

# BLOWING SMOKE

Correcting Anti-Wind Myths in Ontario



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## INTRODUCTION

Ontario's communities must be more involved in the benefits and management of wind power projects. A \$2.3 trillion<sup>1</sup> dollar race is unfolding around the world over the next decade to see who will gain the investment and jobs from the global clean energy shift now well underway. The degree to which Ontario secures the buy-in of its citizens will determine whether it will remain a leader in this race and in securing the benefits, or whether it will fall behind and be stuck with an old, polluting economy.

There is no doubt that the building of a wind power facility brings change to where it is located. Some people see the aesthetics of windmills as hopeful and beautiful while others see them as intrusive and ugly. Some benefit from rent or jobs related to the project, while others nearby do not. Taken together, the change, particularly when rapid, can bring controversy. This is now true in parts of Ontario.

Yet into these controversies has stepped a small group of anti-wind activists who have taken advantage of local concern to spread misinformation and fear. They have claimed, with no scientific backing, that there are health impacts. They have claimed, counter to the evidence, that wind power doesn't work or doesn't have benefits. They have succeeded in creating a misinformed backlash against wind power that now jeopardizes jobs, investment and environmental progress in Ontario.

A big part of the response to this situation must come from better practices by the Ontario government and wind power companies. More community-owned power projects must emerge to spread greater benefits to local communities. Earlier and better consultation with local communities must take place as projects are designed and implemented. Environmental assessments must be robust, and facility siting decisions done well. Communities must be real partners in development.

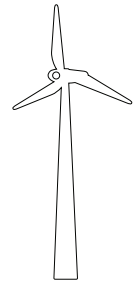
Another part of the response, however, must be to correct the record regarding the misinformation now being spread by anti-wind activists. Communities will not be able to make informed decisions while they are subjected only to a litany of fear-based arguments by those who simply want to shut down the industry. Ontario will not be able to be a leader in clean energy if it is held hostage by those whose only answer is "no."

This report aims to correct the main myths of the anti-wind activists, using credible scientific, mainstream sources to counter the collection of unfounded and unproven opinions promoted by those with only one agenda, to stop wind power.

Whether you live in a local community with a wind power project, are a member of a local council, are a member of the media or are simply an interested party, we hope you will take the time to research the issues for yourself so that you can come to your own informed opinion. Our future depends on getting it right.



## Myth 1: **Health impacts**



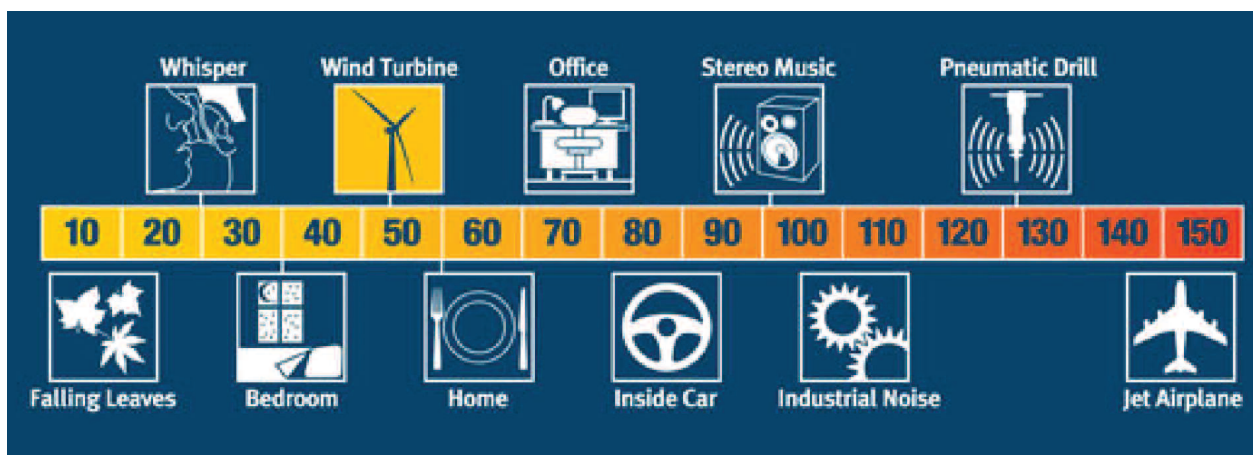
**Reality: Repeated studies around the world have found no scientific evidence of health impacts from wind power projects.**

