WELLS FARGO

Industry Update — June 13, 2021

Independent Refiners
Integrated Oil & Gas

Independent Refiners: Eliminate Ethanol RINs, an Idea Whose Time Has Come

Among the Most Expensive GHG Reduction Plans Ever Designed

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Our Call

Renewable Identification Numbers (RINs) prices pass through to retail consumers thus, we consider it unsurprising the Biden Administration might intervene in the RINs market as reported on June 11, 2021. RINs prices set all-time highs on June 9 with the ethanol (D6) RIN exceeding the impact of the federal excise tax on gasoline. It is well known merchant refiners struggle to recover elevated RINs costs while others benefit, particulary blenders and retail. We estimate independent refiner *net exposure to RINs from most to least as PBF, HFC, VLO, DK, PSX, and MPC*. Finally, D6 RINs do not appear to be driving higher corn consumption and offer an exceptionally expensive path to CO_2 emissions reductions. Should the D6 RIN be eliminated and replaced by a higher federal excise tax?

Impact on Refining Equities. If the Biden EPA were to temporarily alter the D6 RINs market, we expect an immediate decline in D6 RINs and retail gasoline prices. Independent refiners would be likely to react positively to such an announcement. Companies like PBF that have deferred their RINs settlements would likely benefit the most. Since consumers are bearing the vast majority of the D6 costs, they would be the real beneficiaries of a change.

Tax Efficiency with Potential Disinflation Effect. The federal government could eliminate the D6 RIN raise the federal excise tax on gasoline by 50% with the outcome of higher tax revenue but a net dis-inflationary net impact.

Potential for Greater CO2 Emissions Reductions At a Much Lower Cost. While far from the only reason for the RFS, GHG reductions were initially a key selling point. Based on our analysis, the D6 RIN offers an exceptionally expensive path to CO_2 reduction. As compared to open market carbon offset prices of $5 to $30/tonne, the 2019 average and recent peak D6 RINs prices reflect a 9x to 233x premium. We expect ethanol will remain widely deployed even if D6 RINs were eliminated. The positive effects of E10 on emissions would remain but at a greatly reduced cost.

Unlikely to See a Material Change in Ethanol Demand. Ethanol is the primary supplier of incremental octane in U.S. gasoline pool (assumes no MTBE waivers). Given that ethanol production and distribution systems are fully developed across the U.S. a simple 9.9% mandate would suffice to keep ethanol at current levels of demand. Ethanol blends above 10% would need to compete on cost and performance, which might cap growth in a low oil price environment. It might also drive production efficiencies to make ethanol more competitive with conventional gasoline (something less likely to happen while RINs and the RVO are providing support).

Refining Profitability Would Not Materially Change Over the Long-term. Improved market efficiency, lower costs and transparency would be direct benefits. We believe even merchant refiners are capturing part of the D6 RINs - at a minimum they are highly incentivized to do so with RINs at record highs. Those margins would disappear, but likely more than offset by lower costs.

Increased Tax Efficiency

The federal gasoline tax is $0.184/gallon, essentially unchanged since 1993. Based on the recent all-time high D6 RINs price of $1.95, the cost of the RIN exceeds the federal excise tax. This occurs once the D6 RIN exceeded $1.84 (1/10th of each gallon of gasoline sold).

Let's assume the federal government materially restructures the RFS, eliminates the D6 RIN, mandates E10 gasoline and raises the federal excise tax by 50% to $0.276/gallon. The federal government could increase its annual tax revenue to at least $40bn from just over $27bn (normalized pre-COVID), ensure corn maintains its portion of the fuel market, reduce friction while increasing transparency and support a dis-inflationary outcome.

For the purposes of our analysis, we assume the states maintain their current tax rates.

Corn Demand Holds Steady

We know that "Big Ag" and ethanol producers will vehemently dispute our view they will not be hurt by the elimination of the D6 RIN. We see that as unlikely because due to ethanol's value in delivering significant volumes of octane at a reasonable price, the extensive infrastructure already in place and expanding low carbon fuel standards (LCFS) across multiple states.

