Renewable Fuel Standard Program (RFS)

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Agenda

- Refresher: The RFS -- EPACT 2005 and EISA 2007
- Compliance with RFS2 – The Basics
- New Fuel Pathways – The Process
- Where do things Stand in 2012
- What's Next?
- Questions / Discussion

EPACT 2005 vs. EISA 2007

- EPACT 2005 RFS1
  - National Standard
  - 7.5 billion gallons
  - 2012 Full Implementation
  - Obligation based on gasoline – onroad only
  - General definition for renewable fuels
  - 250 million gallons of cellulosic biofuels
  - Different qualification for cellulosic fuel - 2.5 Credits (RINs) per gallon of ethanol
- EISA 2007
  - National Standard but with 4 categories of renewable fuels
  - Significantly increased volumes of renewable fuel – to 36 billion gallons
  - 2022 Full Implementation
  - Expanded to on and off-road gasoline and diesel
  - Explicit definitions for renewable fuels to qualify
  - Inclusion of specific types of waivers
  - Legislation allows renewable fuels used in Home Heating Oil and Jet Fuel to count towards RFS2 program

2007 EISA RFS2 Program - Key Aspects

- **Establishes four categories of renewable fuel volume standards:**
  - cellulosic biofuel
  - biomass-based diesel
  - advanced biofuel
  - total renewable fuel

- **Changes to the program include qualification requirements for renewable fuels and feedstocks**
  - Definitions for qualifying fuels / feedstocks for the categories
    - Specifically defines cellulosic, biomass-based diesel, etc.
    - Set minimum lifecycle GHG reduction thresholds for categories
    - Established grandfathering allowances for renewable volumes from certain facilities
    - Applies restrictions on
      - Types of feedstocks that can be used to make certain renewable fuel types
      - Types of land that can be used to grow and / or harvest different feedstocks
      - Set restrictions on approved applications for compliant use of renewable fuels

- **Final rule set full 2010 EISA renewable fuels volume = 12.95 Bg**

- **The RFS2 Regulations went into effect July 1, 2010.**

- **EPA developed a path for transitioning from RFS1 to RFS2**

Details of EISA Categories and Standards

- **Four Separate Standards**
  - **Biomass-Based Diesel: Minimum of 1 Bgal by 2012 and beyond**
    - Must meet a 50% lifecycle GHG reduction threshold
  - **Cellulosic Biofuel: Minimum of 16 Bgal by 2022**
    - Renewable fuel produced from cellulose, hemicellulose, or lignin
    - Must meet a 60% lifecycle GHG reduction threshold
  - **Advanced Biofuel: Minimum of 21 Bgal by 2022 (Minimum of 4 billion additional)**
    - Essentially anything but corn starch based ethanol that meets the standards
    - Includes cellulosic biofuels, biomass-based diesel and other advanced fuels
    - Must meet a 50% lifecycle GHG reduction threshold
  - **Total Renewable Biofuel**: **36 Bgal by 2022 (Minimum of 15 Bgal additional)**
    - Any other qualifying renewable fuel (market primarily corn based ethanol)
    - Must meet 20% lifecycle GHG reduction threshold - Only applies to fuel produced in new facilities (Grandfathering provisions)

NOTE: Lifecycle GHG reduction comparisons are based on a 2005 petroleum baseline as required by EISA.

Volume Standards in EISA

(Reminder: EPA Sets Standards Each November – These are the standards published in the Act)

Conventional Renewable Fuels + Total Advanced = Total Renewable Fuel

Advanced Biomass Based Diesel + Non Cellulosic Advanced + Cellulosic Advanced = Total Advanced

Year	Conventional Renewable Fuels (Grandfathered Or 20% Reduction)	Advanced Biofuel NESTED STANDARDS				Total Renewable Fuel
		Biomass-Based Diesel (50% Reduction)	Non Cellulosic Advanced (50% Reduction)	Cellulosic Biofuel (60% Reduction)	Total Advanced Biofuel	
2008	9.00					9.0
2009	10.50	0.5	0.1		0.6	11.1
2010	12.00	0.65	0.2	0.1	0.95	12.95
2011	12.60	0.80	0.3	0.25	1.35	13.95
2012	13.20	1.0	0.5	0.5	2.0	15.2
2013	13.80	1.0	0.75	1.0	2.75	16.55
2014	14.50	1.0	1.00	1.75	3.75	18.15
2015	15.00	1.0	1.50	3.0	5.5	20.5
2016	15.00	1.0	2.00	4.25	7.25	22.25
2017	15.00	1.0	2.50	5.5	9.0	24.0
2018	15.00	1.0	3.00	7.0	11.0	26.0
2019	15.00	1.0	3.50	8.5	13.0	28.0
2020	15.00	1.0	3.50	10.5	15.0	30.0
2021	15.00	1.0	3.50	13.5	18.0	33.0
2022	15.00	1.0	4.00	16.0	21.0	36.0

