

From: Rob Pforzheimer

Sent: Saturday, March 30, 2013 12:55 PM

Subject: FW: please distribute widely

- March 29, 2013, 6:46 p.m. ET

California's Coming Green-Outs

The wind and solar mandate means future power shortages.

Regulate first, think later. That seems to be the guiding principle of California policy makers. Take the state's renewable energy standard, which will soon cause a surge in electricity prices and could even lead to rolling blackouts when the weather heats up.

Californians can thank former Republican Governor [Arnold Schwarzenegger](#) and Democratic legislators for the fun to come. In 2006, the state passed a law requiring utilities to derive 20% of their power from renewables by 2010. The mandate has since been increased to 33% by 2020, but the real kicker is that not all renewables are equal under the law.

About three-quarters must come from California even though other states can produce renewables at lower cost due to natural resource advantages (e.g., wind in Wyoming). Democrats say this is important to foster energy independence. You never know when Utah will bomb Wyoming. Large hydroelectric plants—which contribute about 13% of California's power—also don't count toward the target because the state wanted to boost its infant solar and wind industries.

California and its municipalities offer more than 60 incentives to stimulate solar and wind development. Although solar accounted for a mere 0.6% of the state's power supply and 3% of renewables in 2011, about two-thirds of the projects under review last October were for photovoltaic solar plants. By 2020, the state expects to generate 13,600 megawatts of solar and wind, up from 800 megawatts in 2011.



Wind turbines and solar panels on March 27, 2013 in Palm Springs, California.

Utilities have been in such a rush to bring new wind and solar projects online that they've been locking in long-term rates with developers that are often two to four times higher than what they pay for nonrenewables. The Division of Ratepayer Advocates reported in 2011 that the California Public Utilities Commission has "approved nearly every renewable contract filed by the utilities, even when they rate poorly on least-cost, best-fit criteria."

Note: California residents and businesses already pay rates that are 25% to 60% higher than the national average. Excessive energy costs have helped to obliterate the state's manufacturing base. Hence, the obsession to chase green jobs.

Related Video



Assistant OpinionJournal.com editor Allysia Finley on a new study that finds that tapping the Monterey Shale Formation could create 2.8 million new jobs in California. Photo: Associated Press

Meanwhile, the state's cap-and-trade program, which took effect last year, will further jack up rates and is causing some plants to scale back operations. This is impeccable timing since state and federal water regulations also require 17 coastal generators that provide about 12,000 megawatts of electricity—enough to power nine million households—to shut down or be retrofitted over the next decade.

The upshot is that millions of Californians could soon experience power outages. As the state derives more of its electricity from renewables, it needs more "peak" gas-fired plants that can ramp up to meet demand when the sun isn't shining and wind isn't blowing—namely during dawn and dusk. Otherwise, rolling blackouts could ensue.

Nobody knows exactly how much flexible power is needed to ensure a reliable electric supply. The California Independent System Operator's best guesstimate is about 3,100 megawatts by 2017—and more thereafter as more wind and solar come online.

However, energy companies don't want to build new generators or refurbish older ones unless they're guaranteed a return on their investments—especially since peak plants are about 25% more expensive to operate and build than conventional turbines. Utilities also don't want to pay for back-up power they don't know they'll need.

The Independent System Operator says that plant investment decisions need to be made soon to ensure a reliable electric supply, though a spokesman tells us that they don't anticipate rolling blackouts and that they've got everything under control. That's a huge relief since regulators did such a great job predicting the rolling blackouts a decade ago.

The Little Hoover Commission, the state's oversight agency, pointed out in December that an unexpected outage at the San Onofre nuclear plant, which almost left 1.4 million households without power last summer, illustrated how "supply risks can escalate quickly because of constraints imposed by a combination of uncertainty, aging infrastructure and regulations." And "should energy costs unexpectedly escalate or energy become unreliable," California could jeopardize support for renewables across the country. At least there's a

bright side.

When these green-power outages occur, the politicians will blame the utilities. But this is an avoidable crisis caused entirely by politicians and green-energy lobbies who pretend they can defy the laws of energy supply and demand. Californians are going to pay for their wind and solar power indulgences. A version of this article appeared March 30, 2013, on page A12 in the U.S. edition of The Wall Street Journal, with the headline: California's Coming Green-Outs.

From: Rob Pforzheimer

Sent: Saturday, March 30, 2013 4:22 PM

Subject: FW: Of course these things are safe ... notes from the front line | STOP THESE THINGS

<http://stopthesethings.com/2013/03/31/of-course-these-things-are-safe-notes-from-the-front-line/>

STOP THESE THINGS

THE TRUTH ABOUT WIND FARMS IN AUSTRALIA

MARCH 31, 2013

You are here: [Home](#) / [Big wind industry](#) / Of course these things are safe ... notes from the front line
Of course these things are safe ... notes from the front line

March 31, 2013 By [stopthesethings](#)

While we were filming in Cape Bridgewater recently, one of the residents told us an extraordinary story. One morning he and his wife woke to find a fine and greasy film on the tin roof of their house. Unsure what it was, they approached the local wind farm operator who denied any involvement.

Determined to find an answer, they had the substance analyzed and discovered it was a kind of mechanical or engine lubricant.

The only possible way it could have got on their roof was spray from a turbine on adjoining land, about 600 metres away.

But that's not the worst of it.

The property is on tank water so their sole water supply has now been contaminated. Wind farm operator Pacific Hydro continues to deny liability.

Poke around any wind farm in Australia, talk to the locals and such stories are common place. Dodge noise monitoring, no responsibility by operators and outright lying by staff.

That is why pro-wind lobbyists and politicians and academics who refuse to engage with residents on the ground appear increasingly isolated and foolish.

The truth in this issue lies not in the city offices and ivory towers of wind companies and their supporters, but out in the communities where wind farms are impacting on people's lives.

And that's also why those of us at STT, with no axe to grind and no immediate turbine threat to our homes, see this issue as so important.

It's the injustice of it, and the appalling treatment of our fellow Australians by big business, both local and overseas, under a false guise of saving the planet.

FIRE THREAT

A [fire at Dereel](#), outside of Ballarat, this week destroyed homes and almost cost of lives.

Fire fighters utilised three aircraft over a wide tract of land adjoining a proposed wind farm site at Mt Mercer. Aircraft could not have been used if the wind farm had been operational. The toll, undoubtedly, would have been much higher.



Photo by Adam Trafford, The Ballarat Courier

CAPE BRIDGEWATER

Meanwhile, another resident of Cape Bridgewater, Crispin Trist, took this photo (below). Note the blade on the left.

The unit was hit by lightning this week. Residents heard a loud bang when it happened.



MASSIVE INDUSTRIAL COMPLEXES

The term wind farm is a misnomer. These things are massive industrial installations in rural and regional areas requiring massive concrete and steel infrastructure.

And like in any industrial complex, it can be catastrophic when things go wrong, as the following pictures show.









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About stopthesethings

We are a group of citizens concerned about the rapid spread of industrial wind power generation installations across Australia.

From: Rob Pforzheimer

Sent: Saturday, March 30, 2013 7:09 PM

Subject: LePage: High Electricity Rates? Blame Wind Power

LePage: High Electricity Rates? Blame Wind Power

AUGUSTA – Republican Gov. Paul R. LePage told Mainers on Saturday that electricity rates in the Pine Tree State are far too high and the state-mandated wind power industry is to blame.

“Maine’s energy costs are 10th highest in the nation, and our electric bills are 34 percent higher than the national average,” said the Governor. “But it does not have to be this way. Affordable energy is available right here in Maine and just across our northern border.”

LePage has been engaged in negotiations with Canadian officials regarding a deal that could drastically lower electricity rates Maine’s businesses and families pay. But LePage said our friends to the North are reluctant to do business with Maine because of King and Baldacci area policies that limit Maine’s use of hydro power and mandate the use of more expensive wind power.

“I traveled recently to Canada to meet with officials from Hydro Quebec, which has plenty of hydro power to sell at very affordable prices,” said LePage. “They told me that selling power to Maine is not worth it. And it’s all because Maine has a limit on how much renewable energy we can use, including hydropower.”

“Under Governors King and Baldacci, legislators enacted RPS — the Renewable Portfolio Standard — which restricts us to using only 100 megawatts of hydropower,” said LePage. “Hydro Quebec has 41,000 megawatts of energy to sell, but they sell it in 1,000 megawatts increments,” he said. “They wouldn’t even consider selling as little as 100 megawatts.”

“Here in Maine, we have over 700 megawatts of installed capacity for hydropower. It is clean, it is renewable and it is affordable. So why would we limit hydropower?” said LePage. “The answer is simple: Wind.” Because of RPS, said LePage, the average residential consumer will pay \$365 more in electricity over the next five years. He said RPS will cost the average industrial user more than \$63,000 in the next five years.

“Folks, it doesn’t have to be this way,” said LePage. “That’s why I have introduced a bill to remove the 100-megawatt limit on renewable sources of energy, including hydropower.”

“Tell your legislators you want affordable electricity, and you want it now.

<http://www.themainewire.com/2013/03/lepage-high-electricity-rates-blame-wind-power/>

From:

Sent: Monday, April 01, 2013 8:28 PM

Subject: article from "WATTS UP" website

[Rethinking wind power – Harvard study shows it to be overestimated](#)

Posted on [February 25, 2013](#) by [Anthony Watts](#)

Tehachapi wind farm 4 (Photo credit: Wikipedia)

Harvard research suggests real-world generating capacity of wind farms at large scales has been overestimated

Cambridge, Mass. – February 25, 2013 – “People have often thought there’s no upper bound for wind power—that it’s one of the most scalable power sources,” says Harvard applied physicist [David Keith](#). After all, gusts and breezes don’t seem likely to “run out” on a global scale in the way oil wells might run dry. Yet the latest research in mesoscale atmospheric modeling, published today in the journal [Environmental Research Letters](#), suggests that the generating capacity of large-scale wind farms has been overestimated. Each wind turbine creates behind it a “wind shadow” in which the air has been slowed down by drag on the turbine’s blades. The ideal wind farm strikes a balance, packing as many turbines onto the land as possible, while also spacing them enough to reduce the impact of these wind shadows. But as wind farms grow larger, they start to interact, and the regional-scale wind patterns matter more.

Keith’s research has shown that the generating capacity of very large wind power installations (larger than 100 square kilometers) may peak at between 0.5 and 1 watts per square meter. Previous estimates, which ignored the turbines’ slowing effect on the wind, had put that figure at between 2 and 7 watts per square meter. In short, we may not have access to as much wind power as scientists thought.

An internationally renowned expert on climate science and technology policy, Keith holds appointments as Gordon McKay Professor of Applied Physics at the [Harvard School of Engineering and Applied Sciences](#) (SEAS) and as Professor of Public Policy at [Harvard Kennedy School](#). Coauthor [Amanda S. Adams](#) was formerly a postdoctoral fellow with Keith and is now assistant professor of geography and Earth sciences at the [University of North Carolina at Charlotte](#).

“One of the inherent challenges of wind energy is that as soon as you start to develop wind farms and harvest the resource, you change the resource, making it difficult to assess what’s really available,” says Adams. But having a truly accurate estimate matters, of course, in the pursuit of carbon-neutral energy sources. Solar, wind, and hydro power, for example, could all play roles in fulfilling energy needs that are currently met by coal or oil.

“If wind power’s going to make a contribution to global energy requirements that’s serious, 10 or 20 percent or more, then it really has to contribute on the scale of terawatts in the next half-century or less,” says Keith. If we were to cover the entire Earth with wind farms, he notes, “the system could potentially generate enormous amounts of power, well in excess of 100 terawatts, but at that point my guess, based on our climate modeling, is that the effect of that on global winds, and therefore on climate, would be severe—perhaps bigger than the impact of doubling CO₂.”

“Our findings don’t mean that we shouldn’t pursue wind power—wind is much better for the environment than conventional coal—but these geophysical limits may be meaningful if we really want to scale wind power up to supply a third, let’s say, of our primary energy,” Keith adds.

And the climatic effect of turbine drag is not the only constraint; geography and economics matter too. “It’s clear the theoretical upper limit to wind power is huge, if you don’t care about the impacts of covering the whole world with wind turbines,” says Keith. “What’s not clear—and this is a topic for future research—is what the practical limit to wind power would be if you consider all of the real-world constraints. You’d have to assume that wind turbines need to be located relatively close to where people actually live and where there’s a fairly constant wind supply, and that they have to deal with environmental constraints. You can’t just put them everywhere.”

“The real punch line,” he adds, “is that if you can’t get much more than half a watt out, and you accept that you can’t put them everywhere, then you may start to reach a limit that matters.”

In order to stabilize the Earth’s climate, Keith estimates, the world will need to identify sources for several tens of terawatts of carbon-free power within a human lifetime. In the meantime, policymakers must also decide how to allocate resources to develop new technologies to harness that energy.

In doing so, Keith says, “It’s worth asking about the scalability of each potential energy source—whether it can supply, say, 3 terawatts, which would be 10 percent of our global energy need, or whether it’s more like 0.3 terawatts and 1 percent.”

“Wind power is in a middle ground,” he says. “It is still one of the most scalable renewables, but our research suggests that we will need to pay attention to its limits and climatic impacts if we try to scale it beyond a few terawatts.”

The research was funded by the Natural Sciences and Engineering Research Council of Canada.

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A video abstract by David Keith is available for viewing and download [here](#).

From: "Steve Wright" 

Subject: Ridgeprotectors' Recommendations to Siting Commission

Hi Anne,

Attached are two pdf documents. One is the recommendations and comments from Ridgeprotectors, a Vermont 501(c)(3). The second is a statement on connectivity as it relates to natural systems. This latter is submitted as documentation to support the relevant recommendations.

The Staying Connected connectivity maps are large files and I will send each of them separately.

Please let me know you received all three emails.

Thank you on behalf of Ridgeprotectors.

Steve Wright, President
Ridgeprotectors



To: Energy Generation Siting Policy Commission

Connectivity Statement

Submitted on behalf of Ridgeprotectors

Treated here in a physical and biological context, connectivity refers to a physical and biological “wholeness,” or integrity of a natural system. It assumes that the parts and functions of such a system retain their ecological and evolutionary connections to each other. Aldo Leopold, one of the founders of the American conservation movement famously said, “When tinkering with the landscape it is always important to keep all the pieces and parts.”

The term is relatively recent. The principle has been with us for the ages. If one wishes to take advantage of the free services of a healthy landscape: clean air, water, healthy soils, vegetation, protection from flooding and erosion, and wildlife habitat then one must retain the “connections” in the system that provide these free services.

Take water, for example. Vermont’s ridgelines have thin soils on steep—well over 10%—slopes. These soils are saturated in many areas of the ridgeline, and held in place by a complex assemblage of moisture-loving or at least moisture-tolerant plants. Even on steep slopes where water tends to move downward at a more rapid rate the soils are held in place by the vegetative complex. Altering this “connectivity” changes the entire function of the mountain because it changes the function of a critical part of the mountain: water. Clear-cutting and road-building along 3.2 miles of ridgeline in the Lowell Mountains is such a disruption of connectivity and an alteration of the free services provided by the mountains. Removing the woody vegetation—opening the forest canopy—alters the pattern of water falling to the surface and being incorporated into the surface and subsurface flows. Water is now not intercepted by trees and larger vegetation and falls with greater energy on the forest floor. This results in more concentrated flows from micro to macro in context. The greater the flow and velocity—due to lack of interception and disturbance of the forest floor—the greater energy of that flow and its increased capacity for carrying sediment. The greater the energy, the larger the soil particle a specific volume and velocity will move. This condition is exacerbated by the steepness of the slope. The greater the slope the faster the flow, the faster the flow the larger the particles carried by the water. The larger the particles carried the greater the effects: flooding and erosion. The greater the erosion the greater overall habitat damage—including human property and life.

Similar constructs can be made for other functions, water temperature, for example. Again, we must begin with vegetative patterns that hold and disperse precipitation. When the vegetative function is removed due to clear-cutting and road-building (with attendant blasting and ridgeline alteration) we lose a primary function of water temperature control: shade. Opening the forest allows more solar radiation to the former forest floor. Converting the ridgeline profile from an acute angle to a relatively flat surface, building road surfaces that are essentially impervious, constructing turbine pads of several acres each with all vegetation removed tend to increase the solar “gain.” These surfaces become functional passive solar collectors and any water falling to the surface absorbs that heat and becomes warmer. Warmer

water will alter the biological patterns of the aquatic systems. Species will change and energy—heat from elevated temperatures—will be diverted into different energy ‘paths.’ Algal blooms are a common expression of such a temperature alteration. Brook trout, one of the state’s signature species, and in many drainages a “species of special concern,” are most vulnerable to temperature increases.

There is much science does not know, especially regarding behavioral impacts of habitat alteration. With regard to the Lowell Project, the Vermont Fish and Wildlife Department identified 23 acres of critical black bear habitat: high quality American beech stands. Those stands were eliminated by the ridgeline access road and “mitigated” by “protection” of other less-desirable habitat. Mitigation has become a staple response in developers’ efforts to develop sensitive areas such as ridgelines. It operates on the principle that protecting additional land off-site will ameliorate the damage to high-quality habitat on-site. This is the purest of speculation. There is no evidence to suggest that such a scheme actually provides any benefit, ergo the first sentence of this paragraph. Wildlife science has no clue as to behavioral impacts of significant habitat alteration: interfering in reproductive behaviors, eliminating historic food resources and the like. The managers of such resources and project developers essentially leave it up to the various species to figure out that challenge to their quality of life.

Conclusion

To assure the continuation of free ecological services we must maintain the “connectivity” of the landscape, especially those unique elements such as our uplands. This is necessary to assure the long-term health and welfare of humans and their wild neighbors.

Submitted:

March 29, 2013

Steve E. Wright

Former Commissioner, Vermont Fish and Wildlife Department

Postgraduate studies, Aquatic Biology
M.S. Forest Resources/Aquatic Ecology
B.S. Biology



Ridgeprotectors

To: Jan Eastman, Chair
Vermont Energy Generation Siting Policy Commission

From: Ridgeprotectors

Thank you for this opportunity to provide information from a citizen's perspective on the Certificate of Public Good (CPG) process and energy generation siting issues. Our comments largely come from members participating in *Docket # 7628: Green Mountain Power's (GMP) petition for a CPG to put 21, 459' turbines on a 3-mile section of the Lowell Mountain Range.*

Ridgeprotectors, a 501(c)(3) organization, was founded 10 years ago to address nearly identical permitting and siting issues with regard to the Sheffield industrial wind project.

In addition, our perspective is informed by the growing global awareness of the negative impacts of utility scale turbines, and the questionable ability of this technology to provide measurable reductions in greenhouse gas emissions. Our research indicates that Vermonters' experience with permitting and siting is similar to the experience of residents, citizens, and governments throughout the world: operational challenges with industrial scale wind turbine technology combined with 'unintended consequences' when the turbines are sited too close to where people live and work have led to both performance and 'coexistence' problems.

Given the extensive worldwide documentation of problems with industrial wind turbines we respectfully request that the Commission use the Precautionary Principle to guide its deliberations and craft its recommendations.

"Precautionary action is appropriate when there is credible evidence that a particular technology or activity might be harmful, even if the nature of that harm is not fully understood. This means that decision makers must consider potential hazards that have been identified or that are plausible, based on experience, what is known, and/or predicted. Threats of serious, irreversible, cumulative, or widespread harm demand precautionary action commensurate with their nature."

<http://www.healthandenvironment.org/articles/doc/540>

Summary: Top Ten Recommendations

1. Use the Precautionary Principle as an evaluative tool to determine a project's public good benefit.
2. Ask the legislature to resolve the eight conflicting goals in the SPEED legislation as noted in a Public Service Board/Public Service Department report to the legislature this year. This effort would include establishing a decisional principle or hierarchy for these goals, or the repeal/rewriting of some of the goals to insure there is no conflict between them.
3. Identify performance criteria that projects must meet throughout the life of the project, with penalties for failing to do so.
4. Legislatively (if needed) require the Public Service Department (PSD) to identify and evaluate currently externalized project costs and, where warranted, remedy the resulting inequitable distribution of burden.
5. Propose the establishment of a panel/commission to develop criteria to assess the cumulative impact of wind turbines on Vermont ridgelines, including bird and bat mortalities, habitat fragmentation/alteration, loss of property values, aesthetics, tourism.
6. Recommend new legislation that requires CPG petitioners to provide a cost-effectiveness analysis for their project that adheres to established analytics for determination of public good.
7. Develop criteria to evaluate emissions reduction from a project. These should include acknowledging that a renewable energy project cannot be credited with reducing greenhouse gas emissions if the project's Renewable Energy Certificates (RECs) are sold.
8. Assign transmission costs for all projects that will require new transmission. Without accounting for the cost of new transmission infrastructure in determining public good, there is no way to compare a project's cost-effectiveness with systems that require little or no increase in transmission (e.g., distributed solar, efficiency and weatherization).
9. Require a fully transparent pre-permitting process, including notification to area towns and posting in local newspapers, before a first meeting with regulators.
10. Provide specific guidelines for petitioners, regulators, and public officials regarding what they can/cannot say to the press about a project while it is in the permitting phase or under appeal.

What follows is divided into background information and bulleted recommendations to address the permitting process and siting issues. Many of these are specific to industrial wind, though some are applicable to other forms of energy generation. In submitting these recommendations we do not imply it is an exhaustive list. Our comments and recommendations are grouped under each of the Commission's seven charges.

1. Procedures for state-level approval (procedural mechanisms, timelines, substantive criteria and standards)

There is no mechanism in Vermont's permitting process to learn from the siting errors made at hundreds of other projects worldwide. There are now over 500 organizations around the world raising siting and performance issues with this technology. Siting problems have led to proposed bans on building more on-shore industrial wind in some places (most recently England) and to setback recommendations ranging from 2 - 6 kilometers (1¼ - 4 miles). In other words, your charge as it relates to this particular generation technology is to review and make recommendations about something that entire countries with far more experience than Vermont continue to grapple with – politically, environmentally, and socially. Given the significant hurdles regarding the siting of industrial wind, *and* the absence of market ready storage capacity, we recommend the following changes in Vermont's permitting procedures:

- 1.1 Use the Precautionary Principle as an evaluative tool to determine a project's public good benefit.
- 1.2 The legislature should resolve the eight conflicting goals in the SPEED legislation as noted in a PSB/PSD report to the legislature this year. This effort would include establishing a decisional principle or hierarchy for these goals, or the repeal/rewriting of some of the goals to insure there is no conflict between them.
- 1.3 Use national peer reviewed, non-industry generated metrics to help quantify public good as it relates to the cost-effectiveness of a project. For example:
 - According to a November 2010 study, a 'good' renewable energy project should be able to avoid a ton of carbon for \$13 - \$25/metric ton. The Lowell Project costs \$100/metric ton.
Note: This calculation was based upon a scenario in which the RECs are not sold. Once the RECs are sold it is impossible to calculate cost-effectiveness because there is no positive effect. That is, no emissions reduction. Even when the RECs are not sold, ridgeline wind projects are 3 times more costly than necessary to reduce CO2 emissions, signifying that they are not a cost-effective approach to addressing climate change.
 - In a database of renewable energy projects maintained by the Environmental Protection Agency, the average capital cost of wind projects since the year 2000 is \$1,400/KW, with a maximum of \$1,700/KW. The Lowell Project cost \$2,500/KW and still counting.

- **Criteria for pervious and impervious surfaces for stormwater management.**

Note: Don Lake, a stormwater scientist who advises Vermont's water quality division, agrees with Andres Torizzo, the Towns' water expert, that the CN Values (the measure of soil permeability) used to estimate stormwater runoff at the Lowell site were not based on science, but on "professional judgment". His full testimony is here. Please read it. This is science. What ANR approved is not based on science. <http://psb.vermont.gov/sites/psb/files/orders/2012/2012-7/Lake PFT.pdf>

- Project developers account for the amount of power the turbines and related grid stability infrastructure consume to operate.

1.4 Property owners leasing land for a project site provide proof of ownership before a CPG is issued.

1.5 The developer provides a property value easement/guarantee for anyone requesting one within four (4) miles of the project.

1.6 Developers make payments to towns for grand list losses from lowered property values.

1.7 The docket calendar provides parties a reasonable amount of time to contract experts and submit their pre-filed testimony. (eg. in # 7628 parties had only three (3) weeks to pre-file testimony from the time they were told what issues they had party status on).

1.8 Identify conflicting statutory goals and develop clearer guidance to permitting and regulatory bodies via legislation. For example, under the SPEED program a utility is mandated to invest in renewables yet meet other statutory requirements. Vermont statutes name several relevant features to consider for a new renewable energy project. A project is to:

- Contribute to reductions in global climate change. (30 V.S.A. § 8001 (a) (6))
- Be less costly than available energy conservation programs. (30 V.S.A § 248 (b)(2))
- Be the lowest present value life-cycle cost alternative. (30 V.S.A § 248 (b)(2))
- Benefit, to the greatest extent possible, the Vermont economy and rate payers. (30 V.S.A. § 8001 (a) (1))

Vermont statute also names essential features of the decision process. The process is to characterize and compare both environmental and economic costs of alternative projects. (30 V.S.A § 248 (b)(2)). Nowhere can we find how the Board evaluated the environmental costs of the Sheffield and Lowell projects.

1.9 Develop criteria to evaluate emissions reduction from a project. These must include a statement about the sale of RECs, and that if they are to be sold, that the project no longer provides emissions reductions. (Under SPEED a Vermont utility

is allowed to sell the RECs from a renewable generation project, yet still claim that generation as renewable in its portfolio. Claiming this energy as renewable appears to be a violation of FTC guidelines, worsens Vermont's carbon footprint, and misleads Vermonters who clearly want and expect renewable generation to reduce the state's GHG emissions.)

1.10 Costs incurred that were not part of the CPG process should not be passed on to ratepayers. These may include:

- Grid stability upgrades
- Lost productivity because of curtailment
- Replacing another renewable (eg. hydro, not fossil fuel generation)
- Purchase of neighboring properties as mitigation for noise/property value loss
- Post-CPG hearings, appeals, lawsuits
- Environmental costs, other 'unintended consequences
- The cost of adding regional spinning reserve to back up wind. (ISO-NE study)

1.11 Require developers to meet performance criteria or pay a penalty. These criteria could include:

- Meeting capacity factor claims and maintaining them for the life of project, within a specific percentage. This would require accounting for operational power demand (24/7 electronics, heating elements in winter, and powering turbines when there is no wind to keep them from remaining in one position too long). That is, track and account for power that the turbines and related grid stability infrastructure consume in calculating capacity factor.

1.12 Require compensation to abutting landowners for turbines sited closer than 1,000 ft from a property line. (Or the distance the manufacturer recommends as safe when turbines are operating.)

1.13 Require compensation to abutting landowners for use of their property as a blasting safety zone.

1.14 Require pre-project appraisals of properties and guarantee purchase of properties within a specified period of time. In Denmark, for example, homeowners are "compensated for any loss of property value due to the wind turbines" (see pg 8, <http://www.mass.gov/dep/energy/wind/briefreview.pdf>).

1.15 Enforce compliance with fines for violations.

2. Role of and/or opportunity for public participation, public advocacy, and municipal, town or regional planning body participation in the approval process

- 2.1 For large projects (those needing a full CPG) the developer will provide funding for municipalities and opponents to hire counsel and expert witnesses so they can participate in the CPG process.
- 2.2 A developer is prohibited from petitioning for a CPG if the project would be located on lands that are excluded from this type of development in the town or regional plan.

3. Alternative dispute resolution processes

- 3.1 Developers should be required to provide a fund/bond for dispute resolution as a result of 'unintended consequence'

4. Coordination and timing of state-level permit issuance

- 4.1 Require a fully transparent pre-permitting process, including notification to area towns, posting in local newspapers, before a first meeting with regulators. (Currently developers may meet with regulators privately for years before a project issues a 45-day notice of intent to file.) Most Selectboards and Planning Commissions meet once/twice a month. Petitions can be 1,000 pages or more. (The application for the Lowell project was 1300 pages.) 45 days is too little time for satisfactory review.

5. Analyze whether Vermont's criteria for electric generation project siting approval adequately protects Vermont's lands, environmental resources, and cultural resources, both with respect to individual projects and with respect to cumulative impacts of multiple projects

There are significant costs now externalized in the current permitting process and, as the public's advocate, the PSD is obligated to identify and evaluate these externalities and, where warranted, remedy the resulting inequitable distribution of burden.

The unique set of problems that are accompanying the siting of industrial wind beg the question of whether we need to redefine 'public good'. In Vermont and elsewhere, property owners/lessees are allowed to engage in permitted activities on their property so long as the impacts do not go beyond the property boundary. This is not possible with utility scale wind facilities. Noise, flicker, changes to hydrology, and aesthetic impacts can extend for 20 miles beyond a project's geographic boundary. Mitigation after the fact can dramatically diminish the public good of these projects. For example, in a rural French town the noise from eight wind turbines was so problematic that a court ordered the turbines be shut down from 10pm to 7am so people could sleep. In Vermont, ridgeline wind turbines will generate power most predictably at night, and thus their benefit will be greatly diminished if this level of noise mitigation is required.

In addition, it is not in the public's interest to commit grid space to intermittent and costly wind power that is poorly correlated to load when there are promising emerging renewable technologies that could make better use of that grid space and contain transmission and grid stability costs.

Habitat connectivity is emerging as a critical issue as humans continue to erode ecosystem functions. The recent federal funding of the 'Staying Connected' wildlands network project is indicative of the rising challenges from increased habitat fragmentation. Wildlife science has little understanding of the long term effects from habitat alteration. For example, they have no knowledge of how turbine noise may impact reproductive behavior or predator/prey relationships. Erecting large structures, especially in sensitive upland habitat, is an entirely new, unstudied impact. Siting industrial wind turbines on ridgelines is akin to playing Russian Roulette with natural systems and the ecological services they provide. (See attached background info on connectivity. Staying Connected maps will be mailed.)

One of the determinants of public good is a cost-effectiveness analysis. To make a public good claim a project must withstand a cost-effectiveness analysis that adheres to established analytics for determination of public good. In particular:

- 5.1 Establish a panel/commission to develop cumulative impact criteria from increasing the number of turbines on Vermont ridgelines. Include bird and bat mortalities, habitat fragmentation/alteration, loss of property values, aesthetics, tourism.
- 5.2 Propose legislation that requires CPG petitioners to provide a cost-effectiveness analysis for their project that adheres to established analytics for determination of public good, and requires a rigorous testing of the analysis by the PSD.
- 5.3 Assign transmission costs for all projects that will require building new transmission. Socializing the total transmission costs is a bias in favor of developers in remote locations. ISO- NE estimates we will need 4,000 miles of new transmission for 20% industrial wind on the NE grid. Today, there are only 8,000 miles. This represents billions in essential infrastructure costs that a developer may require in order to move their product to market. Without assigning the project a share of that cost in determining public good there is no way to compare between systems that require little or no increase in transmission (eg. distributed solar) in determining a project's public good cost effectiveness.

6. Analyze best practices for monitoring environmental impacts of approved and built facilities going forward, to allow for an iterative process over time based on lessons learned.

- 6.1 Review and utilize the experiences of other countries with similar climate and geography to prepare your recommendations.

6.2 Review the Japanese 4-year health study (should be available next year and we believe it is the first in the world epidemiological study on effects of turbine noise on humans).

7. Consider whether the state should develop generic siting guidelines for developers of electric generation projects by technology, to aid process uniformity and provide guidance on environmental impacts, location, aesthetics and other common issues.

- 7.1 We agree that generic 'pre-submission' siting guidelines could be helpful.
- Include specific guidelines for petitioners and regulators regarding what they can/cannot say to the press about a project while it is in the permitting phase or under appeal. (eg. Sec of Natural Resources stating she is ready to "sign the permit" before her scientists have finished their work; statements by petitioner that are contrary to the wording of their petition.)

Conclusion

To assume that Vermont *must* have in-state industrial wind in its energy mix is akin to building a hydro-electric dam where there is little water resource; you can build it, but it is an imprudent use of the ratepayers' money. When the RECs are sold these projects provide no GHG reduction. Even if the RECs were retired, Vermont does not have the quality of wind to justify the expense to ratepayers when ***we have other options.***

Vermont's PSD and the PSB are essentially gaining 'on the job' training at great public expense with 40-story tall generation facilities placed on ridgelines. There is, however, voluminous data worldwide on the negative impacts from siting turbines too close to homes and businesses. There are also considerable hydrologic issues with siting turbines at high elevations. As we prepare for more intensive storm events, the first rule of downslope flood protection is to protect the uplands. Additional ridgeline development will only exacerbate the effects of future Irene's.

It is environmentally and economically irresponsible to permit more industrial wind projects until we see what happens with projects that already have a CPG. Only then can we adapt our permitting process to ensure future generation projects are indeed a public good, and that our natural resources are protected.

Thank you for considering our comments and recommendations based on the experiences of the towns of Albany and Craftsbury under docket # 7628.

Submitted this day, March 29, 2013

Steve Wright, President

Robert R. Holland, MD, Vice President

Contact info:

Steve Wright

Robert R. Holland, MD

From: Paul Conner

Sent: Thursday, April 04, 2013 9:26 AM

Subject: Energy Siting Input Letter from South Burlington

To the Siting Commission, Representatives, and Senators,

Attached please find a letter of input from the City of South Burlington regarding the Siting of Renewable Energy Facilities in Vermont.

Thank you for your time and attention.

Sincerely,

Paul

Paul Conner, AICP, MCIP
Director of Planning & Zoning

Notice - Under Vermont's Public Records Act, all e-mail, e-mail attachments as well as paper copies of documents received or prepared for use in matters concerning City business, concerning a City official or staff, or containing information relating to City business are likely to be regarded as public records which may be inspected by any person upon request, unless otherwise made confidential by law. If you have received this message in error, please notify us immediately by return email. Thank you for your cooperation.



April 2, 2013

Governor's Energy Generation Siting Policy Commission

c/o Vermont Public Service Department

Dear Commissioners,

The City of South Burlington has had the opportunity to witness and participate in several applications for renewable energy facilities over the past few years. Notably, the City is host to one of the first 2.2 megawatt solar arrays in the State, several smaller solar sites, and wind turbines.

Based on its experience, as well as a review of the draft Options Report published by the Siting Commission, the South Burlington City Council, Planning Commission, and Energy Committee offer the following recommendations as possible amendments to Vermont's energy siting laws:

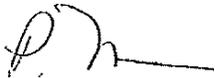
1. Municipal Siting Policy Consideration: 30 VSA §248 should include a provision that states that when there is a valid municipal policy on the siting of renewable energy generation facilities, such a policy should be significantly regarded in the review of applications;
2. "Acceptable Municipal Siting Policy" Definition: 30 VSA §248 should include guidelines for what constitutes a valid municipal renewable energy siting policy in order for it to be given significant consideration during the application review process. , Such a policy should represent a comprehensive planning approach to accommodating the energy supply needs associated with the community's long range planning development plans As part of this provision, technical assistance in developing and revising such a policy should be made available to municipalities;
3. Threshold-based Notification and Siting Policy Consideration: 30 VSA §248 should include one or more thresholds above which municipalities are notified of pending applications and given the opportunity to comment, and above which a municipal siting policy is given significant consideration. Such thresholds should be based on a combination of project capacity (Kw) and project area (acreage affected);

4. Statewide Application Review Criteria: 30 VSA §248 should include statewide criteria for the review of applications. Specifically GIS mapping results (see Options Report) as well as site specific and "corridor" considerations (pertaining to, for example, wildlife habitats) should be included;
5. Expanded Cost-Benefit Analysis Criteria: 30 VSA §248 should include review criteria that consider all costs and benefits of a proposal, including impacts on natural resources as well as the loss of the contribution to addressing climate change and other benefits of the facility if is not approved; and,
6. Simplified Process for Low-impact Projects: 30 VSA §248 should allow for a simplified review process to incentivize projects that are located in desired areas according the valid municipal renewable energy siting policy, have little or no effect on natural resources, or that serve community planning objectives. This includes installations that are integrated with compatible site uses, including rooftop solar installations and multiple use multiple objective site designs.

On behalf of the City Council, Planning Commission, and Energy Committee, thank you for your consideration.

Should you have any questions, please feel free to contact Paul Conner, Director of Planning & Zoning, at (802) 846-4106 or pconner@sburll.com.

Sincerely,



Pam Mackenzie, Chair
City Council



Jessica Louissos, Chair
Planning Commission



Keith Epstein, Chair
Energy Committee

cc:

Vermont House Committee on Natural Resources and Energy
Vermont Senate Committee on Natural Resources and Energy
Representatives Kupersmith, Head, Pugh, Townsend and Senator Fox
Bob Rusten, Interim City Manager

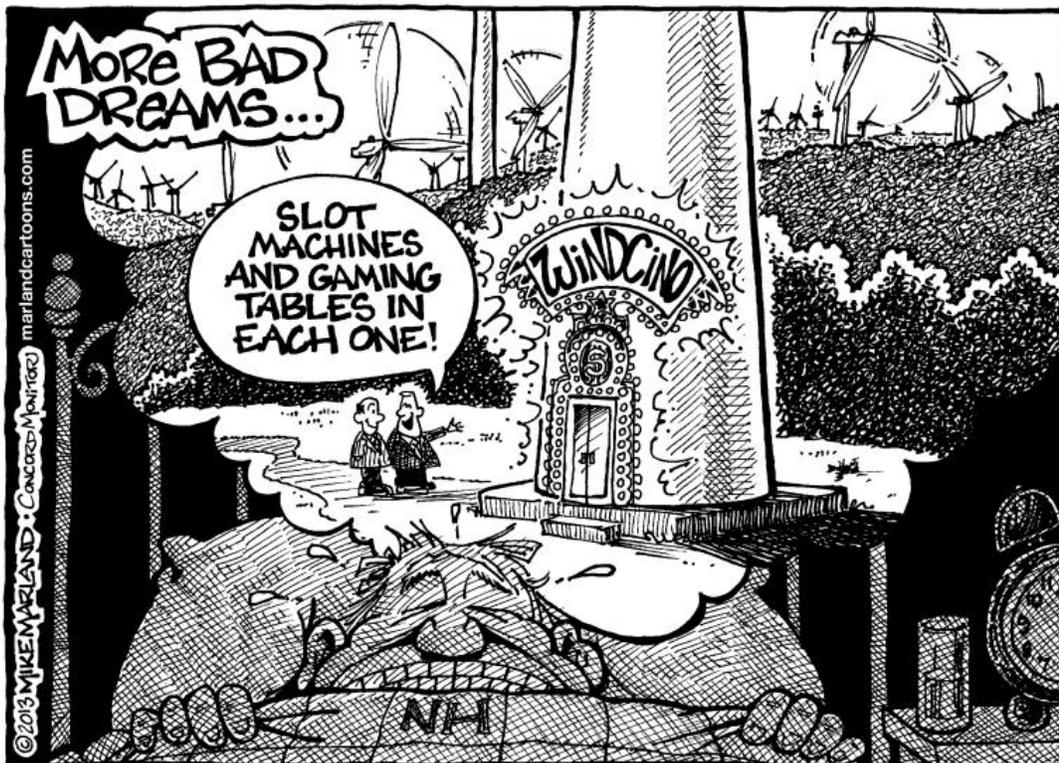
From: Rob Pforzheimer

Sent: Thursday, April 04, 2013 10:14 AM

Subject: RE: Windcino - cartoon

Previous email incorrect. Should read Windcino, not Zw

New Hampshire's state house is wrestling with whether to make gaming machines legal and the problem of wind turbines destroying the landscape. This political cartoon from the left-leaning Concord Monitor speaks volumes.



From: VCE [REDACTED]

Sent: Wednesday, April 03, 2013 3:30 PM

Subject: PSB report to legislature on RPS/RECs

Please see this recent report from the PSB to the legislature that addresses the REC issue.

<http://psb.vermont.gov/sites/psb/files/publications/Reports%20to%20legislature/RPSreport2013/Further%20Analysis%20and%20Report%20on%20Renewable%20Energy.pdf>

Sent from my iPad

From: Rob Pforzheimer

Sent: Wednesday, April 03, 2013 1:34 PM

Subject: Britain to Halt Onshore Wind Projects: 'Wind Farm Impacts May Be Worse Than Climate Change' - Honolulu Civil Beat

” Wind projects, he added, “blight rural lives” and have, among other negative environmental effects, “significant impacts on the rural economy and the rural environment.”

<http://m.civilbeat.com/voices/2012/11/02/17540-britain-to-halt-onshore-wind-projects-wind-farm-impacts-may-be-worse-than-climate-change/>

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Britain to Halt Onshore Wind Projects: 'Wind Farm Impacts May Be Worse Than Climate Change'

By [Mike Bond](#) 11/02/2012



Hawaiian Electric Co.

In a stunning move the British government [announced October 30](#) a halt to land-based industrial wind projects. “We can no longer have wind turbines imposed on communities,” Energy Secretary John Hayes stated, adding that few if any new industrial wind projects will be approved.

This follows [last month’s statement](#) by UK Environment Secretary Owen Paterson that industrial wind projects “may have a worse impact than climate change,” and are causing “public insurrection.” And it welcome news

for Hawaii, where the islands of Molokai and Lanai are battling a huge HECO/Abercrombie industrial wind project, the Big Wind/ Interisland Cable.

Referring to wind farms and climate change, Environment Secretary Paterson added that “some of the steps we are taking might actually cause more damage than the original problem itself.” Wind projects, he added, “blight rural lives” and have, among other negative environmental effects, “significant impacts on the rural economy and the rural environment.”

“We need to understand communities’ genuine desires,” Energy Secretary Hayes noted, buttressing Paterson’s earlier statement that the industrial wind industry’s “never-ending gravy train of green subsidies” must end. The decision reflects a major change in British government policy, formerly in favor of industrial wind. Industrial wind in the UK, studies show, has led to [no reductions in greenhouse gases](#) or [fossil fuel use](#), but has led to huge environmental problems and [massive human health impacts](#), as well as a 30 percent increase in coal-fired generation, according to the [Renewable Energy Foundation](#).

Similar [studies in Denmark](#), the [Netherlands](#), and elsewhere have also found that industrial wind projects [do not lower CO2 emissions](#) and may even increase them. [An analysis last year](#) of 300,000 data points across the U.S. found that “wind energy saves very little CO2 and has only minimal impact on other air emissions”. This is because wind is so erratic that fossil-fuel plants must run constantly to back up wind projects – in some cases consuming more fuel and creating more CO2 than had they generated the power directly.

Though wind projects provide no environmental benefit, they have very negative impacts on human health, families and communities, tourism, property values, the environment (particularly birds, bats and other wildlife) and local and national economies. Despite over \$100 billion in U.S. taxpayer subsidies, wind projects are still not financially feasible, and need further subsidies. But they do make billions in tax-free profits for their corporate backers, with no risk, while raising electricity rates and burdening electricity customers with enormous debt.