Pending Supreme Court Decision

The U.S. Supreme Court (USSC) will soon issue a decision (expected within days or weeks) regarding an appeal of a decision from the 10th Circuit. HollyFrontier Corp (HFC) is appealing a decision regarding denial of a small refinery exemption (SREs) issued to it by the Trump administration. In the short-term we expect the decision will matter to HFC and the others that received SREs under similar circumstances. However, we do not expect a long-term effect on the RINs market regardless of the USSC decision, given SREs requests must be reassessed and issued annually.

Background. The SRE is part of the RFS which provides an out for refineries of less than 75,000 b/d which can prove extreme hardship by complying with their annual renewable volume mandate under the RFS. As we understand the two sides of the case it comes down to whether or not the language of the RFS allows for SREs to be awarded beyond the initial period and in a discontinuous pattern.

2023 Could Be Interesting

If record high RINs prices in 2021 were surprising, just wait until 2023 when two separate shoes drop. First at year-end 2022, the original RFS volume mandates terminate with decisions on future volumes of renewable fuels up to the discretion of the EPA. Second, the blenders tax credit (BTC) for renewable diesel (a $1/gallon tax credit) is set to expire at year-end 2022. The consensus view is the elimination of the BTC will result in reduced bio/renewable diesel profitability, especially for the most marginal suppliers. Thus, biodiesel D4 RINs prices will rise to compensate for the diminished profitability.

Based on the policy desires to support renewable fuels and tangible signs of support within congress to extend the BTC, a 2022 expiration may not occur. However, in prior periods, the tax credit has expired first then reinstated at a subsequent date.

How Did We Get Here?

One cannot have a conversation about refining and crack spreads without discussing RINs. While it is clear RINs negatively affect realized crack spreads (i.e., capture), the magnitude of the impact is not entirely clear. This is due to a number of factors:

- Varied regional impacts of volume and competition,
- Net RINs exposure varies by company and location,
- RINs trading volatility, opaqueness, lack of transparency, and
- Retail consumers ultimately bearing RINs costs.

A fundamental flaw (yes, we are limiting ourselves to just one) in the RFS and the RINs program is the obligation to blend is often disconnected from the capability to blend renewable fuels into conventional fuels. In theory this should not matter as the volumes produced and blended are effectively even. However, the blendwall and the RVO can create a supply/demand mismatch as the RFS tries to force blending in excess of blendwall limitations. Thus, the market power of blenders becomes amplified as the obligated parties are:

- Few,
- Highly identifiable,
- Their RINs needs can be precisely estimated and
- The industry-wide shortfall due to the blendwall limitations is known.

In reality, the combination of mandated volumes of renewable fuel production of all types and interchangeability within the RINs system (which are often unequal and create RINs shortages) and the obligation/blending separation have created a "sellers' market" subject to periods of illiquidity, opaqueness and volatility. Other factors not anticipated at the inception of the RFS or not expected to remain a challenge include the lack of gasoline demand growth since 2007, the ethanol "blendwall" (10% blend limit), technological and commercial shortfalls of cellulosic and advanced biofuels and the occasional failure of the EPA to set the annual RVO obligation for the following year by its statutory deadline of November 30.

Examples of the shortfalls in cellulosic and advanced biofuels include:

- Cellulosic mandated volume for 2019 was 8,500mm gallons; final volume was 418mm, reflecting a 95% shortfall
- Advanced biofuel mandated volume for 2019 was 13bn gallons; final volume set by the EPA was 4.92bn gallons, reflecting a shortfall of 62%.

