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Department of Agricultural and Consumer Economics, University of Illinois Urbana-Champaign

Still Another Wrinkle in the RFS: A RINs Price Cap

Scott Irwin and Jonathan Coppess

Department of Agricultural and Consumer Economics
University of Illinois

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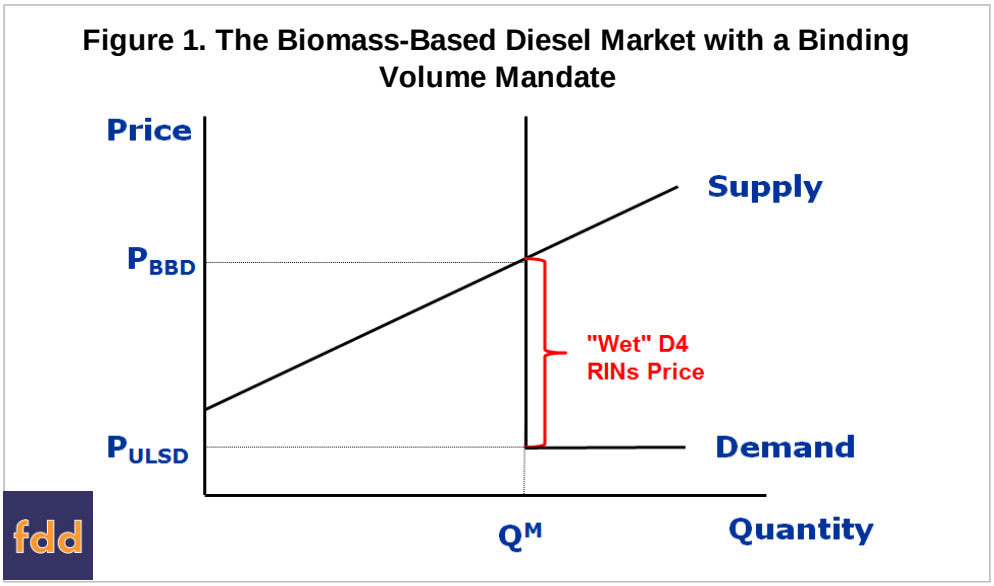
New ideas about how to "fix" the Renewable Fuel Standard (RFS) seem to appear weekly. In our last *farmdoc daily* article from December 6, 2017 we analyzed how a seemingly obscure provision of the RFS that allows the EPA to exempt small refineries in the U.S. from RFS compliance could have surprisingly large impacts on mandate levels and RINs prices in 2018. Other recent *farmdoc daily* articles (August 9, 2017; August 18, 2017; October 5, 2017; October 12, 2017; October 19, 2017) examined the application of different waiver provisions allowed under the RFS. Just in the last week, a new and very specific proposal has emerged. A group of U.S. Senators, led by Senator Cruz of Texas, has reportedly proposed a $0.10 per gallon cap on the price of all RINs. Some economists support the general idea of a price cap on RINs in order to send stable policy signals to the market. The purpose of this article is to provide an economic and legal assessment of issues associated with a RINs price cap.

Economic Analysis

We begin with an economic analysis of a RINs price cap based on the model of biomass-based diesel (BBD) market that has been, in one form or another, used in a number of earlier articles on the RFS and RINs pricing (e.g., *farmdoc daily*, August 23, 2017). We focus on BBD because it has been the "marginal" gallon for filling both the advanced and conventional RFS mandates, which means that D4 biodiesel RINs have been crucial in setting the price level of the vast majority of RINs traded. The model shown in Figure 1 represents the supply of BBD producers and demand from diesel blenders at the wholesale level in a competitive market. It is important to note that supply represents the total of domestic and imported production. Retail demand at the consumer level is implicitly represented by a simple percentage markup of the wholesale demand shown in Figure 1. This implies full pass-through of wholesale price changes to the retail level, so consumers ultimately bear the higher cost of BBD. The model assumes an L-shaped demand curve, with the vertical and perfectly inelastic portion equal to the fixed RFS volume mandate and the horizontal perfectly elastic portion above the mandate equal to ultra low sulfur diesel prices. This reflects an assumption that BBD and petroleum diesel are perfect substitutes after adjustment for the lower energy value of most BBD. As usual, equilibrium is found where the supply and demand curves intersect, which here is the point (P_{BBD}, Q^M). Full details on the model can be found in this earlier *farmdoc daily* article (August 23, 2017).