The worst of these subsidies are the “Renewable Portfolio Standards” that have been peddled by energy companies to Hawaii and other states. These standards require that a certain percentage of electricity be produced by “clean” or “renewable” energies, and that electricity customers must pay for the huge costs involved. In Hawaii, this goal is 15 percent by 2015, 25 percent by 2020, and 40 percent by 2030. But unfortunately these goals could do more harm, as Britain’s Environment Minister has stated, than the problem itself.

Hawaii Needs a 5-Year Moratorium on Wind Projects

HECO’s highly-touted wind project, First Wind’s Kahuku, may now have shut down permanently after only 18 months of operation. Although it only produced 15 percent of its promised power when it was operating, Hawaii rate-payers will continue to [pay millions for it](#). And Oahu’s North Shore residents are up in arms over another First Wind “atrocious”, a new HECO wind “farm” they say violates beautiful historic Waimea. While abandoned wind turbines litter our islands, HECO now wants to build more and bigger wind projects that will turn major parts of rural Maui, Molokai, Lanai and perhaps the Big Island into industrial zones, all supposedly connected to a multi-billion-dollar undersea cable through the Hawaii National Humpback Whale Sanctuary. Strongly pushed by Governor Abercrombie and the PUC, this Big Wind/ Cable project would [cost \\$16 billion](#) — *\$35,500 per Hawaii electricity customer* – and saddle us with massive debt we may never be able to repay. It will cost more than the entire damage done to our nation by Hurricane Sandy.

So if the impacts of industrial wind projects on Hawaii could be greater than climate change, and if the costs are so enormous and unreasonable, shouldn’t we choose another method of making electricity? When so many better methods are available? When every Hawaii rooftop is a potential power plant?

Rooftop solar will soon be able to provide nearly 50 percent of Hawaii's [total electricity needs](#). Solar prices continue to fall, and according to the National Renewable Energy Laboratory, solar will soon be as cheap as coal or gas. Solar is 83 percent of new clean energy projects approved by Japan. Last year, Europe increased its solar generation by 46.1 GW, more than 115 "Big Winds" – and enough to [power all of Austria](#).

The Big Wind/ Cable is a "huge raid on Hawaii tax funds benefitting big corporations," Honolulu City Councilman Tom Berg stated recently, one that sticks electricity customers and taxpayers with the costs and the developer's profits, "whether or not it ever carries a single Watt of electricity."

Why should Hawaii suffer catastrophic costs, environmental destruction, "public insurrection" and "significant impacts on the rural economy and the rural environment" for industrial wind's obsolete, expensive, dangerous and destructive technology? How many more Kahuku disasters do we need?

To move forward, Hawaii should impose a 5-year moratorium on industrial wind projects. Across North America, from Vermont to Ontario to Idaho, industrial wind moratoriums are being imposed. European nations are backing out of industrial wind as fast as they can.

An industrial wind moratorium would give us time to learn more about the health risks, environmental impacts and true economic costs of wind projects – particularly when Hawaii faces huge budget shortfalls. It's certainly time for Governor Abercrombie, the PUC and HECO to stop pushing industrial wind, and learn more about its catastrophic costs and social and environmental impacts on Hawaii.

About the author: *Mike Bond is a renewable energy expert, the former CEO of an international energy company and adviser to more than 70 of the world's largest utilities and energy companies. He lives on Molokai.*

Community Voices aims to encourage broad discussion on many topics of community interest. It's kind of a cross between Letters to the Editor and op-eds. We do not solicit particular items and we rarely turn down submissions. This is your space to talk about important issues or interesting people who are making a difference in our world. Columns generally run about 800 words (yes, they can be shorter or longer) and we need a photo of the author and a bio. We welcome video commentary and other multimedia formats. Send to news@civilbeat.com.

From: Pam Arborio [redacted]
Sent: Wednesday, April 03, 2013 8:56 AM

Subject: Fwd: Vermont Fish & Wildlife Department News...LYNX!

To all,

This is one more important reason to deny the Eolian project in the Senecas. The Lynx are an endangered species and, with Ferdinand being the home of a growing population, a turbine project and its extensive road system will certainly threaten this beautiful animals breeding grounds.

Respectfully,

Pam Arborio

Brighton

Begin forwarded message:

From: "Valerie Desmarais" [redacted]
Date: April 3, 2013 7:51:47 AM EDT

Subject: Fw: Vermont Fish & Wildlife Department News...LYNX!

From: [Vermont Fish & Wildlife Department](#)

Sent: Wednesday, April 03, 2013 6:41 AM

[redacted]
Subject: Vermont Fish & Wildlife Department News

Vermont Fish & Wildlife Department News Releases

Researchers Track Canada Lynx in Vermont's Northeast Kingdom

For Immediate Release: April 3, 2013

Canada lynx are appearing in Vermont's Northeast Kingdom according to the Vermont Fish &

Canada lynx have once again been spotted in Vermont's Northeast Kingdom over the last ten years after centuries with few confirmed sightings. Photo by Erwin Bauer, U.S. Fish & Wildlife Service.

Wildlife Department. Although only four confirmed sightings occurred in the state from the late 1700s to the early 2000s, lynx sightings have been on the increase every year since 2003. The department is conducting surveys to determine the full extent and distribution of lynx in Vermont.

According to Chris Bernier, biologist for Vermont Fish & Wildlife and the lynx survey leader, most confirmed lynx sightings have been on publicly owned lands in the Nulhegan Basin at Silvio O. Conte National Fish and Wildlife Refuge. "Lynx require specific habitat to thrive," said Bernier. "These large, unbroken tracts of mixed-conifer forest are perfect for this species and their primary prey, the snowshoe hare. We were all very excited when lynx sightings started popping up again in Vermont."

[Read more...](#)

Watershed Grants Awarded for 2013

For Immediate Release: April 3, 2013

Watershed Grants Awarded for 2013

Waterways across the state will see improvements in 2013 thanks to Vermont's Watershed Grant Program, which has awarded a dozen watershed improvement projects a total of \$120,000. According to an announcement today from the Vermont Fish & Wildlife Department, the applicants each received individual grants ranging from \$3,500 to \$15,000.

The 2013 projects exemplify a range of restoration and education projects including:

Restoration

- * Riparian habitat along two miles of the Missisquoi River,
- * In-stream trout habitat in the Nulhegan watershed, and
- * Storm-damaged riparian area on the Black River in Cavendish.

Education

- * Creating a residential stormwater education and technical assistance program in the Winooski River watershed,
- * Providing education and outreach on the importance of wild lakeshore buffer creation and maintenance, and
- * Creating a case study publication and outreach to highlight good and bad river and shoreline management.

[Read more...](#)

From: Pam Arborio [mailto:pam.arborio@vec.org]
Sent: Friday, April 05, 2013 1:09 PM

Subject: Fwd: VEC will oppose any large wind project in northern Vermont

Begin forwarded message:

Date: April 5, 2013 9:42:38 EDT

Subject: FW: VEC will oppose any large wind project in northern Vermont

4/5/2013 8:27:00 AM

VEC Will Oppose Seneca Mountain Wind

Robin Smith

Staff Writer

BARTON -- Vermont Electric Cooperative will oppose any large new wind project in northern Vermont, including Seneca Mountain Wind, CEO David Hallquist says.

That's because existing wind projects have introduced instability in the grid, prompting grid operator ISO-New England to order existing wind projects in Vermont and New Hampshire to cut back or "curtail" electricity output, Hallquist said Thursday.

"You are going to see us come out fighting against Seneca Wind," he said of the project that was initially proposed for Brighton, Ferdinand and Newark but now may be centered in Ferdinand alone. Wind farm turbines are not being allowed to operate at capacity, Hallquist said. "The more we put on, the more trouble we are going to have."

VEC and its partner Green Mountain Power, which own the Lowell wind project called Kingdom Community Wind, have lost an estimated \$1 million in electricity sales because of curtailment this winter, Hallquist said. Hallquist said they are counting on every dollar Lowell wind can generate to make it cost effective. "We want every megawatt out of there," he said.

Grid operators across the nation are experiencing problems handling large intermittent renewable projects like wind and solar. VEC is advocating a three-year moratorium to study these problems and find out how to introduce renewable green electricity into the existing grid, Hallquist said.

The state's goal of more renewable energy is not achievable without new ways to store that energy, he said. Hallquist spoke Wednesday to a committee formed by Northeastern Vermont Development Association to study the impacts of big wind projects on health, the economy, property values, the transmission grid and electricity rates. NVDA officials Dave Snedeker and Jim Greenwood said they have about a year to complete their study.

NVDA adopted a regional plan that calls for the state to suspend approval of new wind projects for three years to allow for studies like this.

PHOTO BY ROBIN SMITH

David Hallquist, CEO of Vermont Electric Cooperative, talks about the grid and how intermittent renewable projects destabilize it during a meeting at the Barton town office Wednesday with a wind study committee of Northeastern Vermont Development Association.

PHOTO BY ROBIN SMITH

Orleans Village supervisor John Morley, center, along with Dave Snedeker, left, and Jim Greenwood discuss how wind and solar energy projects affect the electrical grid in New England during a meeting Wednesday of the wind study committee of Northeastern Vermont Development Association.

NVDA wants to determine if industrial-sized wind projects are an appropriate resource for the NEK, Snedeker said, noting that they are divisive and that there are transmission constraints. The committee spent two hours with Hallquist talking about how the grid works and why intermittent renewable power plants cause instability in the transmission grid.

The conversation was about facts and questions about renewable energy and not about the emotions surrounding ridgeline wind projects, a conversation that Hallquist said the state as a whole should have. He would like the Legislature to sponsor a roundtable discussion about how the grid works and how to transition to a "greener" future.

"Renewables in the right place can be helpful, in the wrong place can be hurtful," Hallquist said. He pointed to VEC's plan for a solar project in Grand Isle. It will work there because they have a summer peak demand, right when solar is at its highest capacity, he said. Without cost-effective electricity storage for intermittent renewable projects, Hallquist said they will continue to cause stability problems in the grid.

John Morley, president of NVDA's board, runs Orleans Electric and is a member of the NVDA study committee. He said that he would like to see a poll that asks people to talk about what they value most when it comes to electricity. Both Morley and Hallquist said the members of their non-profit utilities will say that cost and reliability are more important than using renewable energy. "I would be fired if I didn't worry about costs," Hallquist said. Vermont should stop forcing utilities to add new renewable energy projects because the price of energy today is so low. "The real reason you can't build now is you can't compete with natural gas." The company that manages the state's transmission lines, VELCO, has announced that the lines in north-central and northeast Vermont are at capacity, Hallquist said.

That's another reason why the NEK cannot host another big wind project, he said. Seneca Mountain Wind officials are in talks with Lyndonville Electric Department over possible plans for the project to connect to the grid at a facility LED owns in Lyndon. Eolian Renewable Energy of Portsmouth, N.H., and Nordex, USA of Chicago initially talked about a 90-megawatt Seneca Mountain Wind in Brighton, Ferdinand and Newark. However, Brighton and Newark are opposed to the project and now officials talk of a smaller project in Ferdinand. Hallquist said he does not know why they want to connect at LED.

From: Nils Behn

Sent: Friday, April 05, 2013 1:07 PM

Subject: Energy Generation Siting Commission comments

Dear Commissioners,

Here is my input:

The ultimate goal of the siting commission should be to:

1) Encourage a cost effective transition from fossil fuels to clean renewable energy

2) Reduce the public conflict around renewable energy development

In my opinion the best way to achieve these goals is to provide a very clear set of guidelines, in the form of a comprehensive renewable energy ordinance that is fact based and clear. With this in place developers will be able to evaluate potential project early on and determine a go / no go and if the project is out of compliance with this ordinance the public will know if there are grounds for them to raise concerns. With these fact based guidelines in place Anti's will be put on notice that they will be held to the facts and their rhetoric will be discarded if it contradicts the truth.

Extension of the public comment period will only serve to extend the conflict and galvanize and polarize both sides of the debate. There is no precedent of the public debate resulting in everyone coming together in mutual support unless the consensus was there at the start. In many ways this has taken on a very political form in that the Anti's have been given the marching orders to never give ground even in the face of overwhelming facts. The result of extending the public comment period will be to give the anti's more time to fabricate a means of stopping the project outright, their goal is not about having reasonable concerns addressed.

Kind Regards,

Nils Behn
CEO

Aegis Wind

Nils Behn

From: [REDACTED]
Sent: Friday, April 05, 2013 3:30 PM

Subject: Siting Commission EGSPC Draft Options 4-5 final.docSx.docx

Attached are GMP's comments to the Siting Commission's Draft Option. Please forgive the page breaks but for some reason I can't get rid of the extra lines – thus the document is longer than it should be.

Thank you.

Robert

The following comments are submitted by Green Mountain Power
Contact person: Robert Dostis, Dir. Government Affairs and Customer Services
April 5, 2013

EGSPC 2nd Draft Packaging of the Recommendations

(March 27, 2013)

The Commission proposes the following package of recommendations to improve the siting process for electric generation in Vermont. While many of these can be implemented through rulemaking, others will require statutory change. In order to assure expeditious completion of the recommendations, the Commission advocates that current processes under Section 248 remain in place until rulemaking and statutes are in place. It does not favor moving siting to Act 250 regulations or other similar proposals in the interim, but rather recommends moving quickly to implement the following package under five broad categories:

Ø Increase emphasis on planning at State, Regional/Town levels, allowing RPC energy plans to carry greater weight in the siting process to ensure that electric generation projects are sited, whenever possible, in the best places with adequate prior public input.

- To meet Vermont's renewable energy goals as well as the wishes of our customers, the siting of generation needs to be streamlined and less costly. Recommendations that add more process and cost to siting generation will make Vermont's ability to meet its renewable energy goals more difficult and costly and in turn less likely to come from projects built in Vermont. The effect would be the transfer of a significant amount of money and tax revenue out of the State; dollars Vermont's economy would benefit from.
- The current 248 process to site generation is extremely rigorous, inclusive, and expensive. The public has adequate and multiple opportunities to participate in the siting processes; environmental and cultural protections are robust. Developers have significant incentive (their dollars at risk) to develop the "best sites", i.e., those sites that have an optimal mix of the following attributes: close to transmission, small environmental impact, supported by the community, use of brownfields if available, and reasonable access. These "best sites" are in direct competition with sites in other states. Developers have a finite amount of capital to employ in a fiercely competitive market place and cannot develop projects in a cost prohibitive environment, due to permitting requirements or location driven costs. If Vermont projects are not cost effective in the broader, regional market place, then they will not be constructed. GMP believes that the siting of renewable generation projects have to be determined in the context of what is in the best interest of all Vermonters and that the current process works to adequately address issues of siting and public participation in a fair and equitable way.
- At the end of this document is a chronology of the outreach and permit preparation work that occurred prior to submitting the 248 application for Kingdom Community Wind in Lowell, Vermont. You'll note that the work began 16 months before the 248 application was submitted. During this time extensive public outreach occurred throughout the Northeast Kingdom. This does not include the information and outreach conducted by the local utility, and our partner, Vermont Electric Coop to their customers through their regular channels. Our project was not a surprise, and nor is any project of this size. All government and non-government entities had ample opportunity to

participate in the discussion long before and after filing the 248 application. Opponents of the Kingdom Community Wind project participated robustly in all stages of the process with their primary goal to stop the construction, including by slowing down our progress to miss important deadlines, as well as increasing our overall costs. Siting recommendations should not arm opponents of wind, and other renewable projects, with additional leverage to accomplish their objective and stopping renewable development in Vermont.

Ø Implement a Simplified Tiered approach to siting to achieve a quicker, more efficient review of a greater number of small/less controversial projects – and those that conform to Regional Plans - while focusing the bulk of PSB time and effort on evaluation of larger, more complex projects. The goal is to encourage more community/distributed projects while simultaneously providing for greater opportunities for public participation in larger projects. The commission recommends a three-tiered system, where projects are classified by size, but have the ability to be placed in either a lower or higher tier based on complexity, resource impact and if they meet (or not) certain screening criteria.

- Nameplate capacity is the appropriate way to define tiers, because it is simple, straightforward, and matches existing practice. With clear screening criteria and a check list projects would have the desired certainty.
- The specific makeup of the various tiers should be considered in light of the proposed technology. Using a simple MW classified tier across all technologies will not improve the process of public acceptance where projects are controversial or unwelcome. Each technology has different levels of impact on the various Section 248 criteria and it may be useful to split the tiers up after a review of the various criteria weighed against different sized projects – for example a 12 MW wind farm (4 ea 3. MW turbines) is not significantly different from an 18 MW wind farm (6 ea 3 MW turbines) , however the difference between a 1 MW solar farm and a 5 MW solar farm (5 acres versus 25 acres) may be of significance.
- Defining the tiers and conditions where exceptions might be needed because of unique project impacts would be best considered by the legislature through the legislative committees of jurisdiction. They can give thought to how the size of projects impacts to natural resources, the electric grid, and other areas impacted by renewable energy development. The siting commission may want to include in their recommendations areas where further study is required.
- The current Board practices of waiving specific notice and hearing requirements when projects are of a limited scope where the applicants have pulled together a complete and comprehensive package and worked out issues with various parties prior to submitting for a permit works well, at least it has for GMP. If the application/approval process were more clearly understood by applicants prior to their submission, then it is likely more projects would move through the process at a rapid pace. GMP supports a recommendation from the siting commission that the application and approval process and requirements for siting renewable energy be clearly defined, including required studies, permits, mitigation for impacts, along with approval timelines for permits.
- Rather than provide a Public Engagement Plan (PEP) to PSB 150 days prior, GMP suggests that the applicant provide its plan and actual activities at the time the Sec. 248 is filed. PEP guidelines would

need to be developed and developers would need only to check the boxes showing that they fulfilled the requirements.

- If there are going to be specific requirements for public engagement, then successful implementation should provide a significant benefit in terms of expedited Board review, at least under the “non-technical” environmental criteria (orderly development, aesthetics).

Ø Implement specific process modifications to increase the opportunity for Public Participation. The Commission acknowledges the need to increase opportunities to both inform and address public aspirations and concerns in the electric generation siting process. The emphasis on energy planning at the Regional/town levels is a key factor to address this. In addition, the Commission recommends several specific process modifications related to the simplified Tier structure.

- Delegating the responsibility for energy planning down to the Regional/town levels will be counterproductive and likely result in a complex and unmanageable process for determining siting opportunities for renewable energy projects. The existing planning for transmission requirements is done on a statewide basis, as required by the PSB Board Order #7081, with input from a wide variety of interested parties.
- The creation of a statewide renewable generation planning group formulated with a similar make up to the Vermont System Planning Commission (VSPC) is more likely to yield positive, possible results and further leverage the efforts of the existing VSPC.
- The reliability requirement of the statewide grid requires that the planning and modeling of the state’s electrical system be done on a broad based, statewide approach. Planning for generation within a specific region without adequately modeling the remainder of the state and those requirements will likely lead to inadequate system planning, the potential for degradation to the transmission system and incompatibility with ISO-New England’s operation of the New England Transmission grid.
- Planning at the local level for small scale renewable energy sources, such as home solar units are an excellent way to leverage additional, direct community participation in renewable energy, however as more systems come on line system reliability issues become a greater challenge and require technical expertise. Expertise for these analysis is lacking at the regional level.
- Meeting the Vermont Legislatures goal for renewable generation will require both large and small scale systems. Large scale system planning to meet state needs is inconsistent with a region-by-region approach. Weighting of the party status of each RPC should not preclude the approval of a specific project in a region; otherwise this inclusion of the RPC’s will negate the state wide benefit of the Section 248 process.

Ø Implement specific process modifications to increase transparency and efficiency and coordination. The Commission recognizes that the dramatic increase in the numbers and types of electric generation dockets before the Public Service Board requires important refinements in the current processes to provide greater clarity, accessibility, transparency and predictability in the process to all parties. The simplified

Tier process incorporates a number of detailed recommendations to this effect.

Ø Update environmental protection – and other –guidelines (on a by technology basis, where necessary) and make them available on the website under the Simplified Tier approach. As renewable energy technology is deployed at an increasing rate and related siting issues evolve, the Commission recommends that specific guidelines and checklists be developed to reflect these changes. Examples include guidance to minimize fragmentation of habitat blocs and to address potential health impacts of certain technologies. These guidelines should be made publicly available – with all other existing environmental and cultural guidelines related to siting - on the improved PSB siting website, based on peer-reviewed scientific standards.

- GMP supports a recommendation from the siting commission that the application and approval process and requirements for siting renewable energy be clearly defined, including required studies, permits, mitigation for impacts, along with approval timelines for permits.

Increase Emphasis on Planning

1. The DPS shall develop a roadmap for meeting State goals and statutory targets through scenario planning to determine: the mix of in-state and out-of-state renewables; the anticipated mix of technologies; and the broad parameters for cumulative impact. This planning should use available tools to incorporate environmental considerations as well as economic, transmission and load analysis.

- This analysis must include the cost effectiveness and benefit of the in-state renewables versus purchasing these same resources from afar, as well as be closely coordinated with the VSPC efforts to proactively plan for the State's future transmission needs.

2. Regional Planning Commissions (RPCs) shall develop geographic energy plans for high potential/low potential areas for electric siting by technology. The DPS/ANR will provide the necessary guidance, tools and resources to RPCs to work with towns to develop plans. Examples of high priority areas could be where efficiency gains could be made (e.g., McNeil Biomass), 'low-hanging fruit' (e.g., brownfields, public buildings, new construction, rooftops, land under existing transmission lines, etc.), and specific zones. Examples of low potential areas might be those with a particularly high natural resource value, such as rare and irreplaceable natural areas, large habitat blocks or areas that provide an important habitat connectivity function. These high potential/low potential areas may differ significantly by technology, and no RPC or town can say 'no projects' in the region, either directly or indirectly.

- While input from the RPC's in a planning forum would be useful, the complex nature of planning for a statewide energy system cannot effectively be delegated to the towns and RPC's. The expertise required to do such planning exercises, simply does not exist within those groups.

3. The RPCs shall have automatic formal party status once their energy plans have been completed, and their plans shall carry greater weight in the siting process.

- Weighting of the party status of each RPC should not preclude the approval of a specific project in a region; otherwise this inclusion of the RPC's will negate the state wide benefit of the Section 248 process.

4. Initial RPC planning costs (est. \$25,000-\$30,000/region) should be covered by general funds, whereas annual updates should be covered by filing fees assessed to applicants (on a per MW basis) and a portion of

a 'franchise fee' assessed to all merchant generators at a rate similar to the gross receipts tax assessed to Vermont utilities. The latter would also be used to cover some of the additional costs related to other recommendations on improving siting process efficiency.

- GMP believes the current estimated costs for the RPC's to do planning (\$25-\$30K) and coordinate into the state wide effort is grossly understated. The cost would be in the hundreds of thousands of dollars per RPC.

Simplify Tier System

5. The Public Service Board (PSB) shall implement a Simplified Tier process to achieve a more efficient review of a greater number of small/less complex projects – and those that conform to Regional Plans - while focusing the bulk of PSB time and effort on evaluation of larger, more complex projects. The three-tiered system would classify projects by size, but have the ability to place projects in either a lower or higher tier if they meet (or not) certain screening criteria. Each tier would be accompanied by a clear checklist of requirements, available on the PSB website.

See comment above regarding the determination of tiered applications broken up by technology as well.

- A more comprehensive and complete application format (an actual set of forms used to make the application – some of this exists on the PSB website, but it is not as clear as it could be), supported by a “case manager” might achieve the expedited project approval process that is desired, without creating opportunities for future conflicts over the Tier sizing.

6. The screening process shall incorporate criteria designed to encourage the development of projects that will have the greatest chance of success and reflect regional priorities. Whereas the automatic default for tier designation is by MW capacity size (listed above), if a project meets certain criteria, it can be bumped from Tier 2 to Tier 1. Examples include one or a combination of the following: consistency with regional/town plans (those that have participated in the above-mentioned RPC planning process), community-led projects, proximity to transmission, positive ANR score card, proximity to load, appropriate land-use considerations (industrial, commercial, rural, residential), using existing structures. If a project does not meet minimum criteria for a given tier, it can be bumped upward to a more rigorous process.

Increase Opportunity for Public Participation

7. Provide earlier notification to the public in both Tier 2 and Tier 3 project applications. In Tier 2, the notification period should be moved from 45 to 60 days to all affected towns. In Tier 3, the period should be moved from 45 to 90 days.

8. Add increasing levels of public engagement requirements to Tier 2 and Tier 3 project applications. In Tier 2, examples include: demonstrated contact with Selectboard and RPC of affected towns, notification of adjoining property owners, description of public outreach, comments received and explanation of how they were addressed. In Tier 3, applicants would provide a Public Engagement Plan (PEP) to the PSB 150 days prior to the 90 days public notice. The PEP would be based on guidelines developed by DPS (using successful public engagement models such as VELCO and NY state). DPS would designate/contract a facilitator to work with each applicant to ensure the PEP is implemented effectively. The new notice periods and PEP process do not replace the need for applicants to conduct the natural resource assessments and wildlife surveys that may be required by ANR.

- GMP believes that a PEP provided at the time of the official notification of the proposed project permit application to be filed (currently a 45 days) with a history of the activities performed to date, as well as a detailed plan of future activities to inform the public about the project and the permitting process will more than adequately address the public notification concerns. Providing the PEP 150 days before the 90 day notice of intent to file will make the notification period before the application almost 9 months in length.
- An overall outline of how to go about filing a 248 application should be provided to all developers. The Vermont utilities, for the most part, have a strong understanding of how to prepare for and file a 248 application; however the process is unique to Vermont and is likely leading to miss-steps by

inexperienced developers trying to work their way through the process. This need could be addressed by the “case manager” within the PSD (or PSB).

9. Provide RPC funding support, if requested, on a cost-share basis in both the pre-application and application periods. These funds would cover expenses for those RPCs that have completed the planning process and would cover costs associated with experts, own time, attorneys and other related intervenor costs. Costs would be covered by bill-back.

- There must be an established level of “reasonableness” on the bill back costs and requirement to work with the existing statutory parties to establish what, if any, additional “experts” are needed above and beyond those already slated to testify for the other statutory parties. For example, there is no need to hire additional experts to evaluate the historical impact of a project, the State of Vermont’s office of Historic Preservation should be able to provide appropriate expert testimony to support the RPCs.

Improve Siting Process for Increased Transparency and Efficiency

10. The PSB shall hire a Case Manager/Online Docketing Manager to provide guidance on all aspects of the siting application process to all parties, particularly as they relate to timing. In addition, the Case Manager would be responsible for ensuring that the improved website remains up to date.

- A designated resource to act as a source of information on a case or 248 procedures upon request of parties could be helpful. Creation of a position through which all communication for a given case would have to flow could cause significant confusion and delay for petitioners and projects. An alternative approach to the case manager might be to use this position to be a consultant to the “public parties” to help them with the process and how to engage with the various other parties involved, versus being the controlling point in the process. This position could be a benefit to both developers as well as interveners.

11. Develop specific checklists for each Tier to establish when an application is ‘deemed complete’. These would include the specific maps, studies and assessments required by ANR and any other information required by PSB, and may need to vary by technology.

12. Require concurrent timing of ANR permit filing and Certificate of Public Good (CPG). Applicants would be required to have *filed* the necessary ANR permits (and any associated Federal permits) as part of the CPG application that is ‘deemed complete’.

- It is GMP’s goal to have all of our concurrent permitting and VANR concerns addressed prior to filing a 248 petition, however, on large complex projects this is very often not practicable and making it a requirement would introduce new and unnecessary delays and costs to projects. As VELCO pointed out in a recent PSB workshop, ANR permits are by nature more technical in nature and involve review of plans at a higher level of detail. Often during the Section 248 permitting process changes are made to a project that don’t affect the overall scope or intent of the project, but will require significant revisions to the technical permit applications before both VANR and the Army Corps of Engineers. While concurrent permitting can be a reasonable approach for GMP and VELCO on some projects, it may not be a reasonable approach for a private developer. Having to do all of the permitting concurrently can add a significant cost and complexity to the permitting process, when the approval of the Section 248 CPG is not known. This increased upfront cost, in addition to the inherent risk of the permitting of a project, is likely to reduce significantly the number of developers who are willing to undertake renewable energy projects in Vermont.
- The current practice of requiring all collateral permits prior to commencement of construction of a project provides more than adequate protection and integrity of the VANR (and ACOE) permitting process.

13. Establish statutory timelines for all involved parties (applicants, interveners, ANR, PSB) with consequences if not met. For example, PSB shall hold a pre-hearing conference within 14 days of an application being ‘deemed complete’, ANR shall respond to permit application consistent with ANR’s statutory permit performance standards. Include these timelines in an online docketing system, accessible by all parties.

- Predictability in the permitting process is always welcome and should be a goal. Mandating specific time frames could be difficult from a resource perspective for the government agencies.

14. **Establish an overall decision timeline for PSB approval of a CPG into Tier 2 & 3:** 6 months for Tier 2, and 12 months for Tier 3.

15. **Use ‘rebuttable presumption’ for ANR permits.** If an applicant obtains a permit from ANR prior to completing the CPG process, the PSB will accept that approval as a rebuttable presumption.

16. **Ensure that the improved website design includes:** a) full accessibility by all parties; b) a Frequently Asked Questions (FAQ) section with clear layperson terminology; c) required checklists for the Simplified Tiers; d) a docket-management system to signal when new statutory timelines are met (or not); e) all ANR and PSB guidelines and standards by permit, study and by technology; and f) access to historical docket records and orders, easily searchable (and free to the public).

- Improve the filing requirements of the Section 248 to allow electronic submission of all documents, versus the current practice of filing all documents to all parties in paper format. This will simplify the process and reduce the expense for all parties participating in the 248 process. Use of the website/docket-management system would improve this dramatically.

Ensure Adequate Environmental – and Other – Protection

17. **ANR shall, to the extent feasible, update environmental protection standards and guidelines by technology under the tiered approach.** Provide summary guidance on the improved website. Suggested areas include: setbacks, noise, habitat fragmentation, critical wildlife habitat, highest levels of efficiency, GHG and other air pollutant emissions, road construction (least intrusive and limited access), etc. Standards will be based on peer-reviewed, scientific literature.

18. **Incorporate specific environmental criteria currently reviewed under Act 250 into the Section 248 process.** These include: ____

- Currently, the Act 250 requirements are largely included in the Section 248 processes.

19. **DOH shall review national standards from peer-reviewed literature regarding health impacts and monitoring systems** by technology and provide guidelines, where possible, to be updated annually as science evolves. Applicants will provide public health impact assessments under Tier 2 and Tier 3 projects as per 30 V.S.A. 248 (b) (5).

20. **ANR and DPS shall develop guidelines and tools for understanding and measuring cumulative impact** to be used in both the planning, application, and monitoring phases of each project.

- How do cumulative impacts from other non-energy projects affect the evaluation? How does a Big Box Store in St. Albans affect the need for renewable generation in that area and does the Big Box Store development affect the “cumulative impact” analysis for other renewable energy projects?

21. **All parties shall agree on 3rd party monitoring experts to be hired/paid for by the petitioner, and overseen by the appropriate agency (ANR, PSB, DPS, Health)** under bill-back for pre-construction, construction and post-construction phases of a project. Public complaint responsibility shall be assigned to the relevant agency.

- Agreement to 3rd party monitoring for the various compliance requirements of the section 248 permit must include at least three parties from which the applicant can then bid and contract. Requirements to utilize one specific firm as a result of the 248 process may reduce competition in the market place and unfairly increase the compliance costs to the applicant. In the event that 3rd

party monitoring cannot be agreed to by parties, the PSB shall review the resumes of the proposed firms and propose the three most qualified firms from among which the applicant may bid and contract.

Generation Siting Policy Commission – GMP’s KCW Experience
Generation Siting Commission November 30, 2012

I. Pre-Section 248 Public Outreach/Discussion

- Jan 6, 2009 (16 months prior to filing Section 248 CPG petition) – first meeting with Lowell Select Board
- 2009 - 2010 activities (year prior to 248 filing)
 - o Informational website www.kingdomcommunitywind.com
 - o 18 local meetings reaching ~200 people
 - o Presentations/discussions with Select Boards of Lowell, Irasburg, Craftsbury, Westfield, Albany, Jay and Eden. Offered to meet with Montgomery, Troy and Newport
 - o Presentation/discussion with Northeast Economic Development Association
 - o Presentation/discussion with Lamoille County Regional Planning Commission
 - o Appearances on several regional radio talk shows
 - o Meetings with local editorial boards (Caledonian Record, Newport Daily Express and Barton Chronicle)
 - o Nov 5, 2009 Lowell community information meeting sponsored by GMP/VEC
 - o Two GMP-sponsored bus trips to operating wind farm in Lempster, NH, attended by more than 100 people
 - o On February 18, 2010, concerned citizens sponsored a community forum, which was attended by GMP
 - o On February 25, 2010, the Lowell Select Board sponsored a community meeting
 - o January – February 2010, VEC/GMP door-to-door outreach to Lowell residents
 - o VEC/GMP door to door outreach to Lowell residents
 - o March 2, 2010 Lowell town vote. 78% of registered voters participated, 342 in favor of the project, 114 against _____

II. Permit Preparation (~16 months)

- Sought PSB approval of met towers
 - Engineered and developed site plans
 - Evaluated project need, costs, economics
 - Retained experts to perform analyses/studies:
 - o Economic benefit
 - o Aesthetics
 - o Noise
 - o Health impacts of noise
 - o Historic sites
 - o Archaeological review
 - o Potential impact birds/bats
 - o Impacts to streams, wetlands, plant communities
 - o Impact to deer, black bear, moose
 - o Decommissioning plan
 - o Water quality, stormwater/erosion control measures
 - o Winter operating protocol
 - o Detailed transportation plan
 - Commissioned Feasibility Study/System Impact Study to determine impact on transmission system
 - Prepared applications for other required permits
 - o Stormwater (construction and operational)
 - o Water quality (US Army Corps of Engineers)
 - o Wetlands
 - o Wastewater
 - o Curb cut
 - o Tower lighting (FAA)
-

III. Overview of KCW 248 Process

- On February 23, 2010, GMP and VEC provided “45 day” advance notice package to affected municipalities and planning commissions
- On May 21, 2010, GMP and VEC submitted Section 248 Petition for CPG, supported by prefiled testimony and exhibits from 11 witnesses
- The Board granted 12 parties intervention (in addition to ANR, PSD, Department of Health, and CVPS as the interconnecting utility), consisting of:
 - o 5 adjoining property owners in their individual capacities
 - o A group of 200 voters and property owners interested in the aesthetics, economic, and ecological resources of the Lowell Mountain (also including the 8 adjoiners) called the so-called Lowell Mountains Group
 - o The Towns of Albany, Craftsbury, and Lowell
 - o Green Mountain Club, Conservation Law Foundation, and VPRIG
- 4 rounds of prefiled testimony
- 3 rounds of discovery
- 3 PSB-sponsored site visits; all parties invited to attend
- Public hearing in Lowell
- 9 days of evidentiary hearings at which testimony of 55 witnesses admitted -- 41 expert and 11 lay witnesses
- Intensive negotiations with ANR leading to submission to PSB of MOU on stormwater and environmental mitigation measures
- All parties provided opportunity to submit briefs and reply briefs
- On May 31, 2011, PSB issues order approving CPG in a 157- page decision addressing all issues raised by all parties. Order contained 42 construction and operational conditions.
- On August 19, 2011, ANR issued stormwater permits and Section 401 water quality permit
- On September 16, 2011, the US Army Corps of Engineers issued a Section 404 wetland permit
- The Intervenors played a significant role in the litigation of the case, specifically they:
 - o submitted testimony from 14 lay and 6 expert witnesses

- posed over 300 discovery requests to GMP in 3 rounds of discovery
- conducted over 13 hours of cross-examination of GMP's witnesses during the 9 days of evidentiary hearings in the case
- filed approximately 20 briefs and motions prior to the Board's Order approving the Project
- acted on the opportunity provided by the Board to file comments on all of GMP's substantive post-CPG compliance filings
- Appealed to the Vermont Supreme Court the Board's Order approving the project and two subsequent Board Orders to the Vermont Supreme Court
- Appealed to the PSB for de novo review of 5 ANR stormwater permits for the Project issued by ANR to the Board
 - De novo review of the ANR stormwater permits included testimony from 8 witnesses, 4 days of contested case hearings, briefs and reply briefs of GMP and the appellants
 - This appeal remains under advisement before the PSB
- Vermont Supreme Court affirmed the PSB CPG order in a detailed (100+ paragraph) decision substantively reviewing all of the issues raised by appellants
- The Board provided significant opportunity for public participation in the KCW Docket, in addition to the participation of 12 intervenors, including:
 - a public hearing in Lowell on 9-23-10, which was advertised in 3 local papers and attended by hundreds of people, 57 of whom spoke.
 - accepting written comments from the public throughout the process
 - In its Order approving the Project, the Board stated that it reviewed all of the public comments and that they played an important role in the Docket and assisted the Board in formulating questions for witnesses during hearings.

From: Rob Pforzheimer

Sent: Thursday, April 04, 2013 12:05 PM

Subject: Wind developer offers town \$40K for impacts

Eolian (SMW in VT) is trying to bribe NH town of Antrim to get the SEC denial of their project overturned. It's not clear how a one time \$40K payment would mitigate aesthetic impacts that the SEC said were unmitigatable.

<http://www.ledgertranscript.com/home/5429976-95/wind-developer-offers-town-40k-for-impacts>

Wind developer offers town \$40K for impacts

By Brandon Lawrence

Monadnock Ledger-Transcript

Wednesday, April 3, 2013

(Published in print: Thursday, April 4, 2013)

ANTRIM — Antrim Wind Energy has offered the town \$40,000 as recompense for a proposed wind farm's visual impacts to the Gregg Lake area. The caveat is the state's Site Evaluation Committee has already denied the application.

On Feb. 7, the state SEC voted down a proposed 10-turbine, 30-megawatt wind farm for the ridgeline of Tuttle Hill and Willard Mountain. The SEC cited "unreasonable adverse effects" the wind farm would have had on the area, which includes a New Hampshire Audubon wildlife sanctuary.

An appeal of the SEC's decision can be made once the final written order is released by the committee, detailing the court hearings that ended early in February. Antrim Wind Energy has not said whether or not the company will file an appeal, but town officials believe that is the company's plan. SEC representatives could not be reached for comment by press time Wednesday. The Antrim Select Board voted unanimously Monday night to accept a one-time payment of \$40,000 from Antrim Wind Energy, a subsidiary of Eolian Renewable Energy, if the SEC's decision to not go ahead with the project is eventually reversed following an appeal. But the decision got mixed reviews from residents at the meeting. Some residents expressed discontent that the town would accept what they said is essentially a bribe from Antrim Wind Energy.

"They want Antrim to sign the letter so there are no hard feelings for visual impacts," said Shelley Nelkens, who has voiced opposition to the project from the start.

"For them to consider that amount of money is absurd," said Loranne Block — another resident who's been a vocal opponent of the wind farm proposal — in a phone interview Tuesday, referring to the Select Board. "To me it's a total bribe. It's apples to oranges. [The money] has nothing to do with aesthetics. If you put a tennis court in, that doesn't help with the aesthetics overall."

Antrim Wind Energy sent a letter to Antrim town officials on March 15, stating the company "intend[ed] to offer mitigation specifically related to visual impacts, the details of which are still being determined." The \$40,000 could be used to enhance the Gregg Lake Recreational Area, according to the letter.

Town officials drafted a response letter on March 27, saying the town would accept the one-time payment of \$40,000, but asked that it be referred to as "acceptable compensation" for the visual impacts the project would have, rather than as a mitigation payment.

Select Board Chair Gordon Webber said in a phone interview Tuesday that if the SEC does not reverse its decision, the \$40,000 becomes a moot point. But if the ruling is overturned, that's \$40,000 the town will receive, which it hadn't originally planned on.

“Why would we say no to an additional \$40,000?” Webber said. “As a board, I say we use it for Gregg Lake.” The response letter drafted by the town states that the board is willing to accept the offer, and would likely use it to enhance the recreational facilities at Gregg Lake.

Town Administrator Galen Stearns said in a phone interview Tuesday that he was instructed by the Select Board to send the letter drafted by town officials to the town’s legal advisor, Barton Mayer, who works in Concord at the law office of Upton and Hatfield, for review.

If the wind farm decision is overturned and the town accepts the \$40,000, Webber said the town will hold a public hearing to acknowledge the receipt of the donation, per town guidelines.

“Any gift of \$5,000 or more requires a public hearing to say that we’ve accepted the funds,” Webber said. Webber said if the town does receive the donation, they would listen to suggestions at the public hearing about how it should be used to improve Gregg Lake. Ultimately, he said, it would be up to the various town boards to get together and make a decision.

N.H. SEC attorney Michael Iacopino did not return a phone call by press time seeking information about when the committee’s final written order will be published.

In reference to the above comment, Susan Hoyt wrote the following.

From: Susan Hoyt [redacted]

Sent: Thursday, April 04, 2013 3:35 PM

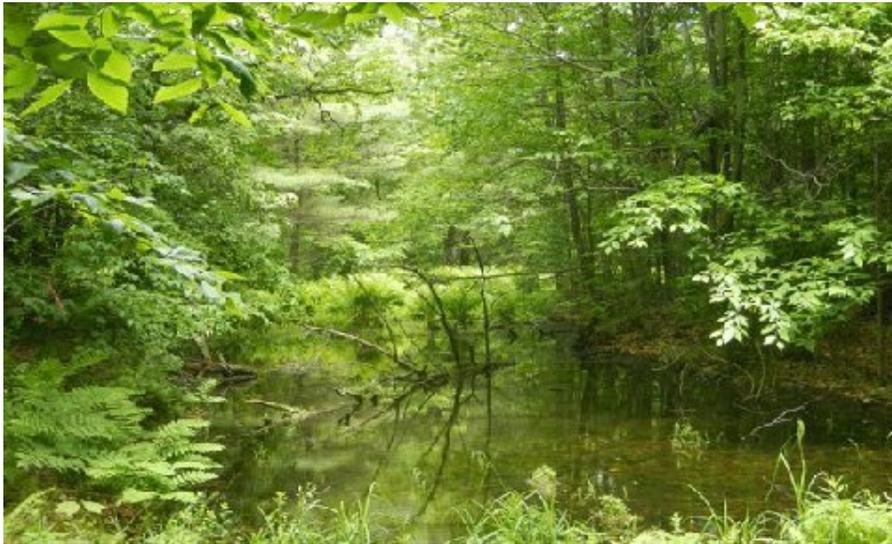
Subject: Re: Wind developer offers town \$40K for impacts

Somebody, Quick, give these people a \$40,000 donation for the improvement of that park fast ~ and permanently ditch that industrial wind company. Shame on that town!

From:

Sent: Thursday, April 04, 2013 9:45 PM

Subject: 'Do you not think that all life comes from the mountain?'