Compliance Basics of RFS2

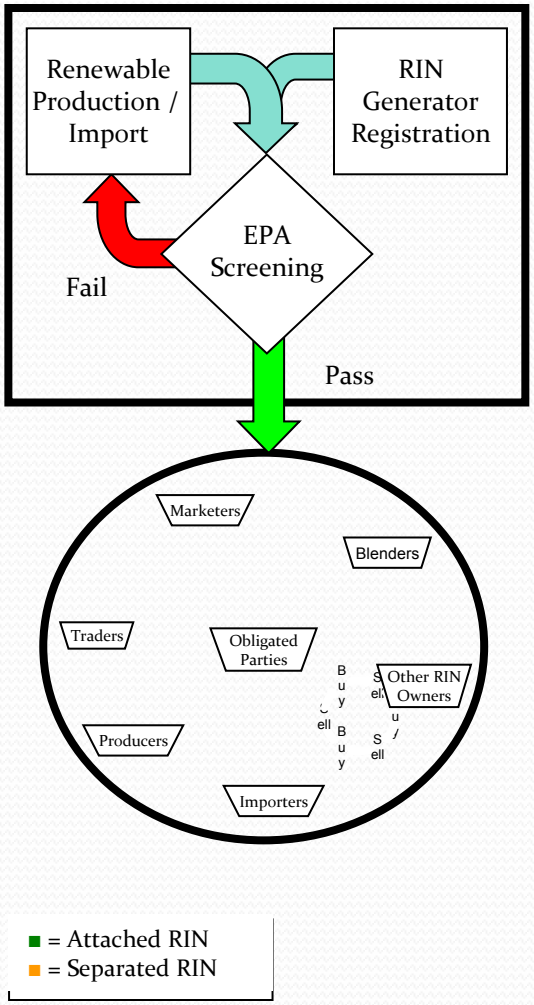
- RINs are the currency of the RFS2 program – used for compliance
- RINS are generated by renewable fuel producer
- Types of Fuels are assigned a D Code – determined by EISA definition, restrictions, GHG evaluation, energy calculation
- RINs follow product volume
- RIN separation from volume may only be performed by an obligated party
- RIN credits have a two year life – year generated, plus one year
- Program continues to be supplemented by recordkeeping and attest requirements

RINs That Can Be Used To Meet Each Standard In RFS2

Standard	Obligation	Allowable D codes
Cellulosic biofuel	RVO_{CB}	3 and 7*
Biomass-based diesel	RVO_{BBD}	4 and 7*
Advanced biofuel	RVO_{AB}	3, 4, 5, and 7
Renewable fuel	RVO_{RF}	3, 4, 5, 6, and 7*

Compliance System

- EPA Moderated Transaction System (EMTS):
  - A closed, EPA-managed system that provides: 1) a mechanism for screening and
    2) a means for tracking RIN credits
  - Screening process checks that the information provided by the RIN generator is consistent with an existing registration
  - RIN tracking process is similar to a banking system.
    - Accounts are assigned to registered users.
    - Transactions are conducted through EMTS which enforces business rules – e.g. a seller must have a sufficient account balance for a buyer to receive their credits.



