Biofuels: Implications for Prices and Production

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Why Ethanol?

Convert relatively abundant domestic sources of energy into a substitute for imported petroleum.
Energy Conversion

Natural Gas
Electricity
Petroleum
Coal
Methane
Sunlight

\{ Ethanol
DDGs \}
Other Benefits

- Economic Development
- Reduce Greenhouse Emissions
- National Security
- Support Farm Income
U.S. Ethanol Biorefinery Locations

Source: Renewable Fuels Association
Economics of Ethanol

Currently economically feasible due to:
- $.51/gallon blender tax credit
- $.54/gallon import tariff
- High crude oil prices
- Mandates
Crude Oil Prices, Cushing, OK WTI Spot Price, Jan. 2, 1986 – Nov. 21, 2006

Source: U.S. Department of Energy, Energy Information Administration
Ethanol and Unleaded Gasoline Prices, F.O.B. Omaha, Nebraska, January 2004 - October 2006

Source: Nebraska Ethanol Board; Nebraska Energy Office
U.S. Ethanol Production, 1980-2006

Source: Renewable Fuels Association and Original Calculations  
*2006 Projected
U.S. Corn for Fuel Use, 1975/76-2006/07

Source: USDA *2006/07 Projected
Implications

Prices
- a new higher plateau?
- impact on other users?
- impact on land values/rents?

Supply
- will corn acreage increase?
- will yields continue to increase?

Stocks
- will a reserve be required?

Policy
- income supports, trade, conservation

Fuel Supply
- a significant contribution?

Source: USDA
Central Illinois Corn Price, September 1- November 22, 2006
Function of Prices

• Make sure all acres are planted
• Bring CRP back into production?
• Shift acres to corn in the US
• Encourage foreign production
• Limit expansion of non-fuel uses of crops
U.S. Corn Exports, 1975/76-2006/07

Source: USDA

*2006/07 Projected
U.S. Corn Feed and Residual Use, 1975/76-2006/07

Source: USDA  *2006/07 Projected
U.S. Dried Distillers Grain (DDG) Production, 1975/76-2006/07

DDGs (million tons)

Source: Original Calculations

*2006/07 Projected
U.S. Corn Acreage, 1975/76-2006/07

Source: USDA

*2006/07 Projected
U.S. Corn Yields, 1975/76-2006/07

\[ y = 1.9x + 86.7 \]

\[ R^2 = 0.73 \]

Source: USDA

*2006/07 Projected
Ending Stocks of Corn

million bushels

- 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 00, 01, 02, 03, 04, 05, 06
**Policy Implications**

- Income supports not needed?
- Alter CRP contracts?
- Allow more ethanol/sugar imports?
- Soil and water conservation?
- Mandated rationing plans?
- Re-think biofuel subsidies?
Contribution to Fuel Supply

• 6 billion gallons of ethanol requiring about 2.2 billion bushels of corn
• US consumes 140 billion gallons of unleaded/yr
• Ethanol = 2/3 BTUs of unleaded gasoline
• 6 billion gallons of ethanol = 4.02 billion gallons of unleaded, or approximately 3 percent of gasoline supply
U.S. Ethanol Production Relative to Unleaded Gasoline Use, 1980-2005

Source: Renewable Fuels Association; U.S. Department of Energy, Energy Information Administration
### Is the Energy Balance Improving?

<table>
<thead>
<tr>
<th>USDA- Dry Milling</th>
<th>1996</th>
<th>2001</th>
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<tbody>
<tr>
<td>- Net energy w/o co-product</td>
<td>+11%</td>
<td>+10%</td>
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<tr>
<td>- Net energy with co-products</td>
<td>+37%</td>
<td>+77%</td>
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* Difference is in the magnitude of energy credit for co-products

* 50% energy balance, means ethanol’s net contribution to fuel supply is smaller than gross contribution (3%)