6 August 2013 │ 16 pages

Global

Lord of the RINs

■ Commodities
■ Regulations

The Fellowship of the EPA can provide policy relief while US Congress debates a permanent legislative solution for RFS2…

- **Skyrocketing Renewable Identification Number (RIN) prices and the gasoline “blend wall” have once again come to the fore this year.** The core of the issue remains a policy bind deriving from the 2007 Renewable Fuel Standard (RFS2) enforced by the Environmental Protection Agency (EPA). The bipartisan law requires obligated parties (OP)—domestic refiners and importers—to blend growing volumes of ethanol and other alternative fuels into the final US gasoline and diesel supply. But mandated volumes are clashing with a structural decline in domestic demand for motor gasoline, thus making RFS2 compliance physically onerous and eventually unfeasible. Excess blending from prior years created ‘paper’ RIN credits that can be drawn down, but are now drying up. Prices for credits have surged ten-fold this year and are likely to push much higher in 2014 absent policy relief as RFS2 becomes even more binding.
- **While we expect no major policy shift from the EPA for its forthcoming final 2013 rule that might publish later this month, the agency will be pressed to address the more binding RFS2 mandates for 2014 and beyond.** Absent policy relaxation RFS2 becomes unsustainable by 2015. While the US Congress could take immediate steps to fix the program, politics remain divisive. Unless high RIN prices lead to a sustained increase in retail gasoline prices, we would not anticipate Congressional action prior to 2014. The EPA has some flexibility to alter rules as administrator of the program via annual waivers but timing is critical. A permanent solution would require Congressional action, but EPA can provide the much needed breathing room.
- **Various policy and market options under consideration for 2014/2015 include:** (1) Holding the 2013 RFS2 proposed volumes constant to 2014 and until ethanol demand expands. This can also involve reducing the advanced biofuels carve-out on both a constituency and aggregate basis. (2) Producing more E15 / E85 and thereby pushing out the blend wall. But this is slow and difficult to implement given current vehicle fleets, a dearth of filling stations and consumer preferences that do not favor large-scale use of midlevel blends. (3) Adjusting the biodiesel (D4) market in ethanol equivalent (EE) terms from 1.5x to 2x or higher—an accounting metric that could reduce RIN generation costs (which ultimately underpins the dilemma with RFS2 for future years due to the lack of low-cost RIN generation capacity given the blend wall).
- **To be sure, the EPA is likely comfortable with high RIN prices persisting.** In theory this should encourage higher level blends—a stated agency policy objective. In practical terms it promotes the drawdown of D6 and advanced RINs—of which there are only sufficient quantities for compliance in the near term and could run out in 2014. **Any RFS2 policy easing—even if it were to be implemented or adjusted as far out as 2015—should be bearish RIN prices;** improving the prospects for both RIN carryout y/y (at the 20% cap) as well as new generation, in a less binding environment.

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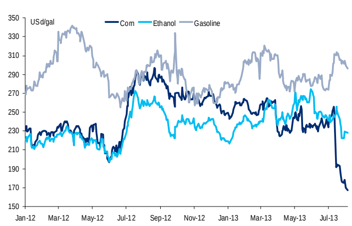
Figure 1. Underlying Commodity Prices



Source: Bloomberg, Citi Research

The Fellowship at the EPA should provide policy relief sooner rather than later[1]...

Figure 2. Renewable Fuel Standards from the 2007 Energy Legislation (EISA) or RFS2*

bn-gal	Corn Based Ethanol	Advanced Renewables	Sum
2011	12.6	1.4	14
2012	13.2	2	15.2
2013	**13.8**	**2.8**	**16.6**
2014	**14.4**	**3.8**	**18.2**
2015	15	5.5	20.5
2016	15	7.3	22.3
2017	15	9	24
2018	15	11	26
2019	15	13	28
2020	15	15	30
2021	15	18	33
2022	15	21	36

Source: EPA, Citi Research, *rounded to nearest single decimal point

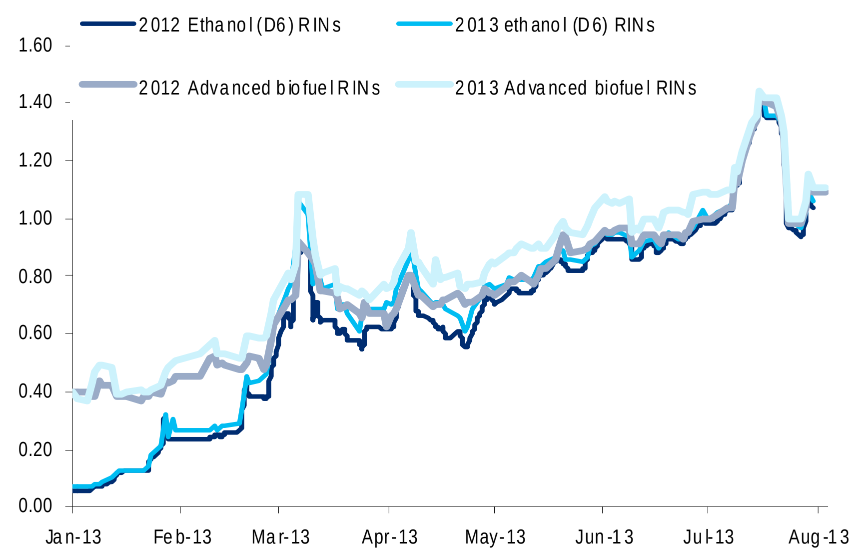
Figure 3. Estimated RIN Carryover (2013)

Type	bn-gal
D6 Conventional	2.1
D5 Advanced	0.3
D4 Biodiesel	0.2
Total	~2.5

Source: EPA, Citi Research

Skyrocketing Renewable Identification Number (RIN) prices and the E10 gasoline 'blend wall' are once again making waves for policymakers, US refiners and domestic producers/users of corn and soy. The US Environmental Protection Agency (EPA) has major decisions to consider regarding future Renewable Fuel Standards (RFS2) rule proposals and the extent it wishes to provide policy relief for a program that we argue would become too binding and unsustainable by the end of 2014. US Congress could act first on the back of hearings held on the subject in July. But the politics behind such a move remain divisive. And unless high RIN prices lead directly to a sustained increase in retail gasoline prices—something markets probably will not observe until 2014—legislative action might not be imminent. But the EPA as administrator of the law can act on its own without political cover and this seems a plausible course for 2014.