2012 Final Standards

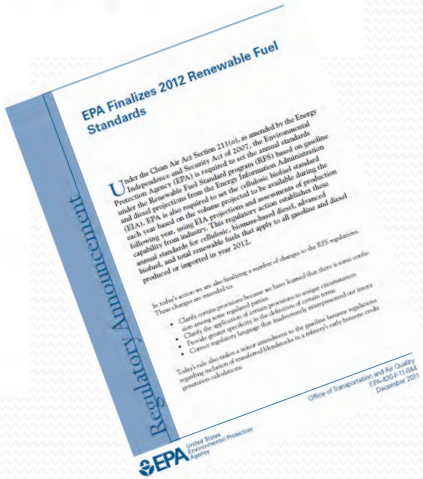
Table 1
Final Volumes for 2012

	Actual Volume	Ethanol Equivalent Volume[a]
Cellulosic biofuel	8.65 mill gal	10.45 mill gal
Biomass-based diesel	1.0 bill gal	1.5 bill gal
Advanced biofuel	2.0 bill gal	2.0 bill gal
Renewable fuel	15.2 bill gal	15.2 bill gal

[a]Biodiesel and cellulosic diesel have equivalence values of 1.5 and 1.7 ethanol equivalent gallons respectively. As a result, ethanol-equivalent volumes are larger than actual volumes for cellulosic biofuel and biomass-based diesel.

Table 2
Final Percentage Standards for 2012

Cellulosic biofuel	0.006%
Biomass-based diesel	0.91%
Advanced biofuel	1.21%
Renewable fuel	9.23%



New Fuel Pathways

- Ongoing Process for Evaluating Petitions for New Fuel Pathways
  - New Feedstock Pathways
  - Process Evaluations for Existing Feedstocks

- Other Pathways
  - Camelina
  - Energy Cane / Grasses
  - Napier Grass
  - Arundo Donax
  - Palm – Comment Period now closed
  - Grain Sorghum –NODA will be issued
  - Woody Pulp – Evaluation in process

Other Renewable Fuel / Process Pathways

Example Pages

Pending Pathway Assessments

The following pathway requests have been received and are under review:

Company	Fuel	Feedstock	Process
11 Good Energy, Inc.	*New (C2 Diesel)*	Soy bean oil, Oil from annual cover crops, Algal oil, Biogenic waste oils, fats, greases, and Canola oil	Esterification
Absolute Energy, LLC	Ethanol	Corn	*New (proprietary)*
BP Biofuels North America, LLC	Cellulosic biofuel	*New (energy cane)*	Any
	Cellulosic biofuel	*New (napiergrass)*	Any
Chemtex Group	Cellulosic biofuel	*New (arundo donax)*	Any
Conestoga Energy Partners, LLC, and Bonanza Bioenergy, LLC*	Ethanol	*New (grain sorghum)*	
Dakota Spirit AgEnergy, LLC	Ethanol	Corn	
Diamond Green Diesel, LLC	*New (renewable naphtha)*	Biogenic waste oils, fats, greases	
DriveGreen, LLC	*New (renewable electricity)*	Landfill biogas	
Emerald Biofuels LLC, Global Clean Energy Holdings, and UOP LLC	Renewable diesel, jet fuel, and naphtha	*New (Jatropha)*	
Emerald Biofuels LLC and Global Clean Energy Holdings	Biodiesel		
Gevo	Isobutanol	Corn	
Green Vision Group	Ethanol	*New (energy beets)*	Fermentation
ICM	Ethanol	Corn	*New (proprietary)*
Kior, Inc.	*New (renewable gasoline blendstock)*	Cellulosic biomass	*New (proprietary)*

Completed Pathway Assessments

The following pathway requests have been completed:

Company	*Date Completed*	*Determination*
High Plains Bioenergy, LLC	February 17, 2012	Approved (PDF) (14 pp, 4.16MB, February 2012)
Viesel Fuel, LLC	September 29, 2011	Approved (PDF) (2 pp, 473K, September 2011)
Changing World Technologies, Inc.	June 10, 2011	Approved (PDF) (13 pp, 408K, June 2011)
Endicott Biofuels, LLC	April 6, 2011	Approved (PDF) (18 pp, 5.1MB, April 2011)
Global Energy Resources	April 6, 2011	Approved (PDF) (16 pp, 4.0MB, April 2011)
Triton Energy, LLC	December 10, 2010	Approved (PDF) (17 pp, 5.0MB, December 2010)

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What's Next?

- 2013 Standards – AND BEYOND
  - Yearly Assessments, Proposals and Final Percentages
- Feedstock Determinations
  - Waste
    - Separated food wastes, waste oils, municipal solid wastes, etc.
- Ongoing Compliance Monitoring
- Regulatory Modifications

Questions

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OTAQ website:http://www.epa.gov/otaq/fuels/renewablefuels/