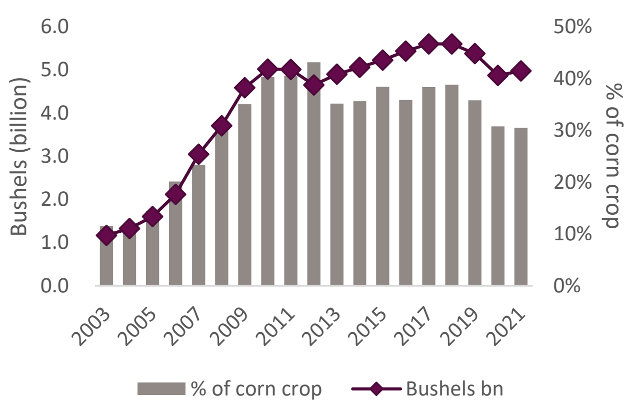
The recent rise in the D6 RINs reflects some of these considerations in our view:

- The RVO for ethanol exceeds the "blendwall" which creates a shortage and requires either "banked" D6 RINs or advanced RINs to settle the annual obligation,
- The more advanced D3, D4 and D5 RINs, which are typically more valuable (i.e., the relationship is a function of energy equivalency - biodiesel RINS are worth 1.5 and renewable diesel RINs are worth 1.7 D6 corn ethanol RINs), can be used to satisfy the D6 obligation, but typically are not as that would invite value destruction, and
- Price of the D4 RIN is elevated due to the combination of higher soybean oil prices and the renewable diesel blenders tax credit (BTC) that provides a $1/gallon tax credit.

Corn Production Growth Not Driven By Ethanol for a Decade

Corn acreage planted jumped in 2007 following the expansion of the RFS in 2006. Since reaching the E10 blendwall, U.S. corn acreage planted has been fairly steady around 90mm acres. Total acres planted has actually declined slightly over the last decade as yields have risen by approximately 15%. Thus total harvests have increased from approximately 150bn bushels to around 175bn bushels. This has driven a decline in the percentage of the corn crop dedicated to ethanol production.

Exhibit 1 - Corn Bushels vs. Ethanol as % of Corn Crop



Source: DOE and Wells Fargo Securities, LLC estimates

The RFS clearly increased the demand for corn. It does not appear the RFS is substantially affecting margins for ethanol producers. This makes intuitive sense as ethanol volumes are recovering to pre-

COVID levels along with gasoline demand, but face E10 "blendwall" limitations across most fuel markets outside of the cornbelt.

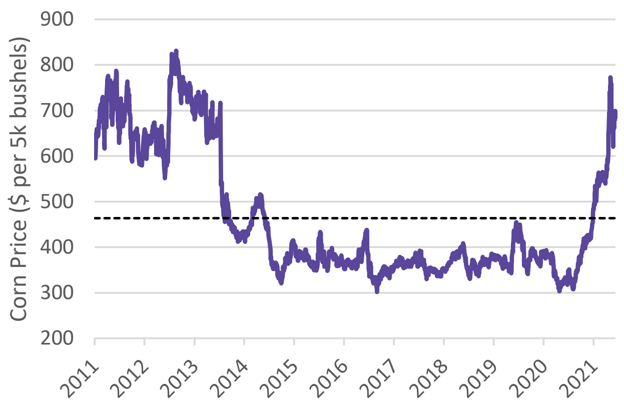
RINs Winners

Who's really winning from RINs? On the ethanol, or D6 RINs, we believe there are three likely winners:

- Fully integrated refining systems,
- Standalone blenders (typically midstream companies), and
- Select retail fuel sellers

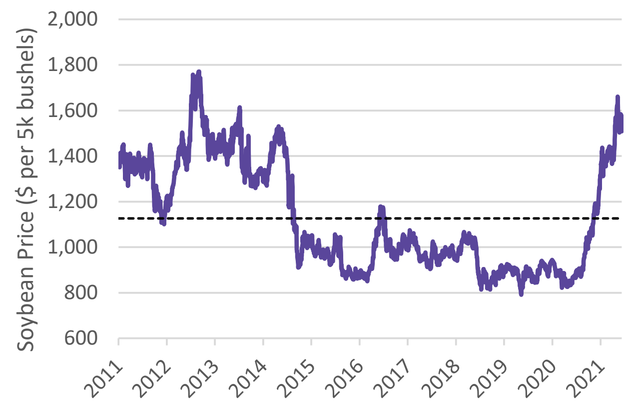
On the biodiesel RINs (D4), we believe the winners extend into the agriculture portion. Thus, soybean farmers and soybean oil processors appear to be winners alongside biodiesel and renewable diesel producers. We recognize there is a little of the chicken or the egg to this analysis. Did higher soybean prices drive higher soybean oil and biodiesel prices and D4 RINS? Or did higher biodiesel prices and higher D4 RINs drive higher soybean oil and soybean prices?

Exhibit 2 - Corn Price 2011-Present



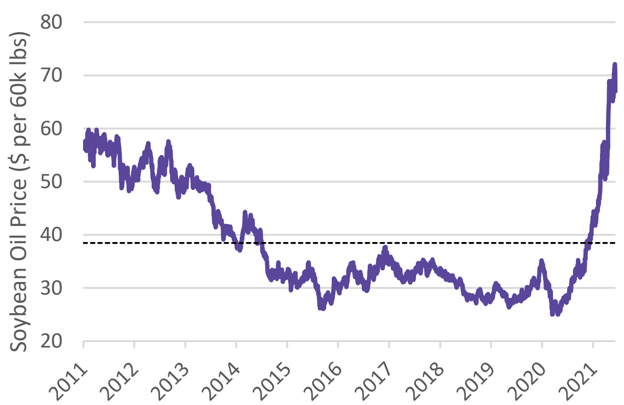
Source: Bloomberg and Wells Fargo Securities, LLC

Exhibit 3 - Soybean Price 2011-Present



Source: Bloomberg and Wells Fargo Securities, LLC estimates

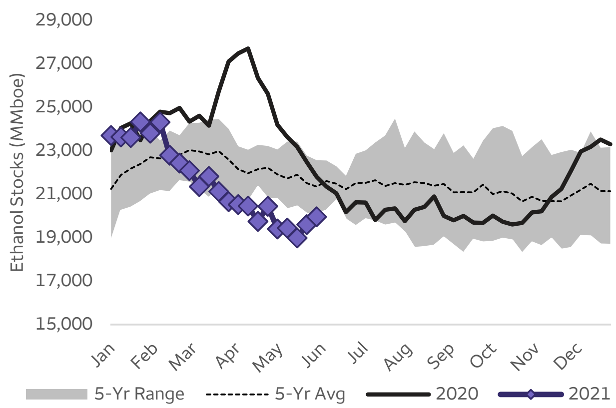
Exhibit 4 - Soybean Oil Price 2011-Present



Source: Bloomberg and Wells Fargo Securities, LLC estimates

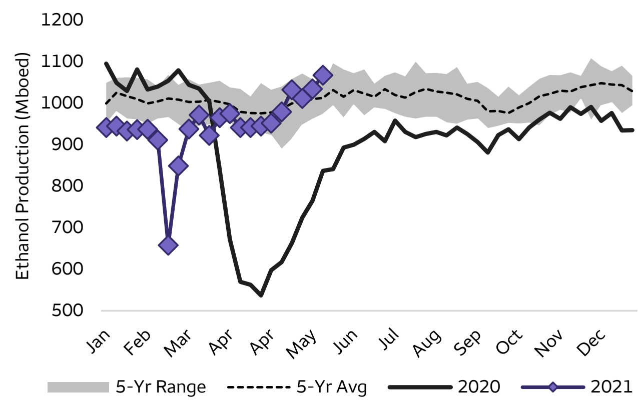
U.S. ethanol production has been fairly steady over the last five years except for COVID and the recent winter storms. Even with RINs at record high levels, ethanol production remains within the five-year average production range.

