



Creating the rural network of the future

Stand-alone power systems | Round 1



Trialling alternative technology for the future

Providing a reliable and efficient power supply to regional WA is a challenge, but here at Western Power we're breaking down those barriers by finding innovative solutions to replace aging infrastructure. One way we're doing this is through stand-alone power systems.

What is a stand-alone power system (SPS)?

Stand-alone power systems are an alternative technology that can be a more efficient option to supplying electricity compared with poles and wires. It's essentially an energy supply unit made up of renewable energy, a battery and back-up generation. An SPS operates independently of the main electricity network to deliver reliable power to a household or business, while still part of our service area.

Pilot project a success

In July 2016, we commenced a groundbreaking 12 month pilot to test the suitability of SPS technology across six rural properties in the Great Southern region. We worked with rural electricity provider Horizon Power and retailer Synergy to develop the strategy and designs. Through our procurement process Energy Made Clean (EMC) were selected to build, install and run the systems.

The pilot exceeded expectations by significantly improving power reliability to these customers, so much so that the customers will now be supplied by the SPS for a further three years.

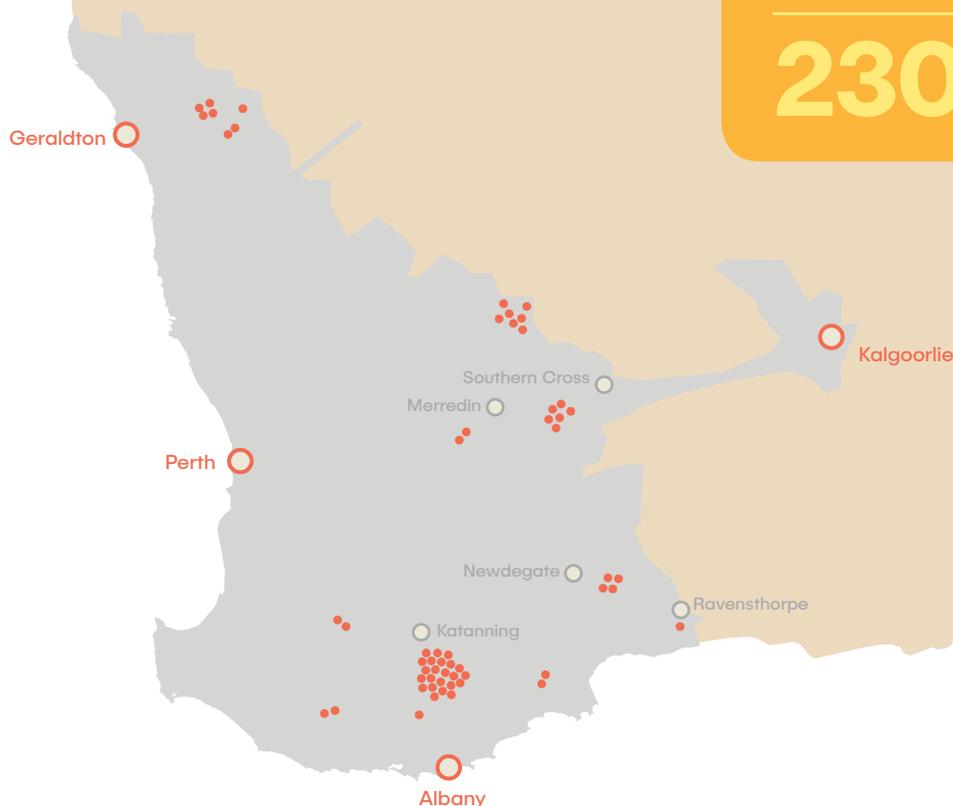
Moving to round 1

With the success of the original pilot, we're now scaling up to round 1, which will see around 57 SPS units installed across regional WA. During this round of SPS, we aim to better understand how the systems can be used at scale in a range of locations across the network. Participants can expect greater reliability of supply, with the long term aim being to remove the aging poles and wires from their property. Synergy will continue as the retailer and customer tariffs will remain unchanged.

Approximately 57 locations have been identified that meet the required selection criteria. These locations are serviced by around 230km of overhead powerlines. That's 4km of powerline per property – all of which needs to be replaced at a significant cost within the next two years.

57 SPS units to be installed during round 1

230 km of line services all participants



Benefits

The results of our initial pilot have shown the use of SPS can make a positive impact to the reliable supply of power to regional customers in WA.

Key pilot findings for regional SPS customers

- Participants experienced significantly fewer power interruptions than customers on the network in the same area. Each pilot customer avoided an average 65 hours of power interruptions during the 12 month pilot.
- Participants reported greater satisfaction compared to the network service.
- The SPS were robust enough to survive extreme weather events.
- More than 90 per cent of electricity during the pilot was generated from the sun.

