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Proposed Changes to the Renewable Fuel Standard Program (RFS2)

Region 10 Webinar

August 5, 2009



Agenda

- Background and statutory requirements
- Lifecycle impacts and GHG thresholds
- Renewable biomass definition
- Program mechanics
- Other important aspects

Setting the Stage

- **On May 5, Administrator Jackson signed the Renewable Fuel Standard (RFS2) proposal**
 - Proposal interprets revisions to the original EPA Act RFS program, as included in the Energy Independence and Security Act (passed in December 2007)
 - Lays out these proposed changes, including alternative options, for public comment

- **RFS2 Program Will Result in a Number of Important and Precedent-Setting Changes to RFS1**
 - Much larger volumes with a focus on advanced biofuels
 - Preserves 15 bill gal for conventional biofuels
 - Grandfathered from the GHG thresholds
 - Significant benefits for
 - Greenhouse gases
 - Energy security
 - Agriculture

Rulemaking Process Update

- A public hearing on the proposal was held June 9 in Washington, DC
- OTAQ held a two day workshop for stakeholders to detail the methodology of the proposed lifecycle analysis on June 10 – 11 in Washington DC
- On June 30, the original 60-day public comment period was extended an additional 60 days (until September 25, 2009)
- EPA is conducting ongoing stakeholder outreach on the rulemaking including implementation issues and lifecycle assessment

Primary Changes Required by EISA

- Energy Independence and Security Act (December 2007) required changes to the RFS program
 - Significantly increased volumes of renewable fuel
 - 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 some volume
 - 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 feedstocks
 - Inclusion of specific types of waivers and EPA-generated credits for cellulosic biofuel
- The changes required by EISA also precipitated a number of other changes that we are proposing and/or taking comment on, for example:
 - RIN bank (EPA Moderated Transaction System - EMTS)
 - Production Outlook Reports
 - Alternative approach to designation of obligated parties
 - Alternative approach to transfer of RINs with batches

New Standards

■ Four Separate Standards

- **Cellulosic Biofuel: 16 billion gallons 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 threshold
- **Biomass-Based Diesel: 1 billion gallons by 2012**
 - E.g., Biodiesel, BTL diesel, “renewable diesel” if fats and oils not co-processed with petroleum
 - Must meet a 50% lifecycle GHG threshold
- **Advanced Biofuel: 21 billion gallons by 2022**
 - Includes cellulosic biofuels and biomass-based diesel plus an additional 4 billion gal
 - Essentially anything but corn starch ethanol
 - Must meet a 50% lifecycle GHG threshold
- **Total Renewable Fuel: 36 billion gallons by 2022**
 - Includes up to 15 billion gallons conventional biofuel (ethanol derived from corn starch or any other qualifying renewable fuel)
 - Must meet 20% lifecycle GHG threshold
 - Only applies to new fuel production capacity (more on this later)

■ EISA language permits EPA to adjust the lifecycle GHG thresholds by as much as 10% -- (60% to 50%; 50% to 40%; 20% to 10%)

