



## Potential Impact of Alternative RFS Outcomes for 2014 and 2015

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We have had a number of previous *farmdoc daily* posts discussing the potential 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 (see [here](#), [here](#), [here](#), and [here](#)). We argued that the EPA faced several constraints as it considered potentially momentous decisions about the RFS rules for 2014 and 2015. The EPA announced [preliminary rulemaking for 2014](#) on November 15, 2013, and the proposal did indeed signal a significant shift in EPA policy. The most surprising and controversial aspect of the proposal was the write down of the renewable mandate from 14.4 to 13 billion gallons. This was much larger than anticipated by most analysts (at least prior to the [leak of the proposed rulemaking](#) earlier this year) and more aggressive in dealing with blend wall constraints than our own "Freeze It" [proposal](#). The purpose of today's post is to trace through the likely implications of the proposed EPA rulemaking in the same manner that we analyzed alternative implementation options in our earlier posts. Specifically, we investigate two scenarios: 1) implementation of 2014 and 2015 rules as proposed by the EPA, and 2) implementation of 2014 and 2015 rules identical to the EPA proposal with the exception that the renewable mandate is not written down.

### 2014 Proposed Rules

There should be no doubt that E10 blendwall constraints drove the shift in EPA policy regarding implementation of the RFS mandates. The change is summarized in the following statement from the [Fact Sheet](#) for the proposal:

The proposal seeks to put the RFS program on a steady path forward – ensuring the continued growth of renewable fuels while recognizing the practical limits on ethanol blending, called the ethanol "blend wall."

This new implementation framework basically takes the E10 blend wall as a starting point and builds the mandated volumes up from this starting point. EPA rulemaking in previous years worked in essentially the opposite fashion by taking the total RFS volume in the statute as the starting point and then reducing the cellulosic sub-mandate as needed. Based on the new framework, the EPA preliminary rule making for 2014 proposed a write down of the cellulosic mandate, the advanced mandate, and the total mandate. The proposed volume requirements, by fuel category, along with the 2013 volume

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requirements and the statutory requirements for 2014 are presented in Table 1. These volumes are in ethanol equivalents, except for biomass-based diesel which is stated in actual “wet” gallon terms. Further details on the proposed 2014 volumes can be found in [this farmdoc daily post by Seth Meyer and Rob Johansson](#).

**Table 1. RFS Volume Requirements for 2013 and 2014**

	2013 RFS requirement	2014 RFS requirement	2014 proposed EPA requirement
Cellulosic biofuel	1.0 bil. gal.	1.75 bil. gal.	17 mil. gal.
Biomass-based diesel	1.28 bil. gal.	> 1.0 bil. gal.	1.28 bil. gal.
Advanced biofuel	2.75 bil. gal.	3.75 bil. gal.	2.2 bil. gal.
Total	16.55 bil. gal.	18.15 bil. gal.	15.21 bil. gal.
Implied renewable fuel	13.8 bil. gal.	14.4 bil. gal.	13.01 bil. gal.

Note: These volumes are in ethanol equivalents, except for biomass-based diesel which is stated in actual “wet” volume terms.

The proposed cellulosic volume reflects EPA judgment about production potential in 2014 and represents a 1.733 billion gallon write down of the 1.75 billion gallon cellulosic mandate for 2014. This continues the very large write downs of the cellulosic mandate in recent years in view of the slower than expected ramp up in cellulosic production volumes. The proposed biomass-based biodiesel volume of 1.28 billion gallons is equal to that of 2013 and above the minimum of one billion gallons required by the RFS. Interestingly, the EPA also proposed holding the biomass-based diesel mandate constant at 1.28 billion gallons in 2015. The proposed total advanced biofuel volume of 2.2 billion gallons is 0.55 billion gallons less than the 2013 requirement and 1.55 billion gallons less than the RFS for 2014. The write down of 1.55 billion gallons for the total advanced mandate is smaller than allowed based on the 1.733 billion gallon write down in the cellulosic requirement. The implied volume requirement for renewable fuels (difference between the total and the advanced) is 0.79 billion less than the 2013 requirement and 1.39 billion less than the RFS for 2014. We use the term implied mandate for renewable biofuel because that category can also be satisfied with additional blending of advanced biofuels.

It is not an understatement to say that the EPA’s proposed rulemaking for 2014 is [highly controversial](#). At the heart of the controversy is the EPA’s argument that it has the statutory authority to write down the total mandate by more than the write down in the cellulosic mandate, which effectively implies a write down in the mandate for corn-based ethanol. The EPA argues that its authority in this regard is based on the waiver provision in the RFS statutes pertaining to “inadequate domestic supply.” It is asserted by the EPA that “supply” in this context encompasses not only the production of biofuels but also the ability to distribute, blend, dispense, and consume biofuels. A thorough analysis of the legal issues surrounding the RFS waiver authority of the EPA can be found in the [November 6, 2013 farmdoc daily post by Jonathan Coppess](#).

