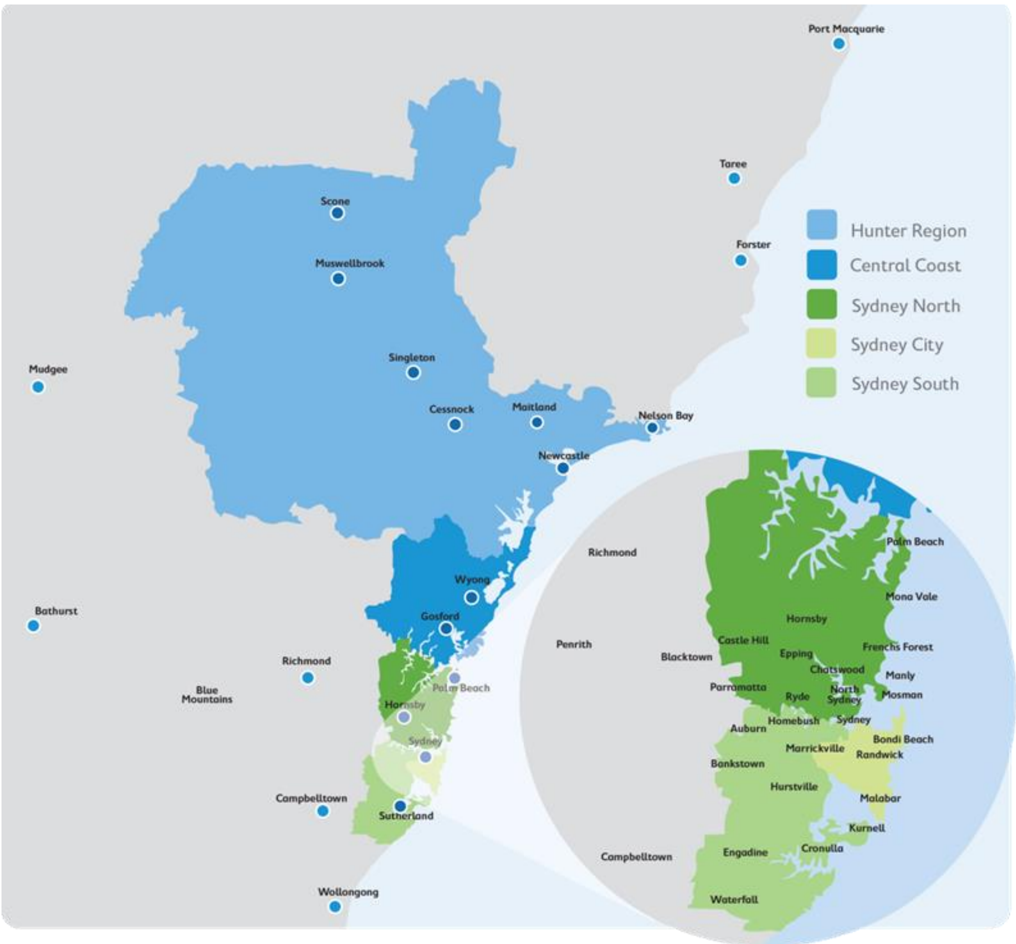
Ausgrid Innovation Project
Demand Management for Replacement Needs

1 Background

1.1 Ausgrid and Demand Management

Ausgrid operates the electricity distribution network for the Sydney, Central Coast and Hunter regions and supplies about 26,500 GWh of electricity annually to more than 1.7 million customers. In an effort to meet network needs at the least cost to consumers, Ausgrid has developed and implemented over 30 demand management (DM) projects. These projects included the use of commercial demand response, power factor correction and residential energy efficiency to defer network investment or manage the load at risk. To date, these DM projects have been to manage the growth in localised peak demand.

The Australian Energy Regulator (AER) introduced the Demand Management Innovation Allowance (DMIA) in 2009, providing distribution networks such as Ausgrid with a dedicated demand management research and development allowance. Over the course of the past 8 years, Ausgrid has implemented over 20 DM research projects including load control of residential air conditioners, battery storage, commercial demand response, innovative generator connections in the Sydney CBD and detailed customer research projects to explore customer preferences. Research projects have explored new technology solutions as well as refining techniques to improve DM solution effectiveness. The DMIA remains an important tool in refining DM solutions so that they can deliver a reliable, cost effective alternative to investment in network assets.



