Message

From: Raburn, Janice [Janice.Raburn@bp.com]
Sent: 12/11/2018 10:29:19 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
CC: Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Machiele, Paul [machiele.paul@epa.gov]
Subject: RFS RIN Market and other environmental credit markets

Mandy,

Thank you and the EPA team for meeting with BP in early October to discuss BP's perspective on the RFS RIN market. At the meeting, we discussed a premise that volatility of the RFS RIN market could be compared to energy commodities markets.

I would like to share BP's initial analysis comparing the volatility of the RFS RIN market to other environmental credit markets – LCFS, California Carbon Allowance (CCA), and Regional Greenhouse Gas Initiative (RGGI). Each program, aside from the CCA, has seen volatility above 50%.

Please let me know if EPA has any questions about the analysis below.

Best regards,
Janice

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Analysis

In order to be able to compare the volatility of price series that have different price levels, a standard industry approach utilizes the daily price returns to normalize the comparison across a similar basis.

To present the volatility in annual terms we simply need to multiply our daily standard deviation by the square root of the number of trading days in a year which is approximated as 250.

Looking at the annualized volatility of daily price returns for several different environmental credits we can compare different markets and speculate on the reasons for these differences.

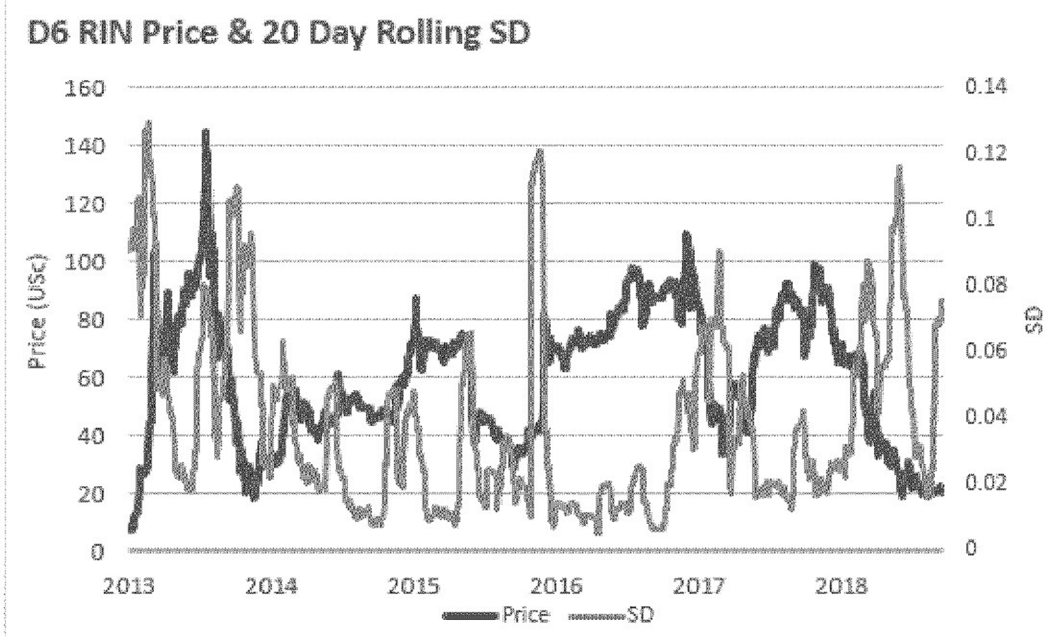
Annualized Volatility

Year	D6	LCFS	CCA	RGGI
2018	97.0%	39.3%	2.9%	13.2%
2017	65.9%	24.2%	7.4%	42.6%
2016	32.2%	37.0%	4.6%	56.3%
2015	69.8%	52.7%	1.7%	
2014	51.1%	52.5%		
2013	117.2%	55.7%		

The first thing that stands out is that, on a daily returns basis, the D6 RIN market exhibits the highest volatility and that this has been high in 2018.

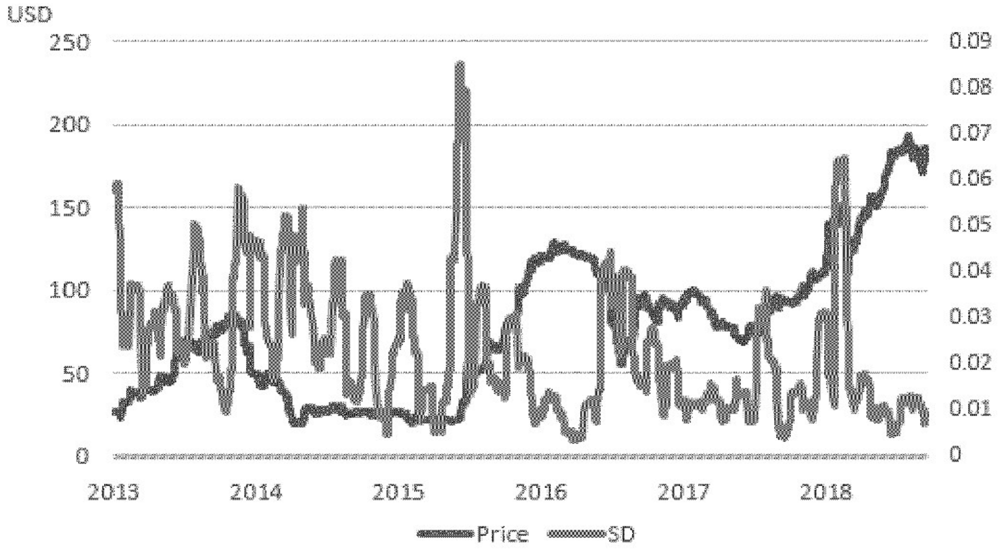
Over the last 2 years, year-end price fluctuation in the D6 market has driven increased volatility while within year volatility was more stable. However, 2018 has seen the highest level of volatility since 2013 at which time prices rallied north of $1.40 as market participants implied that there would be a RIN shortage. Subsequent EPA responses calmed both prices and volatility in that year.

It is interesting to note that while the annualized volatility is similar in 2013 and 2018, the price levels are not. This suggests the market is very uneasy with the level of rumored changes to the RFS program that have included SREs and Obligated Party reallocation, E15 1psi RVP waiver, limits on RIN trading levels, allocating previously waived volumes and RFS repeal/reset/set. Regulatory uncertainty is currently promoting very high levels of volatility in the D6 RIN market.



The LCFS market by contrast has seen smaller volatility spikes and more periods of stability. Higher volatility was seen in Feb 2018 when provisional rulemaking suggested changes to the compliance targets for 2019 and 2020. Outside of this, price return volatility has been constrained back as far as mid-2015. Regulatory certainty has calmed the level of volatility in spite of a big price run up. Volatility is much lower than seen in the D6 RIN market.

LCFS Price & 20 Day Rolling SD



The RGGI market has demonstrated 2 periods of price volatility outside of which price returns have been relatively unchanging and much lower than seen in the D6 market.

RGGI Price & 20 Day Rolling SD