

Public Health Disaster Rolling Across Massachusetts

Adverse Health Impacts from Wind Turbines

This is a Call to Stop Harming People and Conduct Honest, Transparent and Independent Research

*IWT - Industrial Wind Turbine

Nan Cook,
Newburyport, 1,000 ft from IWT
"The strobing effect is excruciating.
We have to leave our home
some times."

Neil Andersen,
Falmouth, 1,320 ft. from IWT
"Headaches, head and ear pressure,
ringing in ears, heart palpitations,
increased blood pressure, loss of sleep.
Completely wiped out financially. Forced
from home, lawyers and doctors fees
dissolve our life and retirement funds."

Tim Dwyer,
Kingston, 1,600 ft. from IWT
"Multiple neighbors have experienced
headaches, sleep disturbance, ringing in ears,
ear pressure and vertigo."

Doreen Reilly,
Kingston, 900 ft from IWT
"Industrial size wind turbines should
never be sited adjacent to residential
neighborhoods. The noise and strobing
impacts have stolen our
quality of life."

Karen Isherwood,
Fairhaven, 1,500 ft from IWT
"I will have to abandon
my home."

John Ford,
Falmouth, 2,300 ft from IWT
"Depressed, high blood pressure, headaches,
earaches, anxiety, stress, vertigo."

David Dardi,
Scituate, 3,100 ft. from IWT
"I have been awakened many
times and have been forced
to shut the windows and take
doctor-prescribed sleeping pills."

Thomas Casella,
Templeton, 1,500 ft from IWT
"We are both experiencing headaches
at night, more than usual, prior to
the turbine going online. Noise
keeps us awake at night. Strobing
effect is intrusive."

Sherman Derby,
Hancock, 2,640 ft. from IWT
"Sounds like a jet plane.
We just can't sleep."

Michael Fairmeny,
Florida, 3,168 ft from IWT
"My wife's ears are ringing constantly
and I have headaches around
the clock."

Locations where people have reported health problems:

1. Bourne - Mass Maritime
2. Brewster
3. Chilmark
4. Dennis
5. Fairhaven - 2 IWT
6. Falmouth - Wind I
7. Falmouth - Wind II
8. Falmouth - Webb Notus
9. Falmouth - Woods Hole
10. Florida & Monroe - Hoosac 19 IWT
11. Gardner - MWCC - 2 IWT
12. Hull - II
13. Hancock - 10 IWT
14. Hancock - Jimmy Peak
15. Hyannis - Country Garden
16. Kingston - Independence
17. Kingston - 3 IWT
18. Nantucket - HS
19. Newburyport
20. Scituate

Reported public safety hazard locations:

1. Charlestown (sinkage)
2. Marston Mills (blade throw)
3. Nantucket - Bartlett's Farm (blade throw)
4. Princeton (structural failure scattering debris & ice throws)

MA Department of Environmental Protection

MassDEP released a report in May of 2012 that acknowledged Wind #1 in Falmouth was found to repeatedly exceed allowable noise levels, thereby creating nuisance conditions as currently defined under MassDEP noise regulation (310 CMR 7.10). This finding by the MassDEP supports the fact that the nuisance conditions created by Wind #1 were a credible threat to public health as defined by the MassDEP's Noise Regulations and Responsibilities. Most importantly, these findings by the MassDEP fully support the veracity of the significant health impacts detailed by MA residents who currently reside near wind turbine installations



Personal Accounts of MA Citizens Living in the Proximity of Wind Turbines
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CLARKSBURG, FLORIDA, MONROE -- ***The Hoosac Wind project consists of 19 turbines***

Larry LaRusso, Clarksburg, MA -- Lives one mile from the nearest wind turbine.

"My home went from quiet and peaceful, to times when the turbines are loud enough to wake us at night inside our home and then we can't go back to sleep from the noise."

Michael Fairneny, Florida, MA – Lives 3,168' from nearest wind turbine.

"My wife's ears are ringing constantly and I have headaches around the clock."

DENNIS – ***One 100kW Regional Transit Authority wind turbine.***

Jennifer O'Neil, Dennis, MA -- 1,657' from turbine.

"I hear a low hum from the wind turbine and it bothers me. When the wind turbine is not operational, I do not hear the low hum."

HANCOCK -- ***The Berkshire Wind project consists of 10 turbines on Brodie Mountain in northwestern Massachusetts.***

Sherman Derby, Hancock, MA -- Lives 1/4 mile from the nearest wind turbine.

He is a Board of Selectman member.

"You wake up sometimes at two in the morning and it sounds a jet plane. When they said it would be no louder than a vacuum cleaner, that may be but if your wife starts vacuuming next to your bed in the middle of the night, you'll notice. It's a heck of a roar...We're up a lot of times because of the noise, we just can't sleep."

FAIRHAVEN -- ***Two wind turbines began operation on May 5, 2012. One month later over 130 complaints were registered with the town.***

John Methia, Fairhaven, MA -- Lives 2,000' from the nearest wind turbine

"The sound is quite disturbing. One of my sons who sleeps in a second-floor bedroom on the turbine side of our house has been experiencing headaches and sleepless nights. My wife and I have been experiencing pressure, almost



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sinus-like headaches. We hoped for the best when the turbines were erected and now we fear the worst."

Karen Isherwood, Fairhaven, MA -- Lives less than 1,500' from the nearest wind turbine

"I welcomed the developer to my home and he said everything would be fine. He lied to me. It is not just the noise volume, the sound can go anywhere from a whoosh whoosh to a traffic level to an airport. I would never purchase a home near an airport, but that's what I've got here with the turbines. I am desperately calling out for help because I have medical issues that have been exacerbated by the noise. If I don't get help I will have to abandon my home."

Louise Barteau, Fairhaven, MA

"Last September, I rented a teaching studio space without any prior knowledge of the imminent construction of two 400-foot wind turbines approximately 1,200 feet away, which were constructed over the winter. I have already experienced feelings of pressure behind my eyes, confusion, and nausea in the studio. I asked the landlord to let me out of my lease early, and moved out this week rather than expose myself to further symptoms."

Seven people that live nearby to the turbines have told me and others that they are experiencing the following: pressure feelings in the head and chest; being woken out of a sound sleep with their hearts pounding; being woken up repeatedly; feelings of confusion; nausea; dizziness; and feeling that their ears are blocked. All of these people have lodged a formal complaint with the Fairhaven Board of Health and will be speaking out at a June 4th meeting of that Board."

KINGSTON -- *There are three so-called O'Donnell turbines, additionally the Independence turbine is located near Route 3*

Tim Dwyer, Kingston, MA -- Lives 1,600 feet from the nearest wind turbine

"Since the Kingston turbines have become operational, I have personally held conversations with local residents from multiple neighborhoods that have experienced symptoms including headaches, sleep disturbance, tinnitus, ear pressure and vertigo."



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Because the Kingston turbines were constructed with an unprecedented lack of public notice or involvement, these residents were completely unaware that their sudden and unexplained symptoms could result from living in close proximity to industrial wind turbines. I'm hopeful that the town of Kingston will follow the lead of other similarly impacted communities, and establish a method of surveying its residents to determine the true extent of the problem."

Doreen Reilly, Kingston, MA -- Lives 900 feet from the nearest wind turbine

"The Independence turbine has been disrupting our sleep and also causing annoyance when going about our daily lives. In the past week alone there were two nights that were unbearable to sleep. The health of my family is at risk from not sleeping at night due to the noise from the turbine. My children are losing sleep. We are all being effected from lack of sleep when the wind is blowing west or northeast.

I love my town, home and my neighborhood. I am very disappointed in the Town of Kingston for allowing this land to be leased to a developer to site this turbine. I want to stay at my home that I have lived at for 19 years and have never had issues sleeping!"

FALMOUTH -- *Wind 1 and Wind 2 are two 1.65 MW town owned turbines. There is also a turbine built by a private developer known as Webb-Notus that is 1.65 MW and a 600 kw turbine at Woods Hole Research Center*

Neil Andersen, Falmouth, MA -- Lives 1/4 mile from the nearest wind turbine

"No human being can live with the torturous, low frequency pressure pulses that are emitted by the blades of the turbine. These repetitive pulses cause headaches, unusual head and ear pressure, ringing in the ears, heart palpitations, increased blood pressure, and loss of sleep, to name just a few of the physical ailments that my family has suffered as a direct result of living too close to the turbine. The psychological effects have us on maximum doses of anti-depressants, relying on alcohol or sleeping pills, or both, in an attempt to get some sleep, or in an attempt to get us through the struggle of another day. We have been almost completely wiped out financially, having been forced to close my home building business during the fall of 2010. Lawyers and doctors fees, as well as money involved with the costs of being forced away from our home when the turbine is particularly bad, continue to dissolve our life and retirement funds. Initial complaints to the Board of Health, the Building Commissioner, the local



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police, the State Police, State Representatives, the Attorney Generals office, all went without any action. I even attempted to file a criminal assault and battery charge against the turbine! We have been labeled as 'NIMBY's' and 'anti-wind fanatics', even having family members describe all of our complaints as 'psycho-somatic'.

Yeah. We are just making it up. Over 30 years building high performance, passive solar homes and pushing the simple concept of energy conservation, and I have nothing better to do than spend every single hour of the day fighting for our lives, fighting both the turbine and those who seem to think that all is OK, that our 'inconvenience' is necessary to prevent the threat of global warming."

John Ford, Falmouth, MA -- Lives 2,300' from the nearest wind turbine

"I cannot enjoy my garden. I cannot enjoy relaxing in my yard reading, walking or simply living. I cannot sleep without being interrupted by the thumping and swooshing of the turbine blades. This pulsating assault has taken its toll. While prior to the wind turbine installations I had the luxury of excellent health, I am currently depressed as well as fatigued and now deal with high blood pressure and an elevated level of triglycerides.

Headaches, earaches, anxiety, stress and anger are just some of the physical and mental maladies [I experience]... Waking at night with labored breathing and a pounding chest are common occurrences. Getting back to sleep is very difficult. Adding acoustical windows to my bedroom to eliminate the noise has not worked. Bouts of un-announced vertigo are experienced while at home. Interestingly, I do not experience these symptoms when I am away from the turbines."

Barry Funfar, Falmouth, MA -- Lives 1,558' from the nearest wind turbine

"My primary care physician ... advised me to move away from the turbines as soon as possible. She told me that I, with PTSD, could not tolerate living close to a turbine, that I must move away from the noise. A number of my individual and group counselors have given the same advice. Since that time my condition has only gotten worse.

[The turbines] sound to me like a rainforest full of giant munching caterpillars, or 500 enemy soldiers marching towards me but always being



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the same distance away, or a jet engine helicopter forever turning-up or shutting-down. These are all triggers to my PTSD.

The gardens I tended for 33 years have now been neglected for over two years because of these turbines. With the noise of the turbines there is no concentration possible for anything else. I cannot safely go out into my own yard. At least four home businesses have been shuttered because of these turbines. My own included. What price must we pay to live peacefully in our own homes? At this stage my wife and I are avoiding Falmouth and our own home as much as possible. Our Town government has given us the taste of being second class citizens. It has changed our healthy home environment to a place we must avoid...

