The Energy Independence and Security Act (EISA): Proposed Changes to the Renewable Fuel Standard Program (RFS2)

Presentation to the NAS Biofuels Workshop

Madison, WI. June 23-24, 2009

Agenda

- Background and statutory requirements
- Lifecycle impacts and GHG thresholds
- Other key issues
- Impacts reporting

Setting the Stage

- **On May 5, Administrator Jackson signed the Renewable Fuel Standard (RFS2) proposal**
  - Proposal interprets revisions to the original Energy Policy 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**
  - Large market forcing growth in the renewable fuels market - to 36 Bgal
    - Primary increase is in advanced biofuels and cellulosic biofuels
  - Preserves 15 bill gal for conventional biofuels
    - Grandfathered from the GHG thresholds
  - Significant benefits for
    - Greenhouse gases – Significant benefits from Advanced Biofuels
    - Energy security
    - Agriculture

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

What are the 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 and beyond**
    - E.g., Biodiesel, "renewable diesel" if fats and oils not co-processed with petroleum
    - Must meet a 50% lifecycle GHG threshold
  - **Advanced Biofuel: Minimum of 4 billion additional gallons by 2022**
    - Essentially anything but corn starch ethanol
    - Includes cellulosic biofuels and biomass-based diesel
    - Must meet a 50% lifecycle GHG threshold
  - **Renewable Biofuel**: **Up to 15 billion gallons of Other Biofuels**
    - 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

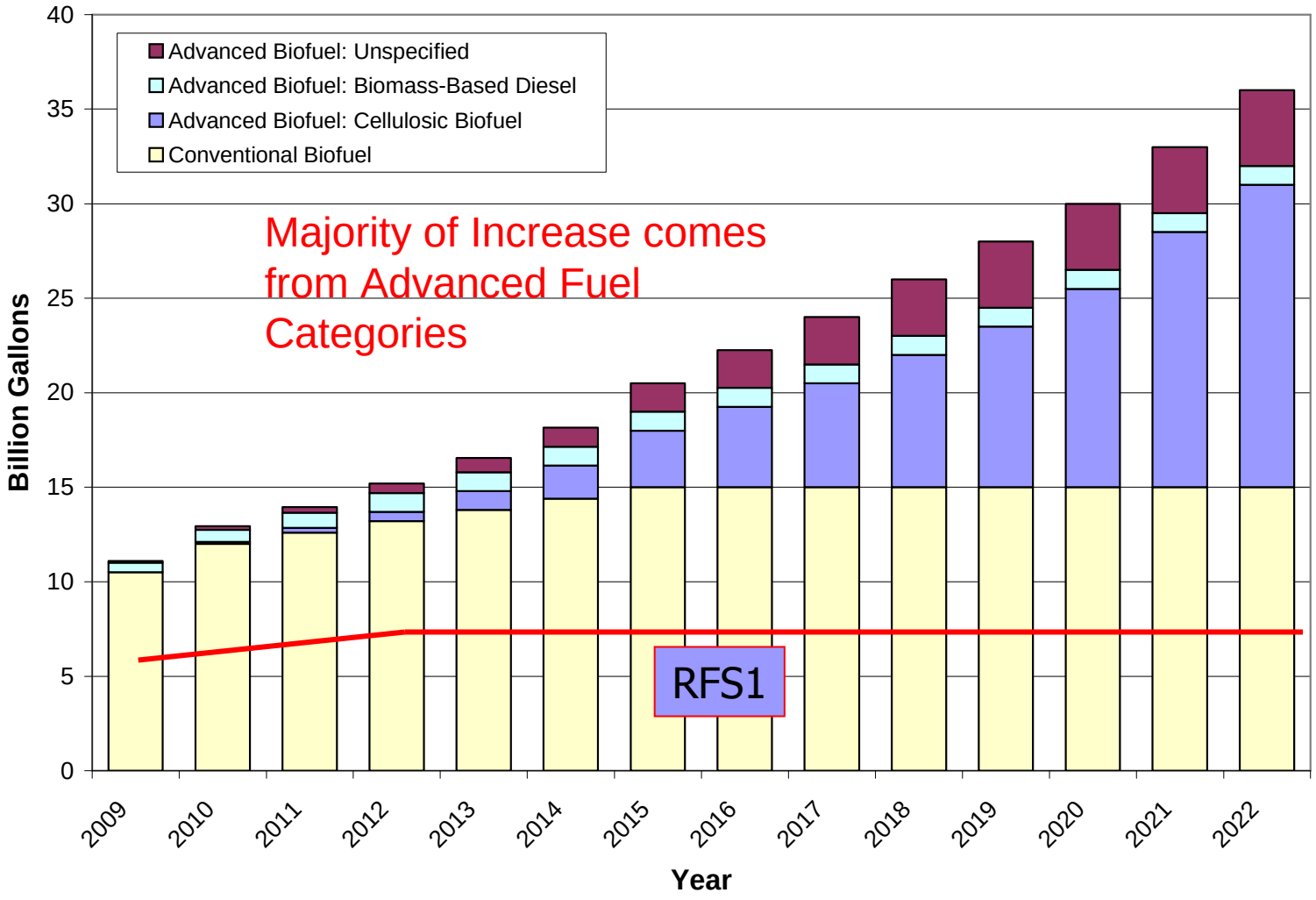
NOTE: Existing biofuel facilities not required to meet conventional GHG threshold