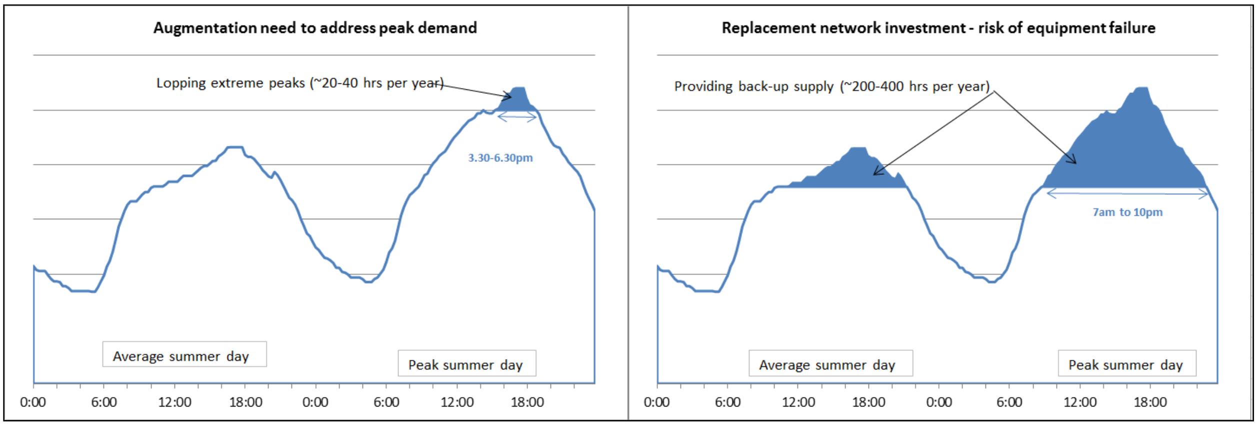
Ausgrid Area Network

1.2 Demand Management For Replacement/Retirement Needs

So while demand management has been successfully used to defer demand-driven network investment, there are few (if any) examples of demand management being used to defer replacement/retirement-driven network investment. As over 80% of Ausgrid's capital investment expenditure over the next 5-10 years is related to the retirement / replacement of aged assets, there is an urgent need for further research into the demand management solutions that can be used to defer this type of network investment.

A recent rule change highlights the increased focus from the industry to consider non-network options for replacement/retirement network investments. Introduced in September 2017, this rule change now requires a Regulatory Investment Test for Distribution (RIT-D) for all projects over $5 million.

A significant challenge in using demand management to manage risk from replacement/retirement driven investments is that the network support required often differs markedly from the typical overload risk for augmentation network investments. Overload risk solutions typically involve providing demand reductions for only a few hours on the top peak days (i.e. up to 40 hours a year). However, non-network solutions used to address a replacement type network investment can require a much longer and larger demand reduction to manage the load at risk associated with an asset failure which leads to a significant loss in network capacity. For illustrative purposes please see diagrams below:



Due to the larger scale of network support required, individual demand management solutions are unlikely to offer the scale of demand reductions necessary to cost effectively manage the risk across all time periods. For example, demand response from the reduction in load from air conditioners would provide material support on peak summer days but might offer limited demand reductions during average summer days when air conditioners for buildings and homes may not normally operate as much. Similarly, the use of standby diesel generators to reduce customer demand every day for an extended period may be restricted by noise, environmental or legal issues. In contrast, changes in demand from energy efficiency or new solar power systems would offer permanent reductions which might vary less day to day or be restricted to select days. Consequently, is appears likely that demand management solutions for replacement/retirement projects would require an innovative approach to building a portfolio of demand reductions from a mix of permanent and temporary demand reductions across the daily profile.

This view was reinforced by the mix of solutions offered by demand management providers for the Powering Sydney's Future (PSF) project, a replacement/retirement project of aged transmission cables to the Inner Sydney area. Submissions received from demand management providers (as part of the RIT-T) included the following solution types:

- Existing customer diesel generation
- Existing customer gas co/tri-generation
- Load shedding by customers (demand response)
- New customer solar power systems
- New customer energy storage systems
- Energy efficiency

The Project Assessment Draft Report for the PSF project, published in May 2017, concluded that non-network solutions could possibly provide network support to reduce load at risk in the years leading up to the need year in 2021/22 and defer the network project by one year to 2022/23. However, though selected as part of the preferred solution, some concerns were raised in the report. Addressing these concerns and refining the demand management techniques necessary would help provide certainty, help optimise such solutions and lead to the greater use of demand management to meet replacement/retirement network needs.

2 Project Overview

This project would aim to provide Ausgrid with learnings to enable us to refine demand management solutions that could be used for replacement/retirement network investments. The project will be funded using Ausgrid's demand management innovation allowance.

The primary concerns which the project would seek to clarify relate to the capacity of the key solution types to contribute to the reduction of demand in the event of a significant equipment failure. These include:

- Commercial potential at a range of incentive levels for additional solar power and energy efficiency (beyond business as usual);
- Daily and weekly contribution viable for customer diesel generation considering noise, pollution and commercial concerns;
- Daily and weekly contribution viable for voluntary customer load shedding;
- Daily and weekly contribution viable from other embedded generation and storage technologies (eg. co/tri-generation and battery systems);
- Identification of strategies to build effective solution portfolios to manage risk;
- Identification of connection process changes to improve customer outcomes.