"SUDDENLY A DEEP VOICE

vibrant with suppressed emotion, spoke from behind me into my left ear:

'Do you not think that all life comes from the mountain?' An elderly Indian had come up to me, inaudible in his moccasins, and had asked me this heaven knows how far-reaching question..... Obviously all life came from the mountain, for where there is water, there is life. Nothing could be more obvious. In his question, I felt a swelling emotion connected with the word 'mountain.' I replied, 'Everyone can see that you speak the truth.' "

CARL JUNG, Memories, Dreams, Reflections. 1963

From: John Soininen

Sent: Friday, April 05, 2013 9:01 PM

Subject: Vermont Needs Well Defined Objective Criteria for Evaluating Wind Projects

Members of the Energy Generation Siting Commission,

Thank you for your efforts related to improving the siting of Energy Projects in Vermont. I believe that first and foremost we need knowledgeable, unbiased professionals to evaluate the specific merits of large, complex energy projects that must compete in competitive markets to ensure the delivery of reasonably priced, reliable, clean electricity to all Vermonters. In that light I offer the following comments:

- "Clarity, accessibility, transparency and predictability in the process" is paramount to furthering the development of renewables in Vermont and to achieve this the process does not need greater public input on individual projects but rather finite public input to develop acceptable objective criteria and clear standards that provide predictability for all parties.
- Providing earlier notification periods for larger projects ignores the fact that wind projects require CPG's for met towers and thus effectively provide significant advanced notice by default.

Finally I would like to remind the Commission that Vermont has one of the most rigorous and comprehensive permitting processes in the country. To improve the process developers and the public need clear objective guidelines like those outlined in Maine's State Planning Office Model Ordinance so that we all have clarity regarding what is deemed acceptable and what is not. Capitalism and competitive markets will ensure that only economically viable projects get built in Vermont so with the addition of some clear objective standards the process can be improved so that the rights of all residents in host communities are protected including the rights of participating landowners working to further the development of clean renewable domestic energy.

Thank you again for your efforts.

Respectfully,

John

John Soininen

Project Manager – Seneca Mountain Wind, LLC

VP, Development

Eolian Renewable Energy LLC



From: Pamela Arborio

Sent: Saturday, April 06, 2013 10:21 AM

Subject: Wenlock Wildlife Reserve

Mr. Recchia, PSB and the Siting Commission,

Please read this report and note there is an important wildlife area that exists in Ferdinand. SMW has repeatedly said there are no beech groves in Ferdinand yet this Fish and Wildlife report mention the beech tree feeding for bears. The attached map shows the large tracts of protected land but not all are included. My previous emails included Ferdinand as a whole and showed the extensive resources owned by different environmental groups. Their goal has always been to protect this delicately balanced, rare ridge line and the lush lowland that surround them. Please take this under consideration when you look at siting a 20 turbine project and the large pads and roads associated with them. Keep in mind, the Seneca ridge line is more narrow than Sheffield and will require more blasting to level turbine sites. Picture if you will the destruction of this precious ridge and the effects on the rare, threatened and endangered species that call the Senecas home.

Pam Arborio
Brighton, Vt

Wenlock Wildlife Management Area

General Description

Wenlock Wildlife Management Area (WMA) is a 1,993-acre parcel of land owned by the State of Vermont and managed by the Vermont Fish & Wildlife Department. The WMA is located in the town of Ferdinand. Primary access from the north is provided by Route 105 (which parallels the Nulhegan River), and from the south and east by South America Pond Road. Wenlock WMA is 7.5 miles east and 8.5 miles west of the villages of Island Pond and Bloomfield, respectively.

There is a parking area on Route 105. Another parking area is located just south of Route 105 on South America Pond Road. The gate on South America Pond Road is closed during mud season. Visitors can also approach from the south via South America Pond Road.

History

Land use in the WMA has always been based in natural resource utilization. Principle uses were characterized by logging, trapping, fishing and hunting; all of which continue on the WMA and surrounding lands. Logging activities were in full swing when David Beattie built a large steam-powered sawmill at Wenlock in 1881. In later years, the Canadian National Railroad provided a major transport route for softwood pulp shipped to New York State. At that time, the wood yard immediately west of the WMA was one of the busiest timber "sidings" in Vermont.

The Vermont Fish & Wildlife Department purchased the WMA land in 1980. Federal Pittman-Robertson Act monies funded the acquisition. These monies are generated from an excise tax on firearms and ammunition. The Nature Conservancy facilitated the transaction by purchasing the property from a private landowner earlier the same year.

Habitat Features

The general character of the Wenlock WMA is boreal. The WMA lies at the southern edge of a vast basin drained by the main stem and four branches of the Nulhegan River. The northern portion of the WMA is fairly level and forested mainly with spruce and fir. It includes extensive wetlands. Elevations on the WMA are from 1,140 to 1,200 feet, with a few hardwood knolls and ridges rising to more than 1,400 feet.



Deer tracks crossing the Nulhegan River.
Cedric Alexander, VFWD photo.

The WMA is part of the largest deer wintering area in the State. The "Nulhegan Wintering Area" is a 15,000-acre softwood basin used by wintering white-tailed deer. Deer gather there from about 202 square miles of summer range. Approximately 1,000 acres of Wenlock WMA are spruce-fir-cedar forests and associated hardwood forests that provide the deer with critical wintering habitat.

The WMA also encompasses Moose Bog, which has been designed a "Fragile Area" by the State of Vermont.

Common Fish and Wildlife

Mammals White-tailed deer are present here year-round, but are greatly concentrated during the winter months.

Wenlock WMA harbors moose throughout most of the year, especially in summer when the wetland areas provide succulent aquatic plant foods. During winter, moose seek hardwood patches within or adjacent to the WMA to browse on the abundant hardwood sprout growth.

Black bears are present throughout the year. Summertime tracks and droppings are often seen, as the WMA offers bears food-producing wetlands and abundant blueberries, raspberries and cherries. Bears also climb beech trees to get beechnuts, an important food resource.

Beaver are present in the various wetlands, as are mink, river otter, muskrat and raccoon. Also present are snowshoe hare, eastern coyote, red fox, bobcat, fisher and red squirrel.

Birds The WMA provides habitat for nesting and migrating waterfowl. Birds use bog ponds, beaver ponds and the Nulhegan River. Species most commonly seen are ring-necked, black and mallard ducks, hooded mergansers and Canada geese.

Breeding bird species of particular importance are spruce grouse, black-backed woodpecker, gray jay and Cape May warbler; all of which breed in only a few other Vermont localities.

Other notable species that may be seen in the WMA are ruffed grouse, wood duck, boreal chickadee, rusty blackbird, yellow-bellied flycatcher, Swainson's thrush, Tennessee warbler, blackpoll warbler, Lincoln's sparrow and white-winged crossbill.

Raptors that utilize the area include goshawk, marsh hawk, sharp-shinned hawk, and barred and great horned owls.

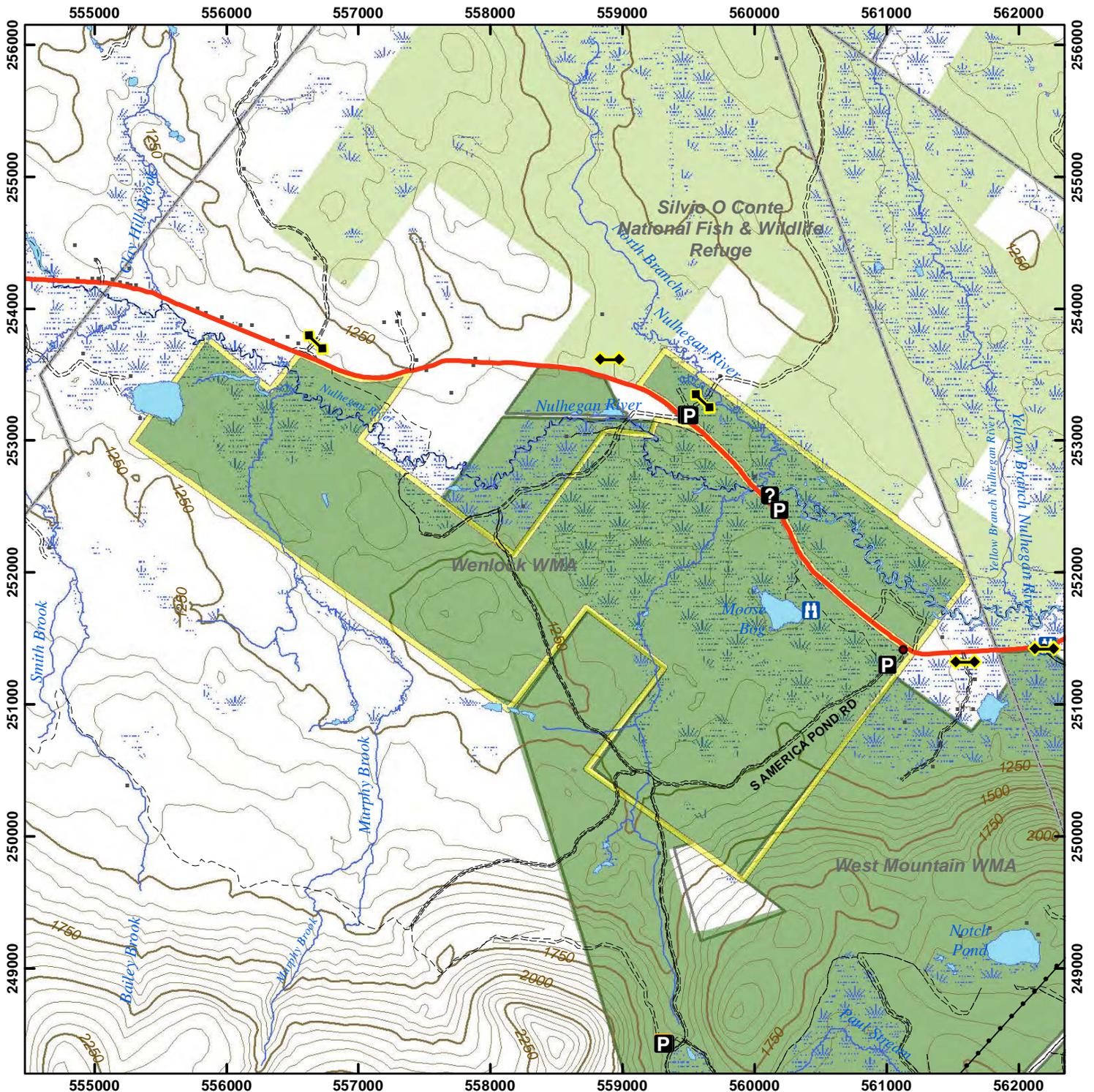
Reptiles and Amphibians Amphibians found in the area include northern spring, northern two-lined and red-backed salamanders, red-spotted newt, pickerel and wood frogs. Northern red-bellied and ring-necked snakes, painted and common snapping turtles likely inhabit the WMA.

Fish Various beaver ponds and the Nulhegan River and its tributaries have low to moderate populations of brook trout. Brook trout are also stocked downstream of the WMA.

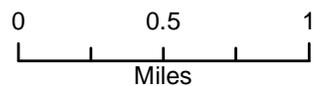
Wenlock WMA is open to regulated hunting, trapping, fishing, hiking and wildlife viewing.



Vermont Fish & Wildlife Department Wenlock Wildlife Management Area



Wenlock WMA: 2,403 acres



- Wildlife Management Area
- Other Public Land
- Private w/Public Access
- Wildlife Viewing Areas
- Car-top Access
- Parking
- ? Kiosk
- Boat Ramp
- Gate
- Designated camp site during Big Game Seasons only

This map is for illustrative purposes only. The accuracy of the data layers shown on this map are limited by the accuracy of the source materials. No warranty as to the accuracy or the usefulness of the data is expressed or implied.

From: Rob Pforzheimer

Sent: Sun, Apr 7, 2013 3:06 pm

Subject: Bird and Bat fatalities Sheffield 2012

Evaluating Bird and Bat Post-Construction Impacts at the Sheffield Wind Facility Vermont 2012 Annual Report
http://www.vce.org/Sheffield%20Wind%202012%20Annual%20Report_FINAL_3-25-2013.pdf

The cumulative bird and bat fatalities from Sheffield, Lowell, and other industrial wind factories in VT and New England will devastate bird and bat populations. The report acknowledges that bat fatalities might be even higher if the bat population was not already decimated by 90% due to White Nose Syndrome.

Seems ridiculous to kill all these birds and bats for expensive, divisive "renewable" generation that we don't even need, other to attempt to fulfill arbitrary, pie in the sky, goals set by Shumlin and the legislature.

Actual bat carcasses found = 63

When searcher efficiency (inefficiency) and predation are figured in the Estimated bat fatalities at Sheffield from April 1 - Oct 31 2012 were 235 bats (low estimate 160, high estimate 361) See Table 7 - page 27 http://www.vce.org/Sheffield%20Wind%202012%20Annual%20Report_FINAL_3-25-2013.pdf

Actual Bird carcasses found = 27

When searcher efficiency (inefficiency) and predation are figured in the Estimated bird fatalities at Sheffield from April 1 - Oct 31 2012 were 211 birds (low estimate 147, high estimate 321) See table4 - page 20
http://www.vce.org/Sheffield%20Wind%202012%20Annual%20Report_FINAL_3-25-2013.pdf

In response to the above comment, Willem Post wrote:

From: [REDACTED]

Sent: Sunday, April 07, 2013 5:36 PM

Subject: Re: Bird and Bat fatalities Sheffield 2012

Rob,
Sheffield is 40 MW. The US has 60,000 MW, 1,500 times more.

$2 \times 1,500 \times 470/\text{yr} =$

$2 \times 1,500 \times 422/\text{yr} =$

From: jennifer [redacted]

Sent: Sunday, April 07, 2013 6:15 PM

[redacted]
Subject: Final Comments to EGSPC

Hello Michelle,

The attached comments were a tad too long to submit on-line so I am sending them to you.

Thank you.

Jennifer Ely

TO: Vermont Energy Generation Siting Policy
FROM: Jennifer Ely (retired, former public natural areas manager in Vermont)
DATE: April 7, 2013
RE: Comments

I have attended many of the Commission's meetings and have been very impressed with every member's openness to listen to all points of view. Thank you each for your service, and the opportunity to comment here.

Climate change will forever alter many of the habitat corridors where Vermont's black bear and bobcat prefer to walk today. This will be especially true within Vermont's most remote and least disturbed wildlife habitat, where two man-induced actions will largely be responsible:

1. Higher temperatures caused by CO2 emissions that change the composition of Vermont's flora and fauna
2. New wind farms along Vermont's ridges installed to help lessen these CO2 emissions.

If we hope to protect the bobcat, black bear and other wildlife, we need to consciously leave an adequate amount of remote landscape undisturbedso that these animals may forage, find shelter, raise their young, migrate in a warming world, and maneuver around a series of new turbine pads, access roads and aerial lines. To accomplish this, I propose that **in exchange for receiving a permit to harvest Vermont's limited wind energy resource, developers should be required to set-aside suitable and adequate habitat land.**

Since the footprint of development disturbance can never be fully erased by restoration (rocky outcroppings will be gone, pads excavated and covered will not support deeper root growth, etc) these set-aside lands, in whole or in part, should be preserved for perpetuity. Also, if the public's use and enjoyment of new ridgeline roads is allowed (thereby introducing human activity to what was otherwise a remote landscape) then a greater amount of set-aside lands should be required.

Vermont's best wind resources are on its highest ridges and these lie within the state's largest expanse of intact forest. Today these forests and ridges are valued as Anchor Wildlife Habitat Blocks of >10,000 acres¹ that are key to the long term survival and wellbeing of the bobcat, black bear and a host of other species. Whatever the future holds for these animals, we can count on two constants which I became familiar with in my 30 years of managing public natural areas in Vermont:

1. Wildlife have only a limited repertoire of responses when confronted with changes to their environment. This will not change and they cannot be expected to learn new strategies.

¹ Anchor Habitat Blocks as defined by VT Agency of Natural Resource at www.biofinder.vermont.gov

2. Species will still need certain physical components within their habitat in order to survive and hopefully thrive which have been well researched by biologists and include such things as adequate acreage to range and cover type. Habitat requirements by species will stay largely unchanged as they have since settlers first came to Vermont.

My sense is that wildlife's future is best assured and protected by a broad-brushed stroke for now, that is--- **to describe, and in turn preserve, baseline physical components of corridors that we already know the indicator species will continue to need, in vicinity of all the best wind potential sites.** We can do this most easily by targeting bobcat and black bear habitat so that the greatest diversity of *other* wildlife species in Vermont's higher elevations will most likely be protected too.

In the interest of protecting wildlife habitat and connectivity, and of providing clear and accessible guidance to developers of large-scale wind farms for Vermont, I urge the Commission to include the following recommendations in its final Report (some of which are already in the Commission's latest Options Paper under consideration):

1. Deference be given to VANR's scientific knowledge and testimony by using "rebuttable presumption" for ANR permits, in order to effectively place burden-of-proof on the developer for proposed project changes and appeals. And in turn....
2. VANR be given the directive to provide better general guidance to the developer about **known baseline physical components of corridors and habitat** needed by bobcat and black bear in order for them to survive and thrive.
3. Additionally VANR be given the directive to explore the feasibility of creating a ranking for Vermont's top wind-potential ridges in terms of their suitability for large-scale wind development that will not unduly harm wildlife. This could include guidance on the amount and configuration of acreage that a developer would be required to set-aside, to preserve wildlife connectivity and habitat. A ranking with categories such as:
 - A. Vermont's Ridges Most Appropriate for Wind Farms. Requires conservation easements on suitable abutting lands in a configuration that allows continuous undisturbed forest of a width no narrower than, say, 1000 feet adjacent to all proposed boundaries of areas to be de-forested.
 - B. Vermont's Ridges *Possibly* Appropriate for Wind Farms. Requires a proportionally larger amount of acreage to be set-aside than for A, with a wider buffer of undisturbed forest and/or some other configuration defined by VANR.
 - C. Ridges Least Appropriate for Wind Farms. Requires a significantly larger amount of set-aside land than A or B, all of it protected for perpetuity.

All of the above will be more effective in protecting wildlife if the construction footprint on Vermont's ridges is minimized, where ever and whenever possible. Brushy growth along either side of a road where it narrows to single width will provide a better crossing point for bobcat, as one example. Preferred design features such as this can be part of the guidelines given to prospective developers early on.

Thank you.

4/7/13

From: Anne Krauss
Sent: Sunday, April 07, 2013 8:07 PM

Subject: Comments on EGSPC 3rd Draft Packaging of the Recommendations

Dear Commissioners,

Thanks for your work. Thanks also for this opportunity to write to you and take part in this important process.

1. (Pertaining to PG 2 & 17. & 19.) I applaud your emphasis on peer reviewed scientific literature as a basis for standards and guidelines. However, please do not let corporate funded "research" masquerading as science have any impact on their development. The corrupting influence of money on research is an increasing problem.

For an overview of how this can occur, please see:

<http://www.stanfordlawreview.org/print/article/punitive-damages-remunerated-research-and-legal-profession>

Although this article pertains to how Exxon funded legal research was positioned to influence Supreme Court decisions on punitive damages, similar techniques can be used to corrupt what appears on the surface to be unbiased research in any area where research outcomes can impact a corporate bottom line. One only need look at climate change denial websites to see cruder examples, or to the example of how peer reviewed scientific literature has been corrupted in the support of pharmaceutical company aims, as explained by award winning journalist Robert Whitaker here:

<http://www.madinamerica.com/2012/07/the-triumph-of-bad-science/>

For these reasons, please explicitly recommend that any corporate funded research or research done by people who have disclosed potentially conflicting interests be excluded from consideration, as well as any research conducted by researchers who do not fully disclose any potential conflicts of interest. I applaud the recommendation that all research studies which are being used to develop a guideline are posted on the website, which will allow the public an opportunity to independently verify that the research is in fact free of any conflicts of interest, as these conflicts of interest can be difficult to detect.

2. Next to energy conservation, small-scale renewable energy projects have the smallest environmental impact. For this reason, I support your suggestions that will make it easier and faster to build these projects in communities around the state.

3. I realize you are tasked only with electric generation projects.

However, the distinction between a watt generated and a watt saved is an artificial one. Energy conservation measures are the most cost-effective approach to making sure there's enough power generated to meet our needs, as well as being the most environmentally friendly.

Rather than making it easier to build large scale projects (as many of the recommendations in this draft appear to do), we should focus on ways to make it easier for people to conserve energy. I realize this is not within your area of control, but please keep it in mind, and don't give in to pressure to streamline processes because energy conservation is outside your scope. In this rush to adopt large wind, we may end up with abandoned projects in the coming decades as cheaper energy sources and high upkeep costs make ridgeline projects unprofitable. This quite possibly will be the legacy of streamlining the siting process.

4. Only local people have sufficient interest in the impact to their local environment that they'll take the time and put forth the effort to carefully scrutinize proposals developed by large companies that have sufficient resources to carefully hide the downsides of their proposed projects. Although I am happy to see that item 7. in the draft increases the public notification requirements for Tier 3 and Tier 4 projects, it is unfair to expect an

unfunded group of citizens to be able, in 60 or 90 days respectively, not only get the word out about a project but also respond to it. Prior notification should be further increased to at least 120 days for Tier 3 projects and 180 days for Tier 4 projects. For the same reasons, in item 16., public notification should take place as early as possible in the pre-development phase. Likewise, in 8.

5. Climate change is the critical environmental issue of our time. All energy generation projects have environmental impact. Permitting a given project because it has a comparatively low impact is like buying something because it is on sale: You still have spent money, not saved it. The best way to reduce climate emissions is to speed up the retirement of coal burning generators, not to build more clean energy projects. If the cost of energy goes up as a result, that's a good thing. The impact of climate change on the economy will dwarf any impact that higher energy costs will have on it. Vermont should be setting an example to the rest of the country by building fewer large scale, greenwashed projects with high environmental impact, rather than feeding the rest of the country's energy addiction.

6. (Pertaining to 21.) A "3rd party" monitor which is hired by the petitioner is an oxymoron (see previous comment, 5., above). If you hire your boss, and your boss's future work depends on pleasing you, he's not your boss. PSB should order the expert in all cases, and should do so in consultation with ANR, the agency most attuned to environmental impact and aligned with public interest in regard to that impact.

7. I am troubled by the "certification that the developer has made good faith efforts to hold a meeting with the Selectboard and Regional Planning Commission" language, as it seems to imply that effort is sufficient in absence of actual meetings. Additional language should be added to cover the possibility that the meetings did not take place, perhaps including a requirement for explanation as to why they didn't, and an alternate public notification system in the event that Selectboard or Regional Planning Commission meetings did not take place. Perhaps this is boilerplate, but never-the-less it seems to provide a potential loophole.

I hope to be more involved in this process in the future, and especially would like to be involved in development of PEP criteria, which I understand from 8. are still under development. Please let me know how I can stay informed about this process, especially regarding PEP.

Thank you for your attention.

Anne Krauss



From:

Sent: Monday, April 08, 2013 12:21 AM

Subject: Allow MORE local input BEFORE siting renewables

Dear Commissioners:

I would ask that you vote to allow MORE public input before siting renewable energy installations in places where the "cost" is felt directly but the "benefit" may not be.

Towns are left out of the current process, for the most part.

Municipalities rarely have the resources to make their case, yet self-determination (in this case, the Town's) is the hallmark of democracy.

Would you please give serious consideration to changing the PSB siting process by requiring applications go through the ACT 250 permitting process?

Thank you!

Irene A. Wrenner
Essex Selectman

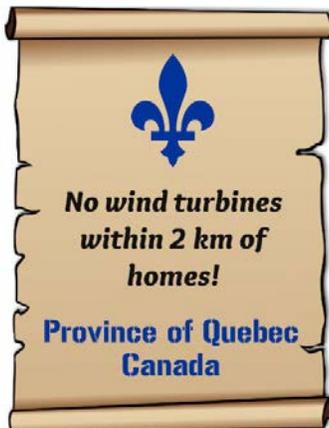
From: Rob Pforzheimer [redacted]

Sent: Monday, April 08, 2013 12:37 AM

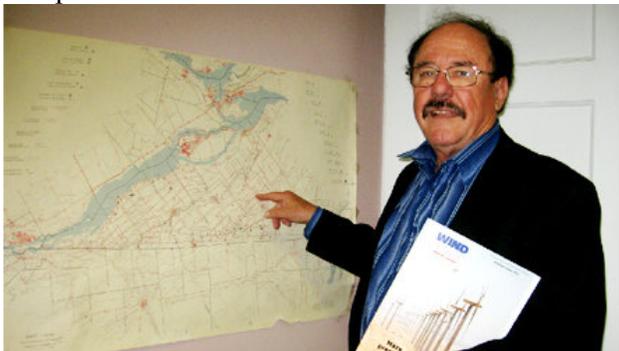
Subject: Quebec bans wind turbines within 2 km of homes

<http://www.windturbinesyndrome.com/2013/quebec-bans-wind-turbines-within-2-km-of-homes-and-1-km-of-public-roads-canada/?var=cna>

Quebec bans wind turbines within 2 km of homes and 1 km of public roads (Canada)
Apr 7, 2013



Editor's note: The following article was translated from French using Google Translate. The photo, below, accompanied the article. It shows the wind developer, Mr. Desgroseillers, pointing out where he had planned to build his "wind farm"—before the new law, passed last month, booted him out.



—Patrice Laflamme, [TVA Nouvelles](#), 3/25/13

No wind turbines can be built less than 2 km from a home and 1 km of a road in the Haut-Saint-Laurent, in the Montérégie.

The Quebec government has officially endorsed the amended interim control (RCI) of the Haut-Saint-Laurent surrounding these structures in its territory, which the council of mayors adopted on 9 January.

The Minister of Municipal Affairs, Regions and Land Occupancy (MAMROT), Sylvain Gaudreault, approved the new RCI in a letter dated March 13.

“The Regulation respects the policies of the government in terms of development. Therefore, under the Planning Act and planning, it shall take effect the day on which this notice is served,” the minister said in this letter for the prefect of the MRC, Alain Castagner.

In the territory of Haut-Saint-Laurent, this revised version of RCI forbids the erection of wind turbines 2000 m (2 km) from any dwelling and 1000 m (1 km) from any public road.

The new version of RCI also seeks to protect agricultural fields, cultivated floodplains, and woodlands, as well as bike lanes from the presence of wind turbines. It also establishes the 1000 m distance between the turbines and the Linear Park of the Haut-Saint-Laurent and 2000 m separating the site Droulers / Tsiionhiakwatha Saint-Anicet.

“As a prefect, I’m glad that the RCI has finally been accepted by the Minister,” said the mayor of Saint-Anicet and prefect of the MRC, Alain Castagner, in a telephone interview.

Mr. Castagner stated that the Minister would have been wrong not to endorse the RCI changes because, he said, “the government had endorsed the approach taken by the Haut-Richelieu last year and we were inspired to amend ours.”

The prefect insisted that any wind farm developers in the region will meet the requirements of the new RCI. “The aim of RCI does not prevent the construction of wind turbines in the MRC, but establishes reasonable distances (setbacks) in an effort to protect the citizens,” he said.

Godmanchester residents opposed to the construction of ten turbines in the municipality, warmly welcomed Minister Gaudreault’s decision. “I’m very happy for all citizens. This is very good news. People felt they were listened to by our leaders. The minister’s response pleases us greatly,” said the spokesman of the group, Carole Trépanier.

Ms. Trépanier recalled that in a letter sent Nov. 13 to Minister Gaudreault, she wanted to raise awareness of the mobilization orchestrated by those citizens who oppose construction of ten turbines in Godmanchester. “We wanted to persuade the government to protect us from wind turbines affecting our health. We wanted to demonstrate that wind turbines in Godmanchester would have negative impacts on the beauty of the landscape and property values,” she said.

Ms. Trépanier also pointed out that 570 people have so far signed the petition launched in recent weeks in the region against the construction of a wind farm in Godmanchester. “There was no community support for the project. Citizens have supported us in our efforts, because we educated them,” she said.

Ms. Trépanier said she was relieved to see that all elected municipal leaders of Haut-Saint-Laurent became aware of the “health hazards posed by wind turbines.”

The president of International Barter, Jean-Claude Desgroseillers, said he was disappointed by the acceptance of the new RCI by the minister, adding that such a decision would effectively block any future construction of wind turbines in the MRC.

With this new version of RCI, the prefect of the MRC wondered if there are still areas of land in the Upper St. Lawrence where it will be possible to build wind turbines. “If such areas remain, they would have to be large,” he said.

From: [REDACTED]

Sent: Sunday, April 07, 2013 10:17 PM

[REDACTED]
Subject: Comments to the Siting Commission

Due to the table included in our comments, please find attached a PDF of the comments.

If questions, please feel free to contact either John Zimmerman or myself.

Thank you for the work you are doing, and for accepting these comments and suggestions.

Regards,

Martha Staskus
[REDACTED]

TO Energy Generation Siting Policy Commission (EGSPC)

FROM: John Zimmerman, President and Owner,
Vermont Environmental Research Associates, Inc, (VERA) dba Northeast Wind

Martha Staskus
Board Chair, Renewable Energy Vermont
Principal at Northeast Wind

Date: April 5, 2013

RE: Comments to Energy Generation Siting Policy Commission's 3rd Package dated April 3, 2013.

Northeast Wind, commends the thoroughness and transparency in which this Commission has extended tremendous review, consideration and effort to address its seven charges: to compare the procedural, public participation, dispute resolution and coordination aspects of Vermont's electric generation siting process with other states, and to conduct an assessment of Vermont's existing analytical processes protecting our environment including whether additional "guidelines" should be considered.

Northeast Wind, is a Vermont Environmental Research Associates, Inc, (VERA) affiliate established in 1980s, and is based in Waterbury Center Vt. Since the 1980s VERA, an independent, small Vermont business, has provided wind energy consulting services to our variety of clients, including four of the five Vermont permitted and operating utility-scale wind electric generation projects, as well as projects in other New England states and services to Massachusetts and Vermont state agencies. We have contributed significantly to the siting, development, and permitting of over 250 MW of our region's utility-scale wind projects – from site and land acquisition, site evaluation, economic and environmental viability, community outreach, permitting, to project construction and performance monitoring. Wind energy related projects and analyses in which we have played substantial roles include:

Wind Power Project Development and Operations			Clients:
	Georgia Mountain Community Wind (2006 – Present)	10 MW , In service 2012	Landowner; Private Investor/Owners
	2010 Deerfield Wind Project Searsburg Expansion Collaborative (2003-2006 for Deerfield Wind Project)	34 MW, VT CPG & Fed EIS permits	International Private Developers and Vermont Utility
	Granite Reliable Project Coos County New Hampshire (2006 – 2008)	99 MW, In service 2011	Regional Developer
	Hoosac Wind Project Florida and Monroe, Massachusetts (2001-2008)	28.5 MW In service 2012	International Private Developers
	Kingdom Community Wind (2003-2010)	63 MW	Private Developer; landowner & GMP
	Searsburg Wind Power Facility (1993 – Present)	6.0 MW, in service 1997	Green Mtn Power

Wind Energy Resource and Energy Production Analyses (VT)		
	2005 Isle LaMotte wind resource measurement program	VT DPS
	2004 County Wind Resource Mapping estimates for wind speed and other statistics for every 200 x 200 meter grid cell	VT DPS
	2003 Estimating the Hypothetical Wind Power Potential on Public Lands (basis of Vt Agency of Natural Resources evaluation process)	VT DPS
	2002 Wind Energy Planning Resources for Utility-Scale Systems in Vermont	VT DPS
	2002 State of Vermont Wind Resources and Transmission Mapping	VT DPS
	2001 PERI Wind and Biomass Integration Scenarios in Vermont assessing the strength of the state's wind resource, proximity of transmission, environmental compatibility and other factors and estimate the theoretical maximum wind power.	VT DPS
	1999 Burke Mtn, Searsburg & Grandpa's Knob Wind Resource Assessment	NREL & VT DPS

The Vermont Comprehensive Energy Plan goal of 90% of all energy coming from renewable resources by 2050 requires significant new electric generation sources as we shift the thermal and transportation energy demands to clean, renewable electric supplies.

Based on our experience and in recognition of the importance of the State reaching its energy planning goals, we offer the following comments to the Energy Generation Siting Commission (EGSC), focused on the EGSC's most recent "package". In summary, we believe:

1. Implementation of a Tiered Matrix Review Approach will expedite a significant number of projects and provide more permit review certainty for all parties. It should be based upon a uniform unit of measure (BTU) of the efficiency of the generation resource as well as the physical land space impact it will require.
2. Project reviews should remain under the jurisdiction of the Public Service Board.
3. Extending the time lines currently as proposed is not necessary because the existing procedures already provide adequate time. Instead, creating a strong web-based platform that provides transparency and comment input for utilization in project review will benefit significantly to both public participation and notification timelines.

General Comments:

This Commission is charged with comparing the procedural, public participation, dispute resolution and coordination aspects of Vermont's electric generation siting process with other states, and conducting an assessment of Vermont's existing analytical processes protecting our environment including whether additional "guidelines" should be considered. Focusing on these broad tasks assigned this Commission, it is anticipated that the siting process of Vermont's electric generation facilities will be better understood by all parties and improved. The EGSPC findings of its seven charges will provide a valuable platform for recommendations that will advance the Commission's efforts and result in improvements and benefits to the review and permitting processes for generation projects proposed within Vermont.

We have concern that as the Commission's findings evolved into recommendations, the unintended outcome of this well-intended investigation, will be to make it more difficult to achieve project approvals and meet the State's energy goals. The process of implementing the Commission's findings will be to subject the permitting of energy generation facilities to additional hurdles, involving more parties and additional layers of bureaucratic and legal review. This will have the inadvertent effect of making it less efficient, more difficult and more expensive for project developers to receive approval for projects.

Comparison of the procedural, public participation and other processes in neighboring states and other jurisdictions is part of the Commission's charge. In addition to the significant material gathered by this Commission on a regional basis, we encourage the investigation of procedures employed by the Region 9 National Forest Service, who manages the large amounts of renewable resources located within the Green Mountain National Forest, right here in Vermont. Following a multi-year process, the US Forest Service issued its 2006 Forest Plan which guides the management and use of federal land through 2021 and which has already designated lands under its jurisdiction appropriate for large wind development consideration.

As the Commission has assessed existing analytical and procedural processes and considered the value of additional guidelines, we encourage the consideration of accumulating permitting costs very near the top of the list. Prior "Draft Packages" provided by the Commission discuss implementing 'application fees', 'bill backs', 'funding needs', etc. at various stages of considerations. Uncapped additional costs have a multiple of cascading impacts. Fees impact Vermont electric rate payers directly as in the instance of Project Proposals from regulated utilities, with relatively low risk to the utility sponsor. Non-utility Project sponsor face a greater risk exposure to such fees and significantly increase development risk to the sponsor. High, un-capped fees will deter renewables development, counter to state policies. Careful consideration of fee structures, use of the fees, management of fees and the magnitude and risks associated with these fees should be carefully considered on the forefront to avoid unintended consequences and creating detrimental economic impacts.

We provide further comments to the Commission's specific areas below:

- ***Increase emphasis on planning at State, Regional/Town levels, allowing siting decisions to be in conformance with Regional Planning Commission (RPC) energy plans.***

If greater consideration and evaluation of renewable energy options is to be addressed at the Regional Planning Commission (RPC) level care must be taken to do so in a manner consistent the

statewide Comprehensive Energy Planning process. Energy planning is currently done at the state/country regional level and should and will continue to be done so. While there are good aspects to RPC involvement, such as consolidation of member towns concerns into one voice, it is difficult to imagine that additional RPC involvement, being yet another layer of bureaucracy will result in a more efficient, cost effective siting and review process. In the Commission's draft package the concept of RPCs developing 'geographic energy plans' is proposed. This present concept should be improved by correcting a potentially serious fatal flaw -- the involvement of Vermont's energy production industry should be in the development of the RPC's planning process.

We have worked with RPCs for over 25 years as we proceeded through the development and permitting process of several major wind projects. This experience has been very uneven, both in terms of the RPC expertise and between individual RPCs within the State. In most cases, though RPCs acknowledge that their "plans" encouraged renewable energy development, few had recommendations that were specific enough to be of much guidance to renewable energy developers. RPCs usually admit as much and cite the reality of limited resources to address the fairly technical nature and distinct disciplines needed to guide development at any specific sites, and the ones they do have, often times conflict with one another.

If increasing RPC involvement is implemented, it should be done by taking a cautious approach to phasing in RPCs into the siting and permit review process. It is difficult to imagine the magnitude of the funding and effort that may be required to implement EGSPC proposed changes effectively. Doing so would require organizational changes in each RPC, the coordinating of them on a statewide basis and a system of follow-up to measure effectiveness in progressing to the Comprehensive Energy Plan goals. In addition to funding concerns, the amount of time needed to fully implement this could extend into years or more. One alternative could be to implement RPCs' involvement on a staged, or trial basis, with one of the more sophisticated RPCs and with a significant component of industry involvement.

We do not support the development of a new map for generation facilities. The DPS is already charged with performing a very similar exercise in the new Comprehensive Energy Plan. To that extent, a "road map" would be redundant, time consuming and largely duplicative with other maps and data currently available and that can be used for this purpose, such as the [Renewable Energy Atlas of Vermont](#), ANR's "Biofinder", numerous data layers available through the [Vermont Center for Geographic Information](#), and the [Land and Resource Management Plan](#) prepared for the Green Mountain National Forest by the US Forest Service.

➤ ***Implement a Simplified Tiered approach***

We support the use of a 'tiered matrix approach' which evaluates proposals based upon a project's unit size relative to a project's impact size. This would provide a consistent mechanism for project review across the range of resource technologies. The lower tiers, those with lower impact projects, should be expedited and not be treated as a contested case review. A tiered system to project reviews would provide *all* parties more clarity in the process, better defined expectations, and greater efficiencies. As well, applicants are much better positioned to evaluate the business risk in advancing a concept.

All renewable resource technologies have different characteristics and attributes; however, they all require the long term use of our limited and valued land resources. In light of the Commission's

specific charge to evaluate SITING generation, meaning the use of these land resources, we suggest that the level of review be tiered by impacted land area (acreage), in a matrix to the resulting energy. Renewable Energy technologies will continue to change and improve, and as much of concern is in large part driven by the siting of energy generation, the potential for impacts on immediate land area should be considered. We note, what is lacking from this matrix is the added impact of some technologies of the delivery of the fuel to the generator.

		Energy (Average MegaWatt)		
		<= 500kw	500kw to 5 MW	> 5 MW
Land Use (Acres)	<= 2 acres	Low/Low	Med/Low	High/Low
	2 to 10 acres	Low/Med	Med/Med	High/Med
	> 10 acres	Low/High	Med/High	High/High

As this type of evaluation occurs, along with conservation, the efficiencies of our renewable resources should be weighted in the process, thereby necessitating a standardized unit of measure across energy sources. Therefore, the generation size of projects should be equated and tiered by equalized output criteria (BTU). Generically labeled “megawatts”, does not adequately reflect the efficiencies of a project’s output.

Thresholds can be and are already applied with respect to electric reliability. The tiered matrix we propose reflects and is consistent with existing state and regional energy review. Regionally, ISO-NE thresholds currently exist. Projects 5 MW and below already are reviewed by Vermont’s distribution utilities and not considered by ISO-NE. Alternatively, the upper tier could be 20MW or 30MW to match with ISO or FERC distinction between small and large generator interconnections agreement projects.

Thresholds are also appropriate and already applied with respect to land use. Acreage as part of a threshold matrix is consistent with existing Federal and Vermont Agency of Natural Resources (VANR) disturbance threshold permits (ie water quality, stormwater impact). Incorporating existing environmental limitation levels can further permitting efficiencies of minimum-sized project proposals.

Generation rated capacity thresholds of 500 kw or less, 5 MW or less and greater than 5 MW, considered in conjunction with acreage land use, is consistent with siting on fewer acres for streamlined permitting and more efficient use of regulatory resources.

We support permit review criteria based upon thresholds, as discussed above, for the purposes of streamlining permitting efficiencies. We do not support, based upon our experience in multiple, stringent, Public Service Board comprehensive reviews of wind energy generation projects and temporary wind measurement stations, moving any project review to the Act 250 process. Energy facility siting policy has state-wide implications, and should be evaluated on a basis of *Public Good* to the state as a whole.

- ***Implement specific process modifications to increase the opportunity for Public Participation.***
- ***Implement specific process modifications to increase transparency and efficiency and coordination.***

We appreciate and acknowledge the aspirations for more public participation in project reviews. Public participation and constructive input is most important in deploying project proposals intended to meet the statewide Comprehensive Energy Plan goals conscientiously and in the “public good” of all Vermonters. Parallel to this should be the discussion of “notice” time. Both of these components should keep in mind the objectives to be gained. After citing some examples below, we suggest both these areas can be significantly improved through the implementation of a robust web-based communication and information system.

We spent significant time and at great expense our clients (the Project Proponents of two of the larger wind projects permitted to date) to engage and provide for public participation in advance of permit review. VERA was directly involved in the design and implementation of specific public outreach efforts for the Deerfield Wind Project (2003-2007) and the Kingdom Community Wind Project (2008-2010).

Deerfield Wind: Being the first project proposed on National Forest land, the Project Proponent established the “Searsburg Expansion Collaborative” four years before permit submittals. The participants (RPCs, towns, community members, regulatory observers, agency observers, NGOs and other interested parties) in this Developer-sponsored, facilitated process met 16 times between 2003-2005 and then the Developer participated in more than 10 additional public events¹, availing significant public participation opportunities. In this situation, so much time may have gone by that the review process became cyclic and somewhat redundant as with the passing of time, new individuals joined in the process. Significant to this process was the opportunity all members were provided to participate in identification of project assessments and who would provide that data collection and analysis. While Deerfield Wind went through this lengthy process and received both a Federal AND State permit, it was still challenged in the courts. Regardless the amount of time a project is “Noticed”, there will be those that say not enough notice was provided.

Kingdom Community Wind: Prior to GMP moving forward with a long public participation and information program, five years of wind resource data was gathered (2003-2008) followed by early phase environmental data collection to assist in community conversations. A two year public engagement process (2009-2010)² with significant human resources and expense to the rate payer ensued, BEFORE a PSB Petition was even filed.

Our experience is that the public, towns, and RPCs do not adequately engage if the development plans are presented prematurely. As well, sometimes in an attempt to conserve financial resources, local/regional regulatory bodies may wait to engage. Additional time BEFORE a Petition is filed to the PSB will not increase public participation or significantly affect the permit review process as may be contemplated. This has clearly been demonstrated in the most recent wind projects (as cited above).

¹ See attachment: Deerfield Wind Project – Public Meetings 2003-2007

² See GMP comments to the EGSPC for further details.

The goal of Notification should be to gain public comment in a productive, informative manner pertaining to valid concerns regarding a Project Proposal. This should be done beginning when the Project Proposal is adequately developed. Based upon our experience we would propose the Commission consider a robust web-based information site whereby public, regulators and the Project Proponent are provided a transparent platform for sharing information, concerns and comments in a constructive, non-intimidating forum (as discussed further below). A system similar to what this Commission has been utilizing to solicit public participation and comments is an example.

