



April 13, 2018

The Honorable John Shimkus
Chairman
Subcommittee on Environment
Committee on Energy and Commerce
U.S. House of Representatives

The Honorable Paul Tonko
Ranking Member
Subcommittee on Environment
Committee on Energy and Commerce
U.S. House of Representatives

Dear Chairman Shimkus and Ranking Member Tonko:

On behalf of the members of the American Coalition for Ethanol (ACE), thank you for convening today's hearing to examine the opportunities and challenges with high octane fuels and high efficiency vehicles. The hearing is timely because EPA will soon publicize a notice of proposed rulemaking to revise greenhouse gas (GHG) standards for 2022-2025 model year vehicles.

According to the Energy Information Administration (EIA), by 2025, more than 80 percent of all new vehicles sold in the United States will include turbocharged engines. To prevent fuel detonation ("knocking"), these engines with higher compression ratios will need to run on fuels with a higher octane rating.¹ Higher blends of ethanol can contribute to a higher research octane number (RON) and heat of vaporization, properties which make it an ideal fuel for new engine technologies.

Unfortunately, the previous leadership at EPA refused to acknowledge the inescapable link between engines, fuel, and tailpipe emissions, overlooking the role fuels with a higher octane rating than today's gasoline could play in reducing GHG emissions and improving fuel economy. ACE members are encouraged by your interest in this topic and by the fact EPA is now seeking information on the potential for high octane blends to be a tool for automakers complying with future GHG standards.

In fact, high octane fuels represent a complementary link between automaker compliance with EPA's GHG standards and fulfilling the intent of the Renewable Fuel Standard (RFS). To be more exact, high octane fuel comprised of 25 to 30 percent (98 to 100 RON) ethanol is a cost-effective, low-carbon solution to successful implementation of both the RFS and GHG standards.

One of the reasons Congress enacted the RFS is because refiners control nearly all of the nation's fuel supply terminals. In other words, the "free market" is a myth when it comes to motor fuel because refiners decide whether or not to blend low-cost renewable fuels such as ethanol into the gasoline they make. Similarly, if refiners are left to their own devices, a new minimum high octane fuel will not materialize. It will require a push either by EPA through future automobile GHG standards or by Congress taking action to require a minimum octane rating for fuel.

No matter how a new high octane fuel rating is established, we encourage EPA or Congress to ensure ethanol in the neighborhood of 25 to 30 percent by volume (98 to 100 RON) is part of the equation. The facts show ethanol-enriched high octane fuel is a low-cost tool for automakers to reduce GHG emissions and comply with fuel economy requirements. What's more, comparative research by the

¹ "Vehicle efficiency spurs premium gasoline sales, octane demand." September 7, 2016. Reuters Market Analyst John Kemp.

Department of Energy to find the most promising fuel to help automakers comply with future GHG standards shows ethanol ranks the highest.²

In announcing today's subcommittee hearing, Chairman Shimkus stated, "High octane fuels have the potential to allow for the greater use of ethanol and other octane enhancers in the gasoline supply while increasing the miles per gallon in new cars." While we agree, the statement is incomplete. Capitalizing on the full potential of high octane fuel requires emphasis on fuel economy, tailpipe emissions, and cost.

Some oil refiners will testify today in support of a transition to a new 91 AKI (95 RON) fuel. As we understand this concept, it would limit ethanol's contribution to just 10 percent by volume, falling short of the need to reduce tailpipe emissions and save consumers money at the pump. For these reasons, ACE cannot support any new high octane fuel standard which restricts ethanol's share to just 10 or 15 percent by volume.

The new 95 RON (91 AKI) being proposed by refiners is approximate to today's premium (91-93 AKI) fuel. According to both the EIA and AAA, premium gasoline today costs on average 50 cents per gallon more than regular unleaded.³⁴ It is foolish to move forward on a new high octane fuel which will impose these costs on American consumers by limiting ethanol's contribution. Furthermore, gasoline prices this summer are expected to rise to their highest levels since 2014, surging close to \$3.00 per gallon during the peak driving season.⁵ Ethanol has a blending octane rating of nearly 113 and trades at a discount to gasoline today. Adding 10 or 15 percent ethanol would help bring down the cost of a new premium fuel, but to gain widespread consumer acceptance and save motorists money at the pump, it will be necessary for a new high octane fuel to be a minimum of 98 RON and contain much higher ethanol inclusion rates.