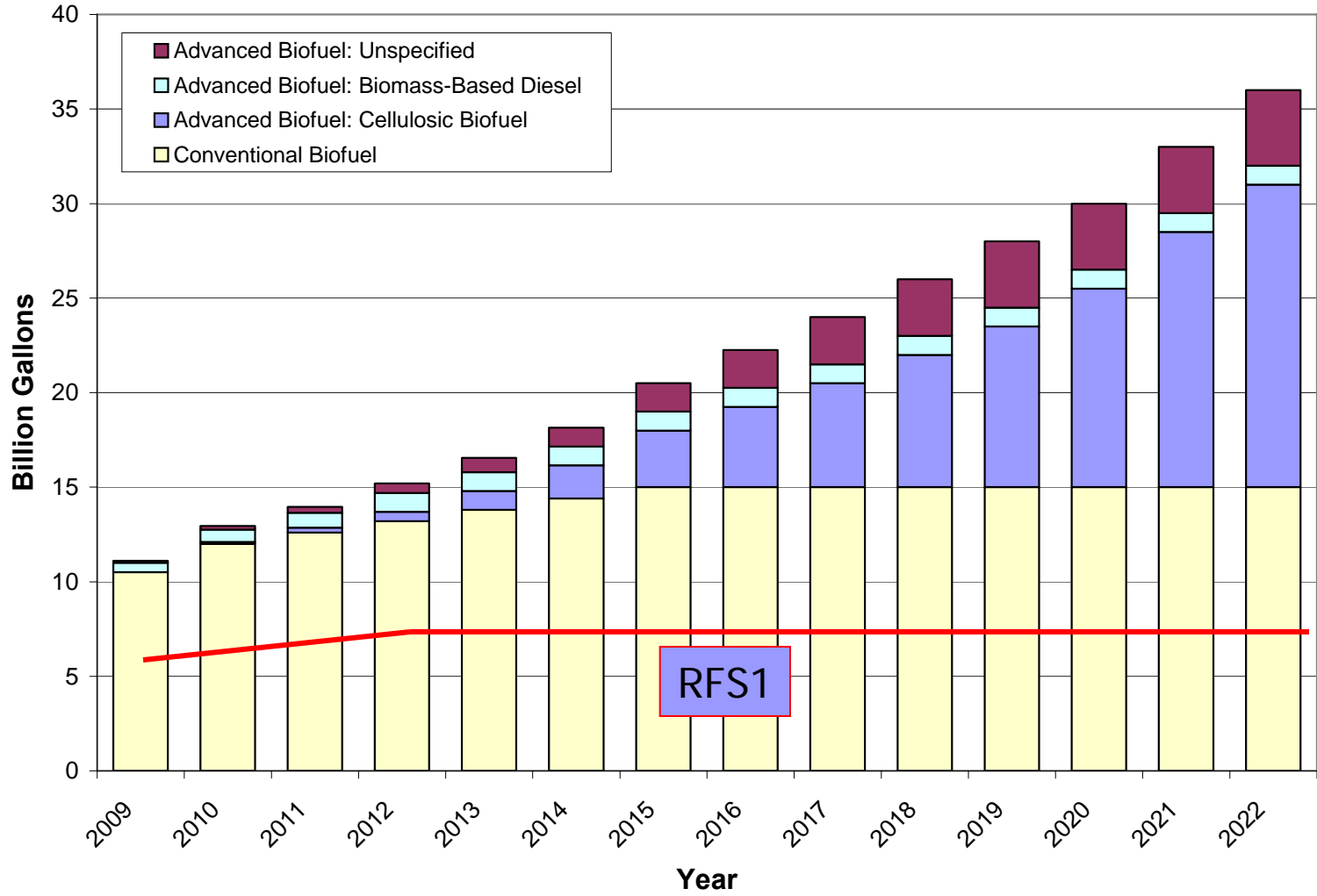
- Based on the market availability of fuels that could count as advanced biofuel, we are proposing that the GHG threshold for advanced biofuel be adjusted to 44%%

RFS2 Standards are "Nested"

Total Renewable Fuel (20% GHG unless grandfathered)				
	Total Advanced Biofuel (50% GHG)*			
	Biomass- Based Diesel (50% GHG)	Cellulosic Biofuel (60% GHG)		
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
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2022	1.0 (Bgal)	16.0 (Bgal)	21.0 (Bgal)	36.0 (Bgal)

* Proposing to lower to 40 - 44%

Volume Changes Over Time



Lifecycle Methodology and Results

Lifecycle GHG Emissions

- **Lifecycle GHG analysis is integral to the new RFS2 Standards**
 - Without a determination of whether a fuel does or does not comply with the thresholds, the program cannot be implemented

“**The term ‘lifecycle greenhouse gas emissions’ means the aggregate quantity of greenhouse gas emissions (including direct emissions and significant indirect emissions such as significant emissions from land use changes), as determined by the Administrator, related to the full fuel lifecycle, including all stages of fuel and feedstock production and distribution, from feedstock generation or extraction through the distribution and delivery and use of the finished fuel to the ultimate consumer, where the mass values for all greenhouse gases are adjusted to account for their relative global warming potential.**”