A caveat relative to large wind projects is the fact that the public is made aware of a Project Proponent's intentions early on with the acquisition of permits to install temporary wind monitoring equipment for, typically at least a year, resource data collection. This is in advance of submitting permit applications for a specific project proposal. The Commission's findings should consider data collection of this nature is a temporary process and, as with any development, a necessary first step of assessment. In the long run, permit acquisition for this type of work can be a cost savings to the public, the State, regulators and the project proponent, in the event the data identifies unviable project benefits.

Extending an early notification timeframe to over six months (as drafted by the EGSPC) is too long and not additionally productive to achieving the goal. Improving project proposal transparency and availing avenues for public comments through implementation of e-filing, electronic applications and web-based comments will significantly advance participation opportunities and timeliness of project reviews. This platform would provide fulltime access to project information, increase the ability for all Vermonters to comment and participate without extending Project Proposers financial risk.

Establish a robust web-based information resource to provide the public, the regulators and the Proponent a transparent platform for sharing information, concerns and comments in a constructive, non-intimidating forum. Then use this web-based environment as the platform and timeframe for facilitating and advancing the review of a Project Proposal relevant to potential impacts of project applications.

At the time a Project Proposal has sufficient information, the Project Proponent would submit the information to a website within the PSB administrative structure. From that point, for a period of 30 to 90 days (30 for lowest tier proposals up to 90 days for the highest tier proposals), the public, all Vermont agencies/departments affected, and the Proponent provide input, comment and relevant information to inform all interested parties on the proposal. All this gathered information, can then be fed into the PSB review process, whereby the Project Proponent will need to sufficiently address the issues raised during this input period.

Establishing statutory timelines for each key stage of the PSB review process will bring more certainty and efficiency to the permitting process for all parties, and this should be encouraged. As well, specifying time periods for PSB and ANR/DPS responses will bring more certainty and efficiency to the permitting process for all parties, and this should be encouraged.

The goal is to provide ample time for public comment AFTER the project proposal is ready for regulatory permitting. While we do not support a "PEP" concept, if it is advanced, it's "guidelines" should be pre-established by the DPS with clear expectations, timeframes and tools so that all

parties (public, regulators and Project Proposer) are all knowledgeable of the process. In addition to public engagement models cited incorporate web-based methods, submittal of public comments and periods as similarly utilized by the Green Mountain National Forest Service in their process to update the GMNF Management Plan (2006).

- ***Update environmental protection – and other – guidelines on a by technology basis, where necessary.***

The recommendations in this section seem to be bias and confined to a review of a project proposals' negative impacts, when in fact substantial benefits accrue to society from renewable energy development. ANR's current mode of review ignores the positive benefits of project proposals even though it is within their purview to do so. For example a proposed project's potential impacts to air quality improvements and its associated health impacts should be included directly in the evaluation and review processes. As this EGSPC is focused on renewable technologies only, where is consideration provided to the offset of locating generation at the site of the fuel resource (for the life of the project) versus the transport of fuel to the site of the generation (typical in fossil fuel fired generation). Similarly impacts on climate change initiatives should be included as an important measure that ANR considers its updating its standards and guidelines.

General Comments to Annex 2 provided 4/3/2013:

All state regulatory agencies/departments that currently receive notice of Public Service Board petition filings should continue to be noticed AND required to respond as to whether they intend to participate (provide comment). Tier requirements (call for studies and assessments) should be relevant to all agencies (ie if transport / construction will impact roads, VAOT should participate from the beginning).

We strongly disagree with ANR's insertion of language suggesting certification "that the project avoids any regulated natural resource" and "that applications for all necessary ANR permits have been filed" as "avoids any regulated natural resource" is vague in its requirement and would be significantly premature to hearing the public's comments. Additionally, it may unnecessarily increase a project proposal's costs if changes are identified during the comment/input period.

Any new application form and checklist should be developed with input from all Vermont state agencies/departments as well as towns/regional planning commissions and the industry at-large.

The inclusion of ANR's request to "retain the right" "regardless of the PSB determination" to request a hearing would not be necessary in the web-based inclusive participatory program as identified above. As the PSB has cited in previous cases, ANR has a statutory responsibility to participate. This request looks to usurp the Board's legislative responsibilities.

Deerfield Wind Project -- Public Meetings 2003 - 2007

Date	Purpose and Venue of Meeting	Sponsors
Feb 2003 – August 2005	16 meetings of Deerfield Wind Collaborative (aka Searsburg Collaborative) to provide a forum for discussion between Deerfield Wind LLC and not-for-profit organizations, local government, regional planning commissions, utilities, state and federal agencies, and the interested public.	enXco (VERA), PPM
9/11/03	Meeting for regional planners, Collaborative and public at the White House in Wilmington to provide update on Deerfield Wind, answer questions and solicit input.	EnXco (VERA)
10/14/03	Meet with the Searsburg Selectboard to update them on Deerfield Wind, answer questions and solicit input.	EnXco (VERA)
10/22/03	Meet with the Wilmington Selectboard to inform them as to Deerfield Wind, answer questions and solicit input.	EnXco (VERA)
1/11/05	Meet with the Readsboro Selectboard to inform them as to Deerfield Wind's plans and permitting procedures.	USFS EnXco (VERA)
8/3/05	Public Scoping meeting at Mt. Snow Resort in Dover to obtain public input on application to the U.S. Forest Service.	USFS, PPM, EnXco (VERA), GMP
8/4/05	Public Scoping meeting at Elementary School in Whitingham to obtain public input on application to U.S. Forest Service.	USFS, EnXco (VERA)
9/12/05	Public meeting with the Windham Regional Planning Commission at Wilmington Town offices, to obtain public input on proposed application to Public Service Board.	WRPC EnXco (VERA)
9/15/05	Public meeting with Bennington Regional Planning Commission in Arlington to present plans for Deerfield Wind and to obtain feedback from the public and commissioners.	BRPC EnXco (VERA)
5/3/07	Public informational meeting "Open House" to introduce PPM, update status of the project; answer questions and obtain feedback. Held at the Readsboro School.	PPM VERA
5/8/07	Searsburg Selectboard public meeting. Introduction of PPM, update status of project, answer questions and obtain feedback.	PPM VERA
8/25/07	Day-long bus tours originating at Deerfield Valley Farmers Day to the Searsburg Wind Facility.	PPM (VERA) GMP
10/5/07	PSB Site tour and public meeting in Readsboro.	PSB
10/10/07	Public "Open Forum" at Wilmington town offices to present project status, answer questions and obtain feedback.	PPM

From: DePillis, Alex

Sent: Monday, April 08, 2013 8:39 AM

[Redacted]
Subject: Agency of Agriculture comments on draft recommendations

Dear Commissioners:

The Agency of Agriculture, Food and Markets submits the attached comments. Thank you for the opportunity, and for all your work.

Yours very sincerely,

Alex

Alexander DePillis

Senior Agricultural Development Coordinator
Division of Agricultural Development
Vermont Agency of Agriculture, Food, and Markets

[Redacted]

The Vermont Agency of Agriculture, Food and Markets (Agency) thanks the Energy Generation and Siting Policy Commission (Commission) for its diligent and thorough work, and for distilling so much information into a concise set of recommendations. Furthermore, we thank the Commission for the opportunity to testify, for including the agricultural perspective in the draft recommendations, and finally for the opportunity to provide comment on the draft recommendations.

We urge the Commission to retain the recommendations as written below, from the draft recommendations “EGSPC 2nd Draft Packaging of the Recommendations” of 27 March, 2013.

- DPS should explore the possibility of spreading the costs of electrical integration of manure-digester projects among the ratepayer base, given the multiple public benefits of manure management through anaerobic digestion that go beyond simple electric generation. This would provide a significant incentive for further development of on-farm distributed energy generation.
- Renewable energy projects should be allowed on conserved land when: i) the installation does not permanently commit a piece of prime agricultural soil or soils of statewide significance to the energy use either by virtue of costs of reversal or destruction of soil quality; ii) the installation does not severely threaten or eliminate the underlying farm’s long term economic and agronomic viability as a farm.
- The PSB should adopt the framework currently under development by the AAFM, PSD and ANR to delegate responsibility for manure management systems in electric generation to the relevant state agencies under Sec. 248(b)(5).
- In cases (Tiers 2&3) where there is more than a de-minimis impact on prime agricultural soils, soils of statewide significance or the project takes place on a farm as defined by the AAPs, the AAFM should become a statutory party.

All these recommendations reflect and respond to actual state practices and issues, drawn from our Agency's direct involvement. In particular, we draw the Commission's attention to the reality of renewable energy projects being allowed on conserved land. There is already a rigorous process in place to review any such use of conserved land, and the Agency continues, with its partner Vermont Housing and Conservation Board, to develop policy and guidelines.

The Agency is glad to know the Commission sees fit to include recommendation 18 in the “EGSPC 3rd Draft Packaging of the Recommendations” (April 3, 2013).

“The AAFM shall become a statutory party in the siting process in cases where there is more than a de-minimis impact on prime agricultural soils, soils of statewide significance or the project takes place on a farm as defined by the AAPs [Accepted Agricultural Practices].”

At the same time, the Agency urges the Commission to provide the full context to the Governor and elected officials and land-use officials, via the Commission's recommendations, as given in the four bullet points of the "2nd Draft."

Finally, we offer the Agency as a resource to explain the realities of renewable energy projects on agricultural lands. Please contact us at your convenience.

From: Annette Smith

Sent: Monday, April 08, 2013 1:44 PM

Subject: Power Shift Away From Green Illusions

<http://truth-out.org/news/item/15588-power-shift-away-from-green-illusions>

Power Shift Away From Green Illusions

Monday, 08 April 2013 09:25 By [Steve Horn](#), [Truthout](#) / *Interview*



(Photo: [twicepix](#))Every day, the news about climate change and the harms that are sure to accompany it gets [worse](#) and [worse](#). To many environmentalists, the answer is simple: [power shift](#). That is, shift from fossil fuels to clean, green, renewable, alternative energy. Well-meaning concerned citizens and activists have jumped on the bandwagon.

The problem with this simple solution: Things aren't as simple as they seem, and "there's actually no such thing as a free lunch" when it comes to energy consumption and production. Further, what we're often sold as "green" and "clean" is actually neither. In the spirit of these inconvenient truths came a timely and provocative book, perhaps missed by many, titled, "[Green Illusions: The Dirty Secrets of Clean Energy and the Future of Environmentalism](#)," by [Ozzie Zehner](#).

As Zehner writes in the book's opening pages, "...this certainly isn't a book for alternative energy. Neither is it a book against it. In fact, we won't be talking in simplistic terms of for or against, left and right, good and evil ... Ultimately, this is a book of shades." The book does show some of the "shady" sides of the clean energy hype and in so doing, dampens the hype around it.

Having recently read the book myself, I decided to contact Ozzie and ask him follow-up questions. Below is a transcript of our email conversation, which unfolded over the past few months.

Steve Horn for Truthout: If you had to give an elevator pitch to someone about what's wrong with the current US environmental movement, what would you say and why?

Ozzie Zehner: I would say that the environmental movement has relegated itself to cheerleading and mindless chants and that it's time for us to step away from the pom-poms. I encounter a boundless enthusiasm for creating positive change when holding dialogues with environmental groups. Unfortunately, the mainstream environmental movement is channeling that energy into an increasingly corporatist, and what I call a "productivist," set of priorities.

Now I admit, it's difficult to say we've ever had a truly transformational environmental movement, but if you go back 50 years, activists were at least on a far better path. Prominent environmentalists were living modestly, challenging dominant economic assumptions, and imagining durable strategies for human prosperity that were more in tune with the non-human planet. That humility has largely eroded.

The modern environmental movement has rolled over to become an outlet for loggers, energy firms and car companies to plug into. It is now primarily a social media platform for consumerism, growth and energy production - an institutionalized philanderer of green illusions. If you need evidence, just go to any climate rally and you'll see a strip mall of stands for green products, green jobs and green energy. These will do nothing to solve the crisis we face, which is not an energy crisis but rather a crisis of consumption.

Can wind/solar ever actually replace the fossils or is that the wrong way to think about the energy/climate conversation to begin with? If so, what are some of the right ways to start thinking about this conversation and what can be done to salvage what looks to be [increasingly horrific runaway climate change](#)?

There is an impression that we have a choice between fossil fuels and clean energy technologies such as solar cells and wind turbines. That choice is an illusion. Alternative energy technologies rely on fossil fuels through every stage of their life. Alternative energy technologies rely on fossil fuels for mining operations, fabrication plants, installation, ongoing maintenance and decommissioning. Also, due to the irregular output of wind and solar, these technologies require fossil fuel plants to be running alongside them at all times. Most significantly, alternative energy financing relies on the kind of growth that fossil fuels drive.

Take, for instance, President Obama's new [Energy Security Trust](#). It aims to expand offshore oil-drilling operations in order to provide a tax base for alternative energy technologies, which will in turn lead to economic growth. The irony in the President's proposal is that it exposes how alternative technologies rely on economic arrangements that are themselves reliant on fossil fuels. And, if they work as advertised, these energy technologies will spur the kind of growth that will increase pressure to extract and burn fossil fuels well into the future.

There's a misconception that once alternative energy technologies get off the ground, they can fly on their own. But alternative energy technologies are better understood as a product of fossil fuels. It's notably more expensive to build a wind turbine today than it was a decade ago. Biofuels rely on petrochemical fertilizers and energy-intensive agriculture. And even though subsidies are driving a perceived rapid drop in solar technology costs, the larger expense of an installed solar system lies in installation, cleaning, repair, insurance and other low-tech costs, according to the largest [database of field data](#) from California.

The high cost of wind and solar technologies brings to light the fossil fuels behind the curtain. If we want to address climate change and the many other consequences of energy production, there's no evidence that lower energy costs and growth are a step in the right direction. The answer is straightforward, really. We'll need to greatly reduce both consumption and the number of people consuming over time.

You mention "productivist" and "corporatist" both here and in your book. By that do you mean [neoliberal](#)? Is the problem that the current green movement, if you want to call it that, has little understanding of the fundamentals of the current socio-economic order?

Neoliberalism, the idea that unfettered markets of privatized resources leads to prosperity, is just one human arrangement that falls under the larger umbrella of productivism. It's tempting to simply focus on critiquing markets and wealth accumulation.

There are many injustices in that realm, to be sure. But we might also talk about human procreation, the work ethic, alternative energy production, or numerous other productivist pursuits. Within these narratives runs a

common theme - that which is produced is good, and those who produce it should be rewarded. This creates problems on a finite planet, to put it mildly.

Our planet has bounded resources and limited ability to absorb the impacts of human activities. Challenging the dominant neoliberal model can help to justly share those resources and risks. However, the precarious stories around growth and productivism are larger than just neoliberalism or capitalism.

Libertarians and Tea Partiers subscribe to the free-growth mindset, but so do Democrats and Republicans. Even Greens and Socialists are not immune to the seductive language of productivism. I know of one political candidate in the US who has run on a platform of slowing down the machine in order to preserve long-term prosperity only: Dave Gardner, who ran for mayor of Colorado Springs and directed a movie about it called [Growthbusters](#).

We've seen material growth and prosperity walking hand-in-hand for so long that we don't know what they look like separately. That will have to change. Perhaps we'd better reorient, or at least recognize, our productivist inclinations now. Otherwise, Mother Nature may force us to reckon with our unsustainable belief systems in a less agreeable fashion.

Guy McPherson uses the term "fossil fuel derivatives," which fits into your assessment. Is that a better way of framing the debate: fossil fuels vs. fossil fuel derivatives? There is no "clean energy" then, right? Any "silver bullet" fuel source, or is the "silver bullet" creating a different world?

The silver bullet is to envision a prosperous, yet smaller and less-consuming populous. In the modern energy system, alternative energy ends up being an alternative way to burn fossil fuel, which incurs alternative side effects and limitations. I wish it weren't so, but that's where the [evidence](#) leads.

Since wind and sunlight are free, why are wind and solar power so expensive? Solar and wind energy technologies should be very cheap - much cheaper than fossil fuels.

But they are not cheap at all. Even with massive subsidies, we see firms going bankrupt trying to sell them. And then we still have to figure in the cost of building batteries, redundant power plants or other infrastructure that arises from their low quality intermittent energy. Finally, we have to consider the mining, health, pollution and waste problems of renewable technologies. For example, we are now learning that the solar cell industry is one of the fastest growing emitters of virulent greenhouse gases such as sulfur hexafluoride, which has a global warming potential 23,000 times higher than CO₂, according to the Intergovernmental Panel on Climate Change (IPCC).

There's no such thing as clean energy, but there is such a thing as less energy. Every energy generation technique has [side effects and limitations](#). The best way to avoid these negative consequences is to use less energy overall. That strategy also has side effects and limitations, but at least those can be addressed within the laws of physics on our finite planet.

Do you believe more so in the "[end of growth](#)" point of view, espoused by Richard Heinberg and others in that school of thought?

Our future success will rest upon our ability to bring the population down over time as we also reduce per-capita consumption. How do we do that while maintaining life satisfaction?

That's the question that Richard Heinberg, Curtis White, Albert Bartlett, Paul and Anne Erhlich, Jeff Gibbs and I are asking along with theorists in the French de-growth movement and others. We certainly don't have all of the answers - far from it. There's not even much room to discuss these topics within the existing progressive

movement, but I invite everyone to come join us in creating that space. The first steps are to shed our green energy illusions and to start thinking more critically about perpetual growth. Afterward, I suspect we'll be able to ask clearer questions and maybe even imagine what a truly advanced civilization might look like.

What about something like biomass or biochar, the latter of which has been touted by some environmentalists as a form of "[black gold](#)"? Will that save our asses or is there hype here?

I recently visited a new tree-burning plant on the campus of the University of British Columbia. The university brags about burning trees to fuel their rather inefficient campus buildings. The practice of burning trees goes by many carefully branded names these days: biomass, biochar, sustainable forestry, selective logging, combined heat and power, and others. Biomass proponents in Vancouver told me their plant is 1) CO2 neutral and 2) only burning waste - two of the central talking points that profit-minded industry officials leverage to bring citizens on board. But, as with other forms of marketing, they are [engaging in a practice of misdirection](#).

It takes a minute to incinerate a tree in a biomass plant, but it takes decades to grow one. And how can that seedling grow back if you've removed the so-called "waste" materials from the forest? [Research](#) shows that forests do not grow back to their original state, of course, and that biomass plants exhaust far more CO2 than natural gas or coal plants.

If you live on an infinite planet and have a time machine, maybe biomass could be sustainable. However, on our finite world, forests are a depleting resource just like fossil fuels. They are also our lungs. That's why burning them is the fastest route to civilization collapse.

Electric cars? You devote a decent amount of space in your book explaining why they're not the answer. Why not? There have been [two very prominent](#) documentaries which conclude that they're the saving grace.

Building a heavy box with wheels and then shoving it thousands of miles down a road requires a lot of energy. There's no physical way around that. Electric car companies haven't found a way around the physics. But they've created an illusion that they have.

Electric cars can seem clean if you're wearing some pretty substantial blinders. And if you read reports by industry, political groups, and academic departments at UC-Davis, MIT, Stanford, or Indiana University, who have partnered with industry, that's what you'll get - narrow questions that measure easily obtainable data that can be quantified within a semester. On their own, they might be a curiosity, but electric car proponents leverage these fractional studies into the spotlight to paint the whole industry green.

Fortunately, we have another point of reference to consider. Researchers at [The National Academy of Sciences](#) took a step back. They investigated the entire life cycle of an electric car and painstakingly compared its impact to epidemiological data from every county across the United States. They determined that electric cars merely create a different set of side effects. It's just that those side effects don't come out of a tailpipe, where we are accustomed to looking for them.

Overall, the researchers found no benefit to an electric car once you account for the broader array of harms - most notably those arising through manufacturing. The National Academies report is showing its age, but it's the best we've got so far because it's comprehensive and independent. It was commissioned by Congress - we paid for it - and it's co-authored by 100 of the nation's top scientific advisers. A more recent [Congressional Budget Office report](#) came to similar conclusions.

Why has the mainstream green movement gone in this direction that you describe? Is it a case of corporate funding interests behind activist groups and an accompanying case of well-intentioned activists "drinking their Kool-Aid?"

Mainstream environmental groups are exchanging their principles for power at a suspect rate of exchange. It's not just the alternative energy technologies that rely on fossil fuels. The environmental groups do, too. They rely on funding from the excess wealth accumulated as froth on the top of the fossil fuel economy. But it's not just money. There are other influences too.

Mainstream environmental groups seem transfixed by technological gadgetry and have succumbed to magical thinking surrounding their pet fetishes. The last thing you want to give to a growing population of high consumers is more "green" energy. Even if it did work as advertised, who knows what we would do with it, but it almost certainly wouldn't be good for other species on the planet or, for that matter, long-term human prosperity.

In addition to the money and magic, there are silo effects. That is, asking narrow questions that can be answered with the methods at hand. We've seen a decline in the social science and humanities as ways of knowing something about our world, as if the human spirit and the natural world were materials to be titrated in a test tube. We are afraid to ask questions that can't be answered by the clever methods we've created. Finally, there's the influence of media, which I spend a whole chapter dissecting in [Green Illusions](#). Green media has become a war of press releases - a contest of half-baked models and glorified science fair experiments. It doesn't have to be this way. We can change it all if we are willing to think and inquire differently as concerned citizens.

What exactly would "de-growth" look like as a movement? Are there examples of communities/nation-states taking part in it now? And do you see any examples of it within the US itself, say, within the Occupy movement?

I can't say exactly what de-growth will look like, but I suspect it will start with a different conceptual landscape. We've built up stories around green technologies and we make comparisons that are bound to satisfy those preconceptions. As a result, we have an environmental movement that is asking the wrong questions about growth, economy, equity and global risks.

Take, for instance, the practice by mainstream environmental groups of vilifying petroleum cars in order to promote electric cars. No doubt, gas cars are expensive and dirty. They kill tens of thousands of people annually. But using them as a benchmark to judge a technology as green is a remarkably low bar. Even if researchers at the National Academies are wrong - even if electric cars someday pass over that low bar - there's another problem. How will electric cars stack up against the broader array of transportation options at hand such as transit, cycling and walking?

Subsidies for electric cars are ultimately a subsidy to car culture and the infrastructure that goes with it. Car culture is not sustainable within the limits we face to growth. The more durable transportation options are cycling and walking. But the United States Congress has nearly eliminated bike lane and pedestrian funding - even while it pays out thousands of dollars to every wealthy electric car buyer. And Congress staged this tragic national embarrassment with the full support of the nation's leading environmental organizations.

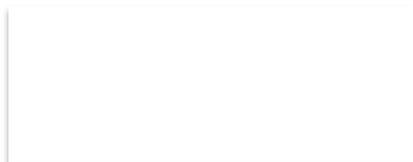
We are so far from finding solutions. We first have to change our questions. We have to stop touting green growth, green jobs, green buildings, green business, and start to interrogate assumptions that undergird the belief that material growth will lead to long-term prosperity. British Columbia's Work Less Party, along with the French de-growth movement, are shifting to different kinds of questions. Occupy, as a political ideal, is building foundations, too. As the green illusions start to unravel over the coming years, we will find opportunities to create a new environmentalism, or perhaps a rediscovered environmentalism, which I am guessing will be both frustrating and exhilarating.

Ozzie Zehner is the author of [Green Illusions](#) and a visiting scholar at University of California-Berkeley.

On Mon, Apr 8, 2013 at 3:15 PM, Gabrielle Stebbins | REV <gabrielle@revermont.org> wrote:

Hello to you both,
Attached please find REV comments regarding the April 3 Recommendations.
Thank you in for your efforts.
Sincerely,

Gabrielle Stebbins
Executive Director



April 8, 2013



To: Energy Generation Siting Policy Commission

Re: Draft Packaging of Recommendations dated April 3, 2013

Dear Commissioners,

Renewable Energy Vermont (REV) provides these comments for your review and consideration, and thanks you for the diligence, thoughtfulness and time that the Commission has volunteered throughout this process. REV represents more than three hundred businesses involved in all sizes and technologies of renewable generation projects – our comments are a compilation of the thoughts and experiences of numerous small and large-scale developers, including utilities.

Our comments are developed along the following framework:

1. The current process is fair, deliberate and allows significant debate and public input – although components of the process can and should be improved (e.g. transparency, clearer deadlines, etc.).
2. If the process is fair, what is it exactly that the Commission is being asked to achieve besides comparing different permitting approaches? If the “unspoken” goal is to lessen controversy regarding projects, this goal may not be achievable regardless of improvements in process – as it relates more to the role of the “common good”, and how different members of the public weigh benefits and costs to various actions.
3. If the recommendations proposed by the Commission move forward, REV politely requests additional changes regarding: tiered structure, potential funding categories, the need for more public input when future decision are made, the need for a “plan-do-check-act” process, etc.
4. Areas of support.

1. The current process IS fair, deliberate and allows significant debate and public input.

REV continues to uphold the fact that the current Section 248 process is complete, thorough, and allows for considerable public input – although stakeholders may not always be satisfied with the final determination made by the PSB. However, REV does agree that the process is costly, lengthy and not transparent enough.

There have been numerous comments made that the current process does not require enough “advance” notice and public outreach. Generally, REV does not agree with this viewpoint. For example, Green Mountain Power (GMP) first met with the Lowell Select Board 16 months prior to submitting a Section 248 application. In the year prior to submitting an application, GMP conducted the following outreach:

- Informational website www.kingdomcommunitywind.com
- 18 local meetings reaching ~200 people
- Presentations/discussions with Select Boards of Lowell, Irasburg, Craftsbury, Westfield, Albany, Jay and Eden. Offered to meet with Montgomery, Troy and Newport
- Presentation/discussion with Northeastern Vermont Economic Development Association
- Presentation/discussion with Lamoille County Regional Planning Commission
- Appearances on several regional radio talk shows
- Meetings with local editorial boards (Caledonian Record, Newport Daily Express and Barton Chronicle)
- Nov 5, 2009 Lowell community information meeting sponsored by GMP/VEC
- Two GMP-sponsored bus trips to operating wind farm in Lempster, NH, attended by more than 100 people
- On February 18, 2010, concerned citizens sponsored a community forum, which was attended by GMP
- On February 25, 2010, the Lowell Select Board sponsored a community meeting
- January – February 2010, VEC/GMP door-to-door outreach to Lowell residents
- March 2, 2010 Lowell town vote. 78% of registered voters participated, 342 in favor of the project, 114 against

Even with the above-list of public outreach prior to filing a Certificate of Public Good, individuals who did not wish to see the Lowell Wind project built have stated that the process was not “open” enough or allowed for enough public outreach.

Similarly, the Seneca Mountain Wind project, which after a year has still not received a determination regarding the construction of temporary meteorological towers, has completed the following public outreach:

- 5/10/12 – BBQ - Hawk Rock Cabin #1
- 5/23/12 – Newark Open House – Newark Street School Gym
- 5/24/12 – Brighton Open House – Brighton Town Hall Gym
- 5/29/12 – BBQ – Jill & Mike Mathers
- 6/19/12 – BBQ – Walker Mountain Camp Site – Newark
- 6/20/12 – Sheffield Wind Farm Project Tour
- 7/9/12 – Brighton Fire Department Presentation – Brighton Fire Department
- 8/2/12 – Vermont Fish and Wildlife Conservation Group Presentation –American Legion Hall, Brighton
- 10/3/12 – Wind Energy Panel Discussion - Brighton Town Hall Gym
- 11/3/12 – Newark Supporters Dinner – Burke Mountain Ski Area
- 11/14/12 – Brighton Supporters Dinner - American Legion Hall, Brighton
- **Note:** This list of events does not include any local town board meetings or regulatory meetings

From REV’s perspective, increasing the number of days of notification prior to filing a Section 248 permit will not improve public notification or outreach.

The issue has not been a lack of public notice, or public outreach, but rather a larger question of: what does the State do if a project is in the interest of the broader public good, but there are some local residents who do not want to see the project built? Unfortunately, REV suspects the increased advanced notice will only serve to “rally the troops” for or against a project earlier in the discussion stage – thereby likely only further solidifying the “camps” in which people find themselves (in support or against a project) – and will not necessarily improve the dialogue or outcome. The real issue is not the pre-notification period (for, in REV’s experience, most entities wait until the deadline to file comments, regardless of the length of time given to file comments), but rather the identification of clear guidelines regarding “go – no go” areas to build.

Ideally, the next step of this process would be for the Public Service Board to oversee an open, public process whereby relevant state agencies, RPCs, and stakeholders (including developers) participate in reviewing the specific site concerns as associated with technology type and size, to ultimately develop a draft set of guidelines regarding “go- no go” project criteria. This “go – no go”

criteria should be reassessed as new, scientific studies are completed so that the criteria remains relevant.

2. The Role of the Common Good

If there is an “unspoken” goal of lessening controversy regarding projects, this goal may or may not be achievable regardless of improvements in process – as it relates more to the role of the “common good”, and how different members of the public weigh benefits and costs from various actions. This brings the conversation to a more elevated, ethical level whereby there is a balancing act between how we value the common good for the benefit of the majority, compared to the concerns or questions of a few of the minority. As stated in *Issues in Ethics*:

“Commenting on the many economic and social problems that American society now confronts, Newsweek columnist Robert J. Samuelson wrote: "We face a choice between a society where people accept modest sacrifices for a common good or a more contentious society where groups selfishly protect their own benefits." Newsweek is not the only voice calling for a recognition of and commitment to the "common good." Daniel Callahan, an expert on bioethics, argues that solving the current crisis in our health care system--rapidly rising costs and dwindling access--requires replacing the current "ethic of individual rights" with an "ethic of the common good"[Appeals to the common good] “urge us to reflect on broad questions concerning the kind of society we want to become and how we are to achieve that society. They also challenge us to view ourselves as members of the same community and, while respecting and valuing the freedom of individuals to pursue their own goals, to recognize and further those goals we share in common.”¹

The question must remain whether we collectively want to see more positive outcomes in the following areas:

(1) climate change,²

¹ *Issues in Ethics* V5, N1 (Spring 1992). <http://www.scu.edu/ethics/practicing/decision/commongood.html>

² Numerous comments have been made regarding the fact that the sale of Renewable Energy Credits (“RECs”) means that Vermont’s renewable energy projects are not actually “renewable”. This is an oversimplification of how RECs work throughout the region, and how energy is utilized across the entire ISO-NE grid. For example, (1) many states allow for entities to pay into an “alternative compliance mechanism”, essentially paying a fee to meet the Renewable Portfolio Standard (RPS) requirements, rather than actually building renewable energy projects or reducing greenhouse gas emissions. (2) Vermont’s renewable projects do reduce the amount of traditional fuels

- (2) employment opportunities in Vermont resulting from construction and monitoring of projects, manufacturing of materials, etc.,
- (3) economic security
- (4) energy security
- (5) keeping dollars in state

And if we do want the above, then which sacrifices are acceptable, and at what levels?

The concerns that have been raised with regards to new, renewable generation projects include, but are not limited to:

- public health impacts
- cumulative impacts to the environment
- immediate aesthetic impacts (and whether/how this does or does not impact property values and tourism)
- other environmental impacts (water quality during and after construction, habitat fragmentation, etc.)

It is REV's opinion that impacts have been weighed and balanced through the Section 248 process.

Public health impacts regarding, specifically, wind projects are actually finding the opposite to be true³:

The findings indicate that negative health information readily available to people living in the vicinity of wind farms has the potential to create symptom expectations, providing a possible pathway for symptoms attributed to operating wind turbines. This may have wide-reaching implications. If symptom expectations are the root cause of symptom reporting, answering calls to increase minimum wind-farm set back distances is likely to do little to assuage health complaints.

required by the region, regardless of the sale of RECs. The issue of RECs, from REV's perspective, is secondary to the issue of how best to permit and process projects. The Legislature could choose to require utilities to retire all RECs in the state, yet it would be unlikely that the concerns from some individuals regarding renewable energy projects in Vermont would be abated. The issue of RECs is a separate issue from energy generation siting procedures and processes, and should be left as an area for further discussion by the State – though all parties should recognize that the impacts to RECs retirement may increase rates.

³ <http://www.desmogblog.com/2013/03/14/research-finds-wind-farm-health-concerns-probably-caused-anti-wind-scare-campaigns>

Cumulative impacts, as expressed in REV’s last comment filing, should be viewed at the **macro**, cumulative level. In April of 2007, the Intergovernmental Panel on Climate Change, based on the work of some 2,500 scientists in more than 130 countries identified the following potential impacts resulting from climate change:

- *Sea level could rise between 7 and 23 inches (18 to 59 centimeters) by century's end, the IPCC's February 2007 report projects. Rises of just 4 inches (10 centimeters) could flood many South Seas islands and swamp large parts of Southeast Asia.*
- *Some hundred million people live within 3 feet (1 meter) of mean sea level, and much of the world's population is concentrated in vulnerable coastal cities. In the U.S., Louisiana and Florida are especially at risk.*
- *Glaciers around the world could melt, causing sea levels to rise while creating water shortages in regions dependent on runoff for fresh water.*
- *Strong hurricanes, droughts, heat waves, wildfires, and other natural disasters may become commonplace in many parts of the world. The growth of deserts may also cause food shortages in many places.*
- *More than a million species face extinction from disappearing habitat, changing ecosystems, and acidifying oceans.*
- *The ocean's circulation system, known as the ocean conveyor belt, could be permanently altered, causing a mini-ice age in Western Europe and other rapid changes.*
- *At some point in the future, warming could become uncontrollable by creating a so-called positive feedback effect. Rising temperatures could release additional greenhouse gases by unlocking methane in permafrost and undersea deposits, freeing carbon trapped in sea ice, and causing increased evaporation of water.⁴*

For REV, the “cumulative” impact of having four wind farms whereby 190 acres of impact to generate clean, renewable energy for an estimated number of 46,000 homes, resulting in the conservation of 5,608 acres elsewhere in Vermont (a result of the PSB Section 248 process) is one that the broader public should (and does, based on polling results) be proud of, embrace, and celebrate. Indeed, the

⁴ http://news.nationalgeographic.com/news/2004/12/1206_041206_global_warming_2.html

cumulative impact of having more wind, solar, hydro and bioenergy technologies should always be framed by the broader cumulative impact of climate change.

The role of ***aesthetic impacts***, REV considers in the same light as the cumulative impact, described above. Additionally, what constitutes “aesthetically pleasing” is a subjective experience, with many Vermonters finding the sight of clean renewable projects pleasing, for what these projects represent regarding climate change, while others find it unpleasant. This may explain why it has been impossible thus far to determine property value changes as a result of having a clean energy project viewable within the site of the property available for sale. Similarly, Italy, Denmark and other countries have constructed numerous wind farms – yet one would find it difficult to argue that tourism has been negatively impacted in these countries as a result of new renewable energy generation projects.

Other environmental impacts have been and should continue to be attended to and monitored during pre-, during and post-construction phases to minimize any potential localized impacts, and to encourage ongoing improvements in project development approaches as lessons are learned during the monitoring period.

3. REV suggested changes and rationale for those changes, based on April 3, 2013 draft recommendations

If the current draft recommendations move forward to the Governor and multiple legislative committees, REV politely requests the following changes, or that these be mentioned as areas of ongoing work by the Public Service Board via an open, public process so that all interested parties can participate (in keeping with the spirit of the EGSPC).

- i. *Tiered structure*: REV supports a tiered approach to permitting energy projects. However, REV suggests that the next step to this process be an open docket workshop process, overseen by the PSB, with all interested stakeholders, to assess the appropriate tiered structure. Specifically, the proposed tiered structure would ideally be based on technology and size. There are different concerns regarding total land used, the type of impact to the land, public health questions regarding siting, etc., that

suggest re-assessing the tiered structure so that it fits the type and size of project more appropriately than the currently proposed “MW” size. However, if this does not happen, REV strongly suggests that the second tier move to 5 MW, not 2.2 MW, so that it is in keeping with current ISO-NE triggers for project size to come under ISO-NE review.

- ii. *Potential Funding Criteria*: There is still no total cap to the total expected amount of funds expected from a variety of sources (bill back, franchise, application fee, etc.), from a developer. This places considerable risk to the developer and threatens the potential for obtaining project financing, as there is no final estimated amount of expenditure clarified for the developer. (Recommendations # 4, #9, #21, Annex 3).
- iii. *Ongoing stakeholder/public input*: In keeping with the EGSPC process, REV strongly requests that any future decisions or decision-making processes be open and available to stakeholders and the public for further review and input. This is particularly important when scientific expert opinion may differ regarding project impact and outcome. Examples include recommendations #1, #2, #5), #11 (checklist development), #17, #18, #19, #20, #21.
- iv. *“Plan-Do-Check-Act”*: REV strongly requests that there be a review period as to the net effects of any changes to the permitting process. Have changes that have been implemented resulted in improvements to the process? Have changes resulted in fewer projects moving forward in a slower timeframe? Questions that developers may provide, if the process is open and allows for ongoing improvement, include:
 - a. Recommendation #12: Concurrent filing may not always make sense in all cases and for all types of permits. It may depend upon the complexity of the project, what tier it is in, etc. – there needs to be some discretion available to the Board, the developer and other parties.
 - b. Recommendation #13: What types of consequences will be applied and how will these be defined?
 - c. Recommendation #19: What is the scope of this assessment, and why should it be done on a case-by-case basis?
 - d. Recommendation #21: What pre-construction activities are being referred to and why do they require third party monitoring? In general, this provision is very broad and onerous. Not every aspect of construction at every project should require 3rd party monitoring as

cost and timing can easily “spin out of control”. Rather, there should be a limited set of highly specific issues that may warrant 3rd party monitoring, and there should be more definition to the scope of this recommendation.

- v. *Review opportunities for communities to participate in renewable energy development:* In other countries, renewable energy projects have been supported more broadly by having a portion of the projects owned by communities. To the extent that the Vermont public and Legislature would be willing to fund and finance these projects, this could help to remediate some of the concern with renewable project development. Thus far, however, projects have required significant private capital investment – and until there is political will to support funding and financing community projects, there may be few opportunities for communities to benefit as fully as possible in renewable energy project development.

4. REV continues to strongly support:

Increasing the transparency and efficiency into the PSB process through an on-line system showing project status and requirements, streamlining smaller projects so that the PSB can spend more time assessing the costs and benefits of larger projects, providing clearer deadlines for decisions and notifications, and providing a capped amount of funding to the PSB for the PSB to manage, to allow for an increase in project transparency and efficiency.

Sincerely,



Gabrielle Stebbins

Executive Director

Submitted on Friday, April 5, 2013 - 10:08 Submitted by anonymous user: [\[68.142.56.137\]](#) Submitted values are:

Name: Donald L. La Haye

Town: Waitsfield

Organization: CVRPC

Title: Vice-Chair

2) Energy Sources and/or Facilities: Please check the type of energy generation you wish to comment upon:

Wind

3) Comment :

I recently viewed an article saying that the wind energy produced by the Lowel Mountain project could not be used in the grid. If so why are the generators there? This sounds like a simple case of fraud at it's best or ignorance being the root of the fraud at it's worse. I support renewable energy, but I don't support fraud. I'm in the process of installing solar panels on my roof. I investigated to be sure I can make use of the evergy produced.

I would appreciate an explanation and a STOP to useless windmills on our State's ridge lines.

Thank you for your service to Vermont.

Don La Haye

The results of this submission may be viewed at:

<http://sitingcommission.vermont.gov/node/7/submission/920>

Submitted on Saturday, April 6, 2013 - 11:11 Submitted by anonymous user: [216.114.148.154] Submitted values are:

Name: ken pick

Town: Putney

2) Energy Sources and/or Facilities: Please check the type of energy generation you wish to comment upon:
Wind

3) Comment :

In a state that has the cleanest electric power in the country measured by the amount of atmospheric carbon produced per megawatt hour, Vt. has the luxury to take the time to make sure that ridgeline wind is appropriate for state. I do not support the development of ridgeline wind until and if there is a process put in place to give a considered analysis of the many controversial issues and the many issues that have contradictory information swirling about the state. Aside from issues of water runoff, increased flooding susceptibility, noise, and appropriate siting, it isn't even clear whether Vt needs to disturb its ridgelines when there are other less invasive alternatives to meet the goal of 90% renewable energy generation by 2050. I believe we can achieve our goals WITHOUT wind. There really needs to be a special commission, legislative or otherwise, to consider these issues in more depth and separate fact from fiction. Please either recommend the act 250 process or a commission to go beyond the good work of the siting commission.

The results of this submission may be viewed at:

<http://sitingcommission.vermont.gov/node/7/submission/923>

Submitted on Sunday, April 7, 2013 - 13:25 Submitted by anonymous user: [71.161.207.174] Submitted values are:

Name: Vicky Farrand - Lewis

Town: Derby

Organization: Holland Derby Citizens For Responsible Energy

Title: Coordinator / Secretary

2) Energy Sources and/or Facilities: Please check the type of energy generation you wish to comment upon:
Wind

3) Comment :

April 7, 2013

Per arrangement by phone, between Karen Jenne and Ann Margolis on Friday April 5th, 2013, We, the Holland Derby Citizens for Responsible Energy (HDCRE) will be submitting our comments and suggestions to the Siting Committee directly, care of Ann Margolis via The Department Of Public Service Board at 112 State Street, Montpelier, Vermont. Our comments will be based in part, on our status as intervenor's during the "Derby Line Wind" project. This project was proposed and withdrawn by Encore Redevelopment and then closed by The Vermont Public Service Board in June 0f 2012, under Docket # 7832. Ann Margolis informed Karen Jenne that multiple copies were not necessary as she will scan our documents when received the week of April 8th, 2013 and distribute them to all members of the Siting Committee, to ensure they will become part of the record.

Sincerely,

Vicky Farrand - Lewis

Coordinator / Secretary HDCRE

The results of this submission may be viewed at:

<http://sitingcommission.vermont.gov/node/7/submission/926>

Submitted on Sunday, April 7, 2013 - 18:05 Submitted by anonymous user: [174.62.140.46] Submitted values are:

Name: sandie blair

Town: South Burlington

2) Energy Sources and/or Facilities: Please check the type of energy generation you wish to comment upon:
Wind

3) Comment : Our camp is in Warren Gore, UTG. We see the Lowell Mts. on our way there. Horrible. Going over Westmore Rd. we see Sheffield and Lowell. Horrible. There must be a place to put these that doesn't ruin the beauty that was Vermont.

The results of this submission may be viewed at:

<http://sitingcommission.vermont.gov/node/7/submission/927>

Submitted on Sunday, April 7, 2013 - 19:59 Submitted by anonymous user: [66.30.225.67] Submitted values are:

Name: Sandy Wilbur
Town: Londonderry

2) Energy Sources and/or Facilities: Please check the type of energy generation you wish to comment upon:

- Biomass
- Wind

3) Comment :

TO THE SITING COMMITTEE:

When 248 was created, the costs and benefits of projects such as transmission lines were spread across many communities for both a common good and a common cost. Lines had to cross mountains and land owned by many individuals in order to benefit a large number of towns and individuals in the state. This was common sense.

