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The Renewable Fuel Standard Shattered the “Blend Wall” for Ethanol

By Scott Richman, Chief Economist

Not so long ago, renewable fuel critics claimed that due to purported infrastructure and vehicle constraints, the ethanol content in gasoline simply could not exceed 10.0%. They referred to this supposed limitation as the “blend wall,” and for several years that terminology found its way into virtually every debate about ethanol, the Renewable Fuel Standard (RFS), and higher-level blends.

But no one really talks about the “blend wall” anymore. Why?

Because ethanol’s blend rate has exceeded 10.0% every year since 2016 and hit a record 10.38% in 2022, according to data from the U.S. Energy Information Administration. The experience of the past several years shows that the “blend wall” was nothing more than a fictional barricade. In fact, as this analysis shows, the U.S. market is on pace to consume some 630 million gallons of ethanol over and above the so-called “blend wall” this year, proving once again that the 10.0% threshold is not a real barrier.

Given this reality, critics changed their tune to say that the blend rate would not have exceeded 10% if not for the RFS, the primary federal program that has promoted the usage of biofuels since 2005. While this argument de-emphasizes other factors that have contributed to the rising blend rate, such as ethanol’s cost-competitiveness compared to gasoline and especially other sources of octane, it is consistent with the intent behind the enactment of the RFS.

As the Environmental Protection Agency has noted, “The RFS program can be thought of as a market-forcing policy. The objective of the program is to introduce increasing volumes of renewable fuels ... into the marketplace. Congress made the decision that this is an appropriate policy objective, and put in place a program to achieve that policy goal.”^[1] Indeed, if we accept the argument that ethanol blending would be “stuck” at or below 10.0% in the absence of the RFS, then actual ethanol consumption without the RFS in 2023 would be around 13.6 billion gallons rather than the 14.2 billion gallons we are expecting with the RFS in place.

The facts clearly show that the RFS has been successful in expanding the market for ethanol. This analysis takes a look at one aspect of that expansion: consumption above the “blend wall.”

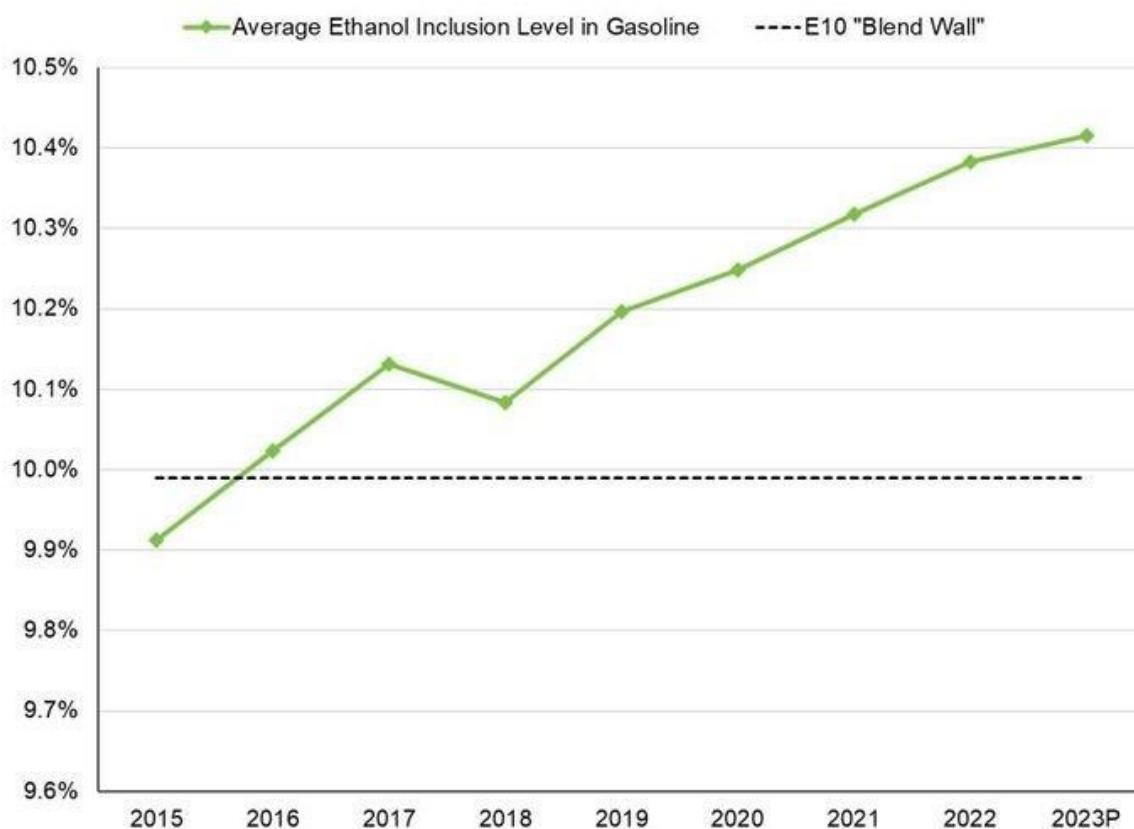
The Blend Rate of Ethanol in Gasoline

The vast majority of gasoline sold in the U.S. contains 10% ethanol (E10), but ethanol flex fuels (for example, E85) have been available for more than two decades, and E15 has been experiencing record sales, due in part to prices that are usually at a substantial [discount](#) to regular unleaded gasoline at the pump. Still, there are small volumes of ethanol-free gasoline (E0) sold in the U.S.,

often near marinas, and for that reason, refiners have said that the effective “blend wall” is 9.95% or lower.

