Re: Conversion efficiency (FAQ?)

Source: http://sci.tech−archive.net/Archive/sci.energy.hydrogen/2006−06/msg00060.html

- *From*: Dan Bloomquist <public21@xxxxxxxxxxx>

- *Date*: Fri, 09 Jun 2006 19:06:10 GMT

Josh Hill wrote:

> A. Mandating that all new cars be capable of running on non−carbon containing (or in the case of hydrogen, made without the release of hydrogen) fuels or the power grid (on the assumption that it can and will be converted to carbon−free operation). This would initially mean flex fuel vehicles running off ethanol or biodiesel.
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> B. Mandating that the new vehicles use an increasing mix of biofuel as cellulosic ethanol and biodiesel become available, just as we mandated the availability of lead−free gas.
>
> D. Establishing as a backup a transfer credit to equalize the price of carbon−containing and carbon−free fuels if reduced demand or oil company shenanigans reduced the price of the former. The government would receive no money, and the transfer credit wouldn't raise the price of gasoline, merely slow the rate of descent under certain circumstances.

What is it with you guys and biofuel?

> Alternatively and less desirably, we could subsidize biofuel by the amount by which it lowered externality costs.

We already do, it is called an ADM handout.

> E. Placing secondary per vehicle limits on biofuel consumption to match projected availability.

Ok one more time...

> I dont expect everyone to read everything I post. but according to a >USDA website, if you convert the numbers posted you see 500 gallons of >ethanol from swichgrass/acre...

That is the gross yield. What is the EROEI? But I'll use your number.

500/42 one for one is 12 barrels/acre/year. You can pretty much get a barrel of fuel from a barrel of oil.

Heating value, Ethyl alcohol to gasoline, 11,600/20,500 so call it 7 barrels/acre/year. (Notice I'm rounding in your favor.)

5E6 * 365 / 7 is 260 million acres a year. That is the size of all the U.S. grains, cotton, and soybeans. More than three times the size of our present corn acreage. And we have not accounted for EROEI.

http://www.extension.iastate.edu/agdm/articles/wisner/WisAug04.htm

Another way to look at it, corn:
Ok, call it 7 billion gallons/year.
(Nation wide planed and existing bio refineries)

We have currently 80 million acres dedicated to corn cultivation.
http://www.extension.iastate.edu/agdm/articles/wisner/WisAug04.htm

This season we yielded 140 bushels per acre
http://www.agriculture.com/ag/story.jhtml?storyid=/templatedata/ag/st...

numbers vary from 2.5 to 3 gallons per bushel but I'll use 3. So if all the corn grown were converted to ethanol that would be 33 billion gallons. So 20% of that corn would go into ethanol.

Now, how does this compare to our liquid demand? 7 billion gallons of ethanol is half a quad of energy. (77000btu/gallon). We currently demand 39 quad of liquid inputs.
http://eed.llnl.gov/flow/02flow.php

So that means 1/80 would be supplied by the gross output of corn. But we still have not accounted for eroei.
http://www.energybulletin.net/14849.html

Looks like the consensus puts it at 1.3. Not a pretty picture for corn.

*** And another, Brazil:

Brazil produces .15mb/d equivalent heat in ethanol.

It isn't an opinion. It is what the numbers say. If the disparity between demand and production grows at just 3mb/d/year that is twenty current Brazils of _gross_ output a year. Even if an EROEI of two is assumed now you are up to forty, (40), Brazils a year. EROEI of corn is 1.3 by consensus so 2 may be quite a leap.
http://www.energybulletin.net/14849.html

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So, before this goes any farther, account for the EROEI of switchgrass. And if the processing is anything like ethanol, you are looking at $60billion/mb/d just for the distilleries. What about the infrastructure to groom, fertilize and harvest this switchgrass? Remember that gross yield requires 50 million acres/mb/d.

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"We need an energy policy that encourages consumption"
George W. Bush.

"Conservation may be a sign of personal virtue, but it is not a sufficient basis for a sound, comprehensive energy policy."
Vice President Dick Cheney

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