
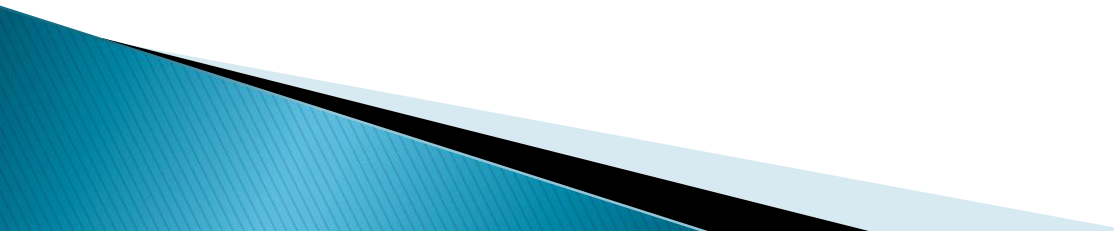


RFS2 – Lessons Learned and What's Next

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CRC Workshop On Lifecycle Analysis
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Outline

- ▶ Overview of first 18 months of implementing RFS2
 - ▶ Hurdles facing new biofuel producers
 - ▶ What is EPA working on
 - ▶ Sustainability and environmental impacts
 - ▶ NAS study status
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Implementing RFS2

- ▶ RFS2 went into effect July 1, 2010
- ▶ Technical amendments, guidance and clarifications
 - Tech amendment package, Q&A's published
 - Impacting eligibility to use existing pathways
- ▶ Setting volume standards each year
 - 2011 in place
 - 2012 proposed and due to be finalized by end of November
- ▶ Expanding number of pathways should help provide volume
 - Canola oil for biodiesel added Sept 2010

Petitions

- ▶ Petition process popular but time consuming
 - Five process specific petitions approved
 - Dozen under review
- ▶ Three types of petitions
 - New processes (existing feedstocks and fuel type)
 - Relatively straight forward mass and energy balance
 - New fuel types
 - Energy-equivalent displacement of petro fuels
 - New feedstock
 - New ag sector modeling
 - Or, comparative analysis (e.g., same inputs but higher yield than feedstock already analyzed)

Pending Pathway Assessments

Company	Fuel	Feedstock	Process
Absolute Energy, LLC	Ethanol	Corn	<i>New (proprietary)</i>
BP Biofuels North America, LLC	Cellulosic biofuel	<i>New (energy cane)</i>	Any
	Cellulosic biofuel	<i>New (napiergrass)</i>	Any
Chemtex Group	Cellulosic biofuel	<i>New (arundo donax)</i>	Any
Dakota Spirit AgEnergy, LLC	Ethanol	Corn	<i>New (proprietary)</i>
Emerald Biofuels LLC, Global Clean Energy Holdings, and UOP LLC	Renewable diesel, jet fuel, and naphtha	Jatropha	Hydrotreating
Emerald Biofuels LLC and Global Clean Energy Holdings	Biodiesel	Jatropha	Transesterification
Gevo	Isobutanol	Corn	<i>New (proprietary)</i>
High Plains Bioenergy	Biodiesel	<i>New (free fatty acids)</i>	<i>New (proprietary)</i>
ICM	Ethanol	Corn	<i>New (proprietary)</i>
Kior, Inc.	<i>New (renewable gasoline blendstock)</i>	Cellulosic biomass	<i>New (proprietary)</i>
Macawber Engineering, Inc.	Ethanol	Algae	<i>New (proprietary)</i>
Montana Advanced Biofuels, LLC	Ethanol	<i>New (barley, wheat starch residue)</i>	Fermentation

In addition to the above pathway requests, we are also conducting pathway analyses of new feedstocks including palm oil, camelina, grain sorghum, sweet sorghum, pulp wood, and jatropha

Hurdles for New Biofuels

- ▶ Two main criteria for pathway approval
 - Lifecycle GHG performance compared to thresholds
 - Renewable biomass definition
- ▶ Is it covered by existing regulations ?
 - Petition process or new regulations take time
- ▶ Is it allowed under EISA constraints ?
 - Does it qualify as an eligible biomass ?
 - E.g., only planted trees, not naturally reproduced trees
- ▶ Can they get financing ?
 - Financing and decision to proceed often contingent on EPA determination of eligibility and appropriate threshold (advanced or cellulosic biofuel)

Regulations vs Petitions

- ▶ Regulation updates for new pathways
 - Provide general applicability, affecting potentially multiple producers and larger volumes than individual facility petitions
 - Tend to take longer to get in place
- ▶ Individual facility petitions respond to immediate needs

Sustainability and Environmental Impacts

- ▶ Clean Air Act Section 204 (EISA amendment) requires triennial assessment of wetlands, ecosystems and wildlife habitat impacts of biofuel production
 - Draft report published for public comment
 - Peer review analysis completed
 - Final report November 2011
- ▶ Focus is on US impact
 - Qualitative rather than quantitative assessment
 - Concerns identified but proper management can mitigate concerns
 - Water run off and mono-cropping biggest concern
- ▶ Recent NAS report provides some additional comment

Future Work on LCA

- ▶ In the RFS2 final rule we recognized that lifecycle GHG assessment of biofuels is an evolving discipline
 - ▶ We indicated we would continue to revisit our lifecycle analyses in the future as new information becomes available.
 - This included plans to ask the National Academy of Sciences for assistance as we move forward.
 - ▶ Still on the table
 - ▶ Have discussed potential question areas with DOE, USDA and other stakeholders
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