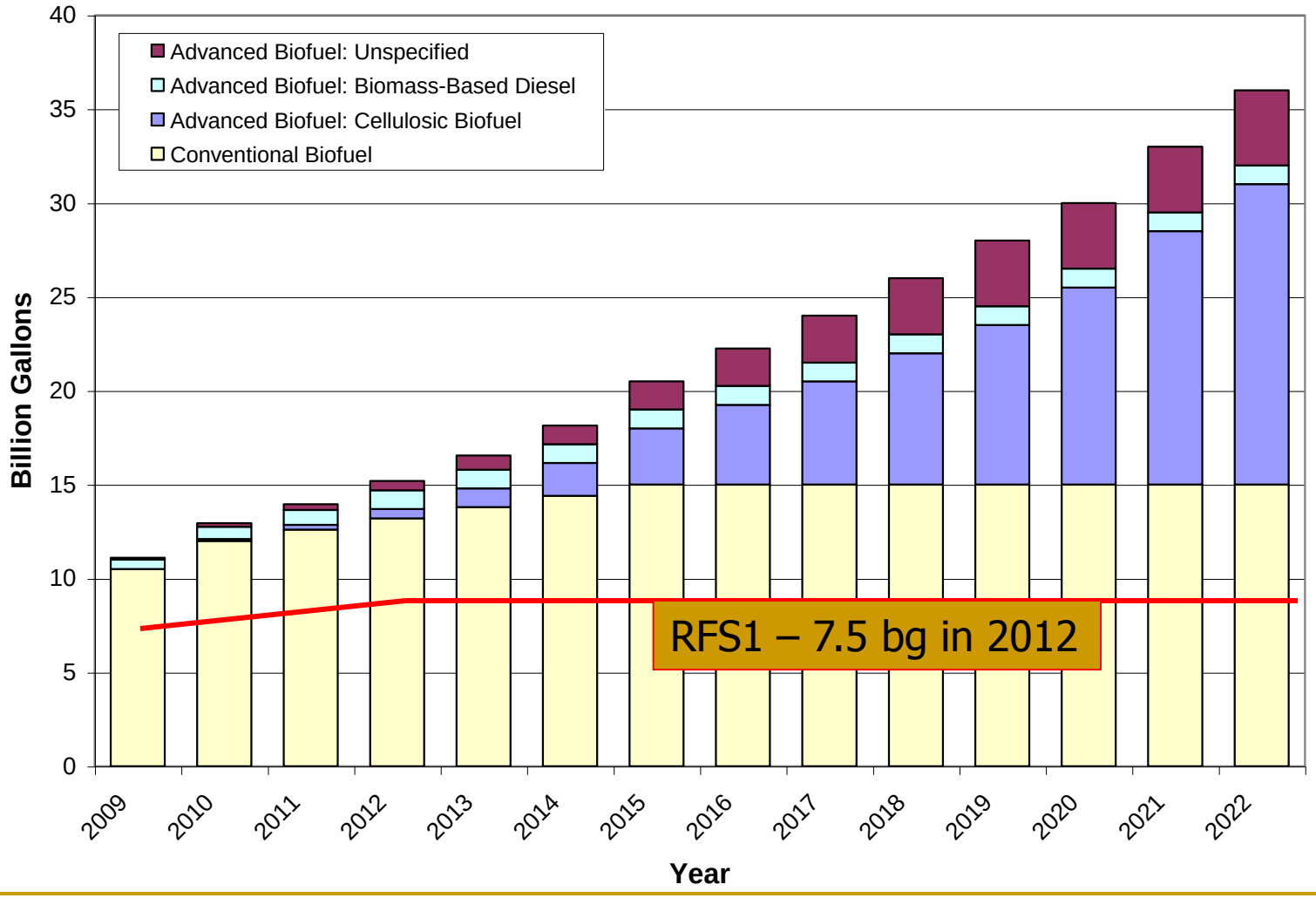
Renewable Fuel Standard (RFS-2): 2010 and Beyond

May 4, 2010

Overview

- EISA Volumes and the Four Standards
- 2010 Standards
- Upcoming Rules for 2011 Standards & Program Amendments
- Renewable Biomass Provisions
- Current Lifecycle Determinations
- Additional Determinations

As You Remember, EISA Mandated a Significant Increase in Renewable Fuel Volumes



The Four Categories and 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
- **Cellulosic Biofuel: 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 threshold
- **Advanced Biofuel: Total 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 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
- **Existing biofuel facilities (domestic and foreign) are not required to meet GHG threshold for conventional biofuel category – these facilities are "grandfathered"**

Implementing the Standards

- **RFS-2 regulatory program will go into effect on July 1, 2010**
  - RFS-1 regulations will apply January – June
- **Final Rulemaking provisions provide for this transition**
  - RFS-1 RINs are valid under RFS-2, applied toward the separate standards based on codes within the RINs
  - Final rule maintains ethanol equivalent energy-based approach for RFS-2
- **Setting the Annual Standards**
  - EPA is required to make a determination each year regarding whether the required volumes of cellulosic biofuel for the following year can be produced.
    - For any calendar year for which the projected volume of cellulosic biofuel production is less than the minimum required volume, the projected volume becomes the basis for the cellulosic biofuel standard.
  - If necessary, EPA can also adjust advanced biofuel and total renewable fuels standards

Standards Set for 2010

1. **Total Renewable Fuel Standard**
   - Applying full EISA 2010 RFS-2 standard – 12.95 billion gallons
2. **Biomass-based Diesel Standard**
   - Final rule combines 2009 (0.5 billion gallons) and 2010 (0.65 billion gallons) requirements
3. **Cellulosic Standard**
   - Based on updated market assessment – EPA set a 6.5 million gallon standard for 2010
4. **Total Advanced Standard**
   - Maintained at 0.95 billion gallons

