

# WHAT DRIVES RETAIL GASOLINE PRICES? NOT RENEWABLE FUEL STANDARD RINs

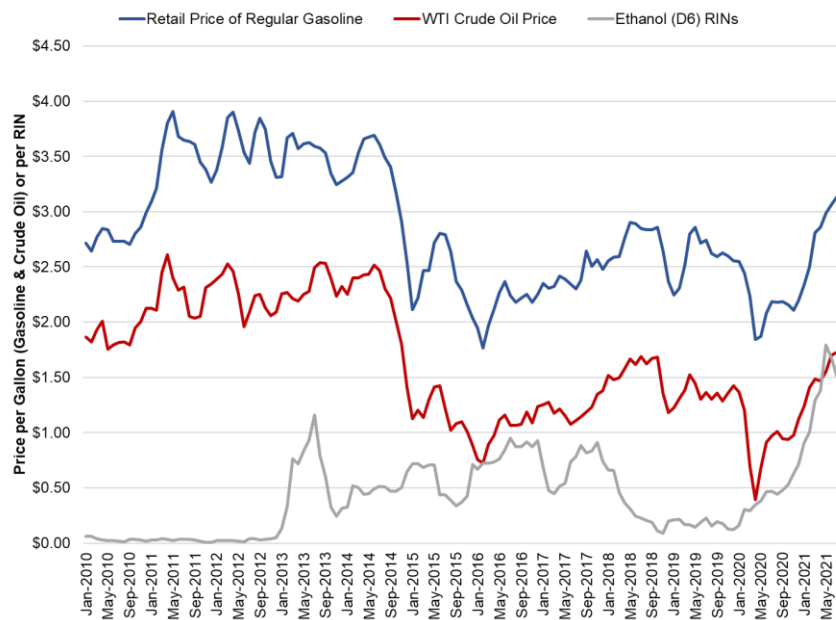
September 13, 2021

Retail gasoline prices hit seven-year highs this summer. Big Oil and its allies in Congress tried to divert attention from the real causes of the increase by blaming the cost of credits used to demonstrate compliance with the Renewable Fuel Standard (RFS), which are referred to as renewable identification numbers (RINs). Recently, a group of senators stated in a letter to the Environmental Protection Agency (EPA) that “high RIN prices are also contributing to the skyrocketing gas prices that our constituents are paying at the pump.”<sup>1</sup> However, the truth is that the drivers of gasoline prices are the same as they have always been: crude oil prices and supply/demand factors.

## Fundamental Drivers of Gasoline Prices

Crude oil prices are the predominant driver of retail gasoline prices. This is evident simply from looking at a historical chart (Exhibit 1).

**Exhibit 1: Prices of Retail Gasoline, Crude Oil and RINs**



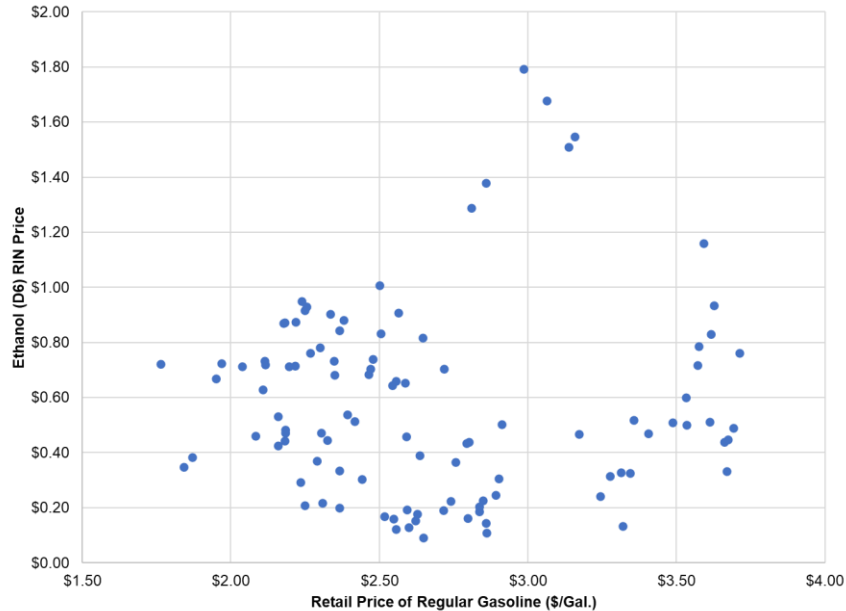
Sources: EIA (gasoline and crude oil prices), OPIS (RIN prices)