Note that the EPA will receive public comment on the proposed volume requirements and announce final rule making after those are evaluated. In addition to the specific volumes proposed as shown in Table 1, the EPA also provided ranges for the cellulosic, advanced, and total mandates that may be considered for final rulemaking. If the proposed volume requirements in Table 1 stand as the final EPA rules for 2014, we expect a legal challenge to ensue.

## Analysis

In this section we trace through the likely implications of the EPA rulemaking as announced on November 15 in the same manner that we analyzed alternative implementation options in our [September 5](#) and earlier posts. Recognizing that the proposed rules could be altered by the EPA or as the result of legal challenge, we also analyze the likely implications of writing down the 2014 advanced volume to 2.2 billion gallons and the total volume requirement to 16.6 billion gallons. This alternative would leave the implied renewable volume requirement at the statutory level of 14.4 billion gallons. The analysis is extended to 2015 under the assumptions outlined below. In addition, the alternative of writing down only the advanced mandate is evaluated under two scenarios. The first assumes that the gap between the

implied renewable mandate and the E10 blend wall is satisfied mostly with biomass-based biodiesel and the second assumes the gap is filled mostly with E85. This parallels the compliance scenarios we analyzed in our September 5 post. In some of our earlier work we assumed that the gap between the implied renewable mandate and the E10 blend wall would be largely filled by biodiesel due to logistical and infrastructure limitations associated with increasing E85 deployment. Recent analysis shows that market incentives may allow more rapid E85 expansion during the next two years (see our own analysis [here](#), analysis by Seth Meyer, Rob Johansson, and Nick Paulson [here](#), and analysis conducted at Iowa State University by Bruce Babcock and co-authors [here](#) and [here](#)). The two compliance pathways are chosen to illustrate the range of possible compliance scenarios to fill the gap between the renewable mandate and the E10 blend wall. In actuality, there are multiple combinations of biodiesel and E85 that could fill the gap.

Some key assumptions for the analysis include: a) ethanol exports total 0.5 billion gallons in 2013, 2014, and 2015; b) imports of Brazilian ethanol total 0.5 billion gallons in 2013 and 0.1 billion gallons in 2014 and 2015; c) the E10 blend wall declines from 13 billion gallons in 2013 to 12.94 billion gallons in 2014 and 12.87 billion gallons in 2015 due to declining domestic motor fuel consumption; d) maximum domestic ethanol production capacity is 15.2 billion gallons per year; e) maximum domestic biodiesel production capacity is 3.6 billion gallons per year; f) no B5 blend wall restrictions on domestic biodiesel use; g) the biodiesel mandate is 1.28 billion gallons each year; h) the cellulosic mandate increases to 0.068 billion gallons in 2015; i) the advanced mandate for all scenarios in 2015 is 2.57 billion gallons, reflecting the maximum write down of the advanced mandate given the cellulosic mandate and projected cellulosic production; j) the renewable mandate is fixed at 13.01 billion gallons in 2015 under the advanced and renewable write down alternative; k) the renewable mandate is set at the statutory levels of 14.4 and 15 billion gallons in 2014 and 2015, respectively, under the advanced only write down alternative; l) blending of undifferentiated advanced domestic biofuels other than biomass-based biodiesel totals 0.1 billion gallons in 2013, 0.15 billion gallons in 2014, and 0.20 billion gallons in 2015; m) net trade of biodiesel is zero; n) the biodiesel tax credit is not reinstated for 2014 and 2015; and o) the stock of 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 needed and available, is applied to the renewable mandate.

A complete set of spreadsheets that shows all the assumptions, calculations, and outcomes for the 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 scenarios is found in Table 2 along with assumed values for each category of the RFS mandates.

**Table 2. Writedown Alternatives for Implementing the Renewable Fuels Standards for 2013-2015--- Billion Gallons except Biodiesel Feedstock (Billion Pounds) and Corn (Billion Bushels)**

RFS Category	Advanced Only Write Down			Advanced and Renewable Write Down		
	2013	2014	2015	2013	2014	2015
Advanced	2.75	2.20	2.57	2.75	2.20	2.57
Renewable	13.80	14.40	15.00	13.80	13.01	13.01
Total	16.55	16.60	17.57	16.55	15.21	15.58
Reduction in Total	0.00	-1.55	-2.93	0.00	-2.94	-4.92
Compliance Scenario: Mainly Biodiesel						
Biodiesel	1.43	1.36	2.81	1.43	1.29	1.47
E85	0.14	0.41	0.68	0.14	0.14	0.14
End-of-Year RINs	1.24	0.00	0.00	1.24	1.08	0.77
Biodiesel Feedstock	10.72	10.23	21.05	10.72	9.67	11.00
Corn for Ethanol	4.76	4.94	4.96	4.76	4.87	4.82
Compliance Scenario: Mainly E85						
Biodiesel	1.43	1.36	1.87	n/a	n/a	n/a
E85	0.14	0.41	2.57	n/a	n/a	n/a
End-of-Year RINs	1.24	0.00	0.00	n/a	n/a	n/a
Biodiesel Feedstock	10.72	10.23	14.05	n/a	n/a	n/a
Corn for Ethanol	4.76	4.94	5.48	n/a	n/a	n/a

Note: n/a not applicable.

