

THE POWER OF DISTRIBUTED ENERGY RESOURCES



Australia is a leader in the decentralisation of its energy system with the highest per capita installation of rooftop solar PV in the world. More than 1.7 million Australian households, or around 20 per cent, already have solar panels on their roof.

The nation's enthusiastic uptake of rooftop solar is expected to be followed by similar growth in the number of households and businesses investing in batteries and energy management systems that include smart thermostats and other demand side technologies. This has been forecast to lead to a future where up to 45 per cent of all electricity could be produced by consumers.

The strong increase in generation of renewable energy presents challenges for the Australian Energy Market Operator (AEMO) in maintaining the grid's stability. Working with AEMO, ARENA has been at the centre of efforts to find solutions that will improve the security and reliability of a more decentralised and renewables-based electricity system in Australia. Part of that work is ARENA's demand response initiative, which is featured in an earlier case study.

To help the providers and users of distributed energy resources (DER) in Australia reach their full potential, ARENA also commenced a program of work this year in collaboration with AEMO, the Australian Energy Market Commission (AEMC) and the DER sector to identify and overcome technical, economic and regulatory challenges.

ARENA launched a \$12.5 million funding initiative in early 2018 to support a range of DER pilot projects and integration studies, with the results of the round expected to be announced in the second half of the year.

The selected pilot projects will be expected to demonstrate new ways of understanding and managing the impacts of high amounts of DER in different parts of the grid. This will allow networks to connect more DER while reducing costs and operating within the technical limits

of the system. The integration studies will be used to help startups, networks, retailers, government and systems operators develop solutions to address the technical, regulatory and commercial challenges of managing a grid that has high amounts of DER.

HORIZON DISTRIBUTED ENERGY TRIAL

Lead organisation: Horizon Power

ARENA funding: \$1.9 million

Total project cost: \$7.1 million

Location: Carnarvon, WA

One of ARENA's existing DER projects is being conducted by Horizon Power, which operates 37 distributed energy microgrids across Western Australia. As part of the pilot project, Horizon will install a variety of distributed energy technologies in at least 90 homes and businesses in the remote WA town of Carnarvon.

The technology will include 'internet of things' energy metering, rooftop solar, household battery storage and inverters with remote monitoring and control devices, as well as weather forecast devices.

The three-year trial aims to overcome the technical and commercial barriers faced by energy 'prosumers' who both produce and consume energy, potentially reducing the cost of distributed energy systems by up to 25 per cent.

This will make it possible to design future energy systems that make it easier for householders and businesses to contribute electricity to the broader system and be rewarded for doing so. It will also benefit energy users by identifying innovative solutions that will give them more choice in how to manage their own energy requirements.