



RFS and RFS2 Regulations

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RFS and RFS2 Regulations Contents

- **RFS**
 - **Background**
 - **Volume Requirements**
 - **RFS%**
 - **RINs**
 - **Compliance**
 - **Waivers**
- **RFS2**
 - **Background and Timing**
 - **Volume Requirements**
 - **RFS%**
 - **Life Cycle Analysis**
 - **Compliance**
 - **Waivers**
 - **Issues – Blend Wall**



RFS and RFS2 Regulations

RFS - Background

- **Background**
 - **The Energy Policy Act of 2005 (EPAct) created the Renewable Fuel Standard (RFS) program**
 - **The current RFS program began on September 1, 2007**
 - **The Industry was deemed to be in compliance for 2006 and 2007 through August**
 - **The current RFS program is still in effect except that the EPA is basing the volume requirement on the total renewable fuel requirement in the 2007 Energy Bill**
 - **The RFS obligation applies to refiners and importers of gasoline**
 - **Small refineries and small refiners are exempt until 2011**
 - **Renewable Identification Numbers (RINs) are assigned to batches of renewable fuels by producers and importers**
 - **The RINs move with Title Transfer of the renewable fuel**
 - **Only obligated parties and renewable fuel blenders can separate RINs from renewable fuels (except for some cases)**
 - **RINs are used to demonstrate compliance with the RFS, they are the credit currency of the RFS program**
 - **Obligated parties can only use 20% of prior year RINs to demonstrate compliance**
 - **Obligated parties can run a deficit if it is made up in the following year and they do not run a deficit in the following year**

The current RFS program is still in effect, but with RFS2 total volume requirements.



RFS and RFS2 Regulations

RFS – Volume Requirements

- **Volume Requirements**
 - **RFS calls for increasing volume requirement up to 7.5 Billion gallons per year (BG/Y) in 2012**
 - **2006 – 4.0 (BG/Y)**
 - **2007 – 4.7**
 - **2008 – 5.4**
 - **2009 – 6.1**
 - **2010 – 6.8**
 - **2011 – 7.4**
 - **2012 – 7.5 (0.25 BG/Y must be “Cellulosic Ethanol”)**
 - **2013+ Same percent renewables as in 2012)**

RFS volume requirements increased to about 5% of the gasoline pool.



RFS and RFS2 Regulations

RFS – RFS%

- **RFS%**
 - **EPA issues the RFS% for obligated parties each year in November for the upcoming year based on projected next year gasoline consumption and the renewable volume requirements in the energy bill**
 - **The RFS% for 2007 was 4.02%**
 - **The RFS % for 2008 was initially 4.63% and then increased to 7.76% after passage of the 2007 Energy Bill**
 - **The RFS % for 2009 is 10.21%**
 - **The Renewable Fuel Standard or RFS% is used to calculate an obligated parties Renewable Volume Obligation (RVO)**
 - **The $RVO = RFS\% \times \text{Annual Gasoline Volume} + \text{Deficit Carryover}$**
 - **$RFS\% = 100 \times (\text{Renewable Fuel Volume Requirement}) / (\text{Projected gasoline usage} - \text{Projected Renewable Fuel included in projected gasoline usage} - \text{Projected Small Refiner Gasoline Production})$**
 - **Or the $RFS\% = 100 \times (\text{Renewable Fuel Required}) / (\text{Petroleum Based Gasoline})$**
 - **In this form an obligated party can multiply the RFS% by their petroleum based gasoline production or imports and calculate the volume of renewable fuels needed to meet their obligation**

The RFS % is used by an obligated party to calculate the amount of renewable fuel they need to blend or acquire credits for.



RFS and RFS2 Regulations

RFS – RFS%

- **RFS%**
 - The RFS% is not the % of renewable fuel in the finished gasoline, it is the percentage factor obligated parties use to calculate their renewable fuel volume obligation
 - Question: What is the RFS% that corresponds to a final blend containing 10% ethanol?
 - Answer: $RFS\% = 100 \times (10 / 90) = 11.1\%$
 - Think of it this way, for a final blend to be 10% ethanol there could be 90 gallons of petroleum based gasoline and 10 gallons of ethanol, what number, x times 90 equals 10? Or $90 \times x = 10$, $x = 10 / 90 = .111$ or 11.1%
 - The 2009 RFS% is 10.21% but this does not apply to the 13.5% of the projected U.S. gasoline production produced by small refiners
 - Small refiners and blenders can blend renewable fuel into small refiner gasoline, the small refiner is just not obligated to do so until 2011
 - If the 2009 RFS% applied to all of the gasoline pool the RFS% would have been 8.71%
 - An estimate of the 2010 RFS% is 11.9%, however this corresponds to only 10.2% when spread over the entire gasoline pool

The RFS% is not the same as the % renewable fuel in the finished gasoline.