If EPA final rules are the same as the proposed rules and those rules survive any legal challenges, the implications of our analysis are:

1. Problems with implementing the Renewable Fuels Standards (RFS) due to the expanding gap between the implied mandate for renewable biofuels (ethanol) and the E10 blend wall are largely resolved.
2. There is little pressure to expand consumption of higher ethanol blends, and consequently, E85 consumption remains small, near 0.14 billion gallons per year.
3. RINs stocks remain plentiful, near one billion gallons, and D6 RINs prices are expected to return to pre-2013 levels. D4 RINs prices will be higher relative to D6 RINs prices but the level will depend to a considerable degree on whether the biodiesel tax credit is reinstated or not.
4. The reductions in the advanced mandate for 2014 and 2015 in combination with a constant biodiesel mandate imply there is little need for ethanol imports from Brazil, and therefore, ethanol imports do not exceed 0.1 billion gallons in 2014 and 2015. To the degree that ethanol imports replaced domestic production in 2013, this represents a net trade gain for ethanol and an increase in domestic use of corn to produce ethanol.
5. Biodiesel production, and therefore feedstock consumption, is stable in 2014 and 2015, with the chance of lower production if D4 RINs stocks are used in place of physical blending. Given the elevated levels of biodiesel production for much of 2013, this is a negative factor for the soybean oil and soybean markets, since soybean oil is the principal feedstock used to make biodiesel.
6. While there is little upside potential to corn use for ethanol due to the E10 blend wall and small growth in E85 use, there is also little downside risk to corn use below 4.8 billion bushels per year in 2014 and 2015. By historical standards, this is a very high floor on corn use for ethanol. So long as ethanol blending margins remain strongly positive (see Figure 3 in this [post](#)), there also is little incentive to use RINs in place of physical ethanol blending. Overall, the implications are generally market-neutral for corn.

If EPA final rules include only a write down of the advanced mandate, the implications of our analysis are:

1. Problems with implementing the Renewable Fuels Standards (RFS) due to the expanding gap between the implied mandate for renewable biofuels (ethanol) and the E10 blend wall are evident in 2014 and 2015.
2. RINs stocks are exhausted by the end of 2014. Consequently, D6 RINs prices are expected to be re-linked to D4 RINs prices, with both at considerably higher levels than in late 2013. The level will depend to a considerable degree on whether the biodiesel tax credit is reinstated or not.

3. Large quantities of biodiesel and/or E85 are required in 2015 to fill the renewable gap. If the gap is mainly filled by biodiesel, production of 2.8 billion gallons will be required in 2015, twice that which would be required under the advanced and renewable write down alternative. If the gap is mainly filled by E85, consumption of 2.6 billion gallons will be required in 2015. A moderate increase in biodiesel production is also required in this compliance scenario because domestic ethanol production hits the maximum capacity of 15.2 billion gallons.
4. Since the reductions in the advanced mandate for 2014 and 2015 are the same under the advanced only write down scenario, there is limited pressure for increased ethanol imports from Brazil, and therefore, ethanol imports do not exceed 0.1 billion gallons in 2014 and 2015. There could be incentives for additional imports by 2015 if Brazilian ethanol imports for use in E85 represent a cheaper compliance alternative than biodiesel.
5. Feedstock consumption in the mainly biodiesel compliance scenario skyrocket in 2015, reaching 21 billion pounds, or over half of all fats and oils produced presently in the U.S. This would undoubtedly be a positive factor for the soybean oil and soybean markets, since soybean oil is the principal feedstock used to make biodiesel.
6. There is some upside potential for corn ethanol use in the mainly E85 scenario by 2015, as much as 700 million bushels compared to what is projected under the advanced and renewable write down alternative. The upside, however, is limited due the assumed maximum ethanol production capacity for the U.S. of 15.2 billion gallons. Overall, the implications are moderately positive for the corn market.

## Conclusions

The EPA surprised many observers when it recently announced proposed 2014 volumes for the RFS mandates. The new EPA framework for implementing the mandates is keyed to the E10 blend wall and the proposal includes a write down of the corn-based ethanol mandate for the first time. Not surprisingly, this policy change is highly controversial and the novel legal argument used to justify the write down is likely to be challenged in court. If the proposed EPA rules are finalized and survive a court challenge, then blend wall problems generally will be resolved, the RINs market will likely return to pre-2012 price levels, and pressures in grain and oilseed markets will be largely abated. If on the other hand the EPA rules are eventually overturned, then blend wall problems will return in short order, RINs stocks will likely be exhausted by the end of 2014, RINs prices will soar once again, and pressure on the grain and oilseed markets will in all likelihood resume. Much hangs in the balance on the outcome.