



## 2016 Year End RIN Update

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Today's article provides the annual summary update on Renewable Identification Number (RIN) generation in 2016 based on available data from EPA's EMTS. Previous quarterly updates covered RIN generation through the first three quarters of 2016 (*farmdoc daily*, [May 12, 2016](#); [August 3, 2016](#); [November 10, 2016](#)).

The RIN generation figures are combined with RIN retirement data from EMTS, ethanol export data from the US Department of Commerce (DOC) via the [USITC DataWeb](#), and biodiesel export data from the [Energy Information Administration](#) (EIA) to compare estimated net RIN generation to targeted RFS mandate needs based on EPA's [final rulemaking](#) for 2016.

### Advanced RIN Generation

The pace of D3 RIN generation increased consistently throughout 2016, with a total of 192 million D3 RINs generated during the year. Non-compliance retirements currently reported total 2.1 million RINs. This puts net generation at roughly 190 million for 2016, or 40 million short of the 230 million RIN mandate for cellulosic.

Figure 1 plots monthly D4 RIN generation relative to implied monthly mandate needs (annual mandate divided by 12) using data from the EMTS through February 2017. Gross generation of D4 RINs averaged 217 million per month during the first quarter, increasing to nearly 330 million per month in the second quarter and 370 million per month during the third quarter. Generation of D4 RINs continued to increase during the final quarter of the year to an average of more than 419 million per month. Total generation of D4 RINs is reported at just over 4 billion RIN gallons.

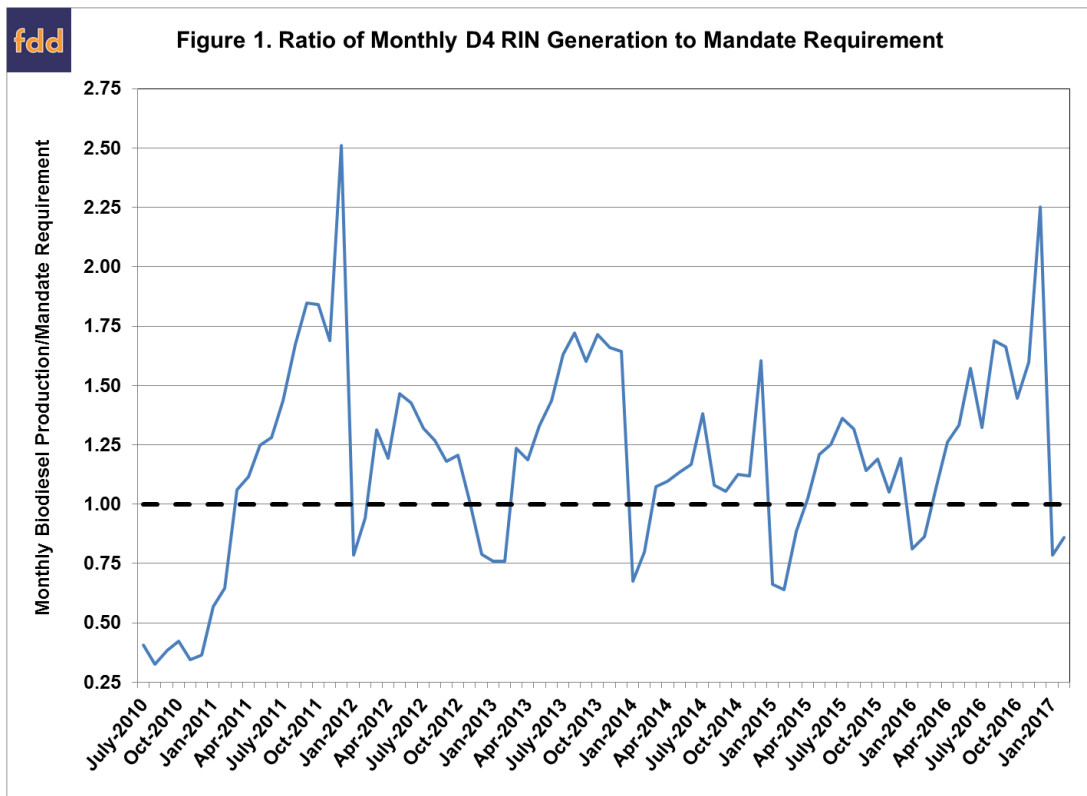
Non-compliance retirements of 2016 D4 RINs are currently at 67.1 million. The EIA reports a total of 88 million gallons or 132 million RINs worth of biodiesel exports. This results in net generation of 3.809 billion RINs or 959 million more than the 2.85 billion RIN (1.9 billion volumetric) mandate for 2016.

Gross generation of D5 RINs averaged 4.3 million per month during the first few months of the year, increased sharply to average 16 million per month over the summer, and then fell back to an average of nearly 6 million per month during the fourth quarter of the year. After accounting for 150,000 non-compliance retirements, net generation of D5 RINs stands at 97 million for the year. Net generation of D5

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RIN falls short of the advanced mandate gap of 530 million gallons. The advanced gap represents the difference between the total advanced mandate (3.61 billion RINs), and the biodiesel and cellulosic mandate levels (2.85 billion and 230 million RINs, respectively).



Note that this advanced gap can be filled with any advanced RIN category (D3, D4, or D5). Combining D4 and D5 generation data results in total non-cellulosic advanced RINs generated in 2016 of more than 3.9 billion, providing more than enough for compliance with the non-cellulosic mandate target of 3.38 billion.

### D6 RIN Generation

Figure 2 plots D6 RIN generation relative to implied mandate needs through February 2017. Monthly gross generation averaged 1.226 billion in the first quarter, and increased to 1.261 billion in the second quarter and 1.285 billion in the third quarter. Generation during the fourth quarter averaged 1.283 billion per month, resulting in a total generation of 15.171 billion D6 RINs for the year.

