Gasoline fuel quality: The looming octane shortage

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By
Lynn Westfall, Director- Office of Energy Markets & Financial Analysis
What is Octane?

“A measure of a fuel’s ability to avoid knock”

What is knock and why is it bad?

“A measure of a fuel’s resistance to detonation”

I thought we wanted the fuel to detonate

“A fuel exhibiting the characteristics of a branched-chain isomer of octane, especially iso-octane, in its ability to resist knock”

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How is Octane Measured?

• The subject fuel is burned in a bench scale engine
  - Octane engines are built to provide a wide range of conditions
  - The subject fuel performance is compared to a standard fuel, one of the chemicals in the octane family which is arbitrarily assigned an octane rating of 100

• The subject fuel is burned under two sets of conditions
  - Low severity, meant to simulate acceleration- Research Octane (RON)
  - High severity, meant to simulate high speed driving – Motor Octane (MON)

  The octane posted on the pump is the average of RON & MON
The History of Octane

- 1920’s to 1970’s- the Era of Lead
- 1980’s to early 1990’s – the Era of Refinery Construction
- 1990’s to 2005 - the Era of MTBE
- 2005 to 2012 – the Era of Ethanol
- 2012 to Present – the Era of Expensive Octanes

Technology reduces octane demands
Technology increases octane demands
The History of Octane

Source: EIA
Panel Members

- Tom Kloza – Global Head of Energy Analysis, OPIS
- Blake Eskew – Vice President, Global Consulting, IHS Markit