Re: Biofuels will just use up our oil even faster

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- *From*: "Stephen Sprunk" <stephen@xxxxxxxxxx>
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Pimental's "research" has been widely and repeatedly discredited. Today, ethanol production gives an output of ~1.7 times the input energy; there was a recent announcement of some folks that've figured out how to improve that nearly an order of magnitude by using bacteria instead of yeast. Biofuels aren't great (only reducing consumption is), but they're not the evil that certain biased "scientists" try making them out to be to appease their oil−industry backers.

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Stephen Sprunk "God does not play dice." −−Albert Einstein
CCIE #3723 "God is an inveterate gambler, and He throws the
K5SSS dice at every possible opportunity." −−Stephen Hawking
"habshi" <habshi@xxxxxxxxx> wrote in message
news:47a4facf.6845953@xxxxxxxxxxxxxxxx

> It takes five watts of energy to make one of grain , and even
> if used the stalk etc. you might get up to 3 watts.
> By growing billions of barrels of biofuel , we will just use
> up our remaining oil reserves even faster , and then all these fields
> will become barren.
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> excerpt
> http://feinstein.senate.gov/05speeches/ethanol−oped.htm
>
> There's just one catch: According to scientists in New York
> and California, it takes more energy to make ethanol than you get back
> in fuel savings. More precisely, says David Pimentel of Cornell
> University, it takes the equivalent of 1.29 gallons of gasoline to
> produce enough ethanol to replace one gallon of gasoline at the pump.
> Instead of making the nation more energy self−sufficient, ethanol
> production actually increases our need for oil and gas imports,
> Pimentel says
> In a recent paper in the journal Natural Resources Research,
> he calculates that it takes the energy equivalent of 271 gallons of
> gasoline to grow a hectare (about 2.47 acres) of corn. Part of that
> energy is for tractor fuel, but the biggest use is for manufacturing

nitrogen fertilizers, which are mandatory for high−yield corn−growing.

These fertilizers are made by heating natural gas under controlled circumstances so that it reacts with nitrogen in the air. Not only does it take heat to do this, but it uses up natural gas that could have been burned as fuel. Pimentel estimates that in corn−growing, nitrogen fertilizers alone use the equivalent of 80 gallons of gasoline per hectare.

More energy is needed to turn the corn into fuel. Ethanol is produced by grinding corn, mixing it with water, and fermenting it in a process similar to that used to make beer or wine. The unprocessed product, in fact, is a lot like beer: 8 percent alcohol and 92 percent water. Not something that's going to burn in a car engine.

To make a usable fuel, all but 0.5 percent of the water must be removed. This is done by a series of distillation and chemical extractions that, according to Pimentel's calculations, use even more energy than was used to grow the corn. And that doesn't count the diesel fuel needed to ship corn to the ethanol plant or ethanol to the pump. In theory, all of these energy costs should make ethanol uneconomical to produce.

But it can be produced affordably, Pimentel says, because the government is subsidizing its production to the tune of $3 billion per year.

Tad Patzek, a chemical engineer at the University of California Berkeley, who collaborated with Pimentel, calls the whole thing a "politically driven initiative" by "confused people" who think it's good for the country. But really, he says, it's equivalent to the medieval alchemist's quest for the mythical Philosopher's Stone, which could turn anything into gold. The only difference is that in this case, the reward isn't gold, it's "pure, environmentally benign energy" that could satisfy the greenest of environmentalists.

"We need a new liquid fuel," Pimentel adds, "but this isn't the one."

Outside the gates
Hosein Shapouri disagrees. An economist with the U.S. Department of Agriculture, he too has spent years studying the amount of energy needed to produce ethanol. His latest calculations, published in 2004, conclude that for each gallon of gasoline invested (or its equivalent in coal, electrical power, etc.), you get back the equivalent of 1.67 gallons of gasoline. That's up, he adds, from 1.36 gallons in 1996 and 1.24 gallons in 1991.

Shapouri charges that Pimentel's work is based on an outdated understanding of how the industry works. "He doesn't see technology," Shapouri says. "Corn production is becoming more efficient, and

ethanol is, too."

Pimentel, on the other hand, charges Shapouri with overlooking important steps in the farm−to−ethanol process. "The reason the USDA comes up with positive returns and we do not," he says, "is that they omit about half of the inputs."

One "input" that Shapouri has overlooked, Pimentel says, is the energy used to make and maintain farm equipment. "Have you seen many farmers raising corn by hand?" he asks. Shapouri "draws the boundary too close to the gates of the ethanol plant," Patzek says. "His whole analysis accentuates the last element of the chain, which is ethanol production."

Patzek also says that Shapouri accidentally mixed up ethanol−production statistics for corn with different amount of moisture in it, so−called "wet" and "dry" corn. "That overestimates the yield by 15 percent," he says.

Patzek thinks the U.S. needs a two−pronged approach, neither of which involves ethanol. First, he says, we need more efficient cars. Doubling the average car's fuel efficiency would cut gasoline needs in half, while converting all of the nation's corn production into ethanol would only satisfy 12 percent of current needs, he says.

Similarly, he says, we could reduce fuel needs by redesigning cities to be livable, rather than "drive−in deserts."

Secondly, he says, we need to remember that corn is merely a natural means of converting solar energy into chemical energy, and that it's not really all that efficient at doing so. Solar cells are much more efficient, and could be harnessed to make hydrogen fuel.

Rather than subsidizing ethanol production, Patzek says, we should invest in research designed to make it possible to produce these cells more efficiently. In the U.S., he predicts that people will eventually realize that corn ethanol isn't efficient and will switch to a succession of other crops, none of which will be much better. A much bigger problem, he says, will come with efforts to supply the developed world's fuel needs with "green" imports from developing countries

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