

RIN07

Ausgrid demand side engagement document

Ausgrid Demand Side Engagement Document

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2. About our engagement strategy

Our Strategy communicates Ausgrid's approach and associated processes for engaging with stakeholders, customers and demand management providers on the supply of demand side solutions for the Ausgrid network.

Our strategy has been prepared in line with Ausgrid's demand side engagement requirements as a Distribution Network Service Provider under the National Electricity Rules.



1. Our mission

Our mission is to help identify demand management solutions that offer credible alternatives to investment in network infrastructure and leads to lower costs for customers.

3. What is demand management?

When the demand for electricity at peak times approaches the capacity of network infrastructure, network service providers such as Ausgrid, must act to maintain reliable electricity supply to customers.

Reliable electricity supply to customers can be maintained by either increasing the network capacity (supply side management) or reducing the peak electricity demand on the network (demand side management).

Demand management is an important part of efficient and sustainable network operations. It can involve either the voluntary moderation of customer electricity demand at peak times or the supply of electricity from generators or storage batteries connected at customer's premises or to the distribution network.

Effective network investment considering demand management is used for both replacement of aged network assets and network expansion due to growth in demand.

Demand management solutions are also referred to as non-network solutions and similarly, a demand management provider may also be referred to as a non-network provider.

Effective use of demand management reduces the cost to maintain the network and helps lower electricity charges for the entire community

There are a range of demand management solutions available for use by electricity networks. Examples include:

- Shifting appliance or equipment use from peak periods to non-peak periods (e.g. off peak hot water);
- Converting the appliance energy source from electricity to an alternative (e.g. switching from electric to gas heating);
- Use of more efficient appliances (e.g. replacing lights with more efficient, lower wattage options);
- Operating appliances at lower power demand for short periods (e.g. air conditioner load control);
- Operation of embedded generators;
- Energy storage (e.g. batteries); and
- Power factor correction.

When a review of a part of the network is initiated, an analysis of options that includes both reducