

Energy hubs and switching stations

Central-West Orana REZ transmission project

September 2023

EnergyCo is delivering the Central-West Orana Renewable Energy Zone (REZ) to provide a clean, affordable and reliable power supply for energy consumers across NSW. The Central-West Orana REZ transmission project will involve the construction of new transmission lines, energy hubs, switching stations and related infrastructure. The new REZ network infrastructure will enable renewable energy from solar, wind and storage projects to be distributed to energy consumers across the State via the existing NSW transmission network.



Overview

Delivering the Central-West Orana REZ transmission project would require the construction and operation of new transmission infrastructure. This would include energy hubs, switching stations and transmission lines which would collect, transform and transmit power to the existing NSW electricity network.

The project would include 500 kV and 330 kV transmission lines, two energy hubs and 14 switching stations from Cassilis to Wollar in the north and south, and Cassilis to Goolma in the east and west of the REZ. Permanent access tracks outside of these facilities would also be developed, to be located between the transmission line easements and public road network.

For more details on the network infrastructure for the Central-West Orana REZ transmission project, please view **Chapter 3: Project description** of the Environmental Impact Statement (EIS) via EnergyCo's website at energyco.nsw.gov.au/cwo.

What is an energy hub?

An energy hub is a substation where electricity exported from renewable energy generation projects at 330 kV is aggregated, transformed to 500 kV (where required), and exported to the NSW transmission network for distribution to the homes, businesses and essential services that need it. Renewable energy generation projects can include solar, wind and storage projects.

For this project, the two energy hubs would be the connection between the surrounding renewable energy generation projects. Located to optimise the connection to surrounding renewable generation, they will transform the voltage of energy generated by renewable energy projects from 330 kV (the voltage it leaves the generators at) to 500 kV so that it can be transferred to the existing NSW network. The energy hubs would be connected to a new switching station at Wollar, which would provide the connection between the renewable energy generation projects and the wider electricity network.

What is a switching station?

A switching station is a facility used to connect two or more transmission lines of the same designated voltage. For the REZ transmission project, this would include:

- One new 500kV switching station to be constructed at Wollar to connect the energy hubs to the 500kV NSW transmission network. This would be the connection point of the REZ transmission project to the NSW transmission network.
- Thirteen new 330 kV switching stations to provide connections for renewable energy projects.

Infrastructure

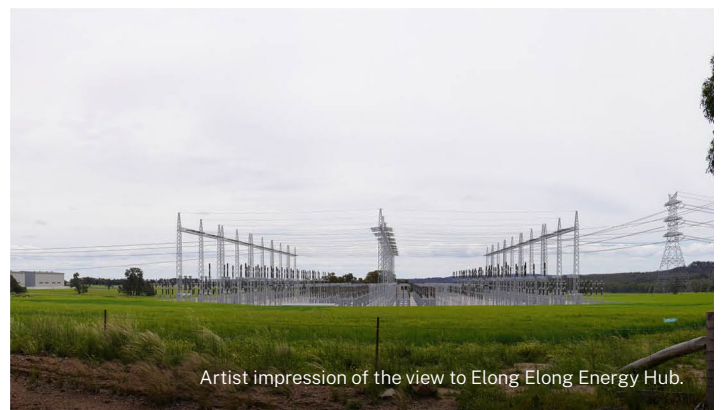
Energy hub sites would include:

- 330 kV and 500 kV switchyards for connecting to other energy hubs and switching stations
- Transformers to change the voltage from 330kV to 500kV
- Synchronous condensers and reactive equipment to provide system strength and power quality
- Supporting electrical components busbars, circuit breakers, isolators, metering to operate, isolate, measure, stabilise and regulate the energy
- A battery energy storage system (optional) at Merotherie energy hub
- Supporting service buildings for protection, communication and control systems
- Equipment buildings and enclosures to provide noise mitigation
- Oil containment systems, water supply, drainage and septic infrastructure

- Gantries to connect with transmission lines
- Amenities for operational and maintenance staff, including a parking area
- Access roads, security fencing and lighting.

