



Hard Look at Gov. Pataki Ethanol Proposal

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As expected, Gov. George Pataki's (R-NY) alternative fuel proposal that I [wrote about](#) earlier in the week, is largely based on increasing ethanol production and availability. As I learned from Cornell Professor Pimentel's [analysis of corn to ethanol](#), the Energy Return On Energy Invested (EROEI) is low (perhaps less than 1.0) and cannot be scaled to replace more than a fraction of transportation fuel. But the proposal has stirred earnest debate in New York about the efficacy of investing so much in ethanol with this [NY Times article](#).

Gov. George E. Pataki wants to ... make ethanol and biodiesel, two controversial alternative fuels, available in the 27 service areas on the New York State Thruway and in 100 more stations throughout the state as early as this year, in a first small step toward reducing the state's petroleum consumption. The governor is also proposing incentives to bring refineries that produce ethanol into the state.

So, let's explore ethanol's place in New York's alternative energy basket.

EROEI

In energy production, this is all that matters. You don't want to waste energy trying to make less energy. Given how dependent our agriculture is on fossil fuels for fertilizer, equipment and how energy intensive it is to refine ethanol for burning, it's not surprising that the full EROEI calculation doesn't add up for ethanol:

Adding up the energy costs of corn production and its conversion to ethanol, 131,000 Btu are needed to make 1 gallon of ethanol. One gallon of ethanol has an energy value of only 77,000 Btu. "Put another way," Pimentel said, "about 70 percent more energy is required to produce ethanol than the energy that actually is in ethanol. Every time you make 1 gallon of ethanol, there is a net energy loss of 54,000 Btu." (Pimentel)

So before we invest too much in ethanol production and distribution, let's make sure there is a positive EROEI. This probably means moving to a more organic method of farming, which would be a great thing, but this doesn't seem to be part of the proposal. Wouldn't it be a cruel hoax if by subsidizing ethanol production to move away from fossil fuels, we end up encouraging more intensive farming practices that require more fossil fuels?

Scale

Let's assume the first (and very important) hurdle of a positive EROEI of 2-5 is met. The next issue we would have to deal with is exactly how much fuel we could replace with corn ethanol:

If all the automobiles in the United States were fueled with 100 percent ethanol, a total of about 97 percent of U.S. land area would be needed to grow the corn feedstock. Corn would cover nearly the total land area of the United States. (Pimentel)

Which is impossible, plus we have to use some of that corn to eat too. Most of the corn produced in this country goes to feed livestock for meat production, so at best we could only replace perhaps a fraction of the gasoline demand and we'd all have to become vegetarians.

Pollution

And from the NY Times, we learn that it's not like ethanol is really that "green" from a local air pollution/global warming perspective since carbon and other dangerous chemicals are still released into the atmosphere:

Peter Iwanowicz, a director of environmental health for the American Lung Association of New York, said the environmental benefits of the two fuels were mixed.

"Ethanol increases ozone formation, which is obviously harmful for people with lung disease, and biodiesel increases emissions of nitrogen oxide," he said.(NY Times)

Politics

Then we finally get at the political dimension to Pataki's ethanol idea, which goes beyond just having a Green Republican image:

Mr. Pataki has been criticized for promoting ethanol because it is made from corn grown in states that include Iowa, which he has been visiting recently to gauge support for a possible presidential run...Environmentalists have largely denounced making ethanol-capable vehicles, calling that a boondoggle intended for the agriculture lobby and Detroit. When automakers build cars and trucks that can use ethanol, called flex-fuel vehicles, they earn credits that make it easier to meet fuel-economy regulations, in turn giving them leeway to build more gas-guzzlers.

Now that's triangulation politics that even Clinton (Bill or Hill) would be proud to play. And at the end of all this it seems we will be using more fossil fuels than ever before.

A Better Way for NY: Niche Strategy for Cellulose Biofuels

This kind of examination is helpful because it redirects us to better ideas, like plug-in hybrids and biodiesel made from cellulose, instead of food that can be eaten:

...even the governor's advisers say that making ethanol from corn is a bad idea and that they prefer using wood or certain kinds of grass. The plan also includes incentives to help the state modify its hybrid-electric vehicles so that the cars can be plugged into stationary outlets to enable them to use even more electricity than fuel, a practice discouraged by the auto industry.

These aren't universal answers to replacing fossil fuels, but they can serve as incremental steps to a world that is better prepared for peak oil.

Just putting aside the plug-ins for the moment, here's my bio-fuel proposal for New York:

Step #1. Create more incentives for local farms to reduce their consumption of fossil fuels.

Step #2: Locally produce a biodiesel fuel (not ethanol) from excess cellulose or cooking oil waste (not usable food) with a positive EROEI. Create a complete system from farm to refining to sales outlet that is not highly dependent on fossil fuels.

Step #3. Target useful niches in the transportation system, like Buses and Trucks, which run on

diesel only and can be easily adapted to biodiesel. These are highly efficient at moving people to work and products to market. More essential to the economy than a single occupancy vehicle, which could use ethanol.

Step #4. Roll this new fuel out in the distribution chain of diesel outlets using only biodiesel supply trucks. Then set realistic targets to convert a significant percentage of over to locally produced biofuels.

This plan would spur more local organic farms and stimulate a local bio-fuel supply system that could operate relatively independent of fossil fuels. This system could keep the economy moving in a fuel crisis and it wouldn't be competing with all the single occupancy vehicles directly since they can't run on diesel.

If Gov. Pataki really wants to insulate the local economy from fossil fuel price fluctuations, then he should really think about the whole supply chain of how biomass becomes a fuel and focus on critical elements in the economy that we would want to prioritize in a fuel crisis.

Send him a [note](#) with your thoughts on ethanol and bio-diesel.



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