

## Re: Using nuclear power to make renewables and a hydrogen economy cost effective

Source: <http://sci.tech-archive.net/Archive/sci.energy/2004-11/0036.html>

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**From:** daestrom (daestrom\_at\_NO\_SPAM\_HEREtwcny.rr.com)

**Date:** 10/31/04

Date: Sun, 31 Oct 2004 14:38:14 GMT

"Chris Torek" <nospam@torek.net> wrote in message  
news:cm0i61020e4@news2.newsguy.com...

> In article <vaPgd.57660\$107.20200@twister.nyroc.rr.com>

> daestrom <daestrom@NO\_SPAM\_HEREtwcny.rr.com> wrote:

>>But the point was simply that this whole idea of 'excess electricity' is

>>nonsense. When demand is low, less electricity is generated, period. The

>>idea that there is some 'excess' at 2:00AM that is just being 'dumped' and

>>that we would be better served by funneling it over to electrolysis is

>>what

>>I was objecting to.

>>

>>And yes, when you have a variety of fuel types of generation, each with

>>their own startup/shutdown costs/times, and each with their own

>>capital/O&M/fuel cost structures, the decision of which plants to regulate

>>with, which to shutdown and which to run 'flat-out' is complicated.

>

> Indeed.

>

> The entire system is structured around "load-following" -- idling

> and/or shutting down the least-economical generators, so that the

> generation matches the load. Thus, there is no "excess electricity"

> (well, there might be a tiny amount, depending on how one views

> voltage and frequency excursions, but probably an equal tiny amount

> of "deficit electricity" so that it averages out to none).

>

> I think, though, that it is an interesting question -- as a sort

> of academic exercise for the moment -- to consider whether a

> "generation-following" system might, in the end, be *\*more\** economical

> and *\*easier\** to schedule (in load/generation matching software).

> Are there some load(s) that are easy to throttle and yet have a

> good value-for-capital-cost? This is where questions about "making

> synthetic fuels" enter (not necessarily hydrogen: any synthetic

> fuel, including [say] decombused boron, will serve).

>

Yes, it could be an interesting question. Just finding the 'floor' generation setting could be an interesting puzzle. A higher 'floor' would mean more electricity available for a modulating load at 2:00 AM, but the price of electricity would be higher. But a more stable generation demand, brought on by some loads modulating opposite of current loads, could make hi-capital/low-fuel-cost plants more attractive.

After all, utilities have been offering various incentives to 'load-level' for years. But often the non-energy costs of an industry can cancel out the cost-savings. For example, if an industry's labor costs vary from day to night because employees demand a 'shift-differential' (and labor costs are higher than energy costs), such a plant might find it cheaper to operate during the day. Despite higher electricity costs.

> *Having asked this question (even without finding an answer), we  
> can then see that there is now a middle ground: perhaps we could  
> build a system in which \*both\* generation \*and\* load are modulated,  
> in co-operation. This might turn out to be the most economical of  
> all. It also might even turn out to be what happens today: after  
> all, people \*do\* start and stop loads -- including such things as  
> aluminum production -- based on electricity prices. (At least one  
> facility in the Pacific Northwest shut down entirely and just sold  
> their contracted electricity in 2000 and/or 2001, because they got  
> more money from that than they could by producing aluminum.)*

I have heard of several of these types of situations. Some gas-turbine plants have found it more profitable to shutdown and re-sell their gas contracts. But I think both of these are short-term anomalies in the market and not really viable for long-term planning.

> *I  
> merely suggest that perhaps it could be done on a finer time-scale  
> than occurs now: day-to-day, perhaps even hour-to-hour, instead  
> of month-to-month. Of course, the details matter, a lot: losing  
> power unexpectedly in a smelter is not a good thing. Different  
> physical processes have time constraints. Engineering a workable,  
> practical, money-saving system is nontrivial and is not going to  
> happen in this newsgroup. :-)* (None of the three to which this  
> is cross-posted, in fact.)

That's a good point. If we shift to a load-modulated model, the chosen load must be at least as responsive as the current generation-modulated model. If some form of off-peak hydrogen production is used in this load-modulated 'universe', it would have to have the ability to swing its loading to maintain grid stability. So the production facility would need to be under the direction of the ISO and conform to some FERC requirements.

This could be a pretty severe 'damper' on investor interest. Having production modulated at the 'whim' of weather and other industrial loads can stretch out the economics of such a venture.

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