

# EECON 2017

22-23 NOV MELBOURNE

COLLABORATION AND INNOVATION:  
ADAPTING TODAY'S GRID FOR  
TOMORROW'S FUTURE

eecon.com.au



## Evolution of the rural network – Standalone Power Systems

Mike Chapman<sup>1</sup>; Sean Mc Goldrick<sup>2</sup>

<sup>1</sup> Western Power – Asset Performance Function, Asset Management Business Unit, Perth, Australia; [mike.chapman@westernpower.com.au](mailto:mike.chapman@westernpower.com.au)

<sup>2</sup> Western Power – Asset Management Business Unit, Perth, Australia; [sean.mcgoldrick@westernpower.com.au](mailto:sean.mcgoldrick@westernpower.com.au)

### KEYWORDS

Remote, Renewable Energy, Stand-alone Power System, Edge-of-Grid.

### INTRODUCTION

Significant sections of fringe-of-grid assets in the South West Interconnected Network (SWIN) have exceeded 30 years of age and will progressively be scheduled for replacement. In some circumstances stand-alone power systems (SPS) present a safer, more reliable and economically efficient alternative to network rebuild for edge-of-grid customers.

In July 2016 Western Power installed 6 Stand-alone power systems as part of a 12 month trial to test the suitability of this technology as an alternative to a traditional network solution. The installed systems consist of solar photovoltaics, lithium battery storage and a backup diesel generator.



Figure 1: Stand-alone power system installed in West River in June 2016 as part of Western Power SPS pilot program.

## **RESEARCH DESIGN**

Lifecycle costs for the preferred hybrid PV/diesel/battery system were compared to a traditional network rebuild; where lifecycle costs of the SPS solution were less than 50% of the network replacement cost it was considered to be a candidate for SPS deployment.

Suitable potential sites for deployment of SPS were selected via strategically targeting areas of the network with ageing assets, low customer density and low energy use. Candidates were refined further by filtering for medium to high bushfire risk areas where a safety benefit could also be realised.

Simultaneously to project activities, Western Power has submitted a rule change request to the Australian Energy Market Commission (AEMC)<sup>[1]</sup> for such emerging technology solutions to be reclassified as part of the network planner's solutions toolset, as current definitions prevent wider implementation of these technologies. Similar discussions have taken place with Western Australian regulatory bodies.

## **PROJECT RESULTS AND DISCUSSION**

Learnings to date from the trial have been positive:

- Trial participants have experienced significantly fewer power interruptions than network interruptions on the same feeders,
- Customer feedback has indicated a very high level of satisfaction,
- The systems have been robust enough to survive extreme weather events,
- The need for detailed customer equipment audits and energy usage was seen as a necessary step to identify any non-standard loads within the customer's facility which have the potential to negatively impact the operation of the SPS unit.

## **CONCLUSION**

Western Power is in the process of determining next steps for the six installed trial SPS sites. Pending the resolution of statutory and regulatory barriers, Western Power is investigating the potential for a wider rollout of SPS as a network replacement tool.

## **REFERENCES**

- [1] AEMO, "AEMO Rule Change (Pending): Alternatives to grid-supplied network services," 2016. [Online].