Fixing Weaknesses in the Feedstock Regulatory Landscape

Pre-Processing, Follow-the-Crop, Depot, Dandelion Model—Taking a New Look at the Definition of *Feedstock Material* at a Biofuels Production Facility

Advanced Bioeconomy *Feedstocks* Conference  June 9, 2015
Advocates for the adoption of advanced biofuels as an

- energy security,
- military flexibility,
- economic development
- climate change mitigation
- pollution control

solution.
Advanced Biofuels USA, a nonprofit educational organization, advocates for the adoption of advanced biofuels as an energy security, economic development, military flexibility and climate change solution.
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Renewable Fuel Standard

Figure 1: Biofuel Use Mandates Established by the Energy Independence and Security (EISA) Act of 2007

- **Cellulosic** = (S)
- **Biodiesel** = (B)
- **Other Advanced** = (O)
- **Conventional Gap** = (C)

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<th>Year</th>
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“means all of the activities and equipment associated with the production of renewable fuel starting from the point of delivery of feedstock material to the point of final storage of the end product, which are located on one property, and are under the control of the same person (or persons under common control.” (40 CFR 80.1401)
But … How does it really work for many advanced biofuels?

Relevance

Algae Feedstock Supply and Logistics

1. Supply and Logistics
   - Resource Assessment

2. Algae Production
   - Feedstock Development
   - Cultivations Systems
   - Nutrient Supply

3. Harvest
   - Dewatering
   - Concentration

4. Conversion Interface
   - Preprocessing
     - Intermediate Production
   - Stabilization

5. Transport
   - Residual Processing

Conversion
The Dandelion Model: Two-step biofuels technologies and the emergence of super-refineries *Biofuels Digest* October 24, 2012

DOE EERE Biomass Feedstocks website page
How RINs Work  Part A

- Renewable fuel produced
- Fuel sold to obligated party with RIN attached
- Obligated Party gives RINs to EPA to prove use in market

Fuel sold without RINs has less value.
How RINs Work Part B

Terminal Operator/Blender or Obligated Party has extra RINs

Sells RINs in open market

RIN-needy Obligated Party buys RINS to give to EPA to prove use in market

Speculator buys RINs to keep for future sale

Fuel sold without RINs has less value.
But … How does it really work for many advanced biofuels?

Relevance
National Advanced Biofuels Consortium (NABC).
- three intermediates to be further processed in standard refinery operations:
  - bio-crudes for co-processing with crude oil;
  - refinery-ready intermediates substantial downstream processing; and
  - near-finished fuels or blendstocks.

National Alliance for Advanced Biofuels and Bioproducts (NAABBB).
- Goal: to reduce the cost of producing algae-based “biocrude” as an intermediate that could be processed into hydrocarbon fuels at a refinery location.
DOE Integrated Biorefineries.
- Solazyme
- Algenol

DoDAlgal-derived Jet Fuel.
- DARPA awarded to General Atomics
- Dynamic Fuels
- Solazyme

Alcohol-to-Jet (ATJ).
- LanzaTech
- Pacific Northwest National Lab
- Swedish Biofuels
How to Fix the Problem?

- Doesn’t need an Act of Congress

- EPA can address by
  - Clarify interpretation of *feedstock material* in the definition of *facility* in the RFS consistent with government research, investment and practice
EPA should clarify that For the purposes of section 80.1401 it understands, within the definition of facility, "feedstock material means any material that arrives at the facility that is processed into the end renewable fuel product."
Addressing Compliance Concerns

- Doesn’t need an Act of Congress

- **EPA can address by**
  - Reporting and Recordkeeping Requirements
  - Strengthening the Quality Assurance Program (QAP)
  - Improving Testing
Reporting and Recordkeeping Requirements

- The generator of RINs would be responsible for compliance with requirements of the appropriate pathways.

- The RFS rules already provide for the tracking and accounting for the integrity of “renewable biomass” pre-processing at a location different from fuel production.
Addressing Compliance Concerns

Strengthening the Quality Assurance Program (QAP)

- Third-party site visits,
- Mass and energy balance that include pre-processing,
- Appropriate documentation,
- Technical methods of measuring the renewable energy content of a finished product.
Improving Testing

- Gauge biogenic fuel content through isotope testing methods
  - Accelerator Mass Spectrometer (AMS)
  - Liquid Scintillation Counter (LSC)
Questions?

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