

Additional information regarding community batteries

The following sections provide additional information regarding Distributed Energy Resources, Network Opportunity Map, battery storage on City buildings, community batteries (including PowerBank batteries, Virtual Power Plants and microgrids) and solar uptake within the City.

Distributed Energy Resources

Distributed Energy Resources are smaller–scale devices that can either use, generate or store electricity, and form a part of the local distribution system, serving homes and businesses. Distributed Energy Resources can include renewable generation such as rooftop solar photovoltaic systems, energy storage, electric vehicles, and technology to manage demand at a premises. There has been considerable uptake of rooftop solar PV systems within the City.

Network Opportunity Map

Western Power’s Network Opportunity Map provides insights into the South West Interconnected Network’s challenges and intentions in the next 5-10 years. Kinross is identified in the Network Opportunity Map as a high utilisation feeder area for the Clarkson substation which is ranked as an over utilised asset. Kinross is therefore a priority area of focus for Western Power to manage the Clarkson substation capacity shortfall risks.

Battery Storage on City Buildings

In 2018, the City installed a 9kW battery storage system at Fleur Freame Pavilion in Padbury and a 10kW battery storage system at Penistone Park Community Sporting Facility in Greenwood, with both buildings also having a solar PV system.

Community Batteries

A community battery is a shared neighbourhood battery solution that supports the grid by improving power reliability and smoothing power flow in a local area to enable further uptake of rooftop solar. Community batteries absorb excess solar energy that is exported to the local network by local properties and discharge this energy during times of peak demand i.e., usually in the evening. Currently, a community battery does not allow for individual storage (meaning you cannot draw on it to power your home when you are not generating any solar energy) unless it is a PowerBank battery.

Community batteries provide a wide range of benefits including:

- Allowing more rooftop solar installations by storing electricity generated by nearby solar systems during the day and discharging it during the day when local demand is at its peak, enabling local renewable energy generation and consumption.
- Reduce costs of maintaining and upgrading the electricity network by providing services that help to manage electricity congestion in the network.
- Provide services that help maintain the security and reliability of the electricity system and reduce the risk of blackouts.
- Help suburbs become electric vehicle ready by providing electricity storage for charging infrastructure.

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PowerBank Batteries

Western Power has partnered with Synergy to conduct community battery trials using PowerBank batteries. A PowerBank is a type of community battery that is shared by eligible households who generate solar energy with the added benefit of individual solar energy storage. Western Power identify customers who are likely to benefit from PowerBank battery storage as some customers are already using energy efficiently and battery storage in general may not be cost effective for them.

The location of a community battery is based on comprehensive data and modelling work and is determined by several factors. Some of these include the amount of solar being generated from customer rooftops in a particular area, the age of the infrastructure in that area and any local pressure on the transformers. One of the primary considerations is ensuring the battery location provides optimal benefit to the community and the grid. Once the PowerBank battery is installed, suitable customers are identified and invited to pay a daily subscription fee.

Current locations of PowerBank community batteries include:

- 1 City of Mandurah, Meadow Springs.
- 2 City of Mandurah, Falcon.
- 3 City of Swan, Ellenbrook #1.
- 4 City of Swan, Ellenbrook #2.
- 5 City of Wanneroo, Two Rocks.
- 6 City of Wanneroo, Ashby.
- 7 City of Canning, Canning Vale.
- 8 City of Rockingham, Port Kennedy.
- 9 City of Stirling, Yokine.
- 10 City of Kwinana, Parmelia.
- 11 City of Kalgoorlie-Boulder, Kalgoorlie-Boulder.
- 12 City of Busselton Vasse.

PowerBank batteries are approximately 30% cheaper than buying a home battery system with home battery systems generally costing between \$8,000 to \$13,000. PowerBank batteries have been shown to be an effective tool in helping the network cope with peak solar power generation in high solar areas, smoothing the flow of energy and reducing the chance of faults. Trials indicate that PowerBank batteries work well for households who generate a lot of solar energy during the day but are not home to use it. However, trials indicate that PowerBank batteries are not likely to benefit households that have solar panels and efficiently use that energy during the day. Western Power are planning on future roll outs of PowerBank batteries based on learnings from their initial installation of PowerBank batteries.

Virtual Power Plants

A Virtual Power Plant is a network of electricity sources like household rooftop solar PV systems, household, commercial and community batteries and electric vehicles. It combines these sources which generate, store and distribute electricity locally. The benefits of the commercial battery system are that energy can be taken from the grid when there are low cost periods and returned to the grid when there are high cost periods, stabilising the network and sharing renewable energy in the community.

The State Government launched its first Schools Virtual Power Plant Pilot Project with selected schools in 2020, providing commercial batteries and solar panels to help schools store their excess energy for later use. Belridge Secondary College in Beldon is one of the schools that were selected to participate in the Project which is a key initiative of the State Government's Distributed Energy Resources Roadmap. A behind the meter commercial battery system was installed at Belridge Secondary College in March 2021 and the project is expected to be trialled until 2024. Solar panels have not been installed at Belridge Secondary College as the trial compares sites with solar panels and commercial batteries and sites with only commercial batteries.

Project Symphony is a collaboration between Synergy, Western Power, the Australian Energy Market Operator with support from Energy Policy WA and is a key deliverable of the State Government's Distributed Energy Resources Roadmap and Energy Transformation Strategy. Project Symphony is a Virtual Power Plant trial which commenced in Harrisdale, Piara Waters and Forrestdale in November 2022 and will continue until September 2023. One of the criteria used to select these suburbs was their solar uptake which is over 50% of homes. The Virtual Power Plant coordinates eligible Distributed Energy Resources like rooftop solar, batteries and selected household appliances. The Project Symphony Virtual Power Plant organises and aggregates the connected Distributed Energy Resources to generate and store electricity at a local level. The City could express interest to be involved in future Virtual Power Plant trials and projects.

Smart infrastructure and microgrid

DevelopmentWA is exploring opportunities for Smart Infrastructure and a renewable energy microgrid to be designed and developed as part of the Ocean Reef Marina project. The City would not have any obligations in connection with the microgrid although it may grant appropriate tenure for the associated infrastructure.

Solar Uptake

Solar uptake in the City's suburbs ranges from 30% to 65% as of January 2023 and is detailed in the table below.

Suburb	Percentage of solar uptake
Beldon	45%
Burns Beach	65%
Connolly	47%
Craigie	36%
Currambine	39%
Duncraig	48%
Edgewater	47%
Greenwood	45%
Heathridge	40%
Hillarys	49%
Iluka	63%

Suburb	Percentage of solar uptake
Joondalup	32%
Kallaroo	46%
Kingsley	50%
Kinross	52%
Marmion	41%
Mullaloo	48%
Ocean Reef	54%
Padbury	42%
Sorrento	41%
Warwick	41%
Woodvale	57%