

Ethanol Production in The
United States: how the US
public are being misled

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Impact of Ethanol Production on U.S. and World Agriculture



U.S. Ethanol Production

- 2003: 2.81 billion gallons
- 2004: 3.4 billion gallons
- 2005: 4 billion gallons
- 2006: 5.5 billion gallons

[chart](#)

U.S. Ethanol Production

- Currently, there are 118 ethanol production facilities in the U.S.
- 76 more under construction

[map](#)

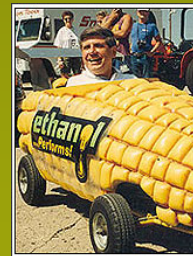


Who is supporting ethanol production?

- Today, about 40% of the nation's ethanol facilities are owned by farmers and other local investors.
 - They have driven the growth of the industry over the past decade
- Most of the facilities under construction are made up of farmer cooperatives, though a number of new companies and investors have joined the industry in the last few years.
- The largest producer of ethanol in the U.S. is Archer Daniels Midland Corporation
 - Agricultural giant
 - Made profits of 10.98 billion in 2006

Types of Ethanol

- E10- blend of 10% ethanol and 90% unleaded gasoline
 - Safe to use in all vehicles without modification
- E85- blend of 85% ethanol and 15% unleaded gasoline
 - Can only be used in flexible fuel vehicles (FFVs)
- The American Coalition for Ethanol (ACE) is trying to overcome technical and regulatory obstacles to use blends above 10% such as E20, E30, and E40



Corn Production for Ethanol

- Corn is the primary feedstock for U.S. ethanol production



U.S. Corn Production for Ethanol

- Less than 5% a decade ago
- 2000: 6%
- 2005: 14%
- 2006: 20% (over 2 billion bushels- nearly equal to the amount of corn exported)



Corn

- With a corn-to-ethanol conversion rate of 2.7 gallons per bushel, the U.S. ethanol sector will need 2.6 billion bushels per year by 2010 in order to increase their output
 - 1.2 billion bushels more than it consumed in 2005.

Where will the corn come from?

- Divert corn from exports
- Ethanol producers will compete with other buyers in the marketplace and raise the price of corn
- Farmers will increase corn supply
 - Over the past decade, U.S. corn yields averaged 138 bushels per acre, compared with 115 bushels during the previous decade
- U.S. could devote more land to corn

Where will the corn come from?

- U.S. could grow corn more intensively
 - Producers currently pursuing a corn-soybean rotation, might shift to a corn-corn-soybean rotation, or might produce corn continuously every year



Brazil

- World's leader in ethanol production
- By law, all gasoline contains a minimum of 25% alcohol
- Ethanol accounts for 40% of all vehicle fuel
- By 2007, 100% of all new Brazilian cars may be able to run on 100% ethanol
- Ethanol is now being used for aviation

Future of Ethanol in U.S.

- The share of ethanol in total corn use will rise from 12% in 2004/05 to 23% in 2014/15
- In Feb. 2006, annual capacity of U.S. ethanol sector stood at 4.4 billion gallons. U.S. ethanol production could reach 7 billion gallons in 2010, 3.3 billion more than the amount produced in 2005.

Deforestation Diesel

What will happen to the Environment?

- Increased use of chemicals
 - Soils from lands already in production contain less soil nutrients over time
- Environmental degradation
 - Deforestation
 - Previously uncropped land will be brought into production
 - Increased soil erosion on existing farm land
 - Increased amounts of smog
 - Ethanol increases evaporation rate of gasoline which increase smog amounts
 - EPA confirmed with 14 out of 18 realistic models in California

How will the United States get enough ethanol to support energy needs?

- The United States will need an additional 135 billion liters of ethanol per year to reach Bushes target of lower gasoline by 20%
 - The world leader in ethanol production, (Brazil) currently produces 16.5 billion gallons per year
- The United States is currently the largest importer of Brazilian ethanol (58% of total Brazilian export)
- In 2006 Brazil exported almost 70% of the ethanol supply
 - That number will soon increase and is hoped to replace 10% of global gasoline use by 2025
 - Sugarcane planted land will increase from 6 to 30 million hectares

What is happening in Brazil?