Figure 4. Conventional and Advanced RIN prices have surged and converged this year…



Source: Starfuels Inc., Citi Research

[1] Previously published RINS research for further background by Aakash Doshi and Eric G Lee→ *March 2013:* ABCs of RINS and RIN Mechanics | *July 2013:* Lord of the RINS Flash Comment

The RIN Backdrop

For the first time since the passage of the 2007 EISA legislation—obligated parties (US refiners and gasoline importers) are faced with a true market dislocation—fast approaching a physical 'blend wall' whereby volumetric blending mandates dictated by RFS2 cannot be physically achieved in 2013 without the drawing down of carryover RIN credits…

The clash between aggressive volumetric quotas to blend renewable fuels into the final US gasoline (and diesel) supply (Figure 2) established via the 2007 EISA law and enforced by the EPA is rippling through the US refining system amid a structural decline in domestic gasoline consumption. For the first time since the passage of the legislation, this year obligated parties (US refiners and importers) are faced with a physical conundrum. **2013 statutory rules require blending 13.8-bn gal of conventional renewable fuel to comply with 134-bn gal of domestic gasoline consumption (Figure 5); forcing an unprecedented drawdown of RIN credits.** Obligated parties (OP) are thus approaching a physical wall since blends above E10 are limited in size by exceptional waivers (E15) or lack of demand (E85).

Figure 5. Volumes Used to Determine the Proposed 2013 Percentage Standards*

bn-gal	Total domestic use	Renewable Volume portion	Net non-renewable volumes	%age standard	Renewable Fuel Type (bn gal unless noted)
Gasoline	133.7	12.85	120.85	0.008%	Cellulosic biofuel (14-mn gal)
Diesel	52.26	1.23	51.03	1.12%	Biomass-based diesel (1.92)
Total	**185.96**		**171.88**	1.60%	Advanced biofuel (2.75)
				9.63%	Renewable Total (16.55)

Source: EIA, EPA, Citi Research, *renewable fuel volumes subtracted from total gasoline and diesel use; biodiesel is part of the advanced carve-out and the 1.92-bn gal is in ethanol equivalent (EE) terms; physical ethanol need is near the blend wall point (E10)—a market poised near saturation amid a drawdown of pricy RIN credits.

…Sufficient quantities of banked 'paper' RIN credits do exist in order to ensure compliance this year. But as RFS2 becomes even more binding in 2014/2015 the policy would become unsustainable absent ongoing annual EPA waivers or a permanent legislative fix…

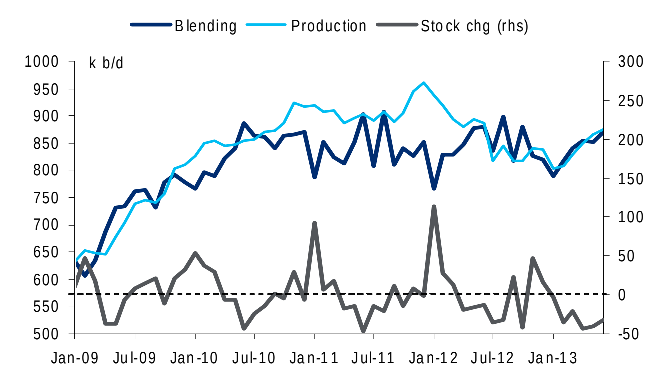
Carryover banked RIN credits of ~2.5-bn gal (Figure 3) ensure that compliance can be achieved in 2013. Looking forward the task becomes extremely onerous in 2014 and unsustainable by 2015 without policy easing or a push out of the E10 blend wall since OPs must continue to source a scarcity of RINs. Markets have taken notice of the policy challenges the EPA faces in maintaining current RFS2 targets. The price of conventional (D6) RINs are averaging ~$1.15/gal this quarter—a nine-fold jump from levels in January and a measurable 15% rise from their prior peak in March to just north of $1 (Figure 4). The convergence of D6 and advanced RIN prices this year also implies the market already is or will be short credits (or at minimum, specs are willing to go long RINs) absent policy adjustment, though the recent price drop from $1.40/gal to the $0.9-$1.10 range is likely due to market optimism of some sort of rules change. To be sure, the acceleration of RFS2 mandates in 2014 to 3.75-bn gal advanced biofuels out of 18.15-bn gal in aggregate renewables suggests required ethanol blending volumes near 16-bn gal (14.4-bn gal conventional, ~1.6-bn gal or more towards the advanced carve-out), exceeding domestic nameplate production capacity of ~14-bn gal/annum for the first time in history (Figures 6, 7).

