

## Re: Solar-hydrogen home power system?

**Source:** <http://sci.tech-archive.net/Archive/sci.energy/2004-10/1308.html>

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**From:** Dan Bloomquist (*EXTRApblic21\_at\_lakeweb.com*)

**Date:** 10/21/04

Date: Thu, 21 Oct 2004 21:28:04 GMT

Ray Drouillard wrote:

> *"Dan Bloomquist" <EXTRApblic21@lakeweb.com> wrote in message*

> *news:41771727.4060908@lakeweb.com...*

>> *Ray Drouillard wrote:*

>>

>

>>> *Efficiency is engineering, not economics.*

>>

>> *If you only get 5% of the heating value of coal to the wheels of a*

>

> *car,*

>

>> *what does that fuel cost? What infrastructure? It does all count. If*

>

> *it*

>

>> *were not about cost, we could cover a little spec of desert with solar*

>> *thermal and stop using coal for electricity.*

>

>

> *Who said anything about using coal?*

If it is about hydrogen from electrolyses, it is about coal.

>

> *Even so, assuming that your statement and figures are right (they look*

> *right), they don't indicate that engineering and economics are the same*

> *thing.*

I never said they were. Read what I wrote if you can get past the Outlook hack.

>>

>> *I've been an advocate of methane powered SOFC, with a possible bottom*

>> *cycle for the heat, for years. But we would have to stop wasting*

>

> *methane*

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- >
- >>*on peakers and get Canada to expand production.*
- >
- >
- > *Eat more beans :-)*
- >
- > *Seriously, though, if we run out of the methane that's in the ground and*
- > *the stuff that's stuck in this methane ice stuff at the bottom of the*
- > *ocean, we can make our own by digesting biomass. Even if no cheap way*
- > *of digesting biomass on a large scale is developed, it is still*
- > *worthwhile to for some people (hobby farmers, homesteaders, people with*
- > *kudzu or water hyacinth infestations) to make methane on a small scale*
- > *and use it to power their cars and homes.*

If we had some ham... Methane hydrates may never be an economical resource. And if it ever is, it may always be too dangerous.

If we had some eggs... Bio from crops will not have an impact on demand for energy.

- >
- > *We need a methane fuel cell that we can buy for a reasonable price.*
- > *After a few years, people will be buying them from the junkyards and*
- > *using them at home.*

<http://www.powergeneration.siemens.com/en/fuelcells>

Last I hear they were looking at \$400/kw. Reasonable.

- >
- >>>*Thirdly, it's a real fuel -- not something that is derived from a*
- >>
- > *fuel.*
- >
- >>>*It can be mined, or very easily created from biomass.*
- >>
- >>*There are no currently viable bio sources. Angiosperms and*
- >
- > *Gymnosperms*
- >
- >>*don't grow rapidly enough to be meaningful. Cultivated algae could*
- >
- > *work*
- >
- >>*in principle. But if it costs like solar...*
- >
- >
- > *Farmers currently dump manure into a big pond and let it rot there.*
- > *There is currently some work on digesting that stuff. It isn't going to*
- > *solve the energy crisis, but it'll turn a liability into an asset for*
- > *those people.*

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It doesn't do anything meaningful for U.S. hydrocarbon demand.

>>>

>>>As far as comparing a hydrogen system to a battery system -- well, I  
>>>expect the battery system to win when you consider efficiency. The  
>>>biggest obstacle for EV transportation is the lousy range of even

>>

> the

>

>>>best vehicle. It would be worth it to some people to give up some  
>>>efficiency just to get more range.

>>

>>I don't think 2 to 3 times the efficiency is just 'some'. So many of

>

> our

>

>>miles are just to get to work and back, short trips. Hell, if those  
>>commuter miles were done in civics and with car pooling, it would

>

> have

>

>>a dramatic effect on our consumption.

>

>

> We are already living with vehicles that are a whole lot less efficient  
> than an EV. We're doing that because EVs cost more (higher capital  
> costs), and EVs have a lousy range and take a long time to refuel.

Are you sure it is not because folks that drive 3 ton SUVs in bumper to bumper traffic aren't willing to give them up? Considering the price of a civic, I wouldn't blame the economics.

