuel that is now blended into 97 percent of our fuel supply, meeting more than 10 percent of our motor fuel needs. And because ethanol blended fuels have the highest octane of any available liquid alternatives, it allows for better performing engines that have greater fuel efficiency. Furthermore, our industry today produces over 15 billion gallons of renewable fuel and over 44 million tons of animal feed, which



helps meet our nation's need for fuel and food.

Every gallon of clean-burning ethanol decreases our dependence on foreign oil. In fact, since 2005 – the year the RFS was enacted – we have helped cut our oil imports by more than half. But gasoline consumption has increased over the last five years, and ethanol can help meet that growing demand for fuel. In 2016 alone, biofuels displaced 510 million barrels of oil. Overall, American ethanol has increased our energy security, reduced our dangerous dependence on foreign oil, created American jobs, and improved our nation's environment.

The American biofuels industry stands ready to move America forward. With a stable policy and market access, we believe we can deliver low-carbon, low-cost, high-performing, sustainable vehicle fuel solutions. This will save consumers money at the pump, increase vehicle performance, and improve our environment.

THE RENEWABLE FUEL STANDARD IS KEY TO BIOFUELS INNOVATION

In years past, consumers had limited choices when it came to alternative transportation fuels. Congress recognized the importance of having a more diverse and stable fuel supply and enacted the RFS in 2005. Congress then revised it further in 2007 to specifically drive innovation and investment in biofuels of all kinds. The RFS set forth a long-term predictable energy strategy to blend 36 billion gallons of renewable fuel into our transportation fuel supply by 2022 and beyond. With the stability provided by the RFS, our industry is now successfully producing more than 15 billion gallons of ethanol. The RFS is lowering our dependence on foreign oil, keeping our air clean, and is essential to the topic of the hearing today. It is providing consumers access to more affordable fuel options that

are also good for engine performance. The RFS is a critical component to the success of our nation's rural economy. The policy supports nearly 360,000 U.S. jobs while saving taxpayers billions of dollars in farm program payments. In fact, moving to higher blends such as E15 will create an additional 136,000 jobs. It is obvious that ethanol production has provided an essential market for our nation's grain farmers and has revitalized rural communities around the country.

The RFS program is also driving considerable investment in the next generation of advanced biofuels, like cellulosic ethanol. These advanced biofuels can reduce emissions by 100 percent, and we are now seeing the first commercial-scale cellulosic ethanol plants bringing advanced biofuels to the market. These next generation biofuels are made today by turning corn kernel fiber, corn stover, and other feedstocks into high-value energy. In the past, rulemaking delays by the Environmental Protection Agency (EPA) to enforce statutory targets set by the RFS have led to a halt in investment in advanced biofuels. Cellulosic ethanol production is now a reality, and it is vital that the RFS be implemented as Congress intended to reach the statutory goals set by the program.

RECENT THREATS TO THE RFS AND HIGHER BIOFUEL BLENDING

While delayed RFS rulemaking in the past has led to a halt in investment and the growth of higher blends, more recently we have seen several actions taken by EPA that have significantly impacted the marketplace and further growth in higher ethanol blends. First, we saw EPA agree to absolve the Philadelphia Energy Solutions (PES) Refinery and notably, its wealthy investors of its obligations under the Clean Air Act even though they have had more than a decade to invest in higher biofuel blending. The PES settlement alone resulted in these wealthy investors being released from nearly 500 million renewable fuel credits. Next, we have seen numerous back-door waivers provided to refiners - including for oil giants. Only recently have some of these waivers come to light. In its 2018 RFS rulemaking, EPA discussed some of these waivers in aggregate again reducing obli-

gations by more than 300 million renewable fuel credits. These actions taken together have the impact of taking away of nearly 1 billion gallons of demand for homegrown biofuels as well as for the related demand in American agriculture.

It is imperative that the RFS not be undermined and that the intent of Congress to further drive innovation and to continue to provide access to the marketplace for renewable fuels be upheld.

