National Renewable Fuel Standard Program - Overview

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Office of Transportation and Air Quality
US Environmental Protection Agency

Topics

- Key Changes Required by EISA
- Key Highlights of the RFS2 Rule
- Annual rulemaking to set standards
- Changes to RINs
- Standards for 2010
- Application of Lifecycle Analyses
- New Biofuels Petition Process
- Renewable Biomass Provisions

Primary Changes Required by EISA

- **Energy Independence and Security Act (December 2007) required changes to the RFS program**
  - Significantly increased volumes of renewable fuel – to 36 billion gallons
  - Separation of the volume requirements into four separate categories of renewable fuel: cellulosic biofuel, biomass-based diesel, advanced biofuel, total renewable fuel
  - Changes to the definition of renewable fuels to include minimum lifecycle GHG reduction thresholds and grandfathering of volume from certain facilities
  - Restrictions on the types of feedstocks that can be used to make renewable fuel, and the types of land that can be used to grow and harvest feedstocks
  - Inclusion of specific types of waivers and EPA-generated credits for cellulosic biofuel

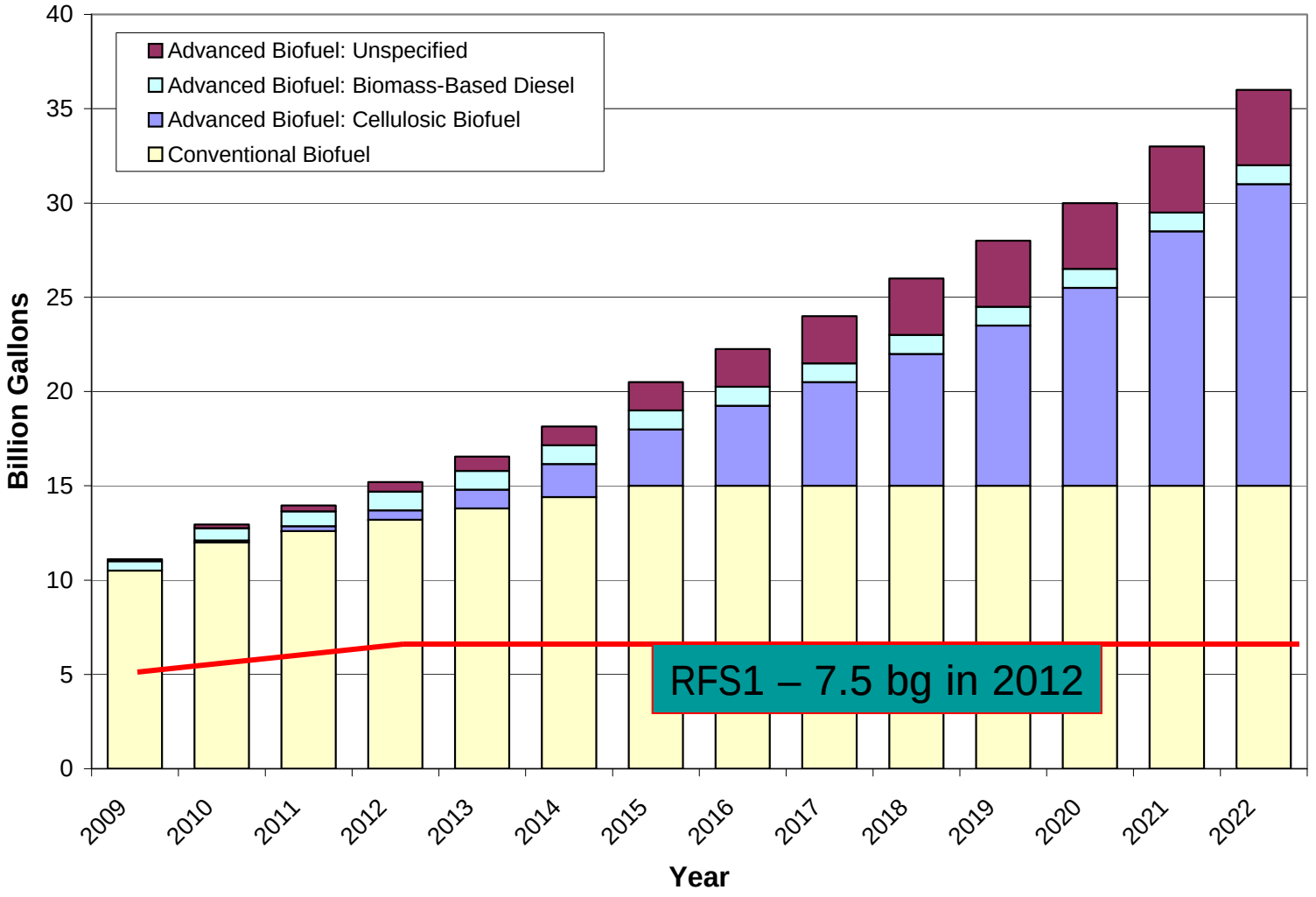
Highlights of the New RFS2 Program

- The RFS2 Regulations will go into effect July 1, 2010, but the 2010 standards apply to all gasoline and diesel produced or imported in 2010
- All renewable fuel producers must re-register under RFS2 due to the additional information required
- All RIN generation, trading, and use for compliance will be done in the context of the EPA-Moderated Transaction System (EMTS)
- The rule provides a process to evaluate new fuels and feedstocks to determine the appropriate D code (renewable fuel category) if such pathways are not already approved for RIN generation
- Rule provides an aggregate compliance approach for renewable biomass, applicable to domestic feedstocks

Requirements for New Standards

- **Four Separate Standards**
  - **Biomass-Based Diesel: 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 threshold
    - EPA may increase the volume above 1 bill gal for 2013+
  - **Cellulosic Biofuel: 16 Bgal by 2022, but subject to annual assessments**
    - Renewable fuel produced from cellulose, hemicellulose, or lignin
    - E.g., cellulosic ethanol, BTL diesel, green gasoline, etc.
    - Must meet a 60% lifecycle GHG threshold
  - **Advanced Biofuel: Total of 21 Bgal by 2022 (Minimum of 4 billion additional)**
    - Can be essentially anything except corn starch ethanol
