

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