Figure 1. The Biomass-Based Diesel Market with a Binding Volume Mandate



Biodiesel RINs pricing in the model shown in Figure 1 is quite simple. Since the mandated quantity (Q^M) substantially exceeds the amount of biodiesel that would be produced in the U.S. absent the mandate (zero), the mandate is said to be "binding." (For simplicity, we ignore the biodiesel tax credit at this point.) In order to incentivize the higher production, BBD producers must be paid a price that is higher (P_{BBD}) than the wholesale diesel price (P_{ULSD}). This price difference (P_{BBD} - P_{ULSD}) is the equilibrium "wet" D4 RINs price. We use the terminology "wet" here to denote physical gallons of BBD since actual RINs are traded in ethanol equivalent gallons. The conversion from wet to ethanol equivalent RINs prices is accomplished by dividing the wet price by 1.5. One can think of the D4 RINs as representing the price at which a diesel blender is indifferent between actually blending BBD or blending on paper by purchasing the RINs.

With these results, we can derive a prediction model for D4 biodiesel RINs prices as follows:

$$D4 = P_{BBD} - P_{ULSD}.$$

This model of RINs pricing was shown to fit actual data on D4 RINs prices quite well in the *farmdoc daily* article of article August 23, 2017. It is a simple step to rewrite the above model in terms of the producer BBD price:

$$P_{BBD} = P_{ULSD} + D4.$$

So, at the producer level the price of BBD simply equals the diesel price (adjusted for the higher energy value of diesel) plus the RINs price. Since this model has already been shown to predict D4 RINs prices quite well, it must also be a good prediction of producer BBD prices.

Figure 2 now adds to the model a non-binding RINs price cap. The cap is non-binding because it is set at a higher level than the market determined D4 RINs price. As a consequence, the non-binding cap does not have any impact on the BBD price, BBD quantity, or RINs price. Of course, market conditions could change and the RINs price cap could become binding through a higher mandate level, an upward shift in the supply curve, or a downward shift in the demand curve.

Figure 3 includes a binding RINs price cap such that the cap is lower than the market determined RINs price. This sets off a series of important responses in the market. Given that the BBD price is the diesel price plus the D4 price, the cap on the RINs price also caps the producer BBD price at P_{BBD^*}. At the new lower price of BBD the equilibrium production drops from Q^M to Q^{M^*}, which, of course, reduces the volume mandate by the same amount. This leads to the essential insight from the analysis that, all else constant, the RINs price and the mandate level are directly related—one cannot be changed without changing the other. Stated differently, reductions in the volume mandates will reduce the RINs price, or reductions in the RINs price will reduce the volume produced, effectively reducing the mandate. Of course, this analysis is strictly economic and does not consider whether this "backdoor" method of reducing mandate levels is even feasible. For example, if Q^M is the legal statutory mandate and the RINs price cap is

binding as in Figure 3, then the statutory volume mandate is infeasible because not enough BBD will be produced.

