Analysis of the Ethanol vs. Drop-in Fuel Market and the Pass-through of RINs and the Blenders’ Credits under RFS

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Outline

• Motivation
• Objectives
• Tasks
• Approaches
Motivation

- The Renewable Fuel Standard (RFS) was developed to promote renewable fuel.
Motivation

• Supply chain and market interactions between ethanol, renewable drop-in fuel and regular petroleum fuel are complex

Government Policy and Regulations
Objectives

• To investigate the market interactions and conduct market equilibrium analysis for various stakeholders along the supply chain
• To study the potential impacts of the RINs and the blender’s credits on the market prices under the Renewable Fuel Standard
• To analyze the implications of various volumetric scenarios of RFS regulations on different stakeholders in the biofuel supply chain
Fuel Classifications under RFS

- **Type C.** Cellulosic Biofuels, 60% GHG reduction;
- **Type B.** Biomass-Based Diesel, 50% GHG reduction;
- **Type A.** Advanced Biofuels, 50% GHG reduction;
- **Type R.** Renewable fuel, 20% GHG reduction;
- Existing ethanol production facilities are subject to grandfathering requirements
RINs and Blender’s Credits

- **Renewable Identification Number (RIN)**
  - 38-character numeric code
  - Value change with market: 0.25 cent each in 2007, has been traded for 25 cents each

- **Volumetric Ethanol Excise Tax Credit (VEETC)/Blender’s credit**
  - 45 cents per gallon of corn ethanol (expired)
  - $1.01 per gallon of cellulosic ethanol
Approach and Tasks (1)

• Visit and interview stakeholders to understand the interactions between feedstock producers, biofuel companies, oil companies, and regulatory agencies.
  – Cargill
  – Archer Daniels Midland (ADM)
  – ConocoPhillips
  – Sundrop Fuels, Virent
Approach and Tasks (2)

- Model blenders’ and other entities’ economic problems based on the feedbacks from the interviews and existing literature.

- Calibrate the models with existing data to form the baseline scenario of the market analysis.
Approach and Tasks (3)

- Analyze the pass-through of blender’s credits and RINs under various scenarios
  - Perfect competition
  - Imperfect competition
  - Mandate binding
  - Mandate not binding
Approach and Tasks (4)

• Assess the influence of current and proposed policies on gasoline and ethanol fuel and corn markets.
  – Policy as is
  – Tax credit is removed
  – RIN is removed
Deliverables

- Market-based bottom-up engineering-economics equilibrium models
- Analysis of the economic and environmental consequences of biofuel policies
- Uncertainty and sensitivity analysis of biofuel policies to stakeholders along the biofuel supply chain
Thank you

Questions?