

Energy hubs and switching stations

Central-West Orana Renewable Energy Zone

September 2022



An existing electrical substation at Wollar

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 REZ will initially unlock at least three gigawatts of new transmission capacity from solar, wind and storage projects within the next decade, which is enough to power 1.4 million homes.

Overview

To enable renewable energy to be distributed to energy consumers across the state, EnergyCo is leading the planning and delivery of new high capacity transmission infrastructure for the Central-West Orana REZ. This includes new energy distribution and storage infrastructure and overhead transmission lines.

What is an energy hub?

Energy hubs are a modern type of substation that act as connection points between renewable energy projects and the broader transmission network. Energy hubs collect electricity from solar, wind and storage projects and transfer it to the network so it can be distributed to the homes, businesses and essential services that need it.

Where will the energy hubs be located?

There are two main energy hubs proposed for the REZ transmission network at Elong Elong and Merotherie. Additional energy hubs may be identified for future stages of the project.

Energy hubs will be located close to planned major generation projects. Positioning energy hubs close to these developments helps provide a centralised connection point and reduces the distance of generator connection lines to the transmission network.

The exact locations of the energy hubs are not yet confirmed. We are engaging with landowners and carrying out further work to refine the design before we confirm the locations and the layout of the energy hub sites.

Detailed assessments of the proposed energy hub sites will be included in the project's Environmental Impact Statement (EIS), which is planned for public exhibition in mid-2023.

Energy hub infrastructure

Energy hub sites will include:

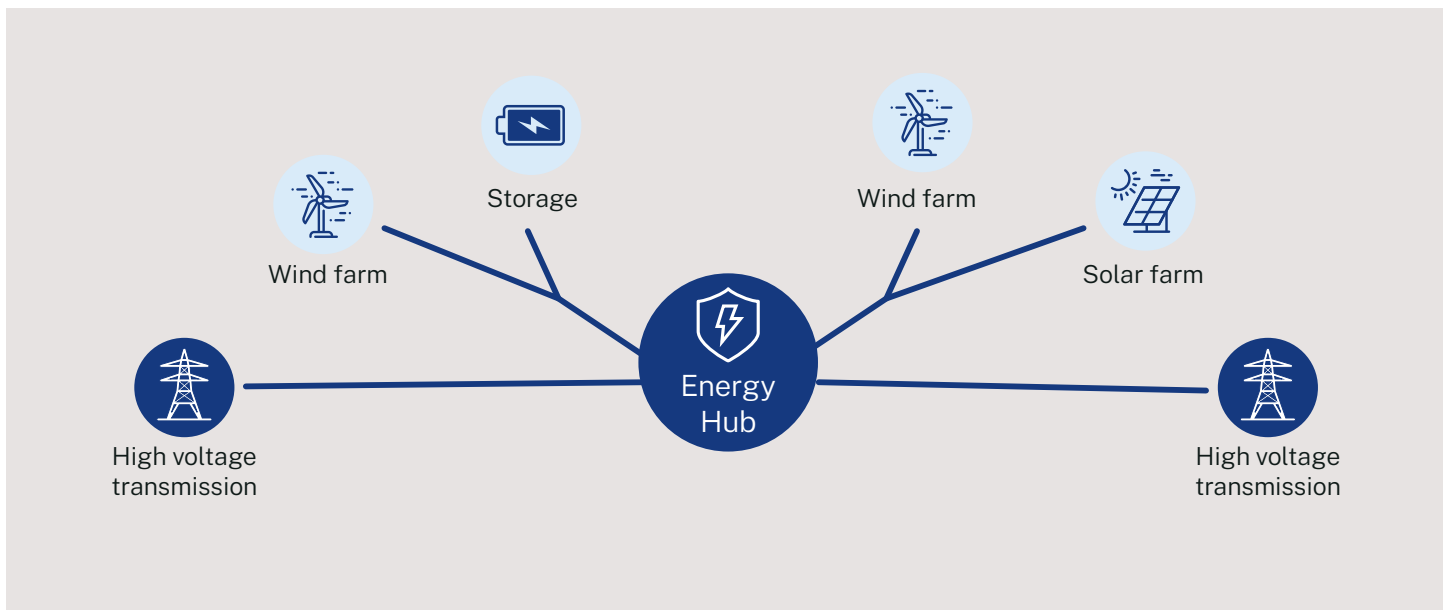
- electrical equipment including synchronous condensers, switching gear and transformers
- small buildings for protection and control equipment
- amenities for maintenance staff.

Switching stations

A switching station is a type of substation which is used to connect two or more transmission lines of the same voltage. For the REZ transmission project, a new switching station will be built at Wollar to facilitate the transfer of energy to the broader NSW transmission network. Switching stations are smaller than energy hubs and don't include any power transformer equipment.

A number of minor switching stations will also be built along transmission lines which connect solar, wind and storage projects to the nearest energy hub. These switching stations will enable connections within the generators' internal networks.

