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filed: March 23, 2014 • Australia, Letters, Sweden

## Infrasound from wind turbines can trigger migraine and related symptoms

| Credit: Håkan Enbom, M.D., Ph.D ~~

Dear Sir

It has come to my knowledge that you have released a position paper about the effects of low frequency noise and infrasound from wind power.

I would like to draw your attention to my recently published article about migraine and infrasound in the Swedish Medical Journal "Läkartidningen" which is attached [\[link\]](#).

As you well know, migraine is a polygenetic inherited disease with occasional episodes of headache. It is also well known that people with migraine are more sensitive to sound and light than the normal population, especially during an attack of migraine headache. Futhermore it is a well known fact that pulsating sound and flickering light are strong triggers to elicit an attack of migraine.

Migraine is a very common condition in the population with a 15% prevalence for migraine headache. It is quite obvious that the genetic predisposition is much higher – everyone with a genetic disposition will not suffer from migraine headaches. You may well live with the genetic predisposition and never suffer from migraine headache in all your life.

Recent studies have found that these genetic changes affect among others the Ca-channels. This channelopathie increases the cellular depolarisation and as a result the nerve cells are more sensitive to stimulation – less stimulus is needed to trigger a nerve-potential. The main triggers for migraine are – as we all know – all kinds of sensory stimulation, food containing biogenic amines such as tyramine, glutamine, histamine etc., and increased levels or fluctuating levels of estrogen.

Thus sound is a trigger. Loud noise of varying amplitude is a strong trigger that will increase the neural sensitivity in persons with migraine. For example a teacher with a genetic tendency to migraine in a noisy classroom. After a while all senses will become more sensitive (more sensitive to sound, more sensitive

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WEHMHOFF Group #1

to light, more sensitive to vestibular stimuli for example). Hyperacusis makes the situation in the classroom worse and eventually an attack of migraine headache will appear.

Low frequency noise or infrasound noise is no exception. Even if the sound is not heard the sound pressure will exert the same force on the eardrum as audible sound. The sound waves will be transmitted to the inner ear and hair cells are then stimulated. Even if the stimulation is not recognized as sound it will affect brainstem centres and elicit other sensations.

Infrasound is normally not possible to hear, you more likely will feel it as a vibration. Low frequency sound is possible to hear if the volume (sound pressure in dB) is strong enough. But it is a known fact that there are persons who can hear low frequency sound and infrasound at sound pressure levels of 40 db or less. If you have migraine and have developed hyperacusis it is most likely that you are as sensitive to low frequency sound as to normal sound.

Infrasound from wind turbines has properties that differ from other types of infrasound such as infrasound emanating from natural sources (eg wind, rivers) and from artificial sources including road traffic. Infrasound from road traffic (as well as the other examples) has a continuous, constant character – a kind of constant background noise. Infrasound from wind turbines has a fluctuating character with varying amplitude. Infrasound from wind turbines also has three distinct frequencies with higher amplitude than the average infrasound pressure (blade pass frequencies).

A third issue is that the sound pressure for infrasound and low frequency sound is much stronger than the sound pressure for the sound you can hear (for audible sound). If the measured sound pressure at a given distance is 40 dB for audible sound, then the sound pressure for infrasound is 60–80 dB at the same measuring point. Additionally infrasound is amplified inside buildings by resonance effects.

Thus the conclusion is that low frequency sound and infrasound from wind power has the qualities to trigger increased sensitivity and eventually migraine headache or other migraine-symptoms – such as vertigo or tinnitus (without headache).

As migraine is so common in the population, this is a relationship that you can not avoid considering.

Futhermore there is increasing knowledge that continuous stimulation of triggers eventually will create a central sensitisation in the brain with a chronic extremely increased sensitivity to sensory stimulation.

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I hope that you will take these facts in consideration and advocate for further studies and work for a safe distance for wind power from homes and workplaces that will protect the public health.

