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Wind Energy: A Review of Human Health & Safety Concerns

by John Droz Jr.

July 6, 2011

This is a more detailed examination of the wind energy situation in North Carolina that I previously [outlined](#), which is part of an ongoing investigation of the state's process of getting wind energy permits. All this came about as North Carolina's first industrial wind project ([Desert Wind](#)) is now in the pipeline.

As a part of my research, I had a productive conversation with North Carolina's Health Director. My question to him was: *what state agency will be assuring that NC citizens are protected regarding health and safety matters resulting from this industrial development?*

He agreed that there should be such an assessment, but concurred with other North Carolina agency people that I had already contacted: there currently is no provision in the state's rules and regulations that requires a comprehensive human health assessment for such a project.

We subsequently had several good correspondences, and below is a composite. I'm sharing this as I'm sure similar situations exist in other states and provinces, so the sample Health & Safety references should be helpful.

Doctor:

Per our recent phone conversation, I would like to supplement your industrial wind energy knowledge by recommending that you read the conclusions of some independent experts about some of the known human health impacts of wind turbines. This will put some scientific balance into the situation, so the state won't be just looking at what the developer says. I don't want to overload you, so below are just some samples. If you want more, please let me know.

The most pressing matter is that a comprehensive, objective assessment of the possible human health effects of the proposed *Desert Wind* project (Iberdrola/Atlantic Wind: Elizabeth City) needs to be authorized.

Additionally it would be much appreciated if you would use your connections as the NC State Health Director to see that a NC Health agency is an *automatic* participant in all future NC industrial wind project permitting approvals. As we discussed, that is not the case now.

In our conversation you raised a good point: *what are the human health and safety effects of wind projects compared to those resulting from a coal facility?*

This is a classic case of comparing apples to oranges, as these sources of electrical power are profoundly different, and are not interchangeable.

Once you carefully study [EnergyPresentation.Info](#) you'll see that *no number* of wind turbines equate to a single coal facility. Wind energy **always** must be augmented by a conventional power source, and (with the fast response times needed) it is almost always gas.

Interestingly, independent studies have shown that *there is more pollution from a wind+gas combination than there is from gas alone* (due to the fact that different types of gas turbines are used, different efficiencies, etc.). [See [this](#) sample discussion.]

In other words if our primary motivation is to reduce pollution from coal, we could do it **more effectively and much less expensively** by just using high efficiency gas turbines (as vs wind + low efficiency gas turbines).

A nuclear facility would be an even lower pollution option, but would cost more than coal. In my view, Small Modular Reactors are clearly the future — and they have significantly less environmental concerns than does a large nuclear facility. Here is an interesting [study](#) on SMR economics.

Deep-drilled geothermal power plants could be a worthwhile option, but government subsidy policies have not made them financially attractive, compared to wind energy. Hopefully this can be fixed. Here is an MIT [study](#) on geothermal.

You said that although you advocated that the state have robust rules and regulation to protect the health and safety of its citizens —that there was no money budgeted to do so regarding wind energy at this time.

My responses to that are:

1 – this issue will become larger and larger as time goes on (and more expensive), so the time to get it right is in the beginning — not after NC citizens are knowingly subjected to health and safety impacts.

2 – legislators need to hear from state health professionals about the need to address this matter *scientifically*. If this is properly presented to them, I'm sure that they can solve the financial part.

3 – I have contacts with independent health and safety experts who would be glad to assist in writing up any state level health and safety document. Most would provide their services for free.

4 – look at the excellent [study](#) that citizen *volunteers* created in the small town of Bethany (NY). This proves that objectivity and competence is possible without a high financial expenditure. The environmental/health/safety considerations that they researched and dealt with included:

1. Aesthetic / Quality of Life Impact
2. Backup Power Issues
3. Construction Disruption
4. Earthquake / Seismic Effects
5. Electronic & Electromagnetic Interference
6. Fire Risk & Fire Department Needs
7. Ground Water Impact
8. Hazards to Aviation
9. High Wind Failure & Other Breakdowns
10. Ice Throw
11. Lighting
12. Lightning Protection
13. Monitoring
14. Noise, Including Infrasonic
15. Road Upkeep & Repair
16. Security (Vandalism / Terrorism)
17. Shadow & Flicker Effects
18. Siting & Placement Issues
19. Storm Water Runoff, Erosion & Sedimentation
20. Stray Voltage AKA Ground Current

NC would be far better off just copying their document as versus doing nothing!

Let me know any questions.

Since wind energy is a technical area, most people get confused with terminology. Before delving into wind assessments, I would strongly recommend reading through this fine [summary](#) of wind energy related terms, written by an independent energy expert.

I tried to arrange the following items by topic. You should also keep in mind that I have the contact information for almost all of the experts who authored the following studies/reports/articles. If you want any of their contact info, please let me know.