Figure 2. The Biomass-Based Diesel Market with a Binding Volume Mandate and Non-Binding RINs Price Cap

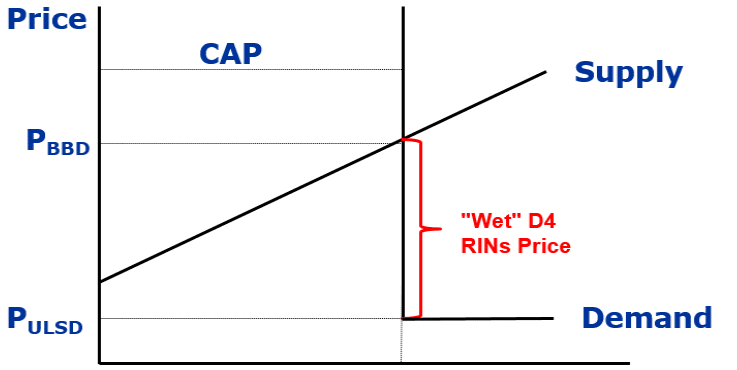
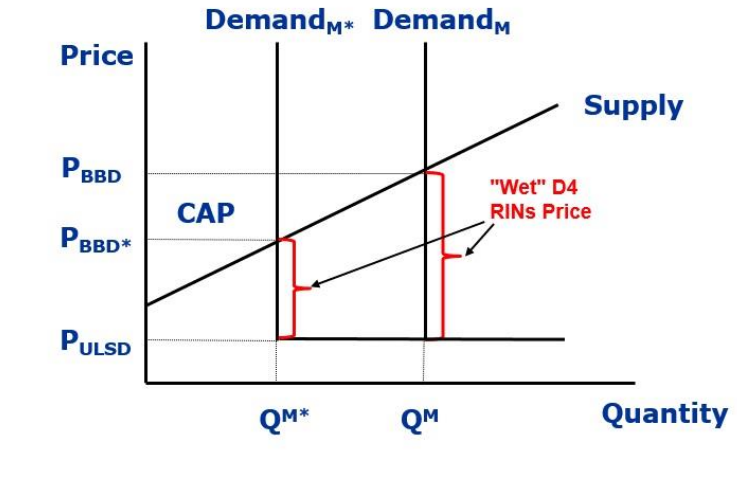
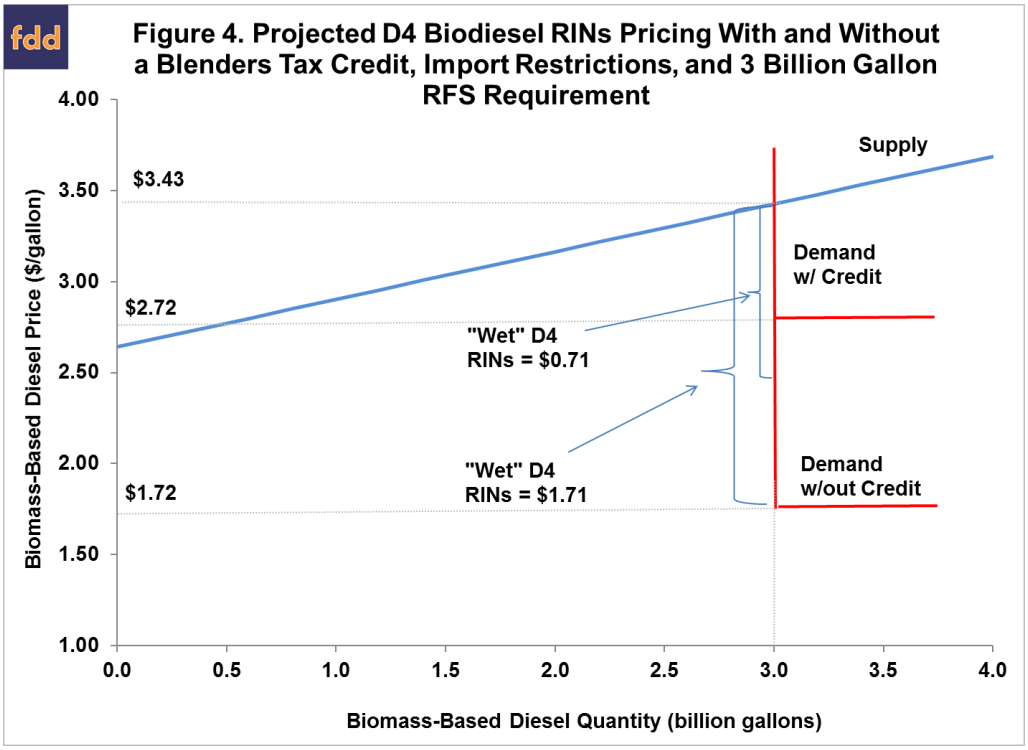