As noted above, that threshold was breached in 2016 (Figure 1). In fact, the blend rate showed a consistent upward trend from 2012 to 2017 before retrenching in 2018—the first drop in the blend rate since 1996, a drought year. What happened in 2018? Massive exemptions from the RFS were doled out to small refineries by the EPA under Scott Pruitt (the administrator from February 2017 to July 2018), stocks of compliance credits (i.e., RINs) swelled, and RIN prices crashed. Once the granting of sizable exemptions was halted, the ethanol blend rate resumed its upward trend. Under new leadership, the EPA eventually changed its [approach](#) to small-refinery exemptions and [denied](#) almost all pending petitions, restoring integrity to the RFS.

Figure 1: Actual Ethanol Inclusion Rate vs. E10 "Blend Wall"



Source: U.S. Energy Information Administration (consumption data), RFA (analysis)

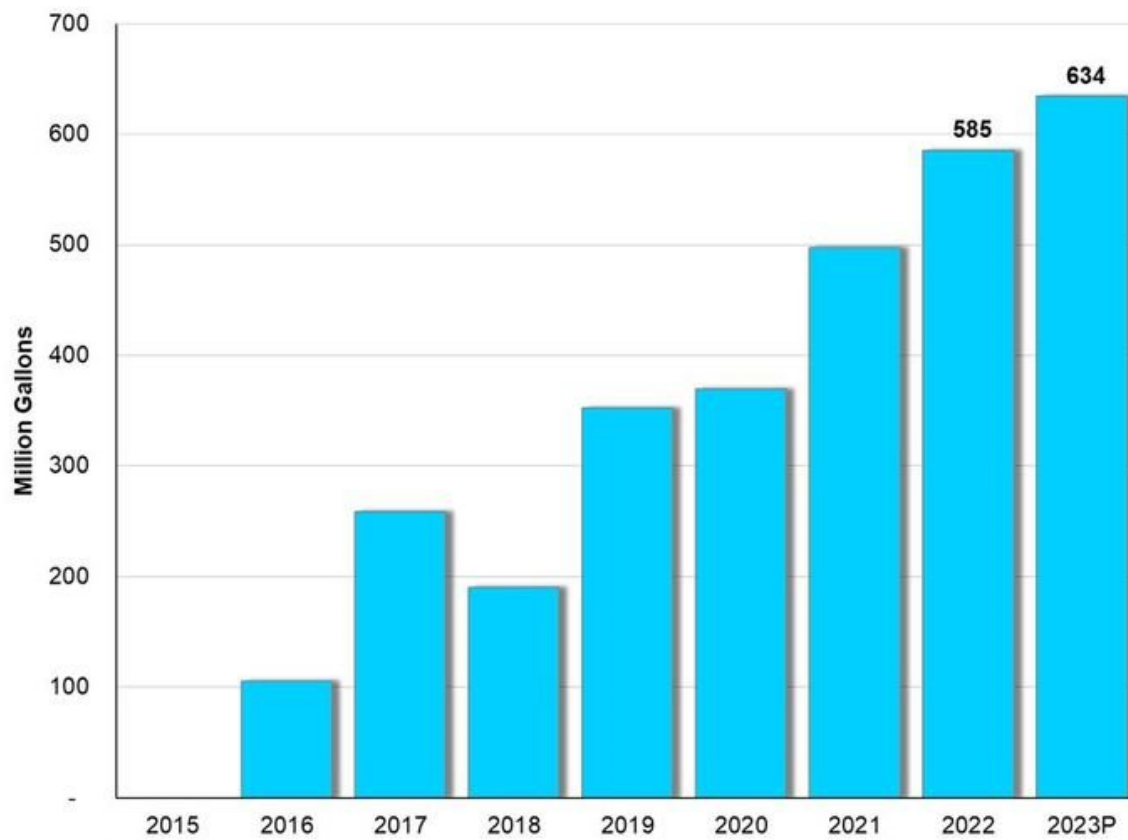
Note: 2023 is a projection based on EIA's [Short-Term Energy Outlook](#)

Ethanol Consumption Above the “Blend Wall”

If those who say ethanol usage above the effective “blend wall” would not occur absent the RFS are correct, this raises the question of how much of the more than 14 billion gallons of ethanol consumed annually in the U.S. is attributable to the RFS. This can be readily calculated by multiplying actual gasoline consumption by 9.95% and then subtracting the product from actual ethanol consumption.

Based on this approach, an additional 585 million gallons of ethanol were used in 2022 (Figure 2). In 2023, it is projected that 634 million gallons of ethanol will be used beyond the “blend wall,” given that the percentage increase in ethanol usage is expected to be greater than that of gasoline. Those are significant volumes, representing the equivalent of a 4-5% boost in total annual ethanol demand.

Figure 2: Ethanol Volume Blended Above the E10 “Blend Wall”



Source: RFA

Conclusion

Under the RFS, ethanol approached and then soundly broke through the alleged “blend wall.” In 2005, when the original RFS was enacted, the blend rate was approximately 3%. By 2010, it was above 9%. This year it is expected to exceed 10.4%. Given that ethanol is cost-competitive with gasoline, enhances energy security, and reduces greenhouse gas emissions by 44-52% compared to gasoline, it’s clear that the RFS has been a resounding success.

[1] 80 Fed. Reg. at 77,423