My family's list of medical ailments include: Eye problems, anxiety, stressfulness, depression, irritability, anger, palpitations, high blood pressure, migraine headaches, sleep deprivation, tiredness, exasperation of PTSD, suicidal tendencies, thoughts, and plans, and marital problems. The anxieties and stress of being forced out of my own home and the possibility of having to sell have also contributed to my mental fatigue.

The above symptoms have been worsened by the Falmouth and State governments

refusal to recognize that there is a MAJOR PROBLEM WITH THESE MACHINES.

All the hullabaloo over the DEP sound study and compliance with the 10db State Noise Ordinance is rubbish. These turbines would be causing just as many problems for abutters if they stayed somewhat under the 10db threshold. 5 or 6db from these machines may be too high of a noise threshold for some human beings. The current Massachusetts Noise Ordinance was set in Sept. 1972 and is totally unprotective of citizens when applied to industrial wind turbines because of the special characteristics of the noise made by them...

Why is our state dragging its feet to provide adequate protection to we citizens from the delirious effects of IWTs? Answer: Political will is pushing in one direction only, and that is the governor's goal of 2000Mwatts of wind energy by 2020. My tombstone will say "MY LIFE WAS SHORTENED BY THE ENERGY POLICY OF MASSACHUSETTS GOVERNOR DEVAL PATRICK."



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Newspaper Reports in MA

Judy Whitman, Hancock, MA

In the *Berkshire Eagle*, Judy Whitman of Hancock wrote a letter in which she said, "I had no strong objection at the onset but did worry about the scenery. Now that they have been in operation for almost a year, I have lots to tell you folks in south county. They do disturb the scenery and the quiet. If you live within a mile they are loud, sounding like a jet plane flying high overhead." The letter is dated November 22, 2011.

Irean Schreiber, Nantucket, MA

According to the *Nantucket Inquirer and Mirror*, in an extensive article on wind turbine noise in its February 9, 2012 issue: "Across the street from Nantucket High School, just a few hundred feet away from the 100-kilowatt wind turbine installed in 2010, Irean Schreiber says she's living in agony. She can't sleep, and she complains of an accelerated heart rate, vertigo, dizziness and headaches."

Barbara Schlesigner, Chilmark, MA

According to the *The Martha's Vineyard Times*, regarding the Martha's Vineyard Commission wind energy plan hearing "I have spent the summer in PA instead of on our once-lovely Chilmark property because the motion of the Allen Farm turbine blades, constantly in our sight, has driven us away...This is a negative affect [sic] upon personal health, use and enjoyment of property." She owns a home near the Allen Farm, where a 149.5 ft wind turbine operates.

Wednesday, June 2, 2010

John Auerbach, Commissioner
Department of Public Health
One Ashburton Place
Boston, MA 02108

RE: Call for Immediate Review of Public Health and Safety Standards Near Wind Turbines

Dear Commissioner Auerbach:

As health professionals and representatives of citizen groups, we submit this urgent request for your immediate action.

It is imperative that, as Commissioner of the Department of Public Health, entrusted with the responsibility to protect the health and safety of the citizens of Massachusetts, and consistent with your power under M.G.L. Chapter 111, Section 6 to define, control, and prevent diseases deemed dangerous to public health, you launch an **immediate and comprehensive study** of the public health and safety impacts to Massachusetts citizens in relation to the siting of wind turbines.

Some of us have been directly involved in the wind siting review process in a number of Massachusetts communities during the past two years. Through this participation we have become acutely aware of the emergence - and growing potential - for serious public health and safety impacts of wind turbines in Massachusetts exacerbated by the "rush to wind" and siting wind turbines less than 1.24 miles (2 km) in flat areas and less than 2 miles in mountainous areas from human habitation.

It is Governor Patrick's goal to site 2,000 megawatts of wind turbines throughout Massachusetts by 2020, a policy that seems to be translating into "*site wind at any price*". In addition, legislation recently enacted, such as the Green Communities Act of 2008, requires the development of wind facilities throughout the state. These aggressive goals and legislative mandates highlight the growing critical need to ensure that the locations and operations of all future wind facilities in our state reflect adequate protective public health and safety oversight.

We implore you to begin this process in those communities where proximity to a wind turbine has already caused health effects in residents. The most recent incident has occurred in the town of Falmouth.

In addition to assessing public health and safety impacts on residential neighborhoods, there is also a need to protect the health and safety of sensitive and less mobile populations – those in nursing homes, hospitals, schools, and prisons.

Wind turbines have already been erected near schools, and more are planned.¹ School sites can involve complex constraints and should take into consideration the example of a turbine blade breaking with parts hurled near an Ohio high school² and the collapse of a turbine in a primary school playground in Scotland.³ In fact, there are numerous documented instances around the world of turbine malfunction that have potential impacts on public safety.⁴

According to a report on the renewable energy potential at state-owned facilities, wind turbines are also planned at three sites controlled by the Massachusetts Department of Corrections.⁵ Imprisoned populations may be particularly vulnerable to the health and safety effects of living near wind turbines.

We therefore further implore you to take a public and firm position in support of a rigorous, independent and comprehensive study of the public health and safety effects of proximity to wind turbines.

The compelling motivation for our request to you is based upon the recent events in this state. The completed and operating wind turbines in our state are rapidly becoming “natural experiments” for demonstrating adverse impacts to the health and safety of the citizens of Massachusetts even though a decade of similar impacts by industrial wind turbines when sited too close to human habitation are documented in other states and countries.

Here is what we know:

- The validity of research showing adverse human health impacts when industrial wind turbines are placed in proximity to homes, businesses, schools and institutions is irrefutable. Physicians, public health officials and researchers around the globe are reaching the same conclusions based upon the reality that people living near wind turbines experience the same illnesses.⁶
- Faced with mounting evidence of health and safety concerns near wind turbines, numerous jurisdictions in the U.S. and other countries have initiated their own health impact reviews. As just two examples, the Environment Ministry of Japan has started a four-year study of the possible health hazards of wind turbines.⁷ The Maine Medical Association has adopted a resolution to “work with health organizations and regulatory

¹ P. 12, http://www.mass.gov/Eoeea/docs/eea/press/publications/022409_renew_potential_study.pdf

² <http://www.morningjournal.com/articles/2009/02/10/news/mj594813.txt>

³ <http://www.windaction.org/news/24196>

⁴ www.windaction.org; www.wind-watch.org

⁵ P. 12, http://www.mass.gov/Eoeea/docs/eea/press/publications/022409_renew_potential_study.pdf

⁶ http://www.windturbinehealthhumanrights.com/wtnhr_june2007.pdf

⁷ <http://www.asahi.com/english/TKY201001180410.html>

agencies to provide scientific information of known medical consequences of wind development in order to help safeguard human health and the environment.”⁸

- Nina Pierpont M.D., Ph.D. recently published a book titled Wind Turbine Syndrome, A Report on a Natural Experiment which describes the common illnesses caused by living or working near wind turbines. According to Dr. Pierpont:

“The symptoms that people report follow a common pattern, or cluster, which I call ‘Wind Turbine Syndrome.’ These are the most prominent: sleep disturbance, headache, ringing or buzzing in the ears (tinnitus), ear pressure, dizziness and vertigo, nausea, visual blurring, racing heartbeat (tachycardia), irritability, problems with concentration and memory, panic episodes associated with sensations of internal pulsation or quivering, which arise while awake or asleep.

“People suffering from these health effects were, in nearly all cases, supportive of these wind energy projects. Let me be clear on this. Moreover, they were assured that as the closest neighbors they would not experience any disturbance or illness. Of the 10 families (38 individuals) included in my “Wind Turbine Syndrome: A Report on a Natural Experiment” ..., 9 families have had to leave their homes, and the tenth has sued and is living in misery. Mind you, this is just the families in my report; I have since learned of numerous people, globally, who suffer from Wind Turbine Syndrome and are being forced to leave their homes. My phone and email in-box are loaded with these complaints.

“...Whether the precise pathophysiological mechanism I lay out is correct or not, there is no serious dispute among medical doctors that these people suffer from bona fide and serious illness-and that its cause is the wind turbines, and that this constellation of illness disappears when these people remove themselves from the vicinity of the turbines. I repeat, there is no serious clinical dispute about this.”

- Christopher Hanning M.D., retired director of the Leicester Sleep Disorders Service, has authored a report titled Wind Turbine Noise, Sleep and Health. He writes “...there is compelling evidence that wind turbine noise can and does disturb sleep and impair the health of those living too close and that current guidance is inadequate protection.”

He adds that “In my expert opinion, from my knowledge of sleep physiology and a review of the available research, I have no doubt that wind turbine noise emissions have been clearly associated with sleep disturbances.”⁹

- In a press conference on May 7, 2010, Michael Nissenbaum M.D. reported to the Vermont legislature on his research into the health effects of living within 3,500 feet of wind turbines. He explained:

⁸ http://windvigilance.com/noise_ahe.aspx#_edn12

⁹ http://windvigilance.com/downloads/Wind_Turbine_Noise_Sleep_Health.pdf

"It is a medical fact that sleep disturbance and perceived stress result in ill effects, including and especially cardiovascular disease, but also chronic feelings of depression, anger, helplessness, and, in the aggregate, the banishment of happiness and reduced quality of life."

"If industrial wind turbines installed in close proximity to human habitation result in sleep disturbance and stress, then it follows as surely as day follows night that wind turbines will, over the long term, result in these serious health effects and reduced quality of life."

He then presented a summary of his research:

"In my investigation of Mars Hill, Maine, 22 out of about 30 adults ('exposed') who live within 3500 feet of a ridgeline arrangement of 28 1.5 MW wind turbines were evaluated to date, and compared with 27 people of otherwise similar age and occupation living about 3 miles away (Not Exposed).

"Here is what was found:

"82% (18/22) of exposed subjects reported new or worsened chronic sleep deprivation, versus 4% (1 person) in the non-exposed group. 41% of exposed people reported new chronic headaches vs 4% in the control group. 59% (13/22) of the exposed reported 'stress' versus none in the control group, and 77% (17/22) persistent anger versus none in the people living 3 miles away. More than a third of the study subjects had new or worsened depression, with none in the control group. 95% (21/22) of the exposed subjects perceived reduced quality of life, versus 0% in the control group. Underlining these findings, there were 26 new prescription medications offered to the exposed subjects, of which 15 were accepted, compared to 4 new or increased prescriptions in the control group. The prescriptions ranged from anti-hypertensives and antidepressants to anti migraine medications among the exposed. The new medications for the non exposed group were anti-hypertensives and anti-arthritis." ¹⁰

- The careful research of Amanda Harry M.D. in England,¹¹ Bridget Osborne M.D. in Wales,¹² Robert McMurtry M.D. in Canada (a former Assistant Deputy Minister of Health),¹³ and Robyn Phipps Ph.D. in New Zealand,¹⁴ have confirmed the substance of these findings.

