

The Impact of Small Refinery Exemptions on Ethanol Demand

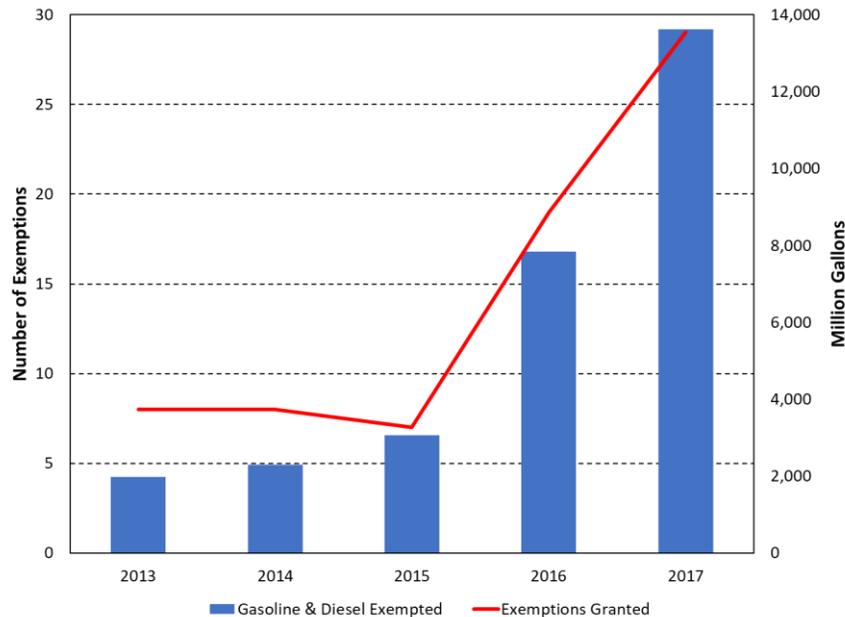
November 20, 2018

The Environmental Protection Agency’s (EPA) rampant granting of Renewable Fuel Standard (RFS) exemptions to small refineries, some of which are part of large oil refining companies, has continued to impact ethanol demand despite recent statements to the contrary by the oil industry. The exemptions have impacted both components of demand: quantity and price.

Background

Under former Administrator Scott Pruitt, the EPA granted 19 RFS exemptions retroactively for the 2016 compliance year and an additional 29 for 2017.¹ This far exceeded the seven or eight granted for each of the three previous years (Figure 1). Obligations to blend biofuels into a combined 21 billion gallons of gasoline and diesel were excused for 2016 and 2017.

Figure 1. Number of Small Refinery Exemptions Granted and Associated Fuel Volumes



Source: EPA

To implement the exemptions, the EPA reinstated RFS credits known as renewable identification numbers (RINs) to refiners, which they could use for compliance rather than blending physical

¹ One petition for 2016 and seven petitions for 2017 were pending as of early November. Fifteen petitions had been submitted for 2018, all of which were pending.

biofuels. It is common sense that exemptions and associated RIN reinstatements of this magnitude would affect the consumption of biofuels, and that is what has occurred.

Demand Destruction, Part 1: Quantity

The impact of small refinery exemptions on the quantity of ethanol consumed is reflected in the ethanol “blend rate,” the average inclusion level of ethanol in the nation’s gasoline supply. It is necessary to look at the blend rate rather than simply the usage of ethanol, since underlying gasoline consumption changes from month to month and year to year.

From 2013 to mid-2016, the ethanol blend rate approached 10%, which until 2011 was the maximum allowed in non-flex-fuel vehicles (Figure 2). It hit 10.1% at times but never exceeded that level. Finally, starting in December 2016, the blend rate pushed through previous highs several times. The blend rate exceeded 10% in all but three months in 2017 (missing by only 0.01% in one of those months) and hit a record 10.8% in January 2018.

However, the ethanol blend rate slumped starting in February 2018, as exempted refiners were flush with reinstated RINs, and as rumors and press reports regarding the exemptions made their way into the market. The blend rate fell to 9.8% in February (1.0% below January), ticked down to 9.7% in March and dropped further 9.5% in April. Between February and June, the blend rate exceeded 10% in only one month.

