

# New RFS Requirements under the Energy Independence and Security Act (EISA)

Presented to the  
Blue Skyways Collaborative  
Fuels Subcommittee  
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# Primary EISA Elements

- Increases volume under RFS1 for 2008
- Modifies the RFS program ("RFS2")
  - Volumes
  - Renewable fuel categories and eligibility
  - Waivers and paper credits
  - Obligated parties
- New studies and reports

# 2008

- RFS1 remains in place
- Volume changed from 5.4 to 9.0 billion gal
- New Federal Register published 2/13/08
- Std now 7.76%

# RFS2 Standards Overview

- There are now four volume mandates
  - Total renewable fuel
  - Advanced biofuel (part of total)
  - Cellulosic biofuel (part of advanced biofuel)
  - Biomass-based diesel (part of advanced)
- EPA sets the standards each November (FR Notice)
  - “Based on” October EIA projections for the following year
    - Gasoline
    - Diesel
    - Biomass-based diesel (primarily biodiesel)
    - Cellulosic biofuel (primarily cellulosic ethanol)

# RFS2: 4 Nested Stds

Year	Total Renewable Fuel			
	Total Advanced Biofuel			
	Biomass-Based Diesel	Cellulosic Biofuel		
2007			4.7	
2008			9.0	
2009	0.5		0.6	11.1
2010	0.65	0.1	0.95	12.95
2011	0.80	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

# Energy Equivalency

- For RFS1 we treated the 7.5 Bgal as 7.5 Billion ethanol-equivalent gallons
- We established values for different fuels based on energy content in relation to ethanol. E.g.,
  - Ethanol: 1.0
  - Biobutanol: 1.3
  - Biodiesel: 1.5
  - Renewable Diesel: 1.7
- EPA Act 2005 set the value for cellulosic ethanol and waste-derived ethanol at 2.5
  - This is eliminated under EISA
- Presumption is that Congress intended for this approach to continue for RFS2
  - No explicit guidance to the contrary
  - Consistent with the President's 20-in-10 plan
  - 36 Bgal is 36 billion ethanol equivalent gallons
- Industry has accepted and is familiar with this approach 6

# Energy Equivalency

- The new Biomass-based diesel fuel standard is different
  - Its clearly a diesel standard, not an ethanol standard
- We likely need to treat it as actual volume of biodiesel
- But Congress didn't keep track of their units in setting the stds
- Treating the biomass-based diesel std as actual gallons and the other stds (total advance biofuel and total renewable fuel std) as ethanol equivalents results in the biomass-based diesel std being larger than the total for “advanced biofuels” for the first few years

# Renewable Fuel Definitions

- Significantly changed from RFS1
- Creates new categories
- Eliminates some old categories
  - Waste-derived ethanol
  - "90%" cellulosic ethanol
- Definitions now include new elements
  - Lifecycle GHG reduction thresholds
  - Existing cropland criterion

# "Renewable Fuel"- Existing Cropland

- Must be produced from renewable biomass grown on existing cropland
  - Under EISA, renewable fuel made from crops, trees, waste crop material, algae... can only generate RINs if the land existed as cropland prior to December 19, 2007
    - EISA says land must be "agricultural land cleared or cultivated" "at any time" prior to enactment
    - Cropland could be either actively farmed or fallow as of enactment
    - But for crops it must have been non-forested
    - For trees and tree residue, nothing from Federal lands
  - Unfortunately, renewable fuel producers usually do not know the source of their feedstocks
  - Provision was likely intended to address domestic concerns, but as written would apply worldwide
- Renewable fuel used in home heating fuel or jet fuel is now valid
  - Under RFS1 this was not the case leading to implementation complexity
  - Marketers and blenders of heating oil may now be required to track RINs

# "Renewable Fuel" - Lifecycle

- Renewable fuels must meet a 20% threshold for lifecycle GHG emission performance relative to the gasoline or diesel fuel they displace
  - 2005 baseline required to be used for gasoline and diesel fuel
  - Requires that we define subgroups of renewable fuel type/feedstock/process for evaluating GHGs
  - Plants that started construction prior to December 19, 2007 are grandfathered
- Can a facility that doesn't meet the threshold "earn it" in the future?
  - Yet to be determined
- Could very well have excess corn ethanol produced – or greater "advanced biofuel" volumes than required in the early years
  - The producers simply generate the RINs for whatever volume of fuel is produced, and the market decides their value
  - Extra "advanced" fuel simply competes with conventional biofuel

# "Renewable Fuel" Grandfathering

- We must define the start of construction
  - Financing secured
  - Land purchased
  - Permits approved
  - Broke ground
  - First physical structure underway
- We must define a “facility”
- Applies internationally
- Separate provision in Sec 210 deems all NG and biomass fired ethanol plants to meet 20% for 2008 and 2009

# "Advanced Biofuel"

- Essentially anything but corn starch ethanol (e.g., ethanol from cellulose, sugarcane, non-corn starches and waste products, biodiesel, biogas, and butanol)
- But must meet a 50% threshold for lifecycle GHG emission performance
- Not clear, but presumably a plant could produce some advanced biofuel and some conventional biofuel – would need to sort the mechanism out through regulations
- Will also need to develop a mechanism for certifying production facilities as meeting the various criteria
  - RFS1 was based on product, not facility

# "Biomass-Based Diesel"

- Essentially biodiesel (FAME)
- Can include renewable diesel produced from dedicated units – just not if co-processed with petroleum
- But must meet a 50% GHG threshold for lifecycle GHG emission performance
- Biodiesel that does not meet the 50% threshold may still be valid renewable fuel under some circumstances
  - e.g. 20% minimum GHG threshold may not be relevant if palm oil is imported and made into biodiesel at a grandfathered plant (plenty of excess capacity exists)
  - Some biodiesel produced would be biomass-based diesel, and some not – this will have to be tracked and enforced

# "Cellulosic Biofuel"

- Must be produced from cellulose, hemicellulose, or lignin (no longer any provision for it to be corn starch ethanol with 90% of process heat from renewable sources)
- Primarily assumed to be cellulosic ethanol but could be BTL diesel, could be imported ethanol from sugarcane bagasse
- Must meet a 60% GHG threshold for lifecycle GHG emission performance
  - Some imported ethanol may not meet this threshold
- Can a cellulosic biodiesel fuel also count toward the biomass-based diesel std?

# Lifecycle Performance

- Lifecycle performance means
  - All stages of fuel and feedstock production, distribution and use
  - CO<sub>2</sub>, HFCs, Methane, N<sub>2</sub>O, PFCs, Hexafluoride, others through rule
  - Direct emissions
  - Indirect – land-use changes
    - This was specifically required in EISA
    - Could make or break some renewable fuels
- We'll need to decide how to group fuels into type/feedstock/process
  - Will have a big impact on which fuels are valid, and for which of the four categories

# Lifecycle Performance

- Can adjust 20%, 50%, and 60% thresholds
  - Can only adjust if not commercially feasible to be met
  - Can only adjust down by a maximum of 10%
  - Adjustment for 20% must be based on natural gas fired corn ethanol plants
  - If we adjust, must review and revise through rulemaking in 5 years
- Once established via rule, can only adjust again if there is a significant change in analytical methodology
  - Can only adjust back as high as the original 20%, 50%, 60% values
  - Future adjustments only apply to new facilities – previous facilities are grandfathered
- There are no provisions for partial credit
  - A fuel with a factor of 30% gets no credit for Advanced
  - If we lower the threshold, fuels meeting the same threshold do not get different credit based on lifecycle performance

# Biomass-Based Diesel Standard

- Administrator can adjust the standard in the Act downward if significant supply or other market circumstances lead to high prices
  - Up to 15% of the standard
  - Can renew it once for up to a total of 30% of the std
  - Can reduce Advanced biofuel and Total renewable fuel standards accordingly, but don't need to if other fuels can displace it

# Cellulosic Biofuel Standard

- Irrespective of the volumes required in the Act, the Administrator must establish the standard for the following year - "based on" EIA's projection of production
- If the projected cellulosic volume is less than the volume required in the Act (or a lower volume set via a later EPA rule),
  - EPA can also reduce the volume of Advanced Biofuel and Total Renewable
    - If other advance fuels can make up the difference, then no need to change these stds
  - EPA must make EPA-RINs available for sale to refiners at the greater of
    - 25 cent/gallon
    - \$3.00 per gallon less the wholesale price of gasoline (at today's prices this equates to ~75 c/gal)
    - Money goes to the U.S. Treasury

