



Household solar on the rise in Australia

As at 31 October 2020, Australia had 2,591,865 rooftop solar systems installed amounting to a cumulative capacity of 12.4 gigawatts. One in four homes has a rooftop solar panel system. The amount of electricity being generated is more than anywhere else in the world.

The challenge

The amount of electricity being generated by grid-connected solar photovoltaic (PV) panels has the potential to exceed the capacity of the local distribution network and can affect the stability of the community's energy supply. These 'power quality' problems include unacceptably high and fluctuating voltages, an unstable power supply, and an inability to export electricity to the grid, leading to wasted energy and revenue. These concerns may result in restrictions being placed on penetration levels of solar PV installations in Australia, limiting customer choice and the amount of clean energy generated.

The response

We developed Virtual Power Station (VPS) technology to help overcome some of the reliability challenges associated with renewable energy supply through the aggregation of a number of geographically dispersed small-scale renewable energy generators and storage systems. VPS links dispersed renewable energy generators – such as rooftop solar PV panels – with energy storage and load control systems in a web-based network.

A central control point intelligently monitors the power output of each energy generator in the network so that the VPS can combine them into a single electricity supply and provide one smooth, reliable energy source and dispatchable supply to the electricity grid, much as a traditional power station.

The impact

- Creation of Evergen in 2015
- VPS 1 proof of concept in collaboration with Lake Macquarie City Council in 2012
- VPS 2 proof of concept in collaboration with Lendlease in 2015
- Licensing of VPS technology by Upp Energy, Netherlands (Global)
- Our contribution to the development of AS/NZS4755 standard in 2017.

Networking renewables for smoother energy

Partners

ARENA, LMCC, Ergon Energy, Lendlease communities, Selectronic Australia, SMA Australia, Tritium, The University of Newcastle (UoN)