The Role of Agribusiness: Getting *There* from *Here*

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Agenda

There 1
Here
And Agribusiness

Biofuels 2
Fuels from BioMASS

Speed to there 3
Is the issue
Agribusiness

Technology
- Seed
- Chemicals
- Equipment
- Services

Aggregate, Move, Transform

Processing
Transporting
Distributing
Services
Agenda

1. There
   Here
   And Agribusiness

2. Biofuels
   Fuels from BioMASS

3. Speed to there
   Is the issue
US Ethanol Use

Billion Gallons

HERE

8 B

THERE

36 B

2008

2022
Across the World:

Here

Ethanol
Biodiesel

Feedstocks

There
<table>
<thead>
<tr>
<th>CROP</th>
<th>Harvestable Biomass (tons/acre)</th>
<th>Ethanol (gal/ac)</th>
<th>Million acres needed for 35 billion gallons of ethanol</th>
<th>% 2006 harvested US cropland</th>
<th>2006 harvested US cropland</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn grain¹</td>
<td>4</td>
<td>500</td>
<td>40</td>
<td>15.3</td>
<td>15%</td>
</tr>
<tr>
<td>Corn stover²</td>
<td>3</td>
<td>300</td>
<td>35</td>
<td>3.5</td>
<td>3.5%</td>
</tr>
<tr>
<td>Corn Total</td>
<td>7</td>
<td>800</td>
<td>40</td>
<td>15.3</td>
<td>15.3%</td>
</tr>
<tr>
<td>Prairie</td>
<td>2</td>
<td>200</td>
<td>210</td>
<td>75.1</td>
<td>75.1%</td>
</tr>
<tr>
<td>Switchgrass</td>
<td>6</td>
<td>600</td>
<td>60</td>
<td>20.7</td>
<td>20.7%</td>
</tr>
<tr>
<td>Miscanthus</td>
<td>17</td>
<td>1700</td>
<td>18</td>
<td>5.8</td>
<td>5.8%</td>
</tr>
</tbody>
</table>
Winter Stand Recovered After Ice-Storm
Winter Harvest
Biomass Handling: Logistical Considerations for Year Round Supply

1. Grow
2. Harvest
3. Load in field
4. Field storage
5. Field side grind & load
6. Transport biomass to biorefinery
7. Conversion biorefinery

Year Round
Loading and unloading 182 semi-loads per day 360 days per year would be required (7.6/hour for 24 hour shifts, or 11.3/hour for 16 hour shifts)
Agenda

There
Here
And Agribusiness

Biofuels
Fuels from BioMASS

Speed to there
Is the issue
US Ethanol Use

Billion Gallons

2008: 8 B
2022: 36 B

Here

There
Biofuel System Pressures:

Volumes, Relationships, Systems

Seed
Chemicals
Equipment
Services

Processing
Transporting
Distributing
Services
Across the World: It Depends
Here
There
“It’s” Been Done Before

US Soybeans

Million bushels

0 500 1000 1500 2000 2500 3000 3500


THERE

HERE
“It’s” Been Done Before

Million bushels

THERE

AND BRAZIL

HERE
Summary Thoughts
1. We’re not “here” yet (in some respects)
2. Speed of change?
   Demand uncertainty
   Investment
   System relationships