MOVING TO HIGHER LEVEL ETHANOL BLENDS

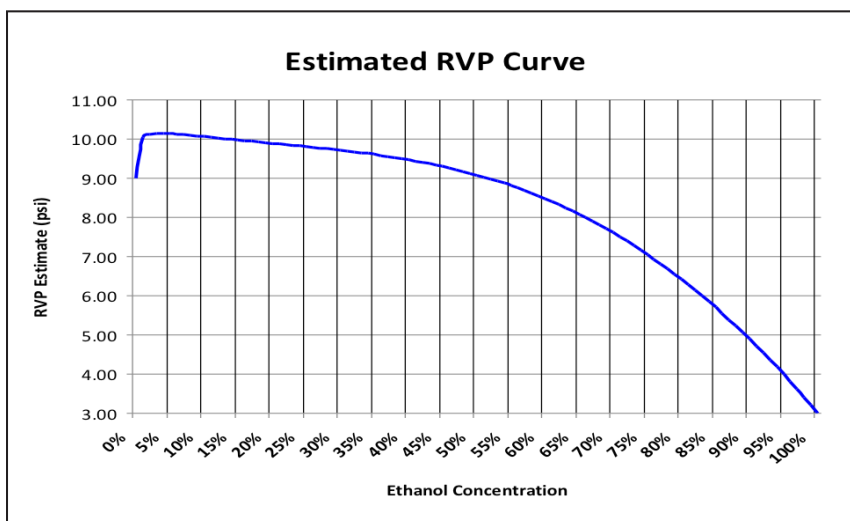
For the RFS to continue to succeed as Congress intended and continue to drive innovation and investment in our rural economy as well as in next generation biofuels, U.S. consumers need to be given access to alternative fuel choices at the pump. In 2011 the EPA approved the sale of E15 for all 2001 and newer vehicles. Since that time, Growth Energy has worked with fuel retailers to build the marketplace for higher levels of biofuels, such as E15, E85, and installing key infrastructure that can be used for high-octane, midlevel ethanol blends such as E30. Today, these higher ethanol blends are available at thousands of gas stations around the country, and with E15, consumers are saving 3 to 10 cents per gallon. Major retailers such as Sheetz, Kum and Go, RaceTrac, Kwiktrip, Quiktrip, Thorntons, Caseys, Mapco, Protec Fuels, Family Express, Murphy USA, Cenex, and Minnoco are making these cost-competitive ethanol blends available to more and more consumers by offering them at more than 1300 high-volume fuel locations in 29 states including Colorado, Georgia, Illinois, Michigan, Mississippi, North Dakota, Ohio, Tennessee, Texas, and West Virginia.

REID VAPOR PRESSURE (RVP)

While we continue to grow the market for E15 and higher ethanol blends, the largest impediment to market growth is the restriction on summer sales from Reid Vapor Pressure. Reid Vapor Pressure, or RVP, is the term used to measure the evaporative emissions of a fuel. In 1990, Congress limited RVP to 9 pounds per square inch (psi) as part of a larger effort to combat smog during the summer fueling

season, which lasts from June 1 until September 15. Under this provision, fuel blended with 10 percent ethanol (E10) would be granted a 1 psi waiver from RVP requirements, allowing E10 to be sold year-round nationwide. This 1 psi waiver was extended in part because ethanol blended fuels reduce other types of emissions, including carbon monoxide, tailpipe, and particulate emissions. The waiver applied only to ethanol fuel blends E10 and lower and excluded ethanol blends above 10 percent, even though the overall RVP decreases as the percentage of ethanol blends increases. Therefore, when E15 was approved as gasoline for 2001 and newer vehicles, it did not receive the same 1 psi waiver

that was extended to E10, and E15 cannot currently be sold year-round nationwide. No other fuel product on the market is treated like E15. Every other large-scale, commercially available liquid fuel can be sold the same way year-round. However, in the case of E15 and potentially higher ethanol blends, without the technical regulatory fix in H.R. 1311, fuel retailers are forced to change fuels or relabel E15 as flex-fuel only during the summer fueling season (June 1 - September 15). The number of stations selling E15 is rapidly growing, resulting in more pumps that need to be relabeled twice a year at an approximate annual cost of \$200 to switch labels at the beginning and end of the summer fueling season – on every single dispenser. With more than 1,300 retail stations in 29 states currently selling E15, it is estimated that roughly 11,000 fuel pumps sell E15. For 2017, this switching cost was almost \$2.2 million. That is more than \$2 million in lost revenue for other store upgrades. And that \$2 million nets the U.S. zero additional environmental benefit. Given that there could be 2,000 active E15 stations by the end of this year, the switching cost alone in 2018 could be almost \$5 million.



HIGH-OCTANE FUELS AND MIDLEVEL ETHANOL BLENDS

While E15 is approved for all 2001 and newer automobiles, representing roughly 90 percent of the vehicles on the road today and has been run for nearly 4 billion consumer miles without any issues, I want to talk more about ethanol's substantial benefits as a high-octane fuel.

Both worldwide and U.S. fuel economy standards for vehicles are increasingly becoming more and more stringent. Automobile manufacturers are being forced to move toward higher efficiency engines that require high-octane fuels to operate effectively, meet fuel economy standards, and lower greenhouse gases. Ethanol continues to be the most valuable and competitive source of octane in the world, and because it is also lower in greenhouse gas emissions, it would provide substantial benefits to automobile manufacturers.

Growth Energy has been an industry leader in advocacy in this area, first commenting to both the U.S. EPA and the California Air Resources Board on



E15 labeling most of the year.



E15 labeling during summer months.

the need for higher octane, midlevel ethanol blends when the greenhouse gas standards for vehicles were being first developed in 2012. At that time, we submitted a proposal for a 100 Research Octane Number (RON), E30 fuel for both vehicle certification and for consumer use.

