Industrial Wind Plants: Bad Economics, Bad Ecology

by jboone

http://www.masterresource.org/2009/10/industrial-wind-plants-bad-economics-bad-ecology/#more-5413

Editor Note: Jon Boone, a lifelong environmentalist, co-founded the North American Bluebird Society and has consulted for the Roger Tory Peterson Institute in New York. He has been a formal intervenor in two Maryland Public Service Commission hearings and produced and directed the documentary, *Life Under a Windplant.*

Industrial wind technology is a meretricious commodity, attractive in a superficial way but without real value—seemingly plausible, even significant but actually false and nugatory.

Those who would profit from it either economically or ideologically are engaged in wholesale deception. For in contrast to their alluring but empty promises of closed coal plants and reduced carbon emissions is this reality: *Wind energy is impotent while its environmental footprint is massive and malignant.*

A wind project with a rated capacity of 100 MW, for example, with 40 skyscraper-sized turbines, would likely produce an annual average of only *27 MW*, an imperceptible fraction of energy for most grid systems. More than 60% of the time, it would produce less than 27 MW, and at peak demand times, often produce nothing. It would rarely achieve its rated capacity, producing most at times of least demand. Whatever it generated would be continuously skittering, intensifying, magnifying the destabilizing effects of demand fluctuations, for wind volatility is virtually indistinguishable from the phenomenon of people whimsically turning their appliances off and on.

Moreover, the project could *never* produce capacity value—specified amounts of energy on demand, something that should be anathema to regulatory agencies, with their task of ensuring reliable, secure, affordable electricity. The ability of machines to perform as expected on demand is the basis of modernity, underlying contemporary systems of economic growth, wealth creation and well-being.

Machinery that doesn't do this is quickly discarded, although this wasn't the case for much of history (look at the early days of television or radio or even the automobile). Only in the last hundred years or so have has the West come to rely on machines with this standard. Capacity value allows society to go from pillar to post in accordance with its own schedule. Wind provides no capacity value and can pass no test for reliability; one can never be sure how much energy it will produce for any future time. And *generating units that don't provide capacity value cannot be reasonably—and favorably—compared with those that do.*

"Windball" Waste

Adding wind instability to a grid may be an engineer's idea of job security, but it is criminal for ratepayers, taxpayers, and a better environment. *For the grid is then forced to extend itself.* As the wind bounces randomly around the system, operators must continuously balance it to match supply precisely with demand, compensating for the ebb and flow much in the way flippers keep the steel ball in play during a game of pinball.

Windball expends a lot of energy. In real life on the most American grids, more than 70% of any wind project's rated capacity must come from the flippers of reliable, flexible, fossil-fired generation, constantly turned up and back inefficiently to compensate for wind fluctuations. These inefficiencies will result in substantial carbon emissions. And increased consumer costs.

Yes, engineers can make-work by adding wind flux to the system. They can lead a horse to water; but they *can't* make it change its spots…. By its nature, wind will require lots of whips and whistles, even at small levels of

penetration, in ways that will negate the very reason for its being. This is why people quickly switched to steam 200 years ago. Retrofitting modern technology to meet the needs of ancient wind flutter is monumentally backasswards, a sure sign that pundits and politicians, not scientists, are now in charge. It would take more than a smart grid to incorporate such a dumb idea successfully.

Because of wind's unpredictable variability, it can never replace the capacity of conventional generation. Twenty-five hundred 450-foot wind turbines, spread over five hundred miles, *can mathematically* offset a large coal or nuclear plant; but they *cannot do* so *functionally*–for what must happen when 5,000 MW of volatile wind is only producing 100 MW at peak demand times, a common occurrence?

This business is absurd. The whole point of modern power systems has been to move beyond the flickering flutter of variable energy sources. Prostituting modern power performance to enable subprime energy schemes on behalf of half-baked technology is immoral. As is implementing highly regressive tax avoidance "incentives" to make it appear that pigs can fly. No coal plants will be shuttered and little, if any, carbon emissions will be reduced as a result of *this* project—or thousands of them.

Indeed, wind technology mirrors the subprime mortgage scams that wreaked havoc with the economy. Both are enabled by wishful thinking; bogus projections; no accounting restraints, accountability, or transparency; no meaningful securitization; and regulatory agencies that looked the other way, allowing a few to make a great deal of money at everyone else's expense while providing no meaningful service.

Environmental Tradeoffs

Industrial wind projects will clearcut hundreds of acres, if placed on forested ridges. Even small 100 MW industrial wind parks would hover for miles over sensitive terrain, threatening vulnerable species while mocking endangered species protections–and scenic highways strictures. They will cause unlawful noise for miles downrange. They will devalue properties in the area as much as 50%, if they could sell at all. Dynamiting will threaten wells and aquifers. Out-of-region workers would perform most of the temporary construction jobs and only one or two permanent jobs would result, at modest wages. There would be little value added revenue. Claims about local tax revenues would be typically unsubstantiated and unsecured.