RFS and RFS2 Regulations

RFS – RINs

- **RINs**
 - **Renewable Identification Numbers (RINs) are used to track ethanol movements and used to demonstrate compliance**
 - **A RIN is a 38 digit serial number that is assigned by renewable fuel producers and importers to each gallon/batch of renewable fuel**
 - **The RIN contains:**
 - **Company Registration ID**
 - **Facility Registration ID**
 - **Year of production**
 - **Batch serial number**
 - **Batch volume**
 - **Equivalence value**
 - **Other information**
 - **For corn based ethanol or most ethanol that is not cellulosic each gallon of ethanol corresponds to one RIN gallon**
 - **Cellulosic ethanol has 2.5 RINs per gallon**
 - **“Cellulosic Ethanol” can be any ethanol if animal waste or other waste materials are used to displace 90% or more of the fossil fuel normally used in the production**
 - **Biodiesel, renewable diesel and biobutanol also have more than one RIN per gallon of renewable fuel**

RINs are the credit currency of the RFS program.



RFS and RFS2 Regulations

RFS – Compliance

- **Compliance**
 - **Background**
 - **Renewable Identification Numbers (RINs) are assigned to batches of renewable fuels by producers and importers**
 - The RINs move with Title Transfer of the renewable fuel
 - Only obligated parties and renewable fuel blenders can separate RINs from renewable fuels (except for limited exceptions)
 - RINs are used to demonstrate compliance with the RFS, they are the credit currency of the RFS program
 - **Obligated parties are producers and importers, thus the point of compliance is in effect at the refinery gate**
 - **At or above the truck rack means before gasoline is put into a truck for delivery to a retail outlet or a wholesale purchaser/consumer (fleet filling location)**

RFS compliance applies to refiners and importers.



RFS and RFS2 Regulations

RFS – Compliance

- **Compliance**
 - **Point of compliance issues**
 - **The RFS regulations are not about changing the gasoline produced at the refinery or imported but changing what is added to the gasoline at the truck rack**
 - **The party that holds title to gasoline at the truck rack controls what if any renewable fuel is blended into the gasoline**
 - **Obligated parties have an obligation for fuel that they have no control over**
 - **There is an uneven playing field among refiners and importers as some companies are naturally short RINs and others are naturally long RINs due to the structure of the market**
 - **There is an uneven playing field between refiners and importers and renewable fuel blenders as one party has a regulatory obligation to buy RINs but the other party does not have a regulatory obligation to sell**
 - **State laws are being enacted to require marketers (refiners) to provide for sale gasoline that can be blended with ethanol**
 - **One state law is in effect and about 20 other states have legislation in the approval process**
 - **These laws force refiners to sell gasoline and not blend the ethanol themselves**
 - **These laws could work against the RFS or RFS2 program as they rely on there being an economic incentive for the buyer to blend ethanol or cellulosic ethanol**

Since obligated parties do not necessarily have control of the fuel where renewable fuel is added, the current regulations have created an un-even playing field.



RFS and RFS2 Regulations

RFS – Compliance

- **Compliance**
 - **Point of compliance issues**
 - **The EPA considered having the RFS obligation apply to blenders or title holders at the truck rack but did not take this approach to lessen the number of parties reporting (ethanol at 7.5 BG/Y was expected to be in only 50% of the U.S. gasoline market)**
 - **The NPRA was in favor of the obligation applying to title holders at the truck rack but with ethanol production anticipated to exceed the 7.5 BG/Y requirement in 2012 as early as 2008 did not press this issue**

The EPA chose the current point of compliance or definition of obligated party because renewable fuel was expected to only be in half of the total gasoline pool.



RFS and RFS2 Regulations

RFS – Waivers

- **Waivers**
 - **States can apply for a waiver but it would only lower the total renewable fuel requirement and not stop application of the RFS to producers and importers in that state**

Only states can ask for a waiver under the RFS regulations.



