Re: Hydrogen economy will never exist

Source: http://sci.tech−archive.net/Archive/sci.energy.hydrogen/2004−07/0333.html

---

From: william mook (*william.mook_at_mokindustries.com*)
Date: 07/13/04

Date: 13 Jul 2004 16:17:22 −0700

"Fred B. McGalliard" <frederick.b.mcgalliard@boeing.com> wrote in message news:<I0sz4r.1J8@news.boeing.com>...
> *"Don Lancaster" <don@tinaja.com> wrote in message*
> *news:40F41838.B6E6FA2C@tinaja.com...*
> ...
> > *Exergy is the thermodynamically reversibly recoverable energy fraction.*
>
> *This is a bit left handed Don. Thermodynamics, reversability, entropy,*
> *recoverable energy, all usefull issues to understand. What is not at all*
> *easy is dealing with a combustion process and a single part of a dual fuel*
> *as if it were no more than hot water.*
>
> > *It is the centralmost key to understanding which energy technologies are*
> > *viable and which are not.*
>
> *So, of course, is entropy. The problem is not that the available energy,*
> *paraphrased as exergy to seperate it from the heat energy which is not*
> *really available, is not central, but that misusing the process is so easy,*
> *it is probably best to stick with entropy.*
>
> >
> > *And clearly shows us why hydrogen from electrolysis flat out ain't gonna*
> > *happen.*
>
> *And again, the conclusion implies the misuse of the very idea. Gasoline, as*
> *we have already discussed, has so much less exergy than the oil and natural*
> *gas used to produce it, on top of the huge losses in the IC engine, that it*
> *equally "flat out ain't gonna happen". Since this inimitable logic fails so*
> *miserably for gasoline, I would suggest a more careful look at how the*
> *argument works for H2. (Not that I would want to suggest H2 in any*
> *unmodified form as a fuel for anything except rockets and scramjets.)*

The power available to every person in a society in general is a function of the cost of power. The sun deposits energy at something like 171,500 terawatts of power. Humanity uses about 5 terawatts of power in the form of oil. Humanity spends around $600 billion per year on this energy.

Spending substantially more than this will reduce the utilization of industrial energy by humanity with resulting reversals in living standards and all that implies. Spending substantially less than this will increase the utilization of industrial energy by humanity with resulting improvements in living standards and all that implies.

Right now the cost of energy is largley dominated by discovery risks and discovery rates of hydrocarbons. Since the sun reliably shines for a known number of hours each year at any location on Earth, these risks are non−existant for solar systems. The costs of solar are dominated by their capital costs.

Given the low utilization of solar power equipment due to the lack of adequate sunlight most times, replacing the 5 trillion watts of human usage with solar implies the construction of 25 trillion watts of solar collectors, along with adequate energy storage and conversion utilities. Dividing costs in half, and applying an 8% discount rate, and a 15 year lifespan for equipment, we can see that $600 billion per year yeilds a capital investment of $5.13 trillion.

SO, if half the cost is chemical processing costs, and half the costs are solar panel costs we need to achieve $0.10 per watt to displace oil in a way that positively impacts the economy of Earth. We also need to process 28 billion barrels of synthetic crude from atmospheric CO2 and water at a capital cost of about $10 fixed capital cost per barrel per year capacity.

Both these numbers are achievable and will provide an alternative to natural oil extracted from fixed reserves while closing the presently open ended carbon cycle that drives our industrial economy.

25 trillion watts, at 40% efficiency implies 100,000 square kiometers of desert lands are converted to solar collectors. Can we control this much land?

Sure!

Mok Industries already has control of this much land − and has prospects of gaining control of more land.

http://www.mokindustries.com