

Wind energy





Origin operates across the whole energy supply chain, making us uniquely placed to meet today's energy needs and create tomorrow's energy solutions. We buy renewable energy from wind farms across the National Electricity Market (NEM) and are currently building our portfolio in both on-shore and off-shore wind farm projects in Australia.

Benefits of using large-scale wind farms

Wind energy is one of the lowest cost sources of electricity generation. It involves the generation of electricity from the naturally occurring wind. Wind farms are crucial in supporting the transition to renewable energy by generating clean electricity, reducing reliance on fossil fuels, and complementing other renewable sources like solar. Another key benefit of wind farms is that they can coexist with other productive land uses, such as agriculture, providing additional revenue streams for landowners. They offer scalability, economic benefits, and technological advancements that contribute to the decarbonisation of the electricity sector.

How wind turbines work

Wind turbines generate electricity by capturing the wind's energy. A wind turbine turns wind energy into electricity using the aerodynamic force from the rotor blades. The spinning blades drive an electrical generator that produces electricity. The electricity generated by each turbine is fed into a substation, where it is stepped up in voltage and fed into the national electricity grid.

Best locations for wind farms

Wind farm facilities are typically located in areas where there is strong, steady wind all year round, and close to a spot where they can connect to the electricity grid. When designing the layout of a wind farm, we carefully choose turbine locations to avoid impacts on things like waterways, protected forests, homes, roads and other important areas.

In Australia, wind farms are often required to be built within Renewable Energy Zones (REZs). REZs are designated areas that aim to facilitate the development of renewable energy projects by ensuring that there is adequate infrastructure, such as transmission lines, to support the generation and distribution of renewable energy.

Wind turbines and noise

During the planning approval process for the development of a wind farm, noise impacts are assessed to ensure noise levels do not significantly impact landowners who host wind turbines on their properties, neighbours and the local community. We also comply with relevant state government guideline requirements.

Wind farms and fire risk

Wind turbines and the towers that support them are insulated against lightning strikes, providing a safe path for lightning to strike the ground. Modern wind turbines are built with fire safety in mind, using appropriate materials and construction techniques, along with fire suppression systems and emergency procedures in case of any malfunction. During development of a wind farm, relevant fire authorities are always consulted for guidance and to ensure there is proper road access into the wind farm site, in case of emergency.

The carbon footprint of a wind farm

Wind farms have a significantly lower carbon footprint compared to traditional fossil fuel-based energy sources. A 3.5MW wind turbine, for example, can power around 2,100 homes and reduce greenhouse gas emissions by about 7,100t annually. That's the equivalent of taking about 2,300 petrol cars off the road.¹

The operational life of a wind farm

Modern wind farms typically have an operational lifespan of about 25 to 30 years. When the wind farm reaches the end of its design life, we may have opportunities to repower or extend its operational life. If not, it will be decommissioned, the equipment removed, and the site restored to its original condition.

A wind turbine is predominantly made of recyclable metals such as steel, aluminium, copper and cast iron. According to the Clean Energy Council², about 85–94 per cent of a wind turbine (by mass) is recyclable and can be recycled in Australia. The wind industry is currently seeking to go further and avoid any disposal of waste. The biggest opportunity to further reduce waste in the industry is establishing an end-of-life pathway for turbine blades, which are mainly made of fibreglass and carbon fibre (composite materials).

A comprehensive decommissioning and rehabilitation plan is required, prior to commencement of rehabilitation at the end of the project. We are currently working with various suppliers to understand and maximise end-of-life options.

Wind farm construction process

Before a wind farm gets built, there are several steps that need to happen first—things like feasibility studies, picking the right location, and getting environmental approvals. When construction is ready to begin, it typically includes the following activities. While every project is unique, the construction period generally takes between 18 to 24 months.

Building access roads: Construction at each site begins with building access roads that allow equipment to be transported to each turbine location. The roads are also used for ongoing maintenance after the wind turbine is up and running. In many cases, landowners can use these roads for their own benefit too.

Establishing the foundations: Reinforced concrete foundations are prepared to support the wind turbine towers. Turbine foundations consist of concrete, steel and bolts.

Assembling the towers: Once the foundation is built, the towers will be assembled in sections by a large crane and bolted into position. Wind turbines are made up of a tower, a three-blade rotor and a nacelle, which is the main body of a turbine that sits atop the tower. The nacelle supports the turbine's rotor hub and houses the generator, gearbox and other components. The nacelle is then lifted and fixed to the tower. The blades are then typically attached one by one.

Connecting the wind turbines: Each wind turbine is then connected to an onsite substation by an electrical network, which is mainly underground but sometimes also includes overhead lines. The onsite substation includes a transformer which increases the voltage of the electricity for transmission into the national energy grid.

Constructing the operations and maintenance building: A wind farm also involves the construction of a building for ongoing maintenance, storing spare parts and as a base to monitor performance on site.

Our engagement

Working with landholders

We recognise landholders who host wind farms on their properties have a significant interest in the development of these projects. We are committed to working with our landholders through each step of the wind farm process, from site selection through to construction, operation and maintenance and eventual decommissioning.

Working with neighbours

We recognise our operations will be of interest to neighbouring properties. We take proactive steps to ensure we engage with our neighbours throughout each phase of any wind farm development and are committed to mitigating and limiting any impacts of the development wherever feasible.

Community benefits

We recognise the importance of engaging and listening to local communities where our operations, landholders, neighbours, stakeholders, community members and workforce are based. This allows us to identify opportunities to support local community initiatives and build long-lasting partnerships.

1. <https://www.energyandclimate.qld.gov.au/energy/types-of-renewables/wind-energy/about-wind-energy>
2. <https://assets.cleanenergycouncil.org.au/documents/Wind-turbine-recycling-report-2023.pdf>



Operation of the wind farm

As wind technology evolves, the operational life of modern wind farms continues to increase. These days, wind farms can operate for more than 20 years with minimal maintenance. Most wind farms in Australia are maintained by an onsite team of about five people. Occasionally, some major components are replaced, including blades. This requires specialised equipment and a crane for the duration of the replacement.

Project benefits

- ✓ Employment opportunities for local workers, businesses and suppliers where possible
- ✓ Development of a community benefit sharing program
- ✓ Agricultural production able to continue on renewable energy sites
- ✓ Pressure on electricity prices eased due to lower-cost electricity sources
- ✓ Each unit of renewable energy fed into the grid reduces the greenhouse gas emissions from energy
- ✓ Helps meet state and federal climate change targets

Contact us

If you have any questions or feedback, we want to hear from you.

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