Is the RFS Program Really Lowering Gasoline Prices?

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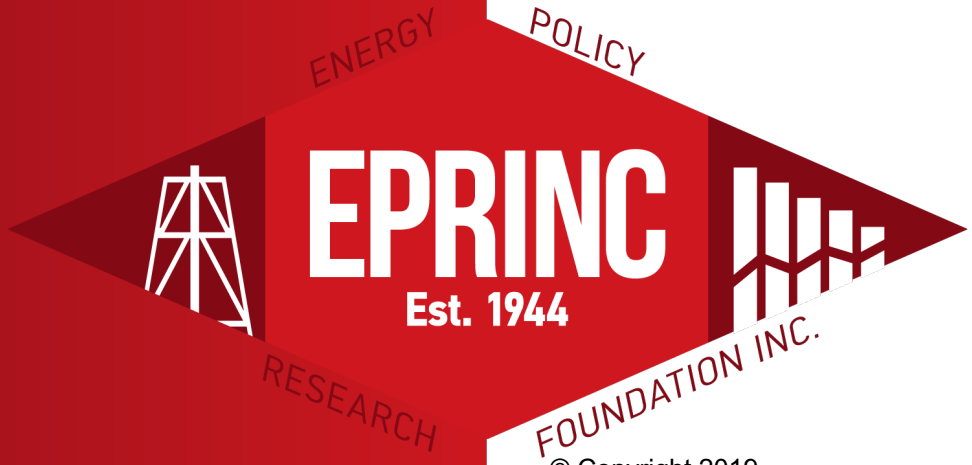

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Recently, the Renewable Fuels Association (RFA) has begun circulating a study by Philip Verleger entitled "The Renewable Fuel Standard Program: Measuring the Impact on Crude Oil and Gasoline Prices."[1] The study concludes that the Renewable Fuel Standard (RFS - the federal program mandating the blending of ethanol into the U.S. gasoline pool) lowered average national gasoline prices by 22 cents a gallon and crude oil prices by $6 barrel between 2015 and 2018.

Through the use of several statistical models, Verleger concludes that the price reduction was the result of the "... blending of approximately one million barrels per day of ethanol into U.S. motor fuels." Note that these specific conclusions are not from the incremental output in ethanol across the four-year period but the entire domestic supply available to the U.S. transportation fuels system.

Verleger also quotes a paper by Wallace Tyner, Farzad Taheripour, and Harry Baumes (Tyner and Taheripour are from Purdue University) claiming that it supports his results. However in communications with EPRINC, the authors pointed out that their paper has not been circulated nor have they authorized any quotations from the paper. Their research is still ongoing seeking to quantify the amount of ethanol consumption that can be tied to traditional market forces and the volumes due to government policy.

It is important to point out that ethanol production did not expand during the period the Verlerger study concluded it reduced the price of gasoline. From 2015 to 2018, U.S. ethanol production, including net exports, was essentially unchanged with average annual output at approximately 1 million barrels per day (MBD). In contrast during the same time period, U.S. output of crude oil, the primary feedstock for the production of transportation fuels, increased from 8.5 MBD to 11 MBD, an annualized rate of 6.3 percent.

This "but for" assessment could also be applied to U.S. oil production. If we use the same model, but only accounting for the incremental output, U.S. gasoline prices were at least 70 cents per gallon lower from rising U.S. oil production. We agree, increased domestic fuel for the transportation sector is a positive outcome whether it comes from petroleum or biofuels.

There are two critical determinants that drove ethanol demand: the 2005 effective ban of MTBE, and Tier 3 gasoline desulfurization standards. In the U.S. following the 1975 ban of lead, MTBE was the critical source of oxygenate and octane; Tier 3 standards made refinery-produced octane more expensive. Since 2006, fuel ethanol has filled these voids for oxygenate and octane cost-effectively. Given this, the U.S. Energy Information Administration (EIA), EPRINC research, and other analysts have repeatedly pointed out that ethanol would continue to be used in gasoline distributed in U.S. markets even if the RFS mandate did not exist.

SO WHAT'S GOING ON HERE?

EPRINC's own work has repeatedly pointed out that ethanol is a valuable blending component used in the production of gasoline. It can help reduce local air pollution and also increase octane in gasoline. At volumes below 10 percent of the gasoline pool, it is usually the most cost-effective blending component, and market forces alone would drive it to blending levels anywhere from 8 to 10 percent of the gasoline pool.