Retail gasoline prices have had a correlation of 0.96 with West Texas Intermediate (WTI) crude oil prices on a monthly basis from January 2013 to July 2021. This indicates a very

<sup>1</sup> Letter from Pennsylvania Senator Pat Toomey to EPA Administrator Michael Regan (August 23, 2021) [https://www.toomey.senate.gov/imo/media/doc/epa\\_letter\\_8-23-21.pdf](https://www.toomey.senate.gov/imo/media/doc/epa_letter_8-23-21.pdf)

strong relationship, given that perfect positive correlation is 1.00. On the other hand, the correlation between gasoline prices and the prices of ethanol RINs (referred to as D6 RINs) has been -0.05, indicating virtually no relationship, as is reflected in Exhibit 2.

### Exhibit 2: Regular Gasoline Retail Price vs. D6 RIN Price, Since Jan. 2013

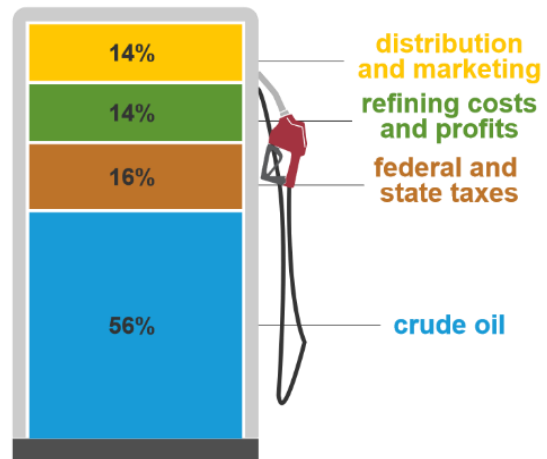


Sources: EIA (gasoline prices), OPIS (RIN prices)

What causes changes in gasoline prices? According to the U.S. Energy Information Administration (EIA), “Retail gasoline prices are mainly affected by crude oil prices and the level of gasoline supply relative to gasoline demand.”<sup>2</sup>

The EIA estimates that the cost of crude oil accounted for more than half of what consumers paid for gasoline from 2011 to 2020, and crude oil and taxes together represented nearly three-quarters of the total (Exhibit 3). Costs and profits at the refining and distribution/marketing stages of the supply chain each accounted for 14%.

### Exhibit 3: What Do We Pay Per Gallon of Retail Gasoline?



Note: Regular gasoline, 2011-2020  
Source: EIA

<sup>2</sup> U.S. Energy Information Administration. (2020). “Gasoline explained: Gasoline price fluctuations.” <https://www.eia.gov/energyexplained/gasoline/price-fluctuations.php>

## The Role of RINs

A RIN is generated when a gallon of ethanol is produced, and it is separated when the ethanol is blended, at which point it can be submitted for RFS compliance, held in inventory or sold. Obligated parties under the RFS (mainly refiners) can secure RINs by blending biofuels, or they can purchase RINs from other entities. A considerable body of research has shown that the *wholesale* price of gasoline incorporates the price of RINs, allowing refiners to recover their costs.

However, there is another step in the fuel supply chain that is important to understand. When ethanol is blended at the terminal and a RIN is separated, the RIN has value and can be sold (or retained if the blender is an obligated party). This value is used to offset the higher *wholesale* gasoline price that reflects the RIN cost to the refiner, and the net result is that the *retail* price of gasoline paid by consumers is essentially unchanged.

This has been acknowledged by the EPA: “When RIN prices rise, the market price of the petroleum blendstocks produced by refineries also rise to cover the increased RIN costs. . . . The effective price of renewable fuels . . . however, *decreases* as RIN prices increase. When renewable fuels are blended into petroleum fuels these two price impacts generally offset one another for fuel blends such as E10.”<sup>3</sup> [EPA’s emphasis.]

