The Impact of Liquid Biofuels

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Background:

Viewing the larger scope- liquid fuels concerns
• 1970 versus 2005
• Supply Driven
• Demand Driven
Supply Driven:

- Ethanol (grain and cellulosic)
- Liquids from Coal
- Hydrogen
- Middle East & USSR
- Price
Demand Driven:

- Price
- Rationing
- Regulation

New Technology/Conservation

- Transportation Infrastructure
Viewing ethanol in its limited context

Ethanol $\rightarrow$ higher corn prices $\rightarrow$ higher ethanol costs $\rightarrow$ more subsidy
Ethanol Capacity: Existing + Under Construction:
Source: Renewable Fuels Association
Ethanol Capacity Existing and Under Construction: June 2007

Million Gallons/Year

- **ia**: Existing 3,432, Under Construct 1,461, Total 4,893
- **ne**: Existing 1,212, Under Construct 808, Total 2,020
- **il**: Existing 1,104, Under Construct 808, Total 1,912
- **mn**: Existing 910, Under Construct 508, Total 1,418
- **sd**: Existing 808, Under Construct 508, Total 1,316
- **in**: Existing 508, Under Construct 498, Total 906

Renewable Fuels Association
Existing and New Ethanol Capacity: June 2007

- WCB (nd, sd, neb, ks, mn, ia, mo):
  - Existing: 4,000 million gallons per year
  - Construction: 3,400 million gallons per year
  - Total: 7,802 million gallons per year

- ECB (wi, il, ky, tn, mi, in, oh):
  - Existing: 1,200 million gallons per year
  - Construction: 1,200 million gallons per year
  - Total: 3,400 million gallons per year

- Other States:
  - Existing: 400 million gallons per year
  - Construction: 400 million gallons per year
  - Total: 1,240 million gallons per year

Renewable Fuels Association
Total Ethanol Corn Capacity by Mid-2008 Relative to 2007 Production

- IA: 48%
- NE: 34%
- IL: 18%
- MN: 33%
- SD: 59%
- IN: 28%
- KS: 39%
- WI: 36%
- OH: 24%
- TX: 52%
- U.S.: 33%
Total Capacity by mid-2008 In Relation to 2007 Corn Production (Sept 2007 USDA Estimate)

- WCB (nd, sd, neb, ks, mn, ia, mo): 39.7%
- ECB (wi, il, ky, tn, mi, in, oh): 24.7%
- Other States: 57.7%
- U.S.: 33.4%
2007 Iowa Weekly Average Distiller Grains - 10% Moisture
Assumptions: August 2007
- Construction cost = $1.90/gallon of capacity
- Natural Gas = $8.00/mbtu
- Wholesale gasoline = $2.00
- Ethanol yield = 2.7 gallons/bushel
- Distiller’s dried grains = $100/ton
## Ehanol value/price margin – additive or other

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<th>Date</th>
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Key areas of environmental impact:

Water Quality:
• Production Plants
• Crops – grain or cellulosic!
• Land use – land quality & intensity
• Carbon Ratio
• Energy Ratio
Policy Considerations
Trajectory of Current Ethanol Policy

• Crop Prices & Cropping Impacts
• Subsidy/Renewable Fuel Standards Costs
Role of Transition Policy

• Improved Energy output per water/energy input
• Long term sustainability life cycle based
• Reduced loadings of nutrients, pesticides & sediments
• Lower net Carbon emissions
Where Might We Go?

• Link to demand and consider cost effectiveness
• Consider Biofuels in the context of liquid fuels overall
• Consider a Transition Policy with performance standards