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# **Renewable Fuel Standard Waiver Options for 2014 and Beyond**

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## Summary

The Environmental Protection Agency (EPA) is charged with implementing the Renewable Fuel Standard (RFS), or biofuel use mandates. Last month, EPA released their proposal for the 2014 requirements. The proposal suggests the use of ethanol to help meet the mandate in 2014 would be lower than the volumes initially envisioned in the Energy Independence and Security Act (EISA) of 2007. The proposal also indicates a method to reset mandates in later years.

The analysis starts from a base case, or “Baseline”, that assumes the EPA proposal is implemented in 2014 and beyond. Using the FAPRI-MU economic models of biofuel and agricultural commodity markets updated with data available as of autumn 2013, we explore alternative scenarios with less of the mandate waived from 2014 to 2016.

Results relate to how waivers affect mandate “gaps”. The conventional gap is the difference between the overall and advanced mandates, and it can be met using corn starch ethanol. The advanced gap is the difference between the advanced mandate and its two submandates, biodiesel and cellulosic biofuel, that can be met using sugar cane ethanol imported from Brazil and other advanced biofuels. Results depend as well on the possibility of “demotion”, extra biofuel for one of the submandates used to help meet a broader mandate, such as when extra biodiesel beyond its mandate is used to help meet the broader advanced mandate.

## Conclusions

**Waiver choices have important impacts on biofuel use and RIN prices.** The conventional RIN price in 2014 differs from the baseline level of \$0.31 substantially, as low as zero in one case or as much as double the baseline value in another, with changes in the overall mandated volume of less than 20% explored here.

**Impacts depend in part on RIN rollover stocks.** If anticipated, then expected waivers in 2015 might have an impact in 2014 through demand for RIN rollover stocks. An expectation of large waivers might reduce the demand for RIN rollover stocks significantly and projected RIN prices would follow suit.

**Crop price impacts are sensitive to mandate levels and the response of market participants.** The combination of RFS requirements mostly as outlined by the EISA and lower RIN rollover response creates a scenario with average corn price effects on the order of \$0.20 per bushel in the 13/14 marketing year, relative to the baseline with the EPA proposal. If the baseline with the EPA proposal is compared to an alternative case with less of the RFS waived, but still some reduction from the legislated amounts, and RIN rollover responds, then the corn price impacts are small.

**Consequences of waiver options in later years also vary widely.** The exact pattern depends on how conventional and advanced gaps evolve. Estimated costs of mandate compliance range from \$5-7 billion a year in the baseline to tens of billions in some alternative scenarios.

## Key uncertainties

We use the FAPRI-MU deterministic economic model to estimate markets under different RFS waiver scenarios. Data were updated as of autumn 2013. There are several points of uncertainty about how biofuel markets could evolve in the scenarios explored here.

1. We represent the **blend wall** as a steep discount in the value of ethanol in retail fuels that contain more ethanol, like E85, in order to accelerate sales. The exact discount required and pace of expansion are matters of speculation.
2. California's **Low Carbon Fuel Standard** (LCFS) has the potential to support sugarcane ethanol imports from Brazil, even when the fuel is not needed to satisfy the advanced mandate under the RFS. Here, we assume that the LCFS causes almost half a billion gallons of sugar cane ethanol imports that count towards advanced mandate in the event that no imports would occur for the RFS.
3. In some scenarios, **ethanol import** levels rise rapidly to meet the much higher advanced requirements. Those levels may be larger than current infrastructure can handle. The pace of import infrastructure development is also a matter of speculation.
4. The prospect for larger or more price-sensitive **conventional ethanol exports** is a key uncertainty at this time. Depending on the conventional ethanol price in the US and the prevailing petroleum prices and fuel prices in markets around the world, as well as the price of competing ethanol exporters, US ethanol exports could be greater than expected here. Ethanol exports could also be more responsive to price changes, expanding quickly as domestic price falls or contracting if price rises. Such response could have implications for corn price and other impacts.
5. The **biodiesel tax credit** is assumed to expire at the end of 2013, so it is not directly relevant. However, 2013 data suggest high biodiesel production, well beyond the mandated volume, presumably motivated in part by this tax credit. If the tax credit were extended, then the additional incentive to blend biodiesel could lead to greater biodiesel use and corresponding RIN generation than in the scenarios explored here.
6. So far, we have only the **proposed rules**, not the final rule, so the key assumptions of the baseline are uncertain and current market prices for RINs likely reflect this. The EISA outlines a reset of mandates after large or persistent waivers as soon as 2016, but the potential for a mandate reset is not studied here.

