



MURCHISON GREEN HYDROGEN



Wind Turbines

Version 2.0 | September 2024

Using renewable energy to produce clean energy

The environmental, social and economic impacts of climate change are being felt across the globe. Renewable energy will play a crucial role in the fight against climate change and our transition away from fossil fuels and towards new, sustainable energy sources.

Wind energy forms a large part of today's renewable energy industry. Onshore wind turbines utilise wind to generate electricity, without emitting greenhouse gas emissions. Embracing renewable energy sources as our 'energy of the future' will play a critical role in our transition to a carbon-neutral economy and help Australia to meet its international commitment of net zero emissions by 2050.

The Mid West region has an opportunity to be at the forefront of Australia's clean energy future, by supporting one of Australia's first, large-scale green hydrogen projects. Murchison Green Hydrogen will utilise the abundantly available wind and solar energy in the Mid West to produce green hydrogen.

Green hydrogen will play a pivotal role in reducing carbon emissions from what is known as 'hard-to-abate sectors'. These hard-to-abate sectors account for ~ 20% of global CO₂ emissions each year and are made up of major industries, such as iron and steel manufacturing and bunker fuels for shipping that rely exclusively on fossil fuels.

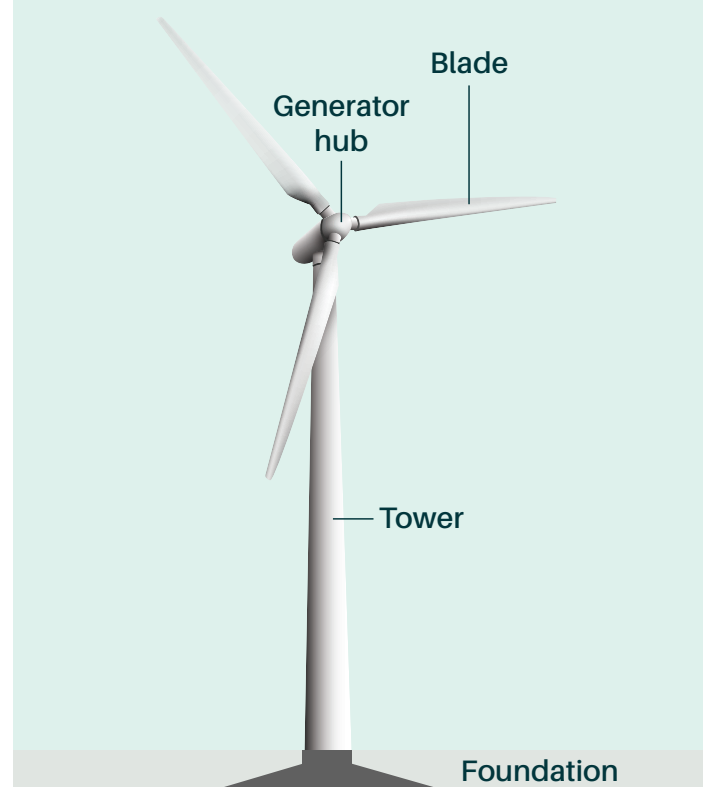
What are wind turbines and how do they work?

Wind turbines are tall towers featuring fan-like blades that rotate to produce energy.

The wind moves the rotor blades producing kinetic energy. A generator, located in the hub of the turbine, then converts the kinetic energy to mechanical energy generating electricity.

- No fossil fuels are used;
- No greenhouse gases are emitted; and
- No pollutants are released.

Wind turbine parts



Did you know?

There are currently 110 wind farms operating in Australia

110

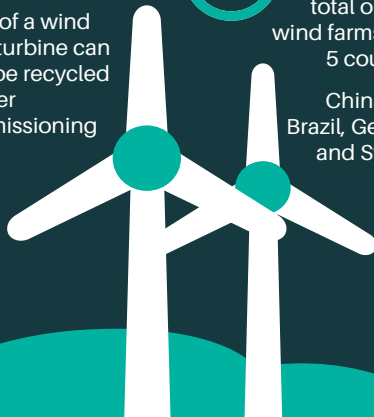
Almost a third of Australia's wind farms have been operating for more than 15 years



Up to 94% of a wind turbine can be recycled after decommissioning

71% of the world's total onshore wind farms are in 5 countries:

China, USA, Brazil, Germany and Sweden



Wind turbines on Murchison House Station

The project will have a generation capacity of approximately 6 GW of green energy, produced from onshore wind and solar.

- Our wind farm will produce more energy than any operational wind farm in the world.
- There will be up to 522 onshore wind turbines on the project.
- The closest turbine to Kalbarri will be approximately 16km away.
- There are no offshore wind turbines on this project.

Thanks to ongoing improvements in technology, the project has been able to reduce the number of wind turbines from 700 to ~522, without sacrificing green energy output.

How do you decide where the turbines will be located?

The wind turbine locations on Murchison House Station have been determined based on the following inputs:

- Avoidance of Aboriginal heritage sites;
- Avoidance of high-value flora and fauna species;
- Minimising vegetation clearing;
- Best wind quality; and
- Minimising wake losses.*

*As air travels through the turbines' blades, energy is extracted and turbulence is created. This is similar to a wake that is created by a boat's propeller in water. To ensure the wind farm runs efficiently, the turbines will be spaced ~1km away from one other. This will enable each turbine to operate in clear air and not be affected by turbulence generated from surrounding turbines.