    - Includes cellulosic biofuels and biomass-based diesel
    - Must meet a 50% lifecycle GHG threshold
  - **Renewable Biofuel**: **Total of 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 threshold - Only applies to fuel produced in new facilities

RFS2 Volumes



RFS2 Standards In 2010

Standards for 2010

(percentage of obligation)

Fuel Category	Percentage of Fuel Required to be Renewable	Volume of Renewable Fuel (in billion gal)
Cellulosic biofuel	0.004%	0.0065
Biomass-based diesel	*1.10%	*1.15
Total Advanced biofuel	0.61%	0.95
Renewable fuel	8.25%	12.95

**Combined 2009/2010 Biomass-Based Diesel Volumes Applied in 2010*

RVO = Standard x (gasoline + diesel) + Deficit

Annual Rulemaking to Set Standards

- Irrespective of the volumes required in the Act, EPA must set the cellulosic biofuel standard each November for the following year
- If the cellulosic standard is lowered, EPA may also lower the required volumes for advanced biofuel and total renewable fuel
  - Requires an assessment of the availability of excess volumes of advanced biofuel
- Since the required analyses are more substantial than a simple application of a formula as in RFS1, we must go through a notice-and-comment rulemaking process each year
  - Current NPRM is under development and is expected to be released mid-summer
- Analyses include an investigation into all known existing or potential domestic or imported sources of cellulosic biofuel
  - We will also be evaluating sources of uncertainty such as difficulty in securing funding, delays in permitting and/or construction, use of cellulosic biofuel for testing purposes rather than for commercial sale, etc.
- For the 2013 compliance year we are also required to evaluate and determine the appropriate required volume for biomass-based diesel (≥ 1.0 bill gallons)

Changes to RINs

KYYYYCCCCFFFFFBBBBBRRDSSSSSSSSEEEEEEEE

K	= RIN assignment code (1=assigned, 2=unassigned)
YYYY	= Year batch is produced/imported (when it leaves the facility)
CCCC	= Company registration ID
FFFFF	= Facility registration ID
BBBBB	= Producer assigned batch number
RR	= Equivalence Value for the renewable fuel
D	= 1 for cellulosic biomass ethanol under RFS1 regulations
	= 2 for all other renewable fuels under RFS1 regulations
	= 3 for cellulosic biofuel
	= 4 for biomass-based diesel
	= 5 for advanced biofuel
	= 6 for other renewable fuel
	= 7 for cellulosic diesel
SSSSSSSS	= RIN Block Starting Number
EEEEEEEE	= RIN Block Ending Number

Note: Within EMTS, 38 digit RIN is invisible. Users generate, trade, and use “generic” RINs identifiable only by category, generator name, etc.