Lifecycle GHG Thresholds

- **GHG thresholds are defined as the % reduction in lifecycle GHGs for a renewable fuel in comparison to the 2005 baseline gasoline or diesel that it displaces**
 - Lifecycle GHG estimates are only used to categorize renewable fuels into the four standards, not to value them

- **We have conducted lifecycle analysis for a variety of renewable fuel pathways**
 - Additional analysis for final rule is expected to expand the list of pathways and revise input assumptions based on new information
 - Also proposing a "default" mechanism that would allow some renewable fuels to temporarily generate RINs even if we did not explicitly analyze their lifecycle GHG impacts

- **While each renewable fuel pathway has a unique lifecycle GHG emissions impact in grams/mmBtu, for RFS2 regulatory purposes these lifecycle emissions are used only to compare each pathway to the applicable threshold and assign it to one of the four renewable fuel categories**

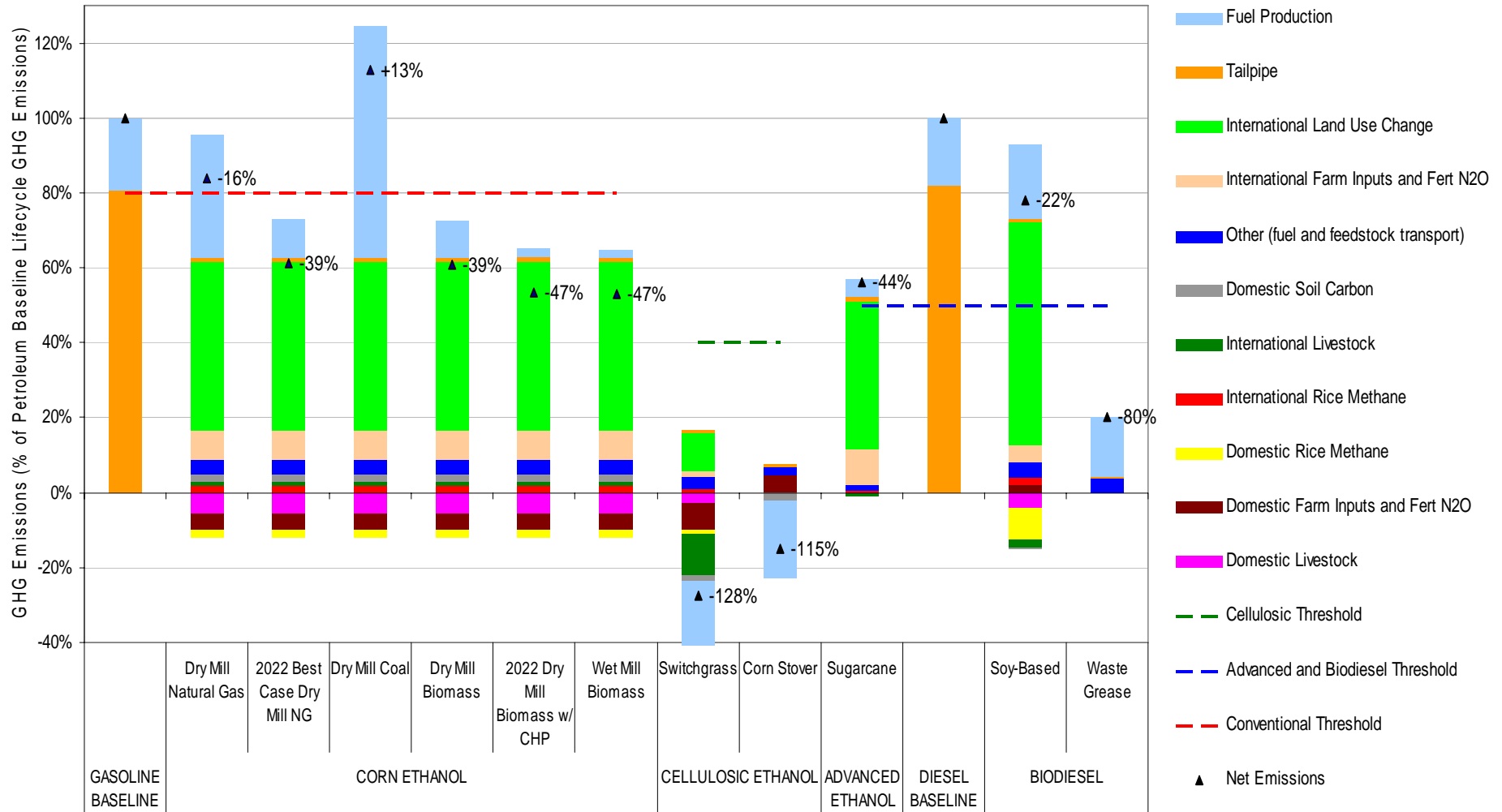
Methodology

