Wind farms and your health

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Key facts

Wind farms are very safe

Multiple scientific studies show wind farms don't harm our health. The safety of wind farms is supported by the main agency for health and medical research in Australia, the National Health and Medical Research Council (NHMRC).

This body looked at all the available evidence and found no proof that wind farms make people sick.

Wind farm noise

The noise from wind farms is similar to other quiet background noise, like a quiet residential area or a rural area at night. There are very few complaints about noise from existing wind farms in Australia.

Infrasound

Humans can hear frequencies between about 20 Hz to 20,000 Hz at their highest pitch.

All sounds below 20 Hz are known as infrasound and are below the usual frequency of human hearing.

Recent high quality research has found that infrasound does not cause headaches, nausea or dizziness and it has no effect on sleep, mood or other bodily functions.

Annoyance

Few people report annoyance at the noise or perceived noise from existing wind turbines in Australia. Annoyance can increase psychological stress along with sleep disturbance.

Those who already believe the misinformation that wind farms are harmful are much more likely to feel annoyed, and to report having adverse health effects.

Proper community education and consultation, sharing of economic benefits with the community, and complying with noise regulations are all important measures to reduce annoyance.

Shadow flicker

The sun shining through turning turbine blades can have a flickering effect. This depends on the time of day, location and height of the turbines and the wind direction. Shadow flicker can be predicted and avoided. It is rarely a problem in Australia.

The risk of shadow flicker triggering seizures caused by flashing or flickering lights (photo-sensitive epilepsy) is extremely low. It's less than 1 in 10 million in the general population.

Renewables are much healthier

There is clear evidence that burning coal harms health through both air pollution and climate change.

Moving our energy system to renewable sources like wind will benefit our health and should be strongly supported.

Further information

Climate change is a health issue

Climate change due to carbon emissions is damaging human health directly through extreme events such as floods, heatwaves and increased bushfires, and indirectly through rising cost of living, changing patterns of infectious diseases and air pollution as well as threats to secure shelter, food and water. 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 to produce electricity. For example, in NSW the largest component of carbon emissions is the burning of coal so the closure of coal-fired power stations is a priority. In 2022 coal was still the fuel source for 63% of electricity generation in NSW, 58% in Victoria and 62% in Queensland.[1] Coal burning also has direct harmful effects through air pollution.

Wind and solar are the only mature low-emissions technologies that can generate electricity at the scale required. However, only wind can generate energy at night, and at the scale needed it is still much cheaper than storing solar energy for night use. Consequently, wind generation is the key development that will allow the closure of coal plants. Wind farms can be co-located with stock and other agricultural activity, and can provide diversified income to farmers and local communities.

Do wind farms impact health?

Multiple reviews of evidence show wind farms cause 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 the 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

Noise is measured in two 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) describe 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 64 km/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[5] and Australian Energy Infrastructure commissioner.[6]

Australian standards for wind farm noise vary from 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.[6]

The noise from wind farms is similar to other quiet background noise and existing wind farms in Australia cause very few noise complaints.[7]

Infrasound

Infrasound is sound below the usual frequency of human hearing, that is, less than 20 Hz. Many human-made and natural sounds that humans can hear (like waves on a beach) also produce infrasound, which we cannot hear.

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 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 impacts from traffic noise.[8] This is a definitive result and the research never needs to be repeated.

Annoyance

Some people report annoyance at the noise or perceived noise from wind farms, although there are few complaints about existing wind farms in Australia.[7] Many factors influence annoyance, including financial benefit, pre-existing beliefs about wind farms and the visibility of turbines. Annoyance can lead to increased psychological stress and associated sleep disturbance. Those with pre-existing beliefs about the harms of wind farms are much more likely to perceive annoyance and subsequent health effects.[3]

Proper community education and consultation, sharing of economic benefits with the community and adherence to noise regulations are all important measures to reduce annoyance.

Shadow flicker

Shadow flicker refers to a flickering effect from 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.

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 where shadow flicker effects dwellings, which is easily predicted using shadow modelling.[3] Shadow flicker rarely causes disturbance in Australia.[7]

Summary

There is no scientific basis for suggesting that wind farms harm human health. However, there is strong evidence that burning coal and gas harms health through both air pollution and climate change.

Transitioning the energy system from harmful fossil fuels to clean, renewable sources such as wind will benefit health and should be strongly supported by governments and decision-makers.

More information

How climate change affects your health: the facts
How climate change affects mental health in Australia
The health toll of coal

References

1. Department of Climate Change, Energy, the Environment and Water. Australian Energy Statistics, Table O Electricity generation by fuel type 2021-22 and 2022. Accessed May 30, 2024. 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. https://doi.org/10.3389/fpubh.2014.00063
3. *NHMRC statement: Evidence on wind farms and human health*. Australian Government National Health and Medical Research Council; 2015. Accessed May 30, 2024. https://www.nhmrc.gov.au/about-us/publications/nhmrc-statement-evidence-wind-farms-and-human-health
4. Wind turbine noise & human health: A review of the scientific literature. Vermont Dept of Health; 2017. Accessed May 30, 2024. https://www.healthvermont.gov/sites/default/files/documents/pdf/PHA_wind_turbine_sound_05_2017.pdf
5. NHMRC. *Information paper: Evidence on wind farms and human health*. National Health and Medical Research Council; 2015. Accessed June 6, 2024. https://www.nhmrc.gov.au/about-us/publications/nhmrc-information-paper-evidence-wind-farms-and-human-health#block-views-block-file-attachments-content-block-1
6. Australian Energy Infrastructure Commissioner, Australian Government. Governance and Compliance of Standards and Permit Conditions. Australian Energy Infrastructure Commissioner. Accessed May 30, 2024. https://www.aeic.gov.au/observations-and-recommendations/governance-compliance#:~:text=5.2.,accommodate%20 increased%20visual%20 amenity%20 impacts
7. Australian Energy Infrastructure Commissioner. Governance and compliance of standards and permit conditions. Australian Government. Updated June 30, 2023. Accessed July 10, 2024. https://www.aeic.gov.au/observations-and-recommendations/governance-compliance
8. Marshall NS, Cho G, Toelle BG, et al. The Health Effects of 72 Hours of Simulated Wind Turbine Infrasound: A Double-Blind Randomized Crossover Study in Noise-Sensitive, Healthy Adults. *Environ Health Perspect*. Mar 2023;131(3):37012. https://doi.org/10.1289/ehp10757

About Doctors for the Environment Australia

Doctors for the Environment Australia (DEA) is an independent, non-government organisation of medical doctors and students in all Australian states and territories.

DEA's work is based on the premise that humans need a future with clean air and water, healthy soils capable of producing nutritious food, a stable climate, and a complex, diverse and interconnected humanity whose needs are met in a sustainable way. We are therefore interested in environmental protection and restoration to promote human health and social stability.

Acknowledgement of Country

Doctors for the Environment Australia's members live and work around Australia. We would like to acknowledge Aboriginal and Torres Strait Islander peoples as the Traditional Owners of these lands, in the spirit of reconciliation.

We recognise that First Nations peoples have cared for Country and lived sustainably for millennia, and that sovereignty of this land was never ceded. We pay our respects to First Nations Elders past and present, and to emerging leaders