U.S. Fuel Ethanol Industry: Trends and Future Development

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The Trend in Ethanol Plant Sizing

- Sizes increasing
  - In the 1980s, sizes ranged from 20,000 gallons per year to 7 million gallons per year (MGY)
  - In the 1990s, 20-30 MGY plants became standard
  - Today, 100 MGY is becoming the standard
Ethanol Production Growth in the U.S.
Projections through 2008

Requires ~ 4 billion bushels of corn

Average growth = 2950 mmgy gal./yr.

Average growth = 770 mmgy gal./yr.

Average growth = 75 mmgy gal./yr.

Requires ~ 4 billion bushels of corn
As of January 2007

- In operation: 113 plants, 5.48 bgy
- Construction: 65 plants, 5.35 bgy

U.S. Ethanol Plants
As of January 2007
Educate the Consumer

- Ethanol Promotion and Information Council
  - EPIC was formed in the U.S. to help raise consumer awareness and demand for ethanol
Research showed 1 in 3 consumers consider themselves aware of ethanol and likely to purchase. After exposure to the benefits, 3 in 4 would choose ethanol.
Grain and Cellulose R&D Facility (Lifeline Foods – St. Joseph, MO)

- Goal—Demonstrate new technology for grain-fed plants
- Pilot plant investigates both forms of ethanol production from cellulose
  - Sugar platform – converting corn fiber to ethanol
  - Thermal platform – converting corn fiber to ethanol
Exploring New Feedstocks

- Cassava
- Wheat
- Sugar/Molasses
- Barley
- Sorghum
- Cellulose
Some experts say that the U.S. has enough excess cellulose to replace all imported petroleum products:

- Corn stover
- Wheat straw
- Wood waste
- Energy crops
- MSW (municipal solid waste)
How do we transport products?

- Infrastructure and transportation assets will be a key component
  - Gasoline terminals
  - Ethanol by truck, rail and barge
  - Distiller’s grains by truck, rail and barge
An example 100 MGY plant

- If 75% into national markets (rail) and 25% into regional markets (truck) for ethanol and distiller’s grains

  - **Corn Supply**
    - 118 Trucks per day

  - **Ethanol**
    - 7.3 Railcars per day
    - 9 Trucks per day

  - **Distiller’s grains**
    - 7.5 Railcars per day
    - 24 Trucks per day (WDG)
If you extend the example out to 3 billions gallons new production

- If 75% into national markets (rail) and 25% into regional markets (truck) for ethanol and distiller’s grains
  - **Corn**
    - 3,540 Trucks per day
  - **Ethanol**
    - 219 Railcars per day
    - 262.5 Trucks per day
  - **Distiller’s grains**
    - 227.5 Railcars per day
    - 720 Trucks per day (WDG)
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