Interest in renewable transportation fuels in general and ethanol as a vehicle fuel in particular goes back to the beginning of the automotive age. One paper on this history of ethanol fuels said: “When Henry Ford told a New York Times reporter that ethyl alcohol was ‘the fuel of the future’ in 1925, he was expressing an option that was widely shared in the automotive community.” The documented debate in the 1920s and 30s regarding ethanol’s role as an automotive fuel mirrors in many ways the debate today on the very same issue: economics, octane rating, supply and the impact of ethanol on vehicles and infrastructure.

The debate paused temporarily after tetraethyl lead was added to inexpensively boost the octane of gasoline, which in turn enabled the use of higher compression internal combustion engines. Inexpensive high-octane gasoline disappeared when emission regulations forced leaded gasoline out of the market in the early 1970s. This in turn led to reduced engine compression ratios and diminished engine efficiency. In spite of nearly a half century of research to create a safe octane-boosting additive to replace lead, the only environmentally safe way to boost the octane rating of gasoline economically is by blending it with ethanol. So today, we are once again debating ethanol’s role in the “fuel of the future.”

The Renewable Fuel Standard (RFS) enacted in 2007 has led to ethanol blend gasoline again becoming widely available in the market. Today, pure gasoline has become a niche fuel like aviation gasoline while the blend of 10 percent ethanol – 90 percent gasoline, or E-10, accounts for nearly all the gasoline sold in the United States. Initially, E-10 was produced by adding ethanol to regular gasoline with an octane rating of 87 AKI (anti-knock index) and the resulting E-10 blend had an octane rating of 89 to 90 AKI. Since regular gasoline only needed an octane rating of 87 AKI, refiners quickly realized that they were “giving octane away.” As a result, they reduced the octane in the gasoline used to blend with to 84 AKI. This in turn reduced the cost to the consumer of the gasoline used today.

If, however, more ethanol could be blended into today’s E-10 (raising the concentration of ethanol from 10% to 25% - 30%), a new gasoline-ethanol blend fuel could be produced that would:

- Have an octane rating of today’s premium grade fuel;
- Result in lower toxic emissions than is the case with today’s premium fuel;
- Cost the consumer about the same as today’s regular grade fuel;
- Allow vehicles designed for this fuel to achieve higher efficiency with the same or better fuel economy as today’s vehicles while substantially reducing their greenhouse gas emissions.

Governments at all levels are being challenged to reduce greenhouse gas emissions. The possibility of doing so at little or no additional cost or inconvenience to the public is an opportunity that cannot be ignored.

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