¹⁰ <http://www.windaction.org/documents/27196>; <http://windconcernsontario.files.wordpress.com/2009/08/mars-hill-nissenbaum1.pdf>; <http://vodpod.com/watch/2060980-interview-with-dr-michael-a-nissenbaum>

¹¹ http://www.wind-watch.org/documents/wp-content/uploads/wtnoise_health_2007_a_harry.pdf

¹² <http://www.telegraph.co.uk/education/3326712/Wind-farms-make-people-sick-who-live-up-to-a-mile-away.html>

¹³ <http://www.wind-watch.org/ww-noise-health.php>; <http://alleghenytrees.wordpress.com/2010/01/10/dr-robert-mcmurtry-on-the-issue-of-wind-turbines-and-health/>;

<http://online.wsj.com/article/SB10001424052748704240004575085631551312608.html>

¹⁴ <http://www.ohariupreservationsociety.org.nz/hiphps-moturimutestimony.pdf>

- Other researchers have linked proximity to wind turbines with vibro-acoustic disease.¹⁵
- There is substantial evidence of impacts to human health through videos and other materials available on the internet. Among those, we refer you to the following items:

Life Under a Windplant (Meyersdale PA)

<http://www.youtube.com/watch?v=SNxvkrGoPLo>
http://www.youtube.com/watch?v=_utFV2ukOtU
<http://www.youtube.com/watch?v=A0d5tSZF3A4>

The Voices of Tug Hill (Lowville NY)

<http://www.youtube.com/watch?v=ePZO76z2iBY>
<http://www.youtube.com/watch?v=ugmxuYQvjv4>
<http://www.youtube.com/watch?v=ZgeQjtuwxuE>

Welcome to Mars Hill (Mars Hill ME)

<http://www.youtube.com/watch?v=Lp31TWPC5tc>
<http://www.youtube.com/watch?v=JpFLsNiXE0g>
<http://www.youtube.com/watch?v=JpFLsNiXE0g>

Weekend Voices (Vinalhaven ME)

<http://archives.weru.org/voices/weekend-voices-121909>

How Close is Too Close? (Hull MA)

<http://www.wind-watch.org/video/windwise.mp4>

Our Life With DeKalb Turbines

<http://lifewithdekalbturbines.blogspot.com/>

Claims of wind farm illness: Waubra Disease

<http://www.abc.net.au/news/video/2010/02/19/2825235.htm>

It is imperative that your agency undertake an **immediate and comprehensive** review of all health aspects of wind turbine siting, particularly in those communities where wind projects have resulted in significant numbers of residents becoming ill, including Falmouth. Such affected communities should be the focus of a standard epidemiological study in an attempt to learn from them to help improve wind siting and placement of wind turbines in the future.

Furthermore, you and your agency have the obligation to immediately help the people who are now suffering due to health impacts from operating wind turbines.

The public health and risks posed by industrial wind turbines represent unacceptable threats to the citizens of Massachusetts and require your personal and immediate intervention and action.

¹⁵ <http://visitwalesnow.org.uk/VAD%20press%20release.pdf>

Respectfully submitted,

(Signatures on file)

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President, Save Our Seashore
Wellfleet, MA

Sheila Bowen
President, The Harwich Neighborhood Alliance
Harwich, MA

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Falmouth Land Owners Against Wind
Falmouth, MA

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Properly Interpreting the Epidemiologic Evidence about the Health Effects of Industrial Wind Turbines on Nearby Residents

Carl V. Phillips, PhD
Populi Health Institute

July 19, 2011

*This is a preliminary draft of the following article in press:

Carl V. Phillips, "Properly Interpreting the Epidemiologic Evidence about the Health Effects of Industrial Wind Turbines on Nearby Residents," *Bulletin of Science, Technology, and Society*, vol. 31, no. 4 (August 2011), pp. 303-315.

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 non-expert 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.

Introduction

There is overwhelming evidence that large electricity-generating wind turbines (hereafter: turbines) cause serious health problems in a nontrivial fraction of residents living near them. These turbines produce noise in the audible and non-audible ranges, as well as optical flickering, and many people living near them have reported a collection of health effects that appear to be manifestations of a chronic stress reaction or something similar. However, many commentators (dominated by those who stand to profit from national government subsidies for building wind turbines, particularly energy companies and local governments) have repeatedly claimed that there is no evidence of risk. This appears to be widely believed by those unfamiliar with the evidence but who believe that turbines are an eco-friendly energy source (a claim that is subject to debate) and think that anything "green" must be harmless to people.

While it is typical for industries and their supporters to downplay risks and argue that the benefits make the risks worthwhile, the wholesale denial of the evidence by both business and government in this case is reminiscent of such claims as "there is no evidence that smoking causes cancer" or "Iraq has weapons of mass destruction". However, unlike most industry denials or *casus belli*, where critical thinkers know to exercise some skepticism before accepting the claim, the denial of the evidence of turbines seems to have produced widespread credulity among those who would be expected to know better. This may be because the epidemiologic evidence is complicated and the attempts to deny it sound like the language of science. In response to that abuse of science, the goal of this paper is to empower interested observers to understand the nature and quality of the epidemiologic evidence and the weakness of the common arguments used in attempts to deny it.

It is argued here that there is ample evidence that turbines cause a constellation of health problems, and attempts to deny this involve claims that are contrary to proper methods of scientific inference. Moreover, there is no basis for claiming that current regulations and recommendations are sufficient to avoid substantial risk, and those who claim otherwise do so without any basis. Indeed, ironically, what is often presented as evidence that there are no risks shows no such thing, but does demonstrate that most claims about what constitutes sufficient regulation cannot be scientifically. Moreover, the balance of the necessary ethical analysis seems never to have been performed. Given these observations and consideration of public policy ethics, it is difficult to see how most of the ongoing siting of new turbines can be justified.

A brief review of the epidemiologic evidence

For those not familiar with the term, epidemiology refers to the study of health outcomes and exposures in people for purposes of making assessments about population health. The critical feature is the studying of actual health outcomes in actual people, as opposed to other sciences (like toxicology or, most relevant in the present case, acoustics) which might help predict health outcomes but can be quite wrong about them. Those other sciences sometimes suggest possible effects that the epidemiology shows do not actually occur to a measurable degree and other times fail to predict the health effects that really do occur. Epidemiology is a quantitative science, though the quantification ("effect estimates") that is the preferred endpoint for most epidemiologic research is not always possible, as in the present case. Most, but not all epidemiology, focuses on whether a particular *exposure* (possible cause experienced by people) causes a disease outcome. While epidemiology often depends on observational evidence,

sometimes experiments can be done; clinical trials are the most familiar, but a different kind of experiment has been done in the case of turbines.

There are many different types of evidence that contribute to epidemiologic knowledge. While the majority of formal epidemiologic studies use only three or four study designs, there are numerous other types of studies and sources of information. As with any science, when engaging in a directed inquiry to answer a particular question, one uses what information is available and purpose-builds further information-gathering, and often such information and study design differs from the most common study types. Indeed, in the present case some information is available from the common study types, but the vast majority comes from other sources, particularly *adverse event reports* (a particular type of what are known as case studies, sometimes denigrated as "anecdotes", that generally report on the rapid onset of a disease which appears to be related to a particular exposure) many of which involve *case-crossover* experiments. Both of these are useful and well accepted sources of epidemiologic information, and since they are intuitively recognized by both experts and lay-people seeking to assess whether an exposure is causing disease outcomes, people have collected this information for years (though it is not clear that anyone working in the area had identified the established terminology and its established history in the science value before I pointed them out last year).

Large collection of evidence

Most of the adverse event reports are self-published by those concerned about the health effects experienced by themselves or family members in the interest of contributing to public health knowledge on the subject. Most of these are yet to be organized, although efforts are underway. Others have been collected more systematically, such as the WindVOiCe collection

from Ontario (Krogh et al. 2011), the scholarly book by Pierpont (2009), and in a paper by Harry (2007). Since several research groups and NGOs have collections that number in the three-figure range, it seems safe to conclude that the total number published or collected in some form is in the four-figure range, and it is quite conceivable that the total number of adverse event reports numbers in five figures.

Excerpts from three of these from my research group's collection appear in the Appendix to illustrate some of the points that follow. These three were self-published by the authors on the web and are fairly typical, though they were chosen because they were good examples, not because they are somehow perfectly representative of the collection. The reports have been abridged to remove information not presently relevant, and to reduce length.

In cases of emerging and unpredictable disease risk, adverse event reports are the cornerstone of public health research. Since it is obviously not possible to study every possible exposure-disease combination using more formalized study methods, just in case an association is stumbled upon, collecting reports of disease cases apparently attributable to a particular exposure is the critical first step. The most familiar examples of hazards revealed by adverse event reporting are infectious disease outbreaks or side effects from pharmaceuticals, but the case of turbines and health also fits the pattern. Pharmaceutical regulators rely heavily on clearinghouses they create for adverse event reporting about drug side effects (and often become actively concerned and even implement policy interventions based on tens of reports). The WindVOiCe report collection is an example of this same well-accepted kind of active-recruiting data collection system.

As explained in the next few sections, useful self-reporting of adverse events is only possible for particular types of exposures and outcomes, but exposure to turbines and many of the reported health effects are just those types of exposures and outcomes.

Reasons the adverse event reports are compelling

Adverse event reports are under-appreciated as a source of evidence. The main reason for this seems to be overgeneralization from cases where they are indeed uninformative by those who do not understand what characteristics exposures and outcomes must have for them to be informative. It is always possible to find a single case study of an exposure-disease combination because even if there is no relationship between an exposure and a disease, it is statistically inevitable that someone will have both by coincidence. Thus, when political activists dig up a story about one such individual ("here is someone who had that exposure, and look what happened to him!"), we should be skeptical. This is especially true when the disease in question occurs frequently in the population and it is not possible to simply "see" the exposure that triggered it, like common cancers or heart disease. Many people get those diseases (and thus it is not difficult to find a few examples), the exposures that trigger them are invisible, and we cannot identify the onset to associate it with a proximate exposure. The challenge is greater still when the exposure itself is vague and difficult to precisely define, like "lived near the chemical factory". In such cases, it is nearly impossible to learn much from reports of adverse events, and indeed claims about a particular cause of one person's case of the disease can almost never be justified, and so more systematic studies are needed.

The reports about the effects of turbines are not such a case. The sheer volume of reports elevates the evidence beyond the few coincidental cases that can usually be found. The quantity

further tells us that the effects go beyond a few rare individuals who are extremely susceptible. It is a legitimate limitation of adverse event reporting, no matter how voluminous, that it does not allow an estimate of what portion of the exposed population suffers health effects. There are undoubtedly similar effects among those who have not made the effort to publish the information, but we can only guess how common they are. It should be noted, however, that pharmaceutical regulators often make decisions based on exactly that guess.