Exhibit 5 - US Ethanol Stocks



Source: DOE and Wells Fargo Securities, LLC

Exhibit 6 - US Ethanol Production



Source: DOE and Wells Fargo Securities, LLC

Analysis of RINs, Potential Tax Policy Changes and the Cost of Emissions Reductions

Based on the best available estimates the average US driver is consuming just over 500 gallons per year. This is based on an estimated fuel economy of 22-25mpg and average annual mileage driven of 11,500 to 13,500. Using prior year and current RINs prices the typical U.S. driver faces $26 to $108 in annual RINs costs. Based on the use of E10 and the 20% GHG reduction corn-based ethanol is estimated to provide, the average car has reduced its annual CO_2 emissions by 0.1 tonnes, or approximately 2%. Converting this CO_2 reduction to a RIN value, U.S. drivers bear an implied per ton GHG reduction cost of $270 to $1,164. By contrast, direct CO_2 offsets can be purchase for as little as $5/ton. Thus the current RFS/RINs program forces drivers to pay 9x to 233x the open market option for CO_2 reduction. This implies most U.S. drivers could offset their entire annual CO_2 footprint for far less than they are expending on RINs ($5/tonne * 5.0 tonnes = $25/year <= $27/tonne when RINs are 5c/gallon, i.e., approximately the 2020 average RINs price)

Exhibit 7 - CO2 Reduction in RINs

CO2 Reduction in RINs	Low	High
Estimated Fuel Economy (mpg)	22.0	25.0
Estimated Annual Miles Driven	11,500	13,500
Gallons gasoline purchased per annum	523	540
Estimated CO2 Emissions per annum	4.4	4.9
Adjusted CO2 Emissions Ex. Ethanol per annum	4.5	5.0
Implied CO2 Benefit of Ethanol per annum	0.09	0.10
Per gallon D6 RINs price 2019	0.05	0.05
Recent per gallon D6 RINs price record	0.20	0.20
Total annual RINs cost in dollars	26	27
Total annual RINs cost in dollars	105	108
CO2 Reduction Per RIN in $/ton	$291	$270
CO2 Reduction Per RIN in $/ton	$1,164	$1,080
Open Market Carbon Offset Costs in dollars/ton	$5.00	$30.00
Premium for CO2 Reduction in RIN Terms	58	9
Premium for CO2 Reduction in RIN Terms	233	36

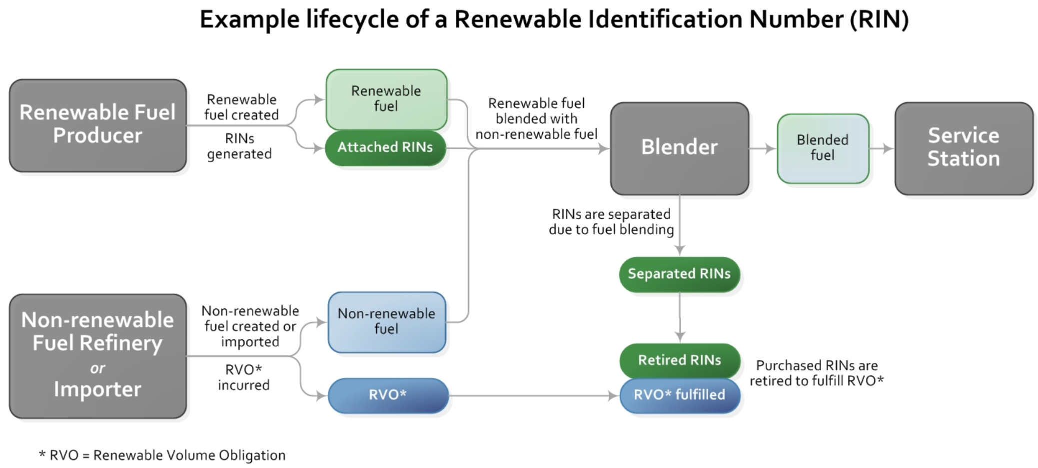
Source: DOE, Bloomberg and Wells Fargo Securities, LLC estimates

The Who, What and Where of RINs Generation and Settlement

The business that produces or imports an obligated fuel is required to produce or procure a RIN and present it to the EPA. However, that obligated party does not always possess the physical capacity to generate the RIN.