For the purpose of this project we have separated the project into two categories of non-network solutions.

A. <u>Permanent demand reductions</u> where there is no ongoing contractual arrangement, price input or other factor that significantly changes the operation of the customer technology. For example, we consider solar power systems and energy efficiency retrofit activities would offer permanent demand reductions over the typical network need period once installed.

B. <u>Temporary demand reductions</u> provided by technologies such as diesel generators, co/tri-generation, battery storage systems or voluntary customer load shedding that typically rely upon contractual arrangements or price inputs (such as gas prices or electricity peak pricing) in order to influence customer operations to provide demand reductions.

3 Project Structure

The project will be divided into Part A and Part B with the aim of separately exploring the two different demand reduction types and how they can be used effectively to address a replacement network need.

<u>Part A – Permanent Demand Reduction Incentives Program</u>

This part of the project will establish an incentive fund for delivery of verifiable, permanent demand reductions. The main objective is to test the effectiveness of incentives in targeted geographic areas that lead to new installations of customer technologies and permanent demand reductions. These technologies will most likely be solar power and customer energy efficiency measures. Key learning objectives will be to determine how much installation activity the incentives stimulate **<u>in addition</u>** to what would have occurred without them and whether the scale of activity is sufficiently material for a selected area.

Indicative incentive fund size: $1.2 to $2.0m

<u>Part B – Temporary Demand Reduction Feasibility Studies</u>

This part of the project will study the viability of customer demand response options to manage load at risk in the event of a network outage, which would have much longer periods of support required than a typical augmentation network need. The objective of this part of the project would be more focused on exploring the potential of using customer generation, load shedding, battery storage or other demand response options. For this part of the project we do not intend to subsidise or incentivise the installation of new technologies but to explore through customer research or feasibility studies how existing demand response options can be used to address a replacement network investment.

An important feature of this project is that it is technology neutral, but outcome specific. What that means is, within the permanent and temporary reduction categories, Ausgrid has no preference for particular technologies provided their reliability, safety, quality etc. can be satisfactorily demonstrated and their demand reduction value can be verified in a practical way.

The market engagement process will be run separately for Parts A & B and will not affect each other. It is therefore possible for bidders to provide submissions for Part A only, Part B only or both Part A & B.

4 Stakeholder Outcomes

4.1 What is Ausgrid trying to achieve?

In Part A, Ausgrid is trying to learn how much additional customer take up of permanent demand reduction technologies can be stimulated by providing financial incentives in specific geographic areas for a defined period of time. Ausgrid would like to contract with market providers to leverage their access to customers, marketing skills and resources, as well as their knowledge of customer needs and capabilities. Market providers will form the link to the customer, and will have responsibility for delivering these reductions in a safe, timely and high quality manner.

In Part B, the aim is to research to what extent temporary/dispatchable demand response technologies (such as voluntary load shedding, dispatchable generators and, if feasible, energy storage) can be used in replacement scenarios where more network support than previous arrangements would be necessary. Ideally, Ausgrid would like to engage an organisation or organsisations to carry out research and feasibility studies across a variety of organisations/ customers that have provided demand response reductions in the past (or may do so in the future). It may be the case that different organisations will have unique and specialised relationships in different industries, therefore Ausgrid may choose to engage more than one provider for this service.

4.2 What could Market Providers gain?

This is an exciting opportunity for market providers and demand management proponents/aggregators to work with Ausgrid and other project partners to drive customer uptake of permanent demand reductions and to learn about different uses for existing and well known demand response technologies.

Benefits to participants include:

- Offers an additional feature for existing customer offers by market providers
- Helps deliver lower bills for your clients/customers
- Long term relationship building with networks and other project partners
- Opportunity to help inform improvements to Ausgrid’s customer connection process
- Leverage program lessons to improve your operations

4.3 Who is involved?

A number of parties have expressed interest in collaborating for this project. Ausgrid is currently in discussion with various potential project partners including networks, government bodies and educational institutions. Ausgrid is open to offers of research collaboration and incentive funding from other entities.

5 Request For Information (RFI) and Other Enquiries

Ausgrid will be inviting market providers to make written submissions for Part A and Part B through a Request for Information process.

Submissions in response to the RFI will close on Thursday, 23 November 2017 and Ausgrid will be holding a briefing session for bidders on Thursday 9 November 2017. Other important dates will be detailed in the RFI document.

If you are interested in making a submission in response to the RFI, you can find the documentation on Tenderlink at: https://www.tenderlink.com/ausgrid/ and then click on the tab, "All Current Tenders" and select **RFx No. AUSGRD-787055**. You will need to then login to access the tender documents or register if you are a first time user.

It's important you make formal submissions to the RFI via Tenderlink.

If you have any general enquiries about the project, please email them to: demandmanagement@ausgrid.com.au