Figure 6. US Nameplate Fuel Ethanol Plan Production Capacity*

PADD	Number of Plants		2013	
			Nameplate Capacity	
			(bn gal/year)	(k b/d)
PADD 1	4		360	23
PADD 2	172		12,598	822
PADD 3	5		419	27
PADD 4	5		190	12
PADD 5	7		285	19
U.S. Total	193		13,852	903

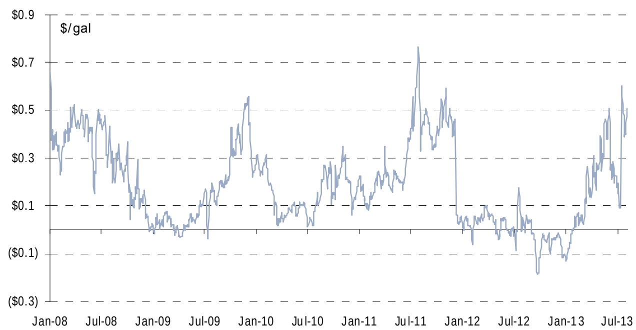
Source: DOE, Citi Research, *as of January 2013

Figure 7. US Ethanol Production and Blending Levels (2009 – Present)



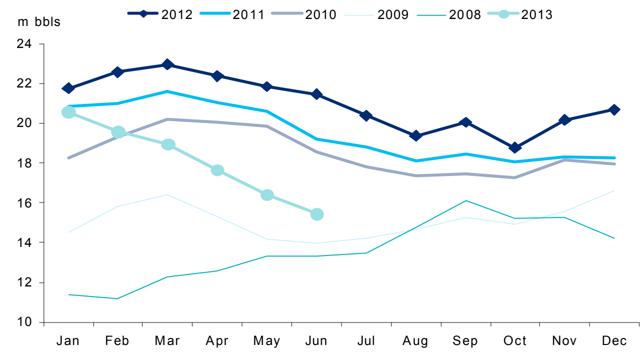
Source: EIA, Citi Research

Figure 8. Simple Dry Mill Ethanol Plant Margins



Source: Citi Research

Figure 9. US Ending Stocks of Fuel Ethanol



Source: EIA, Citi Research

Figure 10. US Corn Balances*

Millions of Acres Millions of Bushels				USDA Estimates		Citi Estimates	
	09/10	**10/11**	**11/12**	**12/13**	**13/14**	**12/13**	**13/14**
Area Planted	86.5	88.2	91.9	97.2	97.4	97.2	96.5
Area Harvested	79.6	81.4	84.0	87.4	89.1	87.4	88.2
Percent Harvested	92%	92%	91%	90%	92%	90%	91%
Yield per Harvested Acre	164.9	152.8	147.2	123.5	156.5	123.4	158.0
Beginning Stocks	1,673	1,707	1,127	988	729	989	769
Production	13,131	12,447	12,360	10,780	13,950	10,780	13,936
Imports	10	28	29	160	30	120	10
Total Supply	14,814	14,182	13,516	11,929	14,709	11,889	14,715
Feed and Residual	5,550	4,795	4,545	4,450	5,150	4,350	5,225
Ethanol Usage	4,591	5,019	5,011	4,650	4,900	4,660	4,875
Food, Seed and Industrial	5,565	6,426	6,439	6,050	6,350	6,030	6,325
Total Domestic Usage	11,115	11,220	10,985	10,500	11,500	10,380	11,550
Exports	1,900	1,834	1,542	700	1,250	740	1,350
Total Demand	13,015	13,054	12,527	11,200	12,750	11,120	12,900
Ending Stocks	1,799	1,128	989	729	1,959	769	1,815
Stocks to Usage	13.8%	8.6%	7.9%	6.5%	15.4%	6.9%	14.1%

Source: USDA, Citi Research, *subject to revision; published on 15 July 2013

Muddling through 2013…

Lower grain prices are forecast for the next several quarters pointing to a y/y increase in corn use for ethanol but the E10 blend wall still remains an impasse…

During most of 2012 and 1H’13, record high cash corn prices severely compressed ethanol production margins, even to negative levels, before the recent rebound. The expiration of both a blender tax credit and import tariff in 2012 further impacted unfavorable output economics buttressing a sharp and steady draw on US ethanol inventories during 1H’13—of about 30% to ~16-mn bbls—after holding more ample levels in 2012 (Figures 8, 9) amid ~100-k b/d y/y decline in output. Coarse grain prices falling to three-year lows in recent weeks (Figure 1), pursuant Citi forecasts which project ~$4.50-$5.25/bu CBOT corn prices to persist through cal’14 should help keep ethanol production margins strong and positive. Elevated RIN prices and the perceived lack of RIN credits also encourages maximum physical blending into the E10 pool and the y/y increase in US corn use for ethanol is estimated to rise by over 200-mn bushels for the new-crop marketing year to ~4.88-bn bushels (Figure 10). In the short-term we expect production to remain around 850-870-k b/d this year and unlikely to push much harder than 900-k b/d in 2014 given physical capacity constraints and strained utilization rates.

While higher levels of ethanol output were seen in 2011-12, the corn price spike during the 3Q'12 drought forced some plant closures, keeping capacity lower. With improving margins there is the return of economic incentives for ethanol plants to produce again, but given the blend wall, incremental output might target the export market amid signals that policymakers might look to ease standards.

