

A Problem With Wind Power

[www.aweo.org/windbackup.html]

by Eric Rosenbloom

Output figures from wind developers are typically annual averages expressed in the vague figure of "number of homes provided for." Homes, however, account for only a third of all electricity use, and electricity represents only a third of all energy consumption (only a fifth in Vermont). Further, home use of electricity varies widely through the day, week, and year, but wind plants generate electricity by the whims of the wind rather than the actual needs of the grid.

As averages, the figures ignore the fact that hour to hour, day to day, season to season, even the most windy sites experience periods of calm when the turbines are producing no electricity at all and cycles of slower wind when they are producing far less than their maximum capacity. When the wind is too fast, the turbines must shut down to avoid damage.

This variability, they say, is balanced by wiring up a multitude of sites, one of which at any time must surely be producing significant power. Instead of a "free and clean" source of energy, then, the necessary proposal is an expensive network of redundant installations that must fill most of our land and seascapes to have any impact at all.

Despite local variabilities, however, the overall rise and fall of the wind is generally the same over the larger region. The grid must plan for the likely low point, i.e., the least power it may see from all of the attached wind plants. Large power plants cannot respond quickly to the hourly variations of the wind, so they must be already going when the power from the wind plants drops off.

There are solutions to this on a small scale, but for most grid systems, any power produced by wind plants is therefore in practice superfluous. The backup generation is already providing it.

On top of this uselessness, the turbines use a great deal of electricity themselves. Most of them cannot even run without input from the grid. Although they produce electricity intermittently, they consume it continuously. In every report I've seen, input from the grid is not accounted for in the figures of net output. Specifications from turbine manufacturers do not include the amount of electricity they require.

It may be that large wind turbines use as much electricity as they produce. Whether the wind is blowing in the desired range or not, they need power to keep the generator magnetized, to keep the blade and generator assembly (92 tons on a 1.5-MW GE) facing the wind, to periodically spin that assembly to unwind the cables in the tower, to heat the blades in icy conditions, to start the blades turning when the wind is just getting fast enough to keep them going, to keep the blades pitched to spin at a regular rate, and to run the lights and internal control and communication systems.

It is clear that industrial wind generation is not able to contribute anything against the problems of global warming, pollution, nuclear waste, or dependence on imports. In Denmark, with the most per-capita wind turbines in the world, the output from wind facilities equals 15%-20% of their electricity consumption. The Copenhagen newspaper *Politiken* reported, however, that wind provided only 1.7% of the electricity actually used in 1999. The grid manager for western Denmark reported that in 2002 84% of their wind-generated electricity had to be exported, i.e., dumped at extreme discount. The turbines are often shut down, because it is so rare that good wind coincides with peaking demand. A director of the western Denmark utility has stated that wind turbines do not reduce CO₂ emissions, the primary marker of fossil fuel use.

But industrial wind facilities are not just useless. They destroy the land, birds and bats, and the lives of their neighbors. Off shore, they endanger ships and boats and their low-frequency noise is likely harmful to sea mammals. They require subsidies and regulatory favors to make investment viable. They do not move us towards more sustainable energy sources and stand instead as monuments of delusion.

-- December 2004

... for the complete article (this is an abbreviated version), including many links, click on www.aweo.org, "A Problem with Wind Power," by Eric Rosenbloom, Science Writer, E. Hardwick, Vermont