Given that the state has mandated a certain amount of in-state renewable energy generation, and given the fact that economics of renewable energy currently favor industrial size wind turbines or large biomass plants, given that keeping costs as low as possible mandates being close to transmission lines, and given that locations tend to be in areas with fewer and often more disadvantaged people, siting regulations must deal with the fact that a certain number of residents within a few miles of a large industrial project will suffer a disproportionate amount of the negative impacts of a project versus the typical 248 projects we've seen in the past. Siting considerations, therefore, must compensate nearby residents for potential health impacts, for property value impacts, for erosion and flood potential, without regard for whether or not these neighbors unwittingly signed away any rights to the developer before the project was installed.

It is not reasonable or fair to expect a small number of people to suffer financial or possible health consequences without compensation for projects which don't directly benefit them.

If your property or your quality of life were destroyed by Hurricane Irene, you wouldn't expect the insurance company to pay the town where it happened. You expect the people involved to be compensated directly. In the same way, the people who are principally affected by these projects should not see the money going to their town or a neighboring town, but directly to them. This alone would alleviate the terrible conflicts communities face when projects are proposed in their communities and where the winners have been those who get a tax benefit without any impacts while the losers get all the impacts without appropriate compensation in regard to the damage they suffer.

The results of this submission may be viewed at:

<http://sitingcommission.vermont.gov/node/7/submission/929>

Submitted on Sunday, April 7, 2013 - 20:05 Submitted by anonymous user: [69.54.0.83] Submitted values are:

Name: Richard Faesy

Town: Starksboro

Organization: Energy Futures Group

Title: Principal

2) Energy Sources and/or Facilities: Please check the type of energy generation you wish to comment upon:
Wind

3) Comment :

Siting Commission -

Your work is very important and I appreciate all of the effort you have put into this initiative. In order to meet the goals of the Statewide Comprehensive Energy Plan goal whereby 90% of all Vermont energy comes from renewable sources by 2050, permitting of energy projects need to be assured time and cost certainty. Vermont also needs to remain a clean energy leader as we battle climate change. Developing an process for development of large scale wind projects is important in meeting these goals. Your work should allow these projects to proceed in appropriate locations following sound enviromental safeguards in a predictable regulatory environment. As we transition from a fossil-fuel-based infrastructure to a renewables-based one, your work can help us provide a sound foundation for development of future projects, managed by the Public Service Board. I appreciate your good work and support your proposal. Thank you!

The results of this submission may be viewed at:

<http://sitingcommission.vermont.gov/node/7/submission/930>

Submitted on Sunday, April 7, 2013 - 20:30 Submitted by anonymous user: [71.181.122.165] Submitted values are:

Name: Andy Robinson

Town: Plainfield

2) Energy Sources and/or Facilities: Please check the type of energy generation you wish to comment upon:

- Solar
- Wind

3) Comment : The state has ambitious renewable energy goals and a pretty rigorous set of siting rules that are currently followed by the PSB. Given the impending threats from climate change, we need to move away from fossil fuel as rapidly as possible. Additional siting requirements and limitations would slow that progress.

The results of this submission may be viewed at:

<http://sitingcommission.vermont.gov/node/7/submission/931>

Submitted on Monday, April 8, 2013 - 06:16 Submitted by anonymous user: [74.94.142.33] Submitted values are:

Name: Davis Terrell
Town: Shrewsbury
Organization: Green Earth Energy
Title: Project Manager

2) Energy Sources and/or Facilities: Please check the type of energy generation you wish to comment upon:

- Solar
- Wind

3) Comment :

Vermont has a very stringent siting review process for renewable energy projects. The V.S.A. 30, Section 248 Certificate of Public Good review process balances the state's energy needs, orderly development of the region and inclusion of Act 250 environmental criteria. The Public Service Board (PSB) oversees a professional, fact-based review of proposed energy projects.

In order to meet the goals of the Statewide Comprehensive Energy Plan whereby 90% of all Vermont energy comes from renewable sources by 2050, permitting of energy projects needs to be assured time and cost certainty.

We support the following recommendations:

n The implementation of e-filing, an electronic docket system and web-based information for increased transparency and streamlining permit timelines.

n A clear, filing fee structure, managed by the Public Service Board (PSB), provided that all fee revenues remain with the PSB and are used to improve efficient processing of applications. (Filing fees, bill back, franchise fees, etc., are all mentioned. There must be a cap on fee structure otherwise there is too much risk for any project to be developed).

n An increased role of RPCs to assess their regions' total energy consumption and identify proposals to reduce total energy consumption. Renewable resource developers, knowing the siting criteria of their renewable resource should be involved in any stakeholder process to identify places of renewable deployment. Final authority of locating energy generation facilities should remain with the Public Service Board, as energy is a common good and a common need – shared and used by all Vermonters.

The results of this submission may be viewed at:

<http://sitingcommission.vermont.gov/node/7/submission/934>

Submitted on Monday, April 8, 2013 - 09:48 Submitted by anonymous user: [68.142.44.51] Submitted values are:

Name: Henry Erickson

Town: Warren

Organization: Erickson Consulting

Title: Principal

2) Energy Sources and/or Facilities: Please check the type of energy generation you wish to comment upon:

- Solar
- Wind

3) Comment :

1. Vermont has a very stringent siting review process for renewable energy projects. The V.S.A. 30, Section 248 Certificate of Public Good review process balances the state's energy needs, orderly development of the region and inclusion of Act-250 environmental criteria. The Public Service Board (PSB) oversees a professional, fact-based review of proposed energy projects.

2. In order to meet the goals of the Statewide Comprehensive Energy Plan goal whereby 90% of all Vermont energy comes from renewable sources by 2050, permitting of energy projects need to be assured time and cost certainty.

3. The ultimate goal of the Siting Commission should be to encourage a cost-effective transition from traditional fuels to clean renewable energy and reduce the public conflict around renewable energy development. The best way to achieve these goals is to provide a very clear set of guidelines, in the form of comprehensive renewable energy ordinances that are scientifically fact-based, and clear. With this in place, potential projects can be determined early on in the project planning phase as to whether a project is "go / no-go". If the project is out of compliance with these ordinances, the public will be able to determine potential concerns.

4. The implementation of e-filing, an electronic docket system and web-based information for increased transparency and streamlining permit timelines is suggested. A clear, filing fee structure, managed by the Public Service Board (PSB), provided that all fee revenues remain with the PSB and are used to improve efficient processing of applications. (Filing fees, bill back, franchise fees, etc., are all mentioned. There must be a cap on fee structure otherwise there is too much risk for any project to be developed).

5. An increased role of RPCs to assess their regions' total energy consumption and identify proposals to reduce total energy consumption.

Renewable resource developers, knowing the siting criteria of their renewable resource should be involved in any stakeholder process to identify places of renewable deployment. Final authority of locating energy generation facilities should remain with the Public Service Board, as en1. Vermont has a very stringent siting review process for renewable energy projects. The V.S.A. 30, Section 248 Certificate of Public Good review process balances the state's energy needs, orderly development of the region and inclusion of Act-250 environmental criteria. The Public Service Board (PSB) oversees a professional, fact-based review of proposed energy projects.

2. In order to meet the goals of the Statewide Comprehensive Energy Plan goal whereby 90% of all Vermont

energy comes from renewable sources by 2050, permitting of energy projects need to be assured time and cost certainty.

3. The ultimate goal of the Siting Commission should be to encourage a cost-effective transition from traditional fuels to clean renewable energy and reduce the public conflict around renewable energy development. The best way to achieve these goals is to provide a very clear set of guidelines, in the form of comprehensive renewable energy ordinances that are scientifically fact-based, and clear. With this in place, potential projects can be determined early on in the project planning phase as to whether a project is “go / no-go”. If the project is out of compliance with these ordinances, the public will be able to determine potential concerns.

4. The implementation of e-filing, an electronic docket system and web-based information for increased transparency and streamlining permit timelines is suggested. A clear, filing fee structure, managed by the Public Service Board (PSB), provided that all fee revenues remain with the PSB and are used to improve efficient processing of applications. (Filing fees, bill back, franchise fees, etc., are all mentioned. There must be a cap on fee structure otherwise there is too much risk for any project to be developed).

5. An increased role of RPCs to assess their regions’ total energy consumption and identify proposals to reduce total energy consumption.

Renewable resource developers, knowing the siting criteria of their renewable resource should be involved in any stakeholder process to identify places of renewable deployment. Final authority of locating energy generation facilities should remain with the Public Service Board, as enenergy is a common good and a common need – shared and used by all Vermonters.

6. This process should be reviewed through “plan/do/check/act” – if the recommendations provided by the Siting Commission inadvertently prevent Vermont from reaching our goals (supported by 66% of Vermonters), then we need to revisit this discussion.

7. An extension of the public comment period is not necessary. This will likely only serve to extend the conflict and galvanize and polarize the various sides of the debate. There is no precedent of the public debate resulting in everyone coming together in mutual support.

8. Small-scale renewable energy projects are important for meeting our state’s clean energy goals. I support your suggestions that will make it easier and faster to build these projects in communities around the state.

9. While small projects are absolutely worthwhile, it is also essential that we move forward in developing utility-scale renewable energy projects so that Vermont can do its part to combat climate change and take responsibility for our clean energy future. I do not support regulatory hurdles that will make it more difficult to build larger renewable energy projects since they are a necessary part of our energy mix. 10. While moving towards meaningful planning is important, regional and local input into where renewable projects should be built should be considered fairly and on its merits. If we’re serious about producing renewable energy, prioritization must be given to areas that have the greatest potential for renewable energy production.

11. Climate change is the critical environmental issue of our time. In reviewing the environmental or cumulative impacts of a particular project, the project’s capacity to reduce climate emissions must be the utmost consideration.

The results of this submission may be viewed at:

<http://sitingcommission.vermont.gov/node/7/submission/935>

Submitted on Monday, April 8, 2013 - 09:53 Submitted by anonymous user: [64.223.118.252] Submitted values are:

Name: Malcolm McNair

Town: Landgrove

2) Energy Sources and/or Facilities: Please check the type of energy generation you wish to comment upon:

- Hydroelectric
- Solar
- Wind

3) Comment :

Climate change is the critical environmental issue of our time. The project's capacity to reduce climate emissions must be the utmost consideration. Becoming energy dependent must start in our own back yards. Wind, Solar, and hydro are things that can be removed from our landscape if something better comes along. But for now Vermont \$ would stay in Vermont and not be sent around the world. Making Vt a better place to live. with more jobs, better air and more \$ staying in the state. Keep renewables the biggest part of the mix and we all live better.

Thanks to all that are working to make this real. Poles show that over 65% of Vermonters are in favor of home made energy. Who will vote for you next time.

The results of this submission may be viewed at:

<http://sitingcommission.vermont.gov/node/7/submission/936>

Submitted on Monday, April 8, 2013 - 11:06 Submitted by anonymous user: [75.67.82.197] Submitted values are:

Name: Ken Alberti

Town: Londonderry

2) Energy Sources and/or Facilities: Please check the type of energy generation you wish to comment upon:

Wind

3) Comment : I would like to express my support for the development of wind energy in Vermont. I support the evolution of the state permit review process to one that encourages the use of this energy resource in the future. The roadblocks and delaying tactics employed by the NIMBY oriented organizations are unacceptable to such an important issue as renewable energy development in Vermont.

The results of this submission may be viewed at:

<http://sitingcommission.vermont.gov/node/7/submission/937>

Submitted on Monday, April 8, 2013 - 12:32 Submitted by anonymous user: [71.169.136.31] Submitted values are:

Name: Ann Ingerson

Town: Craftsbury

Organization: The Wilderness Society

Title: Economist

2) Energy Sources and/or Facilities: Please check the type of energy generation you wish to comment upon:
Other Energy Sources, Facilities or General Comment

3) Comment : Thank you for your continued thoughtful work. I have one suggested modification to the Four Tier system proposed in the 3rd Packaging Draft of EGSPC Recommendations dated 04-03-13. For all tiers, project proponents must notify DPS, ANR, town, regional planning commission, and adjoining landowners at a stated time, with notification time increasing as project size increases. For some projects, it may be appropriate to notify towns directly affected by a project even though the actual project footprint is located in a different town. The same may be true for surrounding landowners that are not directly adjacent to the project property. For instance, water supply, river flow, air quality, scenic vistas and property values are several examples of impacts that may directly affect nearby towns and property owners. For projects in Tier 4, and perhaps Tier 3, we would like to see notification extended to all parties with a clear and direct interest in project impacts. Thank you for accepting our comments.

The results of this submission may be viewed at:

<http://sitingcommission.vermont.gov/node/7/submission/938>

Submitted on Monday, April 8, 2013 - 13:41 Submitted by anonymous user: [72.73.80.205] Submitted values are:

Name: James Harrison

Town: Georgia

Organization: Georgia Mountain Community Wind

Title: Owner

2) Energy Sources and/or Facilities: Please check the type of energy generation you wish to comment upon:
Wind

3) Comment :

First, let me share some information on who Jim Harrison is. I am the senior member of the Harrison Family who lives and works (self-employed) in Georgia, VT. Our family spent six years completing wind analysis permitting and limited involvement in the construction of the 4 turbine Georgia Mountain wind project. We also have retained a minority ownership role going forward.

We speak from actual experience from being involved from start to finish the following are some comments we think are relative to energy siting situation.

1. The PSB was very professional and very thorough in its process. Their task at hand on a smaller Vermont scale wind project was very commendable. I do believe the tiered approach that I've seen may help the process for all involved.
2. I believe the "for the public good" concept that the PSB has control of should not be changed to any large degree. I do think that local town involvement should be allowed in the permit trail. Rather than towns being able to "not allow" renewable projects per zoning or planning commission rule making, I would instead ask for the towns to be at the table in front of the PSB and state their case. "For the public good" should remain a state mandated process.
3. I believe certain performance standards should apply to the PSB, ANR and state agencies in general I refer to time lines for activities relating to responses back to developers, intervenors and the like. As it is now there is no certainty on just how long any application and subsequent responses will take. The permit process time lines are very open ended.
4. Given the states energy plan of attaining 90% of all energy to come from renewables by 2050 then we need to be more proactive regarding how the permit trail works for ALL concerned. We can not or should not have moratoriums but rather a more concise way of going forward.

Thanks for allowing our family to share some thoughts.

Jim Harrison

The results of this submission may be viewed at:

<http://sitingcommission.vermont.gov/node/7/submission/939>

Submitted on Monday, April 8, 2013 - 13:53 Submitted by anonymous user: [174.252.34.184] Submitted values are:

Name: Brittany Rogers

Town: Lyndon

2) Energy Sources and/or Facilities: Please check the type of energy generation you wish to comment upon:
Wind

3) Comment :

Below I have attached several links to articles given to me by Dr. William Happer from Princeton. The articles say that while global warming is happening, it may not be due to an increase in carbon dioxide and that the increase in carbon dioxide has only made it a more green planet.

This supports my view along with many others that destroying the ridge lines is not an effective or efficient way to 'save our planet'.

<http://www.climatedepot.com/2013/04/08/climate-depot-round-up-the-great-warmist-retreat-has-officially-begun-the-mainstream-media-cannot-maintain-the-official-warmist-narrative-any-longer/>

<http://www.economist.com/news/science-and-technology/21574461-climate-may-be-heating-up-less-response-greenhouse-gas-emissions>

http://blog.nj.com/njv_paul_mulshine/2013/04/climatologists_are_no_einstein.html

http://www.sciencedaily.com/releases/2013/03/130325124402.htm?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+sciencedaily%2Fearth_climate%2Fglobal_warming+%28ScienceDaily%3A+Earth+%26+Climate+News+---+Global+Warming%29

https://www.youtube.com/watch?v=S-nsU_DaIZE

<http://www.dailymail.co.uk/news/article-2294560/The-great-green-1-The-hard-proof-finally-shows-global-warming-forecasts-costing-billions-WRONG-along.html>

The results of this submission may be viewed at:

<http://sitingcommission.vermont.gov/node/7/submission/940>

Submitted on Monday, April 8, 2013 - 15:08 Submitted by anonymous user: [209.198.119.246] Submitted values are:

Name: Aaron Brown

Town: Sharon

Organization: Vital Communities

Title: Energy and Trans. Manager

2) Energy Sources and/or Facilities: Please check the type of energy generation you wish to comment upon: Other Energy Sources, Facilities or General Comment

3) Comment :

Thank you for this opportunity to comment on the EGSPC 3rd Draft. The document provides some improvements to the state regulatory processes that govern in-state generation. My fear, however, is that the lack of specificity in several sections will lead many to doubt the validity of the Siting Commission's work, particularly in ensuring adequate environmental and cultural protections. Please find my specific recommendations below:

- (1) Provide a definitions section and list of acronyms at the start of the document. This will enhance the clarity and usefulness of the document.
- (2) The Commission members should identify themselves and their professional affiliations/towns of residence at the beginning of the document. The document will likely be found in places beside the website, and it's necessary to provide such context.
- (3) The Commission should clarify its role more clearly at the beginning of the document. The extent of the Commission's role in "adequate environmental and cultural protection" (Commission Goal 3), for example, needs major clarification. If the Commission's role was only to lay out the process by which future entities will ensure that protection is adequate, the Commission must state that clearly from the start. Otherwise, detractors may point to Item #17 and claim that the Commission has simply "punted" the responsibility and that no real protection for environmental resources exists.
- (4) Commission Goal #5 should clarify what "unintended consequences" it seeks to avoid.
- (5) Under Item #9, the Commission should substitute "determination" for argument in the first sentence of the second arrowed statement. The RPC's funding should be limited to determinations, not arguments. "Arguments" is too broad and could invite messy public processes.
- (6) Should the "consequences" in Item 13 be spelled out?
- (7) The document must clarify who qualifies as "all parties" in Item 13 and in passim. Do all parties include the public at-large, or only those with standing before the Public Service Department.
- (8) Item 14 shows a change in font size. Please keep font size consistent.
- (9) Under Item 16, the public website should feature a way to sort projects by technology type and/or name. Nobody outside experts uses docket numbers.
- (10) Item 18 – what is the AAFM? It suddenly appears and is an unfamiliar acronym.
- (11) Item 20 should clarify cumulative impacts to what. Impacts to wildlife? Grid congestion? Water quality? Meeting state energy goals?
- (12) In the simplified tier system summary table, the phrase "attestation that project affirmatively meets all the substantive criteria contained in Section 248(b)" is atrocious. Why not say "Project has received a certificate of public good?"
- (13) In the tier summary table, projects in the 2.2-15 MW range should also describe what kinds of public outreach have been done. A 2.2 MW solar field is fairly large by Vermont standards, and it's not too onerous to ask developers to have one or two public meetings to discuss their plans.
- (14) There's unfortunately no discussion of best practices learned from other states. One Vermont-based think

tank, the Clean Energy States Alliance, has an abundance of reports and presentations dealing with siting best practices on its website (192 by my count using "siting" in the search bar): <http://www.cleanenergystates.org>.

This document is a positive first step, and I hope it helps create a friendlier, more collaborative public stance toward energy siting. The state cannot afford to leave its renewable potential untapped due to the clamoring of a loud minority of clean energy opponents.

The results of this submission may be viewed at:
<http://sitingcommission.vermont.gov/node/7/submission/941>

From: Carmen Krogh
Sent: Monday, April 08, 2013 1:29 PM

Subject: Fw: Wind turbine health effects "conclusively demonstrated"

Please acknowledge receipt of this message.

April 8, 2013

Dear Siting Commission of Vermont,

Re: Wind turbine health effects "conclusively demonstrated" [see attached reference addressed to the Prime Minister of Canada]

The purpose of this message and its attachments is to share the Ontario, Canada experiences regarding the serious risks to health that can occur when industrial wind turbines are sited in too close proximity to rural residents.

The attached letter "*Wind turbine health effects "conclusively demonstrated April 8 2013"*" and the information provided is public and may be redistributed.

I trust this will assist with your deliberations and If I can assist in this regard, please do not hesitate to contact me.

Thank you for your consideration of this important matter.

Respectfully submitted,

Ms Carmen Krogh, BScPharm
Ontario, Canada



Published July 22, 2011

Bulletin of Science, Technology & Society
<http://bst.sagepub.com/>

**Toward a Case Definition of Adverse Health Effects in the Environs of Industrial Wind Turbines:
Facilitating a Clinical Diagnosis**

Robert Y. McMurtry

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The online version of this article can be found at:

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On behalf of:

National Association for Science, Technology & Society

**Toward a Case Definition of Adverse Health Effects
in the Environs of
Industrial Wind Turbines
(Facilitating a Clinical Diagnosis)
Robert Y. McMurtry**

**Professor (Emeritus) of Surgery at the University of Western Ontario and
Orthopedic Consultant at St. Joseph's Health Care in London, Ontario**

Corresponding Author:

Robert Y. McMurtry,

Ontario, Canada

rmcmurtry@uwo.ca

Bio:

Robert Y. McMurtry is the former Dean of Medicine for the University of Western Ontario. He was a member of the Health Council of Canada for 3.5 years and a member and special advisor to the Royal Commission under Roy Romanow on the future of health care in Canada. Dr. McMurtry was a visiting Cameron Chair to Health Canada for providing policy advice to the Minister and Deputy Minister of Health. He was the Founding and Associate Deputy Minister of Population & Public Health, Canada. Dr. McMurtry also sat on the National Steering Committee on Climate Change and Health Assessment. Presently Dr. McMurtry is Professor (Emeritus) of Surgery, University of Western Ontario.

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Abstract

Internationally, there are reports of adverse health effects (AHEs) in the environs of industrial wind turbines (IWTs). There was multi-disciplinary confirmation of the key characteristics of the AHEs at the first international symposium on AHE/IWT. The symptoms being reported are consistent internationally and are characterized by cross over findings or a predictable appearance of signs and symptoms present with exposure to IWT sound energy and amelioration when the exposure ceases. There is also a revealed preference of victims to seek restoration away from their homes. This paper identifies the need to create a case definition to establish a clinical diagnosis. A case definition is proposed that identifies the sine qua non diagnostic criteria for a diagnosis of adverse health effects in the environs of industrial wind turbines. Possible, probable and confirmed diagnoses are detailed. The goal is to foster the adoption of a common case definition that will facilitate future research efforts.

Key words: case definition, clinical diagnosis, wind turbines, adverse health effects, symptoms

Introduction

On the last three days of October 2010 a groundbreaking meeting was held in the Waring House situated in Prince Edward County, Ontario (Society for Wind Vigilance 2010). The focus of the symposium was the emerging issue of adverse health effects (AHEs) being experienced by people living in the environs of industrial wind turbines (IWTs).

These health effects appear to correlate with proximity to IWTs, the sound pressure level emitted by the IWTs, the frequency of the noise, the time of exposure and individual response. The pattern of individuals' complaints demonstrates a striking similarity internationally in media reports and in physician generated case series.

The issue of AHEs has considerable complexity and has excited much controversy between proponents of the wind industry and those who have identified widespread media and internet reports of AHEs in virtually all countries where IWTs have been erected (Jopson, 2010), (Turkel, 2010), (Gray, 2010), (Lam, 2009).

The IWT proponents claim IWTs to be a promising green, clean and free alternative source of electrical power and an ideal solution for reducing green house gases (Canadian Wind Energy Association, 2011), (Nextera Energy Resources, 2010). Those who are concerned about IWT development too close to residences and who seek to prevent AHEs have a contrary view denying the foregoing claims and questioning the utility and safety of IWTs (Bryce, 2010), (Gilligan, 2010).

This article will concentrate on the health aspects and the challenge of a case definition, leaving aside the debate surrounding economics, energy policy, lobbying and social marketing although all have a significant impact on government decision-making.

Overview of Conference and Speakers

The purpose of the Symposium was to promote a multidisciplinary dialogue on possible AHEs in an effort to advance the understanding of the genesis of complaints appearing globally. Among the goals of the symposium was a need to develop a case definition which had been under discussion since June 2010.

The Symposium attracted a multidisciplinary international group of speakers (14) including the disciplines of medicine (4 specialities), acoustics, psychology, business, physics, epidemiology, policy analysts, pharmacy, law, statistics and media (Society for

Wind Vigilance, 2011). There was also an informal research meeting of the speakers joined by two family physicians and an occupational health physician where a debriefing of the symposium was held and future plans for research made.

Approximately 100 people attended the symposium including municipal and federal politicians, media, documentary filmmakers as well as two members of a leading consulting group for the industry and two representatives from a wind power developer. There was a notable absence of any representatives from the Ontario provincial government.

Brief Summary of Presentations

The descriptions of the presentations below are highly abbreviated. The reader is referred to the Society for Wind Vigilance's Web site for more details.

Physics of IWTs and the resultant sound pressure level (SPL) are not adequately or consistently regulated. Based on experience with other noise sources SPL clearly presents a health risk (Walsh, 2010), (James, 2010), (Harrison, 2010).

The human ear is perturbed by IWTs in quiet rural areas potentially leading to neural remodelling and disorganization of neural pathways. It is more likely than not that the symptoms and signs associated with Wind Turbine Syndrome are due to the sound energy emitted by industrial wind turbines. Low frequency noise and infrasound will more likely than not be shown in subsequent research to be playing a major role in the genesis of Wind Turbine Syndrome (Pierpont, 2010).

The Outer Hair Cells of the cochlea respond to low frequency and infrasound. Sonic energy that is inaudible is perceived though not necessarily heard (except in sensitive people). What cannot be heard therefore may produce AHEs. This statement was made by Dr. Alex Salt referring to his research utilizing the standard animal model (guinea pig) for the study of human hearing (Salt, 2010).

Noise and infrasound during the day are capable of causing mood disorder, cognitive dysfunction and learning and developmental problems in children. Stress and psychological distress are established findings of chronic exposure to noise. Chronic stress has serious physiological consequences (Bronzaft, 2010).

Night-time noise compromises restorative sleep. Restorative sleep is a necessary condition for maintaining health and well being. Chronic

sleep disturbances (increased arousals and awakenings) and/or deprivation are established AHEs known to substantially increase the risk for chronic disease and premature death (Hanning, 2010).

Control studies comparing populations living near and far from IWTs installations demonstrate a substantial and statistically significant difference in quality of life, mood disorders and sleep disruption (Nissenbaum, 2010).

More than a hundred people in Ontario have self-identified as having AHEs using the Canada Vigilance protocol. AHEs with a very wide range of complaints of which the most frequent are compromise of quality of life, sleep disruption living in the environs of IWTs have left their homes temporarily or permanently in order to restore their health (Krogh, Gillis and Kouwen, 2010). While some improvement in health status is achieved, follow-up has revealed that pre-exposure health status is not necessarily regained.

These findings are significant from a public health perspective for many reasons including the findings the cross-over and revealed preference in the WindVOiCe survey (Krogh et al, 2011). Cross-over refers the phenomena of exacerbation and amelioration when near and far from wind farms, respectively. Revealed preference describes the act of leaving one's accustomed residence permanently or temporarily for significant periods of time in order to achieve restoration.

Legally there is evidence that the precautionary principle has not been respected by the governments who regulate and approve IWT installations in the absence of medical or health evidence establishing their safety (Gillespie, 2010). There is an urgent need to pursue research establishing dose-response curves as well as clinical research regarding psychological and physiological consequences (Bronzaft, 2010), (Hanning, 2010).

There was a clear consensus among the foregoing presentations and from a wide variety of perspectives that ADHs are indeed occurring in relationship to people living in the environs of IWTs. In addition an emerging consensus was evolving regarding a case definition that could be deployed by experts representing the many diverse disciplines in attendance. The importance of unifying the case definition for the purposes of research and future communications was clear.

Audience Response

The symposium featured a learned and diverse group of speakers as noted above. Attendees were able to witness and participate in a successful event of transdisciplinarity. Regardless of discipline, a unity of perspective was achieved. ADHs are clearly an issue for people living in the environs of wind farms. While the precise mechanism for the cause of AHEs remains to be elucidated there is enough evidence to conclude IWTs represent a public health threat. Audience members were also highly supportive of a unified case definition.

Summary

The common denominator of the global reports of AHEs is the compromise of quality of life, restorative sleep and psychological well-being.

There are many reports of AHEs in the environs of industrial wind turbines (AHE/IWT) including several case series (Harry, 2007). Unfortunately no standard protocol for data gathering has been developed. This has led to a wide variety of symptoms being reported and documented. This variance is exacerbated by the non-specific nature of the complaints since the recorded symptomatology can arise from a wide variety of ailments and diseases.

The task of a case definition is to weight the unique elements of AHE/IWT to distinguish the clinical disorder from competing explanations. There are common themes found in the reports which are reflected in the first- and second-order criteria. There are few, if any, alternate explanations for the first- and second-order criteria other than AHE/IWT.

The third-order criteria serve the purpose of capturing the most commonly reported symptoms.

It is hoped that future reports will adopt a standardized protocol based on this case definition which would facilitate future research and management of AHE/IWT.

Case Definition

Case Definition: The criteria for making an individual diagnosis of probable AHEs in the environs of IWTs are presented in the following paragraphs. The definition endeavours to be specific and sensitive. While the definition has not been validated formally in practice it has proven useful. The case definition represents an important

starting point for future international research collaboration. The genesis of the definition is based upon a review of the literature and direct experience with those individuals experiencing AHE/IWT. It has been used to provide guidance to physicians and other primary health providers when they are asked to manage individuals following exposure to IWTs. The value of this proposal is based on the absence of a specific case definition either in the peer-reviewed or gray literature.

Diagnosis of Adverse Health Effects in the Environs of Industrial Wind Turbines

Possible Adverse Health Effects

Report of a change in health status by people living within 5 km of a wind farm installation. Further confirmation is required to validate or exclude AHE/IWT by establishing a medical history that satisfies the criteria identified under “Probable Adverse Health Effects” below.

Probable Adverse Health Effects

1. First-order criteria (all four of the following must be present):
 - a) Domicile within 5 km of Industrial Wind Turbines (IWTs)
 - b) Altered health status following the start-up of, or initial exposure to, and during the operation of, IWTs. There may be a latent period of up to 6 months
 - c) Amelioration of symptoms when more than 5 km from the environs of IWTs
 - d) Recurrence of symptoms upon return to environs of IWTs within 5 km
2. Second-order criteria (at least three of the following occur or worsen after the initiation of operation of IWTs):
 - a) Compromise of quality of life
 - b) Continuing sleep disruption, difficulty initiating sleep and/or difficulty with sleep disruption
 - c) Annoyance producing increased levels of stress and/or psychological distress
 - d) Preference to leave residence temporarily or permanently for sleep restoration or well-being

3. Third-order criteria (at least three of the following occur or worsen following the initiation of IWTs):

Otological and vestibular

- a) Tinnitus
- b) Dizziness
- c) Difficulties with balance
- d) Ear ache
- e) Nausea

Cognitive

- a) Difficulty in concentrating
- b) Problems with recall or difficulties with remembering significant information

Cardiovascular

- a) Hypertension
- b) Palpitations
- c) Enlarged heart (cardiomegaly)

Psychological

- a) Mood disorder, i.e., depression, anxiety
- b) Frustration
- c) Feelings of distress
- d) Anger

Regulatory Disorders

- a) Difficulty in diabetes control
- b) Onset of thyroid disorders or difficulty controlling hypo- or hyperthyroidism

Systemic

- a) Fatigue
- b) Sleepiness

Confirmed Adverse Health Effects

The confirmation of AHE/IWT is achieved by a clinical evaluation and physiological monitoring of individuals during exposure to IWT sonic energy or an accurate facsimile (recording or other imitative source of IWT sound). Ideally sleep studies should be carried out in the home of people experiencing adverse health effects.

The complex physiological monitoring equipment required for a sleep study is not readily made mobile. Accordingly sleep studies need to be carried out in an established clinical sleep laboratory with a source of sonic energy that accurately reflects the person's exposure to IWTs.

The process may be simpler once controlled studies comparing possible victims with a non-exposed matched population are carried out. These studies could help to determine the core physiological change(s) that is (are) likely occurring to those who live in the environs of IWTs.

The need to rule out alternate explanations is the responsibility of the licensed clinician. While adherence to the criteria has resulted in no false positive diagnosis to date further validation is required.

Differential Diagnosis

Consideration should be given to other stressors present in the community. The most obvious is the wind itself which when associated with substantial barometric changes is known to cause a variety of symptoms. In this case the onset of AHEs would not correlate with the establishment of a wind farm and nor would the AHEs improve when leaving the environs of a wind farm.

A second possibility is a stressful home environment which might lead to restoration being more likely away from home. A history for family stressors should be elicited and ruled in or out. Another distinguishing feature is the absence of correlation with IWTs starting up or being in operation.

Psychological issues and/or mood disorders may be simultaneously or independently present. A key differentiating point is the timing of the onset and the impact of being away from home and the environs of IWTs. Significant improvement away from the environs of wind turbines and revealed preference for sleeping away from home serve to distinguish between AHEs due to IWTs versus an independent cause. If the situation appears more complex then a referral to a clinical psychologist or psychiatrist might be considered.

Apart from the foregoing there is very few if any imitative AHEs that can meet the 3 order of criteria outlined above. However the author invites critical commentary that might indicate a different conclusion.

Conclusions

1. A multidisciplinary symposium was held to address the possibility of adverse health effects in the environs of industrial wind turbines.
2. There was a consensus (unanimity) among the various experts that more likely than not, adverse health effects are occurring in the environs of industrial wind farms.
3. A case definition for adverse health effects in the environs of industrial wind turbines has been proposed based on the best available evidence. To date it has proven useful in clinical practice.
4. Further research is required to refine and validate the proposed definition and identify the simplest method by which to diagnose a confirmed case.

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March 10, 2013

The Right Honourable Stephen Harper
Prime Minister of Canada

[REDACTED]

The Honourable Leona Aglukkaq
Minister of Health, Health Canada

[REDACTED]

Ms Kathleen Wynne
Premier of Ontario

[REDACTED]

Mr. Robert Hornung
President of the Canadian Wind Energy Association

[REDACTED]

Copy:

David S. Michaud, PhD
Principal Investigator, Wind Turbine Noise Study
Consumer and Clinical Radiation Protection Bureau
Healthy Environments and Consumer Safety Branch, Health Canada

[REDACTED]

Ray Copes, MD
Director, Environmental and Occupational Health Branch
Ontario Agency for Health Protection and Promotion

[REDACTED]

W. David Colby, MD
Medical Officer of Health
Chatham-Kent Health Unit

[REDACTED]

Ms Cheryl Gallant, MP

[REDACTED]

Mr. Brain Howe
President HGC Engineering

[REDACTED]

Open letter: Request that representatives of: CanWEA; the Government of Canada; and the Government of Ontario provide immediate and full disclosure of the health effects "conclusively demonstrated" from exposure to wind turbine noise March 10, 2013
Any errors or omissions are unintended

Geoff Leventhall, PhD
Acoustical consultant

Mr. John Yakabuski, MPP

Open letter: Request that representatives of: CanWEA; the Government of Canada; and the Government of Ontario provide immediate and full disclosure of the health effects “conclusively demonstrated” from exposure to wind turbine noise.

Dear Prime Minister Stephen Harper, Minister Aglukkaq, Premier Kathleen Wynne, Mr. Robert Hornung,

I am writing to you in order to:

- Discuss statements reportedly made by the president of the Canadian Wind Energy Association (CanWEA), Mr. Robert Hornung; and
- Formally request that representatives of: CanWEA; the Government of Canada; Health Canada; and the Government of Ontario; provide Canadians immediate and full disclosure of the health effects “conclusively demonstrated” from exposure to wind turbine noise.

Contents

Notice to reader.....	3
References cited.....	3
Introduction.....	3
Health defined: Canada.....	4
Wind turbines can harm humans.....	5
Audible noise is the cause: CanWEA sponsored panel members.....	6
Health effects “conclusively demonstrated” and predicted: Health Canada.....	8
Health impacts expected in Ontario Canada.....	9
Summary of evidence	11
Request for full disclosure of “conclusively demonstrated” health effects.....	12

Open letter: Request that representatives of: CanWEA; the Government of Canada; and the Government of Ontario provide immediate and full disclosure of the health effects “conclusively demonstrated” from exposure to wind turbine noise March 10, 2013
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Notice to reader

The contents of this open letter should not be used to infer any bias for or against wind energy.

This open letter is not to be associated with and/or used to characterize any individual and/or organization.

Brett Horner has not received any financial support for the research, authorship, and/or publication of this open letter.

References cited

This letter provides references to support statements contained within.

References provided include:

- Peer reviewed references;
- Non peer reviewed references including grey literature;
- References prepared for the Canadian Wind Energy Association and/or the American Wind Energy Association;
- References authored by consultants for, or members of, the Canadian Wind Energy Association;
- Statements and references authored by Health Canada and/or Health Canada representatives;
- Other references

Introduction

I am a published peer reviewed author on the subject of wind turbines and health effects.

It is my understanding that the Government of Canada ^{1,2,3,4,5,6} and the Government Ontario have provided financial and/or other assistance to the Canadian Wind Energy Association (CanWEA) and/or to members of CanWEA.

On February 26, 2013 it was reported that the president of the CanWEA, Mr. Robert Hornung stated "... we are still quite confident that the balance of evidence to date shows that wind turbines do not have an impact on human health ..."⁷

I am writing to you regarding Mr. Robert Hornung's apparent failure to fully disclose the health effect "conclusively demonstrated" from exposure to wind turbine noise.

Open letter: Request that representatives of: CanWEA; the Government of Canada; and the Government of Ontario provide immediate and full disclosure of the health effects "conclusively demonstrated" from exposure to wind turbine noise March 10, 2013

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It is inaccurate to suggest the balance of evidence to date shows that wind turbines do not have an impact on human health.

I have included references in this open letter which support the conclusion that the balance of evidence demonstrates that wind turbines can harm human health at the sound levels experienced at typical receptor distances in Ontario, Canada.

Health defined: Canada

The World Health Organization (WHO) web site states: “Members of the United Nations may become members of the WHO by accepting its Constitution.”⁸

The WHO web site lists Canada as a WHO member country.⁹

The WHO Constitution states: “The enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition.”¹⁰

As a member of the WHO, Canada accepts the “fundamental right” of every human being to the highest attainable standard of health.

Canada continues to support the WHO definition of health. Correspondence dated July 11, 2012 from David Butler-Jones of The Public Health Agency of Canada states (See excerpt below):

 Public Health Agency of Canada
Agence de la santé publique du Canada
Chief Public Health Officer
Administrateur en chef de la santé publique

JUL 11 2012

Canada, including both Health Canada and the Public Health Agency of Canada, continues to support the definition of health established by the WHO's constitution in 1948: Health is "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."

Sincerely,



David Butler-Jones, MD
MHS, CCFP, FRCPC, FACP

Canada

In his 2005 peer reviewed article, *Noise annoyance in Canada*, Health Canada's Dr. David Michaud acknowledges the WHO defines health as "a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity" stating:

“According to the World Health Organization (WHO), health should be regarded as "a state of complete physical, mental and social wellbeing and not merely the

Open letter: Request that representatives of: CanWEA; the Government of Canada; and the Government of Ontario provide immediate and full disclosure of the health effects “conclusively demonstrated” from exposure to wind turbine noise March 10, 2013

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absence of disease or infirmity" (World Health Organization 2001). Under this broad definition, noise induced annoyance is an adverse health effect.”¹¹

The following 2010 Health Canada document is “Published by authority of the Minister of Health.”¹² and states:



**Useful Information
for
Environmental
Assessments**

“Health Canada considers the following noise-induced endpoints as health effects: noise-induced hearing loss, sleep disturbance, interference with speech comprehension, complaints, and change in percent highly annoyed (%HA).”¹³

Wind turbines can harm humans

A 2011 Ontario Environmental Review Tribunal (ERT) considered evidence and testimony under oath and found that wind turbines can harm humans if they are placed too close to residents.¹⁴ The ERT decision stated:

“This case has successfully shown that the debate should not be simplified to one about whether wind turbines can cause harm to humans. The evidence presented to the Tribunal demonstrates that they can, if facilities are placed too close to residents. The debate has now evolved to one of degree.”¹⁵



The ERT decision also found that ““serious harm to human health” includes ... indirect impacts (e.g., a person being exposed to noise and then exhibiting stress and developing other related symptoms). This approach is consistent with both the WHO definition of health and Canadian jurisprudence on the topic.”¹⁶

In Canada and elsewhere some people exposed to wind turbines experience physiological and/or psychological symptoms and/or reduced quality of life and/or degraded living conditions and/or adverse social economic impacts. Reported effects include annoyance and/or sleep disturbance and/or stress related health impacts and/or reduced quality of life.^{17 18 19 20 21 22 23 24 25 26 27 28}

In some cases the effects are so severe that Canadian families have effectively abandoned their homes and/or been billeted by wind energy developers and/or negotiated financial agreements with wind energy developers.²⁹

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Unwanted sound (noise), visual impacts (shadow flicker), stray voltage and social economic impacts are identified as plausible causes of annoyance and/or other adverse effects.

Peer reviewed and other references acknowledge modern wind turbines produce sound characteristics which are plausible causes for annoyance and/or other health effects. These characteristics include amplitude modulation (swooshing);^{30 31 32 33 34} audible low-frequency noise;^{35 36 37} infrasound;^{38 39} tonal noise, impulse noise;⁴⁰ and night time noise.⁴¹

Audible noise is the cause: CanWEA sponsored panel members

In 2009, The American Wind Energy Association (AWEA) and Canadian Wind Energy Association (CanWEA) “...established a scientific advisory panel ...”⁴² and funded a literature review *Wind Turbine Sound and Health Effects: An Expert Panel Review* (Colby et al., 2009).

In 2010 Mr. Robert Hornung discussed the findings of Colby et al. (2009) and stated “... the sound of wind turbines can be annoying for some individuals and that may cause them to feel some stress etcetera.”⁴³

**Wind Turbine Sound and
Health Effects
An Expert Panel Review**

Prepared by (in alphabetical order):

W. David Colby, M.D.
Robert Dohler, M.D.
Geoff Leventhall, Ph.D.
David M. Lipscomb, Ph.D.
Robert J. McCune, M.D.
Michael T. Seilo, Ph.D.
Bo Sundregard, M.Sc.

Prepared for:

American Wind Energy Association
and
Canadian Wind Energy Association

December 2009

The authors of Colby et al. (2009) discuss Dr. Nina Pierpont’s case series study which includes Canadian participants. The symptoms reported by individuals exposed to wind turbines include: sleep disturbance, headache, tinnitus, ear pressure, dizziness, vertigo, nausea, visual blurring, tachycardia, irritability, problems with concentration and memory, and panic episodes associated with sensations of internal pulsation or quivering when awake or asleep.⁴⁴ Pierpont (2009) coined these symptoms “Wind Turbine Syndrome”.