Figure 3. The Biomass-Based Diesel Market with a Binding Volume Mandate and Binding RINs Price Cap



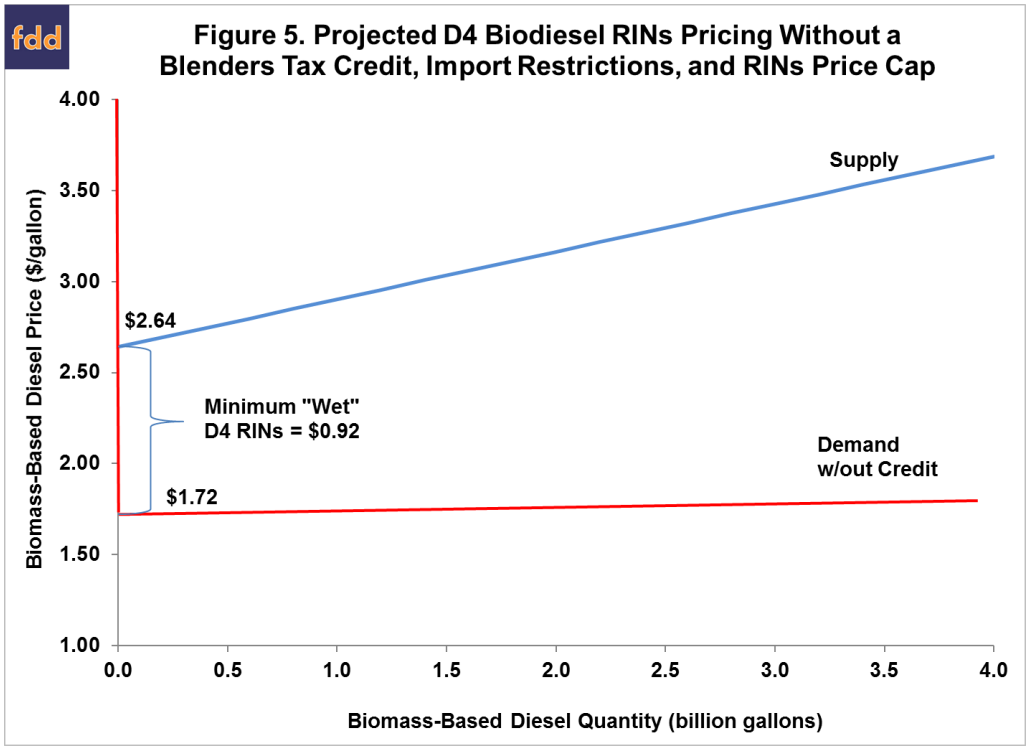
We now turn our attention to analysis of the recent specific proposal to cap all RINs prices at $0.10 per gallon. We use the same basic model of the U.S. BBD market as in the *farmdoc daily* article of August 30, 2017. The model incorporates a policy of restricting BBD imports to the U.S. due to recent imposition of countervailing import duties on BBD imports from Argentina and Indonesia. We assume this is sufficient to eliminate all biodiesel imports from Argentina and Indonesia, which totaled about 546 million gallons for 2016, accounting for 59 percent of total BBD imports. The estimated total supply curve also reflects soybean oil prices in the range experienced in 2016 and currently prevail. Since we assume that BBD and petroleum diesel are perfect substitutes after adjustment for the lower energy value of most BBD, the horizontal segment of the demand curve in Figure 4 is simply a horizontal line equal to the energy-adjusted diesel price. We assume a wholesale diesel price of $1.85 per gallon, near recent levels, which is $1.72 after adjusting for the lower energy content of most BBD (assumed to be approximately 92 percent of diesel). The "L-shaped" BBD demand curves assume a 3 billion gallon total RFS requirement for BBD, which accounts for BBD in 2017 and 2018 filling not only the advanced mandate but also the conventional (ethanol) mandate due to the constraints on ethanol consumption

presented by the E10 blend wall (see the *farmdoc daily* article of July 19, 2017 for further details). Finally, we ignore the potential role of RINs stocks in order to make the analysis tractable.



