

## FURTHER INFORMATION ABOUT INDUSTRIAL WIND TECHNOLOGY

On May 3, 2007, the National Research Council of the National Academy of Science, at the behest of Congress, published its conclusions after a year of study about the *Environmental Effects of Wind Energy Projects* in the nation's Mid-Atlantic region ([www.vawind.org/Assets/NRC/NRC\\_Wind.htm](http://www.vawind.org/Assets/NRC/NRC_Wind.htm)). It comprehensively evaluates the problems and limitations of the wind industry over a range of issues. See especially Chapter 2 for a *Context for Analysis of Effects of Wind-Powered Electricity Generation in the United States and the Mid-Atlantic Highlands*.

Jesse Ausubel, noted conservation biologist and climate change researcher, and Director for the Human Environment at Rockefeller University, recently published a brief essay, *Renewable and Nuclear Heresies* in the International Journal of Nuclear Governance, Economy and Ecology, Vol. 1, No.3, 2007 (<http://phe.rockefeller.edu/docs/HeresiesFinal.pdf>). He discusses the importance of conserving important natural habitats on land and the oceans, shows the intrusive nature of renewable energy projects, and summarizes the continuing per capita decline in the use of carbon for energy.

Britain's David White wrote *Reduction in Carbon Dioxide Emissions: Estimating the Potential Contribution from Wind-Power*, commissioned and published by the Renewable Energy Foundation, December 2004: [www.windaction.org/documents/225](http://www.windaction.org/documents/225). It is a thorough, beautifully reasoned analysis of the limitations of industrial wind as a source of energy and as a method of reducing CO<sub>2</sub> emissions.

Tom Adam's *Review of Wind Power Results in Ontario: May to October 2006* published in Energy Probe, November 15, 2006: [www.energyprobe.org/energyprobe/articles/EPreviewofwindpowerresults.pdf](http://www.energyprobe.org/energyprobe/articles/EPreviewofwindpowerresults.pdf). Adams is executive director of Energy Probe, an independent consumer and environmental research team in Canada. He provides a detailed analysis that reports accurately about the subject, despite Energy Probe's active support of industrial wind development.

Jim Oswald wrote an engineering assessment, *25GW of Distributed Wind on the UK Electricity System* (December 7, 2006), that provides data showing wind turbine output varying enormously within a few hours: [http://www.kr-vysocina.cz/soubory/450008/uk\\_wind\\_phase\\_1\\_web.pdf](http://www.kr-vysocina.cz/soubory/450008/uk_wind_phase_1_web.pdf).

Tom Hewson, one of the most knowledgeable energy experts in the nation, a principle in the company, Energy Ventures, has provided testimony at a number of regulatory wind hearings, notably in Maryland-- [http://webapp.psc.state.md.us/Intranet/CaseNum/submit.cfm?DirPath=C:\Casenum\9000-9099\9008\Item\\_053&CaseN=9008\Item\\_053](http://webapp.psc.state.md.us/Intranet/CaseNum/submit.cfm?DirPath=C:\Casenum\9000-9099\9008\Item_053&CaseN=9008\Item_053) and Vermont-- <http://www.windaction.org/documents/720>. See especially his comments on page 8 of his testimony in Maryland: "... wind projects supply only energy not capacity and thus do not prevent the construction of new power plants."

Lincoln Wolverton and Raymond Bliven, an energy economist and an electrical/mechanical engineer in Washington State, collaborated on a paper, *The Overlooked Environmental Cost of a Wind Generation Portfolio to Serve the Need for Power* (June, 2007). This paper makes a critically important point regarding wind's purported environmental benefits, i.e. "...it is misleading to consider wind on an isolated basis—that is, outside of the context of the full power-supply portfolio that is necessary to serve load. In the context of an integrated portfolio, much of the environmental benefit disappears and may even be non-existent as compared with other resource portfolio choices." In short, wind's environmental benefits (if any) will be grid-specific depending on the emissions generated (if any) of the reliable generating source(s) required to back it up.

E.ON Netz GmbH Wind Report, 2004:  
[www.ref.org.uk/pages/press/061004.html...REPORT](http://www.ref.org.uk/pages/press/061004.html...REPORT).

E.ON Netz GmbH Wind Report, 2005: [www.ref.org.uk/images/pdfs/eon.2005](http://www.ref.org.uk/images/pdfs/eon.2005). These reports provide the most comprehensive summary of the way in which extensive wind facilities affect grid operations in Germany.

Hourly Electricity Generation Data from Ontario. This is a link to the Ontario grid system operator (Ontario EISO) website:

<http://www.ieso.ca/imoweb/marketdata/genEnergy.asp>. Click on this link, then click on any day posted. You'll get the hourly generation for all generators feeding the Ontario IESO. Note that capability refers to the installed capacity (what a generator could do at maximum power) and the output shows what is actually being produced. You should also understand that the difference between capability and output for coal and hydro is due to operator choice, not the inherent limitations of the technology; these units are typically used to augment mid and peak load conditions, as well as for demand flux throughout the demand cycle. For wind, however, the difference is due to the limitations of its power source; energy from wind is proportional to the cube of the wind speed: e.g., a doubling of wind speed from 11 mph to 22 mph increases power from 6% to 73% of a wind plant's installed capacity. Note the level of wind at peak demand times. Also note a high level of hydro, which wind displaces and which is used to balance wind flux--at virtually no CO<sub>2</sub> savings.