Colby et al. (2009) reports “Wind Turbine Syndrome” symptoms “... are not new and have been published previously in the context of “annoyance”...” and are the “... well-known stress effects of exposure to noise ...”⁴⁵

In independent works Colby et al. (2009) coauthors, Dr. Geoff Leventhall and Dr. David Colby, attribute “Wind Turbine Syndrome” to be symptoms of stress caused by audible wind turbine noise.

Open letter: Request that representatives of: CanWEA; the Government of Canada; and the Government of Ontario provide immediate and full disclosure of the health effects “conclusively demonstrated” from exposure to wind turbine noise March 10, 2013
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For example in 2009 Colby et al. (2009) coauthor Dr. Geoff Leventhall states he is happy to accept “Wind Turbine Syndrome” symptoms as he has known about them for years. (See excerpt below)

PSC REF#: 121877
 Exhibit 18 150 Cradocks Avenue, Ashford
 Surrey KT21 1NE, UK
 Tel/Fax: 01372 272 082
 e-mail: geoff@activenoise.co.uk

Dr Geoff Leventhall MSc, PhD, FInstP, HvalFOA
 Consultant in Noise, Vibration and Acoustics

Wind Turbine Syndrome – An appraisal

By Geoff Leventhall

This appraisal is based on a review of the material which has been on the web page www.windturbinesyndrome.com and on the digital version of paediatrician-ornithologist Dr Nina Pierpont's forthcoming self-published book "Wind Turbine Syndrome" (prepublication draft dated June 30, 2009).¹

I am happy to accept these symptoms, as they have been known to me for many years as the symptoms of extreme psychological stress from environmental noise, particularly low frequency noise. The symptoms have been published before (Møller and Lydolf, 2002; Nagai et al., 1989).

On June 7, 2011 Dr. Leventhall presented to the National Health and Medical Research Council at a “Scientific Forum” on “Wind Farms and Humans Health”.⁴⁶ Dr. Geoff Leventhall attributed “Wind Turbine Syndrome” symptoms to annoyance by audible noise from wind turbines. (See excerpt below)

<p>Wind Farms and Human Health</p> <p>Geoff Leventhall Noise and Vibration Consultant geoff@activenoise.co.uk</p>	<p style="text-align: center;">Conclusions</p> <ol style="list-style-type: none"> 1. Infrasound from wind turbines is not a health problem. 2. Effects of wind turbine noise on health are mediated through annoyance from audible noise, particularly if aerodynamic fluctuations occur (swish). 3. Attitude to a noise source is a large factor in annoyance from the source. 4. The Wind Turbine Syndrome is the result of stress from annoyance by audible noise from wind turbines, similar to annoyance from any other noise source.
--	---

In 2010 Dr. David Colby, coauthor of Colby et al. (2009) attributed “Wind Turbine Syndrome” symptoms to be caused by audible amplitude modulation (swoosh-swoosh). (See excerpt below)

<p style="text-align: center;">Sound and Health Wind Energy Workshop Nova Scotia Dept of Energy Halifax, March 4, 2010</p> <p style="text-align: center;">W. David Colby, MSc, MD, FRCPC Associate Professor of Medicine, Microbiology/Immunology and Physiology/Pharmacology Schulich School of Medicine & Dentistry, UWO Acting MOH, Chatham-Kent, ON</p>	<p>Previous work has shown similar effects</p> <p>Dr Pierpont has not made new discoveries.</p> <p>She is describing stress effects of low level noise, which occur with a <i>small number</i> of people.</p> <p>These effects have been published a number of times previously and are well known to those experienced at the “street level” of environmental noise problems.</p> <p>It appears that there is no specific Wind Turbine Syndrome, but there are stress effects from low levels of noise, either high frequency or low frequency noise, which affect a small number of people. It is the audible swoosh- swoosh which, when it occurs, is the cause, not infrasound or low frequency noise</p>
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Open letter: Request that representatives of: CanWEA; the Government of Canada; and the Government of Ontario provide immediate and full disclosure of the health effects “conclusively demonstrated” from exposure to wind turbine noise March 10, 2013
 Any errors or omissions are unintended

Health effects “conclusively demonstrated” and predicted: Health Canada

In February 2009 Stephen Bly, Chief, Acoustics Division Consumer and Clinical Radiation Protection Bureau Health Canada formally provided advice to me stating:

“The Acoustics Division's current assessment of the scientific literature on wind turbine noise and health is that the only health effect conclusively demonstrated to date is an increase in annoyance and complaints.”⁴⁷

In a June 30 2009 letter Honourable Rona Ambrose, states:

“Health Canada provides advice on the health effect of noise and low-frequency electric and magnetic fields from proposed wind turbine projects, particularly for environmental assessments done under the Canadian Environmental Assessment Act. To date, their examination of the scientific literature on wind turbine noise is that the only health effect conclusively demonstrated from exposure to wind turbine noise is an increase of self-reported general annoyance and complaints (i.e., headaches, nausea, tinnitus, vertigo).”⁴⁸



Health Canada provides advice on the health effects of noise and low-frequency electric and magnetic fields from proposed wind turbine projects, particularly for environmental assessments done under the Canadian Environmental Assessment Act. To date, their examination of the scientific literature on wind turbine noise and health is that the only health effect conclusively demonstrated from exposure to wind turbine noise is an increase in self-reported general annoyance and complaints (i.e., headaches, nausea, tinnitus, vertigo).

These “conclusively demonstrated” health effects are proposed and expected by representatives of Health Canada.

Dr. David Michaud and other members Health Canada’s Acoustics Division propose increasing the percentage of Canadians highly annoyed by wind turbine noise. The Health Canada authors of Keith et al. (n.d.)⁴⁹ Keith et al. (2007)⁵⁰ and Keith et al. (2008)⁵¹ (below) propose a 45dBA wind turbine sound limit and predict an increase in the percentage highly annoyed from exposure to wind turbine noise.

A JUSTIFICATION FOR USING A 45 dBA SOUND LEVEL CRITERION FOR WIND TURBINE PROJECTS

Stephen E. Keith, David S. Michaud, Stephen H.P. Bly
Healthy Environments and Consumer Safety Branch, Product Safety Directorate, Consumer and Clinical Radiation Protection Bureau, Acoustics Division, 775 Brookfield Rd. G3018, Ottawa, Ontario Canada, (J.A. IC) sketh@hcc-sc.gc.ca

Second International Meeting on Wind Turbine Noise Lyon France September 20 – 21 2007

A proposal for evaluating the potential health effects of wind turbine noise for projects under the Canadian Environmental Assessment Act

David S. Michaud, Stephen E. Keith and Stephen H.P. Bly
Healthy Environments and Consumer Safety Branch, Product Safety Programme, Consumer and Clinical Radiation Protection Bureau, Acoustics Division, 775 Brookfield Road, Ottawa, Ontario Canada, K1A1C1
dmichaud@hcc-sc.gc.ca

JOURNAL OF LOW FREQUENCY NOISE, VIBRATION AND ACTIVE CONTROL

Page 253 – 265

A proposal for evaluating the potential health effects of wind turbine noise for projects under the Canadian Environmental Assessment Act¹

Stephen E. Keith¹, David S. Michaud¹ and Stephen H.P. Bly¹
¹Healthy Environments and Consumer Safety Branch, Product Safety Programme, Consumer and Clinical Radiation Protection Bureau, Acoustics Division, 775 Brookfield Road, Ottawa, Ontario Canada, K1A1C1 sketh@hcc-sc.gc.ca

Received 27th August 2008

Open letter: Request that representatives of: CanWEA; the Government of Canada; and the Government of Ontario provide immediate and full disclosure of the health effects “conclusively demonstrated” from exposure to wind turbine noise March 10, 2013
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Dr. David Michaud and the other Health Canada authors do not base their annoyance predictions on dose response data for wind turbines.

Based on dose response data for wind turbines Health Canada Study Team Member, Sabine Janssen, reports with a highest allowed immission level of 45 dB(A) it could be expected that "... less than 14% of the exposed population to be highly annoyed indoors by wind turbines and less than 29% to be highly annoyed outdoors." ⁵²

Health impacts expected in Ontario Canada

Stantec is a listed member of CanWEA. ⁵³ Stantec provides consulting services for CanWEA and/or members of CanWEA. Stantec (2011 May) states:



File No. 160060269
May 2011
Prepared for:
Gilead Power Corporation
442 Plasmawic Avenue
Scarborough ON M1V 5J5
Prepared by:
Stantec Consulting Ltd.
Suite 1 - 70 Southgate Drive
Guelph ON N1C 4P6

"What is clear is that some people living near wind turbines experience annoyance due to wind turbines. ... Some people are also disturbed in their sleep by wind turbines." ⁵⁴

Dr. Christopher Ollson and Dr. Loren Knopper provide consulting services for CanWEA and/or members of CanWEA. Knopper and Ollson (2011) states:

REVIEW

Open Access

Health effects and wind turbines: A review of the literature

Loren D. Knopper^{1*} and Christopher A. Ollson²

"What is clear is that some people living near wind turbines experience annoyance due to wind turbines ... Some people are also disturbed in their sleep by wind turbines." ⁵⁵

Dr. Copes is the Director, Environmental and Occupational Health Branch, Ontario Agency for Health Protection and Promotion. A 2010 literature review coauthored by Dr. Copes reports wind turbine noise annoyance and sleep disturbance is common between 30 and 45 dBA. (See excerpt below)



- Annoyance and sleep disruption are common when sound levels are 30 to 45 dBA

Open letter: Request that representatives of: CanWEA; the Government of Canada; and the Government of Ontario provide immediate and full disclosure of the health effects "conclusively demonstrated" from exposure to wind turbine noise March 10, 2013
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Ontario wind turbine noise guideline limits permit,⁵⁶ and projects are being approved for,⁵⁷ noise levels of up to 51 dBA (formerly 53 dBA) at a defined noise receptor (family home).

An April 9 2010 internal Ontario Ministry of Environment memorandum obtained from a Freedom of information request states:

It appears compliance with the minimum setbacks and the noise study approach currently being used to approve the siting of WTGs will result or likely result in adverse effects ...”⁵⁸

HGC Engineering is a listed member of CanWEA.⁵⁹



The President of HGC Engineering is Mr. Brian Howe. The HGC Engineering web site states Mr Brian Howe is:

“... a leader in the assessment of noise from wind power projects. He speaks frequently at Canadian Wind Energy Association (CanWEA) Symposiums, as well as other major international conferences. Brian is an ongoing contributor to acoustical knowledge in the field having prepared a “best practices” guide for CanWEA in 2007 and provided input on the assessment methods contained in the Ontario Green Energy and Green Economy Act (2009). Brian is the Chairman of the CSA Technical Subcommittee on Acoustic Noise Measurements of Wind Turbines.”⁶⁰

HGC Engineering has conducted sound measurements at Canadian wind energy projects where some Canadians exposed to wind turbine noise reported high annoyance and/or sleep disturbance and/or other adverse effects. Some of these Canadians retained legal counsel to resolve issues caused by the wind turbine noise and have negotiated an agreement with the wind energy developer to purchase the home.

In December 2011 the Ontario Ministry of Environment released a report prepared HGC Engineering and signed by Mr. Brian Howe.

The Ontario Ministry of Environment reports “... three experts in the field of noise, vibration and acoustics reviewed and validated the report”⁶¹

Open letter: Request that representatives of: CanWEA; the Government of Canada; and the Government of Ontario provide immediate and full disclosure of the health effects “conclusively demonstrated” from exposure to wind turbine noise March 10, 2013
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HGC (2010) states in the conclusions:

“The audible sound from wind turbines, at the levels experienced at typical receptor distances in Ontario, is nonetheless expected to result in a non-trivial percentage of persons being highly annoyed. As with sounds from many sources, research has shown that annoyance associated with sound from wind turbines can be expected to contribute to stress related health impacts in some persons.”⁶²



HGC (2010) also states:

“Stress symptoms associated with noise annoyance, and in particular low frequency annoyance include sleep interference, headaches, poor concentration, mood swings”⁶³

Summary of evidence

- WHO defines health as "a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity".
- The WHO Constitution states: “The enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being ...”⁶⁴
- Canada supports the WHO definition of health.
- Health Canada’s Dr. David Michaud states under the WHO definition of health “... noise induced annoyance is an adverse health effect.”
- Peer reviewed studies^{65, 66, 67} demonstrate wind turbine produce sound which is perceived to be more annoying than other equally loud sources of sound.
- Annoyance to wind turbine noise starts at wind turbine dBA sound pressure levels in the low 30’s and rises sharply at 35 dBA.^{68, 69, 70}
- Ontario Ministry of Environment wind turbine noise guidelines permit noise of 40 dBA up to 51 dBA⁷¹ (formerly 53 dBA) at a family home (receptor).
- A 2009 panel report sponsored by AWEA and CanWEA determined “Wind Turbine Syndrome” symptoms such as headaches, nausea, tinnitus, vertigo “... are not new and have been published previously in the context of “annoyance”...” and are the “... well-known stress effects of exposure to noise ...”⁷²
- In 2009 Health Canada examined the scientific literature on wind turbine noise and determined the health effect “conclusively demonstrated” from exposure to wind turbine noise is an increase of self-reported general annoyance and complaints (i.e., headaches, nausea, tinnitus, vertigo).⁷³
- Members of Health Canada’s acoustics division propose wind turbine sound levels which are predicted to increase the percentage of exposed Canadians being highly annoyed.^{74, 75, 76}

Open letter: Request that representatives of: CanWEA; the Government of Canada; and the Government of Ontario provide immediate and full disclosure of the health effects “conclusively demonstrated” from exposure to wind turbine noise March 10, 2013

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- At the levels experienced at typical receptor distances in Ontario, sound from wind turbines is expected to result in a non-trivial percentage of persons being highly annoyed and research has shown that annoyance associated with sound from wind turbines can be expected to contribute to stress related health impacts in some persons.⁷⁷

Request for full disclosure of “conclusively demonstrated” health effects

The citations in this open letter represent a sample of references which support the conclusion that wind turbines can harm human health at the sound levels experienced at typical receptor distances in Ontario. Additional references can be provided upon request.

Reported effects include annoyance and/or sleep disturbance and/or stress related health impacts and/or reduced quality of life.

The references cited in this open letter include, but are not limited to, citations by CanWEA sponsored authors or members, and Health Canada.

Members of Health Canada’s Acoustics Division have identified health effects “conclusively demonstrated” from exposure to wind turbine noise.

Members of Health Canada’s Acoustics Division propose imposing health effects on a non trivial percentage of Canadians exposed to wind turbine noise.

Members of, and/or consultants for, CanWEA acknowledge some people experience annoyance and/or sleep disturbance and/or stress related health impacts as a result of exposure to wind turbines.

Failure to fully disclose these and other citations represent errors of omission.

Health Canada (2004) states: “Government’s job is to provide citizens with accurate and appropriate information so that they can protect themselves.”⁷⁸

In the interest of human health protection I request that representatives of: CanWEA; the Government of Canada; Health Canada; and the Government of Ontario; provide Canadians immediate and full disclosure of the health effects “conclusively demonstrated” from exposure to wind turbine noise.

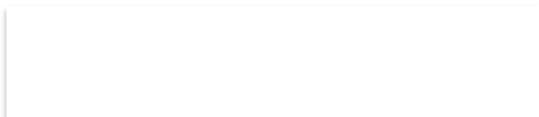
Open letter: Request that representatives of: CanWEA; the Government of Canada; and the Government of Ontario provide immediate and full disclosure of the health effects “conclusively demonstrated” from exposure to wind turbine noise March 10, 2013
Any errors or omissions are unintended

Informed Canadians look forward to your response.

If you should have any questions or require copies of the references cited in this letter please do not hesitate to contact me.

Yours truly,

Brett Horner BA CMA
Killaloe, ON
Canada



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-
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<http://www.ecoaction.gc.ca/ecoenergy-ecoenergie/power-electricite/index-eng.cfm>
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Open letter: Request that representatives of: CanWEA; the Government of Canada; and the Government of Ontario provide immediate and full disclosure of the health effects “conclusively demonstrated” from exposure to wind turbine noise March 10, 2013

Any errors or omissions are unintended

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Open letter: Request that representatives of: CanWEA; the Government of Canada; and the Government of Ontario provide immediate and full disclosure of the health effects “conclusively demonstrated” from exposure to wind turbine noise March 10, 2013

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Open letter: Request that representatives of: CanWEA; the Government of Canada; and the Government of Ontario provide immediate and full disclosure of the health effects “conclusively demonstrated” from exposure to wind turbine noise March 10, 2013

Any errors or omissions are unintended

March 21, 2013

The Right Honourable Stephen Harper
Prime Minister of Canada

[Redacted]

Copy:

The Honourable Leona Aglukkaq
Minister of Health, Health Canada

[Redacted]

Ms Kathleen Wynne
Premier of Ontario

[Redacted]

David S. Michaud, PhD
Principal Investigator, Wind Turbine Noise Study
Consumer and Clinical Radiation Protection Bureau
Healthy Environments and Consumer Safety Branch, Health Canada

[Redacted]

Ms Cheryl Gallant, MP

[Redacted]

Mr. John Yakabuski, MPP

[Redacted]

Open letter: Request that the Government of Canada discontinue Health Canada's ongoing experiment on Canadians exposed to wind turbines

Dear Prime Minister Stephen Harper

I am a published peer reviewed author on the subject of wind turbines and health effects¹ and have written to you previously.

I am writing to request that the Federal government immediately discontinue Health Canada's ongoing experiment on Canadians exposed to wind turbines.

Wind turbines can harm humans if placed too close to residents.²

Wind turbine sound is perceived by humans to be more annoying than transportation noise or industrial noise at comparable sound pressure levels.^{3,4,5,6}

Open letter: Request that the Government of Canada discontinue Health Canada's ongoing experiment on Canadians exposed to wind turbines

March 21, 2013

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Peer reviewed and other references acknowledge modern wind turbines produce sound characteristics which are plausible causes for annoyance and/or other health effects. These characteristics include amplitude modulation (swooshing); ^{7 8 9 10 11} audible low-frequency noise; ^{12 13 14} infrasound; ^{15 16 17} tonal noise, impulse noise; ¹⁸ and night time noise. ¹⁹

Symptoms of annoyance include stress, sleep disturbance, headaches, difficulty concentrating, irritability, fatigue, dizziness or vertigo, tinnitus, anxiety, heart ailments, and palpitation. ^{20 21 22 23}

Representatives of Health Canada, including The Minister of Health ²⁴ and Dr. David Michaud, ²⁵ acknowledge noise induced annoyance and/or complaints are health effects. Dr. David Michaud is the Principle Investigator/Project Manager of Health Canada's Wind Turbine Noise study. ²⁶

Health Canada examined the scientific literature on wind turbine noise and determined the health effect "conclusively demonstrated" from exposure to wind turbine noise is an increase of self-reported general annoyance and complaints (i.e., headaches, nausea, tinnitus, vertigo). ²⁷

In Canada and elsewhere some people exposed to wind turbines experience physiological and/or psychological symptoms and/or reduced quality of life and/or degraded living conditions and/or adverse social economic impacts. Reported effects include annoyance and/or sleep disturbance and/or stress related health impacts and/or reduced quality of life. ^{28 29 30 31 32 33 34 35 36 37 38 39}

A 2009 panel report sponsored by American Wind Energy Association and Canadian Wind Energy Association determined "Wind Turbine Syndrome" symptoms such as headaches, nausea, tinnitus, vertigo "... are not new and have been published previously in the context of "annoyance"..." and are the "... well-known stress effects of exposure to noise ..." ⁴⁰

In some cases the effects are so severe that some Canadian families have effectively abandoned their homes and/or been billeted by wind energy developers and/or negotiated financial agreements with wind energy developers. ⁴¹

Prevention of noise induced health effects is a fundamental health principle. ⁴² Harm to human health can be prevented with wind turbine setbacks and sound limits designed to protect humans from the health effects of unwanted wind turbine sound (noise).

Instead Health Canada representatives, including Dr. David Michaud propose wind turbine sound limits which are predicted to result in health effects (increase in percentage

Open letter: Request that the Government of Canada discontinue Health Canada's ongoing experiment on Canadians exposed to wind turbines

March 21, 2013

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highly annoyed).^{43, 44, 45} Proponents of wind energy development frequently cite these references co-authored by Health Canada's Dr. David Michaud.

In Ontario a non trivial percentage of Canadians exposed to the sound from wind turbines are expected to experience health effects.⁴⁶

Wind turbine development in Canada has resulted in the creation of a living laboratory where a non trivial percentage of exposed Canadians are predicted to experience "conclusively demonstrated" health effects from exposure to wind turbine noise. For years some Canadians have been exposed to these health effects. Now Dr. David Michaud has been granted the opportunity to lead a Health Canada study which intends to examine these health effects.

In my opinion Health Canada's proposal to expose Canadians to "conclusively demonstrated" and predicted health effects and then research the effect on humans is cruel and unethical. Canadian families should not be treated like rats in a laboratory.

I call on you as the Prime Minister of Canada to:

- discontinue Health Canada's ongoing experiment being conducted on Canadians exposed to wind turbines;
- provide full disclosure of the "conclusively demonstrated" and predicted health effects from exposure to wind turbine noise;
- take immediate action to protect Canadians from the "conclusively demonstrated" and predicted health effects from exposure to wind turbine noise;
- stop this preventable harm to human health.

Informed Canadians look forward to your response.

If you should have any questions or require copies of the references cited in this letter please do not hesitate to contact me.

Respectfully submitted,

Brett Horner BA CMA
Killaloe, ON
Canada



Attachment

Open letter conclusively demonstrated wind turbine health effects March 10 2013.pdf

Open letter: Request that the Government of Canada discontinue Health Canada's ongoing experiment on Canadians exposed to wind turbines

March 21, 2013

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Industrial Wind Turbines and Health: Wind Turbines Can Harm Humans if too close to Residents¹

**A summary of some of the peer reviewed articles and conference papers,
abstracts and citations, regarding impairment of health and wind turbines²**

**Compiled by Carmen Krogh, BScPharm
April, 2012³**

**Wind Turbine Acoustic Investigation: Infrasound and Low-Frequency Noise
A Case Study**

Stephen E. Ambrose, Robert W. Rand and Carmen M. E. Krogh

DOI: 10.1177/0270467612455734

Bulletin of Science Technology & Society published online 17 August 2012

<http://bst.sagepub.com/content/early/2012/07/30/0270467612455734>

Bio: Stephen E. Ambrose has more than 35 years of experience in industrial noise control. Board Certified and Member INCE since 1978, he runs a small business providing cost-effective environmental noise consulting services for industrial and commercial businesses, municipal and state governments, and private citizens.

Bio: Robert W. Rand has more than 30 years of experience in industrial noise control, environmental sound and general acoustics. A Member INCE since 1993, he runs a small business providing consulting, investigator, and design services in acoustics.

Bio: Carmen M. E. Krogh, BScPharm, provided research and reference support. She is a retired pharmacist with more than 40 years of experience in health. She has held senior executive positions at a major teaching hospital, a professional association, and Health Canada. She was former Director of Publications and Editor-in-Chief of the Compendium of Pharmaceutical and Specialties (CPS), the book used in Canada by physicians, nurses, and other health professions for prescribing information on medication.

Abstract

Wind turbines produce sound that is capable of disturbing local residents and is reported to cause annoyance, sleep disturbance, and other health-related impacts. An acoustical study was conducted to investigate the presence of infrasonic and low-frequency noise emissions

¹ Excerpted from Case Nos.: 10-121/10-122 Erickson v. Director, Ministry of the Environment Environmental Review Tribunal, Decision, p 207 “This case has successfully shown that the debate should not be simplified to one about whether wind turbines can cause harm to humans. The evidence presented to the Tribunal demonstrates that they can, if facilities are placed too close to residents. The debate has now evolved to one of degree.”

² This summary focuses on published literature 2010 to March 2013 associated with risks to health. References are not intended to be exhaustive.

³ Any errors or omissions are unintended

from wind turbines located in Falmouth, Massachusetts, USA. During the study, the investigating acousticians experienced adverse health effects consistent with those reported by some Falmouth residents. The authors conclude that wind turbine acoustic energy was found to be greater than or uniquely distinguishable from the ambient background levels and capable of exceeding human detection thresholds. The authors emphasize the need for epidemiological and laboratory research by health professionals and acousticians concerned with public health and well-being to develop effective and precautionary setback distances for industrial wind turbines that protect residents from wind turbine sound.

Falmouth, Massachusetts wind turbine infrasound and low frequency noise measurements

**Stephen E. Ambrose, Robert W. Rand and Carmen M. E. Krogh
Invited paper presented at Inter-noise 2012m New York City, NY**

Bio: Stephen E. Ambrose has more than 35 years of experience in industrial noise control. Board Certified and Member INCE since 1978, he runs a small business providing cost-effective environmental noise consulting services for industrial and commercial businesses, municipal and state governments, and private citizens.

Bio: Robert W. Rand has more than 30 years of experience in industrial noise control, environmental sound and general acoustics. A Member INCE since 1993, he runs a small business providing consulting, investigator, and design services in acoustics.

Bio: Carmen M. E. Krogh, BScPharm, provided research and reference support. She is a retired pharmacist with more than 40 years of experience in health. She has held senior executive positions at a major teaching hospital, a professional association, and Health Canada. She was former Director of Publications and Editor-in-Chief of the Compendium of Pharmaceutical and Specialties (CPS), the book used in Canada by physicians, nurses, and other health professions for prescribing information on medication.

Abstract

Falmouth, Massachusetts has experienced non-predicted adverse acoustic and health impacts from an industrial wind turbine (IWT) sited close to neighbors. The public response from this quiet rural area has been very vocal for a majority of homeowners living within 3000-ft. Complaints have ranged from the unexpectedly loud with constant fluctuations and the non-audible pressure fluctuations causing a real loss of public health and well-being. Early research indicates that both the IHC and OHC functions of the ear receive stimulation during moderate to strong wind speeds. This research presents a challenge to noise control and health professionals to determine the causal factors for the adverse public health impacts. This case study will present sound level and analyzed measurement data obtained while living in a house 1700-ft from an operating IWT during moderate to strong hub height wind speeds. There was a strong correlation with wind speed, power output and health symptoms.

Sleep disturbances and suicide risk: A review of the literature.

Rebecca A Bernert and Thomas E Joiner

Neuropsychiatr Dis Treat. 2007 December; 3(6): 735–743. PMID: PMC2656315

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2656315/>

Acknowledgments

This work was supported, in part, by a grant from the National Institute of Mental Health to Rebecca A Bernert and Thomas Joiner (1 F31 MH080470-01) and by the John Simon Guggenheim Foundation.

Abstract

A growing body of research indicates that sleep disturbances are associated with suicidal ideation and behaviors. This article provides a critical review of the extant literature on sleep and suicidality and addresses shared underlying neurobiological factors, biological and social zeitgebers, treatment implications, and future directions for research. Findings indicate that suicidal ideation and behaviors are closely associated with sleep complaints, and in some cases, this association exists above and beyond depression. Several cross-sectional investigations indicate a unique association between nightmares and suicidal ideation, whereas the relationship between insomnia and suicidality requires further study. Underlying neurobiological factors may, in part, account for the relationship between sleep and suicide. Serotonergic neurotransmission appears to play a critical role in both sleep and suicide. Finally, it remains unclear whether or not sleep-oriented interventions may reduce risk for suicidal behaviors. Unlike other suicide risk factors, sleep complaints may be particularly amenable to treatment. As a warning sign, disturbances in sleep may thus be especially useful to research and may serve as an important clinical target for future suicide intervention efforts.

Relevance and applicability of the Soundscape concept to physiological or behavioural effects caused by noise at very low frequencies which may not be audible

Bray, Wade,

Acoustical Society of America 164th Meeting, Kansas City, MO 22–26 October, 2012, 2aNS6

Abstract:

A central tenet of the Soundscape concept is that humans immersed in sonic environments are objective measuring instruments (New Experts), whose reports and descriptions must be taken seriously and quantified by technical measurements. A topic category in acoustics meetings of recent years is “Perception and Effects of Noise.” There is growing evidence from the field, and from medical research, that the ear’s two-part transducer activity involving inner hair cells (IHC, hearing velocity sensitive) and outer hair cells (OHC, displacement-sensitive) may, through demonstrated OHC activation and neural signals at up to 40 dB below the audibility threshold, produce behavioral and physiological effects as reported by a growing number of people. The Soundscape concept centering on human responses, New Experts, is as important and applicable to responses to effects from sound

as it is to responses to directly audible sound. In a wider sense, this is a new sound quality and psychoacoustic issue.

The Noise from Wind Turbines: Potential Adverse Impacts on Children's Well-Being

Arline L. Bronzaft

Bulletin of Science Technology & Society 2011 31: 256, DOI:

10.1177/0270467611412548.

<http://bst.sagepub.com/content/31/4/291>

Bio: Dr. Arline L. Bronzaft is a Professor Emerita of Lehman College, City University of New York. She serves on the Mayor's GrowNYC, having been named to this organization by three previous Mayors as well. Dr. Bronzaft is the author of landmark research on the effects of elevated train noise on children's classroom learning; has examined the impacts of airport-related noise on quality of life; and has published articles on noise in environmental books, academic journals and the more popular press. In 2007, she assisted in the updating of the New York City Noise Code.

Abstract

Research linking loud sounds to hearing loss in youngsters is now widespread, resulting in the issuance of warnings to protect children's hearing. However, studies attesting to the adverse effects of intrusive sounds and noise on children's overall mental and physical health and well-being have not received similar attention. This, despite the fact that many studies have demonstrated that intrusive noises such as those from passing road traffic, nearby rail systems, and overhead aircraft can adversely affect children's cardiovascular system, memory, language development, and learning acquisition. While some schools in the United States have received funds to abate intrusive aircraft noise, for example, many schools still expose children to noises from passing traffic and overhead aircraft. Discussion focuses on the harmful effects of noise on children, what has to be done to remedy the situation, and the need for action to lessen the impacts of noise from all sources. Furthermore, based on our knowledge of the harmful effects of noise on children's health and the growing body of evidence to suggest the potential harmful effects of industrial wind turbine noise, it is strongly urged that further studies be conducted on the impacts of industrial wind turbines on their health, as well as the health of their parents, before forging ahead in siting industrial wind turbines.

Wind turbine syndrome: fact or fiction? Review Article

A Farboud, R Crunkhorn, A Trinidad

The Journal of Laryngology & Otology, 1 of 5.

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doi:10.1017/S0022215112002964

Abstract

Objective: Symptoms, including tinnitus, ear pain and vertigo, have been reported following exposure to wind turbine noise. This review addresses the effects of infrasound and low frequency noise and questions the existence of 'wind turbine syndrome'.

Design: This review is based on a search for articles published within the last 10 years, conducted using the PubMed database and Google Scholar search engine, which included in their title or abstract the terms ‘wind turbine’, ‘infrasound’ or ‘low frequency noise’.

Results: There is evidence that infrasound has a physiological effect on the ear. Until this effect is fully understood, it is impossible to conclude that wind turbine noise does not cause any of the symptoms described.

However, many believe that these symptoms are related largely to the stress caused by unwanted noise exposure.

Conclusion: There is some evidence of symptoms in patients exposed to wind turbine noise. The effects of infrasound require further investigation.

There is ample evidence of symptoms arising in individuals exposed to wind turbine noise. Some researchers maintain that the effects of wind turbine syndrome are clearly just examples of the well known stress effects of exposure to noise, as displayed by a small proportion of the population. However, there is an increasing body of evidence suggesting that infrasound and low frequency noise have physiological effects on the ear. Until these effects are fully understood, it is impossible to state conclusively that exposure to wind turbine noise does not cause any of the symptoms described. The effects of infrasound and low frequency noise require further investigation.

Wind Turbine Noise

John P. Harrison

**Bulletin of Science Technology & Society 2011 31: 256, DOI:
10.1177/0270467611412549**

<http://bst.sagepub.com/content/31/4/256>

Bio: Dr. John P. Harrison has expertise in the properties of matter at low temperatures with emphasis on high frequency sound waves (phonons). For the past 5 years he has studied wind turbine noise and its regulation. He has presented invited talks on the subject at 3 conferences, including the 2008 World Wind Energy Conference.

Abstract

Following an introduction to noise and noise regulation of wind turbines, the problem of adverse health effects of turbine noise is discussed. This is attributed to the characteristics of turbine noise and deficiencies in the regulation of this noise. Both onshore and offshore wind farms are discussed.

Editorial: Wind turbine noise

Christopher D Hanning and Alun Evans

British Medical Journal, BM J2 012;344 doi: 10.1136/ bmj.e1527 (8 March 2012)

www.bmj.com

Bio: Christopher Hanning, BSc, MB, BS, MRCS, LRCP, FRCA, MD is an honorary consultant in sleep medicine Sleep Disorders Service, University Hospitals of Leicester, Leicester General Hospital, Leicester, UK

Dr Chris Hanning is Honorary Consultant in Sleep Disorders Medicine to the University Hospitals of Leicester NHS Trust, UK. He retired in September 2007 as Consultant in Sleep Disorders Medicine.

After initial training in anaesthesia, he developed an interest in Sleep Medicine. He founded and ran the Leicester Sleep Disorders Service, one of the longest standing and largest services in the UK. He was a founder member and President of the British Sleep Society

His expertise in this field has been accepted by the civil, criminal and family courts. He chairs the Advisory panel of the SOMNIA study, a major project investigating sleep quality in the elderly, and sits on Advisory panels for several companies with interests in sleep medicine.

Bio: Alun Evans, is an epidemiologist, Centre for Public Health, Queen's University of Belfast, Institute of Clinical Science B, Belfast, UK

Except from BMJ web site:

Seems to affect health adversely and an independent review of evidence is needed.

The evidence for adequate sleep as a prerequisite for human health, particularly child health, is overwhelming. Governments have recently paid much attention to the effects of environmental noise on sleep duration and quality, and to how to reduce such noise. However, governments have also imposed noise from industrial wind turbines on large swathes of peaceful countryside.

The impact of road, rail, and aircraft noise on sleep and daytime functioning (sleepiness and cognitive function) is well established. Shortly after wind turbines began to be erected close to housing, complaints emerged of adverse effects on health. Sleep disturbance was the main complaint. Such reports have been dismissed as being subjective and anecdotal, but experts contend that the quantity, consistency, and ubiquity of the complaints constitute epidemiological evidence of a strong link between wind turbine noise, ill health, and disruption of sleep.

The noise emitted by a typical onshore 2.5 MW wind turbine has two main components. A dynamo mounted on an 80 m tower is driven through a gear train by ...

Literature Reviews on Wind Turbines and Health : Are They Enough?

Brett Horner, Roy D. Jeffery and Carmen M. E. Krogh

Bulletin of Science Technology & Society 2011 31: 399.

DOI: 10.1177/0270467611421849

<http://bst.sagepub.com/content/31/5/399>

Bio: Brett Horner, BA, is a certified management accountant and has held senior manager positions in international business consulting groups. He has provided information technology consulting and accounting/auditing services to a wide variety of clientele. He has dedicated over 2 years reviewing and analyzing references on the subject of industrial wind turbines and reported health effects.

Bio: Roy D. Jeffery, MD, is a rural family physician and a clinical preceptor for the University of Ottawa and the Northern Ontario Medical Schools. He practices rural medicine with special interests regarding geriatric home care and rural health. He has the distinction of being awarded the Ontario Family Physician of the Year–Northern Division in 2008.

Bio: Carmen M. E. Krogh, BSc Pharm, is a retired pharmacist with more than 40 years of experience in health. She has held senior executive positions at a major teaching hospital, a professional association, and Health Canada. She was a former director of Publications and editor-in-chief of the Compendium of Pharmaceutical and Specialties, the book used in Canada by physicians, nurses, and other health professions for prescribing information on medication.

Abstract

Industrial wind turbines (IWTs) are a new source of community noise to which relatively few people have yet been exposed. IWTs are being erected at a rapid pace in proximity to human habitation. Some people report experiencing adverse health effects as a result of living in the environs of IWTs. In order to address public concerns and assess the plausibility of reported adverse health effects, a number of literature reviews have been commissioned by various organizations. This article explores some of the recent literature reviews on IWTs and adverse health effects. It considers the completeness, accuracy, and objectivity of their contents and conclusions. While some of the literature reviews provide a balanced assessment and draw reasonable scientific conclusions, others should not be relied on to make informed decisions. The article concludes that human health research is required to develop authoritative guidelines for the siting of IWTs in order to protect the health and welfare of exposed individuals.

Wind Turbine Infra and Low-Frequency Sound: Warnings Signs That Were Not Heard

Richard R James

DOI: 10.1177/0270467611421845

Bulletin of Science Technology & Society published online 15 December 2011

<http://bst.sagepub.com/content/early/2011/11/07/0270467611421845>

Bio: Richard R. James, Institute of Noise Control Engineering, has been actively involved in the field of noise control since 1969, participating in and supervising research and engineering projects related to control of occupational and community noise. He has performed extensive acoustical testing and development work for a variety of complex environmental noise problems using both classical and computer simulation techniques. Since 2006, he has been involved with noise and health issues related to industrial wind turbines.

Abstract

Industrial wind turbines are frequently thought of as benign. However, the literature is reporting adverse health effects associated with the implementation of industrial-scale wind developments. This article explores the historical evidence about what was known regarding infra and low-frequency sound from wind turbines and other noise sources during the period from the 1970s through the end of the 1990s. This exploration has been accomplished through references, personal interviews and communications, and other available documentation. The application of past knowledge could improve the current siting of industrial wind turbines and avoid potential risks to health.

**Wind Turbines Make Waves:
Why Some Residents Near Wind Turbines Become Ill
Magda Havas and David Colling**

Bulletin of Science Technology & Society 2011 31: 414. DOI: 0.1177/0270467611417852
<http://bst.sagepub.com/content/31/5/369>

Bio: Magda Havas, PhD, is an associate professor at Trent University where she teaches and conducts research on the biological and health effects of electromagnetic and chemical pollutants. She received her BSc and PhD at the University of Toronto and did postdoctoral research at Cornell University on acid rain and aluminum toxicity.

Bio: David Colling has applied his electrical engineering studies at Ryerson Polytechnical Institute and his specialized training in electrical pollution to conduct electrical pollution testing for Bio-Ag on farms, homes, and office buildings. Some of the homes tested are located in the environs of industrial wind turbines.

Abstract

People who live near wind turbines complain of symptoms that include some combination of the following: difficulty sleeping, fatigue, depression, irritability, aggressiveness, cognitive dysfunction, chest pain/pressure, headaches, joint pain, skin irritations, nausea, dizziness, tinnitus, and stress. These symptoms have been attributed to the pressure (sound) waves that wind turbines generate in the form of noise and infrasound. However, wind turbines also generate electromagnetic waves in the form of poor power quality (dirty electricity) and ground current, and these can adversely affect those who are electrically hypersensitive. Indeed, the symptoms mentioned above are consistent with electrohypersensitivity. Sensitivity to both sound and electromagnetic waves differs among individuals and may explain why not everyone in the same home experiences similar effects. Ways to mitigate the adverse health effects of wind turbines are presented.

Industrial Wind Turbine Development and Loss of Social Justice?
Carmen M.E. Krogh
Bulletin of Science Technology & Society 2011 31: 321, DOI:
10.1177/0270467611412550,
<http://bst.sagepub.com/content/31/4/321>

Bio: Carmen M. E. Krogh, BScPharm is a retired pharmacist with more than 40 years of experience in health. She has held senior executive positions at a major teaching hospital, a professional association and Health Canada. She was a former Director of Publications and Editor-in-chief of the *Compendium of Pharmaceutical and Specialties (CPS)*, the book used in Canada by physicians, nurses and other health professions for prescribing information on medication.

Abstract

This article explores the loss of social justice reported by individuals living in the environs of industrial wind turbines (IWTs). References indicate that some individuals residing in proximity to IWT facilities experience adverse health effects. These adverse health effects are severe enough that some families have abandoned their homes. Individuals report they welcomed IWTs into their community and the negative consequences were unexpected. Expressions of grief are exacerbated by the emotional and physical toll of individuals' symptoms, loss of enjoyment of homes and property, disturbed living conditions, financial loss, and the lack of society's recognition of their situation. The author has investigated the reported loss of social justice through a review of literature, personal interviews with, and communications from, those reporting adverse health effects. The author's intention is to create awareness that loss of social justice is being associated with IWT development. This loss of justice arises from a number of factors, including the lack of fair process, the loss of rights, and associated disempowerment. These societal themes require further investigation. Research by health professionals and social scientists is urgently needed to address the health and social impacts of IWTs operating near family homes.

WindVOiCe, a Self-Reporting Survey: Adverse Health Effects, Industrial Wind Turbines, and the Need for Vigilance Monitoring

Carmen M.E. Krogh, Lorrie Gillis, Nicholas Kouwen, and Jeffery Aramini

Bulletin of Science Technology & Society 2011 31: 334,

DOI: 10.1177/0270467611412551,

<http://bst.sagepub.com/content/31/4/334>

Bio: Carmen M. E. Krogh, BScPharm is a retired pharmacist with more than 40 years of experience in health. She has held senior executive positions at a major teaching hospital, a professional association and Health Canada. She was a former Director of Publications and Editor-in-chief of the *Compendium of Pharmaceutical and Specialties (CPS)*, the book used in Canada by physicians, nurses and other health professions for prescribing information on medication.

Bio: Ms Lorrie Gillis is the process administrator for the WindVOiCe health survey. Ms Gillis volunteers her time and ensures the processes for administering the protocols are maintained.

Bio: Dr. Nicholas Kouwen is a Distinguished Professor Emeritus in the Department of Civil and Environmental Engineering of the University of Waterloo, Waterloo, Ontario, Canada. He is a registered Professional Engineer (Ontario) and a Fellow of the American Society of

Civil Engineers. His field of expertise is in hydraulic and hydrological modelling and is currently involved in studies dealing with the impact of climate change on water availability.

Bio: Dr. Jeff Aramini is a public health epidemiologist with expertise in the investigation of health concerns using epidemiological principles. DVM and M.Sc. from the University of Saskatchewan; Ph.D. from the University of Guelph. Former senior epidemiologist with Health Canada/Public Health Agency of Canada. Currently, President and CEO of an organization that addresses public health, patient care, public safety and information management for clients in government, industry and academia.

Abstract

Industrial wind turbines have been operating in many parts of the globe. Anecdotal reports of perceived adverse health effects relating to industrial wind turbines have been published in the media and on the Internet. Based on these reports, indications were that some residents perceived they were experiencing adverse health effects. The purpose of the WindVOiCe health survey was to provide vigilance monitoring for those wishing to report their perceived adverse health effects. This article discusses the results of a self reporting health survey regarding perceived adverse health effects associated with industrial wind turbines.

Wind turbines can harm humans: a case study

Carmen ME Krogh, Roy D Jeffery, Jeff Aramini, Brett Horner
Paper presented at Inter-noise 2012, New York City, NY

Bio: Carmen M. E. Krogh, BSc Pharm, is a retired pharmacist with more than 40 years of experience in health. She has held senior executive positions at a major teaching hospital, a professional association, and Health Canada. She was a former director of Publications and editor-in-chief of the Compendium of Pharmaceutical and Specialties, the book used in Canada by physicians, nurses, and other health professions for prescribing information on medication.

