

Dundonnell Wind Farm



Newsletter
Edition

12

& Transmission
Line FAQs

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The Dundonnell Wind Farm Project

The inspiration for the circa \$600 million Dundonnell Wind Farm came from a group of local land holders who were keen to host a wind farm on their properties.

The site is located about 23 kilometres north-east of Mortlake, in a sparsely populated area predominantly used for grazing stock. The wind farm will include up to 88 wind turbines and will be connected to the National Electricity Market (NEM) via a 38 kilometre 220kV transmission line to the Mortlake Gas Fired Power Station (MOPS).

The Dundonnell Wind Farm will produce enough clean energy each year to power more than 155,000 homes and save the emission of roughly 670,000 tonnes of carbon. This is the equivalent of removing about 140,000 cars from our roads.

The Environment Effects Statement (EES) and planning permit applications were submitted to the relevant authorities in April 2015. Subsequently, planning approval for the wind farm was granted in July 2016 for up to 96 turbines, as well as approvals for the transmission line and offsite substation.

In December 2017, the Minister for Planning granted an increase in the maximum turbine tip height to 189 metres and a reduction in turbine numbers to 88.

Transmission Line

The proposed Dundonnell Wind Farm will connect at MOPS, via a new substation on Connewarren Lane, requiring a dedicated 38 kilometre 220kV transmission line on steel poles.

The line is located largely on private land, across 12 farming properties. About 10 kilometres of the corridor is located within road reserves along the Mortlake-Ararat Road and Castle Carey Road. The transmission line at its closest point to townships is located about seven kilometres north of Mortlake and six kilometres east of Hexham.

The line will incorporate approximately 125 poles which will be around 300 metres apart. The majority of the poles will be between 34 and 38 metres high and approximately 1.3 to 1.5 metres in diameter. However, a few poles will be about 42 metres high and approximately two metres in diameter where additional height is necessary for engineering requirements.

Construction of the transmission line will occur simultaneously to the wind farm.

We are aware there are other proposed wind farm developments in the area that will also require transmission lines.

We are in active discussions with these proponents regarding the possibility of sharing parts of the transmission line infrastructure.



Tilt Renewables

The Dundonnell Wind Farm will be owned and operated by Tilt Renewables.

We are an owner, operator and developer of renewable generation assets across Australia and New Zealand, primarily consisting of wind, solar and storage projects.

We have an existing asset base of 307 operating turbines across seven wind farms. In addition, we own and will operate the nearby Salt Creek Wind Farm which is currently under construction.

Our portfolio includes the Snowtown Wind Farm - South Australia's largest and Australia's second largest wind farm - and the Tararua Wind Farm, New Zealand's largest wind farm.

You can read more about Tilt Renewables at www.tiltrenewables.com

Project update

In February Tilt Renewables submitted its bid for the Dundonnell Wind Farm to be part of the Victorian Renewable Energy Auction Scheme (VREAS).

An outcome to the process is expected in the second half of 2018. If our bid is successful, construction on the project could commence prior to the end of the year.

In the interim, we are working on several fronts including wind farm layout design, finalising the connection agreements, transmission line and substation detailed design, as well as preparing environmental and traffic management plans to manage construction and operational impacts.

We are currently working with the relevant agencies to ensure that the detailed design of the project is consistent with approvals, as well as ensuring the management plans are appropriate. This includes working with the Moyne Shire

Council and VicRoads to ensure the design, location and construction of the transmission line sections in the road reserves meet the engineering and safety requirements of both parties.

While most of the activities we are undertaking at the moment are office based, you may see an increase in activity in the area. This may include survey work, geotechnical studies or further environmental assessments.

We welcome your feedback if you have any concerns or believe you can provide local insight into matters which we should address as we enter this next stage of the project and the manner of engagement which you prefer going forward.

Employment

A wind farm project brings many direct opportunities for employment to the region during both the construction phase and ongoing operations once the wind farm is commissioned.

Flow on employment benefits are also achieved as the project brings demand for local business services and consumer goods. Most regions have a range of businesses that will provide services to a wind farm project.

Anyone interested in supply of local services or employment is encouraged to register their interest on the 'Goods and Services Register' via the link on the project website (www.tiltrenewables.com/assets-and-projects/Dundonnell-Wind-Farm/).

Community benefits

Tilt Renewables is committed to providing support for the local community through community benefit programs.

Work on a community fund will begin when construction of the project commences. This fund will operate for the life of the wind farm and will be administered by a community-led group.

There will be further shared benefit programs made available to the local community, as well as the regional community. Further information will be made available as the project proceeds towards construction.

Project facts

- Circa \$600 million project
- Up to 88 turbines, with a blade tip height of up to 189m
- Installed capacity of about 350MW
- 12 wind farm host landholders, across some 4500 hectares
- 12 transmission line host landholders
- 38 kilometres of 220kV overhead transmission line to the connection at the MOPS substation
- Underground 33kV cables between the turbines
- Onsite quarry and concrete batching plants

Project status

- Planning and environmental approvals received
- Proposal submitted to the State Government's VRET Reverse Auction
- Could commence construction later this year
- Currently undertaking;
 - Wind farm layout design
 - Finalising of connection agreement, transmission line and substation design
 - Preparing management plans (to manage construction impacts)

Contact details

For more information, or to provide any feedback, please visit the project website

Web: www.dundonnellwindfarm.com.au

Email: dundonnellwindfarm@tiltrenewables.com

Phone: 1800 122 823

Postal Address: PO Box 16080,
Collins St West, Melbourne Vic 8007



Transmission Line FAQs

How long will it be?

The transmission line will be about 38 kilometres long. The majority of the transmission line will be located on private property, while about 10 kilometres will be located within road reserves (namely Castle Carey Road and Mortlake-Ararat Road).

Why will it zigzag instead of going in a straight line?

There are many factors that need to be considered during the planning of a transmission line. These include availability of land access (both public and private), infrastructure constraints, native vegetation, areas of cultural heritage significance, property configurations and dwelling locations, just to name a few.

During the development and approval phase of the project multiple alignment route options to connect the wind farm process to MOPS were investigated. This included the review of environmental, planning, safety and social impacts, as well as active engagement with local landholders along the proposed route options that were being investigated.

The EES and planning permit process further refined the alignment considering these factors.

How many poles will there be?

Detailed design of the transmission line is currently being undertaken so the exact number of poles is still not known.

However, it is likely that there will be about 125 steel poles, which will be about 300 metres apart, over the 38 kilometres. There is a small section of transmission line between the new offsite substation on Connewarren Lane and MOPS, which spans about 600 metres and may include a number of lattice towers (the current design includes about two towers, up to approximately 70 metres in height) to facilitate the 500kV connection at MOPS.

How big will they be and are they all the same?

The types of poles installed along the 220kV single or double circuit transmission line can generally be split into two categories – strain poles and intermediate poles. Single circuit transmission lines traditionally consist of three wires plus a wire for telecommunications, while double circuit lines would generally be twice that.

It is anticipated that in the order of 30 per cent or less of the poles will be the larger strain poles. At a maximum, the strain poles may measure about 42 metres above ground level and have a base width of approximately two metres.

The strain poles are generally installed where the transmission line changes direction and/or crosses major roads or other infrastructure such as a powerline.

The height of the other intermediate poles is likely to range between 34 and 38 metres above ground level. The intermediate poles are generally utilised on the straight sections of the transmission line and have a base width between approximately 1.3 to 1.5 metres.

There is a small section (about 600 metres) of the transmission line between the offsite substation and MOPS which may include a number of lattice towers (the current design includes an estimated two towers, up to about 70 metres in height) to facilitate the 500kV connection at MOPS.

Some poles might require guy wires for support, however, the majority of poles will be designed to be free-standing.

While a pole without guy wires may be larger in size than one which has guy wires, it reduces the overall disturbance footprint of the transmission line, improves public safety around poles and reduces ongoing maintenance requirements.

What influences the design of the transmission line?