- **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% or as low as 40%**

RFS2: Nested Standards (billions of gallons)

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

Volume Changes Over Time



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**

Other Important Issues

- **Peer Review: Conducting a formal peer review (between proposal and final rule) of key elements of our lifecycle analysis:**
  - According to formal peer review guidelines
  - Independent third-party contractor selecting reviewers
  - Four Key Aspects: Land use modeling (use of satellite data/ land conversion GHG emission factors): estimates of GHG emissions from foreign crop production; Methods to account for the variable timing of GHG emissions; How models are used together for LCA estimates
  - Making peer review results available to public

- **Grandfathering: All biofuel facilities (domestic and international) that "commenced construction" prior to EISA are grandfathered:**
  - Not required to meet the minimum 20% GHG threshold in-order to comply
  - Does not apply to other higher / advanced category GHG thresholds
  - Proposing baseline volume would be grandfathered indefinitely - Seeking comments on a range of other applications and approaches
  - Expect at least 15 billion gallons will be grandfathered
    - Corn-ethanol production (~15 Bgal); Most biodiesel (~2 Bgal); Most sugarcane (~5 Bgal)

- **Renewable Biomass: EISA restricts types of renewable fuel feedstocks and land that feedstocks can come from:**
  - Ag land must have been cleared or cultivated prior to Dec 19, 2007 & actively managed, fallow, and non-forested
  - Woody biomass from federal land is not allowed, except from wildfire areas
  - Requires new tracking of feedstocks from point of production to renewable fuel producers
  - Proposing renewable fuel producers be required to maintain records to support decision to generate, or not to generate RINs for a given batch of renewable fuel
  - Seek comments on wide variety of other approaches

- **Implementation Timing – Intend January 1, 2010 – But seeking comment on Alternatives – Contingent upon current schedule being met**

EISA Impacts Reporting

Section 204. Environmental and Resource Conservation Impacts

- EPA, in consultation with USDA and DoE, shall assess and report to Congress every 3 years on the impacts to date and likely future impacts of the requirements of the RFS on:

  (1) Environmental issues, including air quality, effects on hypoxia, pesticides, sediment, nutrient and pathogen levels in waters, acreage and function of waters, and soil environmental quality.
  (2) Resource conservation issues, including soil conservation, water availability, and ecosystem health and biodiversity, including impacts on forests, grasslands, and wetlands.
  (3) The growth and use of cultivated invasive or noxious plants and their impacts on the environment and agriculture.

- EPA may seek the views of the NAS or another independent research institute

- The report shall include the annual volume of imported renewable fuels and feedstocks for renewable fuels, and the environmental impacts outside the United States of producing such fuels and feedstocks.

- The report shall include recommendations for actions to address any adverse impacts found.