Bio: Roy D. Jeffery, MD, is a rural family physician and a clinical preceptor for the University of Ottawa and the Northern Ontario Medical Schools. He practices rural medicine with special interests regarding geriatric home care and rural health. He has the distinction of being awarded the Ontario Family Physician of the Year–Northern Division in 2008.

Bio: Dr. Jeff Aramini is a public health epidemiologist with expertise in the investigation of health concerns using epidemiological principles. DVM and M.Sc. from the University of Saskatchewan; Ph.D. from the University of Guelph. Former senior epidemiologist with Health Canada/Public Health Agency of Canada. Currently, President and CEO of an organization that addresses public health, patient care, public safety and information management for clients in government, industry and academia.

Bio: Brett Horner, BA, is a certified management accountant and has held senior manager positions in international business consulting groups. He has provided information technology consulting and accounting/auditing services to a wide variety of clientele. He has

dedicated over 2 years reviewing and analyzing references on the subject of industrial wind turbines and reported health effects.

Abstract

In Canada the Ontario Government has adopted wind energy as a renewable energy source. Our research in Ontario documents some individuals living in the environs of wind turbines report experiencing physiological and psychological symptoms, reduced quality of life, degraded living conditions, and adverse social economic impacts. Some families have abandoned their homes or negotiated financial agreements with wind energy developers. Wind turbine noise is a reported cause of these effects; however, some commentators suggest sound from wind turbines does not pose a risk of any adverse health effect in humans. These competing claims can confuse authorities responsible for establishing noise guidelines. An Ontario Environmental Review Tribunal considered a wide body of evidence including expert testimony and found wind turbines can harm humans if placed too close to residents. Risks must be understood to ensure guidelines protect human health. Evidence including peer reviewed literature, case reports, freedom of information documents and expert testimony will be presented which support the conclusion that wind turbines, if placed too close to residents, can harm human health.

Wind turbine noise perception, pathways and effects: a case study

Carmen ME Krogh, Roy D Jeffery, Jeff Aramini, Brett Horner

Paper presented at Inter-noise 2012, New York City, NY

Bio: Carmen M. E. Krogh, BSc Pharm, is a retired pharmacist with more than 40 years of experience in health. She has held senior executive positions at a major teaching hospital, a professional association, and Health Canada. She was a former director of Publications and editor-in-chief of the Compendium of Pharmaceutical and Specialties, the book used in Canada by physicians, nurses, and other health professions for prescribing information on medication.

Bio: Roy D. Jeffery, MD, is a rural family physician and a clinical preceptor for the University of Ottawa and the Northern Ontario Medical Schools. He practices rural medicine with special interests regarding geriatric home care and rural health. He has the distinction of being awarded the Ontario Family Physician of the Year–Northern Division in 2008.

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Bio: Brett Horner, BA, is a certified management accountant and has held senior manager positions in international business consulting groups. He has provided information technology consulting and accounting/auditing services to a wide variety of clientele. He has

dedicated over 2 years reviewing and analyzing references on the subject of industrial wind turbines and reported health effects.

Abstract

In Ontario Canada wind turbines are being sited close to humans. Wind turbine noise is perceived to be more annoying than other equally loud sources of sound. This annoyance can contribute to stress related health impacts. An Ontario government commissioned report concludes a nontrivial percentage of exposed persons will be impacted. Our research documents some Ontarians living in the environs of wind turbines report experiencing physiological and psychological symptoms, reduced quality of life, degraded living conditions, and adverse social economic impacts including a loss of social justice. In some cases the effects resulted in families abandoning their homes. Others have negotiated financial agreements with wind energy developers. An Ontario Environmental Tribunal considered a wide body of evidence including expert witness testimony and found that wind turbines can harm humans if placed too close to residents. Peer reviewed literature, case reports, freedom of information documents and expert testimony will be presented which support the conclusion that noise perception via the indirect pathway can result in serious negative effects.

**Annoyance can represent a serious degradation of health:
wind turbine noise a case study
Carmen ME Krogh, Roy D Jeffery, Jeff Aramini, Brett Horner
Paper presented at Inter-noise 2012, New York City, NY**

Bio: Carmen M. E. Krogh, BSc Pharm, is a retired pharmacist with more than 40 years of experience in health. She has held senior executive positions at a major teaching hospital, a professional association, and Health Canada. She was a former director of Publications and editor-in-chief of the Compendium of Pharmaceutical and Specialties, the book used in Canada by physicians, nurses, and other health professions for prescribing information on medication.

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Bio: Brett Horner, BA, is a certified management accountant and has held senior manager positions in international business consulting groups. He has provided information technology consulting and accounting/auditing services to a wide variety of clientele. He has dedicated over 2 years reviewing and analyzing references on the subject of industrial wind turbines and reported health effects.

Abstract

Annoyance is often discounted as a health concern. Wind turbine noise is perceived to be more annoying than other equally loud sources of sound. The Ontario government commissioned a report which concludes a non-trivial percentage those exposed to wind turbine sound will be highly annoyed which can be expected to contribute to stress related health impacts. Our research in Ontario, Canada documents some individuals living in the environs of wind turbines report experiencing physiological and psychological symptoms, reduced quality of life, degraded living conditions, and adverse social and economic impacts. Some families have abandoned their homes or negotiated financial agreements with wind energy developers. An Ontario Environmental Review Tribunal considered a wide body of evidence including expert testimony and found wind turbines can harm humans if placed too close to residents. Evidence including peer reviewed literature, case reports, freedom of information documents and expert testimony are presented which support the conclusion that annoyance can represent a serious degradation of health.

Effects of insufficient sleep on circadian rhythmicity and expression amplitude of the human blood transcriptome

**Carla S. Möller-Levet, Simon N. Archer, Giselda Bucca, Emma E. Laing, Ana Slak,
Renata Kabiljo, June C. Y. Lo, Nayantara Santhi, Malcolm von Schantz, Colin P.
Smith, and Derk-Jan Dijk**

Published online before print February 25, 2013, doi:10.1073/pnas.1217154110

PNAS (Proceedings of the National Academy of Sciences)

February 25, 2013 201217154

<http://www.pnas.org/content/early/2013/02/20/1217154110>

Edited by Joseph S. Takahashi, Howard Hughes Medical Institute, University of Texas Southwestern Medical Center, Dallas, TX, and approved January 23, 2013 (received for review October 3, 2012)

Significance

Insufficient sleep and circadian rhythm disruption are associated with negative health outcomes, but the mechanisms involved remain largely unexplored. We show that one wk of insufficient sleep alters gene expression in human blood cells, reduces the amplitude of circadian rhythms in gene expression, and intensifies the effects of subsequent acute total sleep loss on gene expression. The affected genes are involved in chromatin remodeling, regulation of gene expression, and immune and stress responses. The data imply molecular mechanisms mediating the effects of sleep loss on health and highlight the interrelationships between sleep homeostasis, circadian rhythmicity, and metabolism.

Abstract

Insufficient sleep and circadian rhythm disruption are associated with negative health outcomes, including obesity, cardiovascular disease, and cognitive impairment, but the mechanisms involved remain largely unexplored. Twenty-six participants were exposed to 1 wk of insufficient sleep (sleep-restriction condition 5.70 h, SEM = 0.03 sleep per 24 h) and 1 wk of sufficient sleep (control condition 8.50 h sleep, SEM = 0.11). Immediately following each condition, 10 whole-blood RNA samples were collected from each participant, while controlling for the effects of light, activity, and food, during a period of total sleep deprivation. Transcriptome analysis revealed that 711 genes were up- or down-regulated by insufficient sleep. Insufficient sleep also reduced the number of genes with a circadian expression profile from 1,855 to 1,481, reduced the circadian amplitude of these genes, and led to an increase in the number of genes that responded to subsequent total sleep deprivation from 122 to 856. Genes affected by insufficient sleep were associated with circadian rhythms (PER1, PER2, PER3, CRY2, CLOCK, NR1D1, NR1D2, RORA, DEC1, CSNK1E), sleep homeostasis (IL6, STAT3, KCNV2, CAMK2D), oxidative stress (PRDX2, PRDX5), and metabolism (SLC2A3, SLC2A5, GHRL, ABCA1). Biological processes affected included chromatin modification, gene-expression regulation, macromolecular metabolism, and inflammatory, immune and stress responses. Thus, insufficient sleep affects the human blood transcriptome, disrupts its circadian regulation, and intensifies the effects of acute total sleep deprivation. The identified biological processes may be involved with the negative effects of sleep loss on health, and highlight the interrelatedness of sleep homeostasis, circadian rhythmicity, and metabolism.

Low-frequency noise from large wind turbines

Henrik Møller and Christian Sejer Pedersen

Section of Acoustics, Aalborg University,

Fredrik Bajers Vej 7-B5, DK-9220 Aalborg Ø, Denmark, Acoustical Society of America

[DOI: 10.1121/1.3543957] J. Acoust. Soc. Am. 129 (6), June 2011 PACS number(s):

43.50.Rq, 43.28.Hr, 43.50.Cb, 43.50.Sr [ADP] Pages: 3727–3744

Abstract

As wind turbines get larger, worries have emerged that the turbine noise would move down in frequency and that the low-frequency noise would cause annoyance for the neighbors. The noise emission from 48 wind turbines with nominal electric power up to 3.6 MW is analyzed and discussed. The relative amount of low-frequency noise is higher for large turbines (2.3–3.6 MW) than for small turbines (≤ 2 MW), and the difference is statistically significant. The difference can also be expressed as a downward shift of the spectrum of approximately one-third of an octave. A further shift of similar size is suggested for future turbines in the 10-MW range. Due to the air absorption, the higher low-frequency content becomes even more pronounced, when sound pressure levels in relevant neighbor distances are considered. Even when A-weighted levels are considered, a substantial part of the noise is at low frequencies, and for several of the investigated large turbines, the one-third-octave band with the highest level is at or below 250 Hz. It is thus beyond any doubt that the low-frequency part of the spectrum plays an important role in the noise at the neighbors.

Toward a Case Definition of Adverse Health Effects in the Environs of Industrial Wind Turbines: Facilitating a Clinical Diagnosis

Robert Y. McMurtry

Bulletin of Science Technology & Society 2011 31: 316, DOI:

10.1177/0270467611415075,

<http://bst.sagepub.com/content/31/4/316>

Bio: Dr. Robert Y. McMurtry is the former Dean of Medicine for the University of Western Ontario. He was a member of the Health Council of Canada for 3½ years and a member and special advisor to the Royal Commission under Roy Romanow on the future of health care in Canada. Dr. McMurtry was a visiting Cameron Chair to Health Canada for providing policy advice to the Minister and Deputy Minister of Health. He was the Founding and Associate Deputy Minister of Population & Public Health, Canada. Dr. McMurtry also sat on the National Steering Committee on Climate Change and Health Assessment. Presently Dr. McMurtry is Professor (Emeritus) of Surgery, University of Western Ontario.

Abstract

Internationally, there are reports of adverse health effects (AHE) in the environs of industrial wind turbines (IWT). There was multidisciplinary confirmation of the key characteristics of the AHE at the first international symposium on AHE/IWT. The symptoms being reported are consistent internationally and are characterized by crossover findings or a predictable appearance of signs and symptoms present with exposure to IWT sound energy and amelioration when the exposure ceases. There is also a revealed preference of victims to seek restoration away from their homes. This article identifies the need to create a case definition to establish a clinical diagnosis. A case definition is proposed that identifies the sine qua non diagnostic criteria for a diagnosis of adverse health effects in the environs of industrial wind turbines. Possible, probable, and confirmed diagnoses are detailed. The goal is to foster the adoption of a common case definition that will facilitate future research efforts.

Effects of industrial wind turbine noise on sleep and health

Nissenbaum, Michael A., Aramini, Jeffery J., Hanning, Christopher D.

Noise & Health, September-October 2012, Volume 14, p243

www.noiseandhealth.org

Bio: Dr. Michael A. Nissenbaum received his undergraduate education at McGill University in Montreal and completed medical school at the University of Toronto. He specialized in diagnostic imaging and completed his residency at McGill University. He received a Fellowship from the University of California. Currently, Dr. Nissenbaum is certified by the Royal College of Physicians of Canada, and American Board of Radiology. He is a radiologist at the Northern Maine Medical Center, Fort Kent, Maine. Previous positions include Junior Faculty at Harvard University and Associate Director of MRI at a major Harvard teaching hospital.

Bio: Dr. Jeff Aramini is a public health epidemiologist with expertise in the investigation of health concerns using epidemiological principles. DVM and M.Sc. from the University of Saskatchewan; Ph.D. from the University of Guelph. Former senior epidemiologist with Health Canada/Public Health Agency of Canada. Currently, President and CEO of an organization that addresses public health, patient care, public safety and information management for clients in government, industry and academia.

Bio: Dr Chris Hanning is Honorary Consultant in Sleep Disorders Medicine to the University Hospitals of Leicester NHS Trust, UK. He retired in September 2007 as Consultant in Sleep Disorders Medicine. After initial training in anaesthesia, he developed an interest in Sleep Medicine. He founded and ran the Leicester Sleep Disorders Service, one of the longest standing and largest services in the UK. He was a founder member and President of the British Sleep Society. His expertise in this field has been accepted by the civil, criminal and family courts. He chairs the Advisory panel of the SOMNIA study, a major project investigating sleep quality in the elderly, and sits on Advisory panels for several companies with interests in sleep medicine.

Abstract

Industrial wind turbines (IWTs) are a new source of noise in previously quiet rural environments. Environmental noise is a public health concern, of which sleep disruption is a major factor. To compare sleep and general health outcomes between participants living close to IWTs and those living further away from them, participants living between 375 and 1400 m (n= 38) and 3.3 and 6.6 km (n = 41) from IWTs were enrolled in a stratified cross-sectional study involving two rural sites. Validated questionnaires were used to collect information on sleep quality (Pittsburgh Sleep Quality Index — PSQI), daytime sleepiness (Epworth Sleepiness Score — ESS), and general health (SF36v2), together with psychiatric disorders, attitude, and demographics. Descriptive and multivariate analyses were performed to investigate the effect of the main exposure variable of interest (distance to the nearest IWT) on various health outcome measures. Participants living within 1.4 km of an IWT had worse sleep, were sleepier during the day, and had worse SF36 Mental Component Scores compared to those living further than 1.4 km away. Significant dose-response relationships between PSQI, ESS, SF36 Mental Component Score, and log-distance to the nearest IWT were identified after controlling for gender, age, and household clustering. The adverse event reports of sleep disturbance and ill health by those living close to IWTs are supported.

Properly Interpreting the Epidemiologic Evidence About the Health Effects of Industrial Wind Turbines on Nearby Residents

Carl V. Phillips

Bulletin of Science Technology & Society 2011 31: 303, DOI:

10.1177/0270467611412554,

<http://bst.sagepub.com/content/31/4/303>

Bio: Dr. Carl V. Phillips is a consultant and author specializing in epidemiology, science-based policy making, and communicating scientific concepts to the public. He spent most of

his career as a professor of public health and now works in litigation support, scientific advising, and grant-supported research. He blogs at ep-ology.blogspot.com, which provides links to his other writings.

Abstract

There is overwhelming evidence that wind turbines cause serious health problems in nearby residents, usually stress-disorder type diseases, at a nontrivial rate. The bulk of the evidence takes the form of thousands of adverse event reports. There is also a small amount of systematically gathered data. The adverse event reports provide compelling evidence of the seriousness of the problems and of causation in this case because of their volume, the ease of observing exposure and outcome incidence, and case-crossover data. Proponents of turbines have sought to deny these problems by making a collection of contradictory claims including that the evidence does not “count,” the outcomes are not “real” diseases, the outcomes are the victims’ own fault, and that acoustical models cannot explain why there are health problems so the problems must not exist. These claims appeared to have swayed many nonexpert observers, though they are easily debunked. Moreover, though the failure of models to explain the observed problems does not deny the problems, it does mean that we do not know what, other than kilometers of distance, could sufficiently mitigate the effects. There has been no policy analysis that justifies imposing these effects on local residents. The attempts to deny the evidence cannot be seen as honest scientific disagreement and represent either gross incompetence or intentional bias.

Jerry Punch, Rick James and Dan Pabst
Wind-Turbine Noise
What Audiologists Should Know
Audiology Today, July/August 2010

Authors: Jerry Punch, PhD, Richard James, BME and Dan Pabst, BS are with the Department of Communicative Sciences and Disorders, Michigan State University, East Lansing, Michigan, US

Conclusion

Our purpose in this article has been to provide audiologists with a better understanding of the types of noise generated by wind turbines, some basic considerations underlying sound-level measurements of wind-turbine noise, and the adverse health effects on people who live near these turbines. In future years, we expect that audiologists will be called upon to make noise measurements in communities that have acquired wind turbines, or are considering them. Some of us, along with members of the medical profession, will be asked to provide legal testimony regarding our opinions on the effects of such noise on people. Many of us will likely see clinical patients who are experiencing some of the adverse health effects described in this article. As a professional community, audiologists should become involved not only in making these measurements to corroborate the complaints of residents living near wind-turbine projects but also in developing and shaping siting guidelines that minimize the potentially adverse health effects of the noise and vibration they generate. In these ways, we

can promote public health interests without opposing the use of wind turbines as a desirable and viable alternative energy source.

Occupational Health and Industrial Wind Turbines: A Case Study

Robert W. Rand, Stephen E. Ambrose, and Carmen M. E. Krogh

Bulletin of Science Technology & Society 2011 31: 359 DOI: 10.1177/0270467611417849

<http://bst.sagepub.com/content/31/5/359>

Bio: Robert W. Rand is a principal author with over 30 years of experience in industrial noise control, environmental sound, and general acoustics. A member of the Institute of Noise Control Engineering since 1993, he runs a small business providing consulting, investigator, and design services in acoustics.

Bio: Stephen E. Ambrose is a principal author with over 35 years of experience in industrial noise control. A member of the Institute of Noise Control Engineering since 1978, he runs a small business providing cost-effective environmental noise consulting services for industrial and commercial businesses, municipal and state governments, and private citizens.

Bio: Carmen M. E. Krogh, BScPharm, who provided health-related research and reference support, is a retired pharmacist with more than 40 years of experience in health. She has held senior executive positions at a major teaching hospital, a professional association, and Health Canada. She was a former Director of Publications and Editor in Chief of the *Compendium of Pharmaceutical and Specialties (CPS)*, the book used in Canada by physicians, nurses, and other health professions for prescribing information on medication.

Abstract

Industrial wind turbines (IWTs) are being installed at a fast pace globally. Researchers, medical practitioners, and media have reported adverse health effects resulting from living in the environs of IWTs. While there have been some anecdotal reports from technicians and other workers who work in the environs of IWTs, little is known about the occupational health sector. The purpose of this case study is to raise awareness about the potential for adverse health effects occurring among workers. The authors propose that there is a need for research regarding occupational worker exposure relating to IWTs.

Responses of the ear to low frequency sounds, infrasound and wind turbines.

Alec N. Salt and T.E. Hullar, Department of Otolaryngology,

Washington University School of Medicine, St. Louis, MO, 63110, USA.

Hearing Research 2010 Sep 1; 268(1-2):12-21. Epub 2010 Jun 16

Abstract

Infrasound sounds are generated internally in the body (by respiration, heartbeat, coughing, etc) and by external sources, such as air conditioning systems, inside vehicles, some industrial processes and, now becoming increasingly prevalent, wind turbines. It is widely assumed that infrasound presented at an amplitude below what is audible has no influence on the ear. In this review, we consider possible ways that low frequency sounds, at levels that

may or may not be heard, could influence the function of the ear. The inner ear has elaborate mechanisms to attenuate low frequency sound components before they are transmitted to the brain. The auditory portion of the ear, the cochlea, has two types of sensory cells, inner hair cells (IHC) and outer hair cells (OHC), of which the IHC are coupled to the afferent fibers that transmit "hearing" to the brain. The sensory stereocilia ("hairs") on the IHC are "fluid coupled" to mechanical stimuli, so their responses depend on stimulus velocity and their sensitivity decreases as sound frequency is lowered. In contrast, the OHC are directly coupled to mechanical stimuli, so their input remains greater than for IHC at low frequencies. At very low frequencies the OHC are stimulated by sounds at levels below those that are heard. Although the hair cells in other sensory structures such as the saccule may be tuned to infrasonic frequencies, auditory stimulus coupling to these structures is inefficient so that they are unlikely to be influenced by airborne infrasound. Structures that are involved in endolymph volume regulation are also known to be influenced by infrasound, but their sensitivity is also thought to be low. There are, however, abnormal states in which the ear becomes hypersensitive to infrasound. In most cases, the inner ear's responses to infrasound can be considered normal, but they could be associated with unfamiliar sensations or subtle changes in physiology. This raises the possibility that exposure to the infrasound component of wind turbine noise could influence the physiology of the ear.

Responses of the Inner Ear to Infrasound
Alec N. Salt and Jeffery T. Lichtenhan
Fourth International Meeting on Wind Turbine Noise
Rome, Italy, 12-14 April 2011

Bio: Alec N. Salt received his PhD from the University of Birmingham, UK, in 1977 and has been actively involved in research into the physiology of the ear for over 35 years.

Bio: Dr. Lichtenhan is from the Eaton-Peabody Laboratory, Massachusetts Eye & Ear Infirmary, Boston Massachusetts and the Department of Otolaryngology, Harvard Medical School, Boston, Massachusetts.

Abstract:

Unweighted sound measurements show that wind turbines generate high levels of infrasound. It has been wrongly assumed that if subjects cannot hear the infrasound component of the noise then they cannot be affected by it. On the contrary, the mammalian ear is highly sensitive to infrasound stimulation at levels below those that are heard. Most aspects of responses to infrasound are far from well established. Measurements made within the endolymphatic system of the cochlea show responses that become larger, relative to measurements made in perilymph, as frequency is lowered. This suggests that endolymphatic responses to infrasound are enhanced in some manner. For high-frequency sound, acoustic stimuli in the ear are summed. In contrast, the inner ear's responses to infrasound are suppressed by the presence of higher frequency stimuli. The complexity of the ear's response to infrasound leads us to the conclusion that there are many aspects that need to be better understood before the influence of wind turbine noise on the ear can be dismissed as insignificant.

Infrasound From Wind Turbines Could Affect Humans**Alec N. Salt and James A. Kaltenbach****Bulletin of Science Technology & Society 2011 31: 296,****DOI: 10.1177/0270467611412555****<http://bst.sagepub.com/content/31/4/296>**

Bio: Alec N. Salt received his PhD from the University of Birmingham, UK, in 1977 and has been actively involved in research into the physiology of the ear for over 35 years.

Bio: James A. Kaltenbach received his PhD from the University of Pennsylvania in 1984. He specializes in the neurobiology of hearing disorders and is currently the Director of Otolaryngology Research at the Cleveland Clinic.

Abstract

Wind turbines generate low-frequency sounds that affect the ear. The ear is superficially similar to a microphone, converting mechanical sound waves into electrical signals, but does this by complex physiologic processes. Serious misconceptions about low-frequency sound and the ear have resulted from a failure to consider in detail how the ear works. Although the cells that provide hearing are insensitive to infrasound, other sensory cells in the ear are much more sensitive, which can be demonstrated by electrical recordings. Responses to infrasound reach the brain through pathways that do not involve conscious hearing but instead may produce sensations of fullness, pressure or tinnitus, or have no sensation. Activation of subconscious pathways by infrasound could disturb sleep. Based on our current knowledge of how the ear works, it is quite possible that low-frequency sounds at the levels generated by wind turbines could affect those living nearby.

Perception-based protection from low-frequency sounds may not be enough**Alec N. Salt and Jeffery T. Lichtenhan****Invited paper presented at Inter-noise 2012, New York City, NY**

Bio: Alec N. Salt, Department of Otolaryngology, Washington University School of Medicine, St. Louis, MO, received his PhD from the University of Birmingham, UK, in 1977 and has been actively involved in research into the physiology of the ear for over 35 years.

Acknowledgments

This work was supported by grant R01 DC001368 from the NIDCD, National Institutes of Health. We thank Jared Hartsock and Ruth Gill for their assistance with the experiments.

Abstract

Hearing and perception in the mammalian ear are mediated by the inner hair cells (IHC). IHCs are fluid-coupled to mechanical vibrations and have been characterized as velocity sensitive, making them quite insensitive to low-frequency sounds. But the ear also contains more numerous outer hair cells (OHC), which are not fluid coupled and are characterized as displacement sensitive. The OHCs are more sensitive than IHCs to low frequencies and

respond to very low-frequency sounds at levels below those that are perceived. OHC are connected to the brain by type II afferent fibers to networks that may further attenuate perception of low frequencies. These same pathways are also involved in alerting and phantom sounds (tinnitus). Because of these anatomic configurations, low-frequency sounds that are not perceived may cause influence in ways that have not yet been adequately studied. We present data showing that the ear's response to low-frequency sounds is influenced by the presence of higher-frequency sounds such as those in the speech frequency range, with substantially larger responses generated when higher-frequency components are absent. We conclude that the physiological effects of low-frequency sounds are more complex than is widely appreciated. Based on this knowledge, we have to be concerned that sounds that are not perceived are clearly transduced by the ear and may still affect people in ways that have yet to be fully understood.

Public Health Ethics, Legitimacy, and the Challenges of Industrial Wind Turbines: The Case of Ontario, Canada

Martin Shain

Bulletin of Science Technology & Society, 2011 31: 256

DOI: 10.1177/0270467611412552,

<http://bst.sagepub.com/content/31/4/346>

Bio: Martin Shain S.J.D. is trained in law and social sciences. He is principal and founder of the Neighbour at Work Centre® and assistant professor at the Dalla Lana School of Public Health, Occupational and Environmental Health Division, University of Toronto.

Abstract

While industrial wind turbines (IWTs) clearly raise issues concerning threats to the health of a few in contrast to claimed health benefits to many, the trade-off has not been fully considered in a public health framework. This article reviews public health ethics justifications for the licensing and installation of IWTs. It concludes that the current methods used by government to evaluate licensing applications for IWTs do not meet most public health ethical criteria. Furthermore, these methods are contrary to widely held fundamental principles of administrative law and governmental legitimacy. A set of decision-making principles are suggested to address this situation that are derived from existing and emerging legal principles in Canada and elsewhere. These include the Precautionary Principle, the Least Impactful Means (Proportionality) Test, and the Neighbor Principle.

Daniel Shepherd, David Welch, Kim N. Dirks, and David McBride, (March 2013), Do Quiet Areas Afford Greater Health-Related Quality of Life than Noisy Areas?

International Journal of Environmental Research and Public Health, ISSN 1660-4601

<http://www.mdpi.com/1660-4601/10/4/1284>

Authors:

Daniel Shepherd 1,* , David Welch 2, Kim N. Dirks 2 and David McBride 3

1 School of Public Health, Auckland University of Technology, Auckland 1142, New Zealand

2 School of Population Health, The University of Auckland, Auckland 1142, New Zealand; E-Mails: d.welch@auckland.ac.nz (D.W.); k.dirks@auckland.ac.nz (K.N.D.)

3 Department of Preventative and Social Medicine, University of Otago, Dunedin 9054, New Zealand; E-Mail: david.mcbride@otago.ac.nz

* Author to whom correspondence should be addressed; E-Mail: daniel.shepherd@aut.ac.nz

Abstract: People typically choose to live in quiet areas in order to safeguard their health and wellbeing. However, the benefits of living in quiet areas are relatively understudied compared to the burdens associated with living in noisy areas. Additionally, research is increasingly focusing on the relationship between the human response to noise and measures of health and wellbeing, complementing traditional dose-response approaches, and further elucidating the impact of noise and health by incorporating human factors as mediators and moderators. To further explore the benefits of living in quiet areas, we compared the results of health-related quality of life (HRQOL) questionnaire datasets collected from households in localities differentiated by their soundscapes and population density: noisy city, quiet city, quiet rural, and noisy rural. The dose-response relationships between noise annoyance and HRQOL measures indicated an inverse relationship between the two. Additionally, quiet areas were found to have higher mean HRQOL domain scores than noisy areas. This research further supports the protection of quiet locales and ongoing noise abatement in noisy areas

Shepherd, Daniel; McBride, David; Welch, David; Dirks, Kim; Hill, Erin
Wind turbine noise and health-related quality of life of nearby residents: a cross sectional study in New Zealand

Presented at the Fourth International Meeting on Wind Turbine Noise, Rome, 2011

http://otago.ourarchive.ac.nz/handle/10523/2260_24/03/2013

Abstract:

Hearing allows humans to detect threats in the environment and to communicate with others. However, unwanted sound has the capacity to evoke reflexive and emotional responses, and can act a stressor. The World Health Organisation classifies noise as an environmental pollutant that degrades sleep, quality of life and general health. Previous research provides evidence of a relationship between wind turbine noise and both annoyance and sleep disturbance. However, wind turbines are a relatively new source of community noise, and as such their effects on health have yet to be fully described. We report a study exploring the effect of wind turbine noise on health and wellbeing in a sample of New Zealand residents living within two kilometres of a wind turbine installation. Our data provide evidence that wind turbine noise can degrade aspects of health-related quality of life and amenity. On this evidence, wind turbine installations should be sited with care and consideration with respect to the communities hosting them.

Mitigating the Acoustic Impacts of Modern Technologies: Acoustic, Health, and Psychosocial Factors Informing Wind Farm Placement

Daniel Shepherd and Rex Billington

Bulletin of Science Technology & Society 2011 31: 389

DOI: 10.1177/0270467611417841

<http://bst.sagepub.com/content/31/5/389>

Bio: Daniel Shepherd has a PhD in psychoacoustics and holds a lectureship at the Faculty of Health, AUT University. As an environmental psychologist, he researches the psychological response to noise from both individual and social perspectives.

Bio: Dr. Rex Billington is a research health psychologist at AUT University after 18 years with the World Health Organization including directorships in Mental Health and the Global Program on AIDS.

Abstract

Wind turbine noise is annoying and has been linked to increased levels of psychological distress, stress, difficulty falling asleep and sleep interruption. For these reasons, there is a need for competently designed noise standards to safeguard community health and well-being. The authors identify key considerations for the development of wind turbine noise standards, which emphasize a more social and humanistic approach to the assessment of new energy technologies in society.

**Evaluating the impact of wind turbine noise on health related quality of life
by Daniel Shepherd, David McBride, David Welch, Kim N. Dirks, Erin M. Hill**

Noise & Health, September-October 2011, 13:54,333-9

DOI: 10.4103/1463-1741.85502

www.noiseandhealth.org

Abstract

We report a cross-sectional study comparing the health-related quality of life (HRQOL) of individuals residing in the proximity of a wind farm to those residing in a demographically matched area sufficiently displaced from wind turbines. The study employed a nonequivalent comparison group posttest-only design. Self-administered questionnaires, which included the brief version of the World Health Organization quality of life scale, were delivered to residents in two adjacent areas in semirural New Zealand. Participants were also asked to identify annoying noises, indicate their degree of noise sensitivity, and rate amenity. Statistically significant differences were noted in some HRQOL domain scores, with residents living within 2 km of a turbine installation reporting lower overall quality of life, physical quality of life, and environmental quality of life. Those exposed to turbine noise also reported significantly lower sleep quality, and rated their environment as less restful. Our data suggest that wind farm noise can negatively impact facets of HRQOL.

Acknowledgements: We are grateful to our colleagues and others whose reviews substantially improved the manuscript. We are especially grateful for the thorough review undertaken by Professor Rex Billington, who as the WHO Director of Mental Health in the 1990s oversaw the development of the WHO's program into quality of life, health and the environment.

**Numerical simulation of infrasound perception, with reference to
prior reported laboratory effects.**

M.A.Swinbanks

Presented at Inter-noise 2012, New York City, NY

Abstract

In earlier presentations, the author has argued that conventional assessments of the perception of infrasound based on mean (rms derived) sound energy levels underestimate the importance of the associated crest factor of very low frequency sound pressure variations. By simulating the dynamic response of the ear at levels close to the hearing threshold, it is apparent that infrasound may be perceptible at lower levels than those based on long time constant rms assessment. In particular, it will be shown that the existence of a finite threshold of audibility, together with the added presence of low level higher frequency noise in the first critical band (i.e. below 100Hz), can imply the perception of infrasound at significantly lower levels than has hitherto been acknowledged. The results of simulations will be compared to independently reported effects which have been observed in laboratory testing by other researchers.

Conclusion (excerpt)

The dBG levels for the wind-turbine infrasound inside the house are 10-15dB lower than the Chen test signal which gave rise to adverse effects after only 1 hour. But since there is an 8dB increase in sensitivity for 10% of young adults, it is clear that these infrasonic wind turbine levels could be expected to become a problem after several hours of exposure.

The Problems With 'Noise Numbers' for Wind Farm Noise Assessment

Bob Thorne

Bulletin of Science Technology & Society 2011 31: 262

DOI: 10.1177/0270467611412557,

<http://bst.sagepub.com/content/31/4/262>

Bio: Bob Thorne, MSc, PhD, is the principal consultant of Noise Measurement Services Pty Ltd, Brisbane, Australia. He holds a PhD from Massey University, New Zealand, in health science and is an environmental health research associate in the Institute of Food, Nutrition and Human Health at Massey University. His research work involves using advanced specialized technology for intrusive noise assessment, and a specific application is personalized sound reinforcement for hearing assistive devices.

Abstract

Human perception responds primarily to sound character rather than sound level. Wind farms are unique sound sources and exhibit special audible and inaudible characteristics that can be described as modulating sound or as a tonal complex. Wind farm compliance measures based on a specified noise number alone will fail to address problems with noise nuisance. The character of wind farm sound, noise emissions from wind farms, noise prediction at residences, and systemic failures in assessment processes are examined. Human perception of wind farm sound is compared with noise assessment measures and complaint histories. The adverse effects on health of persons susceptible to noise from wind farms are examined and a hypothesis, the concept of heightened noise zones (pressure variations), as a marker for cause and effect is advanced. A sound level of LAeq 32 dB outside a residence and above an individual's threshold of hearing inside the home are identified as markers for serious adverse health effects affecting susceptible individuals. The article is referenced to the author's research, measurements, and observations at different wind farms in New Zealand and Victoria, Australia.

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**WindVOiCe, a Self-Reporting Survey: Adverse Health Effects, Industrial Wind Turbines, and the Need for
Vigilance Monitoring**

Carmen M.E. Krogh, Lorrie Gillis, Nicholas Kouwen and Jeff Aramini
Bulletin of Science Technology & Society 2011 31: 334
DOI: 10.1177/0270467611412551

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Wind Vigilance for Ontario Communities

**A Self-reporting Survey: Adverse Health Effects, Industrial Wind Turbines (IWT)
and the Need for Vigilance Monitoring**

Carmen M.E. Krogh

Lorrie Gillis

Nicholas Kouwen

Jeff Aramini

Corresponding Author:

Carmen M.E. Krogh, BScPharm

Bios:

Carmen M. E. Krogh, BScPharm is a retired pharmacist with more than 40 years of experience in health. She has held senior executive positions at a major teaching hospital, a professional association and Health Canada. She was a former Director of Publications and Editor-in-chief of the *Compendium of Pharmaceutical and Specialties (CPS)*, the

book used in Canada by physicians, nurses and other health professions for prescribing information on medication.

Lorrie Gillis is the process administrator for the WindVOiCe health survey. Ms Gillis volunteers her time and ensures the processes for administering the protocols are maintained.

Dr. N. Kouwen is a Distinguished Professor Emeritus in the Department of Civil and Environmental Engineering of the University of Waterloo, Waterloo, Ontario, Canada. He is a registered Professional Engineer (Ontario) and a Fellow of the American Society of Civil Engineers. His field of expertise is in hydraulic and hydrological modelling and is currently involved in studies dealing with the impact of climate change on water availability.

Dr. J. Aramini is a public health epidemiologist with expertise in the investigation of health concerns using epidemiological principles. DVM and M.Sc. from the University of Saskatchewan; Ph.D. from the University of Guelph. Former senior epidemiologist with Health Canada/Public Health Agency of Canada. Currently, President and CEO of an organization that addresses public health, patient care, public safety and information management for clients in government, industry and academia.

Authors Note:

The authors wish to acknowledge the important contribution of Dr. Amanda Harry (UK) regarding the development of this questionnaire.

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Abstract

Industrial wind turbines have been operating in many parts of the globe. Anecdotal reports of perceived adverse health effects relating to industrial wind turbines have been published in the media and on the Internet. Based on these reports, indications were that some residents perceived they were experiencing adverse health effects. The purpose of the WindVOiCe health survey was to provide vigilance monitoring for those wishing to report their perceived adverse health effects. This article discusses the results of a self reporting health survey regarding perceived adverse health effects associated with industrial wind turbines.

Key words: self reporting, adverse health effects, industrial wind turbines, health survey, vigilance monitoring

Introduction

Many Ontarians living close to Industrial Wind Turbines (IWTs) who believe they are suffering adverse health effects are hesitant to report their symptoms. Individuals report this hesitancy is due to the manner in which their claims have often been discounted or ignored by the wind energy industry and government officials (Hansard, 2009, p. G-516 and G-547). As a result of a limited number who first came forward to report their symptoms, WindVOiCe was established in March, 2009.

WindVOiCe is a self reporting health survey that collects data about adverse health effects being reported by families living near IWTs. The WindVOiCe health survey follows the principles of Health Canada's *Canada Vigilance Programs*, which encourages all consumers in Canada to self report perceived adverse health effects from prescription and consumer products, vaccines and other. Medical and health care practitioners are encouraged to report perceived adverse health effects to the *Canada Vigilance*. Consumers do not have to prove the effect, only perceive it. The pharmaceutical industry is obligated by law to submit any reported adverse health effects it receives to Health Canada (*Health Canada*).

The objectives of WindVOiCe are the following:

- Document any changes in health outcomes among individuals living near IWTs.
- If documented, provide information to assess the need for large-scale controlled epidemiological studies and to establish evidence-based and safe residence setback distances.

Methods

Study design and participant recruitment

This is a self reporting survey based on perceived adverse health effects occurring with the onset of an industrial wind turbine facility.

The WindVOiCe survey questionnaire reproduced that of Harry (2007). The questionnaire is designed to collect basic demographic information and information on any new adverse health outcomes and changes to quality of life since the start of the respective IWT project (Appendix 1). Health outcome observations included headaches

and migraines, heart palpitations, excessive tiredness and sleep disturbance, stress and anxiety, depression, tinnitus and hearing problems.

A Health Survey Contact Flyer was distributed starting in March 2009 to residents in five project areas where adverse health effects had been anecdotally reported.

(Appendix 2): Melancthon Phase 1 and 2 (Shelburne); Canadian Hydro Wind Developers (Shelburne); Kingsbridge 1 Wind Power, (Goderich); Kruger Energy Port Alma (Port Alma); Ripley Wind Power, (Ripley); Enbridge Ontario Wind Farm, (Kincardine); and Erie Shores Wind Farm, (Port Burwell).

The Health Survey Contact Flyer was distributed by Canada Post and in some cases by volunteers who hand delivered it to mailboxes in the areas where IWTs were situated. The opportunity to participate in the WindVOiCe project also involved distributing notices at community information sessions, by word of mouth, and via the internet (*Participation*).

A confidential toll free telephone number and email address were provided. Those who contacted the WindVOiCe survey team were assured of total confidentiality and anonymity. There were no restrictions placed on the distribution or access to the survey in communities with IWTs. Individuals experiencing adverse health effects and those who were not were encouraged to fill-out and submit a health survey. Both hard copy and rarely, electronic copies, were sent on request. Each interested adult in the home was asked to complete a separate survey, with a minimum age of 18 years and fluency in English specified as requirements. The WindVOiCe health survey could not be used by anyone with any cognitive impairment.

Those interested in participating in the study were provided with the survey, a cover page giving general instructions (*Appendix 3*), and a Cover Note with mailing instructions (*Appendix 4*). Surveys were typically mailed to those wishing to participate and were returned by Canada Post.

Questionnaire processing

The WindVOiCe Scrutinizer validated each returned survey. The survey contact lead and scrutinizer transferred results into an electronic database (*Microsoft® Office Excel 2003*). Respondents were given the opportunity to include additional comments and

these were transcribed exactly as stated. A strict protocol was employed to protect confidentiality and data integrity of the returned surveys.

Data analysis

All analyses were performed using SAS 9.22 (2008, SAS Institute Inc., Cary, NC, USA.)

Descriptive analyses were performed to investigate and describe participant demographics and frequency of health outcome responses. The association between health outcomes and distance to nearest IWT was also investigated. Distance to the nearest IWT was assessed both as a categorical and continuous variable. Significance of associations when distance to nearest IWT was assessed as a categorical variable involved using Proc FREQ (*Fishers Exact Test*). Significance of associations when distance to nearest IWT was assessed as a continuous variable involved using Proc GENMOD (*logit link; binomial distribution*). Age and gender were included in the Proc GENMOD model if significant at P-value < 0.05.