Moreover, most reported health problems are similar across reports and are plausibly related to each other and the exposure. As illustrated by the examples in the appendix, there is a core list of symptoms – sleep disorders, headaches, mood disorders, inability to concentrate, tinnitus, vestibular (balance) problems – appearing in most reports. The commonly reported problems all exist at the border of the psychological and physical, and can all be caused by either of two very plausible effects of wind turbine exposure: stress reactions or vestibular disturbance. There are also a few reports of hypertension and other mortality-causing conditions, though since this is difficult for individuals to monitor themselves it would be unlikely to appear in most adverse event reports.

The Appendix examples also illustrate that some people attribute various other conditions they are experiencing to the turbines; this is not surprising, but the volume of reports lets us sort out rare coincidences (which can indeed generate misleading "anecdotal evidence" if a single story is treated as overly informative) from common patterns. We need not, and should not, simply accept the assertion of one individual or their clinicians about causation, assertions which appear in most of the adverse event reports. Rather, we focus on the consistent patterns of diseases that occur after exposure onset. (It is possible that mining the case reports more thoroughly will reveal apparent associations to diseases that were not previously believed to have

been caused by turbines; such research is ongoing.) If people were complaining only about a collection of seemingly unrelated ailments, without the core overlap, it would suggest that they were just blaming the turbines for all their coincidental problems. But that is clearly not the pattern that emerges.

Most important, in contrast with exposures like invisible chemicals and diseases like cancer, individuals are capable of recognizing both the exposure and outcomes. Local residents are quite capable of observing that they are detecting noise or other effects. Moreover, people are capable of detecting their own insomnia, mood disorders, inability to concentrate, etc. Even more importantly, they are capable of detecting the *incidence* (i.e., onset) of these problems as well as when they cease, and while these problems are fairly prevalent in the population at any given time, their incidence is relatively uncommon and very often has a proximate cause.

For a relatively common condition, if we only had *prevalence* measures (i.e., how many people have the condition at any point in time), then in order to conclude that those living near turbines have a higher rate of the condition we would want to compare their rates to that of similar people not living near turbines. Similarly, if we were talking about cancer (where epidemiologists refer to the diagnosis as the incidence for convenience, but actually have no idea when the cancer initially began growing) we would want such a comparison. But for something that is very rare (e.g., not *having* a pattern of severe insomnia, which is not rare, but having that pattern *start a particular week*, which is) we can conclude the incidence rate is elevated without an explicit comparison. For example, many people have headaches at any given time, but if you have one that started at the time you suffered a trauma there is a good chance the trauma caused it because the probability of a headache starting at just that minute by coincidence is very low. Thus, people are quite capable of determining that incidence of these health problems occurs

after exposure to moving wind turbines begins, unlike claims about what caused a particular cancer where such observations are not possible. Some supposed experts who have merely memorized a few simplistic rules of thumb from first-year epidemiology classes are unlikely to understand this, but the knowledge of that incidence and its timing is compelling evidence of causation even without a formal comparison group.

The above observations alone show that the adverse event reports are strong evidence for a causal relationship. The fact that many of the published adverse event reports include case-crossover observations and experiments push the evidence beyond a hint of plausible doubt.

A case-crossover study is one of the most compelling sources of epidemiologic data. It consists of observing whether someone's outcomes change as their exposure status changes. This is often not possible because the outcomes only happen a single time as a result of long-term exposure (e.g., cancer) or the exposure cannot be changed. But the observed effects of turbine exposure lend themselves perfectly to such studies because the exposure is transient and the effects, while not instantaneous in their manifestation or dissipation, are generally transient over a period of days or weeks at most. Thus, unlike a case of a lifelong exposure or non-transient disease, where we can only make one observation about disease and outcome per person, the effects of turbines allow multiple observations by the same person, including experimental interventions.

The case-crossover study design was first formally documented as a method for epidemiologic inquiry by Maclure (1991) though undoubtedly it was recognized as extremely useful for drawing conclusions about health effects from before the time our ancient ancestors achieved the rank of *H.sapiens*. A case-crossover study is the most natural form of scientific inquiry: "I ate that and my stomach hurt; I did not eat it again for a while and had no problem; I

ate it again and my stomach hurt again; I think I there is a causal relationship here". This natural understanding of scientific inference is why such a large portion of the adverse event reports include crossover data. People observe, and report, that the exposure stops when the wind is not blowing or the subjects remove themselves from the area for a while, or especially when they relocate, and they observe whether the health problems abate. Some of these crossovers are observational (the change in exposure status was unplanned) but many are experimental (people intentionally avoid the exposure for a while to see if their health problems abate). Most of the reported crossover data confirms the causal inference that comes from the initial crossover from unexposed to exposed, the start of operations of the nearby turbines, which would be the only observation possible if it were impossible for exposure status to change again (as it is with such exposures as "ever smoked", "received a high dose of radiation", or "got older"). The examples in the Appendix include several of the common versions of crossover data, including complete relief upon relocating, the ability to sleep well when staying somewhere other than the subject's own home, and reactions to whether the wind was blowing through the turbines at any given moment.

An additional feature of the data in this case is *revealed preference* information about individuals' conviction regarding the causal relationship and intensity of costs inflicted upon them. Many people report expending substantial resources – retrofitting their houses to reduce noise, selling their properties at a loss, or even abandoning their homes without being able to sell them – in order to try to reduce the health impacts. (The Appendix includes examples of such revealed preference.) Thus, rather than just claiming they were confident about the causal relationship (perhaps thanks to personal case-crossover experiments) and describing the intensity of their suffering, they "put their money where their mouth is" and endure great expenditure,

demonstrating great confidence in their assessment and that the magnitude of the suffering warrants such expenditure. Similar revealed preference can be found in the inability of owners of property near turbines to be able to sell it at a price comparable to other homes or land that is not near turbines. It is sometimes claimed that few people believe there are harmful effects or that they would experience them if they lived near turbines, but property values and sales collapse only if almost everyone is uninterested in living there. If merely a few people believed the claims that there were no problems, and were willing to intentionally relocate to live near turbines, then they would take advantage of the bargains and move in; alternatively, speculators – perhaps the energy companies or local turbine proponents – would snap up the bargains. This is apparently not happening, suggesting that no substantial number of people, even those making the claims, genuinely believe that the turbines are harmless.

In sum, the present situation lends itself perfectly to having useful adverse event data, in terms of exposure and outcome that are easily identified, incidence times that are easily identified, the possibility of case-crossover data, and the possibility of revealed preference. The empirical reality is that we have an enormous volume of data, the outcomes reported are plausibly related, many people have performed case-crossover experiments that support the conclusions, and there is indeed revealed preference data.

This still leaves the inherent limitations of this type of non-systematically gathered data: Because the data does not have known sampling properties from a well-defined population, it does not itself tell us how many others might have reported adverse events had they experienced them, but did not. This information is the denominator that would be required to calculate the portion of all exposed people who experienced the adverse events. We have some information that lends itself to estimating that figure, from a handful of systematic studies and using

Myths and Facts: Literature Review of MassDEP Wind Science Panel Process

Myth: The panel convened by MA Department of Environmental Protection (MassDEP) was independent.

Fact: **The panel was chosen to advance a political agenda and members are not unbiased.** ^{(1)(2) (3)} In a meeting on 9/8/12 with top level officials of MassDEP and MA DPH, a group of 11 Wind Wise ~ Massachusetts (WWMA) members from across MA were told that all panel members were carefully vetted and all were unbiased concerning wind energy. The MassDEP website at one point in time showed the falsehood of this assertion. ⁽⁴⁾

Myth: The process DEP and the panel took was of high standards.

Fact: **The panel was chosen by MassDEP under questionable circumstances, they met in complete secret, no member of the public was in attendance at the panel meetings, the panel did not release minutes of their meetings, the panel did not release working drafts of their so-called independent report.** ^{(5) (6) (7)}

Myth: The panel followed the scope of their mission and worked on behalf of the citizens of MA to uncover the truth about health impacts.

Fact: **Even though the scope of the panel included site visits to interview victims, the panel chose to not visit any wind turbine sites. They did not visit people living in the proximity of wind turbines who are experiencing adverse health impacts and who invited them for an interview and even to live in their homes in Falmouth, MA. Two members of the panel released a second so-called report. This was not part of the panel scope and should be rejected outright.** ⁽⁸⁾

Myth: The panel reviewed and seriously considered all valid scientific materials available at the time including all documents submitted to MassDEP by the public.

Fact: **Panel members reviewed a cherry-picked selection of materials. Peer reviewed literature and reports by experts worldwide found in the more than 200 documents submitted by volunteers of WWMA are not found in the references of the literature review submitted to MassDEP by the panel.** ⁽⁹⁾⁽¹⁰⁾⁽¹¹⁾

Myth: The panel reviewed and seriously considered all documents submitted to MassDEP from people experiencing adverse health impacts who live in the proximity to wind turbines.

Fact: **WWMA submitted 83 documents from five locations in MA and from locations around the world documenting adverse health event reports that establish a clear pattern of symptoms and ample evidence that wind turbines cause serious health problems in nearby residents.** ^{(9) (12)} According to the Harvard trained epidemiologist, Carl Phillips, PhD, in an article submitted to MassDEP, *"The attempts to deny the evidence cannot be seen as honest scientific disagreement, and represent either gross incompetence or intentional bias."* ⁽¹³⁾

Myth: The panel issued a final report.

Fact: The panel was charged with the MassDEP scope document to issue a draft report.⁽⁸⁾ Therefore this literature review draft document should not be utilized by any persons as a final report.

Myth: The public is satisfied with the findings of the panel.

Fact: Following the panel findings, the Falmouth Board of Health has formally asked for a rigorous and independent health study to take place⁽¹⁴⁾ which is what the public has been asking for since 6/2/10.⁽¹⁵⁾ Over 500 comments were submitted to the MassDEP following the release of the panel findings. Most were highly critical of the panel's findings.

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(2) Mills, Dora. "Wind Turbine Neuro-Acoustical Issues." 6/09 Report for Maine CDC/DHHS. "I found no evidence in peer-reviewed medical and public health literature of adverse health effects from the kinds of noise and vibrations heard by wind turbines"

(3) Manwell, James. "Policy Options for Renewable Energy Incentives." 2002 presentation promoting wind energy and the proliferation of wind turbines.

(4) MassDEP website.

(5) WWMA letter to MassDEP. 9-19-11. Points to flaws of panel process.

(6) WWMA letter to MassDEP. 9-30-11. Points to flaws of panel process.

(7) WWMA letter to MassDEP. 10-28-11. Points to flaws of panel process.

(8) MassDEP Wind Turbine Panel Scope of Work. Calls for panel to conduct site visits, and "evaluate and discuss information from peer reviewed scientific studies, other reports, popular media, and public comments...on the nature and type of health complaints commonly reported by individuals who reside near existing wind farms."

(9) WWMA catalogue of documents provided to panel. Shows listing of over 200 documents mailed to MassDEP for the panel to review.

(10) www.mass.gov/dep/energy/wind/comments.htm#note MassDEP website link. Shows that a small selection of materials submitted to MassDEP was actually shared with panel members

(11) References used in panel members literature review. Shows a small selection of documents submitted by WWMA were used in the literature review

(12) Letter from MA DEP. 10-3-12. States that the text of the more than 70 letters from MA citizens and people around the world submitted by WWMA was not provided to the panel members.

(13) Phillips, Carl. *"Properly Interpreting the Epidemiologic Evidence about the Health Effects of Industrial Wind Turbines on Nearby Residents."*

(14) Falmouth Board of Health Letter to MA DPH. 6-14-12.

(15) Letter from MA citizens to the Commissioner of MA DPH. 6-2-10.

Exposing the Findings of the MassDEP Wind Science Panel Statements (Presentation by MassDEP)

- Panel: Title: *Wind Turbine Health Impact Study, Report of Independent Expert Panel*
Fact: **The panel included biased members. The findings are not a report but instead a literature review of selected material to advance a political agenda.⁽¹⁾**
- Panel: There are no direct links between wind turbines and adverse health impacts.
Fact: **This statement does not say there are no adverse health impacts. It is far different from what MassDEP alluded to in their press conference, how the words are nuanced on their website, and what the media consequently reported.⁽²⁾ There are well-established indirect links between wind turbines and adverse health impacts to humans.⁽³⁾ It has taken many years to prove a direct link for many health hazards such as tobacco and asbestos. Certainly it was common knowledge that the above are public health hazards with great costs to the victims and to the overburdened health care system well before the direct link was proven.⁽⁴⁾**
- Panel: Audible noise of wind turbines is termed an 'annoyance'.
Fact: **The medical term annoyance means a significant degradation in health, a far different definition than most people would assume.⁽⁵⁾**
- Panel: "There is insufficient epidemiological evidence to determine whether there is an association between noise from wind turbines and annoyance independent from the effects of seeing a wind turbine and vice versa."
Fact: **Sleep disturbance is a major recurring factor in thousands of reports from around the world concerning the impact of wind turbines: it is obvious that there is no visual impact when people are sleeping.⁽⁶⁾ Concerning the impact of wind turbine noise on people living nearby, there is the fall 2011 epidemiological study from New Zealand by a highly regarded interdisciplinary team of scientists -- including an expert in psychoacoustics -- and a medical doctor, all working within the country's university system demonstrates that noise from wind turbines negatively affects the quality of life for those exposed to it by adversely impacting their health. The journal article was peer-reviewed and published in Noise Health.⁽⁷⁾**
- Panel: "There is insufficient evidence that the noise from wind turbines is directly (i.e., independent from an effect on annoyance or sleep) causing health problems or disease."
Fact: **Rather than "insufficient evidence", Phillips stated in his August 2011 peer-reviewed publication⁽⁸⁾ in the Bulletin of Science, Technology and Society that there is overwhelming epidemiological evidence that wind turbines cause adverse health effects, especially since the vast majority of reports exhibit case crossover, whereby when the person moves away, the health problems disappear; when they return, they reappear. If the panel's criteria for "sufficient" epidemiologic evidence for wind turbine health issues were applied to the tobacco industry or to drug side effects, people would still be smoking on airplanes and in other public places, and the FDA's ability to learn about after-market drug side effects would essentially be wiped out.**
- Panel: "Claims that infrasound from wind turbines directly impacts the vestibular system have not been demonstrated scientifically. Available evidence shows that the infrasound levels near wind turbines cannot impact the vestibular system."

Fact: The peer-reviewed publications and public presentations of Dr. Alec Salt demonstrate⁽⁹⁾ that infrasound has profound effects on the vestibular system. As early as 1991, Takigawa et. al. demonstrated⁽¹⁰⁾ the negative impact of infrasound on vestibular-related functionality in humans. High sensitivity of the human vestibular system to infrasound has been measured⁽¹¹⁾ by Todd, et. al. Knowledge of the damage to health from exposure to infrasound and low frequency noise (ILFN) has been known for many years⁽¹²⁾⁽¹³⁾. Two recent studies, one in Falmouth, MA⁽¹⁴⁾ and one in Australia⁽¹⁵⁾ present evidence of high-amplitude infrasound inside homes that correspond directly with the onset of symptoms among people exposed within those homes.

Panel: "There is no evidence for a set of health effects from exposure to wind turbines that could be characterized as a "Wind Turbine Syndrome."".

Fact: Wind Turbine Syndrome was the name given to a group of adverse health effects experienced by people living near wind turbines. A study of these individuals was published in a book⁽¹⁶⁾ by Dr. Nina Pierpont, MD, PhD. The symptoms Dr. Pierpont grouped have been since identified in thousands of reports around the world from people living too close to wind turbines.^{(17) (18)} The panel did not acknowledge that whether or not there is a syndrome specific to the impacts of only wind turbines, there is an immense body of information available and the evidence is overwhelming that exposure to wind turbines causes a series of health effects. More than 80 letters written by impacted people describing their symptoms was submitted by WWMA to the MassDEP. The panel negated their mission scope document and declined to interview any people living in the proximity to wind turbines in MA.

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Wind Science Panel Literature Review Media Headlines vs Truth

Truth: Please note the panel's findings are quoted below:

"It is acknowledged that noise from wind turbines can be annoying to some and associated with some reported health effects (e.g., sleep disturbance) (p. 29) "Given the effects of sleep deprivation on health and well-being, including problems with mood and cognition, it is possible that cognitive and mood complaints and other medical or psychological issues associated with sleep loss can stem from living in immediate proximity to wind turbines, if the turbines disrupt sleep." (p. 32-33)

A majority of media headlines announcing the release of the panel's findings did not properly inform the public. As you will read below, some truths contained in the report were completely ignored.

It is important to note that the headlines also ran counter to Governor Patrick's quote on the report which included the words: "... further study is needed to look at health impacts from "annoyance" for residents who live near turbines."

Question:

Do the following headlines acknowledge the "need for further study" as stated by Governor Patrick?

Media Headlines:

Massachusetts clears wind of health effects after independent experts review evidence

American Wind Energy Association Blog

Panel: Wind turbines not hazard to health

Berkshire Eagle

Report: Wind turbines don't cause health problems

Boston Globe

No Adverse Health Effects from Wind Turbines, Report Concludes

Boston Magazine

Wind Farm Opponents are Hypochondriacs A state panel debunks Cape Cod residents' claims of 'Wind Turbine Syndrome.'

Boston Magazine

Mass. Panel: No major health impacts from wind turbines

Brockton Enterprise

State: Wind turbines not harmful

Cape Cod Times

Study: Wind turbines pose no health issue State report debunks "wind turbine syndrome"

CommonWealth Magazine

DEP panel: Wind turbines pose no health risk

Fitchburg Sentinel & Enterprise

State finds no ill health effects for residents

Newburyport Daily News

Experts say wind turbines aren't health hazard

Old Colony Memorial & Wicked Local Plymouth

Mass Panel: No major health impacts from wind turbines

Quincy Patriot Ledger

Wind Turbines pose no serious health risks to residents, Massachusetts panel says

Springfield Republican & Mass Live

Mass. Panel: No health risk from wind turbines

Springfield Republican & Mass Live

Headlines above **misinterpreted the findings** of the panel to support a definitive and erroneous conclusion that "wind turbines pose no health risk" (Fitchburg Sentinel & Enterprise). **These headlines promote a false and misleading narrative..**

The headlines, listed above, have contributed to a setback in the public's right to an honest understanding of scientific truths on behalf of:

1. Massachusetts residents who have been, and are currently, exposed to the very real and degrading impacts of operational wind turbines, and also for
2. Massachusetts residents living in towns that are currently, or soon will be, engaged in the important process of vetting wind turbine proposals.

Final thoughts:

Why have the Massachusetts Department of Environmental Protection and the Department of Public Health failed to respond to official requests to correct the media supported "False Narrative"? Consider that the Massachusetts Department of Public Health states as their mission:

"Helping People Lead Healthy Lives In Healthy Communities"

"We protect, preserve, and improve the health of all the Commonwealth's residents."

Doesn't the public have the right to be told the truth, especially when their health and welfare are at stake?

Night and Day: MassDEP Wind Science Panel Compared to the National Academy of Sciences

According to a February 1, 2012 presentation by MassDEP "Panelists worked independently and followed a process similar to the National Academy of Sciences protocol"¹

In reviewing the MassDEP Wind Science Panel approach of the National Academy of Sciences (NAS) review process, it is discovered that MassDEP had:

- **No "checks and balances" in the committee selection or review process**
- **No rigorous balancing of the interests of the committee**
- **Little attention to selecting members of diverse backgrounds**
- **Demonstrated conflicts of various Panel members**
- **No public airing of committee conflicts at the first meeting**
- **No public meetings or public hearings**
- **No public involvement other than comments at the beginning of process**
- **No communication with members of the public living in the proximity of wind turbines and who report adverse health impacts**
- **No posting or access to Panel's materials**
- **No posting of brief summaries of Panel meetings**

The National Academy of Sciences, Checks and Balances ²:

"Checks and balances are applied at every step in the study process to protect the integrity of reports and to maintain public confidence in them." For example, in the "committee selection and approval" process, "A committee is not finally approved until a thorough balance and conflict of interest discussion is held at the first meeting, and any issues raised in that discussion or by the public are investigated and addressed." In the NAS process, "all provisional committee members are screened in writing and in a confidential group discussion about possible conflicts of interest". Such a "conflict of interest" is "any financial or other interest which conflicts with the service of the individual because it could significantly impair the individual's objectivity..." and "no individual can be appointed to serve...if the individual has a conflict of interest that is relevant to the functions to be performed". After a series of reviews of potential committee members "at several levels", the NAS provisional committee list is posted for public comment on their website and the applicants complete background information and conflict of interest disclosure forms, discussing these at the first committee meeting. Only then is the committee formally approved.

MassDEP, Checks and Balances:

By contrast the MassDEP "Expert Panel" selection process was conducted in secret and members of the Panel were chosen by MassDEP and MDPH. MassDEP stated that "no member of the panel expressed a particular position about wind turbines and health."³ Numerous challenges were made to MassDEP's assertion and issues were raised regarding the "independence" and "bias" of several of the committee members by Wind Wise – Massachusetts.⁴ No forms signed by committee members attesting to "no conflicts" were made public, DEP stated at one point that no documents were signed.⁵ In addition, it can be argued that James Manwell, as founder and head of the UMass Wind Center, served on the committee as a representative of an organization or interest group, something that is explicitly not sanctioned on National Academy committees.⁶

The National Academy of Sciences, Balancing of Interests:

The NAS approach draws strength from bringing together diverse disciplines and backgrounds who conceive new ways of thinking about a problem. The goal "is to ensure that the relevant points of view are...reasonably balanced so that the committee can carry out its charge objectively and credibly". Committee members "are expected to have points of view" but these should be balanced "in a way deemed appropriate for

the task". An important element of the process is that "each committee member has the right to issue a dissenting opinion to the report if he or she disagrees with the consensus of the other members".