Figure 11. Potential path to 2013 RFS2 compliance for 16.55-bn gal of renewable fuel blending

	Conventional Renewable Fuels	Biomass Diesel, Other Biofuels	Cellulosic Biofuels
Requirement	13.8-bn gal	2.736-bn gal	0.014-bn gal
Potential Fuel and Credit Mix	12.6-bn gal corn ethanol, 1.2-bn gal paper RINs	~0.6 to 0.8-bn gal Brazilian sugar ethanol with balance met with domestic output, paper RINs, plus 1.92-bn gal biodiesel	0.014-bn gal
Comment	~830-k to 840-k b/d domestic ethanol output and drawdown of more than half of the banked D6 RINs	the arb window to Brazil is open and encourages maximum use of 'advanced' sugar ethanol up to blend wall; 1.28-bn gal biomass diesel volume is a statutory requirement equaling 1.92-bn gal towards to the total RFS2 amount	capacity should allow for this portion to be met with physical product

Source: EPA, Citi Research

RFS2 and other policies have succeeded in building out once nascent US ethanol infrastructure since 2005 despite the off/on idling of capacity. Ethanol use as a low cost octane in the domestic gasoline supply is now embedded in the US energy complex with or without the RFS2. **E5 to E10 blending levels and ethanol replacing MBTE as oxygenate for clean gasoline is not a problem for refiners in *percentage* terms. Rather, the *growing volumetric blending requirement* is the main issue** (especially considering that 134-bn gal of estimated final gasoline supply for 2013 is a ~5% *decline* from the late 2000s with EIA projections pointing to even lower 2014 levels at 132-bn gal).

…Additional volumes of ethanol must therefore be consumed as higher blend levels such as E15 or E85…

As the *EPA itself acknowledges*, as the volume requirements of the RFS program rise, it is increasingly necessary that the amount of ethanol that must be blended to meet those requirements exceeds the amount that can be consumed as E10. Additional volumes of ethanol must then be consumed as higher blend levels such as E15 or E85. While higher-nested biofuels can also be used to meet the RFS2 conventional carve-out, traditional ethanol will continue to dominate the overall mix (more than 85% of total renewable fuel product). And with the E10 market saturating and RINs becoming more difficult (costly) to source, there is no release valve other than E15 and E85 which have idiosyncratic obstacles and their own shortcomings. Thus, many OPs are already constrained by an RVO (renewable volume obligation) of ethanol blending that cannot be legally or practically consumed for 2013.

…which are needed in 2014 to provide an outlet for a market that is short RINs.

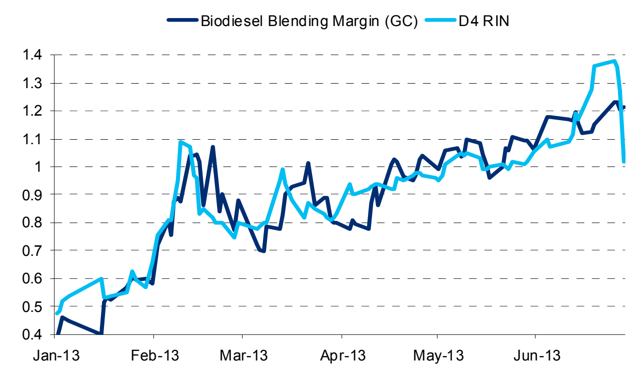
Perhaps to the chagrin of the refining sector—the EPA seems keenly aware of this contradiction. To be sure, the *agency has also suggested* it is comfortable with high RIN prices persisting. In theory, this should encourage higher level blends; an open policy objective. Given sufficient RIN carryover (the full 2.5-bn gal which fell below the 2012 rollover cap) the EPA appears comfortable even if "all [carryover RINs are] used for compliance purposes in 2013" thereby allowing physical blending to occur below the E10 wall. But although E15 or E85 are not needed in significant volumes for 2013, higher blends are sine qua non in providing outlets for 2014 compliance. **This is why the EPA is likely to weigh the growing RIN deficit and to open up a longer comment period to provide early guidance for stakeholders for 2014 proposals with a final 2013 decision perhaps arriving later this month.**

EPA waivers do require observance of "severe economic harm"—a somewhat obfuscated consideration—but given the physical program constraints fast approaching and the fact that gasoline prices could spike (see below) at a measurable cost to consumers, the agency could be more flexible on the program than it was during the 2012 drought when officials denied temporary waivers.

In this context, **for 2013 compliance we estimate a significant reduction in carryover RINs available for 2014** (Figure 11) to a best-case scenario between 0.5-bn gal to 1-bn gal; with about 1.2-bn gal drawn down for the conventional carve-out and the probable exhaustion of nearly all advanced RINs. Obligated parties near the blend wall in 2013 would almost certainly crash through it in 2014 unless they significantly reduce RVOs by cutting throughput or increasing exports (since mandates are limited to final *domestic* supply only); likely resulting in higher compliance costs, higher US gasoline prices and a still unsustainable mandate.

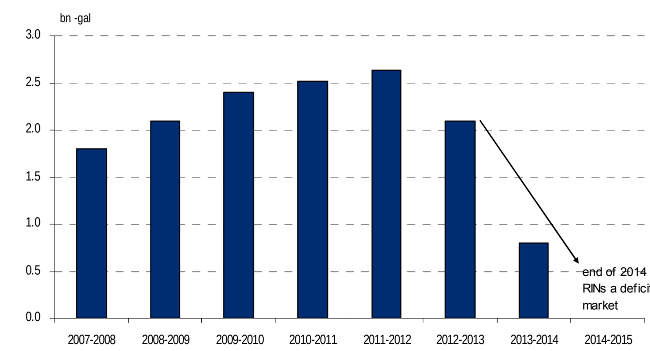
Looking to 2014 and beyond…

Figure 12. D4 RIN Prices Closely Track Biodiesel Blending Margins...



