

Noise FAQs

Are wind turbines noisy?

Although wind turbines do make noise, today's modern generators are generally much quieter than most people expect. It is quite possible to carry out a normal conversation at the base of a turbine running at maximum power, without raising one's voice. The noise at locations within or around a wind farm can vary considerably depending on a number of factors including the layout of the wind farm, the topography or shape of the land and the speed and direction of the wind. It can be accurately measured using acoustic equipment.

What sounds do wind farms produce?

Wind farms produce a range of sounds. The types of sound that can be heard depend on the model of turbine being used, the wind speed, the distance of the listener from the turbine(s) and the surrounding landscape. Sound from wind turbines contains different frequencies. The sound of a blade passing the tower is sometimes described as a 'swish' sound and is in the mid to high frequencies. Low frequency sounds may be more noticeable at distances further away from the turbine, however, wind turbines actually produce more mid and high frequency sound than low frequency sound. ^[1] An intermittent 'swish' sound is the main sound within approximately 300 m of a wind turbine.

What about low frequency sound and infrasound?

Infrasound is very low frequency sound; it usually refers to sounds with a frequency below 20 Hz. Concern is sometimes expressed about the possible effects of low frequency sound from wind turbines on nearby residents. Low frequency sound was a feature of some early wind turbine designs with the blades down-wind of

the tower. This caused a low frequency 'thump' each time a blade passed the tower. Modern wind turbines all have their blades upwind of the tower, thus reducing the level of this type of noise to below the threshold of human perception. The Victorian Department of Health has concluded that there is no evidence that sound which is at inaudible levels can have a physiological effect on the human body. This is the case for sound at any frequency, including infrasound. ^[1]

How does noise affect the layout?

Noise limits are determined by the planning authorities to ensure that turbines are located far enough away from occupied houses to protect the amenity of the people living in them. This can have a significant impact on the design of the wind farm layout and where turbines can be located. In Europe, it is common to have wind turbines within 500m – 1,000m of houses. In Australia however, a more conservative approach is taken and wind turbines are usually placed at least 1,500m from residences not associated with the project.

Wind farm noise levels and who sets them?

In NSW proposals for wind energy projects are usually assessed by the NSW Department of Planning, Industry and Environment (DPIE) through a rigorous process under the Environmental Planning and Assessment Act. NSW has adopted the most stringent noise criteria of any state in Australia and wind farm operators are required to meet these limits at all times. The noise limit at a non-associated residence in NSW as specified in the Noise Bulletin is the greater of:

- 35 dB(A), or
- the existing background noise level, plus 5 dB(A)

Increased set-back distances of turbines from neighbouring residents, along with technological improvements in contemporary wind turbine design has meant that compliance against the noise limits can typically be achieved **"at distances of between 0.8 – 1.5km depending on project and site-specific factors such as turbine configuration, design, intervening topography and vegetation."** ^[2]

A unique characteristic of wind farms is that the noise level from each wind turbine increases as the wind speed at the site increases. As an offset, the background noise also generally increases under these conditions and can mask the turbine noise.

The noise level criteria is designed to **"retain noise levels that are compatible with surrounding land uses and to ensure that noise levels do not significantly affect the living experience of people residing in the area."** ^[2]

Can inaudible sound affect health?

The National Health and Medical Research Council conducted a comprehensive independent assessment on the scientific evidence on wind farms and human health. They 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]

For more information:

1. Wind Farms, sound and health – Vic health department <https://www2.health.vic.gov.au/public-health/environmental-health/environmental-health-in-the-community/wind-farms-sound-and-health>
2. Wind Energy; Noise Assessment Bulletin <https://www.planning.nsw.gov.au/-/media/Files/DPE/Bulletins-and-Community-Updates/wind-energy-noise-assessment-bulletin-2016-12.pdf>
3. National Health and Medical Research Council Statement <https://www.nhmrc.gov.au/about-us/publications/nhmrc-statement-evidence-wind-farms-and-human-health>

Fire Safety FAQs



Access track providing a grass fire break.

Wind farm access roads aid firefighters

In 2013, during a grass fire at a wind farm in South Australia started by lightning, it was revealed that a significant benefit was brought by the access roads built for a local wind farm. *“They were absolutely of great benefit in helping us fight the fires,”* said the Snowtown Country Fire Service (CFS) Captain.

“If it weren’t for those roads, the fires, which were going at a fair rate of knots, would have just kept going. They acted as a natural fire break, giving us an edge to work back to and enabling us to back burn if we’d needed to. These new access roads provided an unexpected bonus, but they’ll help us control fires in the future.”

It was said that access tracks installed to build and maintain a wind farm increased the accessibility onsite and therefore had a positive impact on the response time and ability to fight fires onsite or on neighbouring properties.

Do wind farms have a Bushfire Management Plan?

All projects are required to assess the risk of bushfire and ability to fight a fire in the development application. All wind farms in Australia are required to develop a Bushfire Management Plan in consultation with the Rural Fire Service (for projects in NSW) and in case of a fire in the vicinity of the wind farm, provide assistance to the RFS and other emergency services as much as possible. The Bushfire Management Plan would also establish procedures in the event of a fire moving through a wind farm. During construction the project will ensure that fire fighting equipment is available on site.

What is the risk that a turbine starts a fire?

Wind monitoring masts and wind turbines are designed using materials to provide a safe path for lightning strikes to the ground.

They are also designed with materials to limit fire risk and with systems that can monitor and respond automatically to conditions inside the turbine by following shutdown and isolation procedures.

How do turbines impact aerial firefighting?

The RFS has in the past assessed the risk of wind turbines when fighting fires and stated the following:

“It is the position of the NSW RFS that fire moving across the area of a wind farm is generally managed in the same way as any other bush fire. Firefighting strategies by ground-based resources would continue and be subject to prevailing weather and topographic conditions.” “... aircraft would avoid wind turbines in the same manner as they avoid other obstructions, such as power lines”

- NSW Rural Fire Service’s submission to the Select Committee on Wind Turbines, 2015.

Bushfire on a Neighbouring Property

In 2017 when an accidental spark from machinery operating in a neighbouring field to the Waterloo Wind Farm in South Australia caused a grass fire that travelled up the hill towards the Waterloo ridge line, the bushfire management plan was enabled.

- 1:55pm** SA Country Fire Service (CFS) and Waterloo Wind Farm were notified of a grass fire.
- 2:02pm** Wind farm operations manager check in with the safety of the ground crew members
- 2:17pm** Ground crew ensured all access points were open for fire crews to enter and 18 turbines were paused. For the next hour ground and air crew worked to bring the fire under

control including multiple runs with fixed-wing water bombers expertly manoeuvred through turbines.

- 3:15pm** Ground crew attended 6 paused turbines to manually apply brakes and further assist water bombing aircraft.
- 6:00pm** Turbines not in the fire ground area were restarted.

The response crew grew to 32 CFS and 25 private farmer fire unit vehicles, four fixed wing water bombers and a surveillance helicopter responding to the incident. In all, over 200 people were involved in responding to the fire.

<https://www.cleanenergycouncil.org.au/news/in-case-of-fire-a-real-life-experience-at-a-wind-farm-site>

Property Values FAQs

In Australia, a number of wind farms have been built on or close to private land. There is often debate as to whether the value of those properties has been affected.

What factors can affect Property Values?

In relation to a project like a wind farm, there are a number of factors that could have an impact on land values and therefore require appropriate consideration. These generally include:

- Changes in income earning potential of property
- Aesthetic appearance - impact on scenic views
- Changes in fencing and on-site access roads
- Changes in natural vegetation and ecology
- General trends in property prices in the area independent of wind farming.

The value of properties also go up and down for a wide range of external reasons. Supply and demand, local industry performance, proximity to amenities and infrastructure, housing affordability and the desirability of the location can all have an impact.

Do properties next to a wind farm reduce in value?

The fact that a property is in the vicinity of a wind farm or that a wind farm is visible from a property does not mean that a property value is going to be impacted. There have been two studies commissioned by the NSW Government that have studied many property transactions before, during and after the construction of wind farms. Analysis of the prices obtained in these sales and comparison with the broader market in the region demonstrated no link between wind farms and a decrease in property value. ^{[1] [2]}

In NSW projects such as wind farms are required to undertake a number of assessments to demonstrate compliance against relevant criteria in the following areas:

- Visual Amenity – Assessed against performance criteria in the *Wind Energy: Visual Assessment Bulletin* ^[3]
- Noise Amenity – Assessed against noise limits in the *Wind Energy: Noise Assessment Bulletin* ^[4]
- Construction and operational traffic and transportation

For a project to gain development approval and proceed to construction and operation it must first identify, address and mitigate the issues that could have an impact on surrounding properties. By addressing these issues and demonstrating compliance against the relevant criteria the project is removing the factors that can have an impact on property values.

Property Values FAQs

NSW Government Reports

The potential for wind farms to impact the value of properties in the surrounding area has been the subject of two separate studies commissioned by the NSW Government, one in 2009 by the NSW Valuer-General^[2] and one in 2016 by Urbis on behalf of the NSW Office of Environment and Heritage.^[1]

NSW Valuer General Report (2009)

The 2009 NSW Valuer-General's assessment of the impact of wind farms on property values found that the separation distance identified in NSW appears to be sufficient to ameliorate any dis-amenity associated with the presence of wind farm development.

The study found that ***“properties in rural/agricultural areas appeared to be the least affected by wind farm development, with no reductions found near any of the eight wind farms investigated. The only properties where a possible effect was observed were lifestyle properties in Victoria within 500 metres of a wind farm, some of which were found to have lower than expected land values.”***^[1]

Urbis Report on behalf of NSW OEH (2016)

The Review of the Impact of Wind Farm on Property Values conducted by Urbis on behalf of OEH was comprised of a review of available literature, analysis of actual case studies and a conclusion.

Literature Review

A review of any available previous report including the 2009 NSW Valuer General's assessment of the impact of wind farms on property value.

“The literature review of Australian and international studies on the impact of wind farms on property values revealed that the majority of published reports conclude that there is no impact or a limited definable impact of wind farms on property values.”^[1]

Case studies

A review of all NSW wind farm locations and non-coastal locations in VIC. Actual sales data was used to investigate before and after land value for properties within 2km of a wind farm. This was then reviewed against underlying growth data in the broader market.

“Where possible we used same property resale analysis, where a property was sold before the wind farm was announced and then again after the wind farm had been commissioned. This has proved to be the most reliable and least subjective of the approaches and has been adopted as our primary method of assessment”^[1]

The assessment of impacts to land values was limited to within a two kilometre radius of wind turbines as these properties are the most likely to experience adverse impacts to the visual amenity, background noise and shadow flicker. The fact that there was no clear trend showing any impact to land value is significant given the study was limited to those most likely to be impacted.

“In relation to the same property resale analysis, all analysed properties demonstrated an increase in value between their pre wind farm sales and their respective post wind farm sales. Measurement of this growth relative to the broader private market revealed that this growth appears to be in line with local market trends”^[1]

During the development of a wind farm uncertainty around its potential impacts may increase the amount of time required to sell a property, as potential buyers defer decisions until specific details of the proposed wind farm are known.

Conclusion

“The findings from our review of case studies in NSW and Victoria did not identify any conclusive trends that would indicate that wind farms have negatively impacted on property values. Our same property resale analysis indicates that all of the properties examined demonstrated capital growth that aligned with the broader property market of the time”^[1]

For more information:

1. Review of the impact of Wind Farms on Property Values, Urbis 2016 <https://www.environment.nsw.gov.au/resources/communities/wind-farm-value-impacts-report.pdf>
2. Preliminary Assessment of the impact of wind farms on surrounding land values in Australia, NSW Valuer General https://www.valuergeneral.nsw.gov.au/__data/assets/pdf_file/0006/195315/Preliminary_assessment_impact_of_wind_farms_on_surrounding_land_values_in_Australia.pdf
3. Wind Energy: Visual Assessment Bulletin <https://www.planning.nsw.gov.au/-/media/Files/DPE/Bulletins-and-Community-Updates/wind-energy-visual-assessment-bulletin-2016-12.ashx>
4. Wind Energy: Noise Assessment Bulletin <https://www.planning.nsw.gov.au/-/media/Files/DPE/Bulletins-and-Community-Updates/wind-energy-noise-assessment-bulletin-2016-12.pdf>