

Evaluating New Renewable Fuel Pathways under the U.S. Renewable Fuel Standard (RFS) Program

Bioenergy Webinar, March 20, 2014

Overview

- The U.S. Renewable Fuel Standard (RFS) program
- EPA's lifecycle greenhouse gas analyses of biofuels
- Approved pathways
- Petition process for evaluation of new renewable fuel pathways
- Improving the petition process
- Q&A

RFS Key Aspects

- The Energy Independence and Security Act of 2007 (EISA) expanded the Renewable Fuel Standards (RFS) and set the volume of renewable fuel that generally must be used in transportation fuel, reaching a total of 36 billion gallons by 2022.
- EISA established four categories of renewable fuels with individual volume standards:
 - cellulosic biofuel
 - biomass-based diesel
 - advanced biofuel
 - total renewable fuel
- EISA set specific qualification requirements for renewable fuels and feedstocks:
 - Set minimum lifecycle GHG reduction thresholds for each category of renewable fuel
 - Applied restrictions on types of feedstocks that can be used to make renewable fuel, and types of land that can be used to grow and harvest feedstocks
 - Established grandfathering allowances for renewable volumes from certain facilities

Lifecycle Modeling Approach

- For the March 2010 Renewable Fuel Standard (RFS) rule, EPA developed a science-based lifecycle GHG methodology that is consistent with the EISA statute.
 - Statutory definition of lifecycle GHG emissions includes “significant indirect emissions such as significant emissions from land use changes.”
- Lifecycle GHG emissions from renewable fuels are compared to average lifecycle GHG emissions for gasoline or diesel (whichever is being displaced) sold or distributed as transportation fuel in 2005.
- EPA’s science-based determinations are informed by the best available scientific data and models.

2010 Analysis Included Broad Public Engagement and Review

Coordination and Technical Exchange

- RFS lifecycle analyses were conducted in close coordination with U.S. Department of Agriculture (USDA) and U.S. Department of Energy (DOE).
- EPA worked with stakeholders and experts to determine the most up-to-date data for use in modeling.
- EPA also conducted regular technical exchange with organizations pursuing similar analyses.

Public Review

- 120-day public comment period on the proposed rule in which methodology was proposed.
- Two-day workshop for stakeholders to detail the methodology of the proposed lifecycle analysis.

Independent Peer Review

- EPA initiated four independent peer reviews of components of the lifecycle analysis in order to respond to stakeholder concerns and to ensure that the Agency made decisions based on the best science available.

Fuel Pathways

- Classifications of approved fuel pathways are specified in Table 1 to 40 CFR 80.1426(f) of the RFS regulations.
- Within the table, three critical components of a fuel pathway are listed:
 - Fuel type
 - Feedstock
 - Production process
- Each specific combination of the three components (or a “fuel pathway”) is assigned a renewable fuel category for which it qualifies.
- Example of a fuel pathway: renewable diesel produced from soybean oil using a hydrotreating process

Qualified Fuel Pathways

- In the March 2010 RFS rule, EPA evaluated and qualified a number of renewable fuel pathways, including some of the most widely used types of biofuels.
- Examples of advanced drop-in pathways already approved include:
 - Renewable diesel from camelina oil, soybean oil, or algal oil
 - Cellulosic diesel from switchgrass, miscanthus, energy cane, *Arundo donax*, or *Pennisetum purpureum*
 - Renewable gasoline made from corn stover, separated food waste or separated MSW
- Qualified pathways are listed in Table 1 to § 80.1426, and on EPA's website at: <http://www.epa.gov/otaq/fuels/renewablefuels/new-pathways/rfs2-pathways-determinations.htm>

Petition Process for Evaluation of New Pathways

- During the March 2010 rulemaking EPA recognized that there were new pathways requiring assessment in the future.
- Therefore, we provided § 80.1416 in the regulations, “Petition process for evaluation of new renewable fuels pathways.”
- This mechanism allows parties to request that EPA conduct a lifecycle GHG assessment for a new fuel pathway and provide a determination of the category of renewable fuel (D-code) for which the fuel may be eligible.

Different Types of Petitions

- As outlined in the RFS regulations, all petitions to EPA must include certain information, for example:
 - Technical justification with pathway description
 - Mass and energy balances data
- Petitions involving feedstocks not previously modeled by EPA require additional information, such as:
 - Data on the market value of the feedstock(s)
 - Current and projected yields of the feedstock
 - Current and projected land use

Different Types of Determinations

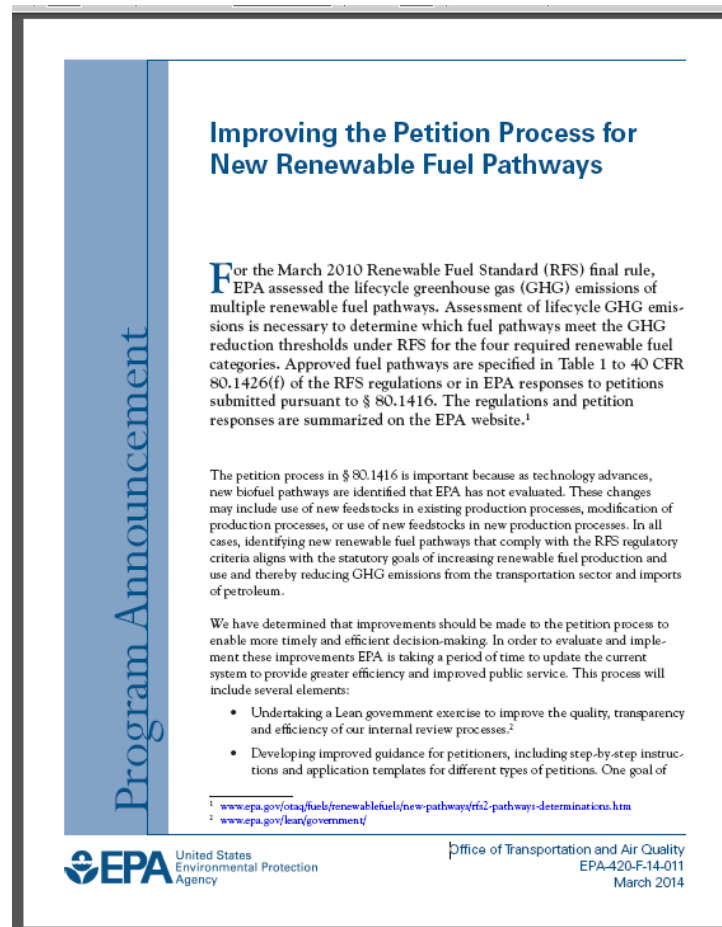
- New pathway generally applicable pathways are added to the RFS regulations with a rulemaking process.
 - Eligible pathways appear in Table 1 to 40 CFR 80.1426
- EPA also has authority to make company-specific determinations without a full rulemaking process.
 - Determinations are posted on EPA's website.

Petitions Currently Under Review

- There are ~35 petitions currently under review.
- They include petitions for new feedstocks, new fuel types and new processes.
 - Some petitions require substantial amounts of new modeling and analysis, e.g., petitions for major new feedstocks.
 - Others require fairly straightforward process modeling, e.g., a known production technology with a small modification for enhanced energy efficiency.
- All petitions currently under review are listed on our website:
 - <http://www.epa.gov/otaq/fuels/renewablefuels/new-pathways/rfs2-pathways-review.htm>

Improving the Petition Process

- On March 13, 2014, EPA made a program announcement that we are initiating activities to improve the petition process for new fuel pathways:
 - <http://www.epa.gov/otaq/fuels/renewablefuels/documents/420f14011.pdf>
- We have determined that improvements should be made to the petition process to enable more timely and efficient decision-making.



Improving the Petition Process for New Renewable Fuel Pathways

For the March 2010 Renewable Fuel Standard (RFS) final rule, EPA assessed the lifecycle greenhouse gas (GHG) emissions of multiple renewable fuel pathways. Assessment of lifecycle GHG emissions is necessary to determine which fuel pathways meet the GHG reduction thresholds under RFS for the four required renewable fuel categories. Approved fuel pathways are specified in Table 1 to 40 CFR 80.1426(f) of the RFS regulations or in EPA responses to petitions submitted pursuant to § 80.1416. The regulations and petition responses are summarized on the EPA website.¹

The petition process in § 80.1416 is important because as technology advances, new biofuel pathways are identified that EPA has not evaluated. These changes may include use of new feedstocks in existing production processes, modification of production processes, or use of new feedstocks in new production processes. In all cases, identifying new renewable fuel pathways that comply with the RFS regulatory criteria aligns with the statutory goals of increasing renewable fuel production and use and thereby reducing GHG emissions from the transportation sector and imports of petroleum.

We have determined that improvements should be made to the petition process to enable more timely and efficient decision-making. In order to evaluate and implement these improvements EPA is taking a period of time to update the current system to provide greater efficiency and improved public service. This process will include several elements:

- Undertaking a Lean government exercise to improve the quality, transparency and efficiency of our internal review processes.²
- Developing improved guidance for petitioners, including step-by-step instructions and application templates for different types of petitions. One goal of

¹ www.epa.gov/otaq/fuels/renewablefuels/new-pathways/rfi2-pathways-determinations.htm
² www.epa.gov/lean/government/

EPA United States Environmental Protection Agency

Office of Transportation and Air Quality
EPA-420-F-14-011
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Elements of Improvement Process

- We are taking a period of time (~6 months) to update the current system for greater efficiency and improved public service:
 - Undertaking a **Lean government exercise** to improve the quality, transparency and efficiency of our internal review processes.
 - Developing **improved guidance for petitioners**, including step-by-step **instructions and application templates** for different types of petitions.
 - One goal of the updated guidance and templates will be to help applicants provide all of the data that EPA needs to complete its assessments, while also reducing extraneous information.
 - Launching a **more automated review process** for petitions using previously approved feedstocks and well known production process technologies (e.g., dry mill ethanol plants).
- During this period we intend to continue reviewing pending petitions that are high priority and for which substantial modeling has already been done.

Allocating Scarce Resources

- Considering resource limitations, the Agency needs to set priorities with respect to petition reviews.
- Consistent with statutory intent and our experience to date, we believe petitions can be prioritized based on the following criteria:
 - Ability to contribute to the **cellulosic** biofuel mandate.
 - Potential for **reducing greenhouse gas emissions** on a per gallon basis, for example by using feedstocks that likely do not have significant indirect land use change emissions (such as non-food feedstocks).
 - Ability to contribute to **near-term increases in renewable fuel use**. This criterion would include, for example, consideration of the ability of the intended biofuel product to be readily incorporated into the existing fuel distribution network.
- Petitions that are similar based on the above criteria will be further prioritized based on closeness to commercialization and date of petition submission.

We Welcome Your Input!

- Our objectives are a more efficient and transparent petition process with improved public service.
- We welcome input from our stakeholders with ideas about how to improve the petition process as we move forward with this initiative.
- Stakeholders who wish to provide input can do so by emailing the EPA Fuels Programs Support Line at support@epamts-support.com with “Petition Process Input” as the subject line.