Source: Bloomberg, Starfuels Inc., Citi Research

Figure 13. Estimated D6 RIN Carryover During the RFS2 era



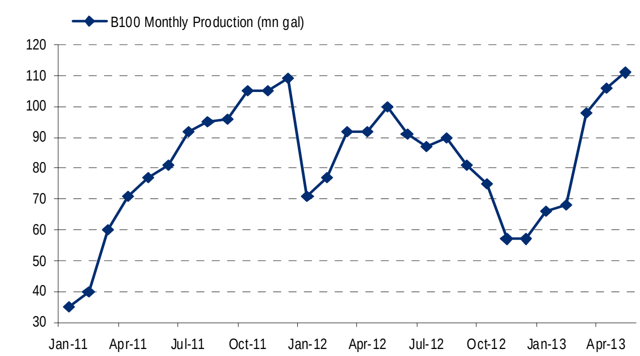
Source: Citi Research estimates

Figure 14. US Soybean Oil Balances

(Mn lbs)	09/10	10/11	11/12	12/13	13/14
Carryin (Oct. 1)	2,861	3,406	2,378	2,540	1,745
Production	19,615	18,873	19,620	19,605	19,495
Imports	103	159	149	350	250
Total Supply	22,579	22,438	22,147	22,495	21,490
Domestic Use	15,814	16,827	18,193	18,550	18,500
Biodiesel	1,622	2,737	4,870	4,800	5,500
Non-Biodiesel	14,192	14,090	1,323	13,750	13,050
Exports	3,359	3,233	1,464	2,200	1,300
Total Use	19,173	20,060	19,657	20,750	19,800
Carryout (Sep. 30)	3,406	2,378	2,490	1,745	1,690

Source: USDA, Citi Research

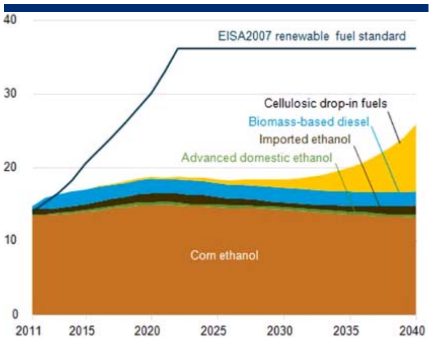
Figure 15. US Biodiesel Production (2011 – May 2013)



Source: EIA, Citi Research

RFS2 is driving the wedge of RINs this year for which sufficient availabilities may disappear by end of 2014 (Figures 13, 16) and even when considering the US government's own projections. US Department of Energy figures suggest a dislocated RFS2 policy without EPA issuance of credits and ongoing annual waivers. The pace of biofuels capacity additions and structural easing of US transportation fuel supply are simply too far off the stated policy targets. And if no relief is provided in 2014, we would argue the RFS2 mandate could fall apart a year from now as the market would run out of sufficient RINs or RIN generation capacity to meet the volumetric blending requirements.

Figure 16. Shortfall in credits from RFS2*



Source: EIA, *bn credits

Obligated parties potentially self-medicating via reduced refinery runs, allocating throughput to non-RFS2 regulated products (i.e. HO, jet fuel) and curtailing imports/increasing gasoline exports could also be a meaningful development; eventually leading to reduced domestic gasoline/diesel supply and thereby making the domestic transportation fuel market more volatile and less secure.

As such, potential fixes (some temporary) previously proposed by Citi and other market participants include:

- ***Partial EPA waiver/2013 flat:*** the EPA has flexibility with the advanced carve-out and has utilized this for several years now; the cellulosic requirement was reduced 99.9% to 14-mn gal (EE terms) from 1-bn gal in 2013 (lack of production capacity). The waiver of cellulosic biofuels under any scenario is almost guaranteed for 2014 as well. But while acceding to this change, the total advanced biofuels amount has remained the same (i.e. 2.75-bn gal in 2013) meaning the EPA expected the gap to be filled from sugar-based ethanol from Brazil, biodiesel and carryover RINs. Hence a proposal is to not only waive the cellulosic constituent (i.e. what would be 1.75-bn gal EE in 2014) but actually cut the entire advanced biofuels amount to ~2-bn gal. This would reduce the 2014 total mandate to 16.45-bn gal—slightly below 2013's 16.55-bn gal, allowing a modest 'kick-the-can' fix until Congress might act post-2014 elections (for the 2015 rule).

If not waivers or curtailed requirements the other side of the coin is pushing up the physical blend wall…although this faces its own difficult hurdles.

- ***E15 / E85:*** the other side of the coin is raising the physical blend wall. Certainly if US gasoline and diesel final supply were to increase it would allow current blending rates to hold or perhaps even rise without saturating E10. But given the structural decline in demand and fleet efficiency, the other option is pushing higher level ethanol blends. But this also faces infrastructure and consumer constraints as well as price distortions.

  - *Infrastructure:* less than 1% of the US vehicle fleet are flex fuel vehicles capable of using an E85 blend which is only available at 2% of nationwide retail stations largely concentrated in a few states such as Minnesota, Iowa and California. E15 faces similar lack of distribution capacity and labeling issues even though it has a much larger potential consumer base.

  - *Consumer preference:* although the EPA has issued E15 waivers for autos after MY2001—industry players, auto manufacturers and several consumer groups have all avoided broad adoption. Some argue blends above E10 distribute too much heat, impacting parts and leading to engine failure. The mix of water and alcohol in greater concentrations could also cause an undue attraction and warping of parts. Additionally this waiver does not include motorbikes or light-duty trucks and some manufacturers might void warranties. Many retailers also do not want to add E85 pumps with the liabilities associated with them and the added costs to their filling stations. Thus, an immediate push to E15 / E85 adoption seems less feasible.

