

Re: Destroy this argument....

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- *From:* dave.walters@xxxxxxxxxxxx
 - *Date:* 30 Mar 2007 10:25:15 -0700
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On Mar 30, 8:43 am, "R.H. Allen" <kka...@xxxxxxxxxxxx> wrote:

nada wrote:

This is the problem with solar, it's simply TOO expensive. Alex Nichols always makes a good rational case for alternatives to coal and nuclear and he will forever have my attention because he's no dingbat like others around this place (present company excluded, of course). But it is TOO expensive right now.

Except that without effective storage, PV is **not** an alternative to coal or nuclear. And that's okay, at least in the short term, as 20–30% of our electricity consumption cannot be met inexpensively and reliably by coal and nuclear. With PV currently at something like 0.02% of our electricity consumption, there's plenty of time to worry about transforming it into a useful base load technology and perhaps it will never get there. But for the time being, at least, it is not one.

Alex supposed that a \$26 Billion investment in solar would be rational, why don't they do this for the whole of the country. Because at best you'd get power only about 35% of the day...and BEFORE peak, not at peak, like some contend. In California, the peak will be in 20 minutes from when I write this: 1800 hours. Thus sun is already an hour away from setting. Yesterday, I think, the peak was at 1900. See the problem?

No, that's not it at all. California has a good (for PV) combination of high insolation and high electricity rates. Not only that, but customers (residential and otherwise) through much of California are not charged the same amount for every kWh they use. In many areas, the first few kWh you use cost some \$0.12–0.15/kWh, the next few go up to \$0.20–0.25/kWh, and so on. Some users are paying in excess of \$0.35/kWh for some of their electricity consumption, which is more than the cost of PV in most parts of California. And rates are only going to go up, if only because California needs both more generating capacity and more transmission

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capacity (both of which will ultimately be financed by the ratepayers).

Not only can PV reduce the need for new generation capacity, but if it is installed at the point of use it can also reduce the need for new transmission capacity. California's subsidy program was actually initiated by Republican lawmakers on fiscal grounds after studies showed a high likelihood that ratepayers would collectively pay less over the next 10 years by subsidizing PV systems than they would by not doing so. (The factors that contributed to that conclusion were numerous and if you want to know what they are I suggest you look the studies up at the California Energy Commission web site.) And the subsidy is a ratepayer subsidy, meaning that if you don't buy electricity in California you don't pay into the subsidy program.

The reason we don't do it over the whole country (aside from the fact that this is a program of the government of the state of California, and not the federal government) is that most of the rest of the country doesn't have the combination of sunlight and high electricity rates that makes it work in California. It's actually the electricity rates that make the biggest difference in this calculation — the northeast is the next place in the country likely to see growth in PV installations, despite having much lower insolation than California. A recent study by MIT indicated that a modest amount of PV installed in Massachusetts would save ratepayers money (again collectively) by reducing demand for electricity on the spot market, which tends to be very expensive in the summer months. And New Jersey recently launched a rather large subsidy program of its own, though its not nearly as large as California's.

If we took that \$26 billion we could build probably 15,000 to 20,000 MWs of nuclear, that would run, be reliable, for 24/7. And, with zero emissions of any sort. I know what I'd vote for if I could vote, in Portugal or in California.

That's fine, but you're neglecting the fact that you can't build a cheap, reliable power network without taking a portfolio approach. If 100% of our power came from nuclear reactors, we would have to choose between cheap and reliable — we couldn't have both. Likewise with any technology, be it coal, gas, wind, PV, geothermal, or whatever. Some would be better choices than others in that scenario, but none of them would be better than a mix of technologies for both low cost and reliability.

The point being that spending \$26 billion on nuclear power plants in California only makes sense if 15–20 GW of base load generation capacity is what California needs. California probably needs *some* base load capacity, but it is quite clear to anybody familiar with their summertime rolling blackouts that what they most desperately need is peak generating capacity. Nuclear is both expensive and unreliable in that role.

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R,

I think the \$26 Billion had to do with Portugal, not California, at least that is the way thread seemed to of trickled down. California would do fine with about 6,000 MWs more of nuclear and then the rest be taken up by existing geothml, NG, etc.

But you are right...solar is best when rates ARE high (like today, at \$77/MWhr down from \$100 an hour ago, as it happens). But with a larger base load from nuclear, I'd question if rates would get up that high. It's an interesting economic question. Under a real regulated system like we had perviously, you'd never get high rates, period. But with this insane anarchy of the market, who knows?

The same holds true for a carbon tax. The big nuclear energy folks at GE and Westhinhouse WANT a cabon tax because it boosts both their wind turbine market AND their nuclear market.

On the contraits issue (transmission contraits). Yes, it's a big deal. And, it's being address by PG&E and the ISO/CEC (california energy commission). Big, big projects are under way (they just completed one of them into San Francisco in fact) to upgrade existing lines and add new ones. Ideally, as I've stated before, this upgrade is being built/planned with new sources of generation in mind (in the case of california, another 7,000 MWs of CGT plants).

On price. In PG&E's jurisdiction, the pricing is somewhat lower than you wrote (and PG&E is the states biggest jurisdiction) runs something like this:

11 cents kWh for the first 200 used (if you 'base line' is 200 kWh, but that's average) and 14 cents kWh after this first 200. But, this is only 17% of the state...residences are SMALL despite the building of all the new housing here...it's actually gone down in the last 10 years as an overall % of usage. The big players are urban commercial, suburban light industrial and industrial for 83% of usage. They pay about 9 cents but lower rates have been negotiated.

So...at the end of the month, I'm paying \$140 a megawatt hour! PG&E is buying it and producing it at from \$30 to \$66 dollars a MW hr. Someone is making a killing. At any rate, any source that comes in under \$90/MWhr is, theorectically, doable.

I see nuclear as the 60 to 80% doable base loading (with variable loading for these plants) running then at 60% to 80% capacity with everything else coming in for peak: gas turbines, wind, solar, hydro (which actually is pretty big in California) and other forms of power to make up the difference.

So you know, California has to weird peak power times. There is actually a high load period from around 1100 hours through 1500 hours, then it dips a few thousand MWs and back up again at 20 or 21 hours.

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So, where solar can come in is during the first peak. But the bulk of the 28,000 MWs (for today) can only really be provided economically be cheap base load.

The curve could be seen here:

<http://oasis.caiso.com/>

Click on "system load" to see the rat-shaped curb the state's load. Right now the 11,000 of the system's 28,000 load is being 'imported'...meaning cheap hydro from the Pacific Northwest and pirate generators of the speculative sorts.

David

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