# Cellulosic Biofuel Standard

- The number of EPA-RINs we make available is limited to the cellulosic volume used to set the standard
- Broad discretion to make the program work and provide certainty for both regulated entities and cellulosic producers

# New Obligated Parties/Volumes

- Standard extended to:
  - Diesel fuel in addition to gasoline
  - Nonroad fuel in addition to highway
  - Would also include CTL diesel designated as MVNRLM
  - Could include CNG and LPG used in transportation, but doing so will be difficult
- Obligated parties now include refiners, importers, blenders of these fuels
- Jet fuel and heating oil aren't covered, but renewable fuel sold into these markets can generate RINs

# General Waiver Authority

- Anyone subject to the requirements (including States) can now petition for a waiver or relaxation of any of the four standards
  - Severe harm to the economy or the environment
  - Inadequate supply
- EPA must approve or disapprove within 90 days
- But requires opportunity for notice and comment
- Limited to one year, but can be renewed
- These provisions don't need to be spelled out in the regulations

# Modification of Standards

- If any of the four standards are lowered by more than 20% in two consecutive years or more than 50% in one year,
- Then EPA is required to issue a rule to change the standards for all subsequent years
  - Reduces the need for future waivers
  - But only for 2016+ standards
  - Not entirely clear, but it would appear that the trigger for future EPA generated cellulosic RINs would then be based off of the new stds, not the stds in the Act

# Standards for 2023+

- EPA shall set the standards by rule with a minimum of 14 months of leadtime
- In consultation with DOE and USDA
- Based on:
  - Review of program to date
  - Impacts on the environment
  - Energy Security
  - Projected production
  - Ability of the distribution system to handle it
  - Cost to consumers
  - Job creation and rural economic development
  - Price and supply of ag products
  - Food prices
- Advanced biofuel standard must be at least the same percentage as in 2022
- Cellulosic std cannot assume waivers would be needed – must be based on projections of actual feasible production
- Biodiesel standard must be set for 2013+ and be at least 1.0 Bgal
  - Evaluation would have to occur in 2010-11

# Possible Approach for 2009

- EISA does not nullify the existing RFS regs, so absent a new rule they remain in effect
- EPA must publish the 2009 standard in the FR by Nov 2008
- If we are not able to complete a new rulemaking in time we could still set the total renewable fuel standard for 2009 using the new 11.1 Bgal value from EISA
  - Supercedes the 6.1 Bgal in EPLA 2005
  - Definition of renewable fuels is different, but not much of an issue for 2009
  - For 2009 it would all be grandfathered volume anyway
  - Standard would apply to just gasoline refiners/importers, not gas + diesel as envisioned by EISA, but same issue already exists for 2008
- Standard would remain in effect for all of 2009
  - However, we would still be able to pursue a waiver during 2009 if it appeared the required volume could not be achieved

# Other Related Requirements of EISA

- EPA Studies and actions for renewable fuels
  - Section 204: Environmental and Resource Conservation Impacts
    - Impacts of RFS2 on air, water, hypoxia, pesticides, noxious plants, soil
    - Study every 3 years
  - Section 206: Electric Vehicle Credits under RFS2 (18 mo.)
  - Section 209: Anti-Backsliding impacts of RFS2 on Air Quality
    - Study by June '09
    - **Fuel** rulemakings by 12/10
  - Section 247: Specification for biodiesel

# Other Related Requirements of EISA

- Studies with EPA in consulting role (DOE lead)
  - Section 203: NAS study of impacts of RFS program on food, forests, and energy
  - Section 221: R&D challenges of high concentrations of biodiesel
  - Section 222: R&D challenges of biogas
  - Section 225: Optimization of FFVs
  - Section 226: Engine performance with biodiesel
  - Section 227: Optimization of CNG vehicles for biogas
  - Section 248: R&D for biofuels infrastructure
- DOE Studies
  - Impact of RFS on industry
  - FFV optimization
  - Biodiesel and engine durability/performance
  - Biogas optimization
  - Challenges to biogas and biodiesel production