



Update on the Renewable Fuel Standard (RFS) Program



Energy Independence and Security Act of 2007

- **Original RFS program began with EPLaw 2005**
- **EISA significantly amended the program**
- **National Standard with 4 categories of renewable fuels**
- **Significantly increased volumes of renewable fuel – to 36 billion gallons**
- **Yearly volume requirements out to 2022**
- **Explicit definitions for renewable fuels to qualify**
- **Inclusion of specific types of waivers**



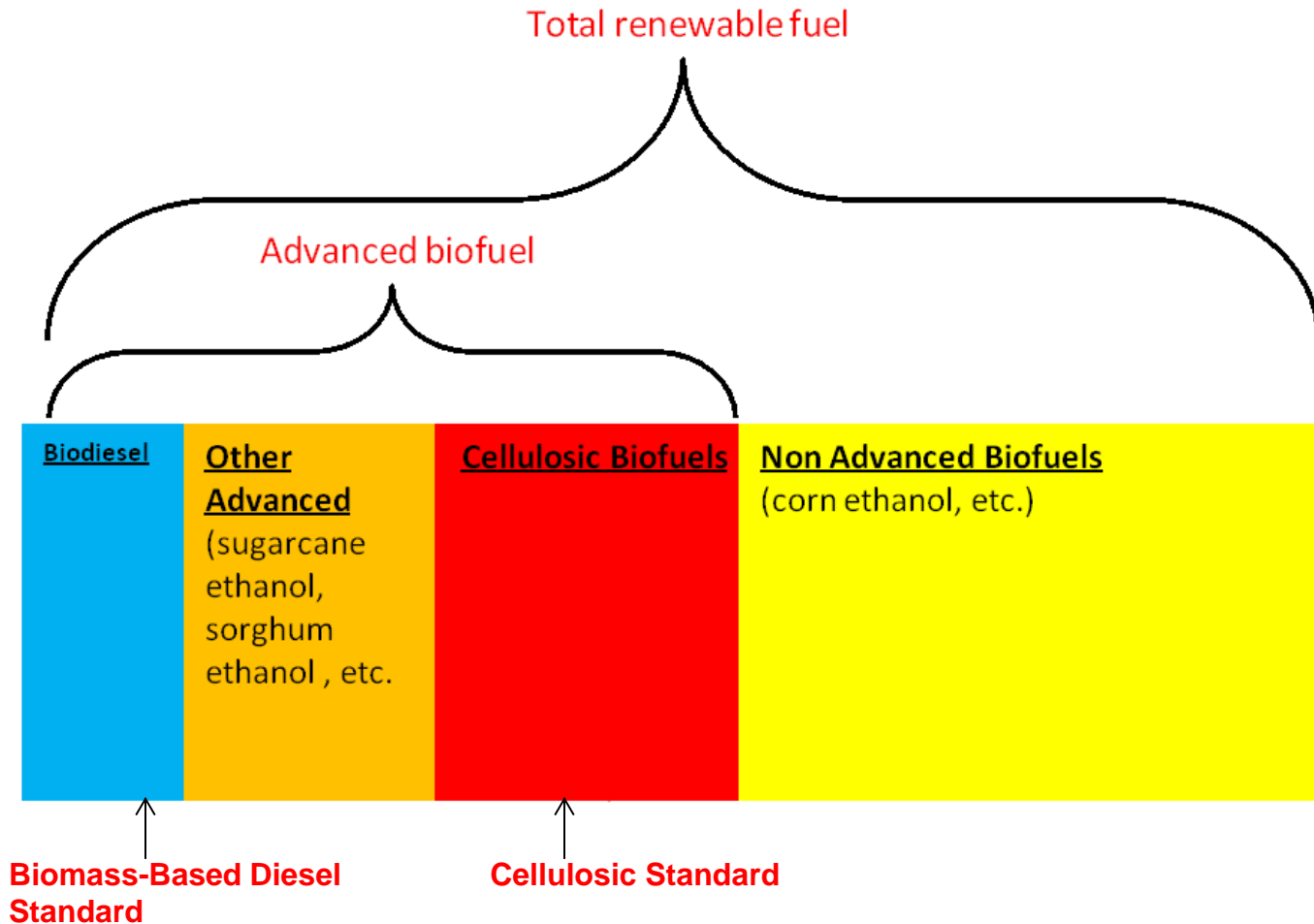
EISA (contd.)

- **Four Separate Standards**
 - **Biomass-Based Diesel: Minimum of 1 Bgal by 2012 and beyond**
 - E.g., Biodiesel, “renewable diesel” if fats and oils not co-processed with petroleum
 - Must meet a 50% lifecycle GHG **reduction** threshold
 - **Cellulosic Biofuel: Minimum of 16 Bgal by 2022**
 - Renewable fuel produced from cellulose, hemicellulose, or lignin
 - E.g., cellulosic ethanol, BTL diesel, green gasoline, etc.
 - 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 ethanol
 - Includes cellulosic biofuels and biomass-based diesel
 - Must meet a 50% lifecycle GHG **reduction** threshold
 - **Total Renewable Biofuel: 36 Bgal by 2022 (Minimum of 15 Bgal additional)**
 - Ethanol derived from corn starch – or any other qualifying renewable fuel
 - Must meet 20% lifecycle GHG **reduction** threshold - Only applies to fuel produced in new facilities

Lifecycle GHG reduction comparisons are based on a 2005 petroleum baseline as mandated by EISA.