Joseph Somsel, a nuclear engineer, discusses the problems inherent with using intermittent, volatile technologies such as wind and solar to produce pumped water storage systems as a means to create bulk electricity storage: *Wind, Solar, Nuclear, and Electricity Storage*:

[http://www.energypulse.net/centers/article/article\\_display.cfm?a\\_id=1808](http://www.energypulse.net/centers/article/article_display.cfm?a_id=1808).

Bryan William Leyland, an electrical/mechanical engineer, with distinguished credentials, including serving as a director of New Zealand's largest electricity distribution company, provided testimony in that country about proposed wind projects there. Please note his comments about the increased thermal implications from the use of

natural gas generators to balance wind flux: <http://www.med.govt.nz/upload/36145/15a-breif-of-evidence.pdf>.

National Wind Watch: ([www.wind-watch.org](http://www.wind-watch.org)) was the first nation-wide organization dedicated to understanding industrial wind issues, in the process gathering thousands of articles and news stories about the industry, and then providing informed interpretations for the public's edification and education. Now the president of National Wind Watch, Eric Rosenbloom is a science writer who lives in Vermont. He also maintains perhaps the nation's best wind blog: <http://kirbymtn.blogspot.com>, as well as the website, Industrial Wind Energy Opposition: [www.aweo.org](http://www.aweo.org), which contains a cornucopia of facts and research about the subject.

Industrial Wind Action Group: [www.windaction.org](http://www.windaction.org) is dedicated to providing educational material to communities and government officials in order to enable better public policy. The site contains over 18,600 database entries covering news articles, opinion pieces, research, photos and quotes pertinent to industrial wind energy. The organization's executive director is Lisa Linowes, a New Hampshire resident concerned about providing, among other issues, the best consumer value for alternate energy sources.

Jon Boone wrote four major essays over the last two years that appear on his website: [www.stopillwind.org](http://www.stopillwind.org), one of the first websites to feature the problems with industrial wind in the eastern United States. Start with *The Aesthetic Dissonance of Industrial Wind Machines* ([www.stopillwind.org/lowerlevel.php?content=Downloads](http://www.stopillwind.org/lowerlevel.php?content=Downloads)), which was published in *Contemporary Aesthetics* on September 28, 2005. *The Wayward Wind* ([www.stopillwind.org/lowerlevel.php?content=WaywardWind](http://www.stopillwind.org/lowerlevel.php?content=WaywardWind)), a speech delivered in June, 2006 to the citizens of Wyoming County, New York, and, in January, 2007, *Less for More: The Rube Goldberg Nature of Industrial Wind Development* ([www.stopillwind.org/lowerlevel.php?content=WaywardWind](http://www.stopillwind.org/lowerlevel.php?content=WaywardWind)) will be published next Spring by McGraw-Hill in an anthology of essays entitled, *Taking Sides: Clashing Views on Environmental Issues*, edited by Thomas Easton. Finally, *Why Wind Won't Work* was written as a basic primer for those who want to know more about electricity terminology and processes: <http://www.stopillwind.org/downloads/WhyWindWontWork.pdf>.

Also note the Top Ten False and Misleading Claims the Wind Industry Makes for Projects in the Eastern United States: [www.stopillwind.org/lowerlevel.php?content=topten\\_intro](http://www.stopillwind.org/lowerlevel.php?content=topten_intro). Detailed debunking follows.

For those interested in a comprehensive analysis of the issue vis a vis a regulatory wind hearing, consult Jon Boone's Maryland Public Service Commission testimony ([www.stopillwind.org/lowerlevel.php?content=Downloads](http://www.stopillwind.org/lowerlevel.php?content=Downloads)) as an intervenor in the Synergics Wind case, including his Responses to a variety of Data Requests and his Appeal to the Proposed Order of the Hearing Examiner.

Some might enjoy the speech he gave last year in Westfield, New York, *Industrial Wind: A Bill of Goods*:

[http://www.stopillwind.org/downloads/IndustrialWind\\_BillOfGoods.pdf](http://www.stopillwind.org/downloads/IndustrialWind_BillOfGoods.pdf).

In *The Wind Technology Scam*, a short essay, Boone discusses the difference between power and energy, shows how wind turbines are different from and inferior to conventional power generators, and provides a good discussion about how much money can be made from the public subsidies wind limited liability companies enjoy:

<http://www.stopillwind.org/downloads/TheWindTechnologyScam.pdf>.

*Life Under a Windplant*, Jon Boone's documentary about the Meyersdale, PA wind facility, which he produced and directed with David Beaudoin, can now be seen in three parts: [http://www.stopillwind.org/lowerlevel.php?content=Downloads\\_Video](http://www.stopillwind.org/lowerlevel.php?content=Downloads_Video). It features how the wind plant affects the lives of the people in the community and shows the sights and sounds that emanate from 375-foot tall wind turbines sited atop surrounding ridgetops.