



Kalbarri microgrid

**Delivering a smarter
energy future**



The Kalbarri microgrid

The Western Australian coastal town of Kalbarri can now be powered by an entirely renewable energy solution utilising solar and wind generation coupled with battery storage.

The new Kalbarri microgrid is a small-scale power grid connected to the main electricity network to help meet peak demand and improve the reliability of power supply for the town. The microgrid uses local generation and energy storage to provide a supply to the town when the network connection is interrupted.

The project is one of the largest of its kind in Australia with the capacity to supply 5MW entirely from the connected Synergy wind farm and feed-in from residential rooftop solar.

Benefits of the microgrid

Commissioned in late 2021, the Kalbarri microgrid provides a more reliable power supply for the 1,500 residents and more than 100,000 visitors to the town each year.

The microgrid uses leading edge technology to minimise disruptions, and in the event of a network interruption can run independently from the main electricity network. This advanced system will address even momentary outages, responding in milliseconds to maintain a seemingly uninterrupted power supply.

The modular design of the microgrid allows for future renewable generation sources to be integrated as they become available.

Delivering a smarter energy future

The delivery of electricity is evolving, and we are helping to shape the power grid of the future.

Every community has unique energy needs and during community reference group meetings held in 2016 Kalbarri residents expressed a preference for a renewable energy solution to address their power reliability issues. Electricity to the town is primarily supplied via a 140km feeder from Geraldton which experiences outages caused by environmental impacts combined with the feeder's length and remoteness.

The Kalbarri microgrid was developed in partnership with Synergy, Shire of Northampton, Mid West

Development Commission and the Kalbarri community. The microgrid is expected to eliminate the majority of power outages experienced by the town.

Microgrids are increasingly being used to deliver electricity in a way that is more resilient to environmental factors, has less impact on the environment, is potentially cheaper and ultimately delivers better outcomes.

The Kalbarri microgrid solution will be used as a blueprint for other regional areas and to help in the development of further renewable generation across the rural edges of the electricity network.



At 5MW it will be one of Australia's largest microgrids to run in complete renewable mode, which means it can draw energy solely from the connected wind farm and feed-in from residential rooftop solar panels.



How it works

The microgrid is connected to the main electricity network but can operate independently by drawing from local renewable energy sources. Intelligent monitoring equipment within the microgrid will detect a fault in the system and can respond immediately to maintain power supply for the town.

The changeover may trip some household appliances, but the majority of appliances will not be impacted. This means you shouldn't notice an outage or subsequent reconnection when the battery has remaining capacity.

When there is a fault upstream from the battery (south of the battery unit), the microgrid will cover that interruption to supply – the battery is designed to address faults on the long powerline from Geraldton.

When there is a fault downstream from the battery (north of the battery unit) the battery is unable to help. Sometimes these transient faults are caused by a tree branch falling across the line. The fault current may clear the problem and power can be restored without a crew being required to attend.

Notifications

An automated text message alert system will be activated so that when power is interrupted and the microgrid is operating, a notification will be sent to mobile phones so residents can adjust their power usage. Managing power usage will prolong the battery charge while the microgrid is operating and the town is disconnected from the network.

Capacity

The Kalbarri microgrid is expected to eliminate 80 percent of outages experienced by the town, and can significantly reduce the length of outages depending on how the power usage being drawn from the microgrid.

1.6MW – supplied by the wind farm
1MW – supplied by rooftop solar
2MWh – supplied by back-up battery



Location

The microgrid covers the townsite of Kalbarri. The wind farm and battery are located 20km south of the town.

Cost

The Kalbarri microgrid was a \$15 million investment by the State Government to secure reliability for the coastal tourist town, and for Western Australia's energy future.

For local residents, there are no additional charges for electricity.

Background

The Mid West town is connected to the network via a 140km long rural feeder line from Geraldton which is exposed to the elements. Interference on the line can cause extended outages.

A new microgrid was announced by the Minister for Energy in 2016 to deliver greater reliability for Kalbarri. The project was completed in 2021 to provide an alternative and renewable energy supply to the town if connection to the main grid is lost.

About Western Power

Western Power is a Western Australian State Government owned corporation responsible for building, maintaining and operating an electricity network which connects our 2.3 million residential, business and community customers to traditional and renewable energy sources, delivering a critical service to the community.

We're at the forefront of the energy industry in leveraging new technologies, including integrating microgrid, stand-alone power systems and battery storage solutions.

We're planning the modular grid of the future that's leading the way to a cleaner, brighter and more resilient energy supply for the next generation.

To find out more visit the Western Power website at westernpower.com.au, email communityenquiries@westernpower.com.au or scan the QR code below.



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