NOTE: Existing biofuel facilities (domestic and foreign) are not required to meet GHG threshold for conventional biofuel category – facilities are “Grandfathered.”

Interaction Between Standards





Statutory Volumes

Year	Conventional Biofuels (Grandfathered or 20% Reduction)	Advanced Biofuel				Total Renewable Fuel
		Biomass-Based Diesel (50% Reduction)	Non Cellulosic Advanced (50% Reduction)	Cellulosic Biofuel (60% Reduction)	Total Advanced Biofuel	
2006	4.00					4.0
2007	7.70					4.7
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

- ▶ Obligated Parties are Refiners, blenders or importers of gasoline or diesel
- ▶ How are Obligations Determined?
 - Obligations are calculated every year, based on EISA volume standards and projections of gasoline and diesel production for the coming year.
 - A formula is used based on the above information to calculate the Renewable Volume Obligations (RVO)
 - The standards are converted into a percentage which each obligated party must demonstrate compliance with each year (Renewable Volume Obligation)
- ▶ Obligated Parties must obtain sufficient RINs for each category in order to demonstrate compliance
 - ▶ There are a number of ways to obtain RINs
 - ▶ Direct product / fuel purchase
 - ▶ Trade, exchange
 - ▶ Purchase on market
 - ▶ Program also has other provisions allowing for flexibility in compliance
 - ▶ Extra RIN carry over provisions (banking from one year to the next)
 - ▶ Deficit carry over (limitations apply)



Proposed 2013 Standards

Volumes Used to Determine the Proposed 2013 Percentage Standards^a

Cellulosic biofuel	14 mill gal
Biomass-based diesel	1.28 bill gal
Advanced biofuel	2.75 bill gal
Renewable fuel	16.55 bill gal

^a All volumes are ethanol-equivalent, except for biomass-based diesel which is actual.

Proposed Percentage Standards for 2013

Cellulosic biofuel	0.008%
Biomass-based diesel	1.12%
Advanced biofuel	1.60%
Renewable fuel	9.63%



Key Fuel Pathways *

Renewable Fuel Category	Example of Qualifying Renewable Fuel
Cellulosic (60% GHG)	Cellulosic ethanol and diesel fuel (Thermal / Biochemical from Corn Stover, Switchgrass, tree residues, other)
Biomass-based diesel (50% GHG)	Biodiesel and renewable diesel from soy, canola, wastes oils, and algae
Advanced biofuel (50% GHG)	Ethanol from sugarcane, others currently proposed / completed under petitions
Renewable fuel (20% GHG or Grandfathered)	Ethanol and Butanol from corn starch (coal-fired does not qualify)

* Other pathways are under evaluation



Other Renewable Fuel / Process Pathways

Pending Pathway Assessments

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

Company	Fuel	Feedstock	Process
11 Good Energy, Inc.	<i>New (G2 Diesel)</i>	Soy bean oil, Oil from annual cover crops, Algal oil, Biogenic waste oils, fats, greases, and Canola oil	Esterification
Absolute Energy, LLC	Ethanol	Corn	<i>New (proprietary)</i>
BP Biofuels North America, LLC	Cellulosic biofuel	<i>New (energy cane)</i>	Any
	Cellulosic biofuel	<i>New (napiergrass)</i>	Any
Chemtex Group	Cellulosic biofuel	<i>New (arundo donax)</i>	-
Conestoga Energy Partners, LLC, and Bonanza Bioenergy, LLC*	Ethanol	<i>New (grain sorghum)</i>	
Dakota Spirit AgEnergy, LLC	Ethanol	Corn	
Diamond Green Diesel, LLC	<i>New (renewable naphtha)</i>	Biogenic waste oils, fats, greases	
DriveGreen, LLC	<i>New (renewable electricity)</i>	Landfill biogas	
Emerald Biofuels LLC, Global Clean Energy Holdings, and UOP LLC	Renewable diesel, jet fuel, and naphtha	<i>New (tatropha)</i>	
	Biodiesel		
Gevo	Isobutanol	Corn	<i>New (proprietary)</i>
Green Vision Group	Ethanol	<i>New (energy beets)</i>	Fermentation
ICM	Ethanol	Corn	<i>New (proprietary)</i>
Kior, Inc.	<i>New (renewable gasoline blendstock)</i>	Cellulosic biomass	<i>New (proprietary)</i>

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, 5.1 MB, 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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Simplified schematic: Compliance with RFS via RINs