Kindest regards

Håkan Enbom M.D. Ph.D

**Also see:**

[Letter from Dr. Sandy Reider, Vermont, to AMA.](#)

[Letter from Dr. Jay Tibbets, Wisconsin, to AMA.](#)

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**Source:** Håkan Enbom, M.D., Ph.D

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filed: March 19, 2014 • Australia, Letters, Vermont

## Intentional bias behind AMA position statement?

| Credit: Sandy Reider, MD ---

Dear Dr. Hambleton,

As a rural primary care physician (graduate of Harvard Medical School in 1971) in northern Vermont, USA, I have observed first hand the adverse health effects experienced by individuals living too close to the two large wind projects that have been brought online in the area over the past few years. In my testimony (see attached below) last year before the Vermont Senate Health Care Committee (as well as testimony before the Senate Natural Resources Committee and the Governor's Siting Commission), I described one such patient in detail. His complaints are typical, and similar to symptoms reported by the 5 or 6 others, who I have seen in my office, as well as many other reports around the world. Though industry and health authorities alike have dismissed these case reports as anecdotal, their sheer numbers and consistency can be ignored only if there exists an intentional bias, but not on scientific grounds. I do understand there is much current debate about whether the health effects are "direct" or "indirect", but from a clinical perspective, looking at health outcomes, this is an entirely academic distinction, and not at all pertinent for the person(s) adversely affected.

Likewise, the industry's refusal to consider that very low frequency sound may be contributing to these adverse health effects, seems to represent another example of intentional scientific bias. A detailed study of infrasound produced by large downwind bladed wind turbines, and its health effects, was undertaken by the US Dept. of Energy and NASA in the mid-1980's:

<http://waubrafoundation.org.au/resources/kelley-et-al-1985-acoustic-noise-associated-with-mod-1-wind-turbine/>

It clearly documented the significant adverse effects of infrasound generated by large downwind bladed wind turbines, and recommended protective sound threshold standards. This is far from new information, and taken with other more recent papers, it does not seem credible to exclude from consideration the adverse health effects from infrasound produced by these large modern wind turbines.

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I cannot escape the conclusion that the siting standards for large wind projects have been, and continue to be, inadequate to protect the health of many persons living in their vicinity, and sincerely hope the Australian Medical Association will review it's current position that negates such concerns.

Sincerely,  
Sandy Reider MD


**Also see:**

- [Letter from Dr. Jay Tibbets, Wisconsin, to AMA.](#)
- [Letter from Dr. Robert McMurtry, Ontario, to AMA.](#)
- [Letter from Dr. Håkan Enbom, Sweden, to AMA.](#)
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**Source:** Sandy Reider, MD

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filed: March 19, 2014 • Australia, Letters, Wisconsin

## Letter to AMA (Australia)

| Credit: Jay J. Tibbetts, MD, March 18, 2014 --

I am a practicing physician, member of the Brown County Board of Health and Medical Adviser to the Brown County Health Department and am appalled by the misguided position of the AMA Australia on their position on the effects of ILFN on human health. Over the past four years the Board has studied the deleterious effects of IWT's on human health. We have the Shirley Wind Farm in out county. It consists of eight 500' 2.5 megawatt IWT's. The effects on our citizens living in the immediate vicinity i.e. 2-3 mi. of the nearest turbine has been devastating. Ear pressure, pain, tinnitus, vertigo, headache, nausea, chest pain pressure, abdominal pain, poor concentration, sleep depravation, irritability and depression are some of the symptoms our citizens are experiencing. These symptoms are not unique to our facility but are reported world wide and a direct effect of ILFN. Three families from Shirley Wind have abandoned their homes and several others would move save for financial reasons. Forty families have left their homes in a wind farm in Ontario, Canada because of the above mentioned symptoms. A study of Shirley Wind in 2013 by a group of acousticians has identified significant ILFN. Professor Alec Salt has identified the pathway of transmission of ILFN in the inner ear.

Brown County has been well aware of wind turbine health issues sending two resolutions passed by the County Board of Supervisors to the State of Wisconsin. Furthermore, Brown County working with Rick James is in the process of amending our noise ordinance to include ILFN similarly to Germany, The Netherlands and Poland.