The science supporting the benefits of a high-octane fuel -- specifically a midlevel ethanol blend in the E20 to E30 range in conjunction with a high compression ratio engine - is not new and has been well explored by several national laboratories including Oak Ridge National Laboratory, National Renewable Energy Laboratory, and Argonne National Laboratory as well as automobile manufacturers and other scientific institutions. Ethanol has a very high octane number relative to other gasoline hydrocarbons, has a lower carbon content than the gasoline components it generally replaces, and has many other benefits that assist in combustion to increase engine efficiency and reduce both tailpipe greenhouse gas and criteria pollutant emissions. The key studies that have been conducted over the past five years that highlight the efficiency improvements and environmental benefits associated with midlevel ethanol blends include:

- Leone, T., Anderson, J., Stein R. et al., *Effects of Fuel Octane Rating and Ethanol Content on Knock, Fuel Economy, and CO₂ for a Turbocharged DI Engine*, SAE 2014-01-1228, April 1, 2014.
- Leone, T., Anderson, J. et al., *The Effect of Compression Ratio, Fuel Octane Rating, and Ethanol Content on Spark-Ignition Engine Efficiency*, *Environmental Science and Technology*, 2015, 49, 10778-10789.
- West B, McCormick, R., Wang M. et al., *Summary of High-Octane, Mid-Level Ethanol Blends Study*, ORNL/TM-2016/42, July 2016.
- Jung, H., Shelby, M., Stein, R. et al., *Effect of Ethanol on Part Load Thermal Efficiency and CO₂ Emissions of SI Engines*, SAE 2013-01-1634, April 8, 2013.
- Leone, T., Anderson, J. et al., *Fuel Economy and CO₂ Emissions of Ethanol-Gasoline Blends in a Turbocharged DI Engine*, SAE 2013-01-1321, April 8, 2013.
- In 2013, Daimler (Mercedes-Benz) identified a worldwide strategy that incorporates E20 to E25 as the main grade gasoline fuel for the 2017-2020 period because "[i]ncreased octane with mid-blend ethanol fuels is [the] key to simultaneously achieve GHG compliance with high customer satisfaction." "Advanced Powertrain Technology Coupled with Octane & Ethanol - Benefits and Opportunities" at 19, William Woebkenberg, Mercedes-Benz Research and Development North America, 2013 SAE High Octane Fuels Symposium.
- Ford Motor Company, which has done extensive research into high-octane fuels, highlighted the GHG emissions benefits of biofuels in its 2014/2015 Sustainability Report and referenced the efficiency gains of naturally high-octane ethanol, with optimized engines. See Ford Sustainability Report 2014/2015, available at: <http://corporate.ford.com/content/dam/corporate/en/company/2014-15-Sustainability-Report.pdf>

To briefly summarize, multiple studies have shown that a high RON, midlevel ethanol blend (e.g. 96-RON E20 or 100-RON E30) when paired with various higher compression ratio engines yield tailpipe CO₂ emissions reductions of at least 5 percent, which in most instances were also coupled with efficiency gains. Some studies also showed significant volumetric miles per gallon savings associated with the higher efficiency engines and a high-octane fuel. One study that was submitted to EPA in response to their Draft Technical Assessment Report (TAR) by Air Improvement Resources, "Evaluation of Costs of EPA's 2022-2025 GHG Standards with High Octane Fuels and Optimized High Efficiency Engines," showed that the use of a 98 RON, E25 would reduce the cost of a MY 2025 vehicle by \$400 and a popular crossover SUV by as much as \$873.

Not only are the benefits of midlevel ethanol blends well understood by the scientific community, but the automobile industry has for years acknowledged the importance of affordable, high-octane fuels coupled with high-compression ratio engines as important to attaining regulatory compliance and improving vehicle performance in the most economical manner possible. A couple of examples can be found below:

When you examine the data, there are clear benefits of moving to a high-octane, midlevel ethanol blend, such as E30, including vehicle engine efficiency, lower tailpipe emissions, and increased use of renewable fuel. We believe that the use of midlevel ethanol blends will continue to drive investment in more efficient vehicles, as well as more advanced biofuels, such as cellulosic ethanol.

However, we cannot move modestly to an octane level that would simply be met with today's existing, premium gasoline as that would deny consumers significant cost savings, increased engine efficiency, and significant environmental benefits.

Recently, there have been discussions about moving to a 95 RON fuel. While we support the move to higher octane fuels, a 95 RON fuel could easily be met with today's premium gasoline, and there would be little to no incentive to move to biofuel blends above 10 percent. Additionally, we cannot assume

that a modest increase in octane to 95 RON will be the necessary driver to continue to grow demand for American-made biofuels and for corn without the access to the market provided by the RFS. Only with a stable RFS and with a significant boost in octane, coupled with a midlevel ethanol blend, can these substantial benefits be achieved.

CONCLUSION

We can and will continue to support the development and use of high-octane, midlevel ethanol blends for the use in today's and future vehicles; however, we cannot support what would only be a modest move in octane at the expense of one of the most successful energy programs in the last decade with the RFS.

I thank you for the opportunity to testify and welcome your questions. 🌱