Ethanol Industry Update

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President & CEO
Renewable Fuels Association
Historical Ethanol Production

U.S. ETHANOL PRODUCTION

Million Gallons

<table>
<thead>
<tr>
<th>Year</th>
<th>Production (Million Gallons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>1,000</td>
</tr>
<tr>
<td>1991</td>
<td>1,200</td>
</tr>
<tr>
<td>1992</td>
<td>1,400</td>
</tr>
<tr>
<td>1993</td>
<td>1,600</td>
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<tr>
<td>1994</td>
<td>1,800</td>
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<tr>
<td>1995</td>
<td>2,000</td>
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<tr>
<td>1996</td>
<td>2,200</td>
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<tr>
<td>1997</td>
<td>2,400</td>
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<tr>
<td>1998</td>
<td>2,600</td>
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<tr>
<td>1999</td>
<td>2,800</td>
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<tr>
<td>2000</td>
<td>3,000</td>
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<tr>
<td>2001</td>
<td>3,200</td>
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<tr>
<td>2002</td>
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<td>2003</td>
<td>3,600</td>
</tr>
<tr>
<td>2004</td>
<td>3,800</td>
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<tr>
<td>2005</td>
<td>4,000</td>
</tr>
<tr>
<td>2006</td>
<td>4,200</td>
</tr>
<tr>
<td>2007</td>
<td>4,400</td>
</tr>
<tr>
<td>2008</td>
<td>4,600</td>
</tr>
<tr>
<td>2009</td>
<td>4,800</td>
</tr>
<tr>
<td>2010E</td>
<td>5,000</td>
</tr>
</tbody>
</table>
## Current Ethanol Industry Capacity

<table>
<thead>
<tr>
<th>Segment</th>
<th>Capacity (MGY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>201 Operable Facilities</td>
<td>13,519</td>
</tr>
<tr>
<td>13 idle facilities</td>
<td>947</td>
</tr>
<tr>
<td>188 operating facilities</td>
<td>12,572</td>
</tr>
<tr>
<td>12 Facilities Under Construction</td>
<td>1,196</td>
</tr>
<tr>
<td>3 Expansions at Existing Facilities</td>
<td>76</td>
</tr>
<tr>
<td><strong>TOTAL CAPACITY</strong></td>
<td><strong>14,791</strong></td>
</tr>
</tbody>
</table>
Ethanol as a Fuel & Fuel Additive

1. **E10 (10% ethanol by volume)**
   - Approved for use in all vehicles and engines
   - ~98% of ethanol consumed as E10
   - 80-85% of U.S. gasoline blended with ethanol

2. **E85 (70-85% ethanol by volume)**
   - For use in flex-fuel vehicles (FFVs) only
   - 7+ million FFVs; ~2,200 retail outlets
   - <2% of ethanol consumed as E85

3. **Mid-level blends (20, 30, 40% ethanol by volume)**
   - For use in FFVs only
   - Dispensed by “blender pumps” (<250 stations)
   - Specifications, BMPs, etc. under development
Renewable Fuels Standard (RFS2)

- Conventional Biofuels (20% GHG reduction)
- Cellulosic (60% GHG Reduction)
- Other Advanced Biofuels (50% GHG Reduction)
- Biomass-based Diesel (50% GHG Reduction)

Note: 20% reduction for conventional biofuels applies only to new construction
RFS2 Final Rule: Corn Ethanol GHG Reductions

- Average Plant
- Dry Mill NG
  - Base Plant (dry DGS)
  - w/ CHP (dry DGS)
  - w/ Fractionation (dry DGS)
  - w/ CHP and Fractionation (dry DGS)
  - w/ Fractionation and Membrane Separation (dry DGS)
  - w/ CHP, Fractionation and Membrane Separation and Raw ...
  - w/ CHP, Fractionation, Membrane Separation, and ...
- Dry Mill Coal
  - Base Plant (wet DGS)
  - w/ CHP (wet DGS)
  - w/ Fractionation (wet DGS)
  - w/ CHP and Fractionation (wet DGS)
  - w/ Fractionation and Membrane Separation (wet DGS)
  - w/ CHP, Fractionation and Membrane Separation ...
  - w/ CHP, Fractionation, Membrane Separation, and ...
- Dry Mill Biomass
  - Base Plant (dry DGS)
  - w/ CHP (dry DGS)
  - w/ Fractionation (dry DGS)
  - w/ CHP and Fractionation (dry DGS)
  - w/ Fractionation and Membrane Separation (dry DGS)
  - w/ CHP, Fractionation and Membrane Separation ...
  - w/ CHP, Fractionation, Membrane Separation, and ...
- Wet Mill
  - w/ NG
  - w/ Coal
  - w/ Biomass

Used for threshold determination.
Meeting the RFS will require approval of “mid-level blends” (i.e. >E10)

