

Administering the Cellulosic Requirements under the Renewable Fuel Standard with Increasing and Uncertain Supply

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Summary

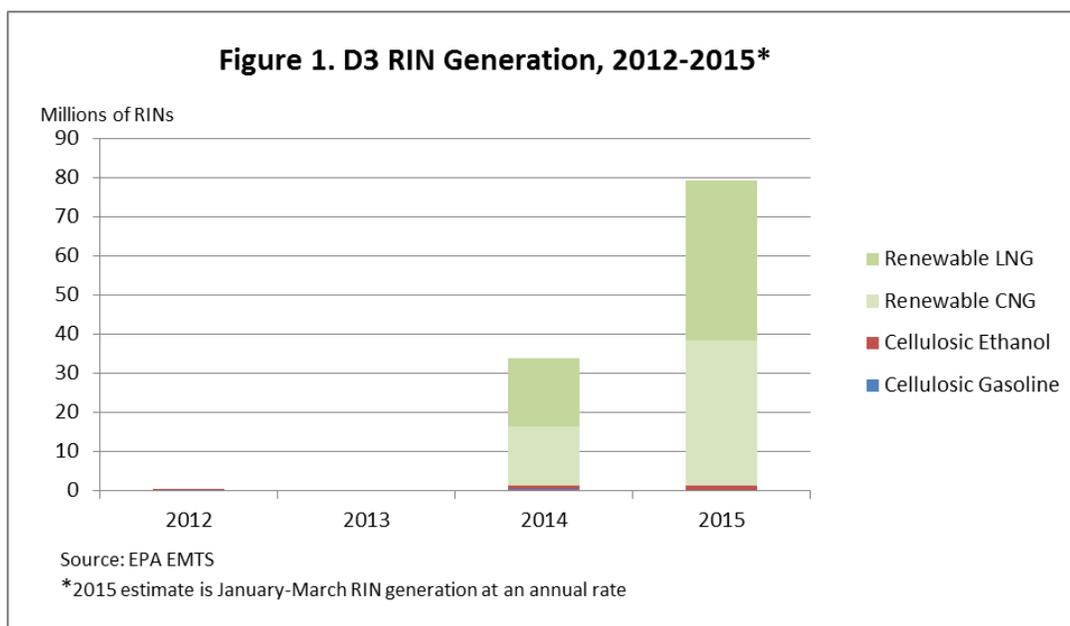
The supply of cellulosic biofuels under the Renewable Fuel Standard (RFS) is increasing but, because of new pathways and early-stage plants coming on line, is difficult to predict. The EPA's job of administering the cellulosic component of the RFS is further complicated by a 2013 court ruling requiring EPA to use a "neutral methodology" to estimate the volume that actually will be produced when setting its annual volumetric requirement under the RFS. The "neutral methodology" requirement, combined with difficult-to-predict supply, is likely to result in large fluctuations in the spread between cellulosic and advanced RINs (the D3-D5 spread), exposing obligated parties to RIN price risk and hampering investment decisions by cellulosic producers. In addition, an obligated party may prefer to purchase D5 RINs in the larger and more liquid D5 market, then upgrade them to synthetic D3 RINs by purchasing cellulosic waiver credits from the EPA, which could impede the sale of D3 RINs by cellulosic fuel producers, further hampering cellulosic production and investment. These problems could be avoided by EPA adopting a policy of first making a provisional estimate before the compliance year, then adjusting the provisional estimate after the end of the compliance year so that the volumetric obligation equals actual production in that year. That way, all parties know that if a D3 RIN is generated it will be sold. Setting the volumetric obligation retroactively can work uniquely for the D3 market because EPA has the authority, through the "relief valve" of selling cellulosic waiver credits which have a price fixed by the statute, to cap the D3-D5 spread and thereby cap the price exposure of obligated parties as intended in the statute. The *ex-post* alignment of the volumetric requirement with actual production would ensure a neutral and accurate estimate, would guarantee a market for D3 RINs for cellulosic fuel producers, and, with the help of the statutory cap, would protect obligated parties.

Background: The RFS and Cellulosic Biofuels

As authorized by the Energy Independence and Security Act (EISA) of 2007, the Renewable Fuel Standard (RFS) specifies that increasing amounts of renewable fuels be blended into the U.S. land transportation fuel supply. The vast majority of renewable fuels currently produced are first-generation fuels such as ethanol produced from corn kernels and biodiesel produced from vegetable oils. A long-term goal of the EISA, however, is to stimulate the production of advanced, domestic fuels not produced from food crops and having low life-cycle greenhouse gas emissions, relative to petroleum gasoline.

