

# Seamless energy supply in heavy demand



ESTABLISHED: 2005

AusNet Services is ASX and SGX listed, and Victoria's largest energy delivery service business, owning and operating approximately \$11 billion of electricity and gas distribution assets that connect into more than 1.3 million Victorian homes and businesses. Principal Engineer Asset Innovation and DER, Dr Yogendra Vashishtha, is the GESS project manager.

[ausnetservices.com.au](http://ausnetservices.com.au)



ESTABLISHED: 2007

Deakin University's ARC Centre of Excellence for Electromaterials Science is a VPTN member facility that aims to develop and provide solutions in the areas of new energy technologies and storage with a strong focus on safety, energy efficiency and cost reduction through the creation of new electroactive materials.

[electromaterials.edu.au](http://electromaterials.edu.au)



## DEMAND MANAGEMENT DEFINED

Demand management is an intended change to the amount of electricity demanded from the network based on two criteria: demand response and energy efficiency.

**YouTube** Victorian Platform Technologies Network channel – [watch Dr Yogendra Vashishtha](#) on AusNet Services' large battery service project

## ENERGY DEMAND MANAGEMENT

For energy networks, the innovation opportunities for demand management are immense – particularly the link between energy efficiency efforts and peak demand reduction. As the demand management market is in its infancy in Australia<sup>1</sup>, the Australian Government is supporting a technology-neutral approach to the nation's future electricity and transport fuel supply. They do this by supporting research, development and demonstration of new energy technologies, while committing to removing unnecessary regulatory and other non-market barriers to future technologies.<sup>2</sup>

## THE DEMAND AND SUPPLY CONUNDRUM

In February 2009, Victoria experienced its worst heatwaves on record, with many houses across the state losing power due to faults and overloading. The common approach when the electricity demand exceeds supply during peak periods such as hot days, is for energy providers to cut supply to select areas known as 'load shedding', causing blackouts. The alternative solution involves a substantial investment and timeframe to upgrade the network.



AusNet Services' Project Manager, Dr Yogendra Vashishtha states that as Victoria's biggest energy provider, AusNet wants to generate knowledge and experience of future demand management solutions. He believes there is potential to replace the current approach while maintaining a good balance between safety, quality, reliability, cost and long-term benefits to consumers.

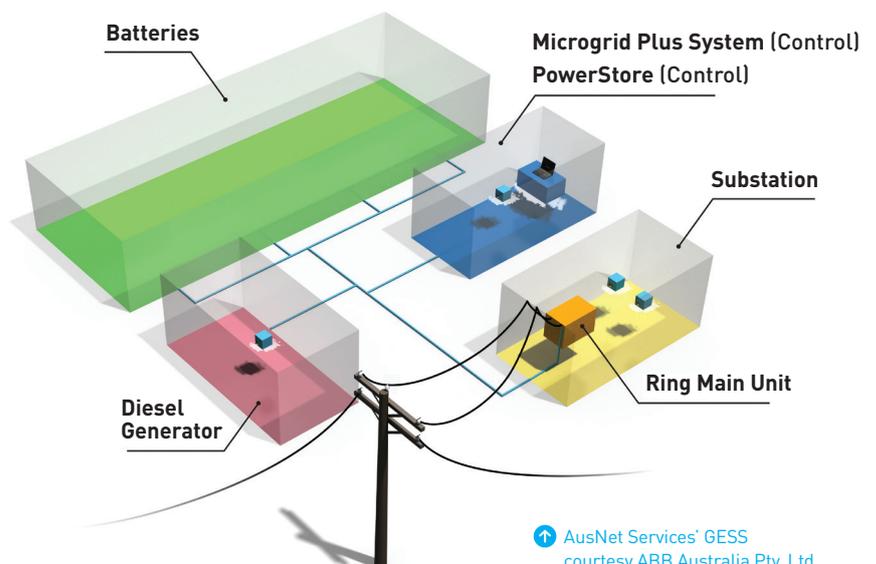
## ENERGY STORAGE SOLUTION IN CONSULTATION WITH DEAKIN

Energy providers, like AusNet Services, are looking at energy storage as a cost-effective and viable alternative to upgrading a network to avoid load shedding.

AusNet's GESS is a portable 2MW Energy Storage System comprising of 1MW/1MWh Li-Ion batteries and 1MW diesel generator. Smarter than a traditional back-up generator. The GESS syncs with the grid so both can simultaneously add power and seamlessly process and respond quickly.

Dr Vashishtha searched for power and energy storage expertise across Victoria and was recommended to consult Deakin University by Professor Doug MacFarlane, ARC Australian Laureate Fellow at Monash University.