How big are the wind turbines going to be?

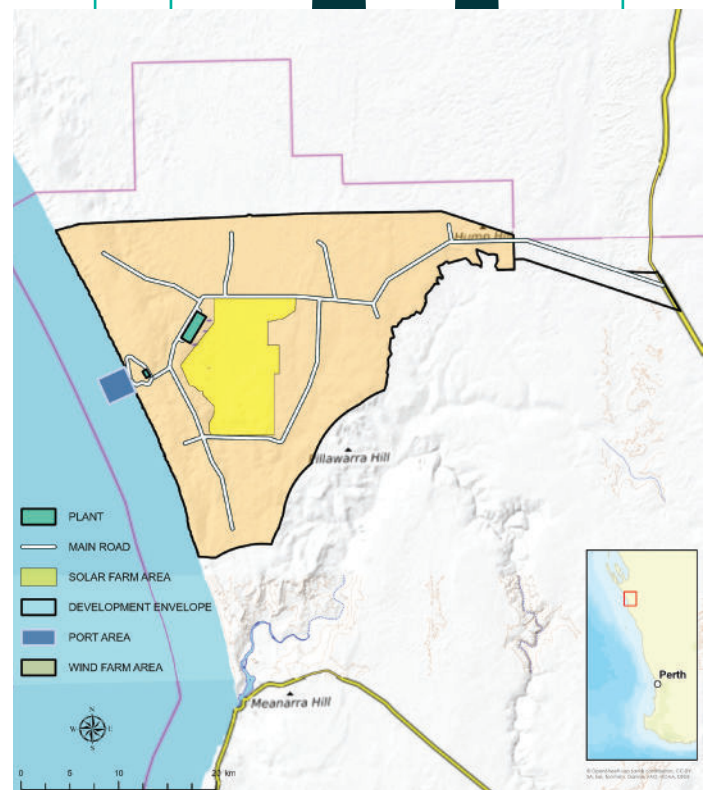
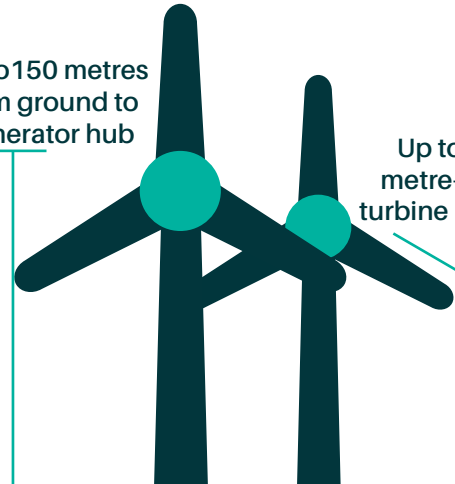
The turbines need to be tall enough to be exposed to winds of sufficient strength and speed, and the blades need to be long enough to generate sufficient amounts of energy when rotating. By using the latest industry technology, MGH will ensure maximum energy production with the smallest number of turbines and vegetation clearing as possible.

The project's wind turbines could have a maximum tip height of up to 272 metres, however based on our current estimates they are more likely to be:

Up to 241 metres high

Up to 150 metres from ground to generator hub

Up to 91 metre-long turbine blades



Will the wind turbines be visible from Kalbarri?

Yes - on a clear day with good visibility, you will be able to see the blades of the wind turbines over the ridge. Other facilities, such as the production plants, will not be visible from Kalbarri.

The MGH team commissioned a specialist visual impact consultant to develop photomontages of what will be visible from various locations in and around Kalbarri. The following locations were chosen following engagement with local community members:

1. Red Bluff residential area
2. Chinaman's Beach
3. Pelican feeding area
4. Kalbarri Sport Oval
5. Kalbarri National Park
6. Meanarra Hill lookout
7. Murchison River Valley
8. Kalbarri Skywalk lookout
9. Nature's Window

To see what the turbines will look like from these locations, visit www.murchisonrenewables.com.au

A full visual impact study is also being undertaken as well and will be supplied to environmental regulators as part of the Environmental Impact Assessment.





How was the visualisation created?

A digital model of the wind turbines has been superimposed onto photographs taken on location.

Atmospheric conditions that are present over long distances, such as sunshine, haze, dust and mist, have then been integrated digitally by a qualified specialist, to create a realistic image.

The end results reflect the anticipated view on an average day in Kalbarri.


Is this what it will really look like?

The visualisations reflect the most accurate integration of the current project infrastructure components and the mapped topographical surrounds.

There will always be a level of interpretation in the production of a visualisation, due to varying atmospheric conditions that can affect the level of visibility. The visualisations produced for this project reflect a 'middle ground approach', erring on the side of greater visibility.

It is important to note that these are still pictures of what will be rotating wind turbine blades. Movement is generally more noticeable than still objects.

It is also important to note that the wind turbines are not required to be lit and will therefore not be visible at night.

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