  - *Cost:* while ethanol trades at a discount to clear gasoline on $/gal terms, it often trades at parity or premium in energy equivalent terms. For 2013 this is not an issue—since the market is still only near the blend wall and the octane value of ethanol is still a positive benefit for consumers. Its normal E10 use also lowers the consumption of more expensive neat gasoline which typically trades at a premium. Market dynamics could change when crossing the blend wall in 2014. Higher RIN prices given an RFS2 potential shortfall of ~2-bn gal+ could distort physical ethanol pricing versus RBOB, prompting ethanol relative

discount to RBOB to narrow or disappear as seen during the latter part of 2Q'13, when in reality wider diffs are needed to promote midlevel blends.

- ***Biodiesel/D4/ethanol equivalence value adjustment:*** solutions could also link to the US biodiesel market which Citi discussed in July. Within the advanced carve-out, biodiesel mandates enjoy flexibility, as they are issued new each year (i.e. 1.28-bn gal for 2013 in volume terms, 1.92-bn gal in EE terms). It can be assumed that the standard on volume terms will at least remain the same for 2014. However, adjusting the biodiesel (D4) RIN market in ethanol equivalent terms from 1.5x (Figure 17) to 2x or even 3x or 4x is an accounting metric that could reduce meaningfully reduce RIN generation costs (which ultimately underpins the dilemma with RFS2 for future years which is the lack of low-cost RIN generation capacity given the blend wall). This also solves the issue in that advanced/biodiesel RINs are facing an even larger potential shortfall than the D6 market given lower blending rates (~3%) vis-à-vis the E10 gasoline pool. For example a volumetric spike in 2014 of 0.5-bn gal to 1.78-bn gal biodiesel valued at 3x-ethanol equivalent terms could generate 5.3-bn RINs—more than adequate to cover the potential 2-bn gal+ shortfall for 2014. Of course this 'paper' solution might not meet the spirit of RFS2, but even a more modest jump to 2-2.5x could provide a potential relief valve for 2014 at perhaps the least harm solution, especially given D4 RINs are quickly exhausting but could be used to fulfill the lower nested conventional carve-out with the eventual depletion of D6 inventory.

Figure 17. Renewable Fuel Equivalence Value

Product	Ethanol Equivalence Value
Conventional Ethanol	1x
Cellulosic biomass ethanol	2.5x
Biodiesel	1.5x
Butanol	1.3x
Non-ester renewable diesel	1.7x
Other renewables (crude linked)	1x

Source: EPA, Citi Research

Operable domestic production capacity for biodiesel is over 2-bn gal per annum with about 2/3 of this available within PADD II. USDA estimates point to a 15% increase in soybean oil production (a biodiesel feedstock) in the coming harvest year on the back of what Citi estimates will be a 10% jump in the US soybean crop size to over 3.3-bn bushels for 2013/14 with bean prices forecast to plunge y/y ~15%. Domestic biodiesel output has already surged in 1H'13 (Figure 15) along with D4 RIN prices which are closely tracking blending margins (Figure 12). But sales of B100 in biodiesel blends remain unimpressive y/y and the differential between biodiesel prices and ultra low sulphur diesel have blown out this year; suggesting that a paper solution might also be needed to provide the physical market some support.

This is also linked to how high can D6 RIN prices might go this year. The theoretical max cost (breakeven) RIN price should be the penalty for non-compliance. Realistically, conventional RIN prices can converge to biodiesel RIN prices. Current margins (ULSD – Biodiesel spot + blending credit) appear to be the main component for D4 prices. Assuming a market without D6 RIN stocks, compliance could be met with these higher category biofuels. The problem is that 2013 targets are already becoming so binding, the diesel market itself faces major RIN shortfalls and the entire RFS2 market outlook is one that is short credits; so RIN price convergence and elevation would persist without policy adjustment and D4 provides a 'multiplier' effect that would allow for quicker generation of new RINs.

Figure 18. US Ethanol Output Capacity by Market Share

	2012 Production Capacity (bn gallons per annum)	Share of Total Output Capacity
Archer-Daniels Midland	1,720	11.6%
POET LLC	1,629	11.0%
Valero Energy Corp.	1,130	7.6%
Green Plains Renewable	730	4.9%
Aventine Renewable Energy Holdings Inc.	460	3.1%
Koch Industries	440	3.0%
Abengoa SA	378	2.5%
Big River Resources LLC	350	2.4%
The Andersons Inc.	330	2.2%
White Energy Holding Co. LLC	258	1.7%

Source: BI, Citi Research

At some level of RINs prices, there arises the incentive to generate RINs, with the high price of RINs allowing final E15 / E85 to be heavily discounted. OPs or other entities could produce higher level blends and dump them on the market and generate RINs, as long as RIN prices were greater than the cost of producing, storing, discounting to sell higher percentage blends. Recently, there have been reports of ethanol producers (non-OPs) selling E85 directly to retailers, banking a high-price RIN that could be sold to an obligated party that was short RINs. Absolute Energy in Iowa was offering E85 at $1.93/gal, versus average Iowa E85 prices of $2.77, subsidized by RIN credits; RIN prices were over $1 at that point. There could be the incentive for refiners/blenders to do similarly. Nevertheless, the cost to comply still accrues to OPs, whether they can or cannot use this means to generate RINs for their own needs, or to sell them onwards.

In short, while this market arbitrage aids RFS2 compliance, it represents a direct cost to obligated parties. Furthermore there appears to be a growing dislocation between obligated parties and ethanol producers. Looking at the large US refiners—Valero, ExxonMobil, Marathon or Phillips66—only Valero has any sizable ethanol production capability (Figure 18). Given that RIN generation was largely a non-issue in 2012 (despite the Midwestern drought) on volumetric terms—statements from various market participants lead us to believe the majority of carryover RINs were held by OPs coming into 2013. But this figure is poised to fall in 2014 both on a total carryover basis and the portion held by obligated parties.