- EISA definition requires the use of a number of models and tools
 - Including direct and indirect impacts such as land use change requires analysis of markets
 - Typical life cycle analysis tools are based on process modeling
 - To capture market impacts need to use economic models
 - Captures opportunity cost of different uses of crops / land
- Scenario Comparison: Run models with different volume scenarios to isolate the impact of specific fuel
 - Consider change between baseline projected fuel volume in 2022 (i.e., without RFS2) and projected RFS2 mandated volume
 - Not considering changes from one year to next but difference in given year with different biofuel volumes
 - Held volumes of other fuels constant at RFS2 mandated levels, hold other outside impacts constant across scenarios (e.g., population growth) so isolating impacts of biofuels
- For areas of uncertainty, we have tested our primary approach and key assumptions with sensitivity analyses and different methods

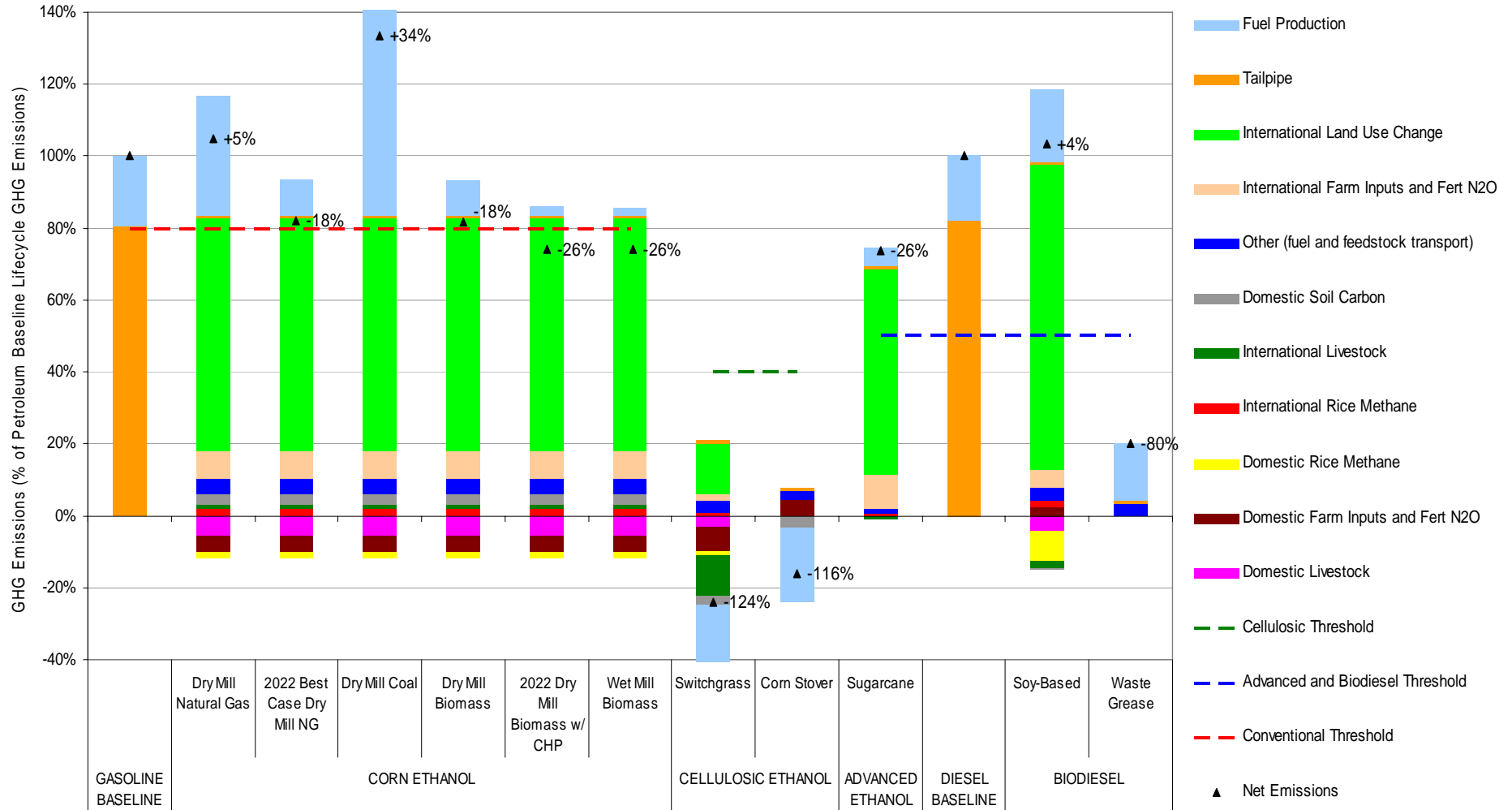
Presentation of LCA Results in the Proposal

