



Decision Time for the RFS?

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There has been much discussion over the last year about problems in implementing the Renewable Fuels Standards (RFS) due to the expanding gap between the implied mandate for renewable biofuels (ethanol) and the E10 blend wall. Our previous posts on this issue can be found [here](#), [here](#), and [here](#). In this post we update our previous analysis of EPA options for implementing the RFS for 2014 and 2015. The main focus is to highlight the constraints faced by the EPA as it considers potentially momentous decisions about the RFS rules for 2014 and 2015.

To begin, note that the implied mandate for renewable biofuels (total mandate minus mandate for advanced biofuels) increases from 13.8 billion gallons in 2013 to 14.4 billion gallons in 2014 and to 15 billion gallons in 2015 and beyond. The E10 blend wall is influenced by the projection of total domestic motor fuel consumption, but is currently near 13 billion gallons. The E10 blend wall is not expected to expand soon and may decline slowly as domestic motor fuel consumption declines. As a result, the gap between the mandate and the expected E10 blend wall will increase substantially over time.

Prospects for an expanding gap between the mandate and the E10 blend wall have been reflected in sharply higher prices for Renewable Identification Numbers (RINs) beginning in January 2013. We have written several posts analyzing RINs prices, including those found [here](#), [here](#), and [here](#). Our analysis shows that the pressure of meeting the RFS renewable (ethanol) mandate with a binding and steep E10 blendwall ultimately shows up in the price of biodiesel. This situation has resulted in numerous calls for changes in the RFS either through the administrative authority granted to the EPA by the RFS statutes or through legislative changes to the RFS statutes. To date, the only change to the RFS made by EPA has been to reduce the advanced biofuels mandate for cellulosic biofuel. Those mandates have been reduced due to lack of production capability. In 2013, for example, EPA established the mandate at 6 million gallons compared to the RFS of one billion gallons. While the cellulosic mandate has been reduced, the mandate for total advanced and total biofuels has not been reduced, even though EPA has authority to do so. Congressional committees have held hearings on the RFS, but we do not expect legislative changes any time soon.

In its [recent final rule making for 2013](#), the EPA indicated that the 2014 proposed rule to be released later this year would include a proposal to adjust the 2014 volume requirements, including both the advanced biofuel and total renewable fuel categories. A number of proposals are possible and each has advocates. Some argue that changes beyond another cellulosic write-down are not required because a combination

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of higher blends of ethanol (E15, E85) and larger volumes of biodiesel will successfully meet existing mandates for 2014 and beyond. Others argue that the advanced and total biofuels mandate should be reduced by an amount equivalent to the cellulosic write-down. Still others argue that both the advanced and renewable mandates should be reduced for 2014 and beyond (see our “Freeze It” proposal [here](#) for one example). The EPA will consider a large number of factors, including biofuels production, distribution, and consumption capacities as well as the scope of its authority, in determining proposed changes for 2014 and there will be opportunity for public comment on the proposal.

We examine here the three main alternatives that the EPA can choose from for implementing the RFS in 2014 and 2015:

1. **Status Quo:** No change to volume levels in the RFS statute except writing down cellulosic mandate to the (low) levels of actual cellulosic ethanol production.
2. **Writedown:** Reduce the advanced and total RFS volume levels in parallel to the reduction of the cellulosic mandate.
3. **Freeze:** Keep the advanced, total, and renewable RFS volumes frozen at 2013 levels.

The specific levels for the RFS in 2013, 2014, and 2015 under each of these alternatives are shown in the top panel of Table 1. Under the writedown option the total RFS is reduced by 1 billion gallons in 2014 and by 2.75 billion gallons in 2015. Note that we assume that the advanced mandate in 2014 and 2015 under this option is written down to no lower than 2.75 billion gallons, which is the level of the advanced mandate in 2013. With the freeze option the total RFS is reduced by 1.6 billion gallons in 2014 and 3.95 billion gallons due to reducing both the advanced and (implied) renewable mandates. This raises a key issue confronting the EPA as they move forward with RFS rules: Do they have the statutory authority to reduce the total RFS by more than the writedown of the advanced mandate?

We now consider two different pathways to filling the gap between the implied renewable fuels mandate and the E10 blend wall under each of the three alternatives shown in Table 1. One pathway assumes that much of the gap is filled with renewable biodiesel and the second assumes more of the gap is filled with E85. In our previous work we assumed that the gap would be largely filled by biodiesel due to logistical and infrastructure limitations to increasing E85 use. We include the E85 compliance scenarios here for a full treatment of possible scenarios and due to recent analysis showing that market incentives may allow more rapid E85 expansion during the next two years (see analysis [here](#), [here](#), and [here](#)). These two pathways are chosen to illustrate the range of possible compliance scenarios. In actuality, there are multiple combinations of biodiesel and E85 that could fill the gap between the renewable mandate and the E10 blend wall.

Table 1. EPA Policy Options for Implementing the Renewable Fuels Standards for 2013-2015---Billion Gallons except Biodiesel Feedstock (Billion Pounds) and Corn (Billion Bushels)

