

# WIND ENERGY – THE FACTS

## WIND FARMS AND HEALTH

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There are nearly 250,000 wind turbines across sites all over the world – many of them close to people’s houses.

Reviews conducted by leading health and research organisations from all over the world, including Health Canada, the Australian Medical Association and Australia’s National Health and Medical Research Council, have found no direct link between wind farms and health effects.

Opponents of wind farms have claimed that ‘infrasound’, or sound that is too low-frequency for humans to hear, can cause negative health effects. However, there have been multiple scientific, thorough, peer-reviewed studies on wind farm noise that have found that infrasound from wind farms is not a problem.

### >> STUDIES FROM GOVERNMENT HEALTH AND ENVIRONMENT AUTHORITIES

#### THE NATIONAL HEALTH AND MEDICAL RESEARCH COUNCIL

The top Australian authority on health issues, the National Health and Medical Research Council (NHMRC), conducted a review into wind farms and potential health issues in 2009, and is currently undertaking a more detailed review of the evidence<sup>1</sup>. A 2010 NHMRC report concluded:

**“This review of the available evidence, including journal articles, surveys, literature reviews and government reports, supports the statement that: There are no direct pathological effects from wind farms and that any potential impact on humans can be minimised by following existing planning guidelines.”**

The NHMRC also released a draft information paper on wind farms and human health<sup>2</sup> for public consultation in early 2014. The paper summarised the evidence on whether wind farms cause health effects in humans, and provided an overview of the process by which the evidence was identified, critically appraised and interpreted by the reference group.

That information paper also found that: **“There is no reliable or consistent evidence that wind farms directly cause adverse health effects in humans.”**

#### HEALTH CANADA

Health Canada, Canada’s national health organisation, released preliminary results of a study into the effect of wind farms on human health in 2014<sup>3</sup>. The study was initiated in 2012 specifically to gather new data on wind farms and health. The study considered physical health measures that assessed stress levels using hair cortisol, blood pressure and resting heart rate, as well as measures of sleep quality. More than 4000 hours of wind turbine noise measurements were collected and a total of 1238 households participated.

No evidence was found to support a link between exposure to wind turbine noise and any of the self-reported illnesses. Additionally, the study’s results did not support a link between wind turbine noise and stress, or sleep quality (self-reported or measured). However, an association was found between increased levels of wind turbine noise and individuals reporting to be annoyed.

- 1 National Health and Medical Research Council, 2014, Wind Farms and human health. Available at <https://www.nhmrc.gov.au/your-health/wind-farms-and-human-health>
  - 2 National Health and Medical Research Council, 2014, NHMRC Draft Information Paper: Evidence on Wind Farms and Human Health Available [https://consultations.nhmrc.gov.au/public\\_consultations/wind\\_farms](https://consultations.nhmrc.gov.au/public_consultations/wind_farms)
  - 3 Health Canada 2014, Wind Turbine Noise and Health Study: Summary of Results. Available at <http://www.hc-sc.gc.ca/ewh-semt/noise-bruit/turbine-eoliennes/summary-resume-eng.php>
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### NEW SOUTH WALES HEALTH DEPARTMENT

In 2012, the NSW Health Department provided written advice to the NSW Government that stated existing studies on wind farms and health issues had been examined and no known causal link could be established.

NSW Health officials stated that fears that wind turbines make people sick are 'not scientifically valid' and that the arguments mounted by anti-wind farm campaigners are unconvincing. The officials wrote that there was no evidence for 'wind turbine syndrome', a collection of ailments including sleeplessness, headaches and high blood pressure that some people believe are caused by the noise of spinning blades.

### VICTORIAN DEPARTMENT OF HEALTH

The Victorian Department of Health released two booklets on wind farms, sound and health in May 2013<sup>4</sup>. One focused on technical information about the nature of sound and the other contained community information.

The community information booklet concluded that: **"The evidence indicates that sound can only affect health at sound levels that are loud enough to be easily audible. This means that if you cannot hear a sound, there is no known way that it can affect health. This is true regardless of the frequency of the sound."**

### SOUTH AUSTRALIAN EPA INFRASOUND STUDY

A report released in January 2013 by the South Australian Environment Protection Authority (EPA)<sup>5</sup> found that the level of infrasound from wind turbines is insignificant and no different to any other source of noise, and that the worst contributors to household infrasound are air-conditioners, traffic and noise generated by people.

The study included several houses in rural and urban areas, houses both adjacent to a wind farm and away from turbines, and measured the levels of infrasound with the wind farms operating and also switched off.

There were no noticeable differences in the levels of infrasound under all these different conditions. In fact, the lowest levels of infrasound were recorded at one of the houses closest to a wind farm, whereas the highest levels were found in an urban office building.

The EPA's study concluded that the level of infrasound at houses near wind turbines was no greater than in other urban and rural environments, and stated that: **"The contribution of wind turbines to the measured infrasound levels is insignificant in comparison with the background level of infrasound in the environment."**

## >> OTHER HEALTH AUTHORITIES

### THE AUSTRALIAN MEDICAL ASSOCIATION

The Australian Medical Association put out a position statement on Wind Farms and Health in 2014<sup>6</sup>.

The statement said: **"The available Australian and international evidence does not support the view that the infrasound or low frequency sound generated by wind farms, as they are currently regulated in Australia, causes adverse health effects on populations residing in their vicinity. The infrasound and low frequency sound generated by modern wind farms in Australia is well below the level where known health effects occur, and there is no accepted physiological mechanism where sub-audible infrasound could cause health effects."**

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4 Department of Health, Victoria, 2013, Windfarms. Available <http://www.health.vic.gov.au/environment/windfarms.htm>

5 EPA South Australia, 2013, Wind farms. Available [http://www.epa.sa.gov.au/environmental\\_info/noise/wind\\_farms](http://www.epa.sa.gov.au/environmental_info/noise/wind_farms)

6 Australian Medical Association, 2014, Wind farms and health. Available <https://ama.com.au/position-statement/wind-farms-and-health-2014>

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### >> ACADEMIC RESEARCH

#### MASSACHUSETTS INSTITUTE OF TECHNOLOGY (MIT)

MIT released a critical review of the scientific literature in December 2014<sup>7</sup>. The review took into consideration health effects such as stress, annoyance and sleep disturbance, as well as other effects that have been raised in association with living close to wind turbines.

The study found that: **“No clear or consistent association is seen between noise from wind turbines and any reported disease or other indicator of harm to human health.”**

The report concluded that living in close proximity to wind farms does not result in the worsening of, and might even improve, the quality of life in that particular region.

#### UNIVERSITY OF AUCKLAND INFRASOUND STUDY ON SYMPTOM EXPECTATION

A study from the University of Auckland published by the American Psychological Association in March 2013<sup>8</sup> considered the idea that health complaints from wind farms could be caused by an increase in discussion and awareness of health risk, rather than actual infrasound. The studies tested whether exposure to the anti-wind farm health effects campaign could create a ‘symptom expectation’ and then actual symptoms in healthy volunteers.

The study exposed 60 participants to ten minutes of infrasound and ten minutes of sham infrasound. Prior to exposure, half of the volunteers were given information that indicated wind farms could cause negative health effects, and the other half were given information on the scientific position that wind farm infrasound does not affect human health.

Before and during the sound exposure, both groups reported their health symptoms. Results showed that the group that had viewed information on negative health effects and therefore expected to feel ill did experience symptoms of illness, while the other group did not.

The study concluded that: **“Healthy volunteers, when given information about the expected physiological effect of infrasound, reported symptoms that aligned with that information, during exposure to both infrasound and sham infrasound.”**

#### UNIVERSITY OF SYDNEY STUDY ON WIND FARM NOISE COMPLAINTS

A 2013 study from University of Sydney Professor of Public Health Simon Chapman examined all complaints made about wind farm noise or health problems at 49 Australian wind farms<sup>9</sup>.

The study found that despite there being 32,677 people who lived within 5 kilometres of a wind farm, just 120 people – or one in 272 – had ever made a formal complaint, appeared in a news report or sent a complaining submission to government. The study also found that some complainants took many years to voice their first complaint, when wind farm opponents regularly warn that the ill effects can be almost instant.

This work supported the findings from the University of Auckland study that anxiety and fear about wind turbines spread by anti-wind farm groups can cause people who hear the frightening information to develop symptoms.

This means that discussion within communities about the alleged health effects of wind farms may trigger the very symptoms about which residents are concerned. If this is the case, media coverage of the wind farm debate must be balanced, so that undue emphasis is not placed on purported health risk.

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7 Journal of Occupational and Environmental Medicine, 2014, Wind Turbines and Health: A Critical Review of the Scientific Literature Available [http://journals.lww.com/joem/Abstract/2014/11000/Wind\\_Turbines\\_and\\_Health\\_\\_A\\_Critical\\_Review\\_of\\_the.9.aspx](http://journals.lww.com/joem/Abstract/2014/11000/Wind_Turbines_and_Health__A_Critical_Review_of_the.9.aspx)

8 American Psychological Association, 2013, Can expectations produce symptoms from infrasound associated with wind turbines? Available <http://psycnet.apa.org/psycinfo/2013-07740-001/>

9 University of Sydney, 2013, Spatio-temporal differences in the history of health and noise complaints about Australian wind farms: evidence for the psychogenic “communicated disease” hypothesis. Available <http://ses.library.usyd.edu.au/handle/2123/8977>

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### >> INQUIRIES AND COURT CASES

#### **STONY GAP WIND FARM IN THE ENVIRONMENT, RESOURCES AND DEVELOPMENT COURT OF SOUTH AUSTRALIA**

After Goyder Council in South Australia chose to refuse planning permission for the Stony Gap wind farm without grounds, the case went to court in late 2014. During the case, the court heard evidence from Sarah Laurie of the Waubra Foundation and acoustician Steven Cooper, and found both to be lacking. The court then overturned the decision, approving the project almost three years after the development application was lodged.

The decision was very clear in its summary judgement of the initial refusal, finding that: **“There is no basis for the refusal of development plan consent to the proposed development on the grounds of health effects.”**

#### **FEDERAL SENATE COMMITTEE INQUIRY**

The Federal Senate Committee Inquiry into a bill calling for regulation of excessive noise from wind farms investigated health issues in late 2012.

The final report<sup>10</sup> contained the following findings:

**“The number of health-related complaints about wind farms is small in proportion to the number of people living near these facilities. The numbers also vary greatly from one facility to the next, for reasons not apparently related to the number of residents in the area.”**

One of the most interesting pieces of information provided to the committee was a research paper that has since been accepted for publication in the well-regarded journal Health Psychology in early 2013. This paper found that the effects of infrasound can be felt by people not exposed to infrasound but who expected that it would make them feel unwell – a hypothesis that has since been tested by researchers at the University of Auckland (more details above).

The relevant extracts from the Senate committee’s final report are below:

**“Late in the inquiry process, the committee was provided with recent research, peer-reviewed and accepted for publication by the leading journal Health Psychology, but not yet released. The research comprises a controlled double blind study, in which subjects were exposed to infrasound and sham infrasound... Conclusion: Healthy volunteers, when given information about the expected physiological effect of infrasound, reported symptoms which aligned with that information, during exposure to both infrasound and sham infrasound.”**

Overall, the Senate committee found that wind farms do not create health problems:

**“The committee concludes that, while it is possible that the human body may detect infrasound in several ways, there is no evidence to suggest that inaudible infrasound (either from wind turbines or other sources) is creating health problems. In contrast, there is an established literature confirming the existence of psychogenic, or nocebo, effects in general, and at least one study suggesting they may be responsible for symptoms in some wind turbine cases.”**

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10 Environment and Communications Legislation Committee report [http://www.qph.gov.au/Parliamentary\\_Business/Committees/Senate/Environment\\_and\\_Communications/Completed%20inquiries/2010-13/renewableenergy2012/report/~/\\_media/wopapub/senate/committee/ec\\_ctte/completed\\_inquiries/2010-13/renewable\\_energy\\_2012/report/report.ashx](http://www.qph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/Completed%20inquiries/2010-13/renewableenergy2012/report/~/_media/wopapub/senate/committee/ec_ctte/completed_inquiries/2010-13/renewable_energy_2012/report/report.ashx)