PALING YARDS WIND FARM
HEALTH

PURPOSE

Health concerns are often cited by the public in relation to wind farm development, including concerns as to potential adverse impacts on the health and wellbeing of people in the immediate vicinity of the wind farms. These health concerns relate to a range of issues including noise pollution (including infrasound noise), vibrations, shadow flickering, electromagnetic interference, blade glint, blade throws, ice shedding, tower failure, and the risk of fire due to the introduction of electrical devices and mechanical components.

This assessment draws on Australian and international research to detail the potential impacts on human health associated with the construction and operational phase of wind farm developments.

PHOTO Levels Road (Proposed View)

KEY FINDINGS & IMPACTS

Following a review of the current literature and scientific data, the national health and medical research council, Australia's preeminent medical research body, found that there is currently no published scientific evidence to positively link wind turbines with adverse health effects. Based on current evidence, modern wind farms do not pose a threat to human health and safety as long as current planning guidelines are followed.

The Social And Economic Impacts Of Rural Wind Farms Senate Inquiry

A Community Affairs References Committee (the Committee) was established by the Australian Senate to investigate any adverse health effects for people living in close proximity to wind farms and the economic impact of rural wind farms. The report, The Social and Economic Impacts of Rural Wind Farms was released in June 2011 (the report). The Committee was unable to establish a direct link between the noise generated by wind farms and negative impacts on human health.

However, the report recommends that the NHMRC should continue to review the research into wind farm health effects. The Committee did not support a mandatory setback distance around wind farms, instead labelling it 'arbitrary' and preferred to apply setback distances using scientific measurements of sound effects.

Noise Impacts On Health

A key issue amongst the health concerns associated with wind farm developments is impacts relating to noise. Wind turbines produce mechanical noise from the motor or gearbox, as well as aerodynamic noise, produced by wind passing over the blade of the wind turbine. As well as the general range of sound emissions, older wind turbines also generate infrasound (NHMRC 2010).

The NHMRC Report noted that, there is no reliable evidence that sounds below the hearing threshold produce physiological or psychological effects (Berglund 1995 cited in NHMRC 2010). The Minnesota Department of Health (2009) found that if functioning correctly, mechanical noise from modern wind turbines should not be an issue (MDH 2009 cited in NHMRC 2010). Dr Mark Diesendorf, the Deputy Director of the Institute of Environmental Studies at the University of NSW, states that infrasound was a problem with older wind turbine technology (NSW Legislative Council 2009), and that infrasound is virtually undetectable at a range of 400 metres (NSW Legislative Council 2009).

Recently, the NSW Health Department was consulted regarding the proposed Bodangora and Collector Wind Farm projects. Both of these projects are now approved. The Department's comments were noted in the NSW Government Planning Assessment Commission's Determination Reports for Bodangora and Collector Wind Farms on 30 August 2013 and 2 December 2013 respectively. In relation to the Bodangora Wind Farm (33 turbines) and the Collector Wind Farm (55 turbines), the NSW Health Department stated that:

- there is no published scientific evidence to link wind turbines with adverse health effects
- noise from turbines may cause some disturbance to people living in close proximity (less than 700 metres from the turbines) but that the 2km buffer distance provided in [each] instance was considered to be very conservative and precautionary from a health perspective
- there is no reliable evidence that sound below the hearing threshold produces physiological or psychological effects, which is consistent with the advice of the World Health Organisation, refer to Chapters 11.4.2 – 11.4.4 below (NSW Health Department cited in NSW Planning Assessment Commission 2013a and NSW Planning Assessment Commission 2013b)

The Senate's Communications Legislation Committee (2012) did not find a causal link between the relatively low levels of noise that are produced by wind farm noise and the symptoms reported by those living near wind turbines.

The Community Affairs References Committee recommended in their report (June 2011) that the noise standards adopted by the states and territories for the planning and operation of rural wind farms should include appropriate measures to calculate the impact of low frequency noise and vibrations indoors at impacted dwellings.

Vibroacoustic Impacts On Health

Scientific evidence details Vibroacoustic Disease as the clinical manifestation of a systemic disease that develops after long-term exposure to noise (≥10 yr) which is characterized by large pressure amplitude (≥90 dB SPL) within the lower frequency bands (≤500 Hz) (Branco & Rodriguez 1999).

In relation to concerns regarding Vibroacoustic Disease, the NSW Legislative Committee (2009) found that there does not appear to be any evidence to support the proposition that vibrations from wind turbines can cause this disease (NSW Legislative Committee 2009).

