

Wind Farm Facts

May 2025



About OX2

OX2 is the leading developer of onshore wind in Europe. As an industry pioneer, we are active in eleven markets and offer fully customised renewable energy solutions involving several technologies, including wind and solar energy, in addition to hydrogen and energy storage projects.

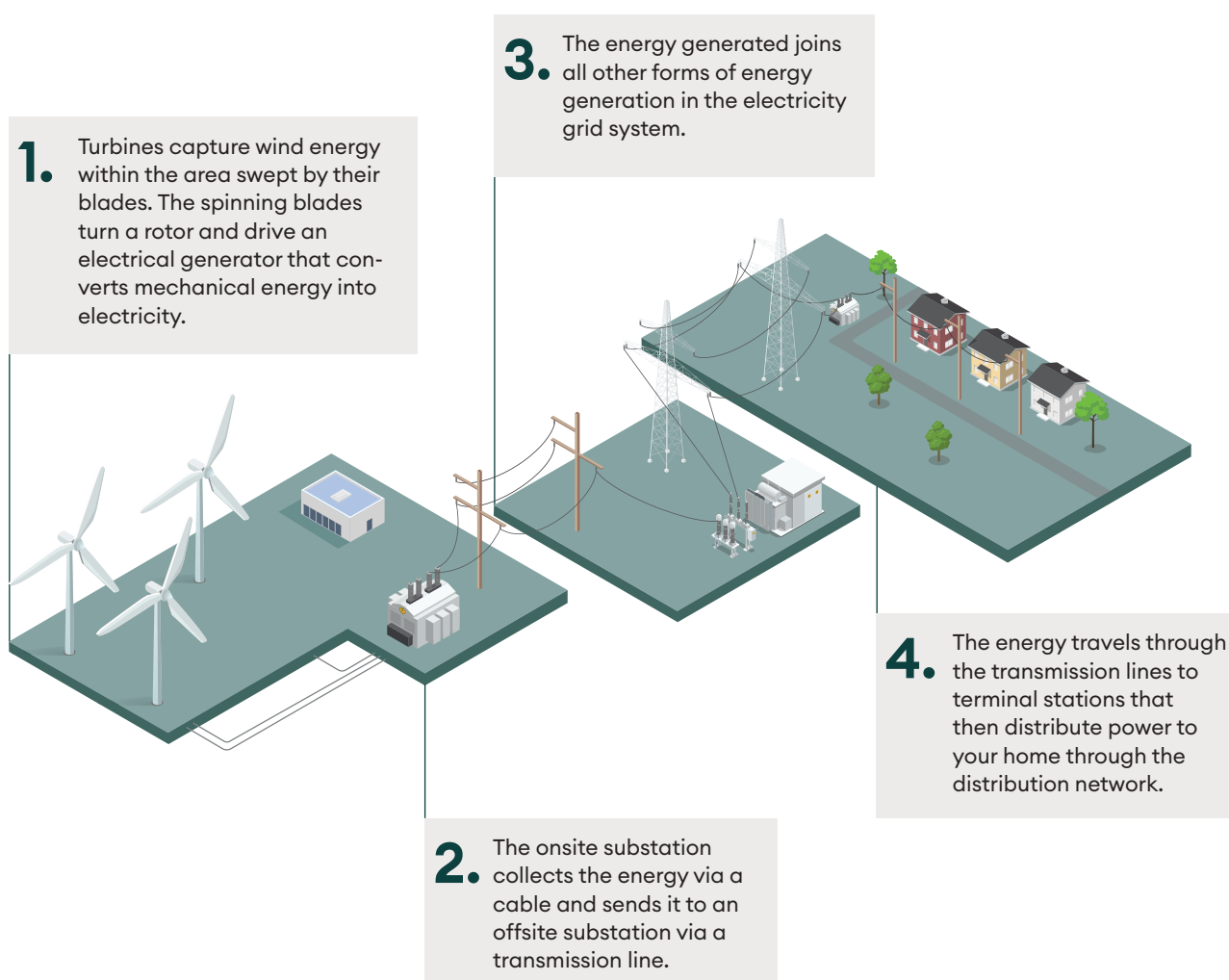
We design and build sustainable projects and tailor them to meet our customers' needs. OX2 has a proven business model and in-house expertise at every step of the process – from project inception and financing to engineering and design, permitting, procurement, construction, and technical and commercial management.

Our mission is to accelerate access to renewable energy. We see ourselves becoming the leading provider of renewable energy solutions globally, thereby powering the great shift.