>>

>>If you are off the grid, you will likely do what most folks I know off  
>>the grid do. Go on an electrical energy diet while on the batteries.

>

> Use

>

>>a generator for short periods of heavy load. Use PV to supplement the  
>>charge on your batteries. And you go on that diet because PV/batteries  
>>means your electricity runs around \$.35–\$.45/kwh if you figure a

>

> twenty

>

>>year lifetime on the equipment.

>

>

> We are already on an energy diet. We replaced almost all of our  
> incandescent lights with compact fluorescents. Still, it's not as  
> extreme as if we had to deal with costly photovoltaics. Even with the  
> low–cost photovoltaics or a methane fuel cell, I would be changing the

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- > *entire lighting system of the house over to DC–powered fluorescents,*
- > *LEDs, or electroluminescent panels. The microwave would either be*
- > *replaced with a DC model, or I would get one of those inverter*
- > *microwaves and modify the innards a bit. I would modify the computer*
- > *power supplies to run straight from the batteries. I would modify all*
- > *of my power tools that already use a DC motor, and probably grit my*
- > *teeth and use a sine wave inverter for the ones that have induction*
- > *motors. I would have to replace the ballast in the mercury lights (not*
- > *that I use them much). The furnace and pellet stove would probably no*
- > *longer be necessary.*
- >
- > *But it wouldn't necessarily be for the money. We only spend eighty*
- > *bucks a month on electricity right now, so paying off a system that*
- > *costs more than a couple grand is going to take a few years.*

If you are using 25kwh/day, you have a surprise coming. You should crunch some numbers.

- >>>*Then, of course, there are things like inverters and/or DC*
- >>
- > *appliances.*
- >
- >>>*The ceiling fans would have to be ripped out and sold. I would also*
- >>>*have to find something to replace the compact fluorescent lamps that..*

I don't understand your aversion to an inverter. They are commonly used by off gridders.

- >
- >>>*So, my next realistic step is to make a digester to turn organic*
- >>
- > *garbage*
- >
- >>>*into methane. I don't expect to find an affordable methane fuel*
- >>
- > *cell*
- >
- >>>*any time soon, so if I get more methane than I can burn in my*
- >>
- > *appliances*
- >
- >>>*and vehicles, I'll use it to fuel a standard CNG generator, and use*
- >>
- > *the*
- >
- >>>*waste heat to heat the house. Lots of research has to be done*
- >>
- > *before*
- >
- >>>*getting anywhere near that far, though.*

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As I missed it last time. You need to crunch numbers. Digesters are used in the third world. It takes something on the order of 500 feet<sup>3</sup> just to run one cooking burner from what I've seen. An auto alone will demand some 100 times that energy.

>  
>>>*to make that practical. On a large scale, off-shore nuclear energy*  
>>>*would make it a good option. On a small scale, it would take a very*  
>>>*specific set of conditions to make it worthwhile.*  
>>  
>>*Even if you have to put in hundreds of miles of super conduction*  
>>*transmission, pumped storage would win hands down because of the loss*  
>>*and capital expenditures of hydrogen.*  
>  
>  
> *If you're talking about large-scale production, and getting the greenies*  
> *to stay off your back, you're talking about a nuke plant someplace*  
> *NIMBY -- maybe on some island somewhere. How do we then get the power*  
> *to the people? Hydrogen is one way. Superconducting cables under the*  
> *sea is another.*

This 'what if' is not reasonable.

> *If you're talking small-scale, then the conditions change a bit. To*  
> *make it worthwhile, you need a use for the hydrogen (like a car or*  
> *tractor), a cheap power source (geothermal, hydroelectric, magical*  
> *low-cost PV panels), and expensive alternatives.*

I'm posting from SEH so don't give a lot of attention to the 'good of the few'.

>  
>  
> *I have Mozilla, but I haven't set it up for usenet yet. The thing likes*  
> *to shut itself down at the most inopportune times, so I haven't totally*  
> *weaned myself off of OE yet.*

Version 7 or better? Mine runs all day without a problem.

>  
>  
> *Ray*

Best, Dan.

--  
<http://lakeweb.net>  
<http://ReserveAnalyst.com>  
No EXTRA stuff for email.