RFS and RFS2 Regulations

RFS2 - Background

- **Background**
 - **The Energy Independence and Security Act of 2007 (EISA) created the Renewable Fuel Standard 2 (RFS2) program**
 - **Proposed Regulations for the RFS2 program have not been issued**
 - **The Final Rule for the RFS2 program must be published in the Federal Register by October 31, 2009 for the regulations to take effect as of January 1, 2010**
 - **The EPA has unofficially said that they will not meet this deadline and are working on what to do for 2010 under the existing RFS regulations**
 - **The current RFS program is still in effect except that the EPA is basing the volume requirement on the total renewable fuel requirement in EISA**
 - **The RFS2 program is expected to be very similar to the RFS program except for:**
 - **Significantly higher volumes of renewable fuels**
 - **4 types of renewable fuels and 4 standards**
 - **Inclusion of Life Cycle Analysis (LCA) and Indirect Land Use Change (ILUC) in determining if a fuel qualifies as one of the three types of advanced biofuels or for new corn based ethanol plants (EISA grandfathers up to 15 BG/Y of existing corn based ethanol plants)**
 - **Standard is extended from only gasoline to gasoline and on and off-road diesel (Jet fuel and Heating oil are not covered but renewable fuel used in either will count in the future under RFS2)**

The RFS2 regulations will likely not take effect until January 1, 2011.



RFS and RFS2 Regulations

RFS2 Volume Requirements

RFS2 - 4 Separate Standards				
Year	Advanced Biofuel			Total Renewable Fuel
	Biomass-Based Diesel	Cellulosic Biofuel	Total Advanced Biofuel	
2006				4.0
2007				4.7
2008				9.0
2009	0.5		0.6	11.1
2010	0.65	0.1	0.95	12.95
2011	0.8	0.25	1.35	13.95
2012	1.0	0.5	2.0	15.2
2013	1.0	1.0	2.75	16.55
2014	1.0	1.75	3.75	18.15
2015	1.0	3.0	5.5	20.5
2016	1.0	4.25	7.25	22.25
2017	1.0	5.5	9.0	24.0
2018	1.0	7.0	11.0	26.0
2019	1.0	8.5	13.0	28.0
2020	1.0	10.5	15.0	30.0
2021	1.0	13.5	18.0	33.0
2022	1.0	16.0	21.0	36.0

- **Volume Requirements**
 - **4 Separate Standards**
 - Need enough RINs of each type to meet each standard
 - There is no corn based ethanol standard but the difference between the Total Renewable Fuel Standard less the Total Advanced Biofuel Standard limits the use of corn based ethanol RINs to 15 Bil Gal/Yr

RFS2 Regulations will have 4 separate compliance standards.



RFS and RFS2 Regulations

RFS2 – Volume Requirements

- **Volume Requirements**
 - **Life Cycle Analysis (LCA) and Other Requirements**
 - **EISA calls for renewable fuels to be produced from renewable biomass harvested from land “cleared or cultivated” prior to December 19, 2007**
 - **Existing corn based ethanol plants and those under construction as of December 19, 2007 are grandfathered**
 - **New corn based ethanol plants must meet a 20% Green House Gas (GHG) reduction target**
 - **Biomass-based diesel must meet a 50% lifecycle GHG threshold (EPA can lower this to 40%)**
 - **Cellulosic Biofuel must meet a 60% lifecycle GHG threshold (EPA can lower this to 50%)**
 - **Renewable fuel must be produced from Cellulose, hemicellulose, or lignen (old definition including burning biomass at a corn based ethanol plant will not apply)**
 - **Advanced biofuel (anything but corn starch ethanol) must meet a 50% lifecycle GHG threshold (EPA can lower this to 40%)**

The RFS2 program will evaluate renewable fuels using LCA including ILUC.



RFS and RFS2 Regulations

RFS2 – RFS%

- **RFS2%**
 - **Will be same format as for RFS except based not only on gasoline but gasoline and on and off-road diesel**
 - **There will be 4 RVO's one for each of the standards**
 - **An RVO for biomass-based diesel,**
 - **An RVO for cellulosic biofuel**
 - **An RVO for total advanced biofuel, and**
 - **An RVO for total renewable fuel**
 - **The Renewable Fuel Standards or RFS% is used to calculate an obligated parties Renewable Volume Obligation RVO**
 - **The RVO's = RFS2%'s x Annual Gasoline Plus Diesel Volume + Deficit Carryover**
 - **Since biomass-based diesel volumes are expected to be small, an interesting exercise is to take the RFS2 total renewable fuel volume standard less the biomass-based diesel standard and calculate the RFS% and then calculate the percent renewable fuel in just the gasoline pool**
 - **An estimated Gasoline Only RFS2 %, for 2010 using the 2009 RFS% assumptions is 11.3% which is slightly over 10% in the finished gasoline pool not including the small refiner gasoline volume and about 9.7% when the small refiner volume is included**

We are approaching the 10% maximum ethanol blend wall under the RFS2 volume obligations.



RFS and RFS2 Regulations

RFS2 – RINs

- **RINs**
 - **Renewable Identification Numbers (RINs) will still be used to track ethanol movements and used to demonstrate compliance**
 - **The RFS2 RINs will have to indicate the type of renewable fuel (there will be changes and possibly more digits beyond the current 38)**
 - **All renewable fuels will have one gallon RIN for each gallon of renewable fuel**

RINs will remain the credit currency in the RFS2 program.



RFS and RFS2 Regulations

RFS2 – Compliance

- **Compliance**
 - **Background – Same as for RFS**
 - **Renewable Identification Numbers (RINs) are assigned to batches of renewable fuels by producers and importers**
 - The RINs move with Title Transfer of the renewable fuel
 - Only obligated parties and renewable fuel blenders can separate RINs from renewable fuels (except for some cases)
 - RINs are used to demonstrate compliance with the RFS, they are the credit currency of the RFS program
 - **Obligated parties are producers and importers, thus the point of compliance is in effect at the refinery gate**
 - **At or above the truck rack means before gasoline is put into a truck for delivery to a retail outlet or a wholesale purchaser/consumer (fleet filling location)**
 - **New background for RFS2**
 - **Higher volumes means ethanol will be required in 100% of the U.S. gasoline pool**
 - Since renewable fuel blenders have to report RIN activity, moving the point of compliance will not increase the number of parties reporting, just the number of parties that also have an obligation

The reason for picking the current point of compliance for the RFS program no longer holds for the RFS2 program.



RFS and RFS2 Regulations

RFS2 – Compliance

- **Compliance**
 - **Point of compliance issues – Same if point of compliance remains the same for RFS2**
 - **The party that holds title to gasoline at the truck rack controls what if any renewable fuel is blended into the gasoline**
 - **Obligated parties have an obligation for fuel that they have no control over**
 - **There is an uneven playing field among refiners, importers and renewable fuel blenders**
 - **State laws are being enacted to require marketers (refiners) to provide for sale gasoline that can be blended with ethanol**
 - **New Point of compliance issues for RFS2**
 - **Expected initial higher cost for advanced renewable fuels makes previous issues more important and negative impact on industry meeting the standards more problematic**
 - **E85 infrastructure will be needed to meet the RFS2 standards, thus compliance costs will increase significantly**
 - **EPA has been asked to make title holders of fuel at the truck rack the obligated party**
 - **CARB has moved partially in this direction with the LCFS regulations but only applying this for refiners and importers, other parties should be treated the same for the LCFS to have the best chance of working**

The same compliance issues under the RFS program will exist under the RFS2 program, only magnified unless the point of compliance is changed.



RFS and RFS2 Regulations

RFS2 – Waivers

- **Waivers**
 - **General Waiver Authority**
 - **Anyone (not just States) can petition for a waiver or relaxation of any of the 4 standards**
 - Severe harm to the economy
 - Inadequate supply
 - **EPA must approve or disapprove within 90 days**
 - **Requires opportunity for notice and public comment**
 - **Limited to 1 year, but can be renewed**
 - **Biomass-Based Diesel Waivers**
 - **Up to 15%, 30% if renewed**
 - **EPA can reduce advanced biofuel and total renewable fuel standards accordingly**
 - **Cellulosic Biofuel “Waiver”**
 - **Irrespective of the volumes required in EISA**
 - **When EPA sets the cellulosic standard in November for the following year, EPA can set different a different cellulosic standard based on EIA projections**
 - **If the cellulosic standard is below the volume in EISA,**
 - **EPA must make EPA-RINs available for sale at the greater of:**
 - » **25 cents per gallon, or**
 - » **\$3.00 per gallon less the wholesale price of gasoline**
 - **EPA can reduce advanced biofuel and total renewable fuel standards accordingly**

Under the RFS2 program the EPA has authority to grant sufficient waivers to make the program work, even if the blend wall delays implementing higher volumes.