Wind Turbine Syndrome

The existence of 'Wind Turbine Syndrome' is debatable and insufficient evidence has been presented to justify its existence as a health issue (NSW Legislative Committee 2009). While Nina Pierpont's research has been heavily drawn upon, the credibility of her work is questioned by scientists, particularly by acoustic specialists (NHMRC 2010).

Pierpont's reports were not published in peer-reviewed journals, the sample sizes used in the research are particularly small, and the conclusions are largely drawn from anecdotal evidence. The latter is known to be particularly unreliable and holds very little weight in medical circles. In addition, it is noted that many of the participants in Dr Pierpont's study had pre-existing medical conditions that may distort her findings (NSW Legislative Council 2009).

The Independent Expert Panel for MDEP and MDPH recently reviewed the literature surrounding this Syndrome and found that there is no evidence for a set of health effects, from exposure to wind turbines that could be characterized as a 'Wind Turbine Syndrome'(MDEP&MDPH 2012).

Shadow Flicker And Electromagnetic Impacts On Health

No experience of unreasonable or dangerous shadow flicker occurring in NSW as a result of wind farms has been presented.

The EPHC Draft National Wind Farm Development Guidelines maintain that risks such as epileptic seizures and the distraction of drivers as a result of shadow flicker are 'negligible' (EPHC 2009 cited in NSW Legislative Council 2009), for the following reasons:

THERE IS CURRENTLY NO PUBLISHED SCIENTIFIC EVIDENCE TO POSITIVELY LINK WIND TURBINES WITH ADVERSE HEALTH EFFECTS

- Less than 0.5% of the population are subject to epilepsy at any one time, and of these, approximately 5% are susceptible to strobing light.
- Most commonly (96% of the time), those that are susceptible to strobe lighting are affected by frequencies in excess of 8 Hz. Wind turbines cause shadow flicker at frequencies of around 1 Hz or less.
- Alignment of three or more conventional horizontal axis wind turbines could cause shadow flicker frequencies in excess of 2.5 Hz; however, this would require a particularly unlikely turbine configuration (EPHC 2009 cited in NHMRC 2010).

The electromagnetic fields produced by the wind farm also do not pose a threat to public health, as the closeness of the electrical cables between wind turbine generators to each other, and shielding with metal armour effectively eliminate electromagnetic fields.

Impacts On Psychological Wellbeing

Unwanted proposals and the development approval processes can have impacts on stress levels and psychological wellbeing. It is almost impossible to propose a project of the scale of a wind farm, and not cause some polarisation of views and disruption in the affected community.

The impact of wind farms on the wellbeing of communities in NSW may be compounded by other issues raised, such as concerns associated with the planning process or the level of community consultation.

People who are opposed to wind farm projects in their local area may become anxious, causing stress related illnesses, which are genuine health effects arising from their worry. However, these are not direct impacts of the wind farm/turbines itself.

The NHMRC found that people who benefit economically from wind turbines were less likely to report annoyance, despite exposure to similar sound levels as people who were not economically benefiting.

The University of Sydney in March 2013 released a public health study that further examined the link between wind farms and health impacts.

Only 120 individuals across Australia representing approximately 1 in 272 residents living within 5km of wind farms appear to have complained, with 81 (68%) of these being residents near 5 wind farms which have been heavily targeted by anti-wind farm groups. About 1 in 107 of those living near turbines >1MW have ever complained. The large majority (82%) of health and noise complaints commenced after 2009 when anti-wind farm groups began to add health concerns to their wider opposition. In the preceding years, health or noise complaints were rare despite large and small turbined wind farms having operated for many years.

The study therefore suggests that wind farms may be harmless, and it is the expectation of harm from those living in proximity of the project that causes actual harm.

RESPONSE TO FINDINGS

Union Fenosa Wind Australia Pty Ltd is committed to undertaking an appropriate level of community consultation, in order to appropriately inform and involve the public in the development of the project.