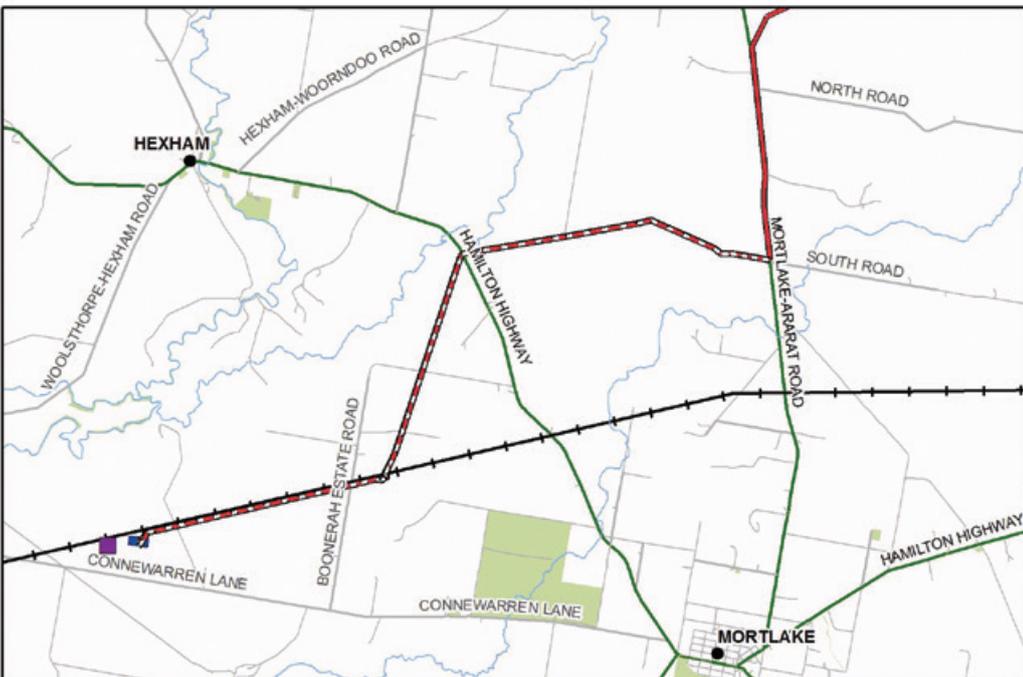
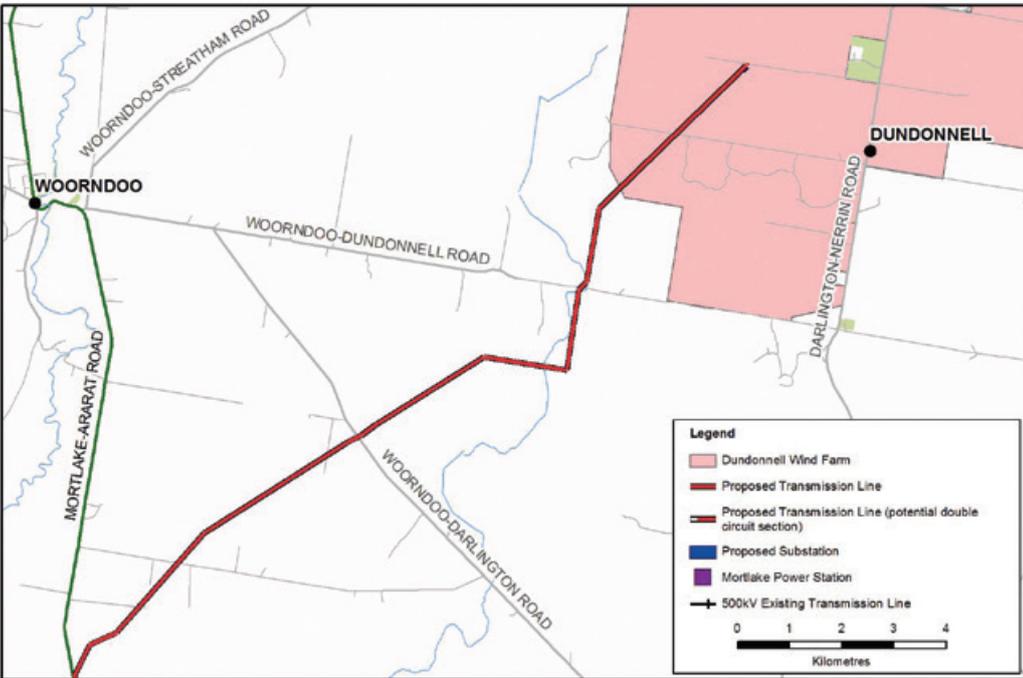
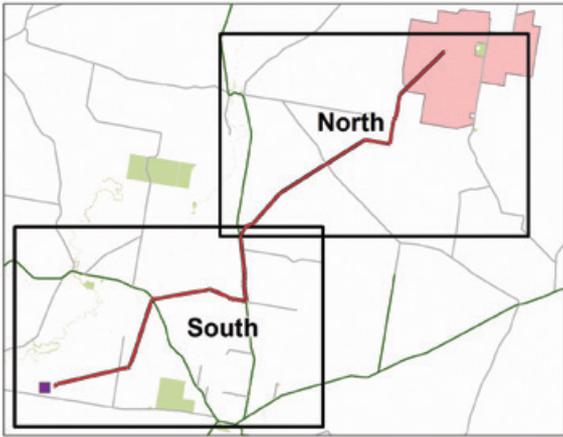
The design of the transmission line (including the size of the poles) is influenced by numerous factors, some of which include:

