

ECONOMICS OF BIOENERGY GROWTH IN KANSAS

2007

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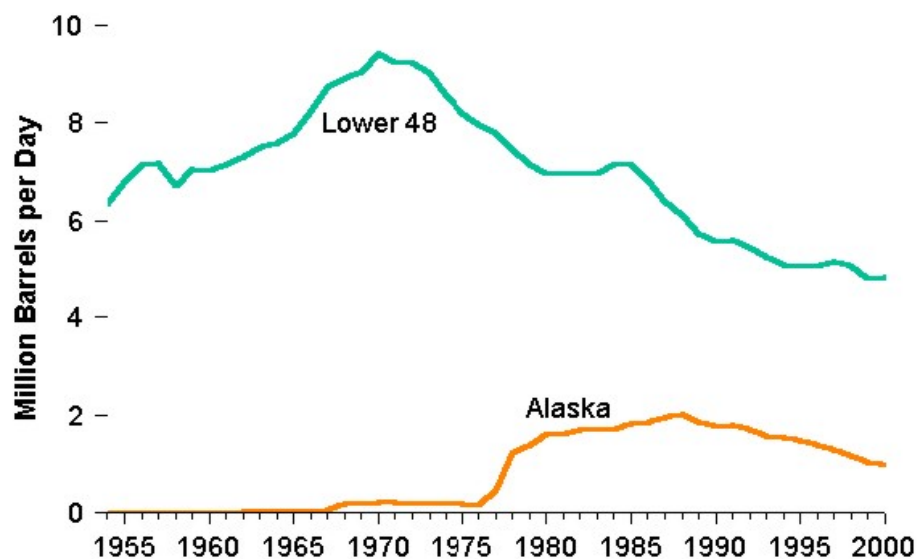
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The Largest Economies and Oil, 2006

1.	United States	\$13.201 Trillion
2.	Japan	4.340
3.	Germany	2.906
4.	China	2.668
5.	United Kingdom	2.345
6.	France	2.230
7.	Italy	1.845
8.	Canada	1.251
9.	Spain	1.224
10.	Brazil*	1.068
11.	Russia	.987
12.	India	.906

U.S. Domestic Oil Production

Source: U.S. Energy Information Agency



U.S. Oil Import Suppliers, 2007

1. Canada
2. Mexico
3. Saudi Arabia (OPEC)
4. Venezuela (OPEC)
5. Nigeria (OPEC)
6. Algeria (OPEC)
7. Iraq (OPEC)
8. Angola (OPEC)
9. Colombia
10. Kuwait (OPEC)

Source: Energy Information Administration

Sources of Total Renewable Energy Used, United States, 2006

■ Biomass (Biofuels)	48
■ Hydro	42
■ Geothermal	5
■ Wind	4
■ Solar	1

2007 Sense of Congress Resolution – 25% by 2025
Now 6%.

Net Energy Balance

<u>Product</u>	<u>Energy Out/Energy In</u>
Gasoline	.81
Ethanol from grain	1.67
Ethanol from cellulose	2.00
Diesel	.83
Bio-diesel	3.2

Source: Congressional Research Service, RL32712, May 18, 2006

Ethanol and Water

Corn Production

Rule of thumb – 1" water \approx 9 bu. of corn per A.
or 800 to 1,000 gallons of water per gallon of ethanol
(Bu./ A./ inch of water: corn - 9; wheat 4; soybeans 3)

To grow 200 bu. corn requires about 22" of water during the 5 month growing season from rain, water stored in the root zone, or irrigation.

Ethanol Process Water

Grain – 3.5 to 5.5 gallons water per gallon of ethanol
Cellulosic ethanol may require twice as much water per gallon

Corn Usage Estimates (Millions of Bushels)

	USDA/WASDE 2006/07	USDA/WASDE 2007/08 est.
Feed and Residual	5,750	5,650 ¹ (-2%)
Food, Seed, and Industrial	1,375	1,390 ² (+1%)
Ethanol for Fuel	2,150	3,200 (+49%)
Net Exports	2,100	2,350 (+12%)
Ending Stocks	<u>1,137</u>	<u>1,897</u> (+67%)
Total Usage	12,512	14,487 (+16%)
 Production	 10,535	 13,168 (+25%)

¹ Assumes DDGS retain 30% of the feed value of corn and are included in the feed and residual category by the USDA.

² Industrial, food, and seed less ethanol.

Local Community Impact of an Ethanol Plant (millions of dollars)

	<u>50 mgy</u>	<u>100 mgy</u>
Annual Expenditures	46.7	88.2
Gross Revenue	209.2	406.2
Household Income	29.2	51.2
Employment (total jobs)	836	1,573
Gross State Product	115.0	223.4

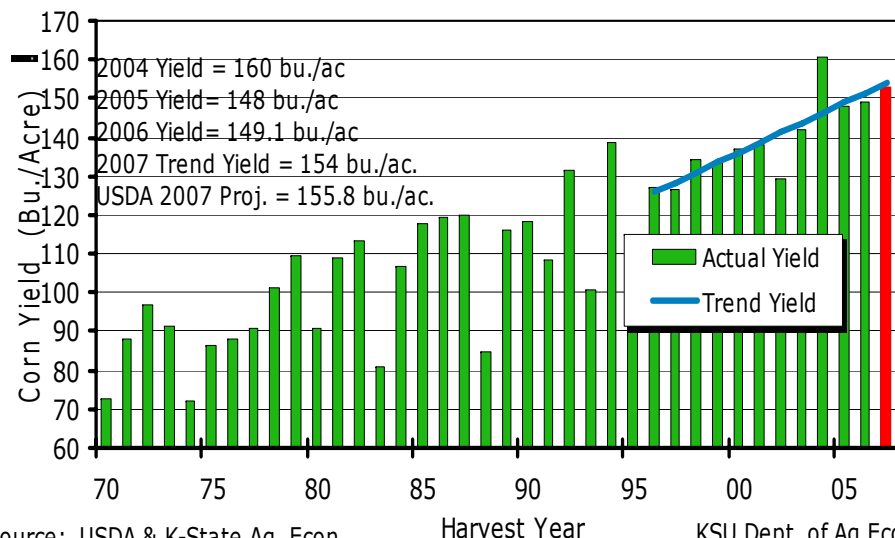
Contribution of the Ethanol Industry to the Economy of the United States, John M. Urbanchuk, February 21, 2006. prepared for the Renewable Fuels Association.

Land in Crops (Millions of acres)

	<u>5 yr. Ave.</u>	<u>07/08USDA</u>	<u>Proj. 08/09</u>
Corn	79.6	92.9	87.0 (-6%)
Soybeans	74.2	64.1	70.0 (+9%)
Hay	62.4	61.8	61.8 (--)
Wheat	59.5	60.5	64.0 (+6%)
Cotton	14.1	11.1	10.0 (-10%)
Grain Sorghum	8.1	7.8	7.3 (-6%)
Principle Crops	297.9	298.2	300.1
CRP		35.9	34.8 (-3%)

Total crop land in the United States – 441.6 million acres

U.S. Corn Yield



Source: USDA & K-State Ag. Econ.
 WASDE Report: 8.10.07

KSU Dept. of Ag Econ
www.agmanager.info

Future Ethanol Technology

- Cellulosic Ethanol
- Bio-butenol

SUMMARY

Grain-based ethanol production...

- is only part of energy security.
- capacity expansion will slow.
- affects water resources in western areas.
- is not distorting grain usage patterns.
- will cause changes in cropping practices.
- positively impacts rural community and state economies.