There is little that is cognitively more dissonant than supporting the concept of minimizing the human footprint on the earth while cheerleading for the rude intrusiveness of physically massive/energy feckless wind projects. The slap and tickle of wind propaganda flatters the gullible, exploits the well intentioned, and nurtures the craven. It is made possible because there's no penalty for lying in the energy marketplace. The country has evidently arrived at a point in its legal culture where no negative consequences seem to exist for making false or misleading claims to sell wind energy—the stuff dreams are made of. But industrial wind is a bunco scheme of enormous consequence. And people who value intellectual honesty should not quietly be fleeced by such mendacity, even from their government.

A lifelong environmentalist, Jon Boone co-founded the North American Bluebird Society and has consulted for the Roger Tory Peterson Institute in New York. He has been a formal intervener in two Maryland Public Service Commission hearings and produced and directed the documentary, *Life Under a Windplant*, which has been freely distributed within the United States and many countries throughout the world. He also developed the website Stop Ill Wind, www.stopillwind.org, where anyone can read his complete direct testimony, with many related documents, in the Synergics wind case before the Maryland Public Service Commission, along with many other documents. His essay, *The Aesthetic Dissonance of Industrial Wind Machines*, was published in the journal, Contemporary Aesthetics. A revised copy of his June, 2006 speech given in Wyoming County, *The Wayward Wind*, was published last year by McGraw Hill.

A former university academic administrator and now a painter who receives no income from his work on wind technology. He seeks informed, effective public policy–and an environmentalism that eschews wishful thinking because it is aware of the unintended adverse consequences flowing from uninformed decisions.

Blog excerpts re: this article

Charles { 10.24.09 at 2:37 am } In my view this is a good article which summarises all the salient points about wind farms, which is in essence the fact there is nothing good about them. There are no winners with this redundant technology, and it is hard to believe that politicians (and the general population) would fall in so readily behind it.

This whole climate change farrago is throwing up actions in people that I never would have thought possible. Who could ever have forseen the day that we might have a market trading in 'thin air'? It defies even the most extraordinary predictions or imagination!

2 **Denny** { 10.24.09 at 11:24 pm } Mr. Boone, thanks for a very good article..I have to tell you that I'm from Northern Ohio and when I grew up we didn't have Bluebirds here until late 70's and early 80's. I got involved and installed 3 trails with the largest at 19 boxes in one area. I managed 38 over the years and supervised about 20 more…It's work but worth it! Thank you for "your" job well done! Regards, Denny

3 **Jon Boone** { 10.25.09 at 8:32 am } Thanks, Denny. When I was very young I remember reading about the Belgian poet and playwright, Maurice Maeterlinck, who, in his play, The Blue Bird, called it the Bluebird of Happiness. When I looked for it, though, I couldn't find it anywhere. Later I discovered it was the victim of good intentions gone awry. Still later, I worked with others to effect a solution. Ultimately, we created an organization with chapters in every state in the USA, every province in Canada, Bermuda, and parts of Mexico, dedicated to bringing the bluebird back. Of course, the answer was the building of nesting boxes with a certain opening size that excluded large aggressive competitors, then placing these boxes in the right habitat, monitoring them regularly.

Thank you for participating in this important work. It is absolutely worth it. For me, that work was my first recognition that much of environmental history is the undoing of the problematic consequences from uninformed decisions by the well intended, which colors so much of the industrial wind support. Cheers!

4 **Noblesse Oblige** { 10.25.09 at 6:19 pm } Gee. It must be GE.
Yes we have been duped by our political class allied with special interests poised to make money at the government trough — our money. Alexander Pushkin: "As long as you have a trough, there will be no shortage of swine.".

5 **Richard W. Fulmer** { 10.26.09 at 7:46 am } If we do build enough windmills to meet the President's goal of producing 20% of our power from renewables, how many birds will this kill each year (extrapolating from current numbers)? Will that number of kills be enough to damage the environment by reducing the avian check on insects and rodents?

6 **Jon Boone** { 10.26.09 at 11:43 am } Richard: Installing a million or more massive wind turbines, particularly in sensitive montane regions well-known for bird and bat migrations will result in the slaughter of millions of birds and bats over time, and fragment the ecology in ways that will degrade much biodiversity. The second leading cause of bird mortality in this country comes from tall structures.
Placing 400-500 foot wind turbines in areas well known for avian migration, with rotating blades moving at 170 mph at their tips, is imposing a huge risk factor, particular to species with highly vulnerable populations. For a brief but good discussion of this, see Bridget Stutchbury's book, Silence of the Songbirds.

How much this will diminish the avian checks on insects and rodents is conjectural. But there will be consequences. Those who are knowledgeable about how much we've lost already should be appalled at the prospect of further loses wrought by something as pretentious as wind technology.

7 **Robert Nagle** { 10.26.09 at 9:08 pm } Your argument about the variability of wind power doesn't strike me s persuasive or interesting. That just means the need for higher capacity.

The environmental costs are interesting, but I'm not sure you have shown that the environmental costs are any greater than using coal as a power source.