- Voltage (e.g. 22kV, 66kV, 132kV), number of circuits, conductor (the wires) type/size, security level and design life requirements;
- Line length, spans between poles, changes in direction and topography;
- Structural loads due to the weight, wind, earthquake, ground water and others;
- Electrical safety requirements;
- Communication and earthing requirements;
- Temperature limits and fluctuations;
- Existing infrastructure constraints;
- Native vegetation, planning requirements, areas of cultural heritage significance, property configurations and dwelling locations;
- Road and traffic safety; and
- Fire safety.

What standards will the line be designed to?

The transmission line has been designed and will be constructed in accordance with (but not limited to) the following primary standards and regulations:

1. Australian Standard AS/NZS 7000:2016 – Overhead line design,
2. Electricity Safety (Installation) Regulations 2009 (Victoria),
3. Electricity Safety (Electric Line Clearance) Regulations 2015 (Victoria), and
4. The Road Management Act 2004.



Above: Indicative single circuit steel strain pole 30m

Why steel poles?

The Dundonnell Wind Farm transmission line will utilise steel poles which will meet all the required standards. The steel poles are likely to consist of three individual sections which fit together on site.

Delivering the poles in sections means they can be transported using conventional trucks and trailers, rather than more complicated over-dimensional transport methods.

The use of steel poles for the 220kV transmission poles will also have less environmental and visual impact than lattice tower structures that may be used for transmission lines of this voltage or higher.

However, we do note that there is a small section (approximately 600 metres) of the transmission line between the offsite substation and MOPS which may include a number of lattice towers to facilitate the 500kV connection at MOPS.

Why can't it be underground?

Typically, it is cost prohibitive to install transmission or distribution lines underground for the distances contemplated by many projects of this nature. There could also be a significantly greater environmental impact installing a transmission line underground – as laying cables could impact a far greater area of native vegetation or other environmentally sensitive areas due to trenching and the process of undergrounding the lines.

Can more than one wind farm share the same transmission line?

In theory, more than one wind farm can share the same transmission poles. This would, however, require both wind farm proponents to be fully committed to construction of these projects at or around the same time, including full coordination and agreement on the transmission line contractor(s), design, construction and operational contracts.

There are a significant number of commercial, technical and regulatory considerations associated with these types of arrangements which add to the complexity and difficulty in facilitating the sharing of infrastructure.

There is currently no single mechanism (i.e. across planning and environment and network planning regulatory systems) which facilitates the coordinated network planning of transmission infrastructure required to connect energy generation projects (renewable or non-renewable) to the National Electricity Market.

The Minister for Planning is responsible for assessing all planning permit applications associated with a wind farm (including native vegetation removal to construct a transmission line). Tilt Renewables is in active discussions with Woolnorth Wind Farms regarding the potential for sharing parts of the transmission line with the Mt Fyans Wind Farm, where possible.

How long will it take to build?

Once construction has commenced, the transmission line will take about 12 months to build.



Above: Indicative single circuit steel suspension pole 31m

Who is building and will be responsible for the transmission line?

It is likely that the new transmission line will be designed, built, owned and operated by a Transmission Network Service Provider (eg AusNet Services). The Transmission Network Service Provider will engage a contractor to construct the line.

How many people will be working on the project?

A wind farm project brings many direct opportunities for employment to the region during both the construction phase and ongoing operations once the wind farm is commissioned. Flow on employment benefits are also achieved as the project brings demand for local business services and consumer goods. Most regions have a range of businesses that will provide services to a wind farm project.

These include:

- Domestic level electricians;
- Transport operators;
- Competent machine operators;
- General labourers;
- Quarry and material suppliers; and
- Concrete businesses.