The statute specifically singles out fuels generated from cellulosic feedstocks. Although cellulosic fuel production has lagged behind the very ambitious path laid out in the EISA, the past two years have seen

increasing production of cellulosic biofuel and investment in cellulosic biofuel capacity. Under the Renewable Fuel Standard (RFS), a cellulosic biofuel produced under an EPA-approved pathway generates a D3 RIN when it is produced. In 2013, no D3 RINs were generated, but in 2014 34 million D3 RINs were generated, and in the first quarter of 2015, D3 RINs were generated at an annual rate of approximately 80 million RINs. As can be seen in Figure 1, most D3 RINs are currently being generated by the production of renewable compressed and liquefied natural gas from landfills under the recently-approved biogas pathway.¹ But 730,000 RINs were generated in 2013 from cellulosic ethanol, and four new commercial-scale cellulosic ethanol plants are nearing completion or in a startup phase, with the potential to generate tens of millions of ethanol D3 RINs in 2015. Between the potentially substantial volumes of cellulosic production through the new biogas pathway and the possibility of meaningful production from the new cellulosic ethanol plants, cellulosic biofuel production is beginning to grow—but at a highly uncertain rate. This uncertainty is likely to persist as new technologies and pathways come on line.



The uncertainty surrounding cellulosic production capacity, combined with two special features of the statute, create a policy challenge concerning how EPA should set and administer the cellulosic obligation. The first of the special features is that the EISA created a relief valve in case cellulosic production falls short of the required volumes. Specifically, the EISA authorizes EPA to issue cellulosic waiver credits (CWCs) which, when combined with a D5 (advanced non-cellulosic, non-biomass based diesel) RIN, serves as a synthetic D3 RIN for the purpose of complying with the RFS. Thus, if EPA were to mandate (say) 100 million D3 RINs but for some reason only 90 million D3 RINs could be produced, EPA can fill in the gap. The price of a CWC is set by a formula in the statute and, for 2015, is \$0.64.² In

¹ 79 FR 42128, July 18, 2014.

² 80 FR 18179, April 3, 2015, Table 5.

addition to providing a relief valve in case of a production shortfall, the CWC price provides a cap on the D3-D5 RIN price spread because EPA can issue CWCs if the spread exceeds the CWC price.

The second special feature is a 2013 court ruling requiring EPA to set the annual volumetric requirement using a “neutral methodology” aimed at providing a prediction of “what will actually happen” regarding cellulosic production during a compliance year.³

In practice, producing an accurate estimate of cellulosic production is particularly difficult, as the uncertainty surrounding 2015 production indicates. Although “neutral methodology” is not a precisely-defined statistical concept, it is plausible that such a methodology would be too high half of the time and too low half of the time. This feature induces considerable uncertainty in the value of D3 RINs and thus exposes both producers and obligated parties to RIN price risk: if the estimate is too high (so the market is short D3 RINs), EPA can issue CWCs at the statutory waiver price and D3 RINs will trade at the D5 price plus the CWC price, whereas if the estimate is too low, D3 RINs will have been produced in excess driving their price to the D5 floor, and potentially depressing the D5 price as well if the marginal advanced RIN is a cellulosic RIN. The resulting swings in the D3 RIN price would create uncertainty and impede investment and planning for all market participants.

In a well-functioning D3 RIN market, the D3-D5 spread would be determined by the marginal cost of production of the marginal cellulosic RIN producer, subject to the relief offered by the availability of CWCs. Thus producers would benefit from the monetary value of the D3 RIN as they expand cellulosic capacity, but obligated parties would be protected from producers with very high marginal costs, or from gouging or market manipulation, by the availability of CWCs. An open question is how EPA can achieve these policy goals given the highly uncertain level of production and the neutral methodology requirement.

