

# THE IMPORTANCE OF OCTANE

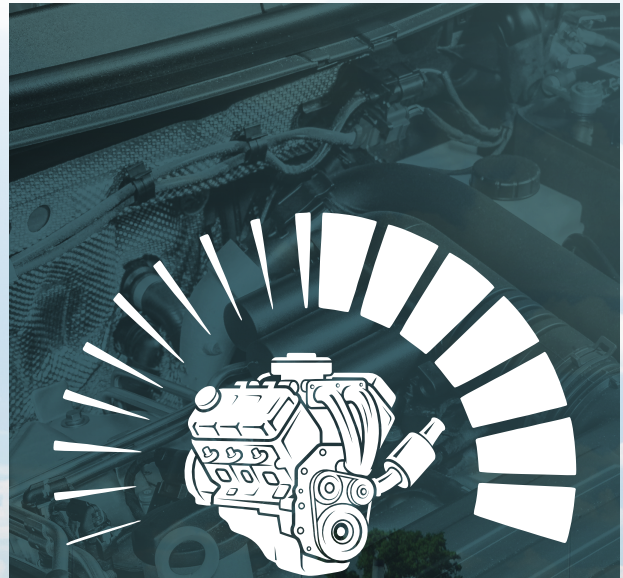
Each year, auto manufacturers produce more turbocharged, higher-compression engines that need higher-octane gasoline to operate efficiently. Currently, automakers either require or recommend premium fuel for more than half the light-duty vehicles on the market, a marketplace dynamic that demands ethanol as a clean and affordable source of octane.

Ethanol's blending octane rating of 114 is significantly higher than the ratings of the main petroleum-based octane components. Moreover, aromatic hydrocarbons such as benzene and toluene may raise octane, but they worsen air pollution and are highly toxic—that's why the use of certain aromatics is strictly limited by the U.S. Environmental Protection Agency and state agencies. In the future, raising the standard inclusion level of ethanol to 15 percent and beyond can enable refiners to further reduce their reliance on harmful aromatics to boost octane.

## ETHANOL'S OCTANE SAVES MONEY

Ethanol as an octane booster saves drivers with each fill-up. A recent analysis conducted by a former BP/Amoco refining engineer estimates the cost of refinery-derived octane to be 4.5 times higher than that of ethanol-derived octane. The analysis found that using just 10 percent ethanol to boost octane ratings reduces gasoline production costs by 39 cents per gallon. If ethanol was removed from the U.S. fuel supply, replacing its current octane contribution with refinery-produced octane would substantially increase refining costs and add \$54 billion per year to consumer spending on gasoline.

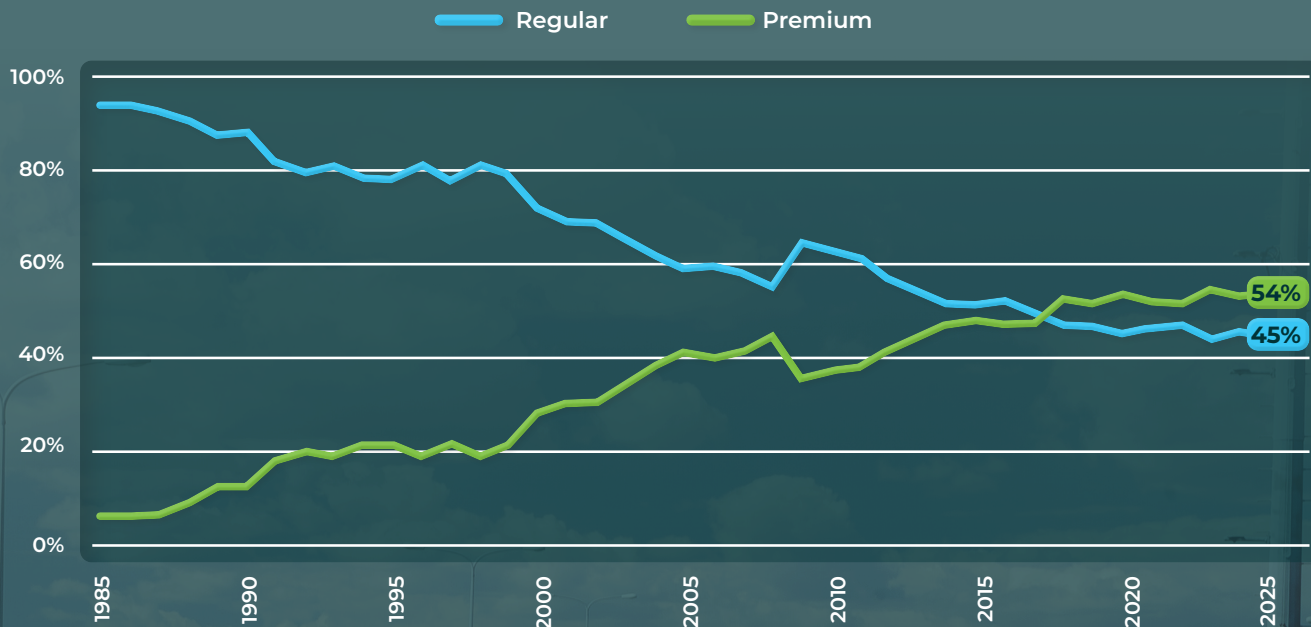
RFA continues to push for an expanded future role for high-octane, low-carbon ethanol and educate policymakers about the benefits of these fuels.