The use of windmills dates back to Persia as early as 200 BC. Many think of the picturesque Dutch windmills used to drain the Rhine delta in the 14th century. The first electricity generating windmills were installed in 1887 in the U.K. and the U.S.. By 1900 Denmark had about 2,500 windmills in service. Around World War I, American windmill makers were producing 100,000 units a year for water pumping on farms and ranches. In 2010 there were enough installed windmills worldwide to produce 430 terrawatt (TW) hours per year, more than the total electricity demand of the U.K..<sup>3</sup>

In short, people have been living around and using all kinds of windmills for many generations. All of these windmills through history, whether for electricity or otherwise, have made a sound when turning. Now, though, anti-wind activists are alleging that the sounds of windmills lead to health impacts.

Ontario's current setbacks establishing a distance of at least 550m (six football fields long) between windmills and residences are designed to limit a person hearing windmill sounds to under 40 decibels (dB), comparable to indoor background sound, and a level that the World Health Organization says is below the level at which impacts on sleep occur.<sup>4</sup> This is not to say, however, that people cannot hear the sound of wind power installations, or that weather-related events like temperature inversions can't help project sounds further away.<sup>5</sup> Even with the setbacks, good siting decisions must still be made in consultation with the community, and the wind industry must keep developing quieter blades.

### Comparison of everyday noises to utility-scale turbine sounds CREDIT: PEMBINA INSTITUTE, 2009





Even at a distance, some people still find the sound “annoying,” and those perceptions deserve respect. Studies show, however, that perceptions vary from person to person, depending on their other feelings about windmills. A comprehensive study in Sweden and the Netherlands found that four to 10 per cent of interviewees expressed annoyance at windmill sound levels of 35 to 45 dB, but that this was heavily influenced by whether or not people found the windmills visually ugly (more annoyed) or whether they benefitted from them financially (less annoyed).<sup>6</sup> This speaks to the need to ensure that communities should both better benefit from and work together with local wind power projects.

A more granular anti-wind argument concerns alleged health impacts from “low frequency sound” and “infrasound” – those sounds that we find hard to hear and which are everywhere in the environment, coming from rivers, the wind itself and also from human sources like cars. Yet, after an extensive review, Ontario’s Chief Medical Officer of Health concluded that “there is no scientific evidence...to indicate that low frequency sound generated from wind turbines causes adverse health effects.”<sup>7</sup> This finding is echoed in scientific reviews done in the U.S., Australia, and Europe.

“It is clear that some people respond negatively to the noise qualities generated by the operation of wind turbines, but there is no peer-reviewed, scientific data to support a claim that wind turbine are causing disease or specific health conditions.”

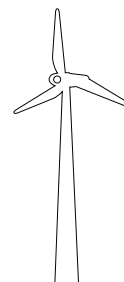
— Evaluation done for **WISCONSIN PUBLIC SERVICE COMMISSION**<sup>39</sup>

While it is important to remain open to new information, it is also important that the information be subject to rigorous scientific analysis, and not taken as fact because it appears on the Internet.