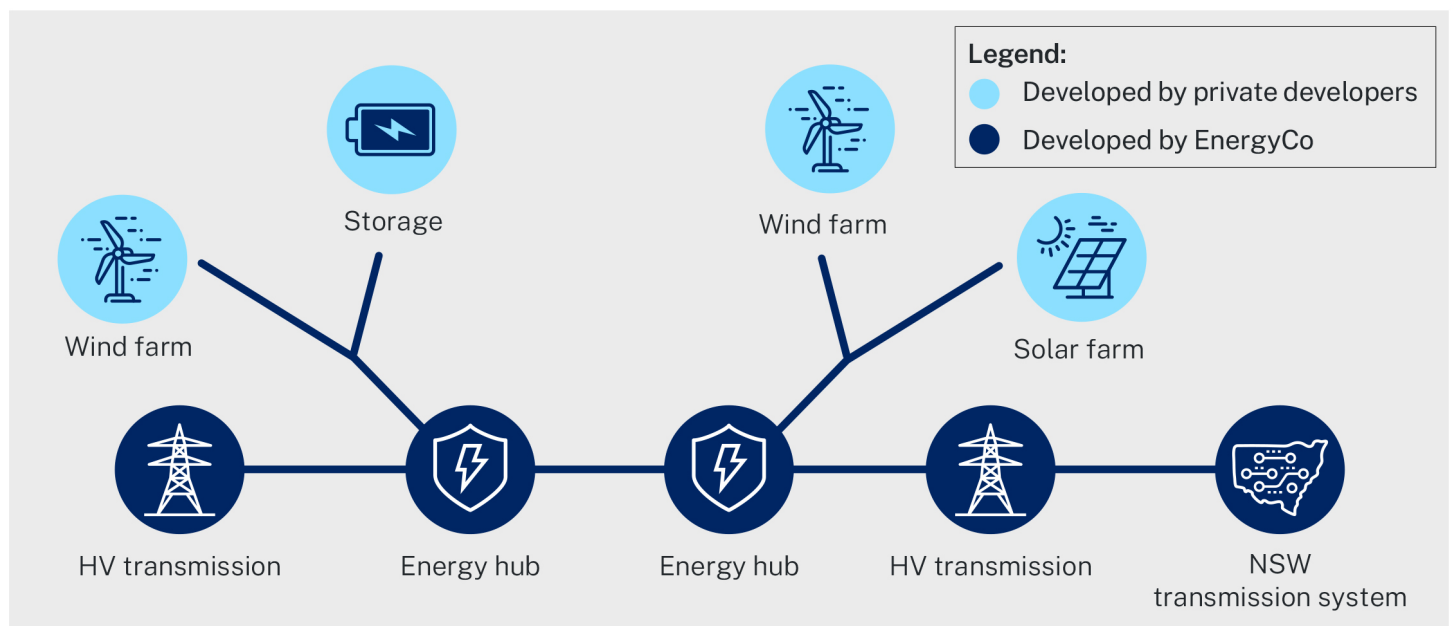
Switching station sites would include:

- 500kV switchyard to connect to the NSW transmission network (Wollar)
- 330 kV switchyards to connect to renewable energy generators
- Supporting electrical components including busbars, circuit breakers, isolators, metering
- Communications equipment and control and protection systems
- Supporting service building for protection, communications and control systems
- Gantries to connect with transmission lines
- Amenities for operational and maintenance staff, including a parking area
- Access roads, security fencing and lighting.



Artist impression of the view to Elong Elong Energy Hub.

Energy hubs in the REZ



Where will these facilities be located?

Energy hubs:

Energy hubs would be located close to planned major generation projects. The two energy hubs required for the REZ transmission project would be located in:

- Merotherie, along Merotherie Road and 17 kilometres southeast of Dunedoo
- Elong Elong, next to Dapper Road, Cobbora and 22 kilometres southwest of Dunedoo.

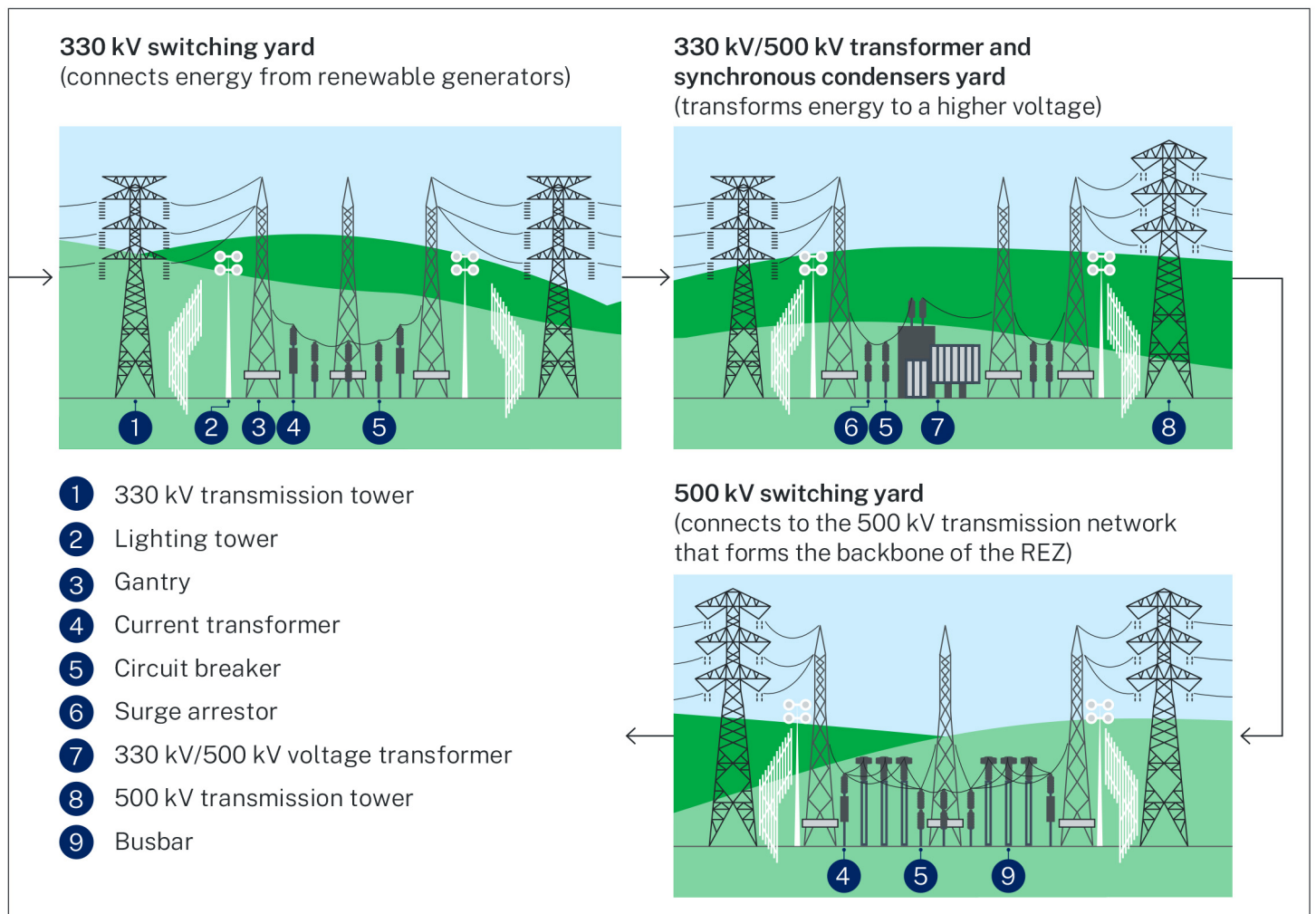
Positioning energy hubs close to energy developments provides a centralised connection and reduces the distance and number of transmission lines connecting generators to the REZ transmission project.