8 **Jon Boone** { 10.27.09 at 9:29 am } Robert: I'm not sure what would strike you as interesting on the wind variability issue. You seem to feel that the wind energy would somehow replace the coal facility, allowing some sort of even-up exchange, thereby getting rid of all that "nasty" coal stuff with problematic wind stuff. I submit this is not only naive. But wrong. You must learn to understand that one cannot exchange a high capacity energy source with one that provides zero capacity.

The are three questions about wind that should perk your interest. One: is it "integratable? The answer is, of course, yes, given that modern grids can integrate virtually anything these days, including a cumquat or a potato, at least at certain levels of penetration. The second question is: at what cost can this integration be achieved? Here the inquiry should include all the variables involved, including financial cost and increased greenhouse gasses , using, say, chronological load dispatch analyses at 15-minute intervals measured over a year's time–to gauge wind impact on the grid. Specifically, one would look at how much conventional fuel would actually be reduced as a specific function of the wind behavior.

I believe such analyses would show that wind behavior would have little affect on total CO2 emissions and would save only miniscule conventional fuel use. And it would increase costs to the consumer substantially, as it has everywhere wind is abundant.

Not a lot to show for all the bombast of a wind physical plant. In today's dollars, a 130MW wind plant is projected to cost $400 million, most of it paid via losses to the Federal Treasury. I've already indicated the environmental risks.

The third question is, can wind projects close any conventional generating units or prevent any new conventional plants from being built in the face of increasing demand or to augment aging infrastructure? And the easy to demonstrate answer is: no. There are now nearly 100,000 wind machines extant in the world, with no demonstrable impact on improving the quality of our energy supply.

What is happening should only give Rube Goldberg satisfaction–in that, with industrial wind technology, the modern world of energy engineering is even zanier than he imagined.

9 **Roger** { 10.27.09 at 12:31 pm } I am a meteorologist. The capacity issue can be illustrated by thinking about the climate of wind. In most of the eastern US, the very hottest and coldest periods which lead to highest energy demand are caused by very large high pressure systems. Those weather systems are characterized by light and variable winds which must reduce the output of the wind farms significantly. As a result, the grid has to keep the fossil-fueled plants available for those peak demand conditions.

I personally disagree with the statement that the wind farms won't cause retirements of coal-fired plants. I think that wind farms will displace coal-fired power plants for large periods of time reducing the revenues of the formerly base-loaded coal plants to the point that some of the coal-fired plants will become uneconomical. To stay viable capacity payments must be increased for the high "capacity value" plants but that is a tough sell politically because it will be construed as a subsidy for coal.

That is until the system reaches the time when the every 20-year immense high pressure system forms that causes a peak energy demand day that cannot be covered by the wind farms and the remaining fossil-plants. Then it will be oops we made a mistake not keeping those coal and oil plants viable, sorry about the blackout.

10 **Wind is not the solution « Green Grift** { 10.27.09 at 2:01 pm } [...] shortcomings of wind generation are becoming increasingly clear. As Jon Boone points out, wind is a bad choice from both an energy and environmental perspective: Because of wind's [...]

11 **Jon Boone** { 10.27.09 at 5:04 pm } Roger: Thanks for your commentary. We evidently agree on the crucial importance of capacity value. Most economists who have studied this issue carefully underscore your point about how wind flutter will make some fossil-fired farms–both coal and natural gas–more problematic to operate because, by operating less, their revenues will be reduced, creating economic distress. Their choice will be either to close–or to charge a lot more to stay in business.

Any closing will be good news for those hoping for the death of fossil-fired generators. And terrible news for electricity consumers expecting reliable, affordable, secure electricity. Since consumers must have capacity, there's not really much of a choice. To get capacity, they'll simply have to pay a lot more than they would without the wind energy.

However one feels about this, though, high capacity electricity production is a sine qua non. It is not really negotiable. If coal plants close in one region because of the economic distress you mention, which I think highly unlikely, as has been the case in Ontario for years, other coal plants will open in other areas, from which the first area will simply import the coal's capacity back–at a higher price, of course.

As is the case with "renewables" in California, what will happen is a political conjuring trick, banning new fossil-fired farms in the state while going out of state, or, as is now the case, out of country, and importing electricity produced from, in this case, natural gas–generated in Mexico. And making everyone pay a lot more in the process, with no real reductions in greenhouse gasses.

This takes both a lot of chutzpa and an exquisitely uninformed citizenry.

12 **Craig Goodrich** { 10.28.09 at 2:40 pm } Roger, Germany, Denmark, and Spain are the most turbine-ridden countries in the world; none have been able to close a single fossil plant.

Also recall that wind power varies as the cube of windspeed, so that a breeze gusting between 24 and 30 mph — a typical and mostly unnoticed variation — would have an entire plant constantly doubling its output, then dropping back. This is simply not commercially viable, even if one were willing to put up with the insane vandalism of our wilderness and countryside and the hideous capital cost per watt actually produced.