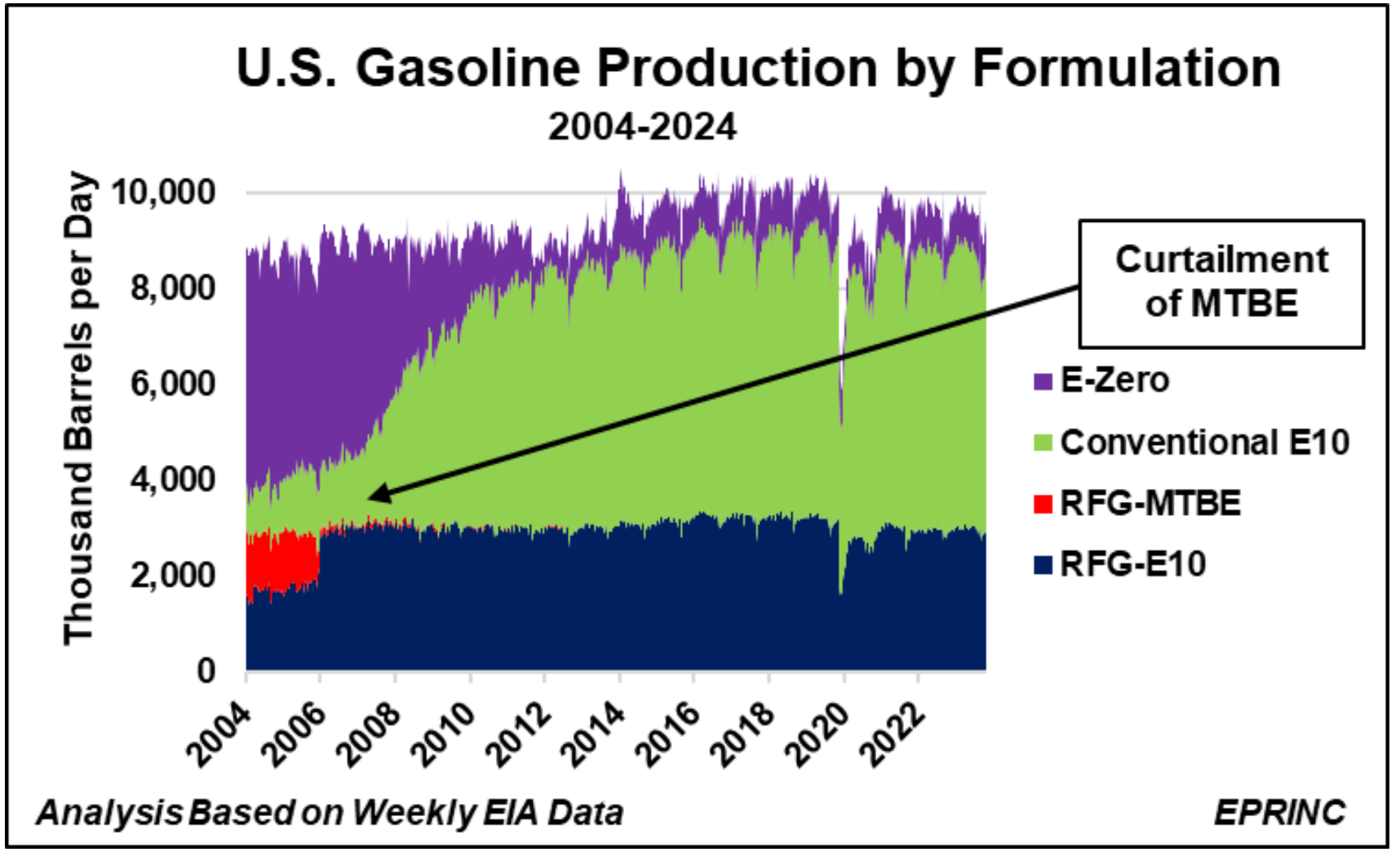
Chart of the Week #2024-22

Changes in Gasoline Formulations in Response to More Exacting Pollution Standards and Blending Mandates

Max Pyziur
June 5, 2024
Washington, DC

Changes in Gasoline Formulations in Response to More Exacting Pollution Standards and Blending Mandates

Energy Policy Research Foundation



Changes in Gasoline Formulations in Response to More Exacting Pollution Standards and Blending Mandates

Energy Policy Research Foundation

- This week's EPRINC's Chart of the Week shows the evolution of gasoline formulations used across the U.S. over the course of the last twenty years. As pollution standards and blending mandates have become more exacting over time, gasoline formulations have been modified to conform to the evolving regulations.
- Beginning in the late 1970s, gasoline formulations were increasingly determined by regulatory standards seeking to limit tailpipe pollutants such as carbon monoxide, sulfur dioxide, nitrogen dioxide, and particulate matter. For a motor vehicle's pollution control equipment to function correctly, especially catalytic converters, lead, the dominant octane enhancer but a toxic pollutant as well, could not be used in gasoline.
- To maintain octane levels, lead was replaced with other high-octane blending components. With the 1990 enactment of the Amendments to the Clean Air Act (CAA), the evaporative emissions from gasoline were more stringently controlled in order to reduce the occurrence of ozone, another atmospheric toxin.
- Beginning in the mid-1990s, California along with certain EPA-designated areas of the U.S. are required to use gasoline that has low evaporative emissions. Dubbed RFG, RFG now makes up about 25% of all of the different formulations sold in the U.S. Non-RFG gasoline blends are generally referred to as being "conventional." To continue lowering tailpipe emissions and maintain octane levels, oxygenates were introduced. The primary one was MTBE (methyl tertiary butyl ether), and to a lesser degree, ethanol.
- *… continuing …*

Changes in Gasoline Formulations in Response to More Exacting Pollution Standards and Blending Mandates

Energy Policy Research Foundation

- *… continuing …*
- **By the early 2000s, MTBE had become controversial and seen as contaminating water supplies. With the Energy Acts of 2005 and 2007, MTBE was effectively banned and ethanol became the dominant oxygenate and octane enhancer.**
- **Despite environmental requirements, there continue to be non-ethanol gasoline blends that are marketed. Known as E-Zero, it is used in vehicles such as motorboats and snowmobiles whose tanks are prone to collect considerable moisture.**
- **This slide deck is available at: https://eprinc.org/chart-of-the-week/**
- **For more information on these charts, please contact Max Pyziur (maxp@eprinc.org).**