## Proposed rules compared to legislated values, 2014 to 2016

### *Baseline and alternative scenarios*

We focus on results for three cases. In the “Baseline” case, we assume the RFS requirements for 2014-forward are determined in a manner consistent with the recently proposed 2014 rules issued by the EPA (Table 1). Each year the biodiesel requirement remains at 1.28 billion gallons. The advanced mandate is based on the availability of supplies of qualifying fuels other than ethanol. The overall requirement is reduced from the EISA level to a quantity such that the conventional gap approximates the amount of ethanol that can be used at the 10% blend level, plus some small but growing amount to account for E85 sales. This waiver method requires a reduction that is greater than the cellulosic shortfall in any given year.

The representation of the EPA proposal in the Baseline results in the overall mandate at less than 16 billion gallons and a fairly flat advanced mandate at least through 2016. The implied conventional gap that can be met using corn starch ethanol is 13-14 billion gallons and the advanced gap open to sugar cane ethanol is a couple hundred million gallons.

The “EISA gaps” scenario imposes a waiver such that both the overall and advanced requirements are reduced by the same amount as the cellulosic mandate. Hence, the conventional and advanced gaps remain the same as implied by the EISA. This implies a greater conventional gap and a smaller advanced gap in 2014, but both gaps are higher in the following years in the EISA gaps case relative to the baseline. The conventional gap accessible to corn starch ethanol rises to 15 billion gallons in 2015, for example.

The other alternative, “No broader waivers,” assumes that the broader mandates are not reduced in the future even though cellulosic biofuel production continues to fall short of its mandate. While this assumption would be consistent with EPA proposals in years prior to 2014, the consequences include much higher overall and advanced requirements and a rapidly expanding advanced gap in the future. The advanced gap in this case rises to over 5 billion gallons in 2016 as the shortfall in cellulosic biofuel must be offset with an equal amount of additional other advanced biofuel or biodiesel.

### *Biofuel market impacts*

The implications for biofuel market quantities and prices are presented in table 1. High-blend fuel use increases rapidly, relative to the baseline, in both the EISA gaps and No broader waivers scenarios in order to meet RFS mandates that require use well beyond the amount that can be used in 10% blends.

Under the EISA gaps scenario, high-blend fuel use reaches nearly 3.5 billion gallons in 2016. The use of higher blend fuels in the No broader waivers scenario is nearly double that of EISA gaps, reaching almost 6.6 billion gallons in 2016. The exact relationship between the price ratio and consumer willingness to buy E85 is a key uncertainty, but E85 priced at a one-third discount below the energy equivalent price would presumably generate more sales.

A percent standard for total renewable fuel use in all fuels can imply ethanol use in gasoline-type fuels greater than the stated percent standard. Figure 1 presents the percent standards in the baseline range from 9.2% in 2014 to 9.5% in 2016. However, ethanol use as a share of gasoline-type fuels ranges from 9.9% to 10.2% over the same period. Based on our understanding, the standard applies to all fuels. The biodiesel mandate corresponds to about a 3% share of the diesel market. If the biodiesel share is less than the overall percent target, then ethanol share of the gasoline market must be greater than the target to

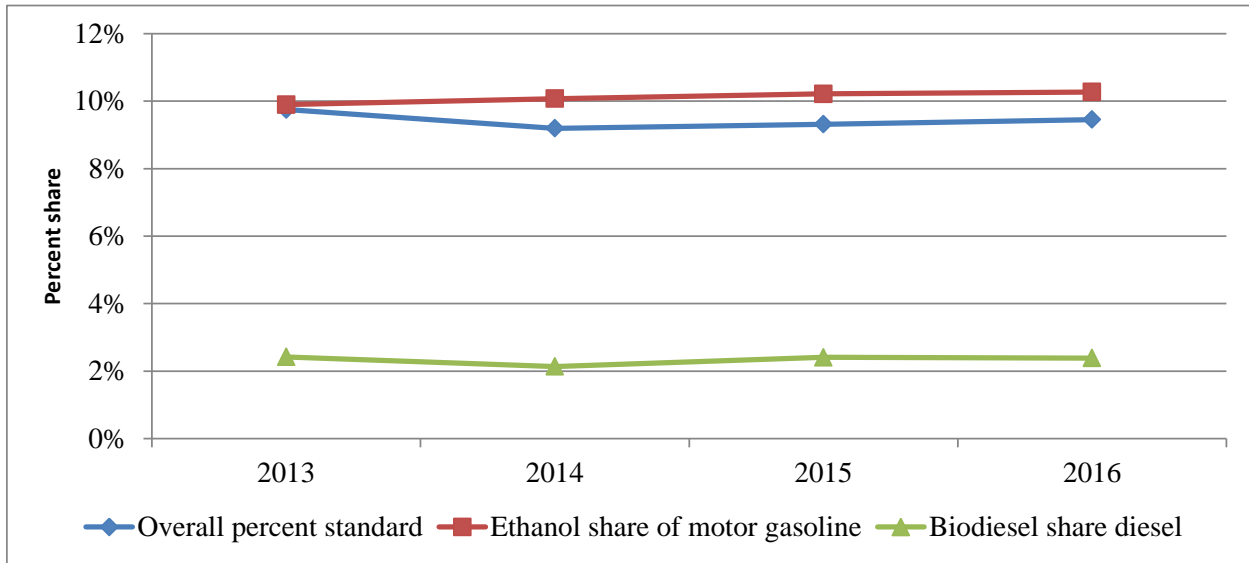
make up the difference. Thus, baseline standards of 9.2% to 9.5% suggest higher shares of ethanol use, pushing up to, or even past, the blend wall that is defined by the limits of E10 use.