Upcoming Rulemakings

- **RFS-2 Program Amendments**
  - Signed by the Administrator on Friday, April 30
  - Will go into effect on July 1 with final regulations, unless we receive adverse comment or a request for public hearing
    - In the event we receive adverse comment or a hearing request for a particular amendment, we will withdraw that amendment and finalize at a later date
  - Amendments correct, clarify, or modify final RFS-2 regulations
    - Correct typographical and grammatical errors
    - Clarify EPA's intent as described in the proposal and/or final preamble
      - Example: Final regs incorrectly require pre-enactment facilities to complete construction within 3 years of commencing construction rather than within 3 years of EISA enactment (i.e. by December 19, 2010)

- **2011 Volume Standards Rule**
  - EPA will propose a rule that describes our assessment of cellulosic biofuel volumes for 2011
  - Will also address advanced biofuel and total renewable fuels standards for 2011
  - Final rule with final 2011 standards will be released in November

Approving Feedstocks Under Renewable Biomass Provisions

- **EISA restricted where feedstocks can grow and be harvested for use in producing renewable fuels for compliance with the RFS-2 program**
  - Planted crops/crop residue from ag land cleared/cultivated prior to Dec. 2007
  - Planted trees/tree residue from nonfederal lands and tree plantations cleared/cultivated prior to Dec. 2007

- **In the Final Rule**
  - For feedstocks from non-agricultural land or forest land, there are two compliance options for fuel producers:

    1: Individually verify and qualify their feedstocks following specific recordkeeping and reporting requirements;

    2: Opt to form and participate in a consortium that employs a third party to conduct a verification program that acts to collectively verify and qualify these feedstocks for RFS2 renewable fuel production

  - For feedstocks from planted crops / agricultural land
    - For US produced feedstocks, producers can comply under an aggregate compliance approach
    - For Foreign produced ag feedstocks, rule provides future option for other (non-U.S.) sources of feedstocks to use aggregate compliance if source region can provide sufficient data to support aggregate analysis
    - Otherwise, producers must verify using one of the options applied in the non-ag / forest sector

- **Moving Forward**
  - EPA is currently exploring a process for approving the aggregate compliance approach for foreign feedstocks

Our Continuing Lifecycle Work

Compliance Determinations Included in Final Rule

- **In the final rule, our modeling accounted for the typical feedstock and fuel production pathway from which significant production and contribution to RFS2 volumes are expected (2022)**
- **Modeled fuel pathways that meet compliance:**
  - Ethanol produced from corn starch at a new natural gas, biomass, or biogas fired facility using advanced efficient technologies meets 20% threshold (Coal fired will not)
  - Butanol from corn starch meets 20% threshold
  - Biodiesel (soy, wastes, algae) meets 50% threshold
  - Sugarcane ethanol (multiple pathways) meets 50% threshold
  - Cellulosic ethanol and diesel fuel (Thermal and Biochemical from Stover, Switchgrass) meets 60% threshold
- **Results extended to <u>same fuel type and feedstock</u> as a modeled pathway, but with feedstock production sources that were not included in the analysis (e.g., soybean biodiesel produced in another country)**
  - If agricultural production from a source is significantly different from those modeled, and fuel volumes from the source increase, EPA retains authority to perform a full analysis of the pathway for compliance determination
- **Results extended to other fuel pathways with low risk of not complying:**
  - Crop residues such as corn stover, wheat straw, rice straw, and citrus residue providing starch or cellulosic feedstock
  - Forest material including eligible forest thinnings and solid residue remaining from forest product production providing cellulosic feedstock
  - Secondary annual crops planted on existing crop land such as winter cover crops and providing cellulosic material, starch, or oil for biofuel production
  - Separated food and yard wastes, including food and beverage wastes from food production and processing
  - Perennial grasses including switchgrass and miscanthus

Determinations for Additional Fuels

- **Threshold determinations for certain other pathways were not possible for the final rule because sufficient modeling or data was not yet available**

- **Based on current/projected commercial trends and status of analysis, EPA anticipates modeling the following fuel pathways and including determinations in a supplement to the final rule:**
  - Pulp wood ethanol
  - Grain sorghum ethanol
  - Palm oil biodiesel
  - Canola oil biodiesel

- **For fuel pathways not yet modeled, EPA provides a petition process through which the fuel pathway can be analyzed and provided a compliance determination**
  - Fuels pathways *sufficiently similar* to pathways that have been modeled (e.g. energy enhancement to fuel processing technology)
    - Upon determination, allow RIN-generation after next quarterly update of RIN reporting system (EMTS)
    - Formalize in regulations during annual rulemaking process
  - Fuel pathways that *require significant new analysis* and modeling (e.g. new feedstock or fuel type)
    - EPA would give notice and seek public comment
    - Carried out as part of periodic regulatory updates to the final rule

- **In addition, we are planning a National Academy of Sciences (NAS) study**
  - EPA recognizes that the state of scientific knowledge continues to evolve in this area; therefore, the Agency is committing to further reassess our determinations and lifecycle estimates
  - EPA will request that NAS over the next two years evaluate the approach taken in the final rule, the underlying science of lifecycle assessment, and in particular indirect land use change, and make recommendations for subsequent rulemakings on this subject
  - This new assessment could result in new determinations of threshold compliance compared to those included in this rule that would apply to future production (from plants that are constructed after each subsequent rule)