- **Thorough description of our new methodology and results**
- **Acknowledges uncertainty, particularly for land-use change impacts**
- **Presents the results, along with various sensitivity runs**
 - Corn ethanol assessments for different volumes, different years
 - Different assumptions for land use impacts
 - Bracketing pasture replacement (zero to 100%)
 - Type of land converted (assume 100% grassland)
 - Impact of foregone sequestration over time
- **Likewise we present several options for valuing the impacts over time**

Biofuel Lifecycle GHG Results: *Different Pathways with 2% Discount Rate – 100 years (2022 Values)*



Biofuel Lifecycle GHG Results: *Different Pathways with 0% Discount Rate – 30 years (2022 Values)*



GHG Lifecycle Analysis Workshop - (June 10-11, 2009)

- **OTAQ held a two day workshop for stakeholders to detail the methodology of the proposed lifecycle analysis**
 - Over 200 participants (in person and online), including key industry, NGO, state, and international stakeholders
 - Format involved EPA technical team presenting on methodology; industry, NGO, and academic experts presenting views on EPA's work and providing technical feedback; and Q&A sessions

- **Workshop was well received**
 - Stakeholders were appreciative of the effort of EPA to outline methodology and for the opportunity to provide comments and questions
 - Discussions allowed for ranges of views to be presented and for EPA to get feedback from experts on key pieces of the analysis

- **Feedback highlighted areas of ongoing work**
 - Comparisons between EPA and California Air Resource Board (CARB) LCA results
 - Ability for third parties to replicate/verify EPA's work
 - Range of views on appropriate time horizon and discount rates from stakeholders
 - Yield growth rate assumptions
 - Petroleum baseline
 - Brazil cropland expansion and pasture intensification

Formal Peer Review

- **Conducting a formal peer review (between proposal and final rule) of key elements of our lifecycle analysis:**
 1. Land use modeling (use of satellite data/ land conversion GHG emission factors)
 2. Our estimates of GHG emissions from foreign crop production
 3. Methods to account for the variable timing of GHG emissions
 4. How the models we've relied upon are used together to provide overall lifecycle estimates
- **We are following EPA peer review guidelines (developed by an internal advisory group in order to ensure consistent Agency-wide implementation of peer review).**
 - EPA's guidelines also incorporate OMB's government-wide peer review bulletin
- **In accordance with this guidance, we are using an independent, third-party contractor to conduct an external peer review**
 - Contractor identifies list of expert reviewers, checking for possible conflict of interest
 - Also conducts meetings, teleconferences, etc, in order to clarify technical components of the product and develops the peer review record
- **The peer review record will be available to the public, including:**
 - Materials provided to the peer reviewers
 - List of names and affiliations of the peer reviewers
 - Summary of comments, as well as comments attributable to individual reviewers
- **Timeframe**
 - The plan is for the peer reviews to be completed this summer

Grandfathering

- All biofuel facilities that “commenced construction” prior to EISA are grandfathered
 - They are not required to meet the minimum 20% GHG threshold
 - Does not apply to other GHG thresholds

- We seek comment on a range of options based on input from stakeholders
 - Protective of pre-EISA investments
 - Level playing field for future investments
 - Practical implementation (avoid NSR-like issues)

- Main proposal is to grandfather a baseline volume for each facility
 - Baseline volume would be grandfathered forever; seeking comment on 110% of baseline
 - Expansions would be treated like new facilities

- We expect at least 15 bill gal will be grandfathered
 - All current corn-ethanol production volume
 - All current biodiesel production volume
 - All current sugarcane ethanol production volume

Renewable Biomass Definition

Renewable Biomass Provision

- **EISA restricts the types of renewable fuel feedstocks and land that feedstocks can come from. For example:**
 - Agricultural land must have been cleared or cultivated prior to Dec 19, 2007 and actively managed or fallow, and non-forested
 - Woody biomass from federal land is not allowed, except from wildfire areas
 - Slash and pre-commercial thinnings from forestland are allowed as long as the forestland is non-federal and not ecologically sensitive as determined by State Natural Heritage Programs
- **Requires renewable fuel producers to know the source of their feedstocks**
 - Applies to both domestic and foreign producers

Renewable Biomass Provision

- **We are proposing that renewable fuel producers would be required to maintain records to support their decision to generate or not to generate RINs for a given batch of renewable fuel**
 - Renewable fuel producers would be expected to work out a system with their feedstock supplier(s) to ensure they generate RINs only for fuel produced from feedstock that meets the definition of “renewable biomass
 - The practical implication is that producers would establish tracking systems up through their supply chain
 - Producers would be required to generate RINs for fuel produced using renewable biomass and ensure that, if they are not generating RINs for renewable fuel, the feedstocks do not meet the definition of “renewable biomass“

- **The RFS2 NPRM seeks comment on a wide variety of alternative approaches:**
 - Same as proposed approach, but less specific about what records need to be kept to demonstrate compliance
 - EPA-specified chain-of-custody tracking program for feedstocks from farmer to fuel producer
 - Company or industry-wide quality assurance program
 - Use of satellite and aerial imagery, GIS mapping tools to help establish baseline database of qualifying land
 - Establish baseline production levels of different feedstocks such that any compliance demonstration would be required only if baseline level were exceeded in a given time period

Renewable Biomass: Foreign Producers

- Proposal would require foreign renewable fuel producers to register, report, and maintain similar records as domestic producers
- We seek comment on whether other requirements should be placed on foreign producers to help ensure compliance, such as more stringent (upfront) evidence of feedstocks meeting/not meeting the definition of renewable biomass
- We also seek comment on allowing foreign producers to sell fuel in the U.S. without demonstrating compliance with the renewable biomass definition, but having to keep it segregated from the rest of the fuel pool.

RIN Generation and Use for Compliance

Basic Program Structure is Built Upon RFS1

- Renewable Identification Numbers (RINs) remain the currency for credit trading and compliance
- RINs must be transferred along with renewable fuel through the distribution system
 - We're seeking comment on alternatives such as allowing all RINs to be transferred separately from renewable fuel
- Refiners and importers have the responsibility of acquiring sufficient RINs each year to meet their obligations
 - We're seeking comment on alternatives on who is an obligated party
- Recordkeeping and reporting requirements would be based upon RIN ownership, not ownership or custody of volume
- Obligated parties now include producers and importers of diesel in addition to gasoline, and nonroad in addition to highway
 - We also take comment on an alternative approach in which blenders are the obligated parties rather than producers and importers

Changes to RINS

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- D** = 1 for cellulosic biofuel
- = 2 for biomass-based diesel
- = 3 for advanced biofuel
- = 4 for other renewable fuel

- Renewable fuel producers and importers generate RINs using a lookup table in the regs
 - By identifying their applicable pathway (combination of fuel type, feedstock, and process), the table specifies the appropriate D code to use in the RIN

Facility Registration

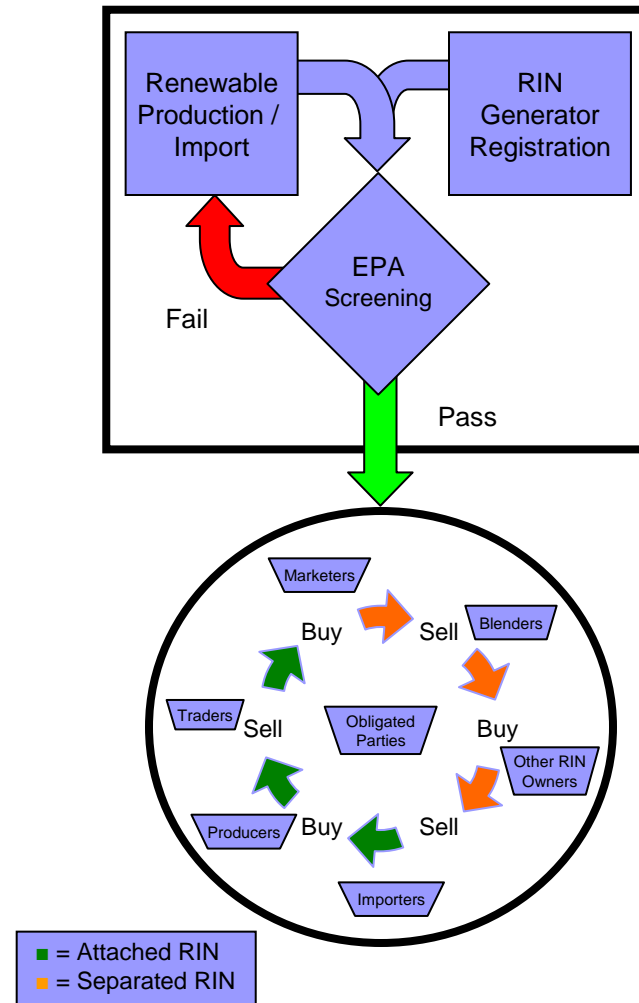
- Given new requirements for RFS2, RFS1 registrations are no longer sufficient
- NPRM proposes a new registration process for all renewable fuel producers that asks for the following types of information
 - Types of products produced at facility
 - Types of feedstocks used to produce fuel
 - Facility production capacity
 - Fuel production processes and sources of process energy
- This information will be used to verify
 - What renewable fuel category (RIN D code) the producer qualifies to generate (e.g., what lifecycle GHG reduction threshold the fuel meets)
 - What volume of production may be grandfathered
- Proposed registration process is two-step:
 - Producer submits registration data to EPA electronically
 - Producer hires independent PE to verify this data through a record review and on-site facility visit, and submits report for EPA approval prior to generating RINs
- New registrations must be in place by the start of the program

EPA-Moderate Transaction System (EMTS)

- EPA Monitored Transaction System (EMTS): a closed, EPA-managed system that provides a mechanism for screening and tracking RIN credits
 - EMTS will not provide “matchmaking” in the market, but instead act as an accounting system to bring integrity to the market
- Retains basic RIN handling requirements from the original RFS
 - Transactions involving attached RIN credits must be accompanied by renewable volume
 - The act of separating RIN credits may only be performed by an obligated party, a renewable blender, a renewable exporter, a seller of neat renewable fuel, etc.
 - RIN credits have a two year life – the year in which the RIN credit is generated, plus one year
 - The RFS program will continue to be supplemented by recordkeeping and attest requirements
 - Product Transfer Documents (PTDs) will still be required

EMTS (cont.)

- EPA Monitored – creates an environment to track the universe of RIN credits; RIN credits are not permitted to exist outside of this environment
- Two-part continuous reporting system
 - First, screen renewable batches and the generation of RIN credits for renewable fuel produced or imported
 - Second, insert RINs into the structured RIN environment and moderate RIN transactions between the various buyers and sellers through the enforcement of business rules



EMTS: Technical Highlights

- New Technologies
 - XML file reporting
 - Phasing out Excel or CSV format files
- Web Interface
- Exchange Network
 - Node to Node (computer to computer)
Capabilities

Other Important Aspects

When Will RFS2 Apply?