The following measures are recommended to mitigate and negate any health related impacts of the project:

- Provide accessible information on wind farm impacts including the benefits, and project details, process and updates.
- Install warning signs to alert the public against unauthorised site entry.
- Restrict access to the wind turbines and associated infrastructure to reduce personal injury and public hazards, including locked access to towers and electrical equipment, warning signs with postings of 24-hour emergency numbers, and fenced storage yards for equipment and spare parts.
- The wind generator blades, tower and nacelle are to be treated/painted with a non-reflective white or off white colour to reduce glare and minimise blade glint.
- Noise levels should comply with the applicable noise guidelines, unless an agreement is in place with the effected landowner(s), and in any case should not be more than the 45dB(A) noise limit (for indoors) recommended by the World Health Organisation (WHO) publication Guidelines for Community Noise.
- Shadow flicker at any dwelling should not exceed 30 hours per year unless an agreement is in place with the effected landowner(s).
- Wind turbines to be equipped with sensors that can react to any imbalance in the rotor blades and shut down the turbine if necessary.
- Regularly maintain and service all wind turbines.

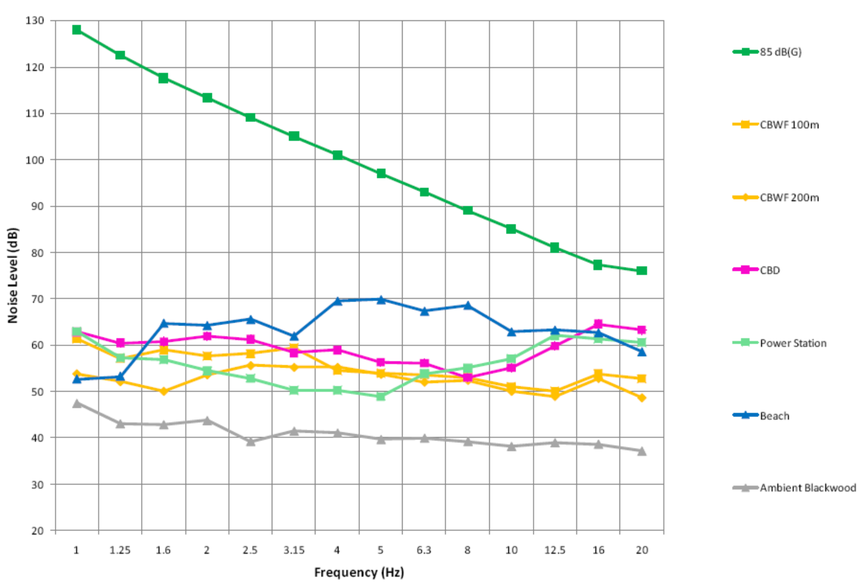

FIGURE 43 Summary of Measurements Cape Bridgewater Wind Farm
SOURCE Extract from Infrasound measurments from Wind Farms and other sources, Sonus Pty Ltd 2010

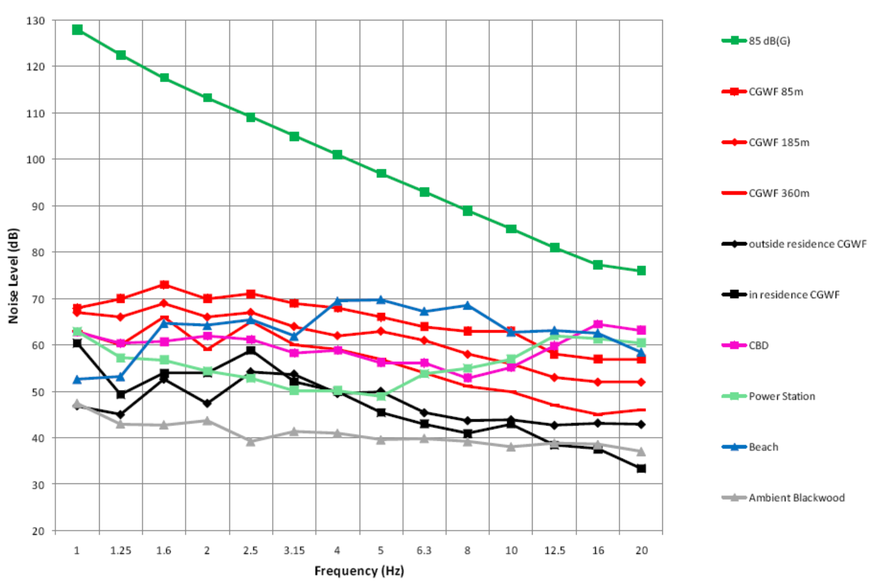

FIGURE 44 Summary of Measurements Clements Gap Wind Farm
SOURCE Extract from Infrasound measurments from Wind Farms and other sources, Sonus Pty Ltd 2010

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