**Table 1. Selected RFS waiver options and their biofuel market impacts, 2014-2016.**

	Baseline			EISA gaps			No broader waivers		
	2014	2015	2016	2014	2015	2016	2014	2015	2016
<b>Applied RFS requirements</b>									
	(billion gallons)								
Overall	15.3	15.6	15.8	16.4	17.6	18.2	18.2	20.5	22.3
Advanced	2.2	2.2	2.3	2.0	2.6	3.2	3.8	5.5	7.3
Biodiesel	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28
Conventional gap	13.1	13.3	13.5	14.4	15.0	15.0	14.4	15.0	15.0
Advanced gap	0.3	0.2	0.2	0.1	0.6	1.1	1.8	3.5	5.1
<b>Ethanol supply and use</b>									
	(billion gallons)								
Production	13.80	13.90	13.81	14.04	15.19	15.69	14.49	15.82	15.86
from corn	13.60	13.65	13.47	13.84	14.92	15.31	14.28	15.53	15.46
from other feedstocks	0.20	0.25	0.34	0.21	0.27	0.39	0.21	0.29	0.39
Imports	0.48	0.48	0.49	0.50	0.63	0.74	0.65	1.64	3.24
Use	13.40	13.54	13.55	13.66	15.07	15.86	14.19	16.71	18.40
in low level blends (E10)	13.07	13.01	12.94	13.02	12.71	12.43	12.93	12.36	11.81
in high level blends (E15, E85)	0.33	0.54	0.62	0.65	2.36	3.42	1.27	4.36	6.59
Exports	0.88	0.83	0.74	0.87	0.71	0.53	0.94	0.74	0.69
Ending Stocks	0.76	0.77	0.78	0.77	0.78	0.80	0.77	0.79	0.81
<b>Biodiesel supply and use</b>									
Production	1.23	1.37	1.37	1.23	1.42	1.50	1.71	2.49	2.50
Biodiesel	1.15	1.30	1.31	1.15	1.35	1.42	1.61	2.39	2.38
Other renewable diesel	0.08	0.07	0.07	0.08	0.07	0.08	0.10	0.11	0.12
Use	1.13	1.27	1.28	1.13	1.31	1.39	1.60	2.39	2.42
Net exports	0.10	0.10	0.09	0.10	0.10	0.10	0.11	0.09	0.07
Ending stocks	0.09	0.10	0.10	0.09	0.10	0.10	0.10	0.11	0.12
<b>Biofuel and related prices</b>									
Wholesale ethanol, Omaha	1.80	1.77	1.79	1.84	1.94	2.05	1.90	2.05	2.07
Retail ethanol	2.11	2.08	2.07	2.04	1.84	1.81	1.92	1.60	1.51
Retail gasoline	3.41	3.36	3.37	3.42	3.42	3.45	3.44	3.49	3.54
Retail ethanol-to-gasoline ratio	62%	62%	61%	60%	54%	53%	56%	46%	43%
Wholesale biodiesel	3.41	3.66	3.94	3.42	3.71	4.08	3.92	4.69	5.00
Wholesale diesel	2.88	2.80	2.78	2.88	2.80	2.78	2.88	2.80	2.78

*Note: Values may not equal sums due to rounding*

**Figure 1. Baseline applicable percent standards and biofuel market shares.**



These results are sensitive to the representation of the blend wall. For example, the percent standards range from 9.8% to 10.6% in the EISA gaps scenario and range from 9.8% to 13.9% in the No broader waivers scenario.

A larger differential in consumer fuel prices in those scenarios is necessary to motivate more ethanol use in high-blend fuels, such as E85, relative to the baseline. The means to lower the retail price is the RIN price: a higher RIN price drives a larger wedge between the ethanol wholesale price required to induce supply of the necessary amount, and the implied retail value of ethanol low enough to sell the blended fuels.