To accept the view of the AMA Australia challenges every bit of reason and study on this subject.

Jay J. Tibbetts, MD  
Green Bay, WI

**Also see:**

- [Letter from Dr. Sandy Reider, Vermont, to AMA.](#)
- [Letter from Dr. Robert McMurtry, Ontario, to AMA.](#)
- [Letter from Dr. Håkan Enbom, Sweden, to AMA.](#)
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filed: April 6, 2014 • Australia, Denmark, Letters

## Highly alarming position paper from a medical association

| Credit: Mauri Johansson, April 6, 2014 ~-

On the background of my long working life in community and occupational medicine, including environmental medicine and research, weighting the preventive aspects, I am shocked to read your position paper on wind farms and health. The style and language is definitely not based on scientific, medical wording but sounds much more of what we hear from the wind turbine industry and their sales promoting lobbyists. A pure worship to this "modern" technology. Based on technologies, that are in sharp contradiction with the legal requirements, that manufacturers may not promote, sale or export harmful products such as machinery, which wind turbines by the EU Machinery Directive per definition are. The industry has never documented their harmlessness, based on research, involving relevant medical expertise (e.g. audiologists, medical epidemiologists, community medical specialists etc.) without any conflicts of interests.

There are several untruths in your text. It is not a question of "modern" or not but about the sound energies emitted, hitting pregnant, children and the elderly or the many neighbors in serious risk groups, especially due to the noise in the low frequency and infra sound (ILFN) range, which is never measured, using the formal, and obviously erroneous prerequisites in the laws and other publications from authorities. For example in Denmark the formal rules for wind turbine noise thresholds, including ILFN, were calculated only by engineers, without ANY participation of competent medical experts, like audiologists, or involving neighbors to wind turbines to >1 MW size. The former CEO of Vestas, well known even in Australia, in public stated, that the Government must not change the noise limits because that will harm their export, if greater distances between wind turbines and dwellings were required. Also the rules dictates the use of A-filters where nothing of the sound pressure can be recorded under 20 Hz, where by far the largest sound pressure from wind turbines is (between 70-95 dB from a 2 MW turbine - according to Kelley and newer research, that measures full spectrum noise down to about 0.2 Hz frequency). But human bodies, inner ears and the brain are easily affected by those amounts of sound energy - only they are not "audible" in a narrow definition, but they are definitely hazardous and strongly

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activating specific brain nuclei (amygdala, hippocampus), causing panic, anxiousness and in long run depression. But worst of all, they cause impaired sleep or insomnia (sleeplessness) with deleterious effects ([see the new Norwegian HUNT study attached](#)). So all the “mechanisms” you speak about, direct and indirect, are there and they are well documented ([see e.g. the Alec Salt recent article attached](#)).

What has AMA done to convince the Australian Medical Authorities to inform the physicians of your country about the mounting evidence of health hazards for wind turbine neighbors since, say, the year 2000? Does the UN Precautionary Principle and the UN Aarhus Convention not apply in Australia and especially among doctors? Preventive action must be taken long before there is final and water proof evidence, if there is just a suspicion of that human life and health is threatened. And finally: wind turbines, due to the fluctuation, unpredictability and capriciousness of the wind requires an everlasting backup from fossil electricity plants, thereby making the postulated “green” wind turbine electricity just black and filled with CO<sub>2</sub>.

The tone and the inhumane wording in your statement seems to me in severe conflict with the World Medical Associations code of Medical Ethics. The forerunner of AMA was in 1947 among the constituting members of the WMA. WMA has glorious traditions in developing solid ethical and moral rules and traditions in the international medical community. By sending a copy of this letter to my now (Danish) Medical Association and my earlier (Swedish and Finnish) and orienting the Norwegian and Icelandic associations I hope to stimulate them to debat the ethical attitudes Australian AMA in the position paper unveil toward diseased countrymen. I also hope the WMA will find time to consider this correspondence during General Assembly to come. Especially I will point to the following paragraphs in the WMA Code of Medical Ethics (2014). The problems with the relations between wind farms and health are not unique for Australia. They are well known also in Denmark, the other Nordic countries and word wide. The debates are raging in 70–100 countries and in an increasing degree now also in the developing countries, towards which the wind turbine industry now is moving and where the knowledge of these complex problems and the prevention necessities in the medical forums are even more limited than in our countries.