Mostly Acoustical Matters —

- 1 – [“Responses of the Ear to Low Frequency Sounds, Infrasound and Wind Turbines”](#).
- 2 – [“The Audibility of Low Frequency Wind Turbine Noise”](#).
- 3 – [“Low-frequency Noise from Large Wind Turbines”](#).
- 4 – [“Review of Noise Studies and Related Material”](#).
- 5 – [“Noise Radiation from Wind Turbines Installed Near Homes: Effects on Health”](#).
- 6 – [“Noise Impact Assessment Report – Waubra Wind Farm”](#).
- 7 – The *Acoustical Ecology Institute* goes to great lengths to take a balanced position regarding wind turbines and acoustical consequences. Here is their [discussion](#).
- 8 – [“Wind Turbines can be Hazardous to Human Health”](#).
- 9 – “Wind Turbine Syndrome” ([extract](#) of an early version);
“Wind Turbine Syndrome” (current version, full [book](#)).
- 10- [“Summary of Recent Research on Adverse Health Effects of Wind Turbines”](#).
- 11-”[An Analysis of the Epidemiology and Related Evidence on the Health Effects of Wind Turbines on Local Residents](#)“.
- 12-”[Wind turbine noise, an independent assessment](#)“.
- 13-”[VibroAcoustic Disease \(VAD\)](#)“.
- 14-”[Industrial Wind Turbines, Infrasound and VibroAcoustic Disease \(VAD\)](#)“.
- 15- A fine [summary](#) of what transpired at the 2011 third annual Wind Turbine Noise Conference.

Electromagnetic Field (EMF) Concerns —

- 16-”[Possible effects of Electromagnetic Fields on Human Health](#)” and [here](#).
- 17-Some of the most recent [studies](#) on EMFs.
- 18-An EMF [assessment](#) of a specific wind project.
- 19-”[Modern Wind Turbines Generate Dangerously ‘Dirty’ Electricity](#)“.

Shadow Flicker —

- 20-”[Evaluation of Environmental Shadow Flicker Analysis for ‘Dutch Hill Wind Power Project’](#)“.
- 21-”[Shadow Flicker Modeling](#)“.

Ice Throw —

- 22- Dr. Terry Matilsky on [Turbine Ice Throw](#).
- 23-”[Risk Analysis of Ice Throws from Wind Turbines](#)“.

Miscellaneous Health & Safety —

- 24-”[Wind Development and Their Effects on Public Safety Radio Systems](#)“.
- 25-[Repercussions of wind turbine operations on human health](#) by the *French Academy of Medicine*, which recommends turbine setbacks of approximately one mile.
- 26-Another safety consideration: [turbine fires](#) and [here](#).
- 27-Here is a good [site](#) that keeps track of wind turbine related accidents and deaths.

Government Health & Safety Documents —

You also asked for an example of a state wind energy health policy. Unfortunately, the reality is that politics have trumped science in most places. [Minnesota's](#), though, is a reasonable assessment.

Some states adopt the unfortunate strategy of closing the barn door after the horses have left. Here is a [story](#) about that in Oregon and their current [catchup](#) status.

As mentioned, many government agencies have a difficult time in separating political policy from a true scientific assessment. For instance, here is an Australian government document “[Wind Turbines and Health](#)” with some insightful scientific commentary by world-renown expert Dr. Nina Pierpont (MD, PhD).

Due to public pressure on the Australian government by its citizens, their Senate set up a high level panel that conducted a nationwide inquiry into wind energy. Their comprehensive and reasonably balanced report “[The Social and Economic Impact of Rural Wind Farms](#)” was just released 6/23/11. Chapter 2 discusses health matters.

As I touched on in the beginning, the citizens of the small town of Bethany (NY) did a superior job in itemizing and explaining many of the concerns with industrial wind development in this [study](#).

Likewise, the citizens of Union (Wisconsin) wrote a superior wind [ordinance](#) that discussed and dealt with many health and safety matters.

In my view, these are the types of reports that should be generated by NC agencies that are interested in presenting this topic to NC citizens in an objective, scientific manner. (I can provide you with dozens of additional good local ordinances, etc. if you like.)

4 comments

[1 Energy and Environment News](#) { 07.06.11 at 9:04 am }

[...] Wind Energy: A Review of Health and Safety Concerns John Droz Jr., Master Resource, 6 July 2011 [...]

[2 John Droz Jr. on how wind blows | JunkScience Sidebar](#) { 07.07.11 at 1:14 am }

[...] Wind Energy: A Review of Human Health & Safety Concerns by John Droz Jr. July 6, 2011 [...]

[3 Tauna Christensen](#) { 07.07.11 at 2:37 pm }

This is an excellent summary on a very important matter that comes up time and time again.

[4 Jeffrey Eric Grant](#) { 07.13.11 at 10:00 am }

John, thanks for the excellent review. As you are aware, the first Wind Electric Generation submittal in Connecticut was approved recently. I suggested a few reasons why that project would not be sustainable in the current environment, but Health & Safety was not my focus. Instead, I pointed to wind “power” unreliability and disruption of the power grid. I will use your summary here for an inquiry into the Health & Safety issues here in Connecticut.

Thanks again!

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