- Brazil attempted to use corn as a source of ethanol
- Brazil now is using sugar cane as their source of ethanol
 - More land is being planted with mono-cropping sugarcane
- Severe labor exploitation is occurring to sugarcane farmers
 - Brazil is the largest producer of sugarcane, but has some of the highest levels of poverty in the world

Destruction In Brazil

- Only 2.5 % of the original forest in the sugarcane region remains today
- In order to keep up with global demand, Brazil will need to clear an additional 148 million acres of forest
- Sugarcane is generating a increased return
 - Land is converted that was previously used to grow grains and graze cattle
 - Cattle ranchers are forced to deforest the Amazon in order to have ample grazing land for cattle
 - » This could mislead deforestation causes

Deforestation

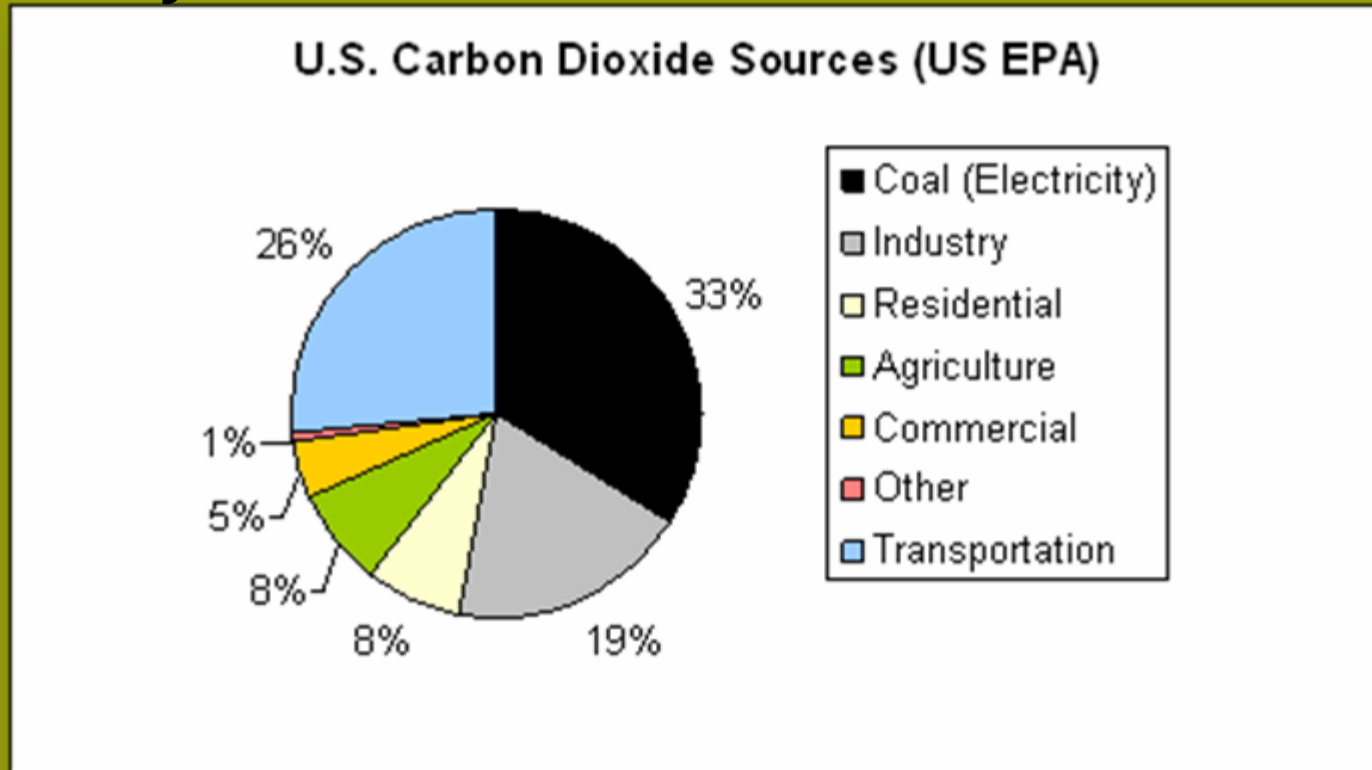
- In the United States monoculture farming strips land of natural nutrients.
 - Land use for farming also increases
 - Natural habitats decrease
- Rainforest accounts for less than 2% of land globally, but it is home to more than 50% of species diversity.