Relative Value of Different Renewable Fuels

- To specify the value of each renewable fuel in the context of compliance, under RFS2 we are maintaining the Equivalence Value for each renewable fuel based on its energy content in comparison to ethanol (adjusted for renewable content):
  - Ethanol: 1.0
  - Biodiesel (alkyl esters): 1.5
  - Renewable diesel: 1.7
  - Butanol: 1.3
- The 2.5:1 credit value for cellulosic biomass ethanol and waste-derived ethanol that was required under EPAct (RFS1) was eliminated by EISA
- Thus, all RINs are ethanol-equivalent, and one gallon-RIN counts towards 1 gallon of a refiner's or importer's four obligations (RVO)
- One biodiesel gallon-RIN also counts as 1 gallon towards meeting the biomass-based diesel obligations, but the volume on which the biomass-based diesel standard was based was treated as biodiesel–equivalent, not ethanol equivalent
  - 1.15 bill gal requirement in 2010 must be met with 1.725 bill RINs

Facility Grandfathering

- Certain facilities are “grandfathered” and are not required to meet the 20% GHG threshold
  - All facilities (domestic and foreign) that commenced construction before December 19, 2007
  - Ethanol facilities that commenced construction prior to December 31, 2009 and use natural gas and/or biomass for process heat
- This means that if your particular pathway (fuel type, feedstock, and process) is not in the lookup table in 80.1426(f), you can still generate general renewable fuel RINs (D = 6) for your grandfathered volume
- Basic approach:
  - Grandfathered indefinitely
  - Only up to a baseline volume
- Baseline volume based on:
  - Maximum allowable volume stipulated in air permits
  - Lacking air permits, maximum capacity achieved is used
  - Also allowing a small tolerance of 5% to account for minor changes due to ongoing maintenance
- Volume increases beyond the baseline must meet the 20% threshold like a new facility
- More on registration and recordkeeping later

Application of Lifecycle Analyses

- Lifecycle analyses were/are conducted by EPA to determine whether specific pathways (combinations of fuel type, feedstock, and production process) meet the GHG thresholds specified in the statute
  - Individual facilities are not required to demonstrate that they meet the GHG thresholds
  - Four additional pathways being addressed in supplemental final rule
    - Biodiesel and renewable diesel from canola oil and palm oil
    - Ethanol from grain sorghum and biofuel from wood pulp

- Based on these analyses, we determine the appropriate D code for each pathway
  - In addition to lifecycle impacts, assignment of the D code also includes a consideration of
    - The type of feedstock used (e.g. cellulosic biofuel must be made from cellulosic feedstocks, advanced biofuel cannot be corn starch ethanol)
    - Process (e.g. biomass-based diesel cannot be produced from coprocessing renewable biomass and petroleum)

Lookup Table in 80.1426(f)

TABLE 1 TO § 80.1426 APPLICABLE D CODES FOR EACH FUEL PATHWAY FOR USE IN GENERATING RINS

Fuel type	Feedstock	Production process requirements	D-Code
Ethanol	Corn starch	All of the following: Drymill process, using natural gas, biomass, or biogas for process energy and at least two advanced technologies from Table 2 to this section.	6
Ethanol	Corn starch	All of the following: Dry mill process, using natural gas, biomass, or biogas for process energy and at least one of the advanced technologies from Table 2 to this section plus drying no more than 65% of the distillers grains with solubles it markets annually.	6

TABLE 2 TO § 80.1426—ADVANCED TECHNOLOGIES

Corn oil fractionation.
Corn oil extraction.
Membrane separation.
Raw starch hydrolysis.
Combined heat and power.

