

Wind Energy's Real Problems: (Hint: It Has Nothing to Do With The Wall Street Journal)

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Posted on Sep. 14, 2010

<http://www.energytribune.com/articles.cfm/5261/Wind-Energys-Real-Problems--Hint-It-Has-Nothing-to-Do-With-The-Wall-Street-Journal>

My August 24 article in the *Wall Street Journal* has apparently caused some discomfort among various advocates of wind energy.(1)

Given that discomfort, it's worth revisiting the thesis of my *Journal* piece. As a reminder, here's the thesis statement: several studies have concluded that "wind-generated electricity likely won't result in any reduction in carbon emissions – or that they'll be so small as to be almost meaningless."

The subsidy-dependent wind industry has gone to great lengths to counter that thesis. Rather than respond to the fusillade of ad hominem attacks and misinformation that have been unleashed since my article was published, let's look at what the industry's own documents are saying about wind energy's ability to cut carbon dioxide emissions. After that, I'll discuss the real threats to the wind industry – threats that have nothing to do with opinion pieces in the *Wall Street Journal*.

In its 2008 outlook, the Global Wind Energy Council put forward a "reference scenario" based on International Energy Agency projections, which estimated that global wind energy generation capacity will total 500 gigawatts by 2030. That's a five-fold increase over 2007, when global capacity was about 94 GW.(2)

Now, the amount of wind generation capacity that will be installed by 2030 will almost certainly exceed 500 GW. But if that projection comes true, then the wind sector will account for about 4 percent of global electricity production by 2030.(3) And, according to the Global Wind Energy Council, if that goal is achieved, it will reduce global annual carbon dioxide emissions by 731 million tons. That sounds significant. But look at how the GWEC typifies that amount of carbon dioxide : "Under this scenario, *carbon dioxide savings under wind would be negligible*, compared with the 18,708 million tons of carbon dioxide that the IEA expects the global power sector will emit every year by 2030."(4) (Emphasis added.)

Thus, while wind promoters are claiming that carbon dioxide reductions are a key benefit of adding new wind power, their own projections reveal that even if the wind power sector continues growing rapidly, it will only reduce electricity-related carbon dioxide emissions by about 4% by 2030.(5) And given that the electric generation sector represents about 40% of total global carbon dioxide emissions, that 4% reduction from wind – if it occurs – will be almost insignificant, amounting to a reduction of about 1.5% of the total

volume of anthropogenic carbon dioxide emissions.

But let's set aside the reference scenario and instead look at GWEC's most aggressive scenario, and assume that wind energy capacity soars to 2,375 GW by 2030.(6) That would be a 25-fold increase over 2007 levels. It would also be nearly 2.5 times all of the installed electric capacity in the United States.(7) Let's further accept GWEC's claims that the result of all that capacity will be an annual emission reduction of 3.2 billion tons of carbon dioxide.(8) Even with that 25-fold expansion in capacity, the wind sector will only cut the electric sector's overall carbon emissions by 17%.

What will that mean in the big picture? The IEA expects global CO₂ emissions in 2030 to be 40.2 billion tons.(9) Thus, even with a gargantuan increase in wind generation capacity, the reduction in global CO₂ emissions will be just 8% of expected total global emissions.

But can the wind industry even get close to that 25-fold increase?

Given current circumstances, the chances are, as my father used to say, "slim and none, and Slim left town." The problems facing the wind industry are many and varied. Among them: citizen opposition to wind energy is powerful and growing, low natural gas prices, and the high cost of offshore wind energy.

For evidence of the growing opposition to wind energy, consider this September 1 story from the *Copenhagen Post*, titled "Dong gives up on land-based turbines." Here's the lead sentence from the article: "State-owned energy firm Dong Energy has given up building more wind turbines on Danish land, following protests from residents complaining about the noise the turbines make." The article goes on to quote the Danish wind giant's CEO, Anders Eldrup, who said "It is very difficult to get the public's acceptance if the turbines are built close to residential buildings, and therefore we are now looking at maritime options."(10)

Remember that this story is coming from Denmark, the country that wind proponents continually hold up as being the paragon of "green" energy. The opposition to wind energy in Denmark is hardly unique. Europe now has about 400 anti-wind energy groups spread among 20 European countries.(11) Canada has more than two dozen groups.(12) The U.S. about 100 anti-wind groups.(13)

Achieving a 25-fold increase in global wind energy capacity would require carpeting vast areas of open space in the US, Europe, and Asia with turbines. That would mean more turbines located close to populated areas. And as the recent clip from the *Copenhagen Post* shows, locating turbines close to people is "very difficult." Huge increases in wind energy capacity would also require huge increases in high-voltage transmission lines, and the fights over transmission lines are perhaps even more vicious than the fights over the siting of wind turbines.

The other key problem facing wind energy: low natural gas prices. Wind energy competes primarily with natural gas-fired generation.(14) And when gas prices are low, wind energy is at a big disadvantage in the marketplace, even with huge federal subsidies i.e., the \$0.022 per kilowatt-hour federal production tax credit.

In 2008, T. Boone Pickens, one of the wind industry's most reliable boosters, said that gas prices must be at least \$9 per million Btu for wind energy to be competitive in the marketplace.(15) In March of this year, Pickens was once again talking up wind energy, and he declared that "The place where it works best is with natural gas at \$7."(16) That same month, a reporter from Dow Jones summarized Pickens' position by writing "Wind power is profitable when natural gas prices are about \$7 a million British thermal units, Pickens said."