The problem with U.S. fuels policy is not ethanol, but the RFS mandate that requires that domestic gasoline include increasing volumes of ethanol regardless of costs or consumer acceptance. Through the requirement of RINs (renewable identification numbers - a credit trading program seeking RFS compliance enforcement that mirrors the incremental cost of blending volumes above the amount required in a traditional market), the RFS has added between 6 and 9 cents per gallon to gasoline prices during the 2015-2018 time period, or a total of between $6.5 and $16.2 billion, annually. These results come directly from EPRINC research, EIA, Congressional Budget Office, and

[1] Verleger, Philip K. "**The Renewable Fuel Standard Program: Measuring the Impact on Crude Oil and Gasoline Prices**," p. 1.

numerous other independent research organizations. Proponents of the mandate argue that this is not the case, but when gasoline is exported, RIN values are explicitly removed from the export price.

So let's take another look at the 22 cents a gallon savings. The claim is that without the RFS program gasoline prices would be higher. You might want to give the federal government some credit for promoting the ethanol market through subsidies and tariffs in its early years, but the volumetric mandate is not particularly important when blending less than 10 percent into the gasoline pool. Some U.S. refiners, for example, have been using ethanol for over 30 year well before the mandate. The question is what to do with the program now.

As we are now in an era of flat or declining U.S. gasoline consumption, higher ethanol consumption can only come about through higher blend levels. Above that, there are two sets of technical constraints that set in. First, most motor vehicles marketed in the U.S. are not warrantied for blends above 10 percent. This is because of the corrosive effect of ethanol on certain standard engine and fuel system components. To use higher ethanol blends, motor vehicles have to be manufactured with more robust materials. In more recent model years, manufacturers have raised most vehicle durability to accommodate 15 to 20 percent blends.

Second, between a third to a half of U.S. filling stations do not have tanks and dispensing equipment that have been certified for gasoline blends above 10 percent. Depending on the equipment's vintage and design and whether or not new tanks need to be installed, the cost of retrofitting a filling station can range from $25 thousand to $250 thousand. Factor this across a landscape of 120 to 150 thousand filling stations, by nature very low-margin businesses, makes the implementation higher-ethanol blends both costly and technically formidable.

Adding to the technical constraints, there are additional cost-risks. Gasoline and ethanol prices are directly determined by their feedstock costs: crude oil and corn, respectively. The markets for these feedstocks are governed by both related and independent dynamics. The particular uncertainties of these market forces underscore the pitfalls of relying upon mandates when implementing fuels policy.
The volumetric mandates in the RFS limits technological advances and traditional cost-minimizing responses to price signals. In a world without a mandate, fuel producers could adjust their production decision to take advantage of a wide range of lower-cost options, including ethers, reformates, and other appropriate gasoline blending components.

In most instances, ethanol would dominate the market and would be the first choice for a blending component to meet octane and local air pollution requirements. But like all fuels in the market place, it would have to remain competitive to ensure consumers get lowest possible price for gasoline. Ethanol is no longer an infant, and it can effectively compete in the fuels marketplace.

ABOUT EPRINC
EPRINC has been a source of expertise for numerous government studies, and both its chairman and president have participated in major assessments undertaken by the National Petroleum Council. In recent years, EPRINC has undertaken long-term assessments of the economic and strategic implications of the North American petroleum renaissance, reviews of the role of renewable fuels in the transportation sector, and evaluations of the economic contribution of petroleum infrastructure to the national economy. Most recently, EPRINC has been engaged on an assessment of the future of U.S. LNG exports to Asia and the growing importance of Mexico in sustaining the productivity and growth of the North American petroleum production platform.

EPRINC receives undirected research support from the private sector and foundations, and it has undertaken directed research from the U.S. government from both the U.S. Department of Energy and the U.S. Department of Defense. EPRINC publications can be found on its website: www.eprinc.org.

EPRINC welcomes comments and discussion on all our research.

About the Authors

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Links to previous EPRINC downstream reports
EPRINC's Updated Primer on Gasoline Blending
http://eprinc.org/2015/06/eprincs-updated-primer-on-gasoline-blending/

The Biofuel Mandate: Technical Constraints and Cost Risks
https://www.dropbox.com/s/j9lw1i7urw2fwc6/Biofuel%20Mandate%20Nov%202015.pdf?dl=0

CAFE, Gasoline Prices and the Law of Diminishing Returns: A New Agenda for the Midterm Evaluation.
http://eprinc.org/2016/03/cafe-gasoline-prices-and-the-law-of-diminishing-returns-a-new-agenda-for-the-midterm-evaluation/