Based on their ongoing success with developing electromaterials and power solutions for batteries, VPTN's member facility ARC Centre for Excellence for Electromaterials Science (ACES) at Deakin, was commissioned by Dr Vashishtha as consultants to assess the suitability of the five shortlisted contractors and their batteries.



[↑](#) AusNet Services' GESS courtesy ABB Australia Pty. Ltd.



*"In my innovation and research role, when I have a network-related problem, I go to the universities to find a pocket of excellence which could work collaboratively in finding a real solution. Deakin's electromaterials facility know-how was ideal to help assess the quality and suitability of the five tender proposals."*

Dr Yogendra Vashishtha, AusNet



*"AusNet Services have been proactive in identifying this new technology in energy storage for the Australian electricity market. It's great we're able to contribute our skills to investigating these types of solutions for operational conditions. As a publicly-funded research facility, ACES Deakin has built up a range of analytical and testing capabilities as well as specialised and extensive expertise that industry can access."*

A/Professor Howlett, ACES



*"If we combine solar and battery storage, like that of AusNet Services' residential storage trial, this will offer developing countries a self-sufficient energy supply with optimal support from the Grid."*

Dr Yogendra Vashishtha, AusNet

## ABOUT THE VPTN

Established in 2009, the Victorian Platform Technologies Network (VPTN) plays a key role in connecting publicly-funded facilities in Victoria with industry and researchers. Through its online services – **ARIN and PlatformConnect** – VPTN is unique in offering a centralised, open and cross-institutional network of over 150 platform technologies across more than 30 institutions. VPTN is realising its vision by linking innovation with technology and expertise in biological, materials, engineering, physical, chemical, food, sports, information, nano, design and mathematical sciences. The VPTN is an initiative supported by the Victorian Government, Biomedical Research Victoria and Monash University. Discover more at [platformtechnologies.org](http://platformtechnologies.org)

✉ [info@vptn.org](mailto:info@vptn.org)

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ACES' Associate Professor Patrick Howlett led the project with Deakin researchers who helped assess the tender proposals and ultimately recommended the selection of Samsung batteries, advising on criteria such as safety, service lifetime, design, experience and performance management.

### ACES' APPLIED CONSULTING SERVICES FOR AUSNET

- › Battery Chemistry Performance Review
- › Safety & Risk Management Assessment
- › Design & Operation Parameters Guidance

### DELIVERING AN AUSTRALIAN FIRST

The GESS is the first of its kind in Australia, a country which is considered to be a prime market for battery storage because its networks need to cover such large distances. Tested in Australia and NZ, the GESS aims to improve the quality of the power delivery, by providing automatically active and reactive power support and other power quality functions, when connected to the network.

In December 2014, AusNet Services also installed its battery module as a critical precursor to the development of a suite of residential demand management tools which forms part of the DMIA Priority Projects 2016 – 2020<sup>3</sup>.

A further collaboration between AusNet Services and ACES is being explored post the Summer 2015-16 trial to enhance the body of knowledge and its growing role in electricity use.



### BIG HOPES FOR GRID-SCALE STORAGE

One of the big hopes for grid-scale storage is that it will give the networks the ability to better control electricity flow during periods of high demand. In the German and US markets, where governments have already mandated for storage to be built into the network, the battery market is set to boom<sup>4</sup>.



LEARN MORE ABOUT VPTN'S INDUSTRY STORIES OR EXPLORE ITS PUBLICLY-FUNDED MEMBER FACILITIES:

🌐 [platformtechnologies.org](http://platformtechnologies.org)

✉ [info@vptn.org](mailto:info@vptn.org)

- 1 TransGrid, *Demand Management Innovation Strategy*, 2014. <https://www.aer.gov.au/system/files/TransGrid%20-%20Appendix%20R%20-%20Demand%20Management%20Innovation%20Strategy%20-%20May%202014.pdf>
- 2 AusNet Electricity Services, *Electricity distribution price review – DMIA Priority Projects*, 2014. <https://www.aer.gov.au/system/files/AusNet%20Services%20-%20Appendix%209A%20-%20DMIA%20Priority%20Projects%20-%20April%202015.pdf>
- 3 Australian Government – Department of Industry & Science, *Energy White Paper – at a glance*. <http://www.industry.gov.au/EnergyWhitePaperataglance/index.html>
- 4 Parkinson, E, 2015, *Utility-scale batteries bring extra power to the grid*, Australian Financial Review. <http://www.afr.com/news/special-reports/energy-and-infrastructure/utilityscale-batteries-bring-extra-power-to-the-grid-20150401-1mcw8s>

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