New South Wales Government
Independent Planning Commission

BEN EWALD **SUPPORT** Submission No: 162925

Organisation:	
Location:	*New South Wales 2300*
Submitter Type:	*I am a member of the community with a view about the proposed development*
Attachment:	*Ewald personal submission Thunderbolt.pdf*

Key issues: *Energy Transition*

Submission date: 20240307 22:10:00

i support the approval of the Thunderbolt wind farm, for reasons detailed in the attached submission.

Wind farms and health – Submission from Dr Ben Ewald

Climate change is a health issue

Climate change due to carbon emissions is damaging human health directly through extreme events such as heatwaves and increased bushfires, and indirectly via many pathways. We must act urgently to make deep cuts to carbon emissions to prevent global heating from rising beyond our ability to adapt. Many states in Australia are still largely reliant on coal, for example in NSW t he largest component of carbon emissions is the burning of coal so the closure of coal fired power stations is a priority. Coal was still the fuel source for 62.8% of electricity generated in NSW in 2022.[1] Wind and solar are the only mature low emissions technologies that can generate electricity at the scale required. However, as only wind can generate at night, and time shifting solar energy for night use at the scale required is still prohibitively expensive, wind generation is the key development that will allow the closure of coal plants.

Multiple reviews of evidence show wind farms causing no harm to health. Some of these reviews are summarised below, and specific health concerns that have been raised by communities are explained in more detail.

An Australian study in 2014 looked at 60 scientific articles on health effects of wind farms, and concluded that wind turbines were not likely to affect health, although audible noise may be annoying to some people[2] . In 2015 the National Health and Medical Research Council (NHMRC) published a review of all the available evidence, and stated that "After careful consideration and deliberation, NHMRC concludes that there is currently no consistent evidence that wind farms cause adverse health effects in humans."[3]

In 2017 the Vermont department of health published a review of evidence on wind turbine noise, and found that there were no direct effects of wind turbine noise on health, although some people reported annoyance and subsequent psychological stress. When the wind farm noise was below 35 dBA people were much less likely to be annoyed by noise.[4]

Wind farm noise

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[1] Australian Energy Statistics published by Dept Climate change, energy, the environment & water. Table O, June 2023. https://www.energy.gov.au/publications/australian-energy-statistics-table-o-electricity-generation-fuel-type-2021-22-and-2022

[2] Knopper LD, Ollson CA, McCallum LC, Whitfield Aslund ML, Berger RG, Souweine K, et al. Wind turbines and human health. Front Public Health. 2014;2:63.

[3] Australian Government National Health and Medical Research Council (NHMRC) (2015). Information paper: evidence on wind farms and human health. https://www.nhmrc.gov.au/about-us/publications/nhmrc-statement-evidence-wind-farms-and-human-health

[4] Vermont Department of Health (2017). Wind turbine noise and human health: a review of scientific literature.

Noise is measured in 2 main ways:

- Hertz (Hz) describes how low or high-pitched a noise is. The 'normal' hearing frequency of a healthy person is 20-20,000 Hz.
- Decibels (dB) describes how loud a sound is. Decibels are often described in dB(A), which means that the decibels are adjusted to take into account the different hearing capacity of the human ear.

Wind farm noise and other noises in the environment	**Approximate noise levels - dB(A)**
Jet aircraft at 250m	105
Traffic	70 – 85
Car travelling nearby (100m away) at 64km/hr	55
Household devices	35 – 70
Wind farm at 500m to 1,500m	**30 – 45**
Wind farm beyond 1,500m	**30 – 35**
Quiet residential area	25 – 55
Background noise in a rural area at night	20 – 40

Table adapted from NHMRC, 2015; Australian Energy Infrastructure commissioner

Australian standards for wind farm noise vary state to state. South Australia varies between 35 dB(A) and 40 dB(A) based on the location of the wind farm, Western Australia is 35 dB(A) , New South Wales is 35 dB(A) and Queensland's standard is 37 dB(A) during the day and 35 dB(A) during the night.[5]

The noise from wind farms is similar to other quiet background noise, and is unlikely to be disturbing at distances of >1.5km.

Infrasound

Infrasound is sound below the frequency of human hearing, that is less than 20 Hz. Many human-made and natural processes produce infrasound, including the ocean waves crashing on a beach.

In 2023 a double-blind placebo-controlled study performed in Sydney looked at whether infrasound affects sleep quality, mood and other bodily functions. They exposed healthy volunteers to either pretend infrasound (placebo), real infrasound or traffic noise over a period of 72 hours/3 days. Their sleep, psychological state, brain wave patterns and bodily stress response were measured. The researchers found that infrasound had no effect on sleep or other body functions measured in this study although they could see measurable

[5] Australian Government, Australian Energy Infrastructure Commissioner. Governance and Compliance of Standards and Permit Conditions. https://www.aeic.gov.au/observations-and-recommendations/governance-compliance#:~:text=5.2.,accommodate%20increased%20visual%20amenity%20impacts.

impacts from traffic noise.[6]The design used in the research makes it very strong evidence of no effect, making it a definitive result and this question never needs to be researched again.

Annoyance

Although wind turbine noise is not associated directly with health effects, some people report annoyance at the noise or perceived noise. Many factors influence annoyance, including financial benefit, pre-existing beliefs about windfarms and visibility of turbines. Annoyance can lead to increased psychological stress and associated sleep disturbance. Those with pre-existing beliefs about harms of windfarms are much more likely to perceive annoyance and subsequent health effects.[3]

Proper community consultation, sharing of economic benefits with the community and residents near windfarms, and adherence to noise regulations are all important measures to reduce annoyance and to ensure that the economic benefits are shared equitably.

Shadow flicker

Shadow flicker refers to a flickering effect on the light as shadows are cast by the revolving turbine blades. This is affected by the time of day, location and height of the turbines and the wind direction. Shadow flicker is generally only present at distances of less than 1.5km from wind turbines.

The risk of shadow flicker triggering photo-sensitive epilepsy is extremely low, less than 1 in 10 million in the general population.[3] It's also possible to temporarily stop turbines for the few minutes per year when shadow flicker affects dwellings, which is easily predicted using shadow modelling. (NHMRC, 2015).

Recommendations

The Thunderbolt wind farm should be approved so the NSW community can gain the health benefits of reduced air pollution and delayed climate change through the hastened closure of coal fired electricity generators.

Proper community consultation and sharing of the economic benefits of wind farms with nearby communities and residents is essential to ensure that benefits are spread equitably. This includes addressing any community concerns and sharing current updates on scientific evidence.

[6] Marshall et al (2023) The Health Effects of 72 Hours of Simulated Wind Turbine Infrasound: A Double-Blind Randomized Crossover Study in Noise-Sensitive, Healthy Adults. 131(3) March. Environmental Health Perspectives