



An artist's impression of one of the options for the fence line for the planned Ballarat East Zone Substation now subject to community consultation.



Ballarat East Zone Substation

A modern \$30 million zone substation is planned for Ballarat East to help keep power reliable for the growing city.

We know that as more people move into the region, new homes go all-electric, and electric vehicles become more common, the quality of our power supplies becomes all the more essential. The new zone substation is therefore designed to support people in the city as well as some communities outside of Ballarat, and make sure they have the power they need when they need it.

Zone substations power communities

Powercor operates 61 zone substations across the network and these are typically located as close as possible to the populations they service. This includes two zone substations currently supplying Ballarat: Norman Street, Wendouree which supplies 37,000 customers; and Sutton Street, Delacombe which supplies more than 43,000 customers.

Zone substations play an important role providing electricity supplies to communities and managing the voltage of those supplies. They are the link between the transmission and sub-transmission networks which move electricity from where it is generated and the distribution network that supplies customers' properties directly.

Power comes into zone substations from the sub-transmission network at a high voltage of 66 kilovolts (kV). The zone substation then converts that power to a lower voltage, typically 22kV or 11kV so it can be distributed on smaller, lighter power poles and powerlines.

The powerlines coming out of a zone substation are called 'feeder' lines because they take power into neighbourhoods where the voltage then steps down again to 400 or 230 volts for direct supply to customer properties. In the Powercor network, feeder lines can span more than 150 kilometres as they link the large numbers of energy users in towns with smaller, less populated communities.



What is a 'volt'?

A volt is a measure of the pressure in an electric circuit. The higher the voltage, the more electrical current will flow in the circuit. It can be likened to water flowing in a pipe: the greater the pressure, the more water will flow. A kilovolt equals 1,000 volts.

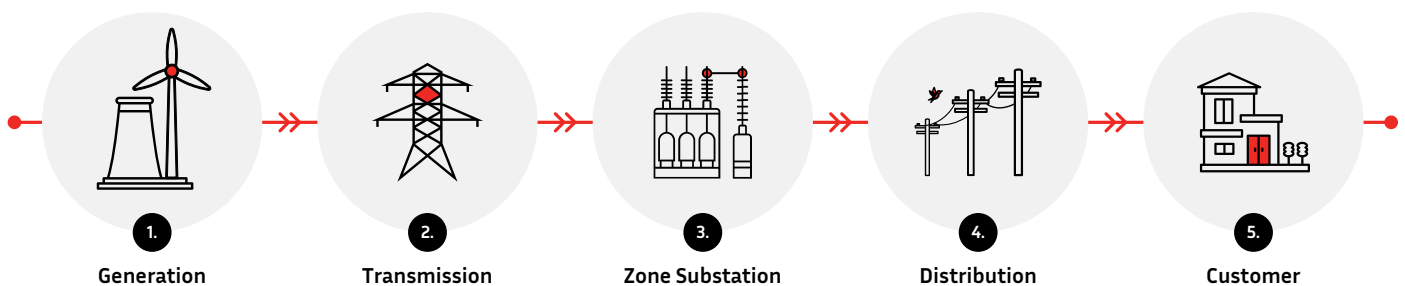


Illustration 1. Energy supply chain showing the role of zone substations in converting power to a voltage that can be distributed.

Site selected

The Ballarat East zone substation will be built on a site at 203 York Street which was purchased by the State Electricity Commission in 1973 and is zoned for the construction of services and utilities

We investigated a range of options before selecting this site. This included options to expand the existing zone substations servicing Ballarat which are at or nearing their full capacity.

However compared to all alternatives, the advantages of the York Street site were:

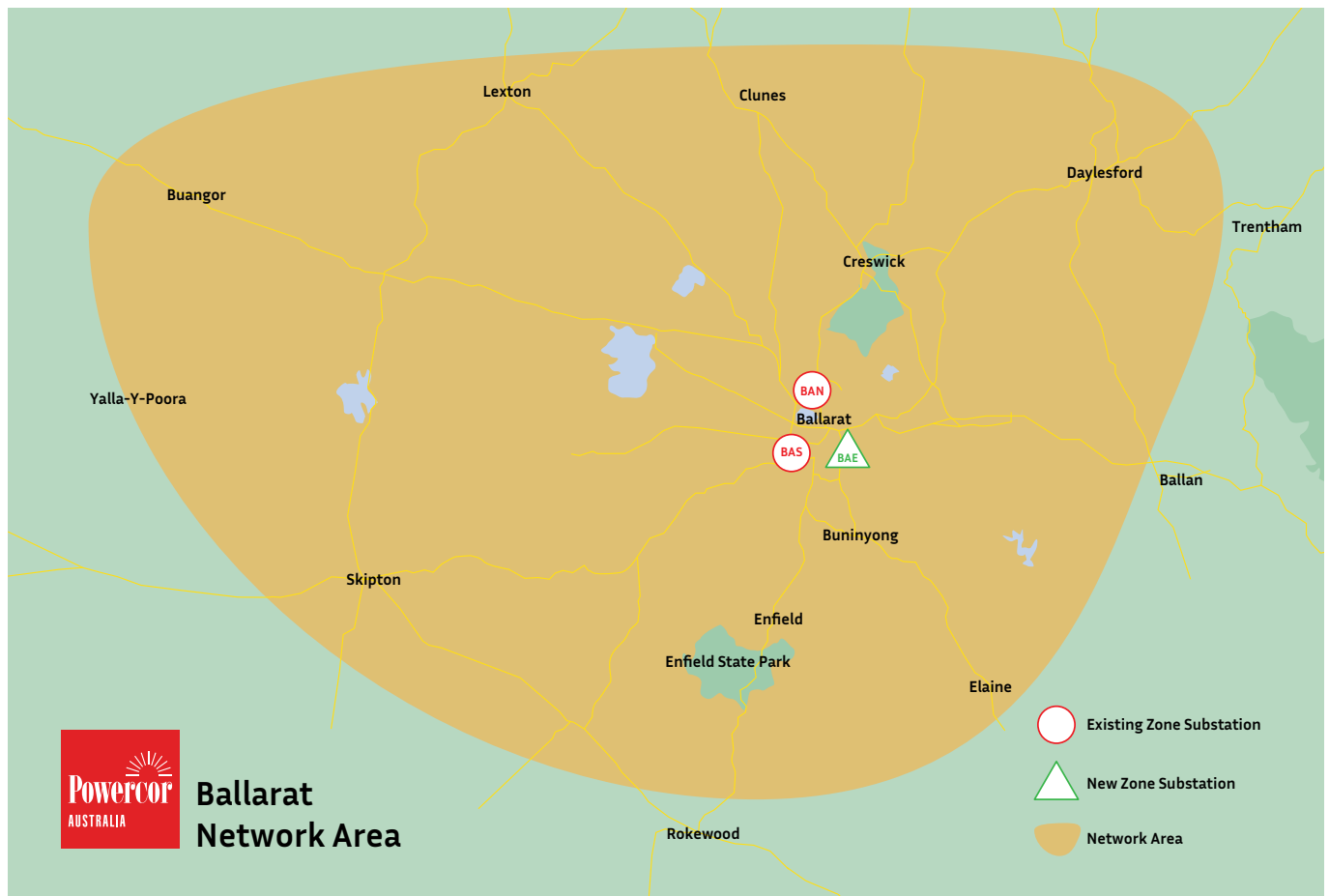
- it is well located to improve power reliability for a large number of customers at a time when the city's population is increasing by more than 2,000 people each year
- the site is readily able to be developed, taking into consideration its zoning and direct access to a 66kV powerline running parallel to one of the site's boundaries
- it can be developed at the lowest cost of all options, delivering the best value for all Powercor customers.

Broad community reach and benefit

When complete, the Ballarat East zone substation will supply power for an estimated 14,400 customers located both across the city and in communities spanning a broad region from Mount Prospect in the north to Lal Lal in the south.

Ballarat East Zone Substation benefits

- **Greater reliability** – providing alternatives for redirecting power for Ballarat and surrounding areas to keep it reliable in the event of power outages or extreme weather
- **Meet growing demand** – since 2016, there has been a 12% increase in demand across the broad Ballarat network. We forecast the network will have an annual growth rate in demand of 2.4%
- **Improve network capacity** - to enable customer choices to install rooftop solar and to charge electric vehicles, including public charging stations
- **Safer communities** - by protecting against powerline-related bushfires



Map showing the site of the new Ballarat East zone substation, the existing substations and the broad area these sites will supply.

Safety in design

Zone substations house and protect the systems and technology needed to supply customers and manage voltage on the network. For Ballarat East this includes:

- two incoming 66kV powerlines and circuit breakers to manage the flow of power from the sub-transmission network into the substation
- one 25/33MVA transformer through which electricity flows and the voltage is reduced
- a 22kV switch room which includes communications, protection and control systems for the power flowing out of the substation
- safety equipment including a Rapid Earth Fault Current Limiter (REFCL) which cuts power if it detects a powerline is struck by vegetation or hits the ground.

Following early feedback from the local community, the Ballarat East zone substation is being purposefully designed to support the safety objectives of neighbours. As a result, extensive studies have been commissioned to consider concerns raised about noise, flooding, visual amenity and electromagnetic fields (EMF).

As part of our commitment to Safety in Design, initial plans have addressed these community concerns as well as all regulatory and license conditions. In particular:

- the main source of noise, the transformer, is designed to sit within a noise-absorbing enclosure
- flood studies have confirmed that water management planned for the site will not increase flood risk for nearby homes

- the site will meet regulated EMF guidelines and allows for a buffer area between the infrastructure and neighbours that allows the low levels of EMF to safely dissipate inside the site boundaries
- architects have been engaged to provide options for the site fencing subject to community feedback on the colour, finishes or patterns and height.

We are committed to working genuinely with the community. We will be sharing more information about the studies undertaken and the proposed design through ongoing engagement with the local community. People are also invited to work with us to co-design features of the zone substation like fencing, landscaping and lighting, that will make a difference to how it sits within the local streetscape. We are also consulting on a dedicated Community Benefits Package being offered locally.

About Powercor

Powercor is your electricity network. We move energy from where it's generated to your property. Every day, our team works hard to make sure you always have the power you need. We're keeping power reliable while supporting the shift to more renewable energy like solar and wind, and people choosing to electrify their homes and vehicles.

Timeline for development

November 2023

Announce site selection

Late 2024

Construction commences

November 2023 - mid 2024

Community co-design on various elements

Late 2025

Construction concludes