MassDEP, Balancing of Interests:

The MassDEP Panel focused on the engineering aspects of wind turbines and the measurement of sound. The Panel had no such "balanced" composition, and lost credibility due to the selection process. A Panel member stated in a public forum that the members of the Panel reached consensus on all points.⁷ Given the complexity and controversy regarding wind studies, such an agreement speaks loudly to the lack of balance on this Panel.

The National Academy of Sciences, Public Statements and Positions:

Among the areas of interest are "public statements and positions" (relevant articles, testimony, speeches, etc. and a brief description of relevant positions or any organizations or groups with which you are closely identified or associated), "research support" (including sources of funding, equipment, facilities etc), and "relevant organizational affiliations" (and relevant remunerated or volunteer non-business relationships). The importance of this review process assures that the committee "should not be placed in a situation where others could reasonably question, and perhaps discount or dismiss, the work of the committee simply because of the existence of conflicting interests.

MassDEP, Public Statements and Positions:

Despite repeated requests to the Commissioners of DEP and DPH, and to their staff involved in this project, there was no public screening of the Panel members. When the "final" list of committee members was announced, a formal letter of complaint was filed with the MassDEP and MDPH Commissioners regarding the blatant bias of several panel members.⁸ The challenge to the membership of the Panel was dismissed by MassDEP because the panel was chosen,⁹ but at the National Academies "committee members continue to be screened for conflict of interest throughout the life of the committee".

The National Academy of Sciences, Committee Meetings, Information Gathering, and Deliberations:

The NAS process, study committees gather information through meetings that are open to the public and announced in advance through the NAS website. The submission of information by outside parties is encouraged, and "In all cases, efforts are made to solicit input from individuals who have been directly involved in, or who have special knowledge of the problem under consideration."

MassDEP, Committee Meetings, Information Gathering, and Deliberations:

A comprehensive study of the public health and safety impacts to Massachusetts citizens in relation to the siting of wind turbines was initially proposed by members of WWMA who demanded transparency and openness of process of the Panel's review of wind concerns.¹⁰ In particular, public meetings open to attendance by the public were to be announced in advance, and submission of relevant information to the work of the Panel should have been accepted during the many months the panel deliberated, not just during a pre-review period as was the case with the Panel. Through meetings with MassDEP and MDPH staff overseeing the Panel review, WWMA particularly emphasized the absolute need for the Panel to include members of the "wind neighbor" public in their discussions, especially impacted neighbors of Newburport, Falmouth, and other wind turbine neighborhoods.¹¹ The panel did not include people impacted. The MassDEP scope document called for a site visit.¹² In yet another breach with NAS procedures, the Panel did not meet with – or solicit information from – "individuals who have been directly involved in, or who have special knowledge of the problem under consideration."

The National Academy of Sciences, Open Meetings and Disclosure to Public:

In the NAS process and "in accordance with federal law", "information-gathering meetings of the committee are open to the public", and written materials provided to the committee "are maintained in a public access file that is available for examination". The public is provided with brief summaries of the committee meetings that include the list of committee members present.

MassDEP, Open Meetings and Disclosure to Public:

After great efforts of MA citizens, MassDEP posted a limited amount of the materials submitted to the Panel during the limited submission period prior to the Panel's deliberations. No further materials have been made public. No public meetings were held. An Oct. 6, 2011 letter from MassDEP states that there will be no open meetings.¹³ No summaries or minutes have been made public. In response to a public records request, MassDEP has stated they want to charge the public in excess of \$18,000 for documents that relate to the Panel and its proceedings.¹⁴

The National Academy of Sciences, Final Report Review:

In order to assure the quality and objectivity of a study, all NAS reports "must undergo a rigorous, independent external review" by (recruited) experts "whose comments are provided anonymously to the committee members", making the identity of these reviews public after the report is thoroughly reviewed and released. The final NAS report "is structured to ensure that each report addresses its approved study charge and does not go beyond it" and that the report "is impartial and objective".

MassDEP, Final Report Review:

MassDEP claims that the Panel report is a final report although in the fall of 2011 they told WWMA the Panel would issue a draft report.¹⁵ MassDEP did hold hearings and a public comment period which closed on March 19, 2012, one year ago. To date, MassDEP claims that they are reviewing the over 500 comments received.¹⁶ The vast majority are highly critical of the Panel findings. The public expects that MassDEP will issue a final report that follows the mission of the MassDEP to protect the health, safety and well-being of MA citizens.

The National Academy of Sciences, Goals:

NAS research methodology is to impart knowledge and advance understanding of important topics using a rigorous impartial investigation process in an open and transparent environment.

MassDEP, Goals:

The MassDEP faithfully replicated the same methodology utilized by the American Wind Energy Association (AWEA) and the Canadian Wind Energy Association (CWEA) in a 2009 white paper.¹⁷ The AWEA/CWEA hired seven individuals from various backgrounds to conduct a highly selective and limited literature search on the same topic as the MassDEP study. MassDEP hired seven individuals in complete secrecy from various backgrounds, some with established pro-wind bias. The AWEA/CWEA White Paper reported a series of findings/conclusions. The MassDEP Panel reported similar findings/conclusions. The driving goal of the MassDEP report was confirmed when the MassDEP Commissioner issued a press release announcing the key panel findings that used misleading language to the average person.¹⁸ The AWEA/CWEA issued similar press releases for their white paper.

The truth is as clear and it is simple: The Goal of the MassDEP panel report was to advance a political agenda of the Patrick Administration to deploy a vast number of land based industrial wind turbines in Massachusetts. Throughout the Commonwealth people living near wind turbines are becoming sick with the same set of symptoms. MassDEP sponsored and is disseminating its panel report to blunt rising local opposition to siting wind turbines in close proximity to people.

References

¹ https://docs.google.com/viewer?a=v&q=cache:Q-o0WNIw4p0J:www.umass.edu/windenergy/downloads/mwwg/Wind_Panel_Presentation-Feb_1_2012-McDevitt.pptx+massdep+wind+turbine+comment+mcdevitt&hl=en&gl=us&pid=bl&srcid=ADGEESijn1Fs0enleCc-hRTcSnmO5uycerGMMGNzXsWIboQOpPz1C5RnYFN-qwyFslbaeOh3ryCy_LRJD1tcjPGHcy6_hCOYCIeiaQT19Wao2cH6AXcbhTbn4sZn9qKxD4dj3Ipg5Yc&sig=AHIEtbSqdS--TaTWSOn28WZNnU4ntr_2BA, PowerPoint Presentation by A. McDevitt, former Deputy Director of MassDEP, accessed March 21, 2013.

² <http://www.nationalacademies.org/nrc/studycommitteprocess.pdf>, "Our Study Process: Ensuring Independent, Objective Advice" published by The National Academies, accessed March 21, 2013.

³ October 6, 2011 letter to WWMA from MassDEP and MDPH.

⁴ Letter to MassDEP and MDPH from WWMA

⁵ Letter to WWMA from MassDEP

⁶ James Manwell - UMass

⁷ Meeting in Fairhaven, MA – audiotape of meeting proceedings

⁸ Letter to MassDEP and MDPH by WWMA

⁹ Letter to WWMA by MassDEP and MDPH

¹⁰ 6-2-10 Letter to Commissioner of MDPH

¹¹ Letter to MassDEP and MDPH from WWMA

¹² MassDEP website - scope document

¹³ 10-6-11 Letter to WWMA from MassDEP and MDPH

¹⁴ Letter to WWMA EC member from MassDEP

¹⁵ Letter to MassDEP and MDPH confirming information at meeting held with WWMA

¹⁶ MassDEP website

¹⁷ AWEA/CWEA white paper

¹⁸ MassDEP press release

Comments Submitted to MassDEP from Experts Regarding the Selective Literature Review of the Wind Science Panel

According to MassDEP over 500 comments were received during the comment period ending March 19, 2012 following the release of the Wind Science Panel findings. The vast majority of the comments were highly critical of the Panel findings. Below please find several examples:

Dr. CD Hanning, BSc, MB, BS, FRCA, MD

"I have nearly 30 years experience in sleep medicine, founding and running one of the largest clinical sleep services in the UK. I have been accepted as an expert in sleep medicine by the UK criminal, civil and family courts. I have over 35 years experience in academic medicine.

For several years, I have been concerned about the effects of wind turbine noise on sleep and health. I have written a detailed major review, based on evidence given at planning inquiries in the UK, which is updated regularly and is made available on the internet as a service to those trying to prevent wind turbines being placed too close to human habitation...I can therefore claim to be at least as well qualified as the medical members of the panel and, as they claim no prior knowledge of wind turbines, considerably more experienced in the matter of wind turbine noise and its effects on sleep and health...

Physicians on the panel...would or should be mindful of the medical precept: 'Primum, non nocere, First, do no harm' and also those of the Hippocratic oath...They would, I hope, be mindful also of the precautionary principle and that absolute certainty may not be required in order to take action to prevent harm. To use a legal analogy, the burden of proof should not be the criminal standard, beyond reasonable doubt, but the civil standard, the balance of probability.

I am surprised that a group of people with, generally, no previous experience in a subject, can nevertheless produce a report which claims to be authoritative in only [several] months with only three meetings. My own review lists over 100 references relevant to wind turbine noise, sleep and health, far more than are listed in this report. I conclude that this can only be regarded as a cursory examination of the subject.

In my opinion, the panel has failed in its duty and instead of reviewing the published data objectively with the principles set out above in mind, has adopted an approach which I can best describe as scientific nihilism. If the same "rigor" and "robustness" as they have applied to the literature on wind turbine noise, sleep and health had been applied to the dangers of cigarette smoke, smoking would still be permitted in public buildings.

The onus of proving safety falls on those introducing new forms of pollution, including noise pollution, into the environment. This is particularly the case where there is a clear causal link between the pollution and harm. The relationship between environmental noise and ill health is well established. The panel seems to have taken the opposite view that it is the responsibility of the public to prove harm using the most "rigorous" and "robust" evidence. This is a complete reversal of the normal burden of proof in such matters. They have singularly failed to note that there is no objective evidence that wind turbines are safe at the distances and noise levels permitted under current Massachusetts' guidance. Not a single study, merely conjecture and opinion. Great store seems to have been set by regulations by other jurisdictions but without any critical assessment of how they have been derived. Not one is based on any objective evidence of safety.

The duty of the panel, and the medical members in particular, was not to exonerate wind turbines but to protect the public. It is to be regretted that they have not done so. The report should be rejected."¹

Dr. Raymond S. Hartman, BA: Princeton University, MS and PhD: MIT

"Dr. Hartman is an economist specializing in microeconomics, econometrics and the study of industrial organization. Since 1977, Dr. Hartman's expertise and experience [in energy markets and regulated industries] have involved regulated industries generally and the markets for electric power and natural gas specifically. Over the past 15 years, Dr. Hartman has participated as testifying or consulting expert in a wide array of matters related to health-care markets generally and, more specifically, markets for medical devices and pharmaceutical products.