Energy hubs in the REZ



Legend:

- Developed by private developers
- Developed by EnergyCo

How much land is needed?

The size of each energy hub will depend on a number of factors, including the amount of suitable land available and the configuration of each site. Each site will need enough land to house the electrical infrastructure and site facilities as well as a buffer around the perimeter of the site for maintenance purposes.

Energy hubs may require up to 90 hectares of land plus a buffer, however this will be confirmed as the design is finalised. Switching stations have a smaller footprint than energy hubs and will require less land.

We will need to acquire some private land for the purposes of building new energy infrastructure and we are working closely with landowners within the study corridor to identify suitable locations.

Living near an energy hub

Once they are built energy hubs are generally low impact for neighbouring landowners and residents. There may be restrictions on certain activities above energy hubs and within the vicinity of transmission easements which connect to energy infrastructure sites. Further information about living and working near transmission easements can be found in our fact sheet at energyco.nsw.gov.au.

Operational noise

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

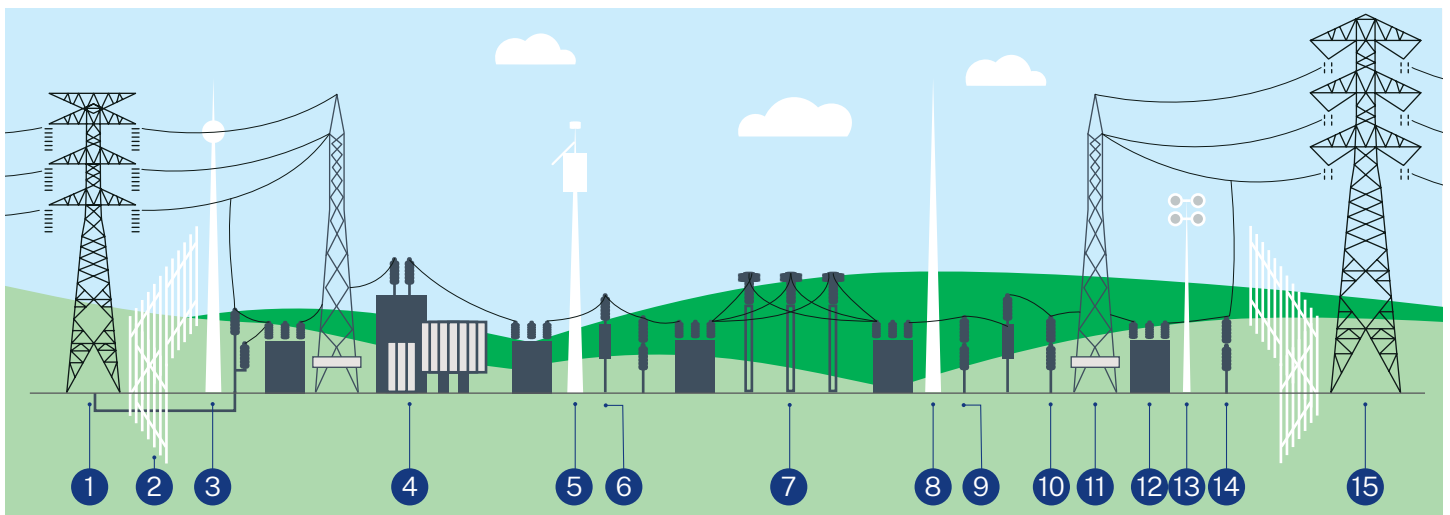
Safety and security measures

Energy hubs will have multi-layered security and safety measures in place to protect the safety of the people, guard the equipment and ensure the reliability of the REZ network. While it is safe to view, pass by or live near an energy hub, it can be very dangerous for a person to enter without the appropriate training and equipment.

Maintenance

Regular maintenance will be carried out at each energy hub, including routine equipment inspections and repair work. Generally, energy sites will not be staffed except during planned maintenance activities. Fault and emergency crews may occasionally attend the energy hubs to respond to unplanned events to make the equipment safe until repairs are completed, or to restore power supply.

Indicative energy hub arrangement



- 1 330 kV transmission line tower which supplies renewable energy from solar, wind and storage projects
- 2 Fence
- 3 Communication tower
- 4 Power transformer
- 5 Weather station

- 6 Current transformer
- 7 Busbar
- 8 Lightning mast
- 9 Circuit breaker
- 10 Voltage transformer
- 11 Gantry

- 12 Line disconnector
- 13 Light pole
- 14 Surge arrester
- 15 500 kV transmission tower which forms the backbone of the REZ transmission network

About EnergyCo

The Energy Corporation of NSW (EnergyCo) is a statutory authority responsible for leading the delivery of the REZs as part of the NSW Government's Electricity Infrastructure Roadmap. EnergyCo will work closely with communities, investors and industry to deliver the state's first five REZs.

For more information about EnergyCo, visit our website at energyco.nsw.gov.au/about-energyco.

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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.