I here remind WMA and all the member associations about the following ethical paragraphs and hope they are not violated either by Australia or any other countries:

WMA International Code of Medical Ethics  
Adopted by the 3rd General Assembly of the World  
Medical Association, London, England, October 1949  
and amended by the 22nd World Medical Assembly,

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NextEra seeks to appeal local judge's ruling  
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Norway:  
Reindeer herders say they will sue to halt Norway's largest wind farm  
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Sydney, Australia, August 1968  
and the 35th World Medical Assembly, Venice, Italy,  
October 1983  
and the 57th WMA General Assembly, Pilanesberg,  
South Africa, October 2006

#### DUTIES OF PHYSICIANS IN GENERAL

- A PHYSICIAN SHALL always exercise his/her independent professional judgment and maintain the highest standards of professional conduct.
- A PHYSICIAN SHALL not allow his/her judgment to be influenced by personal profit or unfair discrimination.
- A PHYSICIAN SHALL be dedicated to providing competent medical service in full professional and moral independence, with compassion and respect for human dignity.
- A PHYSICIAN SHALL deal honestly with patients and colleagues, and report to the appropriate authorities those physicians who practice unethically or incompetently or who engage in fraud or deception.
- A PHYSICIAN SHALL certify only that which he/she has personally verified.
- A PHYSICIAN SHALL respect the local and national codes of ethics.

[www.wma.net/en/30publications/10policies/c8/](http://www.wma.net/en/30publications/10policies/c8/)  
(WMA International Code of Medical Ethics, full text)

I think this also is applicable to the ethics and moral of the medical associations.

With best wishes

Mauri Johansson, MD, Master in Humanities and Health Studies  
Specialist in Community and Occupational Medicine (including  
Environmental Medicine)  
Bording, Denmark  
April 6, 2014

#### *OPEN LETTER*

*To*

AMA President Dr. Steve Hambleton  
Vice President Professor Geoffrey Dobb  
All Members of AMA Federal Council

*Copy:* the Australian NHMRC, The Presidents of the Finnish,  
Swedish, Norwegian, Icelandic and Danish Medical Associations,  
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## Carbon Footprint of Wind Turbines

- Posted by [Brad Blake](#) on August 4, 2014 at 10:46pm
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This is a thought provoking essay from an Australian website called "Andy's Rant".

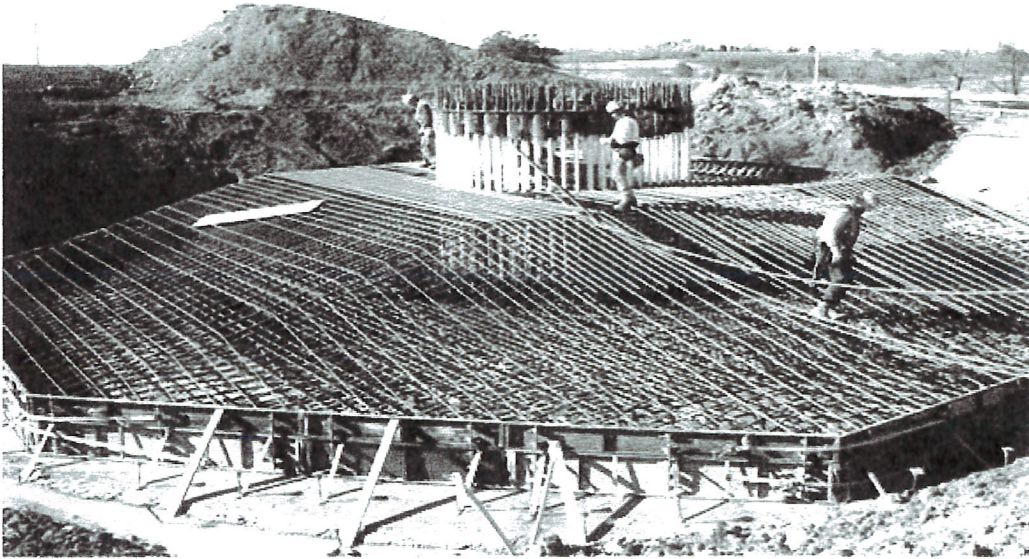
<http://www.andysrant.com/>; His carbon focus is mostly on the base but frequently the question has come up about what goes into the base and the fact that manufacturing cement is a heavy carbon emitting process. I thank him for that analysis alone. He also states what I have been saying all along in this battle to educate the public about the