Ethanol	Corn starch	All of the following: Dry mill process, using natural gas, biomass, or biogas for process energy and drying no more than 50% of the distillers grains with solubles it markets annually.	6
Ethanol	Corn starch	Wet mill process using biomass or biogas for process energy.	6
Ethanol	Starches from agricultural residues and annual covercrops.	Fermentation using natural gas, biomass, or biogas for process energy.	6
Biodiesel, and renewable diesel.	Soy bean oil; Oil from annual covercrops; Algal oil; Biogenic waste oils/fats/greases; Non-food grade corn oil.	One of the following: Trans-Esterification Hydrotreating Excluding processes that co-process renewable biomass and petroleum.	4
Biodiesel, and renewable diesel.	Soy bean oil; Oil from annual covercrops; Algal oil; Biogenic waste oils/fats/greases; Non-food grade corn oil.	One of the following: Trans-Esterification Hydrotreating Includes only processes that co-process renewable biomass and petroleum.	5
Ethanol	Sugarcane	Fermentation	5
Ethanol	Cellulosic Biomass from agricultural residues, slash, forest thinnings and forest product residues, annual covercrops; switchgrass, and miscanthus; cellulosic components of separated yard wastes; cellulosic components of separated food wastes; and cellulosic components of separated MSW.	Any	3

Cellulosic Diesel, Jet Fuel and Heating Oil.	Cellulosic Biomass from agricultural residues, slash, forest thinnings and forest product residues, annual covercrops, switchgrass, and miscanthus; cellulosic components of separated yard wastes; cellulosic components of separated food wastes; and cellulosic components of separated MSW.	Any	7
Butanol	Corn starch	Fermentation; dry mill using natural gas, biomass, or biogas for process energy.	6
Cellulosic Naphtha	Cellulosic Biomass from agricultural residues, slash, forest thinnings and forest product residues, annual covercrops, switchgrass, and miscanthus; cellulosic components of separated yard wastes; cellulosic components of separated food wastes; and cellulosic components of separated MSW.	Fischer-Tropsch process	3
Ethanol, renewable diesel, jet fuel, heating oil, and naphtha.	The non-cellulosic portions of separated food wastes.	Any	5
Biogas	Landfills, sewage and waste treatment plants, manure digesters.	Any	5

New Biofuels Petition Process

- Producers with a renewable fuel pathway that is not currently represented in the lookup table can petition EPA for an assessment of the new pathway
  - Petition process not applicable to grain sorghum, canola, palm oil and wood pulp feedstock pathways
- Detailed requirements for petitions can be found in 80.1416
- Largest component of assessments is the lifecycle analyses and comparison to GHG thresholds
  - We will also be checking to make sure that the feedstock meets the definition of renewable biomass, considering whether the pathway includes coprocessing with non-renewable feedstocks, etc.
- We are currently developing additional guidelines for petitions and will be posting them on our website soon

Renewable Biomass: Overview

- RFS1 regulations generally allow any biomass and certain wastes to be used as feedstock for renewable fuel
- EISA defined “renewable biomass” in a way that restricts both feedstocks and the types of land that feedstocks can come from
  - For example, planted crops and crop residue are permitted from agricultural land that was cleared or cultivated prior to Dec 19, 2007, and actively managed or fallow, and non-forested
- RFS2 regulations include specific definitions for terms related to renewable biomass (see 80.1401) and recordkeeping requirements (see 80.1454)

Renewable Biomass: Definitions

- EPA proposed and finalized definitions for many of the terms contained in the EISA definition of "renewable biomass"
  - Final definitions are as close to industry standard definitions as possible
  - Final regs allow separated municipal solid waste (after all recyclable materials have been removed) to qualify as "separated yard or food waste"

- Renewable biomass means each of the following (including any incidental, de minimis contaminants that are impractical to remove and are related to customary feedstock production and transport):
  (1) **Planted crops** and **crop residue** harvested from **existing agricultural land** cleared or cultivated prior to December 19, 2007 and that was **nonforested** and either actively managed or **fallow** on December 19, 2007.
  (2) **Planted trees** and **tree residue** from a **tree plantation** located on non-federal land (including land belonging to an Indian tribe or an Indian individual that is held in trust by the U.S. or subject to a restriction against alienation imposed by the U.S.) that was cleared at any time prior to December 19, 2007 and actively managed on December 19, 2007.
  (3) Animal waste material and animal byproducts.
  (4) **Slash** and **pre-commercial thinnings** from non-federal **forestland** (including forestland belonging to an Indian tribe or an Indian individual, that are held in trust by the United States or subject to a restriction against alienation imposed by the United States) that is not **ecologically sensitive forestland**.
  (5) Biomass (organic matter that is available on a renewable or recurring basis) obtained from the immediate vicinity of buildings and other areas regularly occupied by people, or of public infrastructure, in an **area at risk of wildfire**.
  (6) Algae.
  (7) **Separated yard waste or food waste**, including recycled cooking and trap grease, and materials described in §80.1426(f)(5)(i).