A Proposed Methodology for Setting Cellulosic Volumetric Requirements and Selling CWCs

The unique features of D3 RINs—the existence of the CWC, the price cap, and the neutral methodology requirement—provide a direct and transparent way to set the cellulosic RVO, specifically, to adjust a provisional volumetric obligation to equal the amount of outstanding D3 RINs at the end of the compliance year. EPA would use the CWC authority to prevent the D3-D5 spread from exceeding the statutory cap. Here is one way to implement this proposal:

- EPA adopts a policy in which:
 - (i) a provisional cellulosic estimate is provided prior to the compliance year, contemporaneously with the biomass-based diesel, advanced, and total renewable volumetric obligations, and

³ EPA summarized the court ruling in the 2013 final rule: “The Court found that in establishing the applicable volume of cellulosic biofuel for 2012, EPA had used a methodology in which ‘the risk of overestimation [was] set deliberately to outweigh the risk of underestimation.’ The Court held EPA’s action to be inconsistent with the statute because EPA had failed to apply a ‘neutral methodology’ aimed at providing a prediction of ‘what will actually happen’ as required by the statute” (78 CFR 49798).

- (ii) the provisional cellulosic estimate is revised after the compliance year to equal the stock of outstanding RINs from cellulosic fuel production and from D5 RIN upgrading using sold CWCs as of Dec. 31, net of adjustments for exports, spillage, sale into the renewable chemical industry, etc. The net effect would be to liquidate the December 31 D3 RIN inventory (actual plus synthetic).
- RIN producers would set up an auction Web site, open to qualified parties including obligated parties, on which D3 RIN producers post asking prices, obligated parties can post bid prices, and on which actual sale prices are posted.
- EPA would monitor the Web site and during the year would stand ready to sell CWCs if D3 RINs are trading in excess of the statutory cap on the D3-D5 spread.
- During February true-up, EPA would stand ready to sell CWCs at the statutory price, however it would do so if and only if there are no asking prices on the Web site for the relevant compliance year that are below the D3-D5 statutory cap.

Discussion

1. This proposal meets the “neutral methodology” requirement because, with the *ex-post* alignment of required and actual volumes, there is neither underestimation nor overestimation of actual production.
2. RIN bankability is an important part of the RFS compliance system for other RIN categories because a RIN inventory stabilizes prices in the event of a drought or other unforeseen developments. In the D3 market, this goal of price stabilization is achieved by the CWC price cap. In effect, EPA stands ready to provide inventories as needed at the CWC price, although the *ex-post* nature of setting the obligation in this proposal means that in practice EPA would likely need to provide only a small amount of CWCs to facilitate market liquidity.
3. If the cost of the marginal actual D3 RIN is less than the price of a synthetic D3 RIN (D5 + CWC), then the actual D3 RIN price would be bid down to the point that it equals that marginal cost. If the cost of the marginal D3 RIN exceeds the cap, then the ability of EPA to sell CWCs at the statutory price will cap the D3-D5 spread.
4. One would not expect EPA to need to intervene in the market during the compliance year because the threat that it would, were the D3-D5 spread to trade in excess of the cap, would effectively hold that spread to the cap.
5. The provisional cellulosic statutory volume (and resulting fractional obligation) would be issued prior to the compliance year, however that provisional fraction would be for guidance purposes only and would be subject to adjustment based on actual production. The fact that the provisional volume is subject to adjustment *ex-post* would not induce uncertainty because obligated parties would understand that all generated D3 RINs offered for sale into the domestic

surface fuel market would need to be purchased, so they could be purchased (and the separated D3 RINs traded) in an orderly fashion over the course of the year.

6. The auction market discussed above is intended to be a primary market. Detached D3 RINs could be traded on a secondary market. Although EPA is under no obligation to enforce a price cap on D3 RINs on the secondary market, enforcing it on the primary market should produce a cap on the D3-D5 spread on the secondary market.
7. The primary market could be organized either as a D3 market or as a market for the D3-D5 spread. Each structure has its pros and cons. Setting up the market as the D3-D5 spread would streamline EPA monitoring, however doing so would require D3 producers to short D5 RINs and obligated parties to go long in D5 RINs, which could prove problematic if cellulosic production were to grow large relative to the D5 market. Setting it up as a D3 market would accommodate cellulosic growth, but would require EPA to have a rule by which they could ascertain whether to intervene by selling CWCs, where the rule would need to take into account the still-thin nature of the D5 market. Thus setting it up as a D3 (not D3-D5 spread) market seems preferable. This and other details should be resolved bearing in mind the statutory goal of promoting cellulosic fuel growth, along with the goals of transparency, low transaction costs, and orderly market functioning for the purpose of discover of marginal RIN production cost.