Denatured ethanol exports averaged nearly 38 million gallons per month to total 454 million gallons in 2016. Non-compliance retirements of D6 RINs are currently reported at 209 million. Thus, net generation of D6 RINs is estimated at 14.509 billion or just a few million over the 14.5 billion renewable mandate gap.

Table 1 summarizes gross RIN generation, exports, and non-compliance retirement exports across all D-code categories for 2016. These values are then used to provide estimates of net RIN generation available for 2016 mandate compliance, and potential RIN stock changes relative to the 2016 mandate levels outlined in EPA's final rulemaking.

Figure 2. Ratio of Monthly D6 RIN Generation to Mandate Requirement

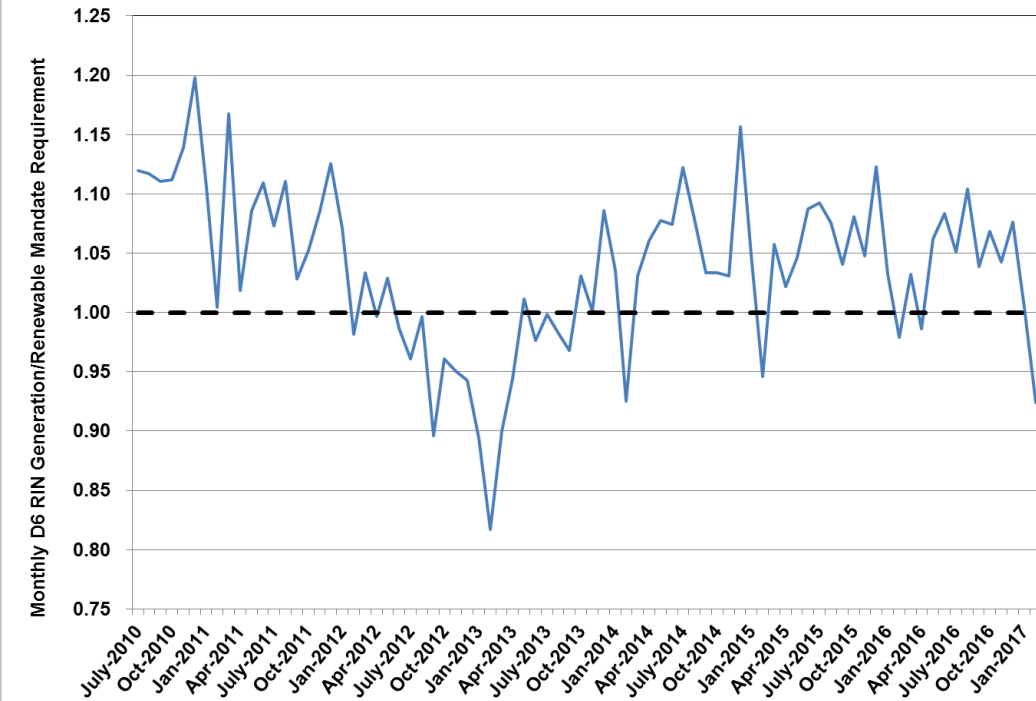


Table 1. Summary of Estimated RIN Generation and Use in 2016 (million RIN gallons)

	EMTS Gross Generation	Exports <sup>1</sup>	EMTS Other Use <sup>2</sup>	Estimated Net Generation	RFS Mandate	Stock Change
D3	192	0.0	2.1	190	230	(40)
D4	4,008	132	67.1	3,809	2,850	959
D5	97.2	0.0	0.15	97.1	530	(433)
Total Advanced	4,297	132	69.4	4,096	3,610	486
D6	15,172	454	209	14,509	14,500	9
All Renewable Fuels	19,469	586	278	18,605	18,110	495

<sup>1</sup>Equal to total biodiesel exports reported by EIA, adjusted to RIN equivalent using a 1.5 EV for D4. Equal to total denatured ethanol for fuel use exports reported by DOC for D6. Assumed to be zero for D3 and D5.

<sup>2</sup>Includes all retirements reported in EMTS for non-compliance purposes.

### Summary

Previous quarterly updates for 2016 showed that generation levels early in the year suggested potential deficits of RINs eligible for use towards the 2016 mandate targets. Consistent with improved profitability for both ethanol and biodiesel production (*farmdoc daily*, [February 1, 2017](#); [March 1, 2017](#)), RIN generation tended to increase throughout the year for all fuel categories resulting in what look to be sufficient amounts to cover compliance for the non-cellulosic advanced and renewable portions of the overall mandate. Using mandate levels from the final rulemaking for 2016 suggests that RIN stocks may increase by close to 500 million RINs, nearly all of which would be advanced D4 RINs which could be applied towards the non-cellulosic advanced or renewable mandate components in future compliance periods.

However, as noted in the third quarter RIN update for 2016, fuel consumption in the US has been surpassing the EPA estimates upon which the percentage-based renewable volume obligations (RVO) applied to obligated parties were based. This will tend to increase the actual mandate volumes above the

targets outlined in the rulemaking (*farmdoc daily*, [June 2, 2016](#); [June 10, 2016](#)). Thus, while net RIN generation estimates for 2016 suggest that obligated parties will be able to comply with targeted mandate levels while building RIN stocks, deviations in domestic fuel use from EIA projections will change the amount of RINs ultimately needed for compliance. The EMTS system now includes data on annual compliance through 2015, and a future daily post will use this data to revisit the RIN stock issue to adjust for actual fuel usage and its impact on compliance implementation.

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