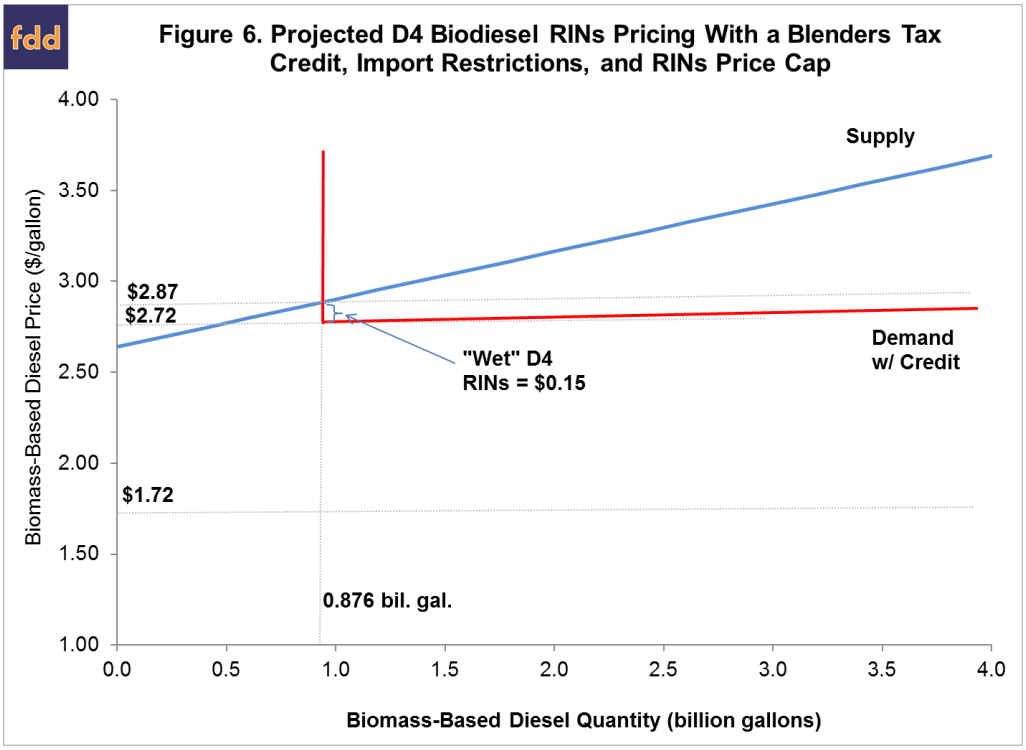
Projecting the D4 price without a RINs price cap using the model in Figure 4 is straightforward. Assuming no tax credit is in place, then, to incentivize production of the required 3 billion gallons under the RFS, BBD producers must be paid a price of $3.43 per gallon, which is higher than the (energy-adjusted) demand price of diesel of $1.72 per gallon. This price difference of $1.71 ($3.43 - $1.72) is the equilibrium "wet" D4 RINs price. The conversion from wet to ethanol equivalent RINs prices is accomplished by dividing the wet price by 1.5, so in ethanol-equivalent terms the projected D4 price without the blender tax credit is $1.14 per gallon. Adding the blender tax credit simply shifts up the horizontal part of the demand curve by $1 per gallon, which reduces the projected wet RINs price by $1 to $0.71 ($0.47 in ethanol-equivalents).