The bad news for the wind industry is that gas is now selling for about \$4 on the spot market.(17) And Paul Sankey, an energy analyst at Deutsche Bank recently wrote that gas is in "fundamental oversupply" and will continue to be in oversupply through 2015.(18) That fundamental oversupply is due to several factors including a surge in natural gas liquefaction capacity in places like Qatar as well as the enormous increases in US gas supplies which are a direct result of the shale gas revolution. The ability of the gas industry to extract huge quantities of gas from shale beds could portend low domestic gas prices for years to come.

Those low gas prices make offshore wind appear even more uneconomic. The cost of building offshore wind projects is about \$5,000 per kilowatt, or about the same as building a new nuclear plant. For comparison, a new gas-fired generation plant costs about \$850 per kilowatt.(19) Those high costs are reflected in the prices that the developers of Cape Wind, the controversial offshore wind project near Cape Cod, are seeking for the electricity that could be generated by the turbines to be located in the waters of one of America's most famous vacation spots. The likely cost for electricity from Cape Wind will be between \$0.17 and \$0.21 per kilowatt-hour. An offshore project off the coast of Rhode Island, Deepwater Wind, was recently rejected by that state's public utility commission because the cost of electricity from the project was expected to be \$0.244 per kilowatt-hour with annual increases of 3.5% per year.(20) For reference, the average retail price of electricity in the US is about \$0.10.(21)

In short, the fulminations of the wind power promoters about my *Wall Street Journal* article are entirely misdirected. Wind boosters want to believe that an evil conspiracy that has been created to short-circuit the push for "green" energy. The real conspiracy they are fighting is a conspiracy of basic physics and basic math.

- (1) <http://online.wsj.com/article/SB10001424052748703792704575366700528078676.html>
- (2) Global Wind Energy Council, "Global Wind Energy Outlook 2008," 15, <http://www.gwec.net/index.php?id=92>
- (3) GWEC, 39.
- (4) GWEC, 46
- (5) The math is straightforward: $731/18,708 = 3.9\%$.
- (6) GWEC, 38.
- (7) US installed electric capacity is about 1,000 GW.
- (8) GWEC's projections are also available in this document: "Wind Power Works," undated, 2, <http://www.gwec.net/fileadmin/documents/Publications/Wind%20&%20climate%20fact%20sheet%20low%20res.pdf>
- (9) IEA, World Energy Outlook 2009, executive summary, 6, http://www.worldenergyoutlook.org/docs/weo2009/WEO2009_es_english.pdf
- (10) <http://www.cphpost.dk/news/scitech/92-technology/49869-dong-gives-up-on-land-based-turbines.html>
- (11) See: <http://www.wind-watch.org/affiliates.php>
- (12) Wind Concerns Ontario, <http://windconcernsontario.wordpress.com/member-pages/>
- (13) Industrial Wind Action Group, <http://www.windaction.org/orglist>
- (14) A 2008 report by the Department of Energy estimated that an aggressive effort to have wind energy provide one-fifth of US electricity needs by 2030 would "displace 50% of electricity generated from natural gas and 18% of that generated from coal." DOE Study on 20% Wind, 2008, 16, <http://www1.eere.energy.gov/windandhydro/pdfs/41869.pdf>
- (15) Steve Hargreaves, "Pickens' wind plan hits a snag," CNNMoney.com, November 12, 2008. Available: <http://money.cnn.com/2008/11/12/news/economy/pickens/index.htm>
- (16) http://www.boonepickens.com/media_summary/030510.pdf
- (17) <http://www.bloomberg.com/markets/commodities/energy-prices/>

(18) <http://blogs.barrons.com/stockstowatchtoday/2010/09/13/exxon-deutsche-cuts-to-hold-natural-gas-glut-through-2015/>

(19) Rebecca Smith, "The New Nukes," Wall Street Journal, September 8, 2009, 3. Available: <http://online.wsj.com/article/SB10001424052970204409904574350342705855178.html>.

Wind figure is for Sheringham Shoal offshore wind farm in the UK. Estimated cost is 1 billion British Pounds. In mid-September 2009, that was equal to about \$1.7 billion. See: "Onshore construction begins for Sheringham Shoal wind farm," NewEnergyFocus.com, September 7, 2009. Available: http://www.newenergyfocus.com/do/ecco.py/view_item?listid=1&listcatid=32&listitemid=2978§ion=Wind

(20) http://www.boston.com/business/articles/2010/05/07/cape_wind_project_could_boost_prices/

(21) http://www.eia.doe.gov/cneaf/electricity/epm/table5_3.html

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Bryce's first book, Pipe Dreams: Greed, Ego, and the Death of Enron, was named one of the best nonfiction books of 2002 by Publishers Weekly. In 2004, he published Cronies: Oil, The Bushes, and the Rise of Texas, "America's Superstate." In 2008, he published Gusher of Lies: The Dangerous Delusions of "Energy Independence." A review of Gusher of Lies in the New York Times called Bryce "something of a visionary and perhaps even a revolutionary." His fourth book, Power Hungry: The Myths of "Green" Energy and the Real Fuels of the Future, was published in April 2010 by PublicAffairs.

An experienced and engaging public speaker, Bryce has spoken to numerous professional and civic groups including the Houston World Affairs Council, American Petroleum Institute, National Association of Attorneys General, and the Bruno Leoni Institute in Rome. He has lectured at universities including the University of Tulsa, University of North Carolina, National Defense University, St. Edwards University, and the University of Texas. He also appears regularly on television and radio programs ranging from the BBC and CNN to PBS and NPR.

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