For the purpose of interpreting statistical significance, the following parameters were used:

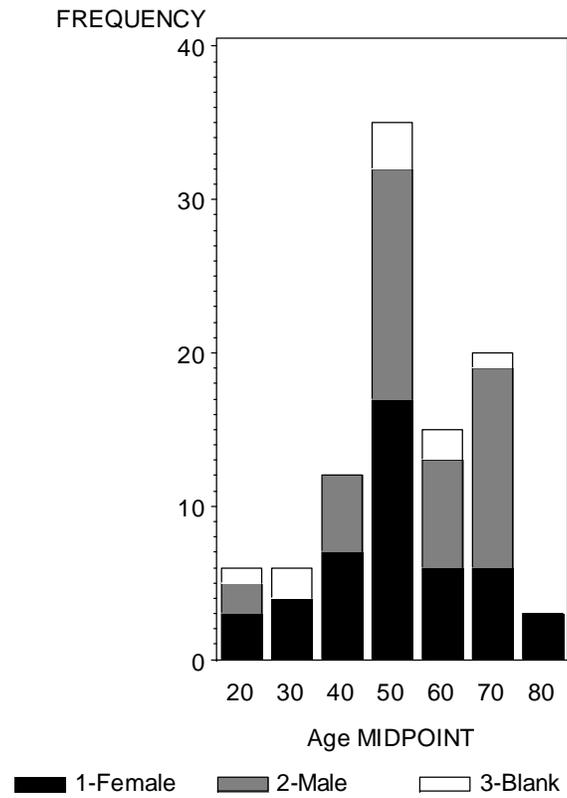
- P-value < 0.05 = Significant
- P-value 0.1 – 0.05 = Moderately significant
- P-value > 0.1 = Not significant

Results

Data preparation for analysis

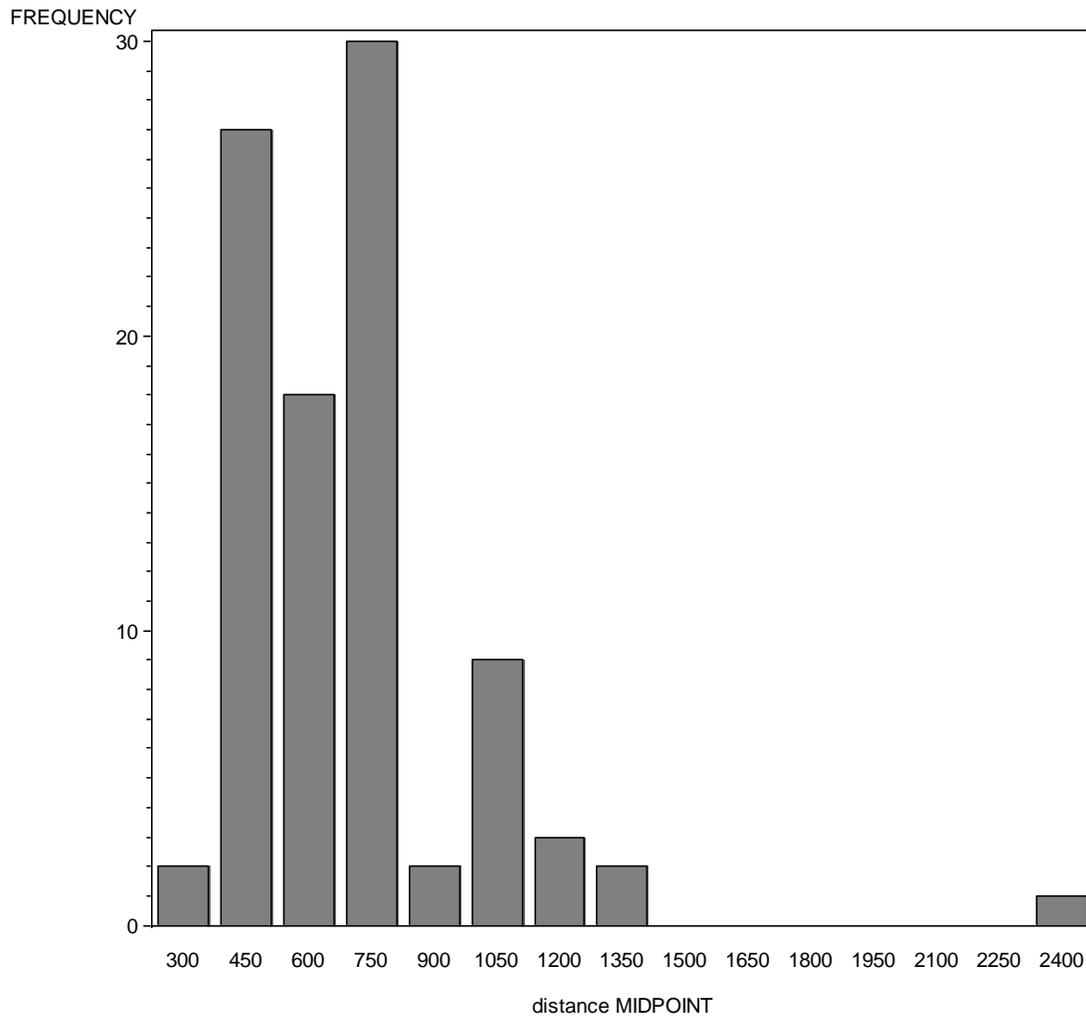
- Number of Ontario WindVOiCe survey participants = 109
- Responses of "Maybe", "unsure", or "left blank", were all set to "No"
- Those reporting either Altered Health or Altered Quality of Life included = 102
- Four (4) participants were less than 18 years old and were removed.
- Two (2) participants were much further away from IWTs compared to the rest (5km) and were removed from further analysis given the distance gap.
- Distance to nearest IWT was divided into 4 groups based on natural break-points among the participants: 350-499m; 500-699m; 700-899m; 900-2400m.

Figure 1. Age (years) and gender of participants



- Age: Mean = 52 yrs; Range = 19-83 yrs
- Gender: Female = 52%; Male = 48%

Figure 2. Distance of participants to nearest IWT (meters)



- Distance: Mean = 707m; Range = 350 - 2400m

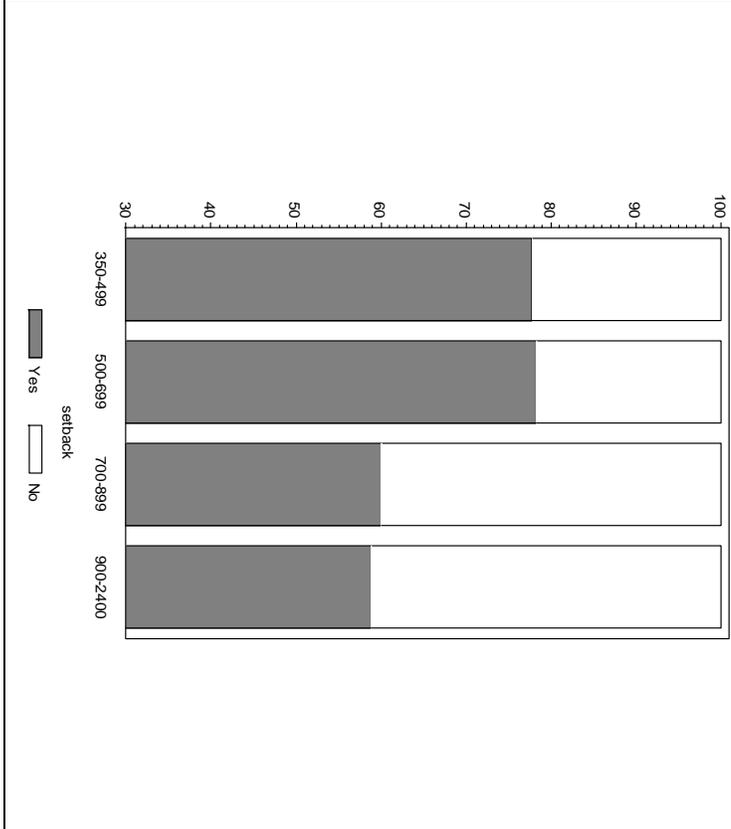
Table 1. Health Outcomes Results

Parameter	All participants	Distance Range from residence to nearest IWT (mean) in meters						P-Value*
		350-490 (428)	500-673 (587)	350-673 (506)	700-808 (769)	900-2400 (1154)	700-2400 (908)	
Number of responses	97	24	23	47	30	17	47	
Altered Quality of Life (%)	97	96	96	96	100	94	98	1.0000
Altered Health (%)	90	93	96	94	87	82	85	0.1908
Disturbed sleep (%)	69	78	78	78	60	59	60	0.0778
Excessive tiredness (%)	76	89	83	86	63	71	66	0.0307
Headaches (%)	62	74	65	70	60	41	53	0.0990
Migraines (%)	13	22	13	18	13	0	9	0.2358
Hearing problems (%)	35	22	57	38	27	41	32	0.6706
Tinnitus (%)	56	59	61	60	33	41	51	0.4179
Heart palpitations (%)	34	26	39	32	33	37	36	0.6750
Stress (%)	69	74	57	66	70	76	72	0.5189
Anxiety (%)	52	52	57	54	40	65	49	0.6864
Depression (%)	41	44	48	46	33	41	36	0.4099
Distress** (%)	72	74	61	68	73	82	77	0.3735
Approached doctor (%)	38	37	39	38	40	35	38	1.0000

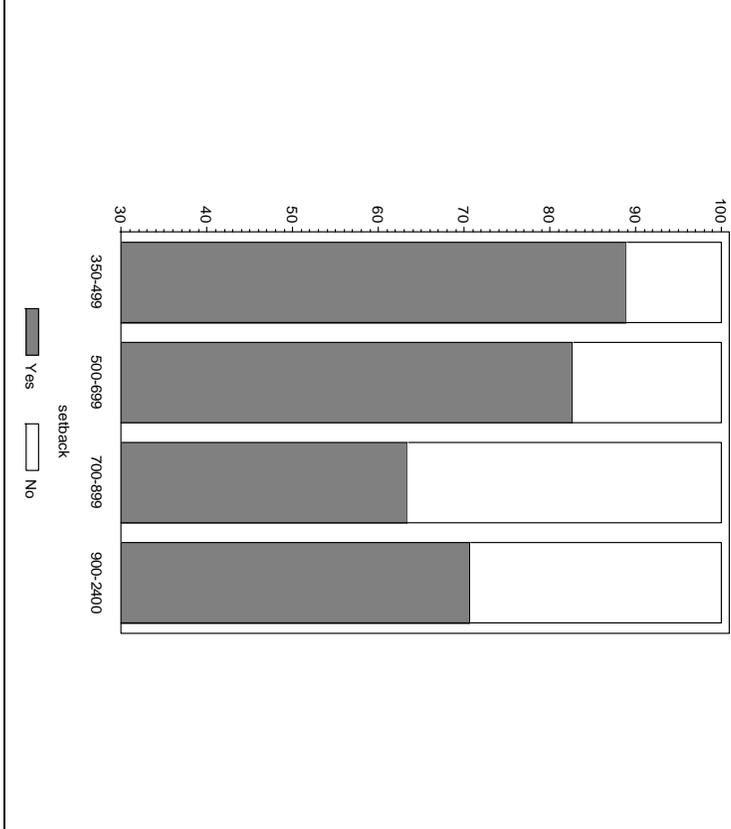
Note: Significant or moderately significant p values are in the boldfaced. *Fishers Exact Test **Distress = 'Yes' if at least one of Stress, Anxiety, Depression reported as 'Yes'

Figures 3-4. Select outcomes by Distance

(3) Sleep Disturbance by Distance (m)

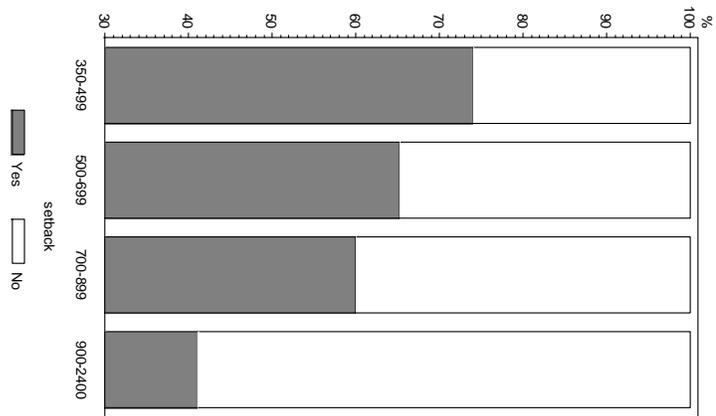


(4) Excessive Tiredness by Distance (m)



Figures 5-6. Select outcomes by Distance

(5) Headaches by Distance (m)



(6) Migraines by Distance (m)

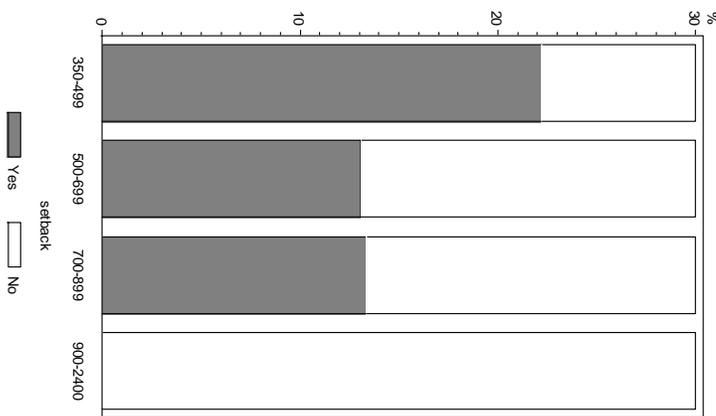
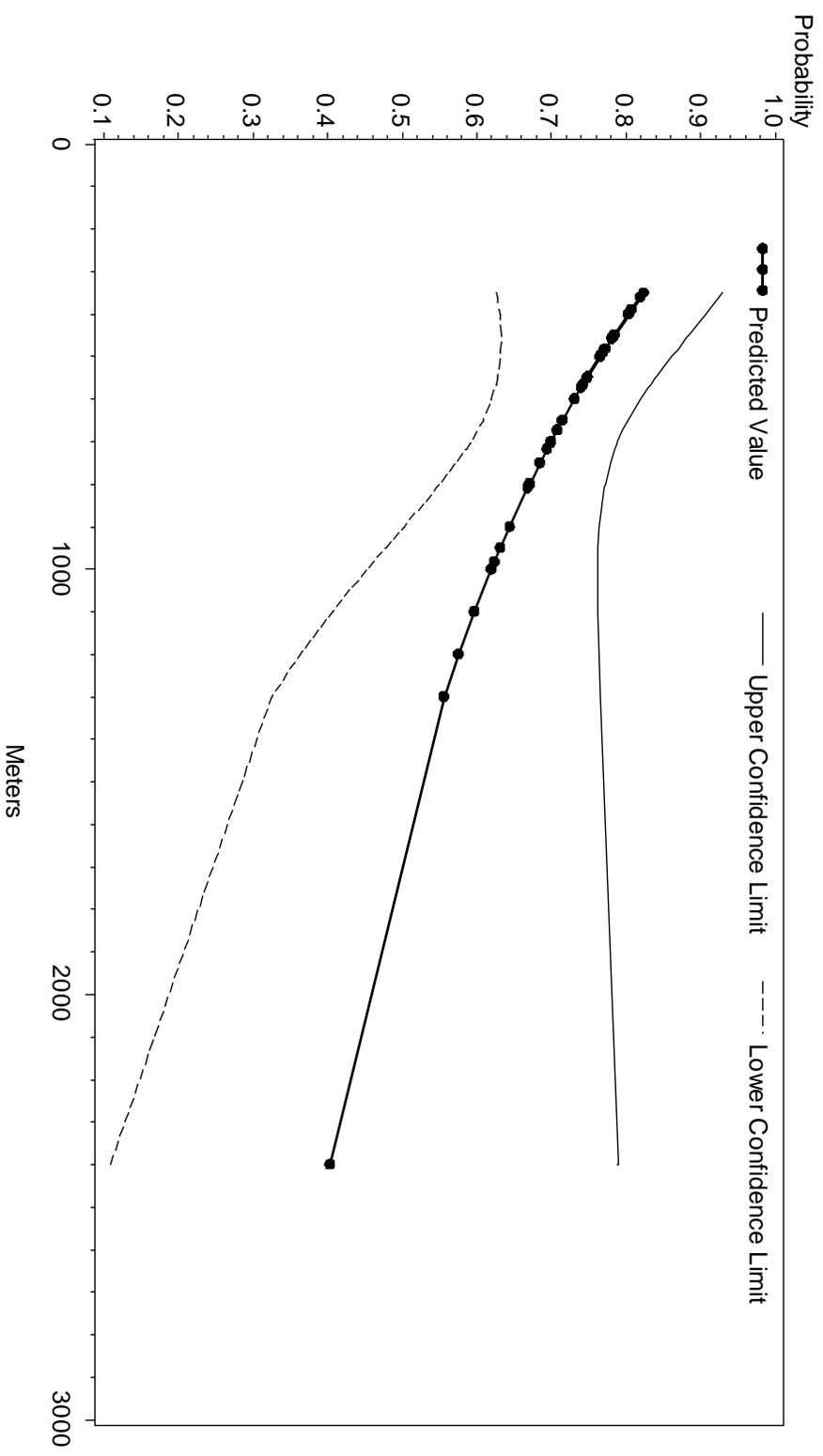
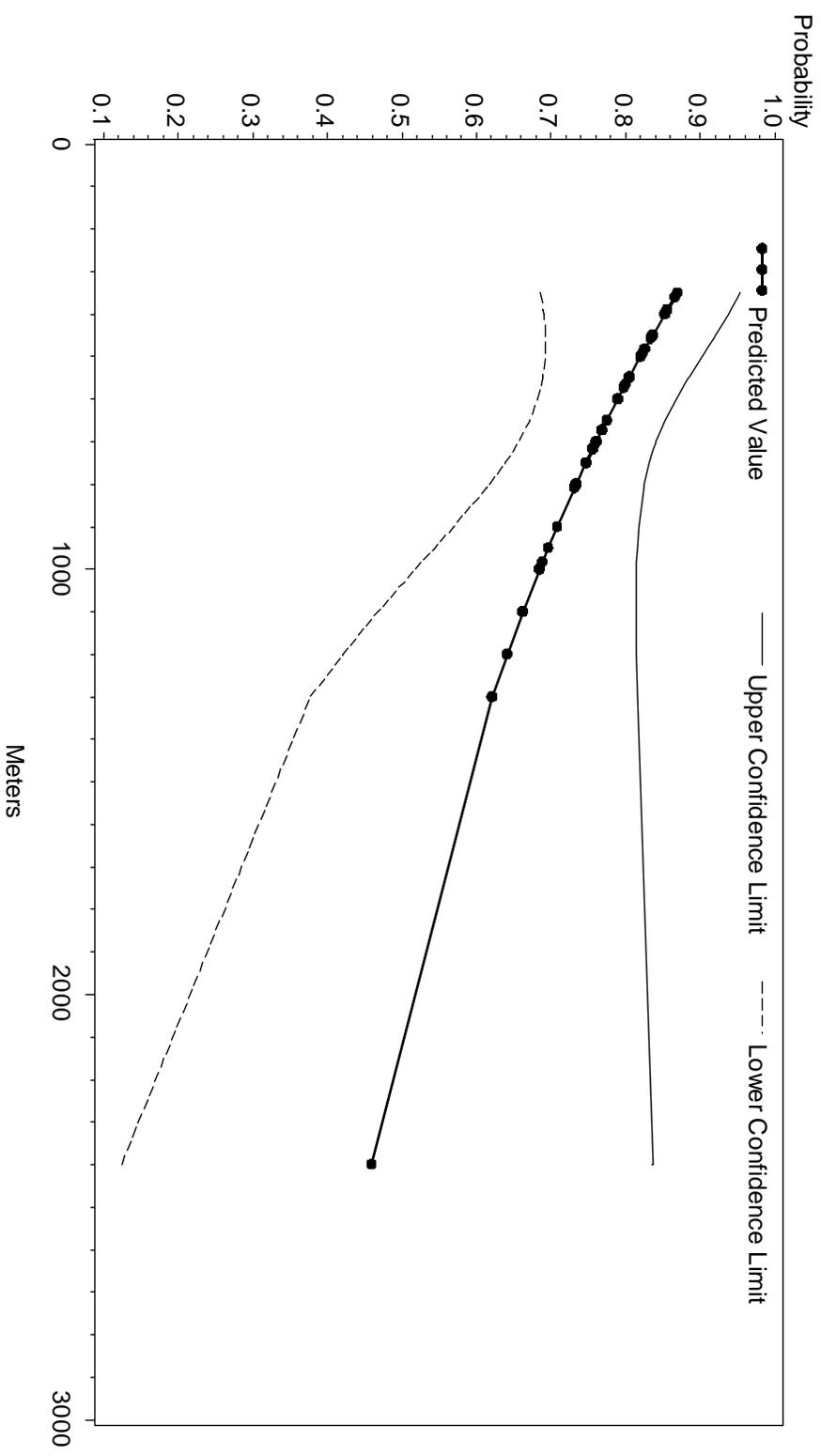


Figure 7. Predicted probability of sleep disturbance by distance to IWT (95% Upper and Lower confidence limits)



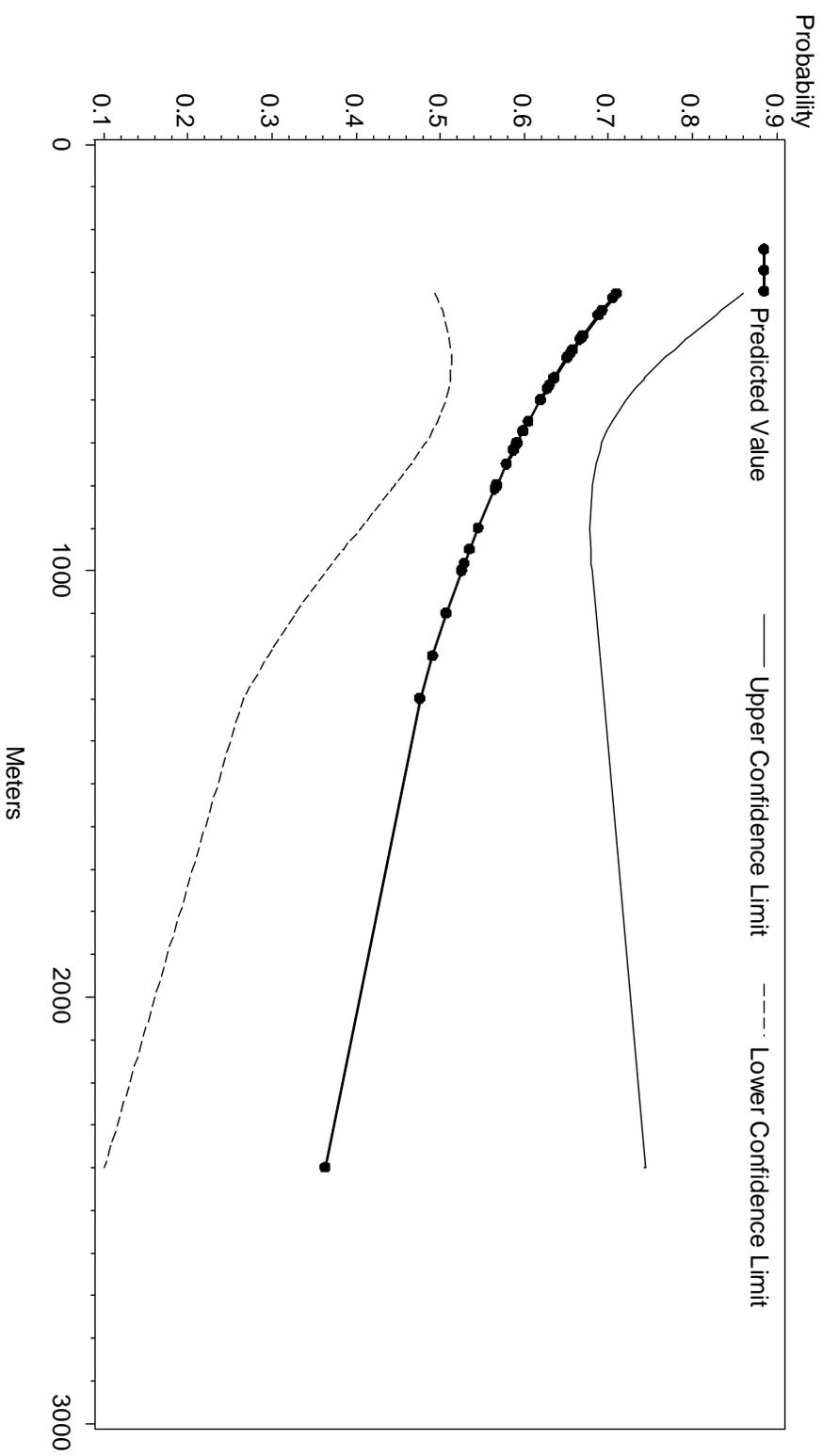
Proc Genmod (logit link; binomial distribution) Sleep=ln(distance) + sex + intercept P-value (ln-distance)= 0.1015

Figure 8. Predicted probability of excessive tiredness by distance to IWT (95% Upper and Lower confidence limits)



Proc Genmod (logit link; binomial distribution) Excessive Tiredness= ln(distance) + sex + intercept P-value (ln-distance)= 0.1005

Figure 9. Predicted probability of headaches by distance to IWT (95% Upper and Lower confidence limits)



Proc Genmod (logit link; binomial distribution) Headaches= ln(distance) + sex + intercept P-value (ln-distance)= 0.1837

Participant comments

Survey participants were given the opportunity to volunteer comments. A representative selection of comments is provided in Appendix 5.

Discussion

A case report is a descriptive study of a single individual (case report) or small group (case series) in which the possibility of an association between an observed effect and a specific environmental exposure is based on clinical evaluations and histories of the individual(s). Because cases in a case series study are often self-identifying and population controls are lacking (as in this study), it is difficult to investigate and measure exposure-outcome relationships, and it is impossible to extrapolate results to the general population as selection bias is always a concern. That said, case reports (or case series) often provide the first indicators in identifying a new disease or adverse health effect from an exposure.

Study participants ranged in age from 19-83 yrs; there was approximately an equal number of males and females enrolled in the study (Figure 1); and the frequency of participants increased with closer distances to IWTs (Figure 2).

In total, seventy two percent of participants reported either increased symptoms of anxiety, stress, or depression since the start of their local wind project (Table 1), and not unexpectedly, mental distress was not associated with distance to nearest IWT. Distress likely played a major role in individuals self-identifying themselves for the study, and it is reasonable to assume that individuals experiencing distress because of IWTs for *whatever* reason (real or perceived adverse health effect, attitude, etc) were more likely to participate in the study. Among study participants, the most common adverse health outcomes reported included sleep disturbance, excessive tiredness, and headaches.

Although it is not possible to compare participants to a control group in this study, it is possible to investigate relationships between exposure levels (as measured by distance to IWT) and outcomes *among* participants. Results suggest dose-response relationships between a number of adverse health outcomes and distance to IWTs, particularly sleep disturbance, excessive tiredness, and headaches (Figure 3-6). Modelling efforts suggested stronger relationships between adverse health events and log-distance to

IWTs compared to linear distance. This mirrors the way in which sounds decays as it travels from source to receptor.

Discovering relationships between adverse health outcomes and log-distance to IWTs among self-reported cases is a significant finding and supports the underlying hypothesis that living too close to IWTs can cause adverse health effects. If adverse effects were purely psychosomatic (i.e., the result of emotional distress and fear), one would expect the proportion of individuals self-reporting to increase closer to IWTs in this alternative hypothesis; but among those who did self-report, one would not expect dose-response relationships. Lack of a true cause-effect relationship should have resulted in relationships with distance to IWTs as seen with stress, anxiety, and depression (i.e. the primary drivers of self-reporting in this alternative hypothesis).

It is noted that the comments excerpted from the survey range from descriptions of altered quality of life and enjoyment of property, health issues related to noise, flicker and sleep disturbance, altered social and family interactions, concerns about property values and altered financial status, changes in pet and wildlife behaviour, and concerns about the future. Some describe the impact on the family unit when a parent or spouse has been billeted at the developers' expense due to adverse health effects. These comments were voluntarily submitted by participants.

Conclusion

Self reporting is an important research tool and frequently used by the research community. Examples of the use of self reporting include peer reviewed articles by Engstrom (2003); Meyer (2009); Zota (2010); and Lim (2010). In addition, self reporting is encouraged with respect to breast cancer vigilance where women are encouraged to conduct routine breast examinations. This self monitoring is used as an adjunct to other monitoring procedures such as mammograms and checkups by physicians.

It is important not to over-interpret results of a self-reporting case-series study. Outcome measures are crude, and the lack of a control group and potential selection-bias prevents investigating traditional population-based epidemiological measures of association (eg. odds ratios, relative-risk, etc). Careful analysis of case-series data however can provide important initial indicators regarding underlying causal relationships, providing support for more thorough and larger-scale epidemiology studies.

Results of this study suggest an underlying relationship between IWTs and adverse health effects and support the need for additional studies.

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WindVOiCe Appendices

- (1) WindVOiCe survey questionnaire
- (2) Health Survey Contact Flyer
- (3) Health Survey Cover Page
- (4) Health Survey Cover Note
- (5) Sample participant comments

Appendix (1) WindVOiCe survey questionnaire

Adult survey questionnaire: WindVoiCe (Wind Vigilance for Ontario Communities)

1) Name - (preferred but optional)

2) Date of birth

Day _____ Month _____ Year _____

3) Occupation _____

4) Address and/or postal code

5) Which wind farm is near your property?

6) How far away from your property is the nearest turbine?

7) How long have you been living at this property?

8) Do you feel that your health has in any way been affected since the erection of these turbines?

If yes, please answer the following

Do you feel that since living near a wind turbine/turbines you have experienced excess of the following symptoms (i.e. more than you did prior to living near these structures)?

Headaches	yes _____	no _____
Palpitations	yes _____	no _____
Excessive tiredness	yes _____	no _____
Stress	yes _____	no _____
Anxiety	yes _____	no _____
Tinnitus (ringing in ears)	yes _____	no _____
Hearing problems	yes _____	no _____
Sleep Disturbance	yes _____	no _____
Migraines	yes _____	no _____
Depression	yes _____	no _____
Other – please specify		

If you have answered yes to any of the above questions, have you approached your doctor regarding these symptoms?

yes _____ no _____

If yes, please state any tests and/or treatment initiated

9) Do you feel that your quality of life has in any way altered since living near wind turbines?

yes _____ no _____

10) If yes, could you please explain in what way you feel your life has been altered?

11) If you have any pets or livestock and have seen any changes in their behaviour since turbines have been erected, please describe

Appendix (2) Health Survey Contact Flyer

WIND ENERGY CONCERNS?

Industrial wind turbine installations are becoming one of the most prolific forms of energy being put into use today.

Some residents living in the vicinity of a wind farm are suffering from adverse health affects and disturbed living conditions.

People from across Ontario who welcomed wind turbines into their community are now coming forward with questions and concerns and may not know where to turn.

If you, or anyone you know is having difficulty, please call *toll free 1-888-700-5655* or email *windaffects@gmail.com* Others are facing similar concerns.

Your call will be kept totally confidential.

Appendix (3) Health Survey Cover Page

WindVOiCe (Wind Vigilance for Ontario Communities) Questionnaire on Health/Disturbed Living Conditions

Some residents living in the vicinity of wind turbines are suffering from adverse health effects and disturbed living conditions.

Currently, there are no authoritative guidelines about how far away turbines should be placed from residences. We are collecting information so that we can advise those in authority about the impact wind turbines have had on some of our population.

Your name will be kept totally confidential.

How to use the questionnaire:

1. If more than 1 adult in the home is affected please have each adult fill out a separate questionnaire.
2. This questionnaire may be filled out by a person 18 years of age or older who is fluent in English. This questionnaire will NOT be used by anyone with any cognitive impairment.
3. Question 5) - please answer with project name and/or wind company name. Question 6) - please give estimate if exact number is unknown. Question 10) - open to any other life alterations you've noticed for yourself. Please, worried parents, use this space to describe any symptoms your children may show.

4. Please mail completed questionnaire to:
Lorrie Gillis
Health Survey
R.R. # 4
Flesherton, Ontario N0C 1E0

Thank you for taking the time to fill out this questionnaire.

Appendix (4) Health Survey Cover Note

Cover Note accompanying the survey with mailing instructions

Thank you for being part of this survey. Your participation gives voice to adverse health and living conditions to people living in close proximity to industrial wind turbines. Confidentiality of your personal information is assured. Results will go forward with no disclosure of any personal or identifying information. All surveys will be kept in locked storage at all times with extremely limited access for tabulation of data. Please return your completed survey to:

Lorrie Gillis
Health Survey
R.R. #4
Flesherton, Ontario N0C 1E0

Appendix (5)

Sample WindVOiCe participant comments
(Authors' note: comments reproduced as written).

3

9)[other] High blood pressure 217/124

Had a foot that don't heal until I moved out of the house

Yes [contact doctor] Blood pressure, urine test, Doppler test, heart machine, on blood pressure pills now (Mavik 1Mg) Trandolapril [sp?]

10) [quality of life altered]

1. Had to move out of my home, just come home now to feed the cattle.
2. Our home can't be sold due to the problem per real estate agent.
3. Family events can't take place at home
4. Financial problems due to keeping two homes
5. Always sick, depressed and bad tempered when at home but when away for a short time feel much better. (Much better in the second house which I had to buy)

6. Had family problems until we moved out.

7. Feel no cares or believes us.

Bottom line:

They took life away as we knew it before the wind farm, same house value 0, sick all the time, financial stress now, world turned upside down.

11) 2 house dogs always sleeping, ear problems itching all the time. Moved the dogs out of house now they are fine.

13

10) [quality of life altered] Everything in my life has changes since the town_x Wind Turbine Project company_x has been in operation. I feel my health has been compromised. I have felt generally unwell physically and mentally since March 24/08. Also Sensitivity to white noise and sounds has increased. My ears are either humming or feeling pressure on them / heart palpitations continue usually while sleeping. My anxiety and stress levels continue to be high. We have discouraged our two daughters and son-in law from visiting. They have also experienced health issues when visiting. The damage that has been done to my body – scares me what will happen in the future. At 60 – I wanted to enjoy my retirement with reasonable good health and now everything has blown up in our faces. We spent 5 weeks in Florida Jan 26 – March/09 improvement in health. Loss of enjoyment of working outside with flower beds and yard. Our property value has been greatly decreased. We are still having problems with electrical pollution. Constant reminder in every direction of our property – turbines. A very uncertain future!!

#18

8)[health affected] Yes –whenever I am there!

9)[other] [other] Pressure in my ears or ear aches tightness feeling in my head

[doctor visit] Not at this time, these symptoms only occur around the Wind Project and not at my own residence.

10) [quality of life altered] As a teacher who spends most of my summer relaxing at home& was disrupted in July/Aug 2008 when I would leave each night with my mother to drive 10 min to a hotel in town z because of the above symptoms. This is something she did for months, it was disruptful for the few weeks I did it, not a peaceful relaxing environment. In December 2008 when I arrived home to my parents on the first night for Christmas the pressure in my head and ears hurt so bad that I had difficulty sleeping and considered spending the rest of the week at a relative's home away from the wind turbines. These are regular occurrences when I visit, and now sometimes think twice before going as I don't know how bad it will be this time, which makes going home no longer relaxing and peaceful like it once was. I also worry on a daily basis for the health and well being of my parents who live through this daily and the negative health impacts and stress worries me greatly. It also causes me stress that the value of my family farm has dramatically been reduced due to these wind turbines.

11) Thank you for organizing this health survey. My family greatly appreciates it.

#34

[palpetations] pressure in chest, dull and stabbing pain in chest

9)[other] joint pain, numb face, dizziness, feeling cold a lot.

Yes, doctor is aware and looking for a referral to an enviromental specialist - so far no luck - not sure what next step will be.

10) [quality of life altered]Along with the above symptoms - experiencing a general lack of wellness.

#40

Struck/hart palpetations

9)[other] Stress tests/ blood tests to numerous to count.

10) [quality of life altered] I now live on drugs that don't seem to help.

11) Livestock were all sold of due to problems that could not be explained.
(Nervousness)

#41

10) [quality of life altered]Forced to sell our property, take less then what it was really worth!! This was due to health problems caused by the wind turbines.

11) Our dogs were nervous, as well as our four(4) ponies. We ended up taking our ponies too the auction barns and had them sold. Two of our dogs had to be put down!!

#46

9)[other] No. Problems with the above go away when I leave the (wind project) home.

10) [quality of life altered]I feel wound up when at home. I just cannot settle. Because of this I do not want to stay in our home or for that matter come home. the biggest change has been the effect on my Mom, sister and Dad's health, especially Mom. To see her suffering from health problems, getting sicker and sicker just pisses me off. It really bothers me a lot.

#50

9)[other] [tinnitus] pop when turbines come on and off.

[sleep disturbance] Do not sleep a full night. Wake up quite often.

[other] nasal cavity felt like I had allergies, but no mucus, Irritable.

10) [quality of life altered] Personal - have found the changes in sleep patterns reduced energy levels, levels of patience and very frustrating and draining. Dec. on there were serious, angry arguements we normally do not have. I am very worried about my partner's, [wife], reduced sleep/rest, humming/ringing in her ears and continued deterioration of health. When [wife] had to live away from home it was hard. She is my partner and my love. We would always chat on family plans from food to finances. Our lives were upside down at all family levels when she was billeted by the windmill

company wind_co_x from May 2008 to July 17th and AGAIN now. She is living at her Mom's in town_y a 30 minute drive away (on Dr. orders). On a very personal level I am like a widower and sad and lonely.

Generally - Our financial outlook for our property has changed. At present we can not sell knowing the possible harm that someone may experience. This is a stressor we did not have prior to the turbines. I can't sleep with the bedroom window open in the summer for a cool breeze due to the roaring jet sound. (This was pleasant and cooling too.) I can't have a quiet sit on the deck without the jet or swoosh sound. And our phone has static on it which is not there when turbine were not here. CKNX am channel is staticy or weaker in the project area.

#58

10) The flicker from the turbines can be very annoying in the mornings. When I'm training horses for 3 to 4 hours the noise gets to you and you have to stop for awhile and go to the house. In the summer when windows are open you can hear them in the house. There is also some problems with some of the neighbours around me because of stray electricity. I have not had mine checked.

11) When the turbines are noisy, the horses always go to the far side of the barn.

#61

9) [other] Yes, doctor did blood tests, oral scope, prescribed sleeping pills, referred me to therapist and a nutritionist, sent me to a sleep clinic, I was vomiting blood.

10) [quality of life altered] We lived in this house for twenty years with the plan that we would pay it off, borrow money to purchase our retirement home and then sell the house to pay for the retirement home. We put the house up for sale the year before the turbines were built and real estate agents told us, people were worried about where the turbines would be placed and the house did not sell. Now the turbines are up and I can count 30 of them from my property. My wife and I can hear them when we are outside and we experience flicker when we are inside. We can see them through every window in the house in the daytime and we see the sea of red flashing lights every night. We live in a school house we took from being vacant for twenty years to a beautiful open concept home in a quiet country setting. Our friends and family have loved our home for years but now just shake their heads when they [see] what has happened here. Don't know what's going to happen to me in five years when I'm ready to retire if I can't sell my house.

#69

10) [quality of life altered] We bought this property to be away from the noise of the city and road traffic now all I hear is the windmills. I love to be outside, walking, hunting in our bush. Now all I hear is the windmills. Peace and quite no longer exists. The rear of our house is all windows, at night all you see is the warning lights. It is driving me crazy. We had no say in the mills because we weren't getting one. The persons that got them get paid and don't live near them. I'm sure our property value has went down because of

them. This summer will be the first time we can lay by our pool and I'm sure they will drive me.

#78

9)[other] [Doctor] Discussed symptoms with doctor twice. At this point we will further monitor my symptoms and discuss possible actions (tests, etc.)

10) [quality of life altered] This previously peaceful/quiet area was to be our retirement home. We are now considering changing our plans. Any further improvement to this property is on hold.

Depending on wind direction there is a loud pulsating, intrusive swooshing noise. I seem to sense a vibration in the air and at times I seem to sense the changing air pressure (like descending in an airplane.)

I spend 80% of my time in [turbine town x] and 20% in [town y]. When in [town y] I sleep better, less headaches and more relaxed.

#83

9)[other] nausea, muscle pain, irritability

10) [quality of life altered] To avoid morning flicker must have blinds or avoid rooms until it passes. When warm weather arrives noise from turbines will limit opening of windows especially at night for sleeping.

Will not enjoy evenings out of doors on decks due to all the Red Flashing lights and noise.

#88

9)[other] Have no family doctor. Went to emerg currently awaiting a CT scan.

10) [quality of life altered] Constant noise, constant headaches. Sleep disturbance since the windtowers have started.

We have recently put a 500' addition on our home with large windows all around. Not only we get flickering from the towers we cannot open any windows due to the constant noise of the blades.

My occupation is a bookkeeper. These constant headaches are affecting my concentration, especially working with numbers. I work from my home. I simply cannot afford to be in ill health.

I can no longer sit on my back porch enjoying the beautiful sunsets. This was so relaxing to me. Now all I see is flickering blades and blinding red lights. The sunsets have disappeared into money hungry pockets of our government.

This area was once known as having the most beautiful sunsets in the world, now gone!

I now am a prisoner in my own home of 23 years.

This is not the future I wanted! That is why I bought this property 23 years ago. Now I am going to sell and start all over again. Extremely depressing!

11) My horses are nervous of the noise and do not focus on what they are doing. Instead they watch the windmills making this a danger when riding or training them. My dogs and cats want to stay in the house more now. This is very unusual for them.

#107

08) Biggest factor is the noise.

Unable to sleep with windows open at night and I'm a poor sleeper under good conditions. Find when I'm outside gardening or reading the constant noise from the blades turning very irritating and I find I have a pressure in my ears that wasn't there prior to the last few months.

#110

8) [health affected] yes, (mostly mental health)

9) [other symptoms] cannot deal with noise

10)[quality of life altered] –cannot enjoy the outdoors and sounds of nature because of noise

-hesitate to invite friends over

-feel upset that we built our amazing energy efficient ICF home in an area full of horrible noise pollution.

-feel violated

-upset that my lonely elderly mother came to live with us to have a happier life but now has vertigo (we have not mentioned to her the possible correlation to windmills.)

-feel like we should have known better!

-we trusted township and [wind company]

#130

6) [distance from turbines] approx 400m but there are 10 of them within 1 mile of our home.

8)[health affected] YES – WITHOUT A DOUBT!!!

9) [symptoms] [palpitations] not sure, [excessive tiredness]I have trouble sleeping,[tinnitus]sometimes, I've just noticed it. [other] I don't know if it's palpitations or anxiety, but sometimes my heart races like it's going to jump out of my chest.

10)[life altered]

-I now have great trouble getting to sleep in fact I now use sleeping pills, I never used to, EVER!!!

-I can no longer enjoy my home outdoors, There is a constant “buzzing” that I cannot escape. The further that I walk onto my vacant land, the closer I get to the neighbors tower – these towers make me feel constantly stressed and I always am anxious or have a feeling of anxiety.

- I worry about my plummeting real estate value, and if a bank will even renew my mortgage when its time.

-I'm in a position that if I complain, I fear that my property value will fall even further.
[identifying comment left out]

-myself and other members of my family are now getting unexplained headaches, even my [age] year old daughter who has never had a headache prior to these towers coming online. I have a feeling of helplessness because I want to get away from the towers but we must remain due to the fact that we can't afford to abandon our home and move.

11) Our dog is restless constantly pacing

#133

9) [other symptoms] Lack of focus – Lack of Concentration – Memory loss – High Blood Pressure – Nausea – Feeling of Fullness in the Head – Fullness Feeling in the ears

[approached doctor] Weekly pain clinic and migraine treatments. Pain medication for migraine. Nausea medication. Anti – hypertensive medication. Anti – depressant medication. Several types of pain medication. Acupuncture and Chinese Medication. Acupuncture bi-weekly.

10) [life altered]

1) Lost my career, which I loved dearly. It was a part of my life since age 18. A huge loss.

2) Lack of sleep has caused an enormous amount of stress; has impacted my everyday life from everyday appointments to social events + friendships; routines of living such as shopping, house cleaning, gardening; entertaining and family gatherings.

3) I was an avid reader but I cannot sit and concentrate to read a book.

4) I'm exhausted most of the time.

5) I feel tense all the time.

6) My ill health has become a major focus of my life and I fear a major fear of having a stroke!

7) I don't have people in my home anymore.

8) All our needed home renovations are on hold.