The problem with... praise, support and reliance by the Commonwealth (Commissioner Kimmel and Governor Patrick) is that it is based upon the false premise that the Wind Turbine Impact Study has conducted scientific research and offers scientific conclusions. It has not and does not.

- The Wind Turbine Impact Study is not the result of independent scientific research.
- The Wind Turbine Impact Study conducts no primary science, while it grossly misinterprets the real science it purports to review.
- The Wind Turbine Impact Study is not "the best science available to ... make decisions on wind energy."
 - It is not science at all; it is advocacy.
 - It certainly should not be used to "help inform future discussions with the public on wind turbines."
- In fact, the Wind Turbine Impact Study is Junk Science.
 - It would be thrown out of court as Junk Science.
 - It would not be acceptable or publishable in an academic peer-reviewed journal.
- These conclusions are not based upon an antipathy toward wind power, as the Governor seems to insinuate. They are based upon facts, many of which are admitted by the Panel in the Report.

This DEP Report on Wind Turbine Health Impacts does NOT present the facts; it presents a contorted and fallacious summary aimed at drawing false conclusions. Indeed, the Commonwealth's ill-informed support of proposals to site industrial wind turbines under the setback and noise limits put forward by the Panel's Report will cause illness and loss of property values, impacts for which the Commonwealth may find itself liable. It is useful to remember that Big Tobacco felt as if it could claim anything; that no research could **really** prove that smoking caused adverse health effects. After decades of avoiding an adverse court ruling, the evidence finally became insurmountable and Big Tobacco paid a very large sum for that liability.

The Commonwealth should stop endangering the health of particular residents. It should stop pretending to be doing science and actually commission real science. Wind-powered energy has a place in the portfolio of generation facilities for the power grid of New England. The inconvenient truth for the DEP and Governor Patrick is that industrial **wind turbines cannot be sited simply anywhere**. If the Commonwealth wants to sacrifice the health and homes of a subset of its residents in the name of Big Wind, just say so. The guidelines proposed in the DEP Report do just that. However, the Commonwealth should keep in mind that current and continuing research into the negative health effects and lost property values caused by improper siting of industrial wind turbines will demonstrate that the Commonwealth and Big Wind are liable for ruining the health and lives of many of its citizens and destroying the values of the single most important asset of many Commonwealth families – their homes."²

Carmen Krogh, BScPharm, Ontario, Canada

"As background, I have held senior executive positions at a teaching hospital, a professional organization and Health Canada (PMRA). I am a former Director of Publications and Editor in Chief of the *Compendium of Pharmaceuticals and Specialties (CPS)*, the book used by physicians, nurses, and health professionals for prescribing information in Canada.

Statements indicating there is no evidence of a "direct" causal link may be accurate but is

also an incomplete assessment of the health risks. The indirect pathway of noise annoyance, sleep disturbance and stress leads to consequences (cardiac). When one focuses on "direct" effect one omits consideration of an equally significant part of the health equation ie indirect effects.

During 2011, there has been significant progress in acknowledging the harm that can occur when industrial wind turbines are sited too close to residents.

Consideration should be given to recent Australian movements towards a minimum 2 km setback (see Senate slides attached for references). Furthermore in January 2012 the National Health and Medical Research Council reaffirmed their position that authorities are instructed to maintain a precautionary approach for this issue.

Social well-being is acknowledged to be a determinant of health: "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (World Health Organization [WHO], 1948). Many jurisdictions, including the Canadian federal, provincial, and territorial governments and health office.

I believe we are at the stage where public health officials must acknowledge there are some suffering from exposure to industrial wind turbines. Furthermore it is time to move beyond repetitive literature reviews. There is an urgent need to conduct the research to determine the siting parameters including setback distances and noise levels to ensure protection of health."³

Helen Schwiesow Parker, Ph.D. Licensed Clinical Psychologist Past Clinical Supervisory Faculty, University of Virginia Medical School Past Director, Purdue Achievement Center for Children Chilmark, MA

"'Absence of Proof of Health Impacts' is Not the Same as 'Proof of Absence of Health Impacts.' The study is often unclear as to whether there is demonstrated evidence that a potential impact does not exist, or whether conclusive studies have not yet been carried out with respect to that factor. [Is this just a BADLY written report? Unintentionally ambiguous, unclear with unjustified conclusions?] In the absence of clear evidence that a given factor is not a problem, it would seem wise to err on the side of caution with respect to development of potentially problematic wind energy projects....

"The report's ambiguous language about this has already lead to questionable interpretations about the report, such as the Conservation Law Foundation's statement that "This new, independent study advances the state of science and debunks common misunderstandings regarding potential health impacts of wind turbines." The study should make clear that it is a partial literature review that summarizes some existing science and does not advance it. It should be made clear that the study's use of the term "limited epidemiologic evidence".does not imply that these impacts should be ignored, and the current absence of definitive scientific proof that wind turbines directly cause a specific health impact does not necessarily "debunk" contentions that this might be the case.

"In the absence of definitive studies clearly indicating the absence of significant impacts, the Martha's Vineyard Commission suggests that the Commonwealth of Massachusetts...apply the Precautionary Principle, which states that if an action or policy has a suspected risk of causing harm to the public or to the environment, in the absence of scientific consensus that the action or policy is or is not harmful, the burden of proof that it is not harmful falls on those taking the action....

"For infrasound, the study indicates that 'A possible coupling mechanism between infrasound and the vestibular system . . . has been proposed but is not yet fully understood or sufficiently explained. Levels of infrasound near wind turbines have been shown to be high enough to be sensed by the OHC [Outer Hair Cells]. However, evidence does not exist to demonstrate the influence of wind turbine-generated infrasound on vestibular mediated effects in the brain.' This does not justify concluding that there is no link; it merely indicates that these robust studies have not been carried out yet. The study suggests that there doesn't appear to be a logical explanation

for a possible impact of low energy sound levels on the vestibular systems and concludes that it is not worth carrying out further studies about this issue."⁴

Mariana Alves-Pereira, Associate Professor Faculty of Economics and Management School of Health Sciences Universidade Lusofona Lisbon, Portugal

"[I am] a leading expert on the biological response to low frequency noise exposure... It would seem that a precious and scientifically useful source of information was overlooked - scientific conferences. Perhaps it would have been helpful to the Panel if scientific/ research papers included in conference proceedings had not been excluded. Although papers presented at conferences are not considered to be peer-reviewed, they are subjected to scientific scrutiny and might have provided the Panel with a broader background, potentially useful for carrying out its charge. The Wind Turbine Noise Conference and the International Conference on the Biological Effects of Noise are but two examples of such sources.

Wrong assumptions and flawed study designs

The use of the dBA unit and the focus on human hearing threshold values are justified however, by the assumption that acoustical phenomena are only harmful if perceived by the human being.

Can acoustical phenomena that are not perceived by the human auditory system be detrimental to human health?

Once this question is set forth, results of studies where subjective parameters are the sole outcome become moot.

- *Does an agent of disease have to be perceived by the host for it to have a pathogenic effect on the host?*
- *Does an agent of disease have to cause annoyance in order for it to have a pathogenic effect on the host?*

Clearly the answer is no.

Nevertheless, where acoustical phenomena are concerned, this is an established assumption of a vast number of researchers and scientists who study "health effects" of noise exposure. The idea "what you can't hear won't hurt you" is responsible for numerous biased study designs which, in turn, have been leading to inconclusive or invalid results (even if peer-reviewed). This has been true for noise studies whether or not they involve WT, and further justifies the use of the dBA unit.

This wrong assumption which permeates the area of science studying the health effects of noise exposure justifies ignoring that noise-exposure effects are cumulative. As a result, noise-exposure histories (including fetal exposures) which could provide crucial information for establishing dose-responses are not obtained.

Lessons from ILFN-rich occupational environments.

Scientists with expertise in Environmental, Public or Occupational Health are well aware that excessive exposure to physical agents is often first seen in occupational environments. The health effects observed in workers have often been later observed in populations exposed to the same physical agent, but continuously and at a lower level.

"The workplace is a unique environment. (...) Environmentally induced diseases have (...) not uncommonly first been seen in working populations. The appearance of these illnesses may provide a warning to the general population of the toxicity of environmental substances".³

After several readings of this Report, it would seem that the Panel has, at times, misunderstood the distinction between noise and vibration where human health is concerned (p. ES-5, 45, 54).

Lessons learned with VAD bring the possibility of objective clinical data being gathered among populations residing in the vicinity of WT. Moreover, if the agent of disease responsible for the development of VAD in occupational environments had been more thoroughly explored (and understood) perhaps the "Panel's efforts (...) to examine the biological plausibility or basis for the health effects of turbines" (p.ES-3) would have been greatly improved."⁵

Dr. Daniel Shepherd, PhD, MSc, BA

"The impact of environmental factors on health defines the scope of my research practice. I approach the study of noise and health both descriptively and experimentally, and conduct both epidemiological (i.e. in the community) and controlled (i.e. in the laboratory) research. I have published papers on both noise-induced health deficits and the psychoacoustical measurement of human hearing abilities, and have presented data at numerous international conferences on the topic.

While I agree that the panel consists of experts, it is somewhat unfortunate that their expertise lies largely in areas other than noise and health, and this needs to be acknowledged.

In asserting that wind turbine noise has no adverse health effects, the authors are effectively denying that any noise, besides that inflicting noise-induced hearing loss, is a public health issue. That is, if they argue that wind turbine noise does not impact health then they cannot logically argue that other noise impacts health, given current data showing the toxicity of wind turbine noise relative to other sources... This stance diverges from that taken by the world's highest authority on health, the World Health Organization, which asserts that chronic exposure to noise can compromise health and wellbeing, even at low levels...

The panel's assessment of evidence demonstrates that a political, as opposed to a critical approach, has been adopted. First, the reoccurrence of the phrase "there is limited epidemiological evidence" ... indicates that there is evidence. Second, there is no limited evidence that wind turbine noise should be considered privileged and benign, incapable of adversely impacting health unlike its road-traffic and aviation counterparts... Note that the limited evidence of road-traffic and aviation noise impacts has grown over time into a large body of evidence showing that these sources of noise do need to be controlled for the public good.

Conclusion: This report says nothing definitive about industrial wind turbine noise and health. As such, this report is of no intrinsic value to guardians of public health.

Recommendation: That a panel of experts in noise and health be convened to consider the impacts of wind turbine noise on public health."⁶

References

¹ Hanning comments

² Ray Hartman comments

³ Krogh comments

⁴ Parker comments

⁵ Alves-Pereira comments

⁶ Shepherd comments

Summary of Communication and Public Records Requests with MassDEP Following the Release of the Findings of the MassDEP hired Wind Science Panel

MassDEP claims they posted online all documents emailed and mailed at the beginning of the panel's meetings and prior to the end of the public comment period, July 21, 2011, including over 200 documents submitted on a CD-ROM by Wind Wise – Massachusetts (WWMA). MassDEP claims this was achieved through a link to the WWMA website.¹

WWMA never posted all of the documents online, only a catalogue listing of the titles of the over 200 documents. Therefore MassDEP has not been factual in stating that it posted the submissions.