false promises of wind: "wind turbines will incur far more carbon dioxide emissions in their manufacture and installation than what their operational life will ever save."

Measures are metric, so if you don't think in metric, open another window and set up a metric converter (meters to feet, etc.)

## So What's the Carbon Footprint of a Wind Turbine

with 45 Tons of Rebar and 481 M3 of Concrete?



Its carbon footprint is massive – try 241.85 tons of CO<sub>2</sub>.

Here's the breakdown of the CO<sub>2</sub> numbers.

To create a 1,000 Kg of pig iron, you start with 1,800 Kg of iron ore, 900 Kg of coking coal 450 Kg of limestone. The blast furnace consumes 4,500 Kg of air. The temperature at the core of the blast furnace reaches nearly 1,600 degrees C (about 3,000 degrees F).

The pig iron is then transferred to the basic oxygen furnace to make steel.

1,350 Kg of CO<sub>2</sub> is emitted per 1,000 Kg pig iron produced.

A further 1,460 Kg CO<sub>2</sub> is emitted per 1,000 Kg of Steel produced so all up 2,810 Kg CO<sub>2</sub> is emitted.

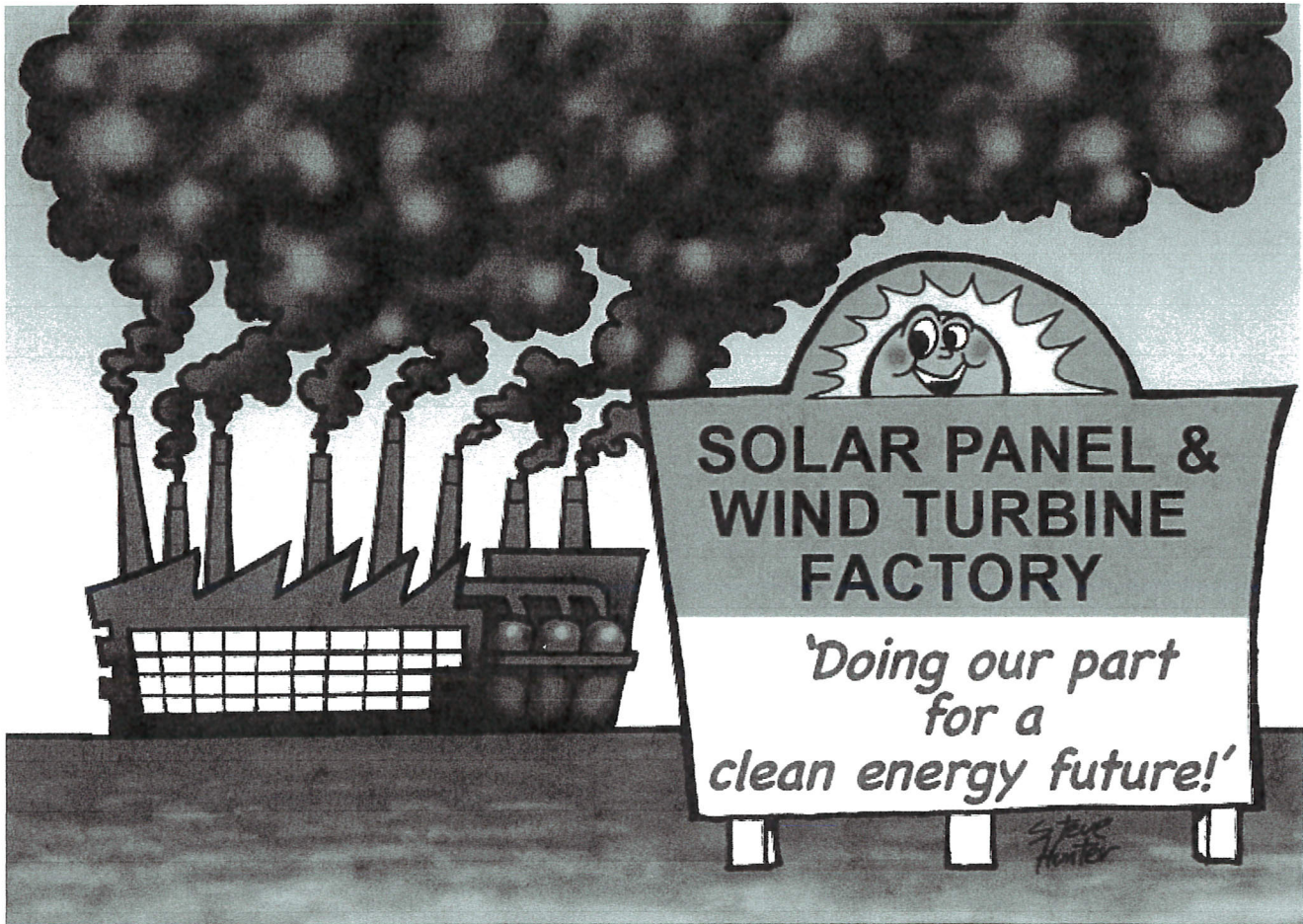
45 tons of rebar (steel) are required so that equals 126.45 tons of CO<sub>2</sub> are emitted.

To create a 1,000 Kg of Portland cement, Calcium carbonate (60%), silicon (20%), aluminium (10%), iron (10%) and very small amounts of other ingredients are heated in a large kiln to over 1,500 degrees C to convert the raw materials into clinker. The clinker is then interground with other ingredients to produce the final cement product. When cement is mixed with water, sand and gravel forms the rock-like mass know as concrete.