Switching stations:

A total of thirteen 330 kV generator connection switching stations would be located at:

- Cassilis
- Coolah

Indicative energy hub layout



- Leadville
- Merotherie (2)
- Tallawang (4)
- Cobbora (3)
- Goolma.

One new 500 kV switching station to connect the REZ transmission project to the NSW transmission network would be built six kilometres south of Wollar, 320 metres from the existing substation off Barigan Road.

How much land is needed?

The size of each energy hub and switching station is dependent on the configuration of the site and the suitable land available. Switching stations have a smaller footprint than energy hubs.

Each site will need enough land to house the electrical infrastructure and site facilities as well as a perimeter buffer zone for safety and maintenance purposes. We will need to acquire some private land for the purposes of building new energy infrastructure and we are working closely with landowners on this.

Living near an energy hub or switching station

Once they are built energy hubs and switching stations are generally low impact for neighbouring landowners and residents.

There will be restrictions on certain activities above or nearby the facilities and within the vicinity of the transmission easements connected to the energy hub and switching station sites. Further information about living and working near transmission easements can be found in our fact sheet at energyco.nsw.gov.au/cwo.

Operational noise and lighting

Energy hubs and switching stations are typically quiet during operation as they act as a connection and not as generators of electricity. The equipment may emit a low humming noise, but this is generally only noticeable when standing close by. Noise-emitting equipment will be placed within enclosures if required.

Operational lighting would be provided at the facilities for site security and worker safety. Lighting would operate between dusk and dawn, seven days a week and would be controlled by daylight sensors.

Safety and security

Safety and security measures would be put in place at the energy hubs and switching stations. These have been designed for the safety of personnel and the public, to protect the equipment and to ensure the security and reliability of the REZ transmission project.

Access

Access to energy hubs and switching station sites once constructed would be via sealed access tracks from

the nearest public road. Where possible, the switching stations have been co-located with infrastructure such as renewable generation projects connection substations and, where suitable, the existing access road network provided to the renewable generation projects would be utilised.

Maintenance

Regular maintenance will be carried out at each energy hub and switching station, including routine equipment inspections and repair work.

An operational maintenance facility would be established within the Merotherie Energy Hub to support the operation and maintenance of the transmission lines, switching stations and the energy hubs. Maintenance staff and personnel would be based at this facility during standard working hours. Each energy hub and switching station would require 24-hour access for emergencies.

The other energy hub and switching station sites would not be staffed except during planned maintenance activities. Fault and emergency crews may occasionally attend the energy hubs or switching stations to respond to unplanned events to make the equipment safe until repairs are completed, or to restore power supply.

About EnergyCo

The Energy Corporation of NSW (EnergyCo) is a statutory authority responsible for leading the delivery of Renewable Energy Zones (REZs) under the NSW Government's Electricity Infrastructure Roadmap. For more information, visit our website at energyco.nsw.gov.au/about-energyco.

Contact Us

For more information about the Central-West Orana REZ project, you can visit our website or contact the project team:

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🗣️ If you need help understanding this information, please contact the Translating and Interpreting Service on **131 450** and ask them to call us on **1800 061 114**.

EnergyCo wants to hear what you think about our plans. If you have questions or want to give feedback, please get in touch with our team. You can find more information on our website by scanning the QR code or by visiting energyco.nsw.gov.au.