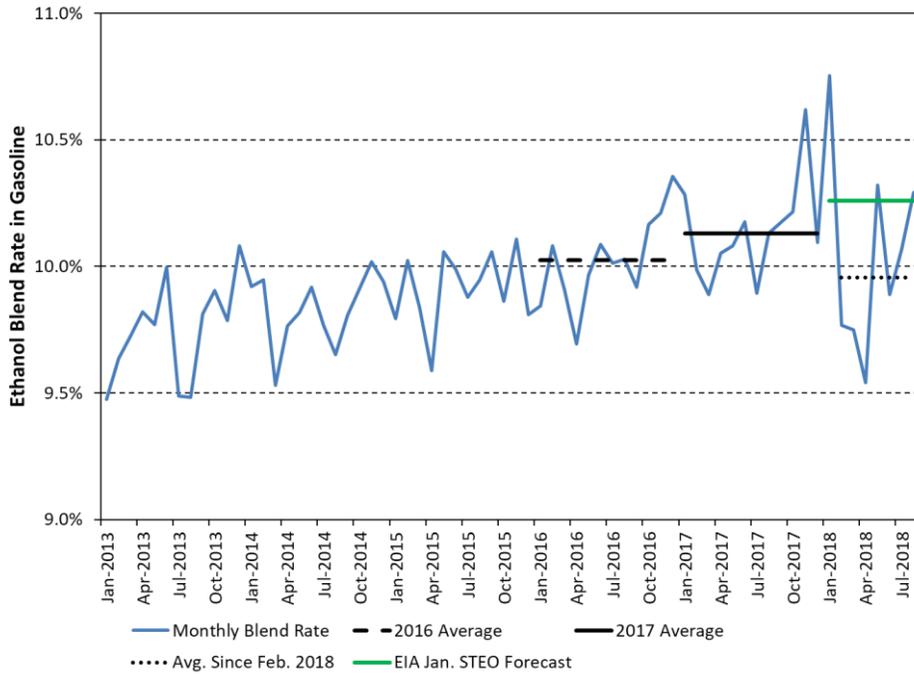
This was far below the government’s own forecasts. In its Short-Term Energy Outlook published in January, which presumably would have reflected expectations about RFS compliance rather than large-scale exemptions for small refineries, the U.S. Energy Information Administration’s (EIA) forecasts of ethanol and gasoline consumption implied a blend rate of just over 10.2% for the January-March period and 10.3% for 2018 as a whole.

Demand Destruction, Part 2: Price

The impact that the exemptions have had on ethanol prices, and thus on overall industry revenues, is rarely addressed in the press and even in economic papers. Yet, it is at least as important as the impact on the quantity of ethanol consumed.

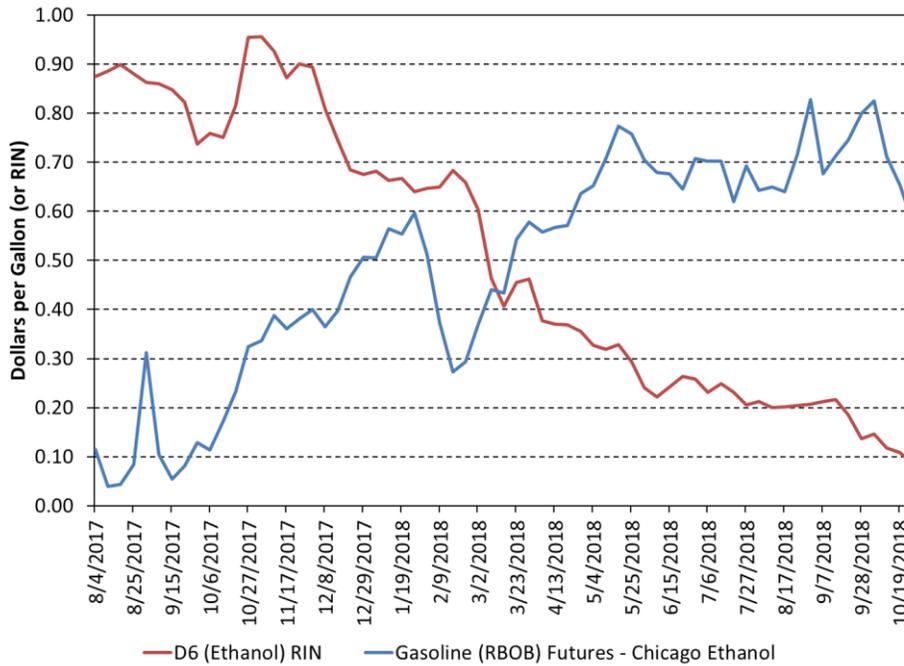
Ethanol RIN prices crashed as a result of the flood of RINs that were reinstated and the lack of any indication in the EPA’s 2019 RFS volume obligation proposal (2020 for biomass-based diesel) that it would reallocate exempted volumes to larger, non-exempt refiners. The price of an ethanol RIN now stands at 7 cents, versus nearly a dollar a year ago (Figure 3).

