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New battery technologies tested at regional WA microgrids

On behalf of the Australian Government, the Australian Renewable Energy Agency (ARENA) has today announced \$2.85 million in funding under the Regional Microgrids Program to trial two novel long duration energy storage technologies at remote microgrids in Western Australia.

Horizon Power, Western Australia's regional energy provider, will install and trial Redflow's zinc bromine flow battery (100 kW / 400 kWh) and BASF's sodium sulphur battery (250 kW / 1,450 kWh) on Western Australian microgrids in Nullagine and Carnarvon, respectively.

The project will test each battery's ability to shift rooftop solar electricity produced in the middle of the day to evening hours as well as demonstrate hybrid operability alongside lithium-ion batteries for optimal network service delivery.

Horizon Power has a number of lithium-ion batteries installed on networks it operates, however, has identified a need for longer duration energy storage technologies to be included in its portfolio.

The ability of zinc bromine flow batteries and sodium sulphur batteries to withstand higher ambient temperatures over long periods, whilst maintaining reliable power with a lower degradation, is particularly important in remote community microgrids and is a distinct advantage over current lithium-ion technology.

If the trial is successful, Horizon Power's \$5.7 million project will validate the technical viability of zinc bromine and sodium sulphur batteries in remote microgrids, reduce the risk in future deployments, and help to accelerate the rollout of Distributed Energy Resource Management Systems (DERMS) across Horizon Power's 34 service areas. The BASF battery will also be the first of its kind connected to a regulated network and a DERMS platform in Australia.

The 2023 [CSIRO Renewable Energy Storage Roadmap](#) highlighted Australia's need to rapidly develop a pipeline of projects across a variety of energy storage technologies given the limited range of commercially mature energy storage options currently available.

ARENA CEO Darren Miller said there is a need to now find new sources of medium and long duration dispatchable renewable energy storage.

"Renewable dispatchable technologies such as solar PV and wind combined with lithium-ion battery energy storage systems, and pumped hydro are well established, however, there are characteristics of each that may not be suited to all locations, particularly in locations with extreme heat."

"Horizon Power's project, if proven successful, could see these innovative battery technologies become an important part of our energy mix in regional communities."

"We look forward to working with Horizon Power in this search for new forms of energy storage and to ensure that people who live in remote areas without grid connected electricity aren't left behind in the energy transition."

Horizon Power CEO Stephanie Unwin said: "We are really excited about these ground-breaking trials which will support Australia's carbon emissions reduction targets, while making renewables more accessible for our regional and remote customers."

"Horizon Power was an early adopter in battery energy storage, and for the past 15 years we have been exploring how energy storage can best be used to promote increased uptake of renewable energy across regional WA."

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“Our latest trials will continue our exploration of Long Duration Energy Storage (LDES) technologies which are suitable for withstanding the extreme temperatures of our regions, providing valuable insights which will support with future deployment of the batteries in our regions.”

Battery Technologies

Redflow’s zinc bromine flow battery - An electro-chemical flow battery where chemical energy is provided by two chemical components dissolved in liquids that are pumped through the battery cell on separate sides of a membrane. Ion exchange (accompanied by flow of electric current) occurs through the membrane while both liquids circulate in their own respective space.

BASF’s sodium sulphur battery - A type of molten-salt battery constructed from liquid sodium and sulphur and is often referred to as a NAS battery. In 2019, BASF entered into a joint venture partnership with NGK to further research the technology and distribute the battery in Australia. The technology requires heating to 300°C for optimum performance and is ideally suited to hot working environments where savings in parasitic losses are possible.

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