ACE believes fuels in the range of 98-100 RON would deliver more benefits at a lower cost than 95 RON. We are not alone. Tony Ockelford, Director of Product and Business Strategy at Ford Powertrain, said the following about octane and engine efficiency at the 2016 CAR Management Briefing Seminars: "Raise the compression ratio and you are raising the efficiency of the engine. One thing everyone would agree: 100 RON, if ever you could get there, is a nice place."⁶

² <https://transportationtodaynews.com/news/8229-ethanol-based-fuels-good-fuel-economy-environment/>

³ <https://www.eia.gov/todayinenergy/detail.php?id=31732>

⁴ <https://gasprices.aaa.com/state-gas-price-averages/>

⁵ <http://www.wndu.com/content/news/Summer-gas-prices-expected-to-be-highest-since-2014-479422363.html>

⁶ OEMs Continue Push for High-Octane Gas. Wards Auto. April 20, 2016. Tom Murphy.

It should be noted that Europe's use of 102 RON fuel helps deliver a 10 percent fuel efficiency improvement in engines operating with a compression ratio of 11.5:1 or more compared to lower compression engines using the lower octane (95 RON) fuel that is marketed as mid-grade.

Air quality, including tailpipe and lifecycle GHG emissions, is another important factor to consider with the introduction of a new high octane fuel. Some might argue EPA's move to eventually relax GHG standards will increase gasoline use and tailpipe pollution, but not if the new standards pave the way for E25-30 (98 to 100 RON) high octane fuel in future engines. E25-30 high octane fuel would enable automakers to simultaneously reduce GHG emissions and improve fuel economy.

This week, two new studies were released by North Carolina State University (NCSU) and the University of California Riverside (UCR). The Urban Air Initiative commissioned both studies to evaluate toxic emissions and air quality comparing various blends of gasoline and ethanol being sold at the retail level today. In comparing an E25 blend to regular unleaded in Raleigh, the NCSU study found E25 reduced ultrafine particulates by 30 to 40 percent compared to regular unleaded. The E25 blend also reduced carbon monoxide by 15 to 30 percent and carbon emissions by up to 5 percent. Importantly, there was no change in NOx emissions between E25 and unleaded in both flex fuel and non-flex fuel vehicles. The UCR study compared unleaded to E30 and E85 blends, and found the high ethanol blends reduced toxic emissions while aromatics, such as benzene and toluene used to boost gasoline octane, increased emissions.⁷

Ethanol also provides better lifecycle GHG emission benefits than other sources of high octane fuel. Nearly three decades ago, scientists at the U.S. Department of Energy's Argonne National Lab developed the Greenhouse gas and Regulated Emissions and Energy use in Transportation (GREET) model. The GREET model is used to calculate energy use and GHG emissions that occur during the full lifecycle production and combustion of all current and potential transportation fuels. The assumptions used by Argonne scientists in the GREET model are under constant review and updates to the model occur frequently. Current data from the GREET model indicate that corn ethanol's carbon intensity is almost 50 percent less than gasoline, providing significantly more GHG reduction benefits than when the RFS was enacted.

Argonne scientists also recently found the use of E25 and E40 reduce well to wheel GHG emissions by 4 and 8 percent, respectively, relative to baseline E10. When Argonne added the full lifecycle GHG benefits of the higher ethanol levels with the well to wheel reductions, the use of E25 and E40 reduced total emissions by 8 and 17 percent, respectively. Argonne concluded, "the analysis shows that ethanol can be a major enabler in producing high octane fuel and E25 and E40 can result in additional reductions in well to wheel GHG emissions compared to regular E10 gasoline."⁸

⁷ <https://fixourfuel.com/2018/04/11/new-studies-show-ethanol-reduces-emissions-and-improves-air-quality/>

⁸ Well to Wheels Greenhouse Gas Emission Analysis of High Octane Fuels with Ethanol Blending. Argonne National Laboratory. Jeongwoo Han, Michael Wang, and Amgad Elgowainy. August 2016.

In closing, American-made ethanol is the lowest-cost source of fuel octane on the planet. We believe EPA should take steps to unlock the octane, efficiency, and environmental advantages of high octane fuel from ethanol.

Below are steps ACE encourages EPA to take during its next rulemaking process to enable high octane fuel to play a role in helping automakers meet future GHG standards, including:

1. Approve an alternative certification fuel with 25-30 percent ethanol and a minimum octane of 98-100 RON so automakers can begin testing future engines on a high octane blend.
2. Establish a minimum octane performance standard for fuel in the range of 98-100 RON.
3. Restore credits to automakers for the manufacture of flexible fuel vehicles and consider a new incentive for future engines designed to achieve optimal efficiency on high octane fuels.

We appreciate the interest of this subcommittee in high octane fuel and we encourage Congress to consider our comments if action is taken to legislate a new minimum octane rating for fuel.

Sincerely

A handwritten signature in black ink, appearing to read "B. Jennings".

Brian Jennings, CEO
American Coalition for Ethanol