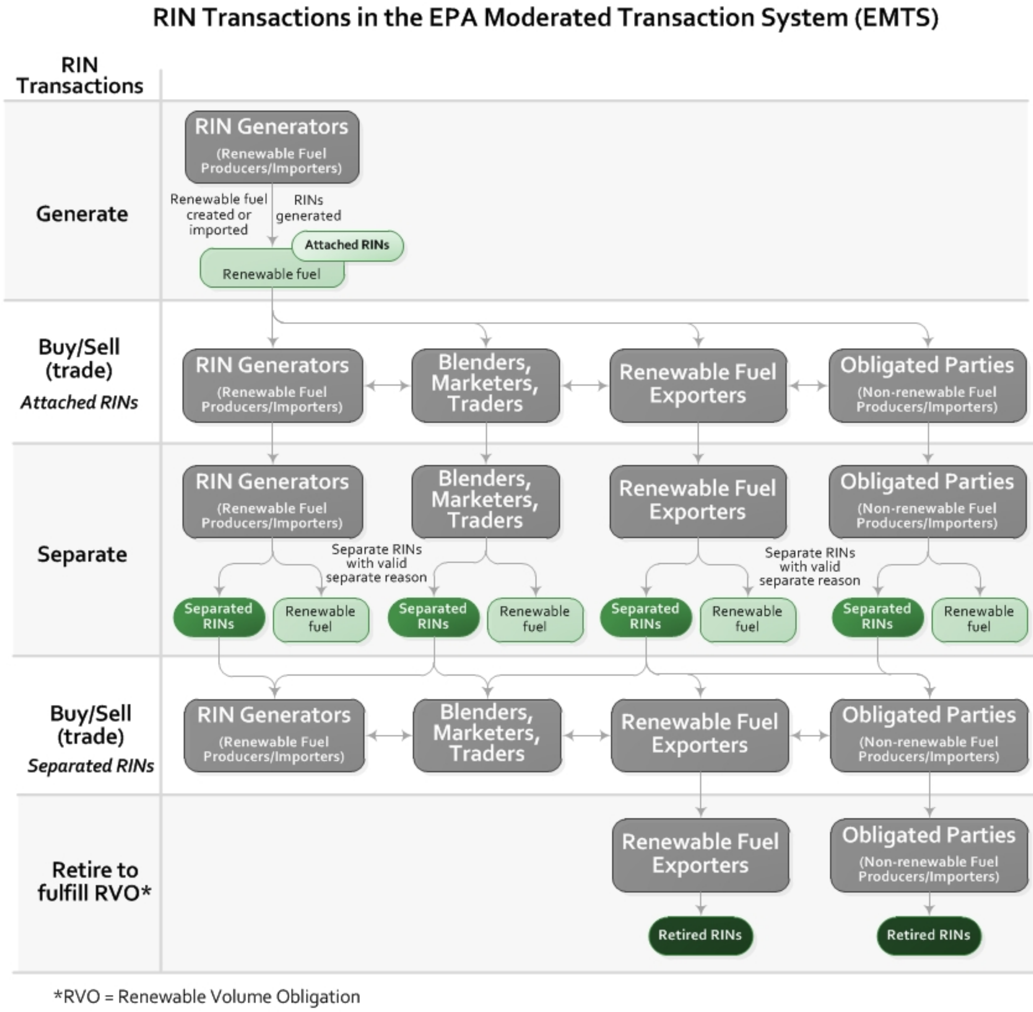
As an example, the refiner produces gasoline and thus becomes obligated for the RIN. The gasoline is sold into a major pipeline system (i.e., Colonial) at an ex-RIN price. The gasoline is ultimately delivered and blended where the RIN is created and value realized. The gasoline is then sold including the RIN, which is paid by the retail consumer. This leaves the blender with the extra value creation.

Exhibit 8 - Example Lifecycle of a RIN



Source: EPA

Exhibit 9 - RINs Transactions in the EPA Moderated Transaction System (EMTS)



*RVO = Renewable Volume Obligation

Source: EPA

What is a RIN? Renewable identification number a 38-digit unique number created when 1 gallon of ethanol is blended with 9 gallons of gasoline.

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