## WHAT IS OCTANE?

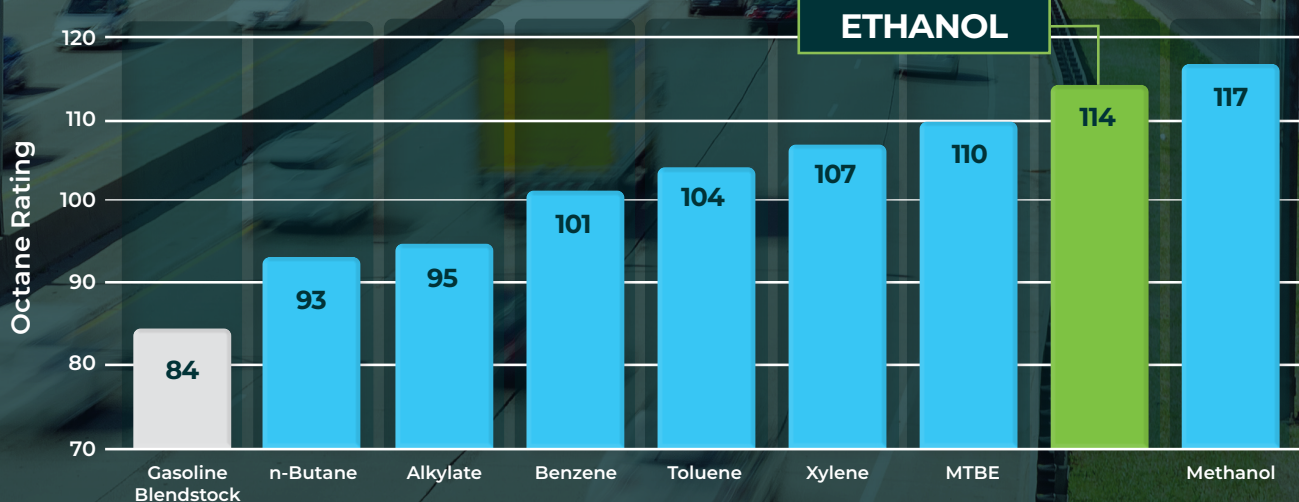
A fuel's **OCTANE RATING** is the measure of its ability to resist “knocking” in the engine, which is caused when the air/fuel mixture detonates prematurely during combustion. According to the U.S. Department of Energy, “Using a lower octane fuel than required can cause the engine to run poorly and can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

## SHARE OF LIGHT-DUTY VEHICLE MODEL CONFIGURATIONS BY RECOMMENDED GASOLINE GRADES



Source: U.S. Dept. of Energy and U.S. Environmental Protection Agency Fuel Economy Guides

## BLENDED OCTANE RATING OF GASOLINE COMPONENTS



Source: U.S. Department of Energy