Advanced Biofuels Association

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How to ReEnergyze your Real Estate
Public Policy discussion

Washington, DC

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Advanced Biofuels Association &
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Agenda

- Who is the ABFA and what do we support?
- The RFS 2 Rule (what’s the mandate?)
- A comparison view of biofuels
- Advancing Policy
Who We Are

What We Advocate

- Technology Neutrality
- Feedstock Sustainability
- Subsidy Parity
Renewable Fuel Standard
RFS2

Total: 36 BG

Conventional
15 BG

Advanced
21 BG

Cellulosic
16 BG

Biomass Diesel
1 BG

BG = Billion Gallons

How to Think About Biofuels

Technology
• Gasification
• Hydrolysis
• Hydroprocessing
• Synthetic Biology
• Fermentation
• Catalyst

Feedstocks
• Corn
• Sugars
• Wood
• Grasses
• Municipal Waste
• Algae

Molecule
• Alcohol
  • Ethanol
  • Butanol
• Ether
  • ETBE
  • MTBE
• Ester
  • Biodiesel
• Hydrocarbon
  • Diesel
  • Jet
  • Gasoline
Fuel Properties

- Energy Content
- Environmentally Advantageous
- Fungibility
- Scalability
- Economically Competitive

Energy Content

<table>
<thead>
<tr>
<th>Products</th>
<th>MMBTU</th>
<th>ABFA Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol</td>
<td>76,600</td>
<td>Osage, GeoSynFuels, Unica</td>
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<tr>
<td>Butanol</td>
<td>95,800</td>
<td>GEVO, BP</td>
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<tr>
<td>Diesel</td>
<td>128,000-129,000</td>
<td>Amyris, LS9, UOP, SunDrop, Rentech, Kern, Neste, Tyson, Elevance, NewGeneration, Viesel, Triton, SGC</td>
</tr>
<tr>
<td>Gasoline</td>
<td>114,000-116,000</td>
<td>Virent</td>
</tr>
<tr>
<td>Jet Fuel</td>
<td>124,150</td>
<td>Tyson, UOP, LS9, Rentech, Solazyme, Amryis, Virent</td>
</tr>
<tr>
<td>Oil feedstock</td>
<td>?</td>
<td>Sapphire, Live Fuels, UOP, KiOR</td>
</tr>
</tbody>
</table>
Environmentally Advantageous

Life Cycle Foot Print

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>EPA Rule</th>
<th>EPA Best Result</th>
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<tbody>
<tr>
<td>Corn Ethanol</td>
<td>20%</td>
<td>21%</td>
</tr>
<tr>
<td>Soy Biodiesel</td>
<td>50%</td>
<td>57%</td>
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<tr>
<td>Sugarcane Ethanol</td>
<td>50%</td>
<td>61%</td>
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<tr>
<td>Cellulosic</td>
<td>60%</td>
<td>92%</td>
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<tr>
<td>Grease, Tallow Diesel</td>
<td></td>
<td>80%</td>
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</table>

Volutility of the Fuel
Habitat
Water Use
Other

Fungability (Drop in Fuels)

Changes to Infrastructure & the Distribution System
Vehicle Fleet Compatibility
Examples: Butanol, Hydrocarbon Biofuels such as Renewable Diesel
Scalability

- Capability for High Volume Production from Available Feedstocks
- Wide Spread Deployment of Technology

Economically Advantaged

- Competitively Priced within the Current Cost Structure of Oil Based Fuels
  - Hydrocarbons and Other Fuels
  - Renewable Fuels and Technologies
Advancing Policy

- Advanced biofuels industry continues to need the strong policy signal of support from the federal government.
- We need loan guarantee programs that WORK! Actually afford the parties to participate.
- All policies should be technology neutral and create a level playing field across technologies and energy applications.
- We need to afford parity across the policy frame for all advanced biofuels. The same opportunity and the same amount of support (taxes, grants, and loans).

Appendix