Renewable Biomass: General Requirements

- In general, renewable fuel producers must maintain documentation on feedstocks used to produce renewable fuel **for which they generate RINs**
  - EPA proposed **but did not finalize** a requirement that producers must also maintain documentation for feedstocks that did not satisfy renewable biomass criteria
- Different feedstocks require different types of records, e.g.,
  - For planted trees and tree residue, documents (specified in regs) from feedstock producer that serve as evidence of active management and that land was cleared prior to Dec 2007
  - For animal waste or animal byproducts, documents from waste supplier certifying that material is renewable biomass, and describing and identifying process used to generate the waste
- For feedstocks harvested or collected from specific lands:
  - Electronic data or maps must be maintained to identify the land the feedstocks came from
  - Renewable fuel producers must submit information quarterly on the types and quantities of feedstocks used in the quarter and electronic data identifying the land the feedstocks came from
- For imported renewable fuel to qualify for RINs, the RIN generator (foreign producer or importer of record) must meet the renewable biomass recordkeeping requirements
- Specific recordkeeping requirements may be found at 80.1454; reporting requirements may be found at 80.1451(d)
- EPA also finalized 2 alternative approaches for verifying renewable biomass

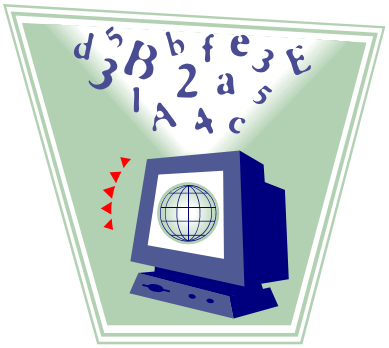
Renewable Biomass: Aggregate Compliance Approach (80.1454(g))

- EPA finalized an aggregate compliance approach for all planted crops and crop residue from U.S. agricultural land
  - EPA established baseline number of acres for agricultural land in U.S. in 2007, found it unlikely that any new land would be devoted to crop production based on historical trends and economic considerations, and therefore deemed any planted crop or crop residue from the U.S. to comply with the requirement in the renewable biomass definition that crops and crop residue come from existing agricultural land
- EPA established baseline acreage using USDA data and will continue to use USDA data to verify annual ag land acreage remains at or below baseline
- If baseline is exceeded, U.S. planted crops and crop residue will be subject to the recordkeeping and reporting requirements in RFS2 regs beginning July 1 of the following compliance year
- In preamble to final RFS2 rule, we also said that we would consider applying the same approach to other countries if "adequate land use data becomes available to make a finding that… crops and crop residues…satisfy the definition of renewable biomass"
  - We are currently determining the process by which we could consider requests for applying the aggregate compliance approach to planted crops and crop residue from other countries

Renewable Biomass: Consortium Approach (80.1454(h))

- Alternative approach to individual recordkeeping and reporting can be used by any domestic or foreign producer, or importer, of renewable fuel
- Renewable fuel producer or importer must arrange to have an independent third party conduct a comprehensive program of annual compliance surveys, or participate in the funding of an organization which arranged to have an independent third party conduct a comprehensive program of annual compliance surveys
- Compliance surveys would be conducted at renewable fuel production and import facilities and their feedstock suppliers' facilities.
- Survey plan must first be approved by EPA

Questions?



- For Additional information: http://www.epa.gov/otaq/fuels/renewablefuels/index.htm
  - Includes Factsheets
  - RFS2 Rulemaking Package
    - Preamble
    - Regulations
    - Regulatory Impact Analysis
  - Links to Other Information
  - Frequently Asked Questions

- Send new questions to: EPAFuelsPrograms@epa.gov