## Analysis of Wholesale and Retail Gasoline Price Drivers

Regression analysis can be used to demonstrate whether and to what extent RIN prices affect gasoline prices at the wholesale and retail levels.

The EIA publishes the methods that it uses to forecast petroleum product prices. For gasoline, the process starts with a projection of the difference (spread) between the average U.S. motor gasoline wholesale price and the cost of Brent crude oil (wholesale prices are more strongly related to Brent than WTI crude oil prices). Per the EIA, “This wholesale gasoline margin is estimated as a function of the following variables:

- The change in the spot price of Brent crude oil;
- Inventory deviation from the previous four-year average;
- A trend variable starting in 2003;
- Monthly dummy variables;
- A lagged dependent variable.”<sup>4</sup>

Notably, the price of RINs is not utilized by the EIA as an explanatory variable.

The RFA utilized EIA’s approach to conduct analyses of wholesale and retail gasoline price spreads to Brent crude oil, with a few modifications:

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<sup>3</sup> U.S. Environmental Protection Agency. (2017). *Denial of petitions for rulemaking to change the RFS point of obligation*. Available at [www.regulations.gov](http://www.regulations.gov) docket number EPA-HQ-OAR-2016-0544.

<sup>4</sup> U.S. Energy Information Administration. (2020). *Short-term energy forecasting petroleum product price module* (Handbook of energy modeling methods). [https://www.eia.gov/analysis/handbook/pdf/STEO\\_Petroleum\\_Product\\_Prices.pdf](https://www.eia.gov/analysis/handbook/pdf/STEO_Petroleum_Product_Prices.pdf)

- Modifications were made to the explanatory variables:
  - The ethanol (D6) RIN price was added;
  - The spread between Brent and WTI crude oil prices was utilized rather than the change in the Brent price, since it improved the results;
  - A dummy variable was added for March and April 2020 due to the impact of coronavirus-related lockdowns;
- The timeframe utilized was August 2010 - May 2021, since all necessary data were available for the period, including RIN prices.

The results were clear. The D6 RIN price change was a significant determinant (at the 5% level) of the price spread between wholesale gasoline and Brent crude oil, as were the other main explanatory variables (Exhibit 4). However, for the retail gasoline price spread to Brent, the D6 RIN price change was not significant, but the other main explanatory variables still were.<sup>5</sup> **In short, RIN prices are a factor in wholesale gasoline prices, but not in retail gasoline prices.**

#### Exhibit 4: Summary Statistics from Gasoline Price Regressions

	Wholesale	Retail
R Square	0.83	0.76
Adjusted R Square	0.80	0.73
Standard Error	0.06	0.09
F	31.5	22.3
	<i>P-value</i>	
Lagged Dependent Variable	0.000	0.000
Brent - WTI Spread	0.002	0.027
Total Gas Stocks - 4-Yr. Avg.	0.004	0.021
D6 RIN Price Change	0.027	N/S
Covid Dummy Variable	0.008	0.027

Notes:

Dependent variable for wholesale price analysis: U.S. regular gasoline wholesale/resale price by refiners - Brent crude oil price.

Dependent variable for retail: U.S. regular all formulations retail gasoline price - Brent crude oil price.

Other explanatory variables included: trend starting August 2010, dummy variables for January - November.

N/S = Not significant at the 5% level.

Sources: RFA (analysis), EIA (petroleum prices and stocks), OPIS (RIN prices).

#### Conclusion

Higher gasoline prices this summer were caused primarily by OPEC+ oil production cutbacks and an increase in gasoline demand. Additionally, supply disruptions such as the Colonial Pipeline shutdown and refinery closures due to Hurricane Ida accentuated price pressures at times. RINs are a convenient target for accusations since they are not widely understood, but as the analysis above confirms, RINs do not contribute to higher retail gasoline prices.

<sup>5</sup> The weighted average price across RIN categories, which is referred to as the RVO value, was tested in the wholesale and retail regressions, but it did not improve results compared to the D6 price.