The exact level of the RIN price associated with a larger volume of ethanol for the mandate depends on other factors, such as gasoline price and consumer willingness to pay. In the baseline, a ratio of ethanol to gasoline values in retail fuels of 61-62% leads to slowly rising E85 use that is assumed to occur when this ratio is somewhat below two-thirds, the energy content of ethanol. A ratio falling from 56% to 43%, a sharp discount in energy equivalent terms, is assumed to lead to billions of gallons more E85 use.

*RIN market impacts*

RIN markets are estimated as part of the exercise, as shown in Table 2. These numbers represent domestic market activity in each calendar year, so they are not intended to equal published EMTS data that tracks RINs by their “vintage”, or year in which they are created, regardless of when they are used. RINs generated but retired for purposes other than compliance, such as for biofuel exports are excluded.

This representation includes generation of each type of RINs associated with domestic biofuel use, their use for compliance, the rollover RINs (or RIN stocks) at the start and end of each year, and any RINs that are demoted from a submandate to help fill a broader mandate.

The RIN prices reflect the difficulty in meeting those larger requirements, although the impact is mitigated by the use of existing RIN stocks – an effect that is explored later. In the EISA gaps scenario, the RIN stocks are drawn down even further in 2015 and are exhausted by the end of 2016. In No broader waivers, the RIN stocks are depleted by the end of 2014.

The RFS requirements are roughly twice as costly to meet in the EISA gaps scenario relative to the baseline. The No broader waivers case leads to much larger increases. It should be noted that the compliance cost and RIN price estimates reported here are not all-inclusive, omitting some factors such as the transaction costs.

Additional biodiesel use beyond its own mandate, or demotion, does not occur in the baseline. However, there is a fair amount of biodiesel demotion occurring in 2015 and 2016 in the alternative scenarios. In EISA gaps scenario, the equivalent RIN prices across the three types in the year 2015 indicate the demotion is large enough that biodiesel displaces conventional ethanol to meet the overall requirement. In 2016, the biodiesel is displacing other advanced biofuels (e.g. sugarcane ethanol from Brazil) only to meet the advanced requirement.

**Table 2. Selected RFS waiver options and their RIN market impacts, 2014-2016.**

	Baseline			EISA gaps			No broader waivers		
	2014	2015	2016	2014	2015	2016	2014	2015	2016
RIN volumes									
Overall	(billions of RIN-gallons)								
Production	15.2	15.6	15.6	15.5	17.2	18.1	16.8	20.5	22.3
Compliance	15.3	15.6	15.8	16.4	17.5	18.1	18.1	20.3	22.1
Rollover	1.3	1.3	1.1	0.5	0.1	0.0	0.0	0.0	0.0
Advanced									
Production	2.3	2.6	2.7	2.4	2.8	3.1	3.3	5.5	7.2
Compliance	2.2	2.2	2.3	2.0	2.6	3.2	3.8	5.5	7.3
Rollover	0.3	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0
Biodiesel									
Production	1.1	1.2	1.2	1.1	1.3	1.4	1.6	2.4	2.4
Compliance	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28	1.28
Rollover	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0
RIN values									
	(dollars per RIN-gallon)								
Conventional	0.31	0.31	0.35	0.43	0.77	0.95	0.63	1.20	1.36
Advanced	0.31	0.31	0.35	0.43	0.77	1.05	1.03	1.84	2.05
Biodiesel	0.51	0.72	0.91	0.51	0.77	1.05	1.03	1.84	2.05
	(billion dollars)								
RFS compliance cost*	5.0	5.6	6.5	6.7	13.2	17.3	11.6	27.6	34.5

*Note: (1) Values may not equal sums due to rounding; (2) RFS compliance cost is calculated as the sum of: a) conventional RINs used for compliance multiplied by the conventional RIN price; b) other advanced RINs used for compliance multiplied by the advanced RIN price; c) cellulosic RINs used for compliance multiplied by the cellulosic RIN price; d) biodiesel RINs used for compliance multiplied by the biodiesel RIN price.*

#### *Selected feedstock market impacts*

Figure 2 displays the corn prices in each of these scenarios. Although the use requirements for calendar year 2014 are larger in the alternative scenarios, the corn price effects in the 2013/14 marketing year are limited if obligated parties choose to draw on RIN stocks rather than produce much more ethanol – a point discussed below. In later year, the corn price effects become larger as the requirements diverge across scenarios. That said, the mismatch of calendar year mandates and marketing year crop prices means that some of the estimated effect in any particular year might bleed over to neighboring years.