An average of 927 Kg of CO<sub>2</sub> is emitted per 1,000 Kg of Portland cement. On average, concrete has 10% cement, with the balance being gravel (41%), sand (25%), water (18%) and air (6%). One cubic metre of concrete weighs approx. 2,400 Kg so approx. 240 Kg of CO<sub>2</sub> is emitted for every cubic metre.

481m<sup>3</sup> of concrete are required so that equals 115.4 tons of CO<sub>2</sub> are emitted.

Now I have not included the emissions of the mining of the raw materials or the transportation of the fabricated materials to the turbine site so the emission calculation above would be on the low end at best.



#### Extra stats about wind turbines you may not know about:

The average towering wind turbine being installed around beautiful Australia right now is over 80 metres in height (nearly the same height as the pylons on the Sydney Harbour Bridge). The rotor assembly for one turbine – that's the blades and hub – weighs over 22,000 Kg and the nacelle, which contains the generator components, weighs over 52,000 Kg.

All this stands on a concrete base constructed from 45,000 Kg of reinforcing rebar which also contains over 481 cubic metres of concrete (that's over 481,000 litres of concrete – about 20% of the volume of an Olympic swimming pool).

Each turbine blade is made of glass fibre reinforced plastics, (GRP), i.e. glass fibre reinforced polyester or epoxy and on average each turbine blade weighs around 7,000 Kg each.

Each turbine has three blades so there's 21,000 Kgs of GRP and each blade can be as long as 50 metres.