Another issue seized on by anti-wind activists is “shadow flicker” from blades turning in the sunshine that can occur for about 30 minutes at sunrise or sunset when the conditions allow.<sup>8</sup> Flickering shadows or light from all sources affects about five per cent of people who suffer from epilepsy, but the frequency of the flickering needs to be above 2.5 to 3 hertz - well above the rate of flickering associated with windmills turning.<sup>9</sup>

Finally, there are allegations of harm from electromagnetic fields (EMFs) from windmills. While the World Health Organization (WHO) does recognize adverse impacts from human exposure to very high levels of EMFs, such high levels are not associated with windmills.<sup>10</sup> In its extensive study of electromagnetic fields, the WHO has not found any evidence to conclude that exposure to low level electromagnetic fields is harmful to human health.<sup>11</sup>

## Myth 2: **Viability**



**Reality: Wind power has been successfully used for decades and the world is rapidly scaling up its use because it works, particularly in light of climate change.**

The first large windmill to feed electricity into the grid did so in 1941 in Vermont.<sup>12</sup> The first modern wind farm was installed in New Hampshire in 1980.<sup>13</sup> Since that time, about 80 countries have installed wind power projects amounting to almost 200 gigawatts (GW) of capacity<sup>14</sup> – for reference, Canada’s installed electricity capacity from all sources is 125 GW. Worldwide, wind power has been the fastest growing source of power generation for several years.<sup>15</sup>

Yet, despite all this, anti-wind activists claim that wind power isn’t viable. That’s certainly news to those thousands of engineers and utility managers around the world who have been successfully using wind power for decades.

A big part of the anti-wind activists’ argument regarding viability is that the wind does not blow all the time – the power is intermittent. While this is true, the fact that wind power is part of an overall electricity system connected to multiple wind projects in different places, other electricity sources, and other jurisdictions who can trade electricity means that intermittency can be planned for and dealt with. Indeed, it is being successfully dealt with in countries like Denmark, Germany, and Spain which already have much higher levels of wind power on their grids than Ontario does.

Ontario’s Independent Electric System Operator concluded that the province could reach peak wind penetration of 17 per cent with minimal system operation impacts.<sup>16</sup> Denmark is now exploring how it can achieve 50 per cent penetration of wind power by 2025, including the use of ‘storage’ in district heating systems.<sup>17</sup>

Digging deeper, anti-wind activists claim that wind power must have polluting electricity sources as backup, which just isn’t true. Even if it were, it’s bizarre to argue for dropping the clean part of the mix, leaving only the dirty part. The reality is that every megawatt hour of wind power delivered to the grid is a megawatt hour that does not have to come from someplace else, clean or otherwise.

At about 2 per cent of Ontario’s electricity output by fuel type,<sup>18</sup> wind’s intermittency is currently easily dealt with by other sources. Hydro, for example, accounts for about 20 per cent and can be used as a type of storage, drawing down water levels when wind is low and letting them build up when it is strong. Ontario could also explore pumped storage at hydro facilities, using wind power during strong wind periods to pump water back behind dams to release for power later.<sup>19</sup> With a better tie-in to the hydro-rich Quebec grid and more electricity trading with that province, the wind-hydro synergy could improve even more. Manitoba, for example, just signed a \$4 billion deal with Minnesota to trade wind and hydro power.<sup>20</sup>

Finally, anti-wind activists allege that wind power isn't viable because it is too expensive. It must be pointed out that if cost is their concern, then they should be arguing against nuclear power, currently Ontario's largest and most expensive source of power, but we rarely hear this from them.

Clean energy in Ontario is currently awarded preferential pricing under the *Green Energy Act*. Nuclear energy in Ontario receives even greater public supports from the province in the form of bailouts for billions in cost overruns. Polluting energy in Ontario does not yet pay for its health and climate impacts that show up in places like hospital costs, although both the provincial and federal governments are moving forward to impose tougher regulations on these sources. Add to this the billions of upgrades to the grid itself that Ontario is finally moving ahead with after years of neglect, and we are left with a complicated picture of what is expensive.

