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# Solution or Distraction? An Ethanol Reality Check

By JIM MOTAVALLI  
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ETHANOL is on a roll, increasingly promoted as a homegrown alternative to oil from the Middle East. But is ethanol really the fuel of the future, or is it destined to remain a niche product in the Midwest, subsidized by Congress for the benefit of farm-state politicians? Here are some basic questions and answers:



Canadian Renewable Fuels Association  
Corn Cob Bob promotes renewable fuels

**Multimedia**

Chart: Sippers and Guzzlers

**Q.** What is ethanol and how is it made?

**A.** Ethanol is a form of alcohol; in the United States, it is produced mainly from corn. The starch in the corn is converted to sugar, which is fermented to produce the fuel, a process not unlike making corn liquor in a still. Ethanol fuel, typically blended with 15 percent gasoline and sold as E85, has some advantages over gasoline — lower emissions of greenhouse gases and higher octane — but it has about 25 percent less energy per gallon and is incompatible with older cars.

**Q.** How much ethanol is produced in the United States? What's the potential?

**A.** Some 3.9 billion gallons were made in 2005 (nearly triple the 1.4 billion gallons produced in 1998), the Omaha-based Ethanol Promotion and Information Council says. Tom Slunecka, the council's executive director, said production could rise to 40 billion gallons by 2025, displacing a third of the unleaded gasoline now used each year.

**Q.** Is ethanol fuel a new idea?

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A billboard near Boonville, Mo., urged passage of a state law requiring gasoline to be blended with ethanol. Lower left, a pump for E85 ethanol, a blend with 15 percent gas.

A. No. The elimination of lead as an octane booster in the 1970's, and the creation of tax incentives for blended gas by federal and state governments, gave rise to a new market for ethanol as an additive, causing production to jump from 10 million gallons in 1979 to 175 million gallons in 1980. For automakers, the big ethanol opportunity came in 1988, when Congress passed the Alternative Motor Fuels Act. It provided credits for manufacturers that raised their corporate average fuel economy numbers, known as CAFE, for producing gasoline vehicles that were also ethanol-ready. But with the nation's limited ethanol infrastructure, most of the vehicles ended up using gasoline.

Q. So we have a rising number of ethanol vehicles, but not many ethanol stations?

A. Precisely. General Motors' "Live Green, Go Yellow" campaign boasts that the company has built more than 1.5 million ethanol-compliant vehicles. But there are only about 600 pumps — none in the Northeast that sell to the public and only four in California — dispensing E85 ethanol in the United States, which has about 180,000 gas stations. The Energy Policy Act of 2005 provides a 30 percent federal income tax credit, up to a maximum of \$30,000, for each gas station installing alternative fuel pumps. But it may be years before a national network is in place. "If 5 to 10 percent of our gas stations had ethanol, that would be huge," a G.M. spokeswoman, Sherrie Childers Arb, said.

Q. Is this just a G.M. thing?

A. No. Chrysler says it will build 500,000 E85-compliant vehicles a year by 2008; this year, G.M. plans 400,000 and Ford 250,000. Ethanol-ready vehicles range from the [Chrysler Sebring](#) to the [Chevrolet Suburban](#) S.U.V.

Q. Is corn really the best raw material for ethanol?

A. Maybe not. Other countries are producing ethanol, using less energy in the process, from cellulose-rich sources like sugar cane (Brazil), logging waste (Sweden), sugar beets (France) and sweet sorghum (India). The final product is referred to as cellulosic ethanol. Switchgrass, a native prairie perennial cited by President Bush as a possible ethanol source, also shows promise.

Q. Is E85 cheaper than gas?

A. There is not much of a price advantage now, and ethanol's lower energy content — which means you must fill your tank more often — has to be taken into account. E85 prices have risen in some markets to a price slightly less than regular-grade gas, but proponents see it as less subject to supply interruptions and more stable because it is produced in the United States.

Q. Don't some scientists contend that making ethanol requires more energy than it produces? Is there enough agricultural land to eventually grow all of the nation's fuel?

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A. David Pimentel, a professor at [Cornell University](#), published a paper in 2005 with Tad W. Patzek of the [University of California](#), Berkeley stating that the corn-to-ethanol process powered by fossil fuels consumes 29 percent more energy than it produces. The results for switchgrass were even worse, the paper said, with a 50 percent net energy deficit. "I'm sympathetic, and I wish that ethanol production was a net positive and a help to this nation," Dr. Pimentel said in an interview. "But I'm a scientist first and an agriculturalist second. I don't think the U.S. will meet its goals with biofuels." He also said the United States did not have enough agricultural land to displace gasoline with biofuels.

Others are far more sanguine. Arthur J. Ragauskas, a professor at the Georgia Institute of Technology and the co-author of a positive study about ethanol that appeared in the journal *Science* in January, said the nation could replace a third of its current fuel demands by focusing on cellulosic ethanol from forest products and agricultural residue. Mr. Slunicka of the Ethanol Promotion and Information Council said that Dr. Pimentel's calculations did not account for the increasing efficiency of ethanol plants and rising yields of corn per acre.

Q. Could we actually replace fossil fuel with biofuel?

A. Environmentalists have grand visions for biofuels. Roland Hwang, vehicles policy director at the Natural Resources Defense Council, says the group's research shows that by 2050, biofuels could replace gasoline if cars were also made more fuel-efficient and a program of "smart growth," reducing the need to drive long distances, was put in place.

Q. Aren't the Swedes already making that vision come true?

A. With only nine million people and four million cars, Sweden already has a network of 320 ethanol stations (half as many as in the United States), and a vision of going "fossil fuel free" by 2020. Sweden is importing most of its alcohol fuel from Brazil, but plans eight plants to produce cellulosic ethanol.

Saab has sold 5,500 BioPower 9-5 models for the home market that can run either on gasoline or ethanol. Volvo is building as many as 7,000 flex-fuel cars this year that can run on ethanol, and 2,500 cars that can run on gasoline or "biogas," a form of methane that comes from landfills.

Q. Finally, who's this "Corn Cob Bob" guy?

A. He's the mascot of the Canadian ethanol industry, promoting good will for corn-based fuel by attending events and handing out balloons and other goodies. But he was unceremoniously thrown out (on his ear) at Canada Day festivities in Ottawa last year, reportedly at the behest of Shell Canada, which had paid to be an exclusive sponsor.

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