

Transmission

Frequently Asked Questions

In order to connect a renewable energy project to the electricity network, the development of transmission infrastructure is required, including transmission lines and substations or terminal stations.

What is the electricity network?

Australia has two main electricity networks and a number of smaller networks to enable the reliable delivery of electricity to households and businesses across the country. Each main network consists of:

- Transmission infrastructure that transmits electricity across large distances at very high voltages
- Distribution infrastructure that delivers electricity from the transmission system to households and businesses.

Australia's electricity grids include:

- The National Electricity Market (NEM), covering Qld, NSW, ACT, Vic, SA, Tas
- The South West Interconnected System (SWIS) covering the southwest of WA
- The North West Interconnected System (NWIS), covering the Pilbara region in WA
- The Darwin-Katherine Interconnected System (DKIS) in the NT



There are over 850,000km of distribution network and 45,000 km of transmission network in operation across Australia. The NEM covers the eastern and south-eastern states and is one of the longest interconnected electricity systems in the world.

In order to facilitate new energy projects, and a renewable energy transition, state governments and agencies are working on their own transmission related projects, including upgrades to existing infrastructure and construction of new infrastructure across the country.

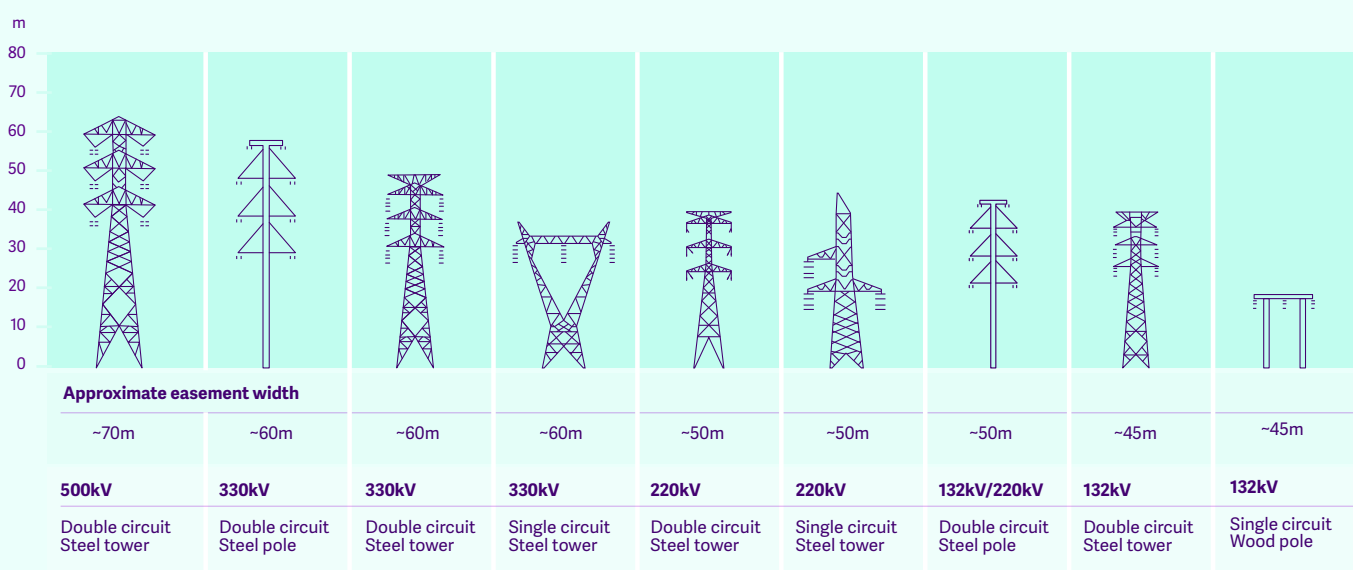


What influences the design of a transmission line?

There are many considerations which influence the design of a transmission line. Key factors include:

- voltage (e.g., 66kV, 132kV, 220kV), number of circuits, conductor (wire) type/size, security level and design life requirements
- land ownership and access (both public and private)
- native vegetation and biodiversity
- areas of cultural heritage significance
- property configurations and dwelling locations
- topography
- line length, spans between poles/structures, changes in direction
- structural loads due to weight, wind, earthquake risk, groundwater and other environmental factors
- electrical safety requirements
- fire safety
- road and traffic safety
- communication and earthing requirements
- temperature limits and fluctuations
- existing infrastructure constraints
- planning requirements

Figure 1 - Transmission line examples



Can transmission lines go underground?

Yes, however there are a number of reasons why it may not be the preferred option.

Underground transmission lines have a much larger construction footprint than overhead lines. Laying underground cables requires digging wide and deep trenches throughout the entire route, and still requires above-ground infrastructure.

They also require more significant excavation and truck movements during construction compared to overhead lines. This results in significantly more land disturbance, resulting in a much greater environmental, cultural heritage and land use impact, along with resulting in higher costs and a much less flexible alignment.

Whilst constructing a transmission line underground removes restrictions of the height of vehicles and machinery used within the easement, an underground transmission line easement is not without land use restrictions (e.g. restrictions on heavy vehicles and machinery or cropping).

There are also several temperature and electrical performance, ongoing maintenance, fault identification and resolution considerations when looking at the viability of underground transmission.

Furthermore, it is often cost prohibitive to install transmission or distribution lines underground for the distances contemplated by renewable energy projects.



Can more than one project share the same transmission line?

Yes, however to facilitate this there needs to be significant coordination between developers upfront and timing must align. There are many commercial, technical and regulatory considerations that require multiple projects to be proceeding (or committed to) construction of the projects at or around the same time to allow full coordination and agreement on the transmission line contractor, design, construction and operational contracts.

Who builds, owns and maintains the transmission lines?

Transmission Network Service Providers (e.g., organisations such as AusNet Services in Victoria, TransGrid in New South Wales, Powerlink in Queensland and Western Power in Western Australia) are usually responsible for project related transmission lines once they are constructed. In some instances, transmission lines can be privately owned and operated.

Are transmission lines a safety risk?

All transmission lines are designed to meet or exceed design and safety standards.

Transmission lines are equipped with fast-acting protection systems designed to prevent injury to people, damage to property and grass or bush fire.

The Transmission Network Service Provider will apply electricity industry best practice to the maintenance of the transmission line (e.g., maintaining vegetation clearance under the transmission line) and ensure all electricity safety and bushfire mitigation regulations are met.



Contact us

1800 HI MINT (446 468)

info@mintrenewables.com

www.mintrenewables.com