The Dundonnell Wind Farm project will directly employ more than 200 staff on site during construction, which will take up to three years. Economic assessments indicate the multiplier effect will sustain about 960 jobs per year throughout this construction period. Once operational, the proposed Dundonnell Wind Farm will employ 10 full-time staff during its 25-year operation.

Anyone interested in supplying of local services or employment is encouraged to register their interest on the goods and services register at the project website.

What provides the Transmission Network Service Provider with the right to design, build, own and operate 'private' transmission lines?

Transmission Network Service Providers hold electricity transmission licenses, granted by the Essential Services Commission. If available and suitable for the specific projects, road reserves can be used by utilities for the installation of transmission lines.

Who pays for the transmission line?

While the transmission line will likely be designed, built, owned and operated by a Transmission Network Service Provider (such as AusNet Services), Tilt Renewables will pay for the installation and ongoing operation and maintenance of the network connection infrastructure.

What can I expect during construction?

During construction, you can expect environmental and traffic management measures in place at the location where the work is focused. Construction will be completed in many areas simultaneously and work will not necessarily be undertaken in one direction along the transmission line – work fronts will move around along the 38 kilometre line route.

What planning process did you go through?

A planning permit was issued for the Dundonnell Wind Farm transmission line on 23 October 2016. The planning permit was issued following consideration through an Environment Effects Statement (EES) process including public consultation, public notification and an inquiry (including a panel hearing). A planning permit was issued for the off-site substation on 23 June 2017.

What other approvals are required before building a transmission line?

In addition to the EES and planning permit application process, the transmission line was also approved under the Commonwealth environmental legislation. Additionally, a Cultural Heritage Management Plan was prepared and approved to ensure impacts on cultural heritage are managed.

Prior to construction of the transmission line, the designer and constructor will obtain approvals associated with the crossing of existing infrastructure, waterways and to undertake work within road reserves (see further discussion below) and other relevant approvals.

Some of the poles are in the road reserves.

Is road safety and flooding considered?

Road safety is considered in the design and placement of poles in road reserves and must be reviewed by local Council and VicRoads engineers who need to be satisfied that appropriate design and safety requirements are met (e.g. VicRoads standards).

To construct the sections of the transmission line in road reserves, works within road reserve permits will be required from VicRoads and the Moyne Shire Council.

These will be obtained prior to construction commencing. The shire and VicRoads will inspect the poles located in road reserves during and following their construction.



Above: Indicative double circuit steel pole



Above: Indicative double circuit steel pole

How will bushfire safety be considered?

The transmission line will be designed to meet or exceed appropriate design and safety standards. In this case, the transmission line will be owned and operated by a Transmission Network Service Provider such as AusNet Services. The provider will apply electricity industry best practice to the maintenance of the transmission line (including, for instance, vegetation clearance) and ensure all required regulations in relation to electricity safety and bushfire mitigation are met (such as Energy Safety Victoria requirements).

For instance, once the transmission line is built, it will be managed in accordance with an Electricity Safety Management Scheme for the Victorian Transmission Network, which must be accepted, approved and audited by Energy Safety Victoria on a regular basis.

What inspections or checks will be undertaken during and after construction?

Compliance audits will continue to be conducted during construction by the Transmission Network Service Provider, Tilt Renewables, WorkSafe Victoria, the Office of Aboriginal Affairs and the Department of Environment, Land, Water and Planning as well as others as required.

The Transmission Network Service Provider must submit commissioning and compliance documentation to the relevant authorities to energise the transmission line, including the Australian Energy Market Operator (AEMO).

The transmission line can only go 'live' once AEMO is satisfied their requirements are met.

What are the benefits of the project?

The wind farm project (including the transmission line) will:

- Directly employ more than 200 staff on site during construction, which will take about two years.
- Sustain about 960 jobs per year throughout the construction period.
- Contribute \$111 million to the regional economy over the construction period.
- Employ up to 10 full-time staff during its 25-year operation.
- Produce enough clean energy each year to power more than 155,000 homes and save the emission of roughly 670,000 tonnes of carbon. This is the equivalent of removing about 140,000 cars from our roads.
- Create additional fire breaks. There will be 60-70 kilometres of new access tracks within the wind farm.
- Have a local community fund that will be implemented when construction of the wind farm commences and be administered by a community-led group.
- Leave a wealth of documentation relating to local flora, fauna and heritage, following a significant amount of research and reports.
- Implement a range of local, regional and state- based benefit sharing programs addressing key social and education-based needs if it is successful through VRET.