- Since RFS2 was not final by the end of 2008, RFS1 regs will continue to apply in 2009
 - Have already put in place the 2009 standard based on the 11.1 bill gal required in EISA
 - 2009 volume requirements for biomass-based diesel and advanced biofuel cannot be implemented in 2009
 - Proposed that the 2009 biomass-based diesel requirement of 0.5 bill gal be added to the 2010 requirement of 0.65 bill gal, with compliance for the total being determined at the end of 2010

- We are proposing that RFS2 begin on January 1, 2010
 - To hold to this everyone needs to start preparing for implementation now – before the rule is finalized

- We are also taking comment on a delayed start date for RFS2 of January 1, 2011 or mid-2010
 - Also seeking comment on what std to apply then for 2010 and how to address the biomass-based diesel std
 - If mid-year, seeking comment on treatment of gasoline and diesel obligated volumes and treatment of RFS1 vs RFS2 RINs

Relative Value of Different Renewable Fuels

- To specify the value of each renewable fuel in the context of compliance, under RFS1 we based the Equivalence Value for each renewable fuel 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

- For RFS2 we are co-proposing both the RFS1 energy-based approach and a straight volume approach

- Note that the 2.5:1 credit value for cellulosic biomass ethanol that was required under EPCRA (RFS1) was eliminated by EISA

Cellulosic Biofuel Waiver and Allowances

- EPA will be proposing the cellulosic biofuel standard each year
 - We are proposing annual Production Outlook Reports from renewable producers for this purpose
 - Proposed for 2010 to maintain the full 0.1 Bgal EISA volume
- If the projected volume is less than the EISA volume, we must make cellulosic biofuel credits available up to the level of the standard
 - We are proposing that credits ("allowances") only be made available to obligated parties at the time of their compliance demonstration
 - Allowances would not be transferable and would only be valid in the year generated

RFS2 Impacts Summary

- GHG Emissions from Transportation
 - Annual average reduction of approximately 160 million tons CO2 equivalent per year.
 - Reductions equivalent to taking about 24 million vehicles off the road.
- Impacts on Overall Petroleum Consumption in 2022
 - 36 billion gallons of renewable fuel will displace about 11% of gasoline and diesel consumption, with most reductions coming from reduced petroleum imports
- Fuel Cost Impacts (Nationwide Average based on low and high crude costs)
 - Gasoline costs would increase by about 2.7 and 10.9 cents per gallon by 2022.
 - Diesel fuel costs could experience a small cost reduction of 0.1 cents per gallon, or increase by about 1.2 cent per gallon
 - Increases in gasoline and diesel fuel costs are equivalent to \$4 billion to \$18 billion in 2022
- Energy Security
 - Estimate, the total energy security benefits associated with a reduction of U.S. imported oil is \$12.38/barrel.
 - Based upon the \$12.38/barrel figure, total energy security benefits associated with this proposal were calculated at \$3.7 billion
- Consumer Food Costs
 - Estimate U.S. food costs would increase by \$10 per person per year by 2022
 - Net U.S. farm income would increase by \$7.1 billion dollars (10.6%)
- Criteria and Air Toxics Pollutant Impacts
 - Air quality analysis for the FRM

The "Blend Wall"

- Analyses for the NPRM were based on an assumption of 34 bill gal ethanol by 2022 used as E10 and E85
- By 2013 at the latest, we expect that all gasoline in the U.S. will be E10
 - 14 - 14.5 bill gal of ethanol
- There are three pathways to meet the RFS2 mandated volumes:
 - Additional ethanol will need to be consumed as E85 in flex-fuel vehicles (FFVs); more FFVs, more E85 stations, better E85 pricing
 - Non-ethanol biofuels - several promising technologies
 - Mid-level ethanol blends as a temporary measure
- The proposal discusses and analyzes the various legal, practical, and economic issues associated with all three pathways

For More Information

- **Information pertaining to the RFS2 is available on the EPA website at:**

- <http://www.epa.gov/otaq/renewablefuels/index.htm>

- **EPA has established a public docket for this action:**

- Docket ID No. EPA–HQ–OAR– 2005-0161

- All documents in the docket are listed in the www.regulations.gov index.
- Some information may not be publicly available if it is confidential
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