Deforestation Diesel

- World Hunger outweighs the fuel needs of one American
- Ethanol demand from places like Europe promote the destruction of vital habitat in places such as South America and Southeast Asia



Relevancy



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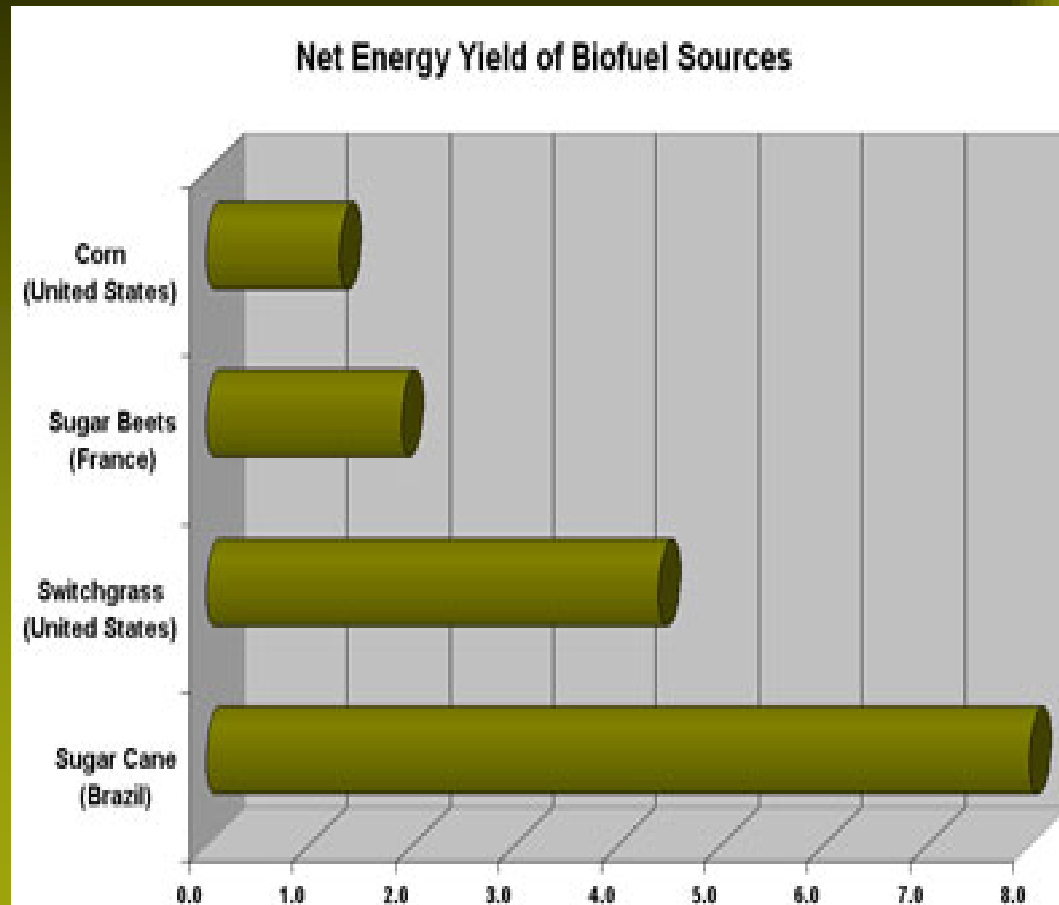
Alternatives

Electricity - Wind, Hydropower, Solar

Transportation - Biodiesel, Ethanol, Hydrogen, Electric

Energy Gain vs. Energy Loss

- Energy In - Energy Out
 - Corn Production
 - Transportation
 - Ethanol Production
- Kyoto



Corn Prices

- High oil prices & low corn prices = happy ethanol producer
 - Break Even Price = \$4.05/bushel (when oil is \$60/barrel) (Elobeid 2006)
- Distance from Plant
 - Farmer owned
 - Conventional business
- Pork and Poultry Farmers suffer

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

Land Prices

- Long-term effects
 - Farmer & Landowner benefit short-term
 - Both lose out in long-term
- Corn prices entice established farmers
- Difficult for new farmers to establish

Alternatives to Corn Pose Threat

- Imported crops displace corn
 - Farmers lose out
- Volatile market as technology changes
 - Investments fail
- Cheaper to import?

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Feedstock and country	Energy yield ratio
Sugarcane, Brazil	7.9
Sugarbeet, Great Britain	2.0
Corn, USA	1.3
Molasses, India	48
Molasses, South Africa	1.1
Corn stover, USA	5.2
Wheat straw, Great Britain	5.2
Bagasse, India	32