



Addicted to Oil and Drunk on Ethanol

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As President Bush goes to Brazil in search of the secret to how they have used ethanol to become "energy independent", many media outlets are starting to catch on that ethanol may not be as great as it has been promised. There are several strains of this out there in the mainstream media, but not as well summarized as a recent [Associated Press piece](#) titled "Biofuels Boom Raises Tough Questions" that pulled most of these together into one place.

It starts off with perhaps the best description of the Ethanol situation.

"America is drunk on ethanol"

America is addicted to oil. Getting drunk on (corn) ethanol does not seem like the way out, just a temporary biofuel bender before we figure out that we live in an energy constrained world.

The article explains what ethanol is, how it differs from gasoline in Energy Return on Energy Invested in plain English and how it may not be the answer to our energy predicament.

It first asks the surprisingly obvious question of "Is Ethanol better than Gasoline?"

For all the environmental and economic troubles it causes, gasoline turns out to be a remarkably efficient automobile fuel. The energy required to pump crude out of the ground, refine it and transport it from oil well to gas tank is about 6 percent of the energy in the gasoline itself. Ethanol is much less efficient, especially when it is made from corn.

So it's not as efficient as gasoline? Fine, but it's renewable right?

Just growing corn requires expending energy -- plowing, planting, fertilizing and harvesting all require machinery that burns fossil fuel. Modern agriculture relies on large amounts of fertilizer and pesticides, both of which are produced by methods that consume fossil fuels.

Oh, so it relies on fossil fuels to a degree. But we can produce it locally here in the US, so it must cost less to transport, right?

Then there's the cost of transporting the corn to an ethanol plant, where the fermentation and distillation processes consume yet more energy. Finally, there's the cost of transporting the fuel to filling stations. **And because ethanol is more corrosive than gasoline, it can't be pumped through relatively efficient pipelines, but must be transported by rail or tanker truck.**

Hmm, ok but it must still be worth it in the end right?

In the end, even the most generous analysts estimate that it takes the energy equivalent of three gallons of ethanol to make four gallons of the stuff. Some even argue that it takes more energy to produce ethanol from corn than you get out of it, but most agricultural economists think that's a stretch.

Making ethanol is so profitable, thanks to government subsidies and continued high oil prices, that plants are proliferating throughout the Corn Belt. Iowa, the nation's top corn-producing state, is projected to have so many ethanol plants by 2008 it could easily find itself importing corn in order to feed them.

But that depends on the Invisible Hand. Making ethanol is profitable when oil is costly and corn is cheap. And the 51 cent-a-gallon federal subsidy doesn't hurt. But oil prices are off from last year's peaks and corn has doubled in price over the past year, from about \$2 to \$4 a bushel, thanks mostly to demand from ethanol producers.

Well this must be a rude awakening for auto driving America. We can't just switch fuels for our gas tanks. It's good to see this stuff making it out into the mainstream media.

The higher corn prices affect many basic commodities like beer, breakfast cereal and tortillas.

High corn prices are causing social unrest in Mexico, where the government has tried to mollify angry consumers by slapping price controls on tortillas. Lester R. Brown, president of the Earth Policy Institute, predicts food riots in other major corn-importing countries if something isn't done.

U.S. consumers will soon feel the effects of high corn prices as well, if they haven't already, because virtually everything Americans put in their mouths starts as corn. There's corn flakes, corn chips, corn nuts, and hundreds of other processed foods that don't even have the word corn in them. There's corn in the occasional pint of beer and shot of whisky. And don't forget high fructose corn syrup, a sweetener that is added to soft drinks, baked goods, candy and a lot of things that aren't even sweet.

Some freaks even eat it off the cob.

But it doesn't stop there. Go a bit further up the food chain and prices are going up even more:

It's true that animals eat more than half of the corn produced in America; guess who eats them? On Friday the Agriculture Department announced that beef, pork and chicken will soon cost consumers more thanks to the demand of ethanol for corn.

It's also true that there's a difference between edible sweet corn and the feed corn that's used for ethanol production. But because farmers try to grow the most profitable crop they can, higher prices for feed corn tend to discourage the production of sweet corn. That decreases its supply, driving the price of sweet corn up, too.

The article also bursts the bubble many people have about ethanol that despite all the trade-offs, it really isn't helping us get to energy independence.

America's appetite for corn is enormous. But Americans consume so much gasoline that all the corn in the world couldn't make enough ethanol to slake the nation's lust for transportation fuels. Last year ethanol production used 12 percent of the U.S. corn harvest, but it replaced only 2.8 percent of the nation's gasoline consumption.

But perhaps the problem isn't ethanol, but the feedstock? Corn is not the best feedstock, but perhaps something else is?

Ethanol would be more beneficial both environmentally and economically if scientists could figure out how to make it from a nonfood plant that could be grown without the need for fertilizers, pesticides and other inputs. Researchers are currently working on methods to do just that, making ethanol from the cellulose in a wide variety of plants, including poplar trees, switchgrass and cornstalks.

But plant cellulose is more difficult to break down than the starch in corn kernels. That's why people eat corn instead of grass. Plus it tastes better.

There are also technical hurdles related to separating, digesting and fermenting the cellulose fiber. Though it can be done, making ethanol from cellulose-rich material costs at least twice as much as making it from corn.

Great, so when will we get there?

Some experts estimate that it will take 10 to 15 years before cellulosic ethanol becomes competitive.

For more on the whole ethanol debate for beginners I highly recommend reading Robert Rapier's [Lessons from Brazil](#), which ends with this challenge:

The real lesson from Brazil is that energy independence can be achieved by slashing our energy usage. It is simply not realistic to expect the U.S. to achieve energy independence with biofuels - unless we sharply curb our consumption. The next time you hear someone say we should emulate Brazil's example, ask them to calculate the amount of ethanol this would require, and ask them how we are supposed to produce that much. It is time to start demanding details from the "Brazil believers" In doing so, we may convey the gravity of the situation to those who think ethanol will lead us to energy independence.

Well Said.



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