**Figure 2. Corn prices with selected waiver assumptions and rollover response.**

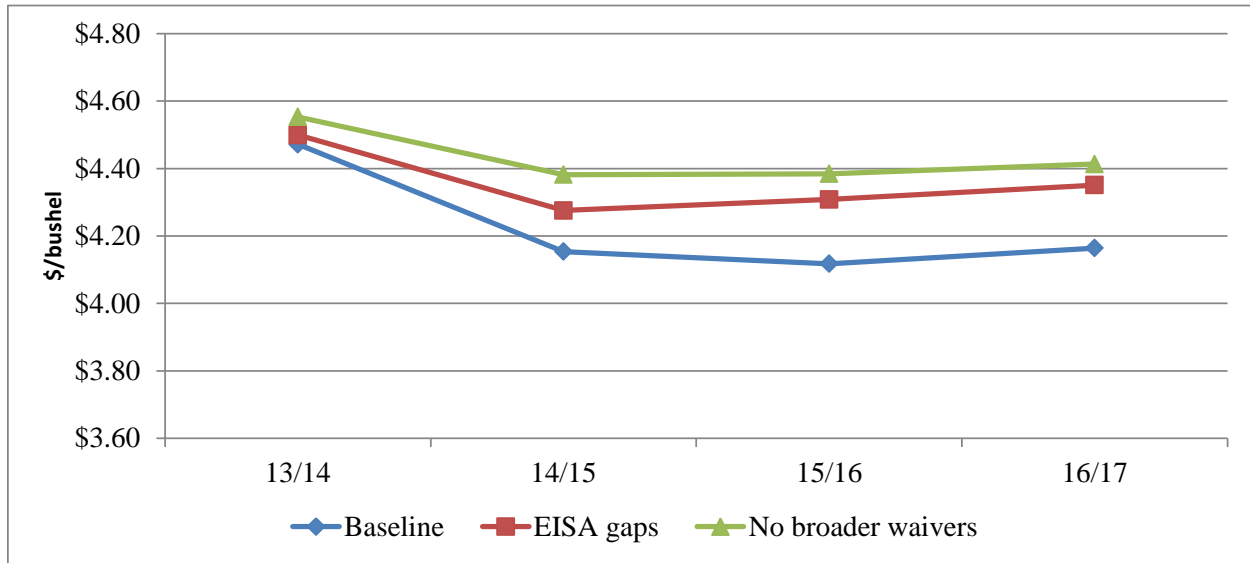


Table 3 outlines some of the other crop and product market impacts. The Baseline projections have corn for ethanol and coproducts at about 5 billion bushels because the conventional gap remains at less than 14 billion gallons and ethanol exports do not expand substantially.

The EISA gaps case leads to an additional billion gallons of conventional ethanol qualifying for the mandates, so corn use for ethanol and coproducts rises. The No broader waivers case also has a higher conventional gap relative to the baseline, and a similar increase in the volume of corn used for these purposes relative to the baseline.

The biodiesel mandate is 1.28 billion gallons in all cases. The soybean oil for biodiesel and coproducts varies with the possibility of biodiesel demotion to help fill the advanced mandate. In the EISA gaps scenario, the advanced gap rises to a higher level than in the baseline, and the advanced RIN price is bid high enough to cause extra biodiesel use beyond its own mandate, with the extra biodiesel RINs used to meet the higher advanced mandate. This difference is translated to somewhat higher demand for soybean oil for biodiesel in the EISA gaps case relative to the baseline.

**Table 3. Selected RFS waiver options and their crop market impacts, 2014-2016.**

	Baseline			EISA gaps			No broader waivers		
	2014	2015	2016	2014	2015	2016	2014	2015	2016
<b>Crop products</b>									
Corn for eth./DDGS (bil bu.)	5.0	4.9	4.9	5.3	5.5	5.6	5.5	5.6	5.6
Soy oil for biodiesel (bil lbs)	6.2	6.2	6.1	6.4	6.6	7.3	11.4	12.0	12.5
<b>Crop prices (marketing year)</b>									
Corn (\$/bushel)	4.15	4.12	4.16	4.28	4.31	4.35	4.38	4.38	4.41
Soybean (\$/bushel)	10.54	10.40	10.56	10.56	10.46	10.71	10.97	10.90	11.21
Soybean oil (\$/cwt)	40.80	41.69	41.40	41.16	42.72	43.85	49.30	50.64	50.88

The impact of demotion on soybean oil for biodiesel is most apparent in the No broader waivers case as compared to the baseline. The amount of soybean oil used for biodiesel is roughly doubled. The reason is the sharply higher advanced mandate of this case drives the advanced RIN price much higher, and more biodiesel is used to help to meet the advanced mandate. This outcome rests on assumptions about how markets behave in as-yet unseen context of ethanol use billions of gallons beyond the blend wall, billions of gallons more imports of sugar cane ethanol, and more biodiesel production.