Figure 2. Monthly Ethanol Blend Rate in Gasoline



Sources: Energy Information Administration (Data, Short-Term Energy Outlook Forecast), Renewable Fuels Association (Analysis)

Figure 3. Ethanol RIN Price and Gasoline-Ethanol Price Spread



Sources: OPIS (Ethanol and RIN Prices), Energy Information Administration (RBOB Prices), Renewable Fuels Association (Analysis)

If this had happened in isolation, blenders would have had less of an economic incentive to use ethanol. However, to encourage continued blending of ethanol in the face of lower RIN prices, ethanol prices have had to fall steeply relative to gasoline. The discount of ethanol prices to gasoline prices reached 70 cents/gallon in May and centered around that level through October, mostly compensating for the decline in RIN prices.

This discount led blenders to return to using ethanol at rates at or above 10% in late summer (as of this writing, comprehensive monthly data are available only through August). At first glance, the rebound in the blend rate appears to be good news for ethanol producers. However, once again, the price component of demand has to be kept in mind.

The extent to which small-refinery exemptions have affected ethanol prices can be estimated through the use of a basic regression, in which the ethanol price in Chicago is a function of the corn futures price and the ratio of ethanol stocks to domestic consumption over the prior twelve months. Based on monthly data since January 2010, the coefficients for the regression equation are as follows:

$$\text{Ethanol Price} = 2.44 + (0.27 \times \text{Corn Futures Price}) - (28.64 \times \text{Stocks/Trailing Twelve Month Usage})$$

For this analysis, a counterfactual trajectory was developed reflecting what monthly ethanol consumption would have been starting in February 2018 in the absence of the small refinery exemptions. Actual gasoline consumption was multiplied by the 10.1% blend rate experienced in 2017 and then by a seasonal factor for the blend rate. (Note that an even higher trajectory would have resulted if the EIA's implied blend rate for 2018 had been used.) End-of-month stocks were then calculated based on counterfactual consumption.

Based on this method, it can be estimated that ethanol prices would have been 8 cents/gallon higher in February 2018 in the absence of the small-refinery exemptions, and that given the continued effect on consumption, the price would have been 34 cents/gallon higher by June 2018. As the blend rate rebounded in July and August 2018, the price impact remained at 34 cents/gallon in those months.

Importantly, this does not only apply to the volume by which ethanol consumption has been reduced due to the exemptions. Rather, every gallon produced and sold by the U.S. ethanol industry has been priced lower than would have been the case in the absence of the exemptions.

Actual ethanol production was 6.6 billion gallons between February and June 2018 and 9.4 billion gallons between February and August 2018. By multiplying monthly production by the monthly price impact, it can be estimated that the 48 small-refinery exemptions cost the U.S. ethanol industry \$1.4 billion as of June and \$2.3 billion as of August 2018. (This leaves to the side the issue of whether ethanol production would have been higher in the absence of the exemptions.)

The Impact Continues

While enough time has passed to be able to analyze the demand destruction that has happened to date, it should be emphasized that the impact on the ethanol industry is not over. Largely as a result of the exemptions, the EPA has estimated that RIN inventories at the end of 2018, which will be available to meet 2019 RFS obligations, will swell to 3.06 billion. This is an increase of 840 million RINs (nearly 40%) from the agency's estimate of inventories carried over into 2018.

To the extent that refineries have "kept their powder dry" by using ethanol and other biofuels in recent months, they will be able to use their RIN inventories for compliance when economically or operationally expedient in the future. One area where this is likely to show up is a reduced impetus to expand blends above 10% ethanol (E10), particularly sales of E15 and E85.

Conclusion

In summary, small refinery exemptions have had a marked effect on ethanol consumption and a massive effect on industry revenues. This has contributed to announcements by ethanol producers over the last month that they will cut back on production rates and start idling facilities.² Despite claims by refiners that RFS compliance is causing them economic hardship even as they have been earning record profits, it is the biofuels industry that has been demonstrably harmed by the manner in which small refinery exemptions have been given out.

² It was also announced that one facility will be permanently decommissioned.