

Re: Research: Wind power pricier, emits more CO2 than thought

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- *From:* disgoftunwells <disgoftunwells@xxxxxxxxxxx>
 - *Date:* Thu, 17 Jul 2008 00:54:35 -0700 (PDT)
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On 17 Jul, 08:28, "rlbell.ns...@xxxxxxxx" <rlbell.ns...@xxxxxxxx> wrote:

On Jul 16, 11:03 am, disgoftunwells <disgoftunwe...@xxxxxxxxxxx> wrote:

On 16 Jul, 08:11, "rlbell.ns...@xxxxxxxx" <rlbell.ns...@xxxxxxxx> wrote:

On Jul 15, 2:13 am, disgoftunwells <disgoftunwe...@xxxxxxxxxxx> wrote:

On 13 Jul, 03:52, Bill Ghrist <notmyn...@xxxxxxxxxxx> wrote:

Regarding the arguments about whether wind power is mature...

If you go back and read the article originally referenced by this topic you will find that the premise has little if anything to do with the maturity of wind power technology. Rather it has to

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do with the amount and type of back up generation that must be provided if wind power is to be a major portion of total generation. The article specifically addresses the situation in the UK, and shows that it is not unusual to have periods of calm winds over all of the UK and continental Europe, sometimes for days at a time, meaning that you need an amount of backup generating capacity equal to the total wind capacity.

Back on topic! Thanks.

And my response was it's an excellent article but there are several points that the author misses. He concedes he doesn't analyse the impact electric cars, which with a 30% market share might provide $10\text{KWhrs} \times 10 \text{ million} = 100 \text{ GWhrs}$ flexible storage capacity.

Let me get this straight: During some parts of the winter when I plug in my hypothetical electric car, not only will I not get any charge, but the electric company will siphon some charge out of it. Even better, it can last every night for a week.

If you agree yes. Probably the easiest way is when you park your car, you set a time for when you want it fully charged. Cheap, complex software does the rest.

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So the vehicle battery is used not for storage, but the charger interacts with the grid to manage the load curve, eliminating some of the need for peaking units that wind supplements fuel for. This makes the economic model for wind worse, not better. Baseload unit produce very inexpensive electricity that wind generators cannot compete against.

Onshore wind power is already cost competitive with most forms of generation, measured by c/KWhr.

The issue raised is that an additional cost of standby capacity is needed.

Making demand more flexible is a way of overcoming some of this requirement.

There are a number of ways of making demand more flexible, of which electric powered vehicles will be the largest scale. (It's like running your dishwasher at night, but on a much bigger scale, and in a smarter way).

This makes the economics of wind better.

He also misses domestic boiler generators / micro CHP, though to be effective that will need improved gas storage facilities.

He did address those when he discussed the kind of gas turbines needed to track varying wind output.

But he was focusing on GW turbines, not KW turbines (or PEM fuel cells).

No the GW turbines are the combined cycle units that are practically baseload units, with thermal efficiencies of up to 60%(GE H1). Tracking variations in wind output is for small peaking turbines in the low-to-mid MW range (5-50), with efficiencies less than 40%. CHP turbines have even worse efficiencies than the ones he referred to,

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and only make economic sense as a topping cycle for a forced air furnace where its high quantities of waste heat are a feature, not a bug (CHP = Combined Heat & Power). As CHP's are typically 15–50 kW, there would need to be hundreds of thousands of them.

I was actually thinking more of 2–5 KW units, but there are about 20 million domestic boilers in UK.

In Winter (when these problems typically occur (If air conditioning doesn't come to dominate demand as in Southern USA)), CHP is about 95% efficient. And over a short cycle, it doesn't matter when you heat your house.

(On that note, as an aside, if the Government wants "carbon neutral" houses, which I don't see as possible, they'd do better to specify a well insulated cubic metre hot water tank and a micro CHP unit).

And the weather analysis didn't cover all of UK and Continental Europe, but covered some of the UK and Denmark / Germany, which will put a premium on wind farms further away, like Lewis. Personally, I think Norway has the best potential for Wind Energy in Europe.

Pity about all that hydro development that economically fills their needs and allows them to export surplus power.

No – BECAUSE they have hydro, building wind allows them to export more. Every KWhr of wind energy can add a almost a KWhr to what they export (or about 0.8KWhr if its stored as pumped storage). And they don't have to worry about additional capacity. (Though for large scale, they might want to increase the power capacity of their hydro resources – i.e. add more turbines)

The problem is that they do not need the capacity and, as a money making venture, it is insufficiently lucrative. Selling a kWh of wind power is only a gain if they can sell it for more than it cost to produce.

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Which is why Norway is starting to invest reasonably heavily in wind.
I'm not sure how they cost their landscape though.

They also have the happy situation of buying cheap wind

electricity when producers have too much of it and selling dear when
there are wind electricity shortfalls.

Which make Norway one giant battery, and enables Denmark to have such
a high mix of wind power. Extended further, it could even help the
Germans get by without nuclear power, which seems to make them happy.
(Especially since, for some reason, Germany has invested hugely in
solar power, which is most productive when the wind doesn't blow.)

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