MassDEP claims that the panel reviewed the over 200 documents submitted by WWMA prior to writing their findings. A recent communication with MassDEP states that a phone call was recently made to a staff member of the third party agency who worked with the panel. The staff member said the panel received the documents.²

WWMA shows there is no evidence that the panel reviewed the documents. Evidence from a MassDEP email points to the fact that the over 200 documents were never sent to the third party and therefore the panel never reviewed the evidence submitted by volunteers of WWMA who spent months of their life working on this project.³ The documents contained peer-reviewed articles, conference papers, white papers, reports, and 83 personal stories and documents from MA citizens and people around the world who are experiencing adverse health impacts and live in the proximity to wind turbines.⁴ Since the panel did not receive all information provided, the panel findings are not valid.

MassDEP has communicated that they will charge the public \$18,824.01 (and possibly more) for documents related to the panel, how the panel was chosen, meetings of the panel, drafts of the panel findings, and communications with MassDEP and MDPH. These documents will be heavily redacted.⁵

WWMA has asked for documents because the MassDEP did not follow the protocols of the National Academy of Sciences. The panel members were chosen in secret. All meetings were held in secret with no public participation. No meeting minutes or account of any proceedings have been released. No drafts of panel finds have been released.^{6,7}

MassDEP is still reviewing the over 500 documents that were submitted as comments after the panel released their findings. The comment period ended on March 19, 2012. Over one year ago.⁸

WWMA has reviewed the documents received through a public records request to MassDEP. The vast majority of the over 500 comments are highly critical of the panel's findings.

MassDEP has received a letter from WWMA regarding new research including three new peer-reviewed articles that have been published since the panel issued its findings. WWMA asked for a response from MassDEP.⁹

WWMA has received no response to date from MassDEP even though the letter clearly asks MassDEP to clarify where they are in the review process.

MassDEP stated that a final report would be issued once they reviewed the comments submitted by the cut off date of March 19, 2012.¹⁰

WWMA and the numerous citizens in MA who are being adversely impacted by wind turbines are waiting for the MassDEP to issue their final report that must reflect their mission of protecting the health, safety and well-being of MA citizens. It is one year later and there is still no final report. WWMA has conducted its research over the last year and found that there are now 21 locations around MA where people living in the proximity to wind turbines are reporting adverse health impacts.¹¹

References

¹ March 11, 2013 Letter to WWMA EC member from MassDEP

² Ibid

³ 3-21-13 Letter to MassDEP from WWMA EC member

⁴ Cover letter with package mailed to MassDEP from WWMA

⁵ Letter to WWMA EC member from MassDEP

⁶ Letter to MassDEP from WWMA

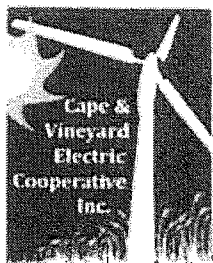
⁷ Letter to MassDEP from WWMA

⁸ Letter to WWMA EC member from MassDEP

⁹ Letter to MassDEP from WWMA EC

¹⁰ MassDEP website

¹¹ WWMA website map graphic

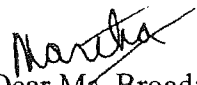


Cape & Vineyard Electric Cooperative, Inc.
Superior Courthouse . P.O. Box 427 . Barnstable, MA 02630
508.375.6648 . www.cvecinc.org

May 25, 2010

Martha Broad
Massachusetts Clean Energy Center
55 Summer Street, 9th Floor
Boston, MA 02110

Re: Allocation of Grant Funds from Harwich to Brewster – Commonwealth Wind
Incentive Program: Community Scale


Dear Ms. Broad:

As we discussed, the actions supported by the May 4, 2010 Harwich Town Meeting voters resulted in the Harwich wind turbine project being indefinitely postponed. As a result of these Town Meeting votes, the Board of Director's of the Cape & Vineyard Electric Cooperative voted at their May 20, 2010 to reallocate the \$200,000 Harwich Design and Construction grant to the Brewster project, upon approval of the Massachusetts Clean Energy Center. This letter is the official request to reallocate the Harwich grant to the Brewster wind project. If approved the Brewster wind project Design and Construction grant would be in the amount of \$400,000.

As part of this request to reallocate funds you asked that I provide a summary of the lessons learned from the Harwich wind turbine project. The following are the key lessons learned from the Harwich project:

- Feasibility Study Phase
 - The site selected in Harwich was not included in the initial list of sites in the Feasibility Study. It was not included because at the time it was unknown that the FAA would impose height restrictions on all of the sites identified in the Study. The final site was selected based on no FAA restrictions, but not having a Feasibility Study for this site worked against the project. It would have been helpful to have an amendment to the Feasibility Study prepared for the final site.
- Community Interaction
 - Standard/official public notice is not a sufficient manner for engaging the community for large scale community wind projects. The Harwich

Energy and Utility Committee had been working on this project for almost eight years. All of their meetings were publicly noticed consistent with Massachusetts General Laws and their meeting minutes are also publicly available at Town Hall. Several public hearings were also held on the project, public notice was given of the hearings, and some of the hearings were televised as part of the Board of Selectmen's meeting. A Town Meeting vote was also held on the project in the Fall of 2009. The Town made a good faith effort to advance the project and keep the community informed using the tools available and required of public entities. The feedback received by the Town and Cape & Vineyard Cooperative from the residents adjacent to the proposed site indicates that this was not sufficient. The type of engagement that the residents wanted is more in line with community and social marketing than public notice. The time/staffing and funds needed to advance this type of community engagement is beyond the scope of municipalities and volunteer energy committees.

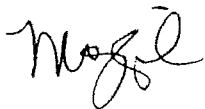
- Information on the impact to property values due to community projects within less than a mile of homes is needed. This was a question raised repeatedly by residents adjacent to the project.
- Community forums are important and should be held from the initial concept of community wind through the commissioning of a community wind project. A way to fund these forums is needed.

▪ Negative Information

- There is a lack of credible positive information on community wind turbine projects. Individuals opposed to wind turbines such as Doctor Nina Pierpont are considered an authoritative voice on wind issues, and no non-wind industry financed information was available to refute the claims raised by this individual. It became apparent that information is needed that is not funded by the wind industry. *Mass DEP panel formed after this*
- Supporters of community wind projects were scarce and did not actively *document* support the project.

I hope the above information is helpful to CEC in its pursuit of other community wind projects. I look forward to hearing from you regarding the reallocation request. If you have any questions, please do not hesitate to contact me at 508-375-6636 or mdowney@barnstablecounty.org

Sincerely,



Margaret T. Downey
Clerk

Cc: CVEC Board of Directors

7/9/13 B2 - SPEAKER: DOUGLAS LONG IN FAVOR OF H 2045, 2046, 1907, 1906

Comments supporting Cape Downwinders' Article 54 @ Orleans town meeting
Tuesday 5/14/2013. Written by Doug Long with help from CDW. Any errors are mine.

Thank you Mr. Moderator, members of our town boards, ladies and gentlemen of town meeting.

My name is Doug Long and I live on Pine Ridge Lane in Orleans.

Article 54 is a **non-binding public opinion advisory**

sponsored by Cape Downwinders, a dedicated group of Cape Codders focussed for many years on the safety of residents and visitors who would suffer serious harm in the event of an accident releasing radioactivity at the 40-year old Pilgrim Nuclear Power Station in Plymouth. We are not discussing nuclear power in general, but rather the Pilgrim plant in particular.

Three events have prompted our current Cape-wide action:

First event: At Fukushima Dai-ichi Japan on March 11, 2011, three General Electric Mark 1 nuclear reactors, the exact same GE reactor and containment structure as at Pilgrim, exploded and collapsed into full meltdowns, spewing dangerous amounts of radioactivity into the air and ocean. A fourth GE Mark 1 reactor exploded but did not meltdown. The three meltdown reactors, Units 1, 2 and 3, went online 41, 39 and 37 years ago, respectively.

On March 24, 2011 New Scientist magazine reported that

"The Fukushima accident has led to trace amounts of radiation, including iodine-131, caesium-134 and caesium-137, being observed around the world (New York State, Alaska, Hawaii, Oregon, California, Montreal, and Austria)."

The GE Mark 1 radioactive releases from Fukushima peaked after nine days and were detected for ten more days - in Seattle, Washington! This is from the Engineering Dept. at the University of Washington.

Second event: in May 2012 the federal Nuclear Regulatory Commission approved a 20-year operating license extension over the written objections of MA Gov. Deval Patrick, Atty. General Martha Coakley, Congressmman William Keating, Congressman Edward Markey, State Senate President Therese Murray, State Senator Dan Wolf, State Representative Sarah Peake, Chair of the Cape Cod National Seashore Advisory Commission Richard F. Delaney and numerous local citizens' groups including us. Even the Chairman of the NRC himself opposed the relicensing, but he was outvoted 4-1.

Third event: Cape Codders were told in plain English last October in Harwich at the Barnstable County Regional Emergency Planning Committee meeting, by Kurt Schwartz, the Director of the Massachusetts Emergency Management Agency (MEMA), that residents and visitors will be prevented from leaving the Cape in the event of a release of radioactivity from Pilgrim.

He described scenarios in which both bridges would be closed for "a period of time" if our traffic interfered with the evacuation from the Plymouth area. If? Seems to me that there is a 100% probability of that happening. So the bridges will be closed.

Schwartz also said: "...we have to accept that in the immediate hours of a release (of radioactivity) while we evacuate people who are at risk, that the **people who are on the Cape are not our priority because you are not at risk in the first hours.**"

But just a 20-mile an hour wind will reach Sagamore in 40 minutes, Provincetown in 60 minutes and Orleans, 33 miles away, in an hour and 45 minutes. And the Cape is downwind of Pilgrim at least half the time.

Director Schwartz again: “**You are in...you are going to be in harm’s way. You will be in the ingestion danger zone and you will relocate.**” But we would not be **allowed** to relocate for many hours, perhaps days, all the while trapped in the radioactive plume.

In truth, there is **no safety at all**, for 215,000 Cape Codders and at least the same number of tourists on a summer day, in this official Pilgrim evacuation plan a plan paid for by the corporate owner of Pilgrim, who also pays MEMA to help execute it.

We have choices: to be **reactive** and suffer from emergency plans that don't protect the public or to be **proactive** and close down the source of the danger - Pilgrim Nuclear Power Station.

14 of the 15 Cape Cod towns are voting this Spring on the exact same initiative as our Article 54; Barnstable will vote in the Fall. Of the 14 towns, 7 have already voted and all 7 have approved the measure: Provincetown, Truro, Wellfleet, Eastham, Mashpee Bourne and Sandwich. [update: by end-June all 14 towns passed the measure handily.

This initiative is also on the ballot next week as question 10.

Thank you for supporting Article 54

Doug Long 774-722-0952 outermost@gmail.com ----END-----



