ETHANOL'S OCTANE ADVANTAGE

HOMEGROWN HORSEPOWER

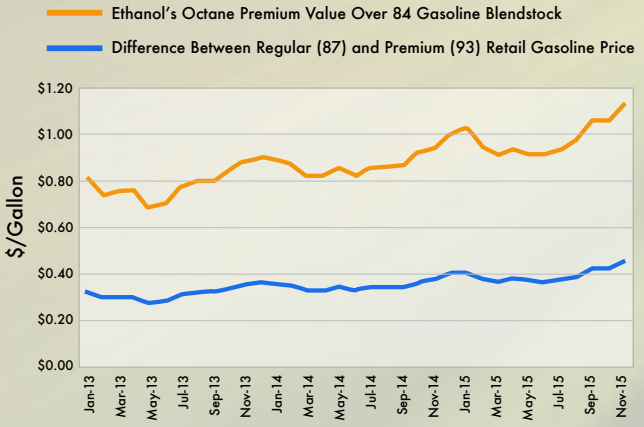
Most of the benefits associated with using ethanol–from reducing petroleum imports to decreasing greenhouse gas emissions–are well known. However, one of ethanol's most important benefits is also one of its best kept secrets: octane.

With an octane rating of 113, ethanol offers more engine knock resistance at a lower cost than any other gasoline additive on the planet. Not too long ago, gasoline refiners produced all of the octane they needed at the refinery from petroleum feedstocks. But refinery processes to increase octane production are energy intensive and costly. In response to the growing availability of ethanol over the past decade, most U.S. gasoline producers have reduced octane production at the refinery and optimized their operations to take advantage of ethanol's superior octane properties. Export markets are increasingly recognizing the appeal of using ethanol for its octane value as well.

Ethanol provides refiners with the lowest-cost solution for upgrading the octane content of gasoline to the minimum levels required for sale into commerce. Most refiners produce gasoline blendstock with an octane rating of 83 or 84, and upgrade it to 87 (the minimum allowable for "regular" grade gasoline in most states) by adding 10% ethanol.

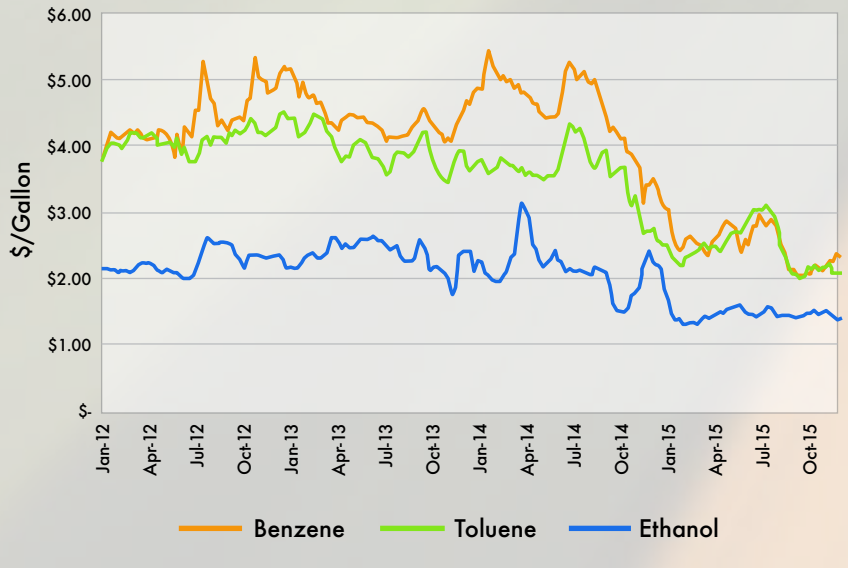
Not only is ethanol the lowest-cost octane source, it is also the cleanest and safest option available. Hydrocarbon octane sources such as MTBE and aromatics like benzene are highly toxic and pose great risk to our air and water.

Ethanol's Octane Premium Value Over Sub-Octane Gasoline Blendstock



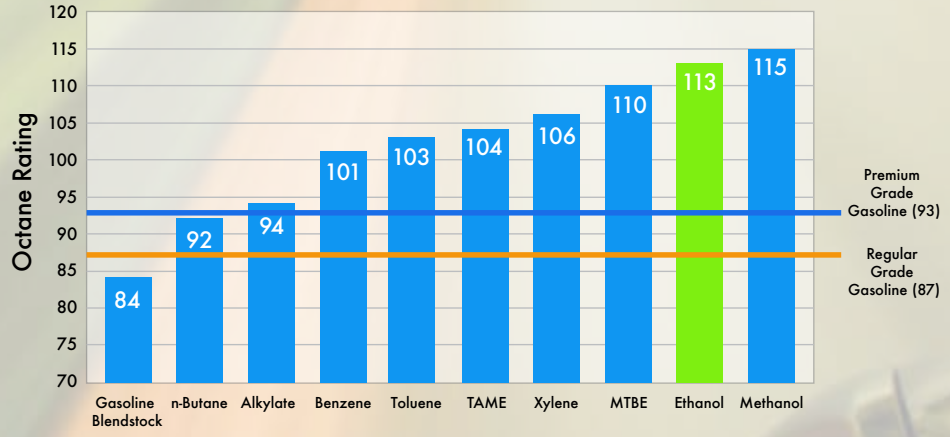
Source: U.S. Dept. of Energy and RFA

Weekly Spot Market Prices for Key Octane Sources



Source: Bloomberg and Thomson-Reuters

"Blending Octane" Ratings of Various Gasoline Components



Source: U.S. Dept. of Energy and Industry Sources

"Ethanol's value as an octane booster was underscored in 2015. Even with the drop in oil prices, we saw record demand for U.S. ethanol because it remained the most cost effective—and cleanest—source of octane in the world."

– *RFA Vice Chairman Mick Henderson, Commonwealth Agri-Energy, LLC*

What is octane and why is it important?

A fuel's OCTANE RATING is the measure of its ability to resist "knocking" or "pinging," which is caused by the air/fuel mixture detonating prematurely during combustion in the engine. According to the Department of Energy, "Using a lower octane fuel than required can cause the engine to run poorly and can damage the engine and emissions control system over time. It may also void your warranty."