RFS Category	Status Quo Option			Writedown Option			Freeze Option		
	2013	2014	2015	2013	2014	2015	2013	2014	2015
Advanced	2.75	3.75	5.50	2.75	2.75	2.75	2.75	2.75	2.75
Renewable	13.80	14.40	15.00	13.80	14.40	15.00	13.80	13.80	13.80
Total	16.55	18.15	20.50	16.55	17.15	17.75	16.55	16.55	16.55
Reduction in Total	n/a	n/a	n/a	0.00	-1.00	-2.75	0.00	-1.60	-3.95
Compliance Scenario: Mainly Biodiesel									
Biodiesel	1.36	2.40	5.08	1.36	1.73	2.98	1.36	1.57	1.78
E85	0.14	0.41	0.68	0.14	0.41	0.68	0.14	0.41	0.68
End-of-Year RINs	1.19	0.00	0.00	1.19	0.00	0.00	1.19	0.35	0.00
Biodiesel Feedstock	10.22	17.98	38.13	10.22	12.98	22.38	10.22	11.75	13.38
Corn for Ethanol	4.74	4.77	4.79	4.74	4.91	4.93	4.74	4.91	4.93
Compliance Scenario: Mainly E85									
Biodiesel	1.36	1.80	2.74	1.36	1.57	1.50	1.36	1.57	1.50
E85	0.14	1.62	4.55	0.14	0.73	3.36	0.14	0.73	0.93
End-of-Year RINs	1.19	0.00	0.00	1.19	0.00	0.00	1.19	0.59	0.00
Biodiesel Feedstock	10.22	13.48	20.53	10.22	11.78	11.23	10.22	11.75	11.23
Corn for Ethanol	4.74	5.00	5.65	4.74	5.00	5.66	4.74	5.00	5.00

Note: n/a not applicable.

Some other key assumptions include: i) ethanol exports total 0.5 billion gallons each year; ii) imports of

Brazilian ethanol total 0.5 billion gallons in 2013 and 0.1 billion gallons in 2014 and 2015, with the exception of the status quo option where imports are allowed to be as large as 1 billion gallons; iii) the E10 blend wall declines from 13 billion gallons in 2013 to 12.935 billion gallons in 2014 and 12.87 billion gallons in 2015 due to declining domestic motor fuel consumption; iv) the biodiesel mandate is 1.28 billion gallons, 1.50 billion gallons, and 1.50 billion gallons in 2013, 2014, and 2015, respectively, with the exception of an increase to 1.70 billion gallons in 2015 under the status quo option; v) net trade of biodiesel is zero; and vi) RINs credits for the D4, D5, and D6 categories total 2.5 billion gallons at the beginning of 2013, and the total stock of credits from all three categories, if available, is applied to the renewable mandate.

A complete set of spreadsheets that show all the assumptions, calculations, and outcomes for the six compliance scenarios described above and graphs comparing outcomes can be found [here](#). The outcomes include the quantities of biofuels consumption by category, the year-ending stock of RINs, and the quantities of feed stocks required for the production of ethanol and biodiesel. The value for key variables under each of the compliance options is found in the bottom two panels of Table 1.

Implementation of the status quo option has the following implications:

1. RINs credits are exhausted in 2014.
2. Large quantities of biodiesel and/or E85 are required in 2014, but those quantities might be achievable under current biodiesel production constraints if E85 capacity is substantially expanded. Vegetable oil feedstock requirements for biodiesel production are large, but can likely be supplied with only modest market disruption.
3. The required quantities of biodiesel and/or E85 in 2015 likely exceed the capacity to produce or distribute those fuels. Vegetable oil feedstock requirements for biodiesel production are so large as to be disruptive to those markets. To illustrate, the current total domestic supply (including imports) of vegetable oils, lard, and edible tallow is near 35 billion pounds, which is less than the feedstock requirements for biodiesel production in 2015 under the primarily biodiesel scenario. The mainly E85 pathway to meeting the E10 gap requires about 650 million bushels more corn used for ethanol production than the recent peak near 5 billion bushels and imports of 1 billion gallons of ethanol from Brazil.

Implementation of the writedown option has the following implications:

1. RINs credits are exhausted in 2014.
2. Ethanol imports from Brazil are reduced to relatively low levels in 2014 and 2015 due to the reduction in the advanced mandate and increasing biodiesel and other undifferentiated advanced domestic biofuels.
3. The required quantities of biodiesel and E85 in 2014 are less than under the status quo option and can likely be supplied with modest expansion in E85 capacity.
4. The required quantities of biodiesel and/or E85 in 2015 may exceed the capacity to produce or distribute those fuels. Vegetable oil feedstock requirements of the mainly biodiesel pathway are large enough to be disruptive to those markets. The mainly E85 pathway to meeting the E10 gap requires about 660 million bushels more corn used for ethanol production than the recent peak near five billion bushels.

Implementation of the freeze option has the following implications:

1. RINs credits are exhausted in 2015.
2. Ethanol imports from Brazil are reduced to relatively low levels in 2014 and 2015 due to the reduction in the advanced mandate and increasing biodiesel and other undifferentiated advanced domestic biofuels.
3. Required quantities of biodiesel and E85 in 2014 and 2015 are achievable with modest expansion in E85 production.
4. Feedstock requirements are not so large as to be disruptive to either the vegetable oil or corn markets.
5. Only small increases in biodiesel and/or E85 are needed in years after 2015 to make this scenario self-sustaining.

Conclusions

The EPA appeared to send strong signals in their [recent 2013 RFS rulemaking](#) that the agency will implement some sort of writedown of RFS volumes starting in 2014. If this is true, then the status quo option is off the table and compliance in 2014 becomes feasible under either the writedown or freeze options because of the very large stock of RINs that have been built up. The real fireworks start in 2015 when the stock of RINs is presumably exhausted. If EPA's statutory authority is limited to writing down the total RFS by the amount that the cellulosic mandate is written down, then compliance may become problematic in 2015 because the required quantities of biodiesel and/or E85 in 2015 may exceed the capacity to produce or distribute those fuels. The only way to assure that compliance is not likely to be problematic in 2015 is under the freeze option, and even this option can require nearly a billion gallons of E85 use. However, it is not clear whether the EPA has the authority to implement this option since it requires writing down the (implied) renewable mandate to 13.8 billion gallons in 2014 and 2015. It is probably no accident that discussion of this issue has appeared in the press in recent weeks. Much will depend on how the EPA interprets its authority in this regard.