The financial benefits are also clear – in selected regional locations SPS technology, when compared to current and forecast network costs in regional areas, are a more efficient option for the state. They also reduce the environmental footprint and the need for Western Power to access large areas of customers' property.

Due to current regulations, we're not allowed to remove the poles and wires supplying these customers, however we have been able to manage them differently and avoid the need to significantly invest in assets that will eventually be retired.

65 hrs of power interruptions avoided for pilot customers*

90 per cent of electricity generated from the sun*

*on average during our pilot project

Customer challenge

Customers in remote locations experience outages more frequently than their urban neighbours. In addition, long feeder lines that stretch hundreds of kilometres present a bushfire risk, which can ultimately result in longer outages.

Customers want more resilient power alternatives and it's up to us to make that happen.



Business challenge

Over 50 per cent of our high voltage overhead distribution network services around three per cent of our customers. Low customer density in regional areas presents significant challenges to the operation and upkeep of our network.

It's our job to provide a reliable power supply and to maintain our customers' connection to the network. This requires ongoing investment to maintain, replace and build network assets such as poles, wires, transformers and substations.

As innovation and new technologies become more cost effective than existing technologies, we aim to safely make use of non-network solutions to deliver a better energy future.

1.1 million customers serviced by Western Power

85 per cent of our customers believe we should use emerging technologies to deliver improved outcomes

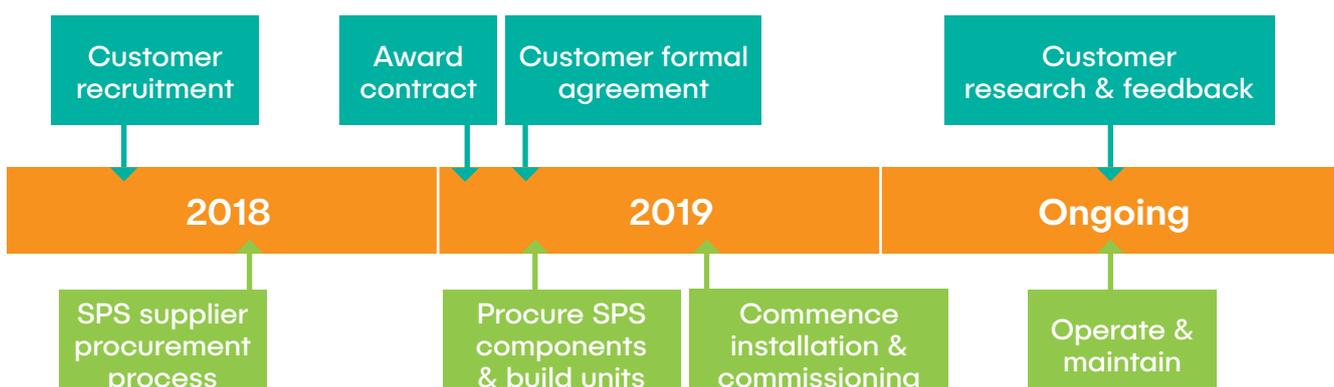
Our network spans an area greater than the size of the **United Kingdom**

Timeframe

We're planning to have all SPS units installed and commissioned in 2019. Round 1 will then run for three years.

Leading up to this we will be finalising arrangements with the nominated customers taking part, and selecting a SPS supplier as part of a rigorous commercial process.

While Western Power will plan, manage and fund the project, the chosen supplier will be responsible for purchasing and installing the systems on site. They will also operate and maintain them for the first 12 months.



Rural network of the future

To ensure a reliable energy future for WA, we're evolving from a network based on transmission and distribution lines to a modular grid that will deliver a range of new technologies to customers.

The future of SPS in WA

Our modelling so far has shown we could install thousands more SPS units to avoid spending hundreds of millions of dollars over the next 50 years replacing poles and wires.

We're already investigating the wider roll out of SPS. This project will play a key role in demonstrating the value of SPS and strengthening the case for change.

The push for change

We're working with the Western Australian Government and the Public Utilities Office to identify regulatory changes required to allow SPS to become part of our regular tool kit. We're also participating in WA's Economic and Industry Standing Committee Inquiry into Microgrids and Associated Technologies.

To learn more about how we're embracing new technologies to improve service and reliability to our customers visit:

westernpower.com.au/energy-solutions

Just like us, many integrated electricity networks around the world are evolving to become modular. This includes dynamically connected microgrids and SPS interacting with centralised electricity networks to support the evolution of our network.

Integrated network

Our current model



All customers
physically connected

Interconnected lines

Central generation

Modular network

Future model



SPS and microgrids located
on network boundaries

Local generation and storage



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