A typical wind farm of 20 turbines can extend over 101 hectares of land (1.01 Km<sup>2</sup>).

Each and every wind turbine has a magnet made of a metal called neodymium. There are 2,500 Kg of it in each of the behemoths that have just gone up around Australia.

The mining and refining of neodymium is so dirty and toxic - involving repeated boiling in acid, with radioactive thorium as a waste product - that only one country does it - China.

All this for an intermittent highly unreliable energy source.

And I haven't even considered the manufacture of the thousands of pylons and tens of thousands of kilometres of transmission wire needed to get the power to the grid. And what about the land space needed to house thousands of these bird chomping death machines?

You see, renewables like wind turbines will incur far more carbon dioxide emissions in their manufacture and installation than what their operational life will ever save.

Maybe it's just me, but doesn't the "cure" of using wind turbines sound worse than the problem? A bit like amputating your leg to "cure" your in-growing toe nail?

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## Hannah Pingree on the Maine expedited wind law



**Hannah Pingree - Director of Maine's Office of Innovation and the Future**

"Once the committee passed the wind energy bill on to the full House and Senate, lawmakers there didn't even debate it. They passed it unanimously and with no discussion. House Majority Leader Hannah Pingree, a Democrat from North Haven, says legislators probably didn't know how many turbines would be constructed in Maine."

<https://pinetreewatch.org/wind-power-bandwagon-hits-bumps-in-the-road-3/>



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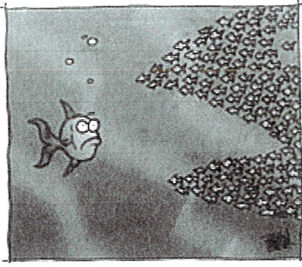
**\*\*\*\*\* IF LINKS BELOW DON'T WORK, GOOGLE THEM\*\*\*\*\***

**(excerpts) From Part 1 – On Maine’s Wind Law** “Once the committee passed the wind energy bill on to the full House and Senate, lawmakers there didn’t even debate it. They passed it unanimously and with no discussion. House Majority Leader Hannah Pingree, a Democrat from North Haven, says legislators probably didn’t know how many turbines would be constructed in Maine if the law’s goals were met.” . – Maine Center for Public Interest Reporting, August 2010 <https://www.pinetreewatchdog.org/wind-power-bandwagon-hits-bumps-in-the-road-3/>**From Part 2 – On Wind and Oil** Yet using wind energy doesn’t lower dependence on imported foreign oil. That’s because the majority of imported oil in Maine is used for heating and transportation. And switching our dependence from foreign oil to Maine-produced electricity isn’t likely to happen very soon, says Bartlett. “Right now, people can’t switch to electric cars and heating – if they did, we’d be in trouble.” So was one of the fundamental premises of the task force false, or at least misleading?" <https://www.pinetreewatchdog.org/wind-swept-task-force-set-the-rules/>**From Part 3 – On Wind-Required New Transmission Lines** Finally, the building of enormous, high-voltage transmission lines that the regional electricity system operator says are required to move substantial amounts of wind power to markets south of Maine was never even discussed by the task force – an omission that Mills said will come to haunt the state. “If you try to put 2,500 or 3,000 megawatts in northern or eastern Maine – oh, my god, try to build the transmission!” said Mills. “It’s not just the towers, it’s the lines – that’s when I begin to think that the goal is a little farfetched.” <https://www.pinetreewatchdog.org/flaws-in-bill-like-skating-with-dull-skates/>

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Sign up today and lend your voice and presence to the steadily rising tide that will soon sweep the scourge of useless and wretched turbines from our beloved Maine countryside. For many of us, our little pieces of paradise have been hard won. Did the carpetbaggers think they could simply steal them from us?

We have the facts on our side. We have the truth on our side. All we need now is **YOU**.



“First they ignore you, then they laugh at you, then they fight you, then you win.”

-- Mahatma Gandhi

"It's not whether you get knocked down: it's whether you get up."

**Vince Lombardi**

**Task Force membership is free. Please sign up today!**

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