**“Wind power is a proven generation technology that is working in today's electrical grids around the world.”**

— UNIVERSITY OF MASSACHUSETTS, Renewable Energy Research Laboratory<sup>42</sup>

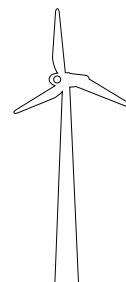
So, while anti-wind activists make simplistic allegations that clean energy is responsible for rising power bills, the truth is that other factors have been much bigger drivers. Ontario's Environmental Commissioner recently analyzed the average power bill and found that clean energy incentives account for only about 0.2 cents of the typical 13 cent per kilowatt hour (kWh) that households pay for electricity, with conservation programs accounting for another 0.2 cents.<sup>21</sup>

Since this will go up, however, as more clean energy projects come on line, it is important to note that the Ontario government is going to review its preferential pricing for clean energy every two years.<sup>22</sup> Other jurisdictions like Germany, France and Spain have reduced clean energy incentives over time as the industry matures and achieves technical strength and economies of scale.<sup>23</sup> At the same time, the global shift towards making fossil fuels bear their true costs on health and the climate will only accelerate, reducing the relative cost of alternatives like wind power. It is expected that by 2020, wind power will be cheaper than both nuclear and fossil fuels.<sup>24</sup>

The future of energy will be clean. Will Ontario embrace the future?



### Myth 3: **Economic & Environmental Benefits**



**Reality: Wind power is creating thousands of jobs across Ontario and letting us reduce the use of harmful fossil fuels.**

Workers in companies like DMI in Fort Erie, Siemens in Tillsonburg, or Samsung in Windsor would be oddly surprised to find that their jobs “don’t actually exist,”<sup>25</sup> as alleged by anti-wind activists. The International Brotherhood of Electrical Workers - Construction Council of Ontario is more than surprised, passionately denouncing efforts to turn the clock back on clean energy as hurting working families, estimating that related projects have resulted in several million person years of employment.<sup>26</sup>

An independent study projects that 80,000 person years of employment will be created in Ontario in the wind industry between 2011 and 2018.<sup>27</sup> These jobs are diverse, ranging from component manufacturing, surveying, engineering, construction, materials supply, operations managers, repair crews, and more.

This sector offers more than a boost for Ontario’s struggling manufacturing base. It is also creating a growing field of education and research. Schools like Kingston’s St. Lawrence’s College are training the next generation of green energy experts, while programs like Repower Ontario help workers make the transition to new careers in the green energy industry.<sup>28</sup>

Another argument seized on by anti-wind activists is that since clean energy incentives are paid for through electricity bills, this drives up the cost of power for industrial users overall, driving away jobs. Some in Ontario are citing the infamous “Spanish” study, a report done by a Spanish author with links to Exxon-Mobil that claimed a net job loss from renewable incentives in Spain. But the report has been thoroughly debunked by the U.S. government and others, including the right-leaning *Wall Street Journal*.<sup>29</sup>

Nonetheless, respected bodies like Ontario’s Task Force on Competitiveness, Productivity and Economic Progress has flagged this issue as one to watch, and has opened a discussion about lessons from places like Germany with a longer history of promoting renewable energy than Ontario.<sup>30</sup> It must be noted, though, that the traditionally conservative Germans, under conservative Chancellor Merkel, have recently pledged to double down on renewable energy, rather than move away from it.<sup>31</sup> When faced with tough choices on the future of energy, one of the world’s leading economies with a long history of renewable energy has decided that even more of it is a big part of the answer.

Ontario must welcome an honest debate on how to keep improving policies to keep Ontario a leader in the global transition to a clean energy economy while staying competitive. As stated above, Ontario has committed to reviewing its clean energy incentives every two years. Related policy tools also come into play. The Task Force, for example, advocates a carbon tax to drive renewable energy development and innovation.<sup>32</sup> There is also no reason, though, why a carbon tax and clean energy incentives cannot work hand-in-hand, with revenues from the former helping to finance the latter, for example.