Crop market impacts follow from the effects on feedstocks. Relative to the baseline, the EISA gaps scenario leads to higher prices for crops and crop products shown in Table 3. The increases are not large in percentage terms. The No broader waivers scenario leads to larger increases in crop and crop product prices. The soybean oil price changes, and by extension those of soybeans and corn, depend on how much vegetable oil markets respond. There is likely some sensitivity to the degree of substitution among vegetable oils and the time allowed for response in these markets, particularly if palm oil production changes take place only slowly.

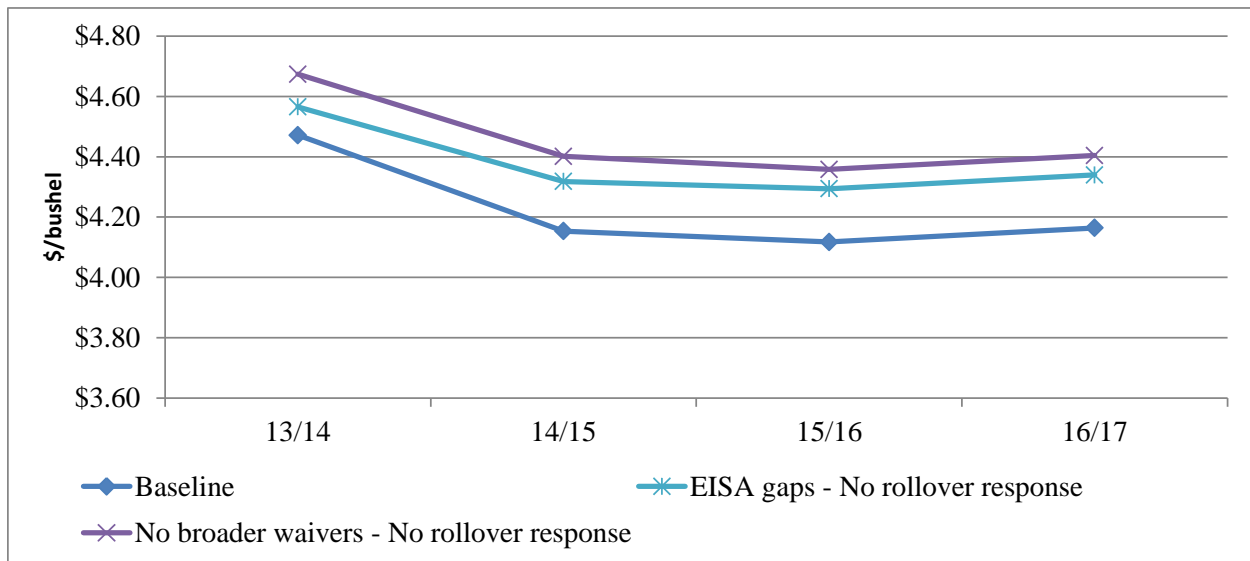
*If stocks of rollover RINs do not absorb the shock*

The EISA gaps and No broader waiver scenarios lead to large RIN price impacts, but the greater need for RINs for compliance is partly met in each case by depleting stocks of rollover RINs. RIN stocks might be held for longer if the mandates are expected to become more binding over time.

The impacts of these RFS waiver alternatives on corn price are identified for the case where RIN rollover stocks are not sold off to help meet the mandates in this period.

If we assume obligated parties choose not to draw on RIN stocks, the crop market effects become more pronounced in 2013/14. Figure 3 displays corn price impacts if RIN rollover stocks do not respond to changing market conditions. By removing the flexibility permitted by RIN stocks, the price differences among scenarios are larger.

**Figure 3. Corn prices with selected waiver assumptions and no rollover response.**



In this case, the corn price difference from the Baseline to the No broad waivers is at its largest, \$0.20, whereas the difference is much smaller if RIN stocks are depleted in 2014 to meet a higher mandate.

In all cases explored here, the exact timing of these effects is uncertain. As seen, RIN rollover stock adjustments can have important effects.