Not all market participants are hit equally by RFS2 mandates…

But all market players are not being hit equally since RFS2 outcomes clearly favor certain portions of the supply chain. Retailers (Susser, Murphy, Pantry) seem to be benefiting from RIN prices. Firms like Western have pointed to it meeting 85% of its RINs obligation and its retail business is helping it find an outlet. OPs in the midstream space that supply small amounts of gasoline through blending are also largely unaffected given small RVOs. Most of the majors can also muddle through compliance (at least in 2013) with CVX, Shell and BP all reportedly net long RINs. Exxon may be slightly short and brokers markets suggest a net seller of RINs back during 1Q'13, but the largest US major now states it is a net buyer of RIN credits with the recent surge in prices having only a small impact on its profit.

…independent refiners (all of whom are obligated parties) are the loudest voice in opposition to the current policy trajectory.

This ultimately leads to the constituency that is most adversely impacted by RFS2; independent refiners that are mostly short RINs. CVR has pointed to the RFS2 system as being broken and claims 'severe hardship' expecting to spend $200-$240mn on compliance in 2013. Larger independents such as Valero claim much higher RFS2 costs of nearly $800mn. Others such as MPC, PSX and PBF are also estimated to be net short from $200-$500mn each with PBF expecting some policy announcement from the EPA or Congress in the next few months. Independents are pointing out that 20-60% of the costs are being passed through but it impacts their margins since blended barrels are being sold at a discount to spot in account of the RIN value. Independent refiners represent the loudest voice of all obligated parties that is calling for significant RFS2 policy relief.

- ***Congressional amendment wild card:*** evaluating the broader political dynamics at play offers insight into the two major political wildcards – policy intervention by either Congress or the EPA.
  - In the House, the Energy and Commerce Committee has been holding hearings on RFS with dozens of stakeholders participating. **Outright repeal of RFS2 is unlikely and any deals struck are likely to target reforms.** But with major constituencies including the oil and biofuels lobby at odds, the livestock/grocer and corn farmer lobby at odds, the environmental community

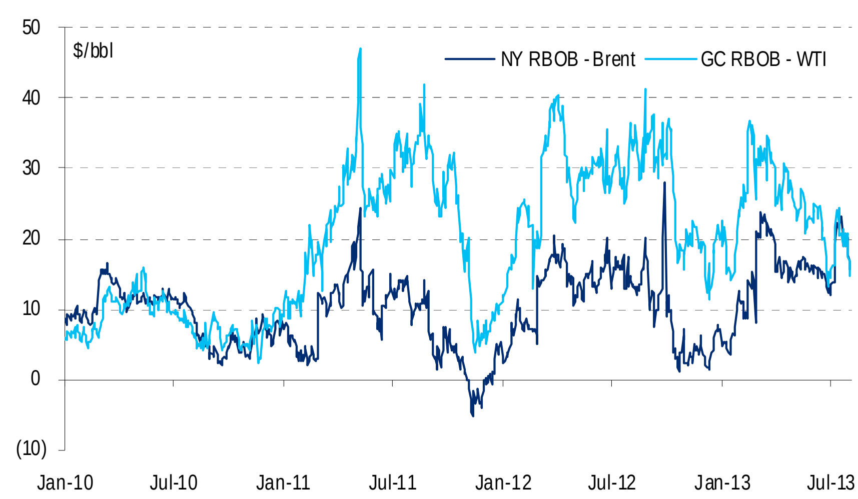
split and persistent Congressional gridlock, a comprehensive legislative fix may be slow to materialize absent ratcheting public pressure as a result of potentially higher gasoline prices next year.

Given the EPA's broad policy agenda, RFS2 / RINs look like a place the agency might compromise rather than fight a protracted battle; providing Congress some breathing room beyond the mid-term elections…

– EPA intervention in 2013/2014 to provide a short-term fix therefore looks like a more likely probability. Our view is that given the EPA's larger agenda and relationship with the House, RINs look like a place to compromise rather than stand and fight a protracted battle, for several reasons. First, legislative efforts are underway in the House to significantly de-fund the EPA and the agency is already fighting to stave off large cuts. Second, Obama has made climate change a priority in his second term and the EPA is the chief architect of his core policies in the power sector (see: "Much Ado About Climate Change" Citigroup: 25 June 2013). The House Republicans are already challenging the EPA's ability to regulate power plant emissions, and we think this battle is more central to the President's environmental agenda than the RFS. Finally, the administration will be highly sensitive to potential spikes in gasoline prices going into the 2014 elections, especially if opponents charge they are caused by the EPA. In short, the EPA probably will not "win the battle to lose the war". Ultimately, a legislative amendment looks needed for a real fix (i.e. move to a percentage rather than volumetric standard) since EPA waiver authority requires annual action. But the EPA can provide a buffer for this process.