As noted above, every kilowatt hour of electricity from wind power is one less that may need to come from burning fossil fuels to drive turbines. The Ontario Medical Association estimates that air pollution causes thousands of premature deaths each year as well as diseases such as asthma.<sup>33</sup> The Ontario Centre for Climate Impacts and Adaptation Resources outlines other costs to the province in the form of increased heat days, decreases in lake water levels, more fire, drought and pests in our forests, extreme weather events, and more invasive species.<sup>34</sup>

Make no mistake, the stark reality of climate change is forcing us to shift rapidly away from fossil fuels and towards renewable energy. This will also be true of our transportation system, which will necessitate the need for more electricity in that sector, while also providing a new source of storage with the widespread deployment of battery technology in electric vehicles. While Ontario must adjust its clean energy policy over time to learn from experience and to adjust to new developments, there is no turning back on the overall drive towards the deployment of renewable energy, including wind power.

“There is no end to the potential of alternative, non-polluting energy sources.”

— PRIME MINISTER STEPHEN HARPER<sup>44</sup>



**“Concerns about fairness and equity may also influence attitudes towards wind farms and allegations about effects on health. These factors deserve greater attention in future developments.”**

ONTARIO CHIEF MEDICAL OFFICER OF HEALTH <sup>35</sup>

**“Although opposition to wind farms on aesthetic grounds is a legitimate point of view, opposition to wind farms on the basis of potential adverse health consequences is not justified by the evidence.”**

DR. DAVID COLBY, Chatham-Kent Acting Medical Officer of Health <sup>36</sup>

**“The perception of the noise is also influenced by the attitude of the hearer towards the sound source. This is sometimes called the nocebo effect, which is the opposite of the better known placebo effect. If people have been preconditioned to hold negative opinions about a noise source, they are more likely to be affected by it.”**

NATIONAL HEALTH AND MEDICAL RESEARCH COUNCIL, Australian Government <sup>37</sup>

**“Anti-wind information is widely available for free online and relatively simplistic, while the science debunking these claims is complex and often hidden behind an academic journal’s pay-walls.”**

Ontario journalist ANDREA MCDOWELL <sup>38</sup>

**“It is clear that some people respond negatively to the noise qualities generated by the operation of wind turbines, but there is no peer-reviewed, scientific data to support a claim that wind turbines are causing disease or specific health conditions.”**

Evaluation done for WISCONSIN PUBLIC SERVICE COMMISSION <sup>39</sup>

**“The articles cited by those who are in favor of a [wind turbine] moratorium are either from non-peer reviewed journals (though some are labeled as “peer reviewed”) or are misinterpreted analyses from peer reviewed journals...If there is any evidence for a moratorium, it is most likely on further use of fossil fuels, given their known and common effects on the health of our population.”**

DORA ANN MILLS, Maine Center for Disease Control and Prevention <sup>40</sup>

**“Wind electricity is both variable and, to some degree, unpredictable, but experience and detailed studies from many regions have shown that the integration of wind energy generally poses no insurmountable technical barriers.”**

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE <sup>41</sup>



**“Wind power is a proven generation technology that is working in today’s electrical grids around the world.”**

UNIVERSITY OF MASSACHUSETTS, Renewable Energy Research Laboratory<sup>42</sup>

**“Renewable energy is an important new source of power generation which will help to reduce CO<sub>2</sub> emissions, stabilize energy costs and support long term prosperity for Canadian businesses.”**

RBC ROYAL BANK<sup>43</sup>

**“Annual income from the wind development has allowed this municipality to achieve sustainability and to reduce property taxes.”**

JIM VANDENHOEK, former mayor of Frontenac Islands<sup>45</sup>

**“There is no end to the potential of alternative, non-polluting energy sources.”**

PRIME MINISTER STEPHEN HARPER<sup>44</sup>

**“Design of turbine blades is of course continually being improved; after all, the noise is a sign of inefficiency (rotational energy sacrificed by aerodynamic turbulence), so newer blades are likely to be quieter.”**

ACOUSTIC ECOLOGY INSTITUTE<sup>45</sup>



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