*Selected ethanol trade impacts*

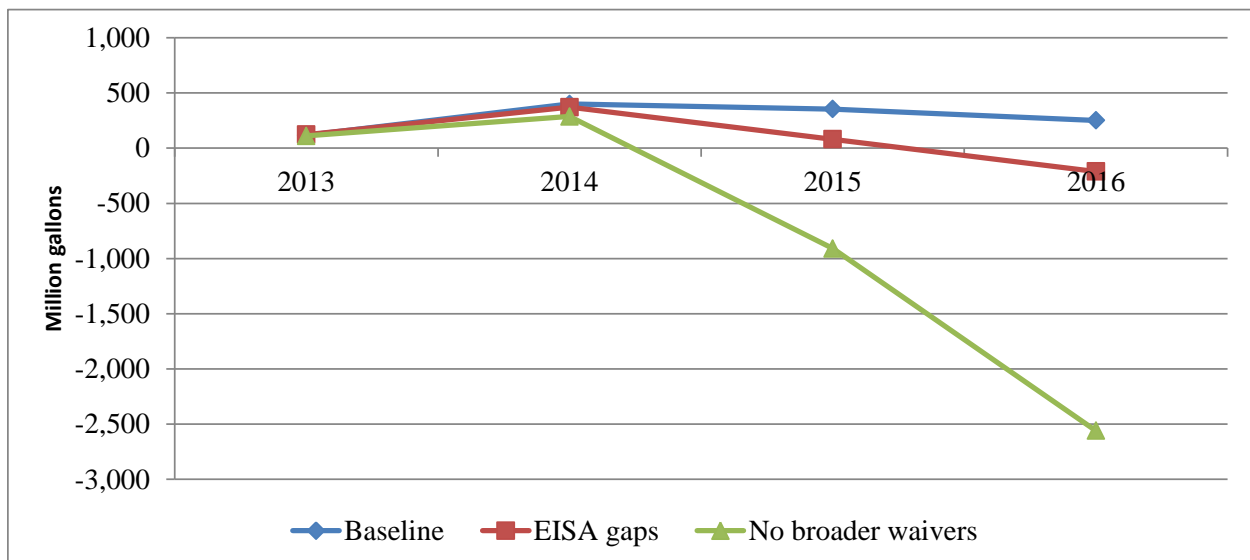
Figure 4 displays net ethanol exports in each of these three scenarios. In the Baseline, there is less need for imported ethanol to meet the lower advanced use requirement, and the small implied advanced gap, so the US remains a net exporter of ethanol through 2016. In the alternative scenarios, ethanol imports rise to meet the higher advanced requirements and exports fall at a quicker pace relative to the baseline.

In the No broader waivers case, the rising advanced mandate of the EISA coupled with a waiver of the cellulosic mandate means a widening advanced gap, leading to more and more sugar-cane ethanol imports, as well as more biodiesel use. In this latter case, ethanol imports are much higher than in the baseline. Conventional ethanol exports are higher than the baseline level initially because of the rising price of ethanol in Brazil, but are lower than the baseline in the end.

The exact outcome for exports is a source of uncertainty: domestic use of conventional and sugar-cane ethanol are both higher in this case than in the baseline. Domestic and Brazilian wholesale prices of ethanol are bid higher, so exports could in principle be higher than the baseline (if the Brazilian price rises more) or lower than the baseline (if the domestic price rises more). The relative impacts will depend on many factors, including the amount of unused production capacity in the US, the ability to acquire sugar cane ethanol through new production or by outbidding Brazilian consumers, and responsiveness in other markets to these prices.

Changes in trade are a key uncertainty, as noted above. Expanding imports might require additional infrastructure in trading countries, such as port facilities, that take time to build. Exports might be more responsive to changes in the conventional ethanol price than anticipated here, potentially moderating corn price impacts.