The effect of a $0.10 RINs price cap on the projected market equilibrium without the $1 per gallon blenders tax credit is illustrated in Figure 5. Note that in Figure 4 the RFS volume requirement is fixed and then the BBD price and D4 RINs price is determined. The process is reversed with a RINs price cap. We fix the wet RINs price at $0.15 ($0.10 in ethanol equivalents) and then determine the RFS volume requirement and BBD price consistent with the capped RINs price. The effect of the RINs price cap without a blender tax credit is most easily seen by determining the minimum cap level below which no BBD is produced or consumed. It is found by measuring the difference between the *y*-intercepts for the supply and demand curves, which in this case is $2.64 - $1.72 = $0.92. Given a diesel price of $1.72, this means that no BBD will be produced for wet RINs prices below $0.92, which, of course, is the same thing as saying that no BBD will be produced for BBD prices below $2.64. This has the startling implication that no BBD will be produced or consumed for all RINs price cap levels up to the minimum of $0.92. The proposed $0.15 wet price cap is far below this minimum level, so if implemented it would eliminate all BBD production in the U.S. This is equivalent to waiving: i) the BBD mandate down to zero, ii) the total advanced mandate down to zero (assuming cellulosic is eliminated by the cap as well), and iii) the conventional ethanol mandate down to the level of the E10 blend wall or lower. The latter impact is the result of BBD filling the gap between the E10 blend wall and the conventional mandate. If no BBD is available, the conventional ethanol mandate cannot be any higher than the E10 blend wall.



The effect of a $0.10 RINs price cap on the projected market equilibrium with the $1 per gallon blenders tax credit is illustrated in Figure 6. The approach is the same as in Figure 5 except we solve for a specific market equilibrium rather than the minimum RINs price level. We fix the wet RINs price at $0.15 ($0.10 in ethanol equivalents), assume a diesel price net of the blender tax credit of $2.72, and then determine the RFS volume requirement and BBD price consistent with these assumptions. It turns out that an RFS BBD requirement of 876 million gallons is consistent with a $0.15 wet RINs price, a $2.87 BBD price, and a $2.72 net diesel price. This is equivalent to waiving: i) the BBD mandate down to 876 million gallons, ii) the total advanced mandate down to 876 million gallons (assuming cellulosic is eliminated by the cap as well), and iii) the conventional ethanol mandate down to the level of the E10 blend wall or lower. Even though BBD production is positive with the tax credit, it is assumed that all of the production is applied to the BBD and advanced mandates, which leaves none to fill the conventional mandate gap. This in turn, limits the conventional ethanol mandate to the E10 blend wall or lower, just as in the previous scenario. In sum, a $0.10 RINs price cap with a blender tax credit results in BBD production that is less than the RFS statutory minimum of 1 billion gallons and substantially less than the 3 billion gallon estimated requirement under the 2017 and 2018 EPA rulemakings.

Up to this point, the analysis of a RINs price cap has focused on D4 biodiesel RINs because BBD is currently the marginal gallon for filling both the advanced and conventional mandates. The implications for D6 ethanol RINs can also be deduced. The previous analysis shows that, with or without a blender tax credit, the conventional ethanol mandate is at the E10 blend wall or lower under a $0.10 RINs price cap. If the blending margin on ethanol is positive, then: i) the conventional ethanol mandate would be equal to the E10 blend wall because it is profitable to blend ethanol up to the physical maximum, and ii) the D6 ethanol RINs price would be at most a few cents, well under the $0.10 cap. If the blending margin on ethanol is negative, then the conventional ethanol mandate would be below the E10 blend well and reduced to the point where the D6 ethanol RINs price would be $0.10, the capped price level. Since the blend margin on ethanol has generally been positive (*farmdoc daily*, March 15, 2017), the first scenario where the conventional ethanol mandate equals the E10 blend wall is most likely.