Gasoline prices today not measurably impacted…but this could change in the near future…

Figure 19. Gasoline Crack Spreads for US East Coast, US Gulf Coast



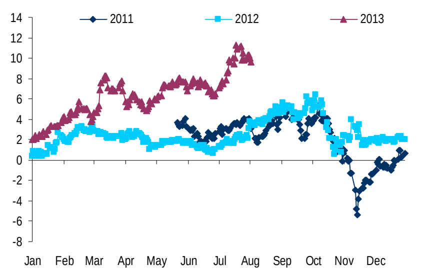
Source: Bloomberg, OPIS, Citi Research

Gasoline cracks have not yet been significantly impacted by RIN prices but could play a larger factor in 2014…

Spot gasoline cracks have not yet been significantly impacted by RIN prices. The sharp summer surges have been partially seasonal due to the uptick of driving season and summer spec gasoline. But in 2012, this was exacerbated by refinery closures in Europe and on the US East Coast, which created tightness in particular among gasoline blending components. This was compounded by refinery outages as Hurricane Sandy swept through the East Coast, leaving gasoline inventories low. The broken Venezuelan refinery system meant greater pull on products from Latin America. In 2013, spots of strong gasoline demand in Africa and the Middle East was joined by further refinery issues and the need to build-up gasoline stocks post-

Sandy. But this summer, the long awaited start-up of the Motiva Port Arthur refinery and better connectivity between the Gulf Coast and the East Coast via an expanded Colonial pipeline has meant a better supplied East Coast and adequate inventory levels. Against this backdrop, RINs prices have not been the major factor, although traders do report that RIN prices have been modestly driving some gasoline crack moves. But only when these spreads surge significantly would they hit US gasoline prices - particularly at the pump - as obligated parties potentially avoid supplying the domestic market so as not to incur the cost of the RIN.

Figure 20. Brent – RBOB Crack (Seasonal)



Source: Bloomberg, Citi Research

While prompt RBOB cracks have so far shown little impact from RINS, looking down the curve at winter cracks (versus Brent) it is does look as if the possibility of a run up in RINS into expiry is a concern for the market (Citi has recommended shorting this crack for fundamental reasons in its 3Q'13 Commodities Market Update: Curb Your Enthusiasm). December 2013 RBOB-Brent cracks are currently trading near $10/bbl; after Hurricane Sandy in 2012 (a perfect storm for the East Coast refining complex) the RBOB-Brent crack averaged $3.3/bbl in December 2012, while fundamentals for gasoline are significantly weaker this year given 7.5% rise in inventories y/y nationwide and 14.2% on the East Coast. RFS2 policy easing is clearly bearish RIN prices but it could also be bearish cracks.

Will there be an end to RINsanity?

Ultimately a legislative amendment would be needed by 2015 (if not sooner) to permanently resolve RFS2. While full repeal is unlikely, even a dramatic move to a pure 'percentage-based' measure (driven by legislative action) is not out of the picture and has been mentioned by obligated parties and suggested by some members of Congress. However, with the debt ceiling debate and mid-term season fast approaching, legal amendments might not be imminent; the EPA may need to issue waivers without legislative cover. To be sure, any sizable policy easing in the interim—even if it were to be implemented or adjusted as far out as 2015—would be bearish RIN prices; improving the prospects for both RIN carryout y/y and stock levels (at the 20% cap) as well as new RIN creation, in a less binding environment. We reiterate our view published in 1Q'13 that suggested the EPA will probably make no changes for 2013, a greater than 50% probability for some policy easing in 2014 and a 100% chance (need) for 2015 given the current RFS2 trajectory.

The potential for policy easing in 2014 appears more likely than not and greater than 50% towards an 'easier' mandate…likely via the EPA as a temporary fix until legislative measures can be passed by Congress. Any RFS2 relaxation would be bearish RIN prices; absent which RIN levels should continue to rise in 2014 in a severely more binding environment.

Traded RIN levels are likely to stay elevated, various categories near parity amongst each other given a systemic shortfall and prices are poised to rise further in 2014 absent policy change (the recent pullback might be indicative of market expectations for some easing although prices seem sticky at ~$1). Biodiesel margins likely remain a source of current price discovery but going forward everything could lift. If there were no change in policy, RIN prices need to move higher, to incentivize different types of adjustments. A theoretical maximum cost should be the penalty for non-compliance. This stands at $32,500 per day per instance of non-compliance, as stipulated in the Clean Air Act. This might be manageable for obligated parties that were only modestly short RINs and only on a temporary basis. But this does not seem to be the case since annual compliance cost estimates are in the $100s of millions for many independent refiners.

This essentially means a different level of tolerance for different OPs, depending on their net short RIN position. At some level below this, RIN obligations may become too onerous, in which case, OPs would opt to avoid supplying the domestic market, discouraged by high RIN prices. At some level, OPs and non-OPs may look to earn RIN credits by blending more than the ethanol needed for RVOs, through higher blends like E15 or E85; this would require RIN prices high enough to encourage this, where the cost of ethanol and gasoline are more than offset. Given current

levels of ~$2.30 for ethanol and ~$3 for gasoline, RINs may need to reach over $3 to incentivize this on a wider basis; and this would still not solve the current impasse. Severely limited E85 fueling infrastructure and final demand means that this would be far from sufficient to plug the RIN shortfall in 2014.

With the prospect of a RIN driven price spike in transport fuel markets in 2014, it might then prompt Congressional action which lacks a clear mandate or much prospects of a tangible deal in the short-term; the House energy committees finally taking some notice of the policy contradiction in the past few months holding hearings with dozens of stakeholders. While pro-RFS2 constituents might keep pressing for a broader adoption of midlevel blends, this is also not a near term solution for obligated parties that are likely to face a severe compliance shortfall as soon as this year let alone for 2014 (despite, interestingly enough, that as discussed E15 / E85 provides one of the few modest outlets for RIN generation in 2014). As such, the EPA could act sooner rather than later to provide a market relief valve before the risk of stalled and volatile US gasoline and diesel system forces its hand. The final 2013 decision which was expected in July could arrive this month or later this quarter. The 2013 rule is likely to remain intact, however, with EPA and White House support appearing to favor policy relaxation beginning with the 2014 rule.

Appendix A-1

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