ETHANOL BLEND WALL AND RFS2 REQUIREMENTS

- **RFS-Conventional**
- **RFS-Cellulosic**
- **RFS-Advanced (excl. biodiesel)**
- **E10 Blend Wall**
- **E15 Blend Wall**

MILLION GALLONS

<table>
<thead>
<tr>
<th>Year</th>
<th>RFS-Conventional</th>
<th>RFS-Cellulosic</th>
<th>RFS-Advanced</th>
<th>E10 Blend Wall</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>5,000</td>
<td></td>
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<td></td>
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<tr>
<td>2008</td>
<td>7,500</td>
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<tr>
<td>2009</td>
<td>10,000</td>
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<tr>
<td>2010</td>
<td>12,500</td>
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<tr>
<td>2011</td>
<td>15,000</td>
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<tr>
<td>2012</td>
<td>17,500</td>
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<tr>
<td>2013</td>
<td>20,000</td>
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<tr>
<td>2014</td>
<td>22,500</td>
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<tr>
<td>2015</td>
<td>25,000</td>
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</tbody>
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Current Ethanol Economics

**RBOB GASOLINE vs. ETHANOL**

- Gasoline-ethanol spread has widened in recent months
- Widest since 9/2008
- Returns over operating costs hit 2-year high in Q4, but have fallen sharply since

**ESTIMATED RETURNS OVER OPERATING COSTS ($/gallon), IOWA DRY MILL**

Source: RFA based on EIA weekly gasoline prices, EIA weekly natural gas updates, and USDA-AMS weekly Iowa ethanol reports
E15 Fuel Waiver

• Waiver submitted to EPA March 6, 2009
• EPA responded Dec. 1, 2009; approval decision delayed
  – Acknowledged no “show-stoppers” in testing to date
  – Still waiting for completion of key tests (e.g., catalysts)
  – Announced pump labeling effort
• Assuming no major issues, EPA could approve E15 for *MY2001 and newer* as soon as this summer
• A partial waiver on E15 likely does very little to boost ethanol demand—*must have a full waiver*
• A waiver for E15 *allows* (but does not *require*) E15 usage. Economics (and RFS requirements) will drive adoption
Increased Brazil ethanol output has come primarily through area expansion.

**Sources:**
1. IBGE (sugarcane area planted & cane yield); 2. USDA/FAS/ATO (TRS yield)
Increased U.S. ethanol output has come primarily through higher corn yields.

U.S. CORN, AREA AND YIELD

Between 1999-2009:

- Yield per acre increased 23% (1.9% CAGR)
- Record yield in 2009
- Planted area increased 11% (1% CAGR)
- 2009 planted area similar to late ‘70s/early ‘80s levels

Sources:
1.) USDA (corn area planted & corn yield)
Ethanol Tax Policy

• Volumetric Ethanol Excise Tax Credit (VEETC) expires Dec. 31, 2010
• $0.45/gallon tax credit paid to gasoline blenders
• Reps. Pomeroy (D-ND) and Shimkus (R-IL) introduced H.R. 4940 (Renewable Fuels Reinvestment Act) in March
• RFRA provides:
  ➢ 5-year extension of VEETC
  ➢ 5-year extension of secondary tariff on imported ethanol
  ➢ 5-year extension of small ethanol producer tax credit
  ➢ 3-year extension of cellulosic ethanol producer tax credit
Ethanol tax credits paid for themselves in 2009

- Industry generated $8.4 billion in Federal tax revenue
- VEETC cost $4.8 billion
- Small ethanol producer tax credit cost ~$200 million
- Ethanol provides a $3.4 billion surplus for the Federal Treasury
- Plus other economic benefits:
  - State and local tax revenues
  - Reductions in farm subsidies (LDPs virtually eliminated since 2006)
  - Decreased spending on oil imports
  - Lower gasoline prices
RFS2 and VEETC programs are interdependent and complementary

- Critics argue that an excise tax credit for ethanol is unnecessary when a mandate requiring refiners to blend ethanol already exists.

- RFS mandates the *use* of ethanol, not the *production*.

- VEETC encourages domestic production and ensures that the RFS volume requirements will be filled primarily with homegrown supply.
Potential Impacts of Failing to Extend VEETC

• Loss of more than **112,000 jobs** in all sectors of the economy
• Reduction of domestic ethanol production by **38%**
• Increased reliance on imported motor fuels (*Trading imported oil for imported ethanol from nations like Brazil*)
• Decrease in corn prices of **8 percent** (or ~$0.30/bushel)
• Loss of investment in/support for second-generation biofuels
• Elimination of **$2.7 billion** in state/local tax revenues and **$2.4 billion** in federal tax revenues
• Reduction of aggregate GDP by **$16.9 billion**
• Reduction of household income by **$4.2 billion**

Source: IMPORTANCE OF THE VEETC TO THE U.S. ECONOMY AND THE ETHANOL INDUSTRY
By John M. Urbanchuk for RFA
Questions