Legal Analysis

As stated in the previous section, the essential insight from the economic analysis is that RINs prices and mandate levels are directly related; reducing the RINs price effectively reduces the volume mandate in the statute. The implication is that capping the RIN price would therefore operate as a waiver of the RFS mandated volumes. We have written extensively in previous *farmdoc daily* articles on the waiver authority of the EPA with regard to the RFS and that authority is briefly reviewed here in order to assess the legality of reducing mandates through a RINs price cap.

With the exception of cellulosic ethanol, EPA can only waive the RFS mandates under three circumstances. First, the biomass-based diesel volumes can be waived if there is a significant disruption of feedstock or other market problem that causes biomass-based diesel prices to spike significantly (*farmdoc daily*, October 19, 2017). Second, EPA can waive the total RFS mandated volumes if implementation of the mandate will cause severe economic harm (*farmdoc daily*, October 12, 2017). Third, EPA can waive the RFS volumes if there is inadequate domestic supply of renewable fuel to meet the mandate (*farmdoc daily*, October 5, 2017). There is no legitimate cause for direct waiver of any portion of the RFS outside of these three explicit authorities. Because a cap on RINs prices operates as a waiver by other means, it also must be justified. There is now considerable guidance from the courts on the limits to these authorities, which would present a substantial challenge to justifying the imposition of a RINs price cap. We are skeptical that the proposal to cap RINs prices at $0.10 per gallon would survive a court challenge because the cap is fundamentally a waiver on RFS volumes by other means and this type of waiver is not explicitly granted in the RFS statutes.

A remaining question is whether there is an alternative way of justifying a cap program via the section of the RFS that Congress used to create the RINs credit program in the first place. This also appears unlikely. The RFS statute authorized EPA to establish a credit program for operating the mandates. The statute merely instructs EPA to establish a credit program that allows an obligated party (refiner, blender or importer) to generate "an appropriate amount of credits" for "gasoline that contains a quantity of renewable fuel that is greater than the quantity required" pursuant to the mandated volumes in the statute (42 U.S.C. §7545(o)(5)). The credits may be used to comply with the statute, transferred to other obligated parties for their compliance or held for up to 12 months to meet future compliance requirements. There is nothing in the statute that addresses the cost of the credits and certainly no explicit authority for EPA to institute a cap on prices for the credits.

Importantly, the lack of explicit authority for EPA to set RINs prices or cap them does not equate implicit permission to do so. First, as discussed above, capping RINs prices would operate as an effective waiver

and the explicit waiver authority in the statute limits EPA's ability to concoct additional waiver authority out of the credit program. Second, using RINs to effectively reduce the mandate is in direct conflict with the clear Congressional intent that the RFS operate as a technology-forcing mechanism to increase the production and use of renewable fuels (*farmdoc daily*, August 18, 2017). As stated in previous articles, the technology-forcing aspect of the statute is the north star of the RFS and this has to guide all of EPA's operating and implementing decisions. Using the concerns of some in the refining industry as justification for reducing the RFS mandates through capping RINs prices, when Congress clearly sought to push that same industry towards greater use of biofuels through the RFS statute, would be yet another clear violation of Congressional intent and would not be expected to survive a court challenge.

Implications

A proposal has recently surfaced to cap the price of all RIN credits for the RFS at $0.10 per gallon, far below the level of RINs prices in recent years. If implemented, a $0.10 cap would have profound impacts on biofuels production and consumption in the U.S. because RINs prices and mandate levels are directly related—one cannot be changed without changing the other. For example, our analysis indicates that a $0.10 price cap without a biodiesel tax credit would eliminate all biomass-based diesel production and consumption in the U.S. and would reduce ethanol consumption to the level of the E10 blend wall or lower. Hence, the proposal to institute a $0.10 cap on RIN prices strikes at the heart of the RFS because it would reverse the technology-forcing intent of the statutory mandate. We are skeptical that the EPA can implement such a policy on its own under the current RFS statute. The only path forward on this idea that does not violate the Constitutional limitations on EPA authority is for Congress to amend the RFS and fundamentally change its purpose.

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