**Figure 4. Net exports of ethanol with selected waiver assumptions and rollover response.**



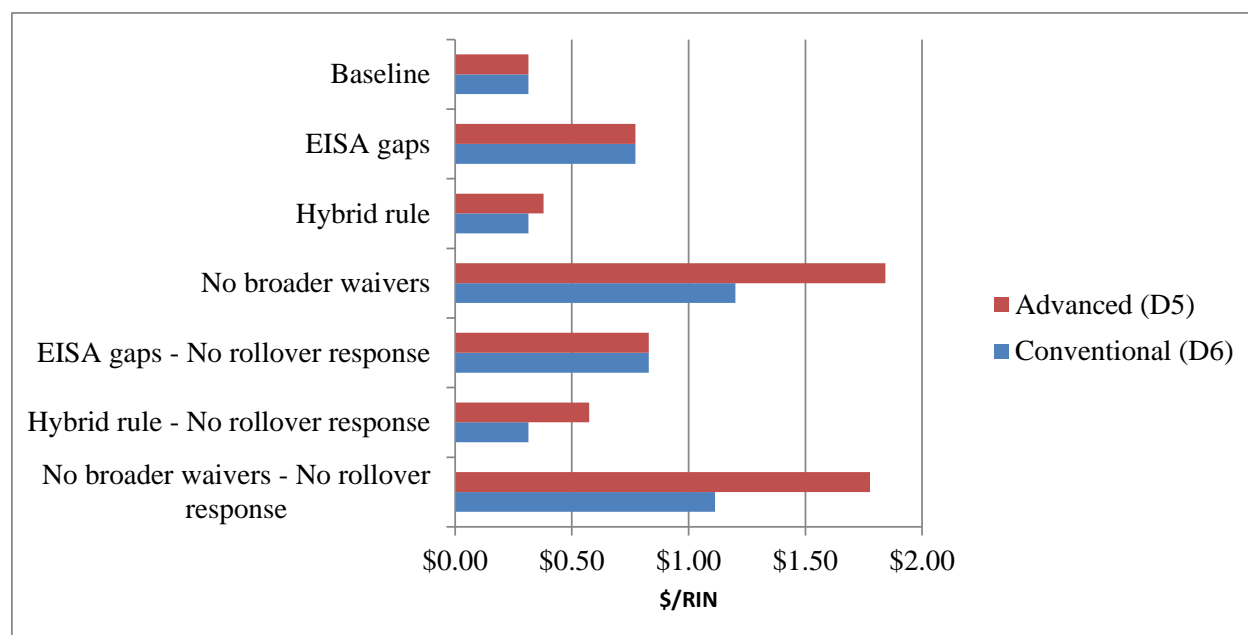
## Other scenarios

We test several alternative assumptions about how the waivers could be implemented going forward. We find a range of RIN prices that, if anticipated, could affect RIN buying patterns in 2014.

RIN prices are estimated in 2015 for seven cases. As before, the “Baseline” imposes the EPA proposal, “EISA gaps” holds conventional and advanced gaps at EISA levels, and “No broader waivers” assumes that neither the overall nor the advanced requirements are waived by the cellulosic shortfall. “Hybrid rule” assumes the conventional gap approximates the blend wall limit, while the advanced gap remains at EISA levels. Scenarios with “No rollover response” assume that RIN rollover does not respond to the new price signals.

Even these few scenarios lead to a wide range of 2015 conventional (D6) and advanced (D5) RIN price estimates, as seen in figure 5. The RIN prices in EISA gaps are much higher than the baseline level, and they are higher still if there is no ability to draw down RIN rollover to meet the rising mandate. In each of those three cases, the equivalent advanced and conventional RIN prices indicate advanced biofuels are displacing conventional ethanol in meeting the overall RFS requirements. The conventional gap is rising quickly in the EISA gaps scenario to 2015. As table 1 shows, the advanced RIN price rises more quickly in 2016 as the advanced mandate continues to rise in the EISA gaps scenario whereas the conventional gap no longer increases.

**Figure 5. RIN prices in 2015 with selected waiver and market assumptions.**



*Definitions: the Baseline assumes the EPA proposal is implemented; EISA gaps maintains the conventional and advanced gaps implied by the EISA, not the smaller gaps of the EPA proposal, the hybrid rule retains the lower conventional gap of the baseline but allows the advanced gap to reach EISA levels; No broader waivers assumes neither the overall nor the advanced requirements are waived by the cellulosic shortfall; and ignoring rollover response means that RIN stocks are not permitted to adjust to the changing RIN prices of these scenarios, so all mandate changes must be met by changing contemporaneous biofuel use.*

In the Hybrid rule scenarios, conventional RIN prices are quite similar to the baseline levels, reflecting similar overall requirements. However, the advanced requirements are much larger compared to the baseline, and it is more difficult for advanced biofuels to be used beyond that requirement. Hence, the advanced and conventional RIN prices begin to diverge in those two scenarios relative to the baseline.

In the No broader waivers scenarios, both conventional and advanced RIN prices are much higher than those in the baseline. However, advanced gap is rising so quickly that advanced biofuels are not displacing conventional ethanol to meet the overall requirement. The RIN prices in 2015 are somewhat lower because, absent RIN rollover response, RIN stocks are not depleted in 2014. Those additional stocks provide a bit of cushion for obligated parties in 2015.

#### *Expectations*

Market participants do not know with certainty what rules will ultimately be applied in 2014, let alone in 2015. However, if one particular path going forward is seen as likely, then future expectations would be built into current markets. This cascading effect can work over more than one year: if there is an expectation that the mandates will not be binding at some point in the future, then this expectation could soften demand for rollover stocks in previous years, subject to certain limitations.

Taken to the extreme, a “No Carryout” case for 2014 is constructed. In addition to baseline waivers that follow the EPA proposal, rollover demand is eliminated, meaning that no rollover stocks are held at the end of the year. This scenario leads to nearly zero conventional RIN prices in 2014. Thus, RIN rollover matters in general, and can be particularly important to determining RIN prices, and other effects, if the RFS is expected to become more or less binding in later years.