How does wind energy work

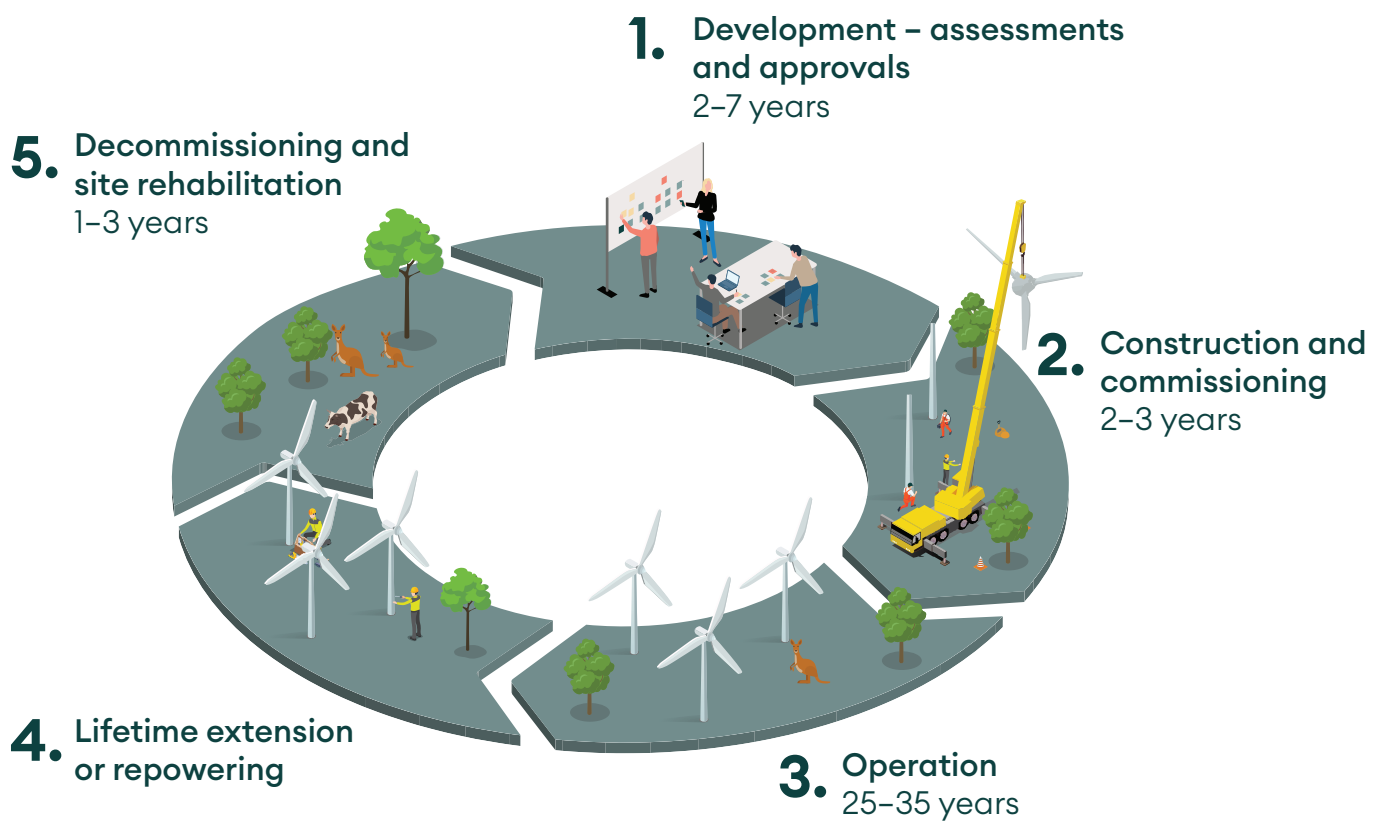
Wind farms generate electricity from the power of the wind. Wind is an inexhaustible resource that is clean, reliable and affordable.

In 2023, 38.6% of Australia's total electricity generation was from renewable energy sources, including solar (18.05%), wind (13.25%) and hydro (7.3%)¹.



¹ OpenNEM: NEM

What are the stages of the lifecycle of a wind farm?





Development

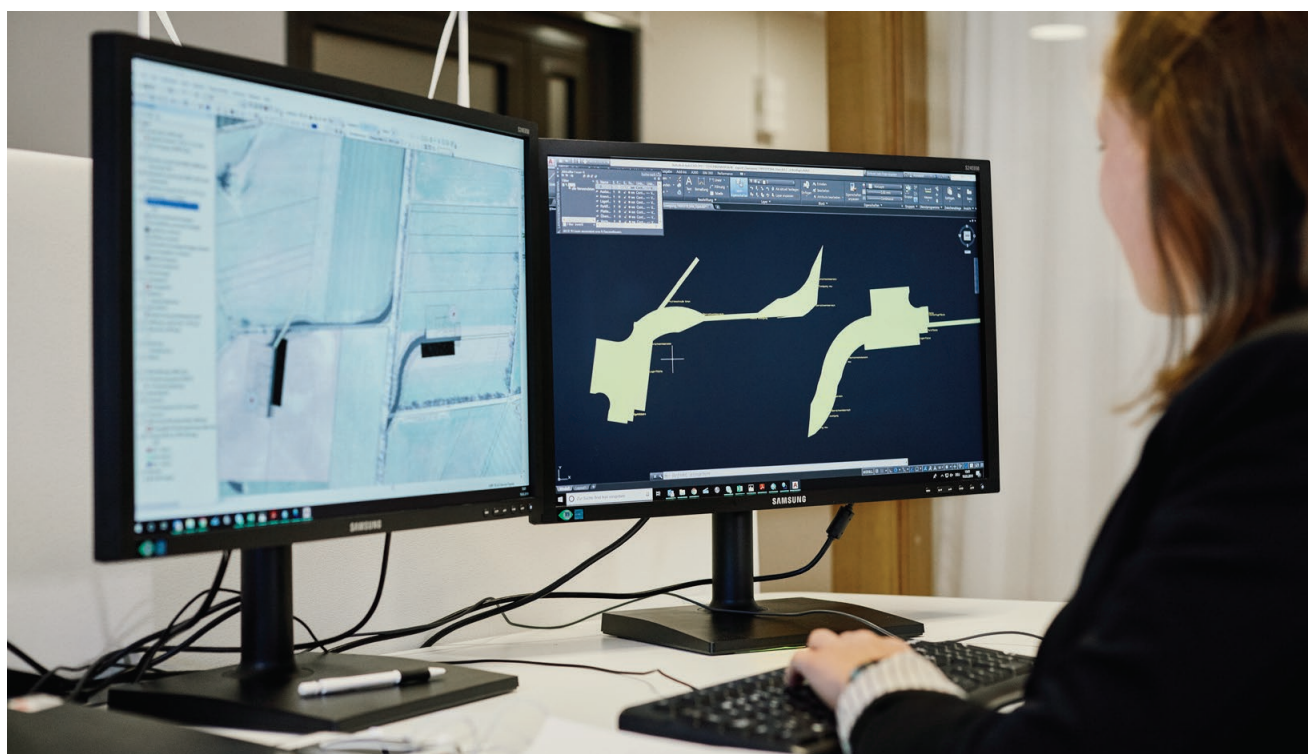
Key activities in wind farm development include:

- Site identification
- Engagement and agreements with landowners
- Wind monitoring - energy modelling
- Grid connection studies
- Consultation with government, communities and industry
- Planning and environmental studies and approvals
- Detailed design of wind farm
- Design of road upgrades and transport route planning
- Investment decision and raising equity to fund the project
- Procurement of contractors and turbines

How is a wind farm designed?

A wind farm design evolves over time and is continuously refined as more information becomes available. Information is fed into the design as it emerges from site investigations, environmental assessments, community feedback and planning permit requirements. We consider a range of aspects:

- Local topography
- Wind resource and predominant direction
- Geotechnical (ground) conditions
- Proximity and connectivity to the grid
- Safety
- Constructability
- Relevant standards, guidelines and legislation
- Stakeholder and community feedback
- Transport routes and access to the site
- Potential environmental and heritage impacts
- Operations and maintenance requirements
- Project cost and value for money



What technical and environmental studies do you undertake to ensure impacts are identified and avoided or minimised?

Technical and environmental studies are undertaken by independent consultants who are experts in their field to identify baseline conditions and possible impacts. We use these studies to inform the project design, planning and construction and ongoing management.

The assessments undertaken for a wind farm project typically include:

- Noise
- Biodiversity
- Cultural heritage (aboriginal and historic)
- Landscape and visual
- Aviation
- Electromagnetic interference (EMI)
- Shadow flicker
- Traffic and transport
- Hydrology
- Social impact assessment
- Economic impact assessment





Construction and Commissioning

A wind farm is a major project, and like any major infrastructure project, construction can be disruptive at certain times. To minimise this, we work with the project landowners, neighbours, contractors, local councils and wider community to plan construction responsibly and manage any impacts effectively and efficiently. Some of the ways we do this include:

- Meeting requirements set out in planning permit conditions, legislation, industry standards and guidelines – this includes preparing and complying with construction environmental management plans and traffic management plans
- Implementing a responsive complaints management procedure
- Developing a workforce accommodation strategy
- Regular communication with neighbours and the community
- Listening to feedback about how impacts could be minimised
- Working during standard construction hours wherever possible
- Scheduling disruptive or noisy work at times when it will have the least impact
- Monitoring and actively managing construction activities
- Using well-maintained equipment and implementing procedures to reduce their noise emissions (for example, avoiding reversing and triggering the reverse alarm where possible)

Each stage of construction can pose different challenges, such as traffic movements during the initial road construction phase or over-dimensional vehicle movements as turbine components are delivered to the site. Adequate stakeholder engagement and early planning will allow those movements to occur safely for the workforce and the community, with any planned disruptions communicated to relevant stakeholders (including the community).

Depending on the size of the wind farm and weather conditions, construction generally takes about 2-3 years.

Management Plans are required to outline how potential impacts are managed, and to ensure that all management and mitigation measures are understood and followed by the project partners.

What should I be aware of during construction?

Safety

To reduce and manage risk, Health and Safety Management Plans are developed to ensure safe construction practices and potential risks are identified, mitigated and communicated to workers. All staff and contractors undertake mandatory training in safety and emergency procedures before starting work on-site.

Fire Safety

The relevant fire safety authorities are consulted during the development stage of the project to ensure that the design of the wind farm meets fire safety requirements and that management and mitigation measures are accounted for. As access tracks are constructed within the wind farm site, fire safety within the site and the surrounding area will increase because access tracks act as fire breaks within the area.

Firefighting infrastructure will be made available on-site during construction and operation of the wind farm and safe access for emergency responders in and around the facility will be provided. The infrastructure will be provided in consultation with the relevant fire safety authorities and will comply with agreed fire safety and emergency response management measures. Vegetation will be managed to avoid increased bushfire and grassfire risk.

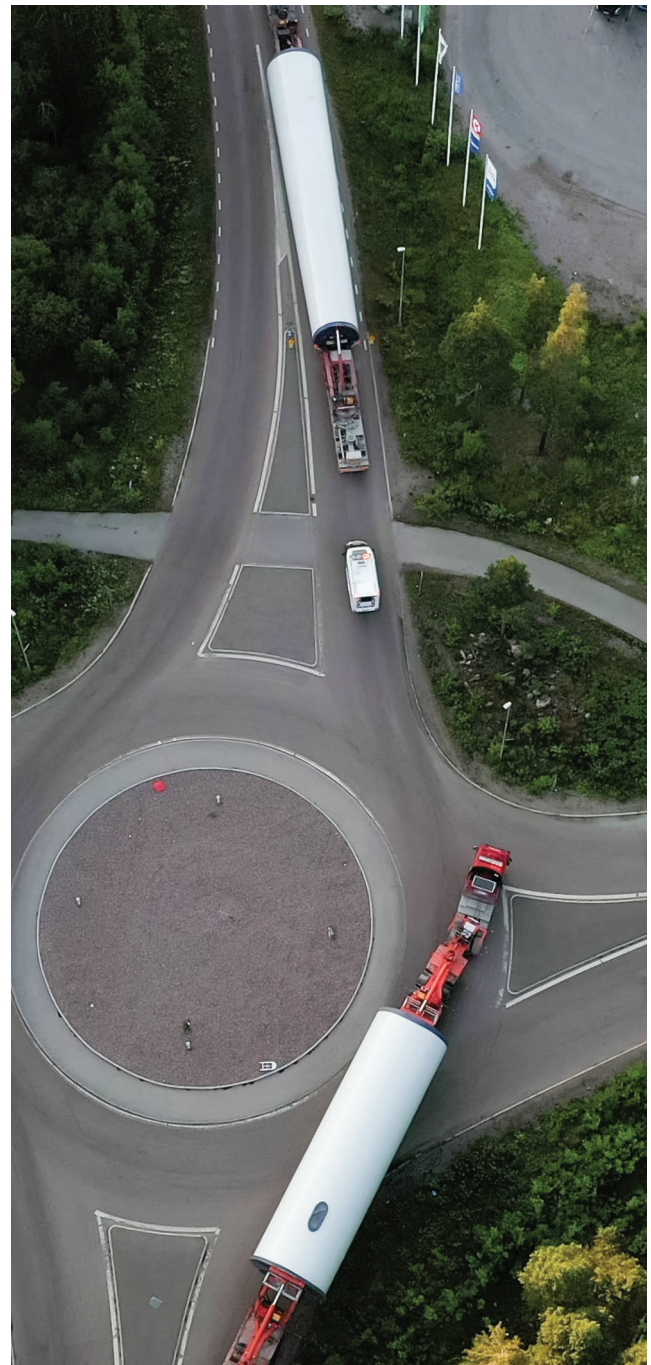
Fire safety regulations will be complied with during construction. For example, no hot works will be undertaken during total fire ban days.

Traffic and roads

The construction of a wind farm generates traffic when materials, machinery and turbines are being delivered to the site. Prior to the commencement of construction, a Traffic Management Plan (TMP) is developed in consultation with road authorities and local councils to ensure that construction traffic is appropriately managed and adheres to the use of approved roads only. School bus routes are taken into account.

Local roads may be upgraded before works begin so they are suitable for the loads from trucks and oversized vehicles. We work closely with our contractors and councils to plan deliveries, coordinate with other road users and provide advance notice of any disruption. Oversize items are often moved at night to reduce traffic disruption.

Any road construction works (including upgrades) required to facilitate the construction of the wind farm will be undertaken at our cost.



Working hours

Standard construction hours are outlined by The Environment Protection Authority (EPA) in each state. The hours are approximately 7am to 6pm, Monday to Friday, and 8am to 1pm on Saturdays.

On occasions we may need to work outside these standard hours. If this is required, we will provide as much advance notice as possible and put measures in place to minimise any disruption. Any required approvals to work outside of the standard construction hours would be sought.

Noise

Construction noise limits are regulated by the EPA and, in some cases, local councils. If construction activities on one of our projects are expected to exceed the noise targets at any time, we notify the local Council and put mitigation measures in place to limit the impact on local residents as much as possible.

Dust

Spraying water is the most effective way to reduce dust during construction. Water trucks are used to wet down work areas and unsealed roads when required.

Historic and Aboriginal cultural heritage

Prior to the commencement of construction, our contractors will be inducted on any measures required to be complied with to manage and protect historic and Aboriginal cultural heritage. Any culturally significant places will be identified during the development stage of the project and the required management measures will be agreed with the relevant authorities and local Aboriginal groups.

Social and economic

During construction, employees and contractors will be present in the local town and on the roads.

Temporary accommodation such as motels and pubs may be busier than normal. We develop workforce accommodation strategies in consultation with councils and work with local communities and our contractors to reduce any inconvenience caused. We seek to ensure local towns and the local economy benefit from additional spending on accommodation, food and local goods and services.

We will seek to create local employment opportunities and advertise them to benefit the local workforce.

Complaints Management Procedure

OX2 will manage and respond to complaints during construction in accordance with our grievance mechanism. The mechanism to submit complaints and follow up on them will be communicated to the local council and the community; it will also be made available on the project website.

Read more about the [grievance and complaint investigation process](#). Your privacy is very important to us, and your personal information will be kept confidential in line with our [privacy policy](#). These documents are available on the OX2 Australia website www.ox2.com/australia

Construction and Commissioning

1. Site Induction

Contractors undertake health and safety inductions in addition to environmental and cultural management inductions.



2. Site Prep

Access tracks, intersection upgrades, quarry and batch plant, cable trenches. Turbine foundations - A foundation is built for each wind turbine. Generally, these foundations are approximately 25 metres in diameter and 3 metres deep. A crane pad and assembly area, known as a hardstand, is also constructed next to each foundation. The foundations are made of concrete and steel reinforcement and are backfilled with excavation materials, leaving only the central bolt assembly above ground level.



3. Turbine assembly

A wind turbine consists of a number of components, a tower (in a number of sections), a nacelle (the container at the top of the tower which houses the generator), a hub (nose cone) and three blades. These parts are delivered individually, laid out in the assembly area, then lifted into place by a crane. Installation of each turbine requires 4 to 5 days of light winds.



4. Supporting infrastructure

Substations, monitoring masts, operations buildings and transmission lines are built to allow the wind farm to operate and export electricity to the network. Electrical connections - Underground or overhead electrical and fibre optic cables are installed to connect the wind turbines and carry electricity and data to the substation.



5. Commissioning

After each wind turbine has been tested through a number of stages, called Hold Points, they can begin to supply electricity.

Any temporary construction buildings are removed and the ground is rehabilitated.

Operation

Wind farms have an operational life of approximately 30 years. A small team of electrical engineers based on-site, or at a central point for a number of projects, will undertake regular maintenance and monitoring. At the end of the life of the wind farm, OX2 may seek to extend the life of the wind farm or to repower the facility with newer technologies. Should this be the case, relevant assessments will be undertaken and approvals sought.

Do wind turbines create audible noise?

Wind turbines do create sound and may be heard. The predominant noise is a swishing sound as the blades rotate through the air. Noise is also emitted from associated infrastructure, such as electricity substations and electricity transmission infrastructure.

Noise emitted from large-scale wind energy projects are regulated by state government agencies (such as the EPA in most states).

Detailed noise assessments are undertaken by specialist consultants during the development stage of the project to inform project design and during operations to assess the compliance of the wind farm with noise limits. The relevant environmental noise guidelines are used to measure baseline conditions prior to the construction of the wind farm and assess potential noise impacts on sensitive receptors during operations.

The final layout of turbines must remain below the noise limits within relevant legislation throughout the entire operational life of a project when assessed at each individual potentially impacted sensitive receptors. The predictive noise assessment achieves this by considering the predicted noise output of each turbine, the cumulative effect of multiple turbines, their location in relation to sensitive receptors and the topographical and meteorological conditions, to arrive at a layout which is compliant with the noise limits. Predictive noise assessments also consider the cumulative impacts of surrounding noise-emitting uses, including other wind energy generation facilities. If the predictive noise levels exceed noise limits at

particular sensitive receptors, we may enter into an agreement with the relevant landowner.

Compliance is confirmed by noise monitoring assessments during operations. In some States, an accredited auditor must be appointed to verify the methodology of the predictive noise assessment and the results of the compliance assessment.

Wind turbines generally produce more sound when wind speeds are higher. Higher wind speeds can also make sounds from the surrounding environment (also known as background noise), which can mask wind turbine noise. This makes measuring wind turbine noise more complex than other types of environmental noise.

Noise may also be due to some form of fault with the turbine. However, these noise impacts are considered temporary as we endeavour to rectify these matters as quickly as possible.

To manage impacts from noise at sensitive receptors:

- Wind farms are generally sited in rural areas and as far away from local towns and clusters of sensitive receptors as possible,
- A predictive noise impact assessment can be prepared to inform wind farm design,
- The operator must ensure regular maintenance of turbines takes place,
- Ongoing monitoring of noise levels must take place over the life of a wind farm,
- wind turbine configuration and operating modes can be adjusted.

Detailed noise assessments are undertaken by specialist consultants during the development stage of the project to inform project design and during operations to assess the compliance of the wind farm with noise limits.

Do wind farms have a visual impact on landscape amenity?

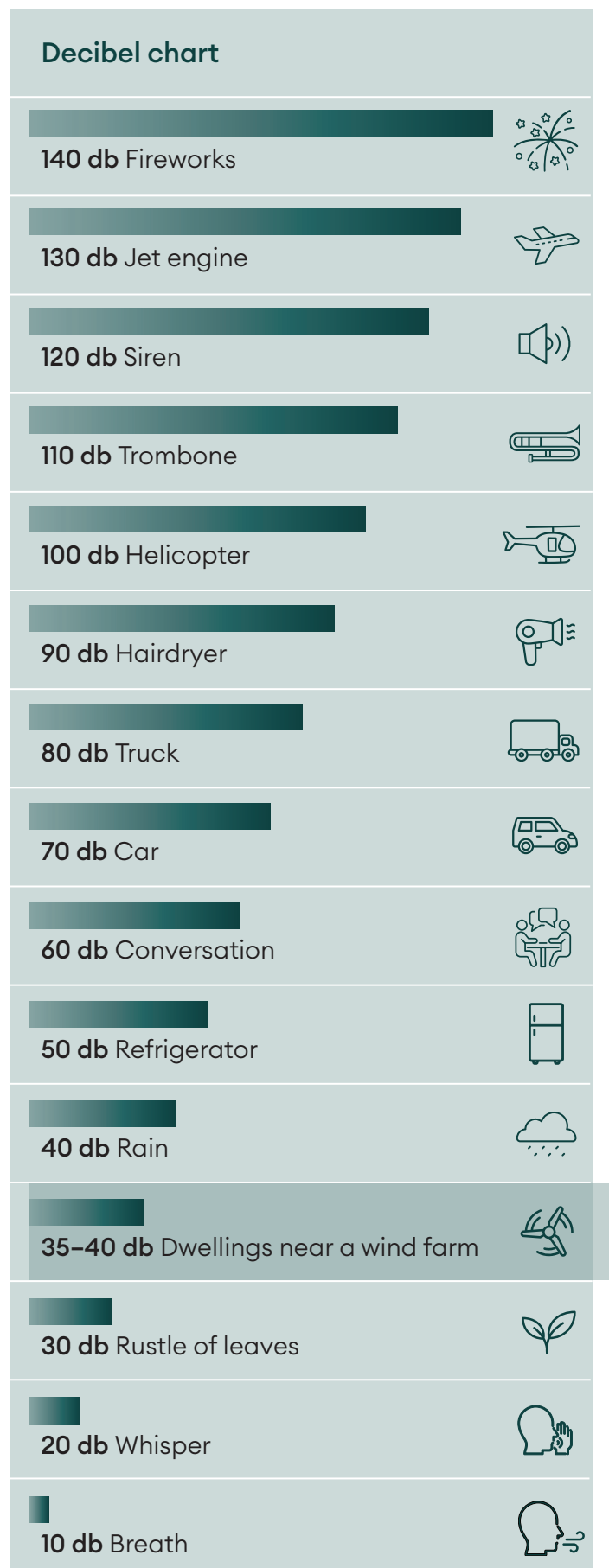
Wind turbines are typically 200 metres to 280 metres tall (from the ground to the tip height of the blade) and may modify the landscape or have a visual impact, particularly if they are part of a wind energy facility that is the first to be introduced to the landscape.

During the development stage of a project, a visual impact and landscape character assessment is undertaken to understand the potential amenity impacts of the project. This assessment informs the wind farm layout design to reduce impacts where possible.

The likely impacts of a wind farm are determined by understanding the sensitivity of an area to a landscape change and the magnitude of the proposal.

In some states, landowners enter into an agreement with the developer to accept the visual impacts of the wind energy facilities. Some states also require developers to offer an off-site landscape screening program to affected sensitive receptors within a certain radius.

The intention of the off-site landscape screening program is to offer receptors affected by the visual impacts of a wind farm landscape screening solutions which are at the cost of the developer.



Will the electromagnetic interference (EMI) affect my TV reception?

Digital TV signals are generally much less susceptible to interference from wind farms than analogue signals but it is possible in areas of low signal strength. In Australia televisions are now digital so any impact will be reduced.

Before construction, we undertake a pre-construction television and radio reception strength assessment of neighbouring properties who wish to take part, or alternatively at representative locations. If a concern is raised once the wind farm is operational, we can assess whether the wind farm is causing any issues.

Residents who experience TV reception issues caused by the operation of the wind farm will receive assistance to rectify those issues.

Do wind farms cause health problems?

The National Health and Medical Research Council (NHMRC) Statement: Evidence on Wind Farms and Human Health was released on 11 February 2015.

The Statement provides advice on this issue. NHMRC concluded that there is currently no consistent evidence that wind farms cause adverse health effects in humans.

What if a wind turbine catches fire?

There is a low fire risk at wind farms due to:

- being surrounded by a cleared area which reduces the available fuel load;
- lightning protection devices being installed on every turbine, which reduces ground strikes that might otherwise have started fires;
- turbine monitoring systems to detect temperature increases which automatically slows or shut down the turbine if the temperature or wind speed exceeds an assigned limit; and
- any flammable substances are located high above the ground.

Could wind farms cause a bushfire?

Wind farms are not considered to increase fire risk. In fact, in most cases wind farms benefit the community via their large access track network, which also act as fire breaks, additional personnel on site during construction and operation, additional water access points and tanks, and the fire mitigation measures required by the responsible authority.

Wind farms are planned and constructed in consultation with the appropriate fire authorities. Furthermore, wind farms are not considered to pose any hazards for fighting bushfires from the air as turbine coordinates are logged with airspace authorities. Pilots view turbines as no different to other tall structures and hazards such as power lines, transmission towers, radio masts, mountains and valleys.

Wind farms are just another piece of infrastructure in the environment that need to be managed on a risk basis when fighting fires. Wind turbines are not expected to pose increased risks due to wind turbulence or moving blades.

Does electricity from wind farms cost more than other sources?

Renewable energy is the cheapest form of new electricity generation. The CSIRO GenCost Report 2023-2024, published in May 2024, confirms that wind and solar are the cheapest source of electricity generation in Australia, even when considering additional integration costs arising due to the variable output of renewables, such as energy storage and transmission².

Do wind farms require Government subsidies to be built?

OX2 does not require government subsidies to finance its projects. Projects are financed through a combination of equity and long-term bank loans. However, we may enter into agreements to sell the power produced by the projects, such as a Power Purchase Agreement (PPA).

² [GenCost: cost of building Australia's future electricity needs - CSIRO](#)

What is the carbon payback period for a wind farm?

The carbon payback period is the length of time it takes a turbine to produce enough clean electricity to make up for the carbon pollution generated during manufacture. There are numerous studies that state that the payback time is between six to twelve months.

Do large-scale renewable energy projects affect nearby property values?

Studies show that impacts of large-scale renewable energy projects are small and temporary, generally limited to the construction phase. Any negative effects typically recover within 3–5 years after project operation begins and some areas even see increased property values due to improved local infrastructure and economic growth.

Will a clean energy project near my home impact my ability to get public liability insurance?

The Insurance Council of Australia (ICA) has stated that insurers do not have specific concerns related to neighbouring clean energy infrastructure. At the time of writing, the ICA is not aware of any instances where its members have been unable to provide insurance, or have increased premiums as a result of a farm (or a neighbouring property) hosting energy infrastructure

Will a clean energy project increase my insurance premiums?

Increases to premiums are unlikely to be related to clean energy projects. Wherever you live in Australia – whether you're directly exposed to extreme weather impacts or not – insurance premiums are rising because of the escalating costs of natural disasters, increasing value of homes and vehicles, inflation pushing up building and vehicle repair costs and the increasing cost of doing business for insurers.



Decommissioning and Rehabilitation

When a wind farm is no longer running efficiently, it can be decommissioned, restoring the impacted area to its original condition. To decommission a wind farm, it is required to:

- dismantle the components and remove the wind turbines;
- remove any related infrastructure, such as buildings and overhead power lines;
- rehabilitate the land; and
- reinstate and revegetate roads and foundations.

Landowners may request that certain aspects of the wind farm remain in situ for their continued farming practices, such as certain buildings or hard stand areas.

The wind farm owner is responsible for decommissioning and rehabilitation and all requirements are outlined in agreements with landowners and as part of the planning approval.

An alternative which is occurring currently on some projects overseas is re-powering. This is

where the equipment and turbines are upgraded and replaced (typically with newer technology) to allow the project to continue to operate. This would require additional environmental assessments and approvals.

What happens to wind turbines at the end of their life?

In April 2023, The Clean Energy Council released a report concluding that 85-94 per cent of wind turbines (by mass) are recyclable and can be recycled in Australia. [Wind turbine recycling | Clean Energy Council](#)

You can find the report at the following link:
<https://assets.cleanenergycouncil.org.au/documents/Wind-turbine-recycling-report-2023.pdf>

Vestas is one of the largest wind turbine manufacturers in the world and is working towards solutions for reusing and recycling components.

“ Currently, the average Vestas wind turbine is 85 percent recyclable. That means at least 85 percent of the weight of the turbine can be fully recycled or re-used. The remaining challenge lies largely in the recycling of wind turbine rotors. These components contain composites that are composed of mainly epoxy resin and glass fiber. While the material is light, strong and highly durable, it is difficult to recycle cost-efficiently and without leaving a higher carbon footprint than using virgin raw materials.

We are working actively in the development of composite recycling technologies to achieve our goal of zero-waste wind turbines by 2040.”
(Zero-Waste (vestas.com))

Employment

Do wind farms create employment during construction?

During construction a wind farm creates hundreds of direct jobs on the wind farm site. These include:

- Health and safety officers
- Environmental compliance officers
- Electricians
- Apprentices/ Trades assistants
- Semi Skilled Labourers
- Unskilled Labourers
- Machine operators
- Transport operators
- Crane operators
- Civil and Electrical Supervisors
- Turbine assembly
- Water truck drivers
- Catering
- Cleaning

In addition, hundreds of jobs may be created in businesses that supply the project. These include:

- Quarry suppliers
- Material suppliers
- Concrete businesses
- Electrical equipment suppliers

Construction can also provide a boost for regional communities by increasing demand for local goods and services, such as accommodation, hotels, grocers, restaurants and cafes.

Do wind farms create employment during operation?

The level of employment depends on the size and location of the wind farm. A small team will be based on-site or in the region to manage the site and provide regular maintenance.

How can I find employment or my business benefit from the wind farm?

To register your interest in employment on a solar farm project or supply local goods and services, please contact us via the project website or using the details in this document. One of our team will be in touch with further information.



Working with communities

It is crucial for us to involve and respect those who live and work where we establish renewable energy projects. The local knowledge about the culture and nature of the area is a great input in planning the layout of the wind or solar farm.

What benefits can a wind farm create for the local community?

Local community benefits can include:

- Boost to the local and regional economy and local businesses
- Jobs during construction and operation
- Training, skills development and education programs
- Creation of community funds for local initiatives, including for local Aboriginal communities
- Direct payments to landowners
- Provision of a drought-proof and post-retirement income stream for farmers.

How do you involve and share benefits with local communities?

OX2 has a clear ambition to provide local jobs wherever possible. Maintaining a close dialogue with local communities is therefore important, not just for anchoring the project but also for engaging the services of local businesses for accommodation, catering, cleaning, earthmoving, transportation and haulage and similar activities.

We may develop a community engagement and benefit sharing plan for each project in consultation with local Council and continue to evolve it as we receive feedback from the community.

How do you keep people informed about development and construction activities?

Depending on the wind farm location, community and community preferences, we use a range of different tools to keep people up to date.

These include:

- Phone calls, emails and/or letters to anyone directly affected
- Meetings with direct neighbours
- Website
- Email updates
- Regular newsletters
- Information displays in nearby towns
- Presentations to community groups and organisations
- Through the local Council.

How do I report a concern about the wind farm or OX2?

Our grievance mechanism is targeted towards individuals, communities and companies who have feedback or concerns regarding our projects.

OX2 takes all complaints seriously and aims to acknowledge and resolve complaints promptly. A complaint is a formal expression of dissatisfaction made to or about OX2, related to its project development, construction, operation, or a staff member.

We acknowledge that anyone has a right to lodge a complaint and we will ensure that all the complaints we receive will be managed respectfully, objectively, and efficiently.

To lodge a complaint please contact us directly or complete the Grievance Mechanism form on our website.

Read more about [the grievance and complaint investigation process](#). Your privacy is very important to us, and your personal information will be kept confidential in line with our [privacy policy](#). These documents are available on the OX2 Australia website www.ox2.com/australia



Transmission line

A transmission line is essential for an energy generation project such as a wind farm as it transports the electricity generated to where it is needed. Electricity is generated, used in each region and traded across regions.

High voltage transmission lines transport electricity from generators to electricity distributors, who deliver it to homes and businesses on lower voltage 'poles and wires'.

How is the new transmission line developed and designed?

There are many factors which are required to be considered when designing a transmission line for a wind farm. While a project is being developed a number of different transmission line routes may be assessed. Each option will be considered against potential impacts and other requirements.

These include:

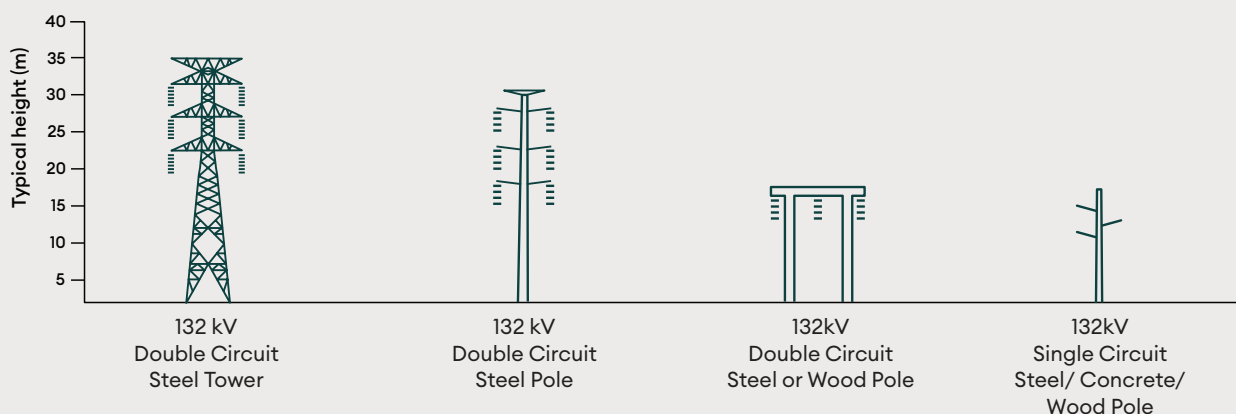
- Voltage (e.g. 66kV, 132kV, 220kV)
- Existing easements
- Line length, spans between poles, changes in direction of the line
- Topography

- Structural loads due to the weight, wind, earthquake risk, groundwater and other environmental factors
- Electrical safety requirements
- Communication and earthing requirements
- Temperature limits and fluctuations
- Existing infrastructure constraints
- Land ownership and access (both public and private)
- Native vegetation
- Planning requirements
- Areas of cultural historic and Aboriginal heritage significance
- Property configurations and dwelling locations
- Road and traffic safety
- Drainage
- Fire safety

What do the transmission towers and power poles look like?

The type and size of the structure used depend on the voltage being used. Transmission towers are large steel structures (lattice or monopoles) used to carry high-voltage power lines. Power poles are single steel-reinforced concrete or wooden poles used to carry lower-voltage power lines.

Indicative image of transmission lines can be seen below



In Victoria, AusNet provide some additional information on their website at:
www.ausnetservices.com.au/electricity/transmission-network



OX2 Australia
Level 4/65 Dover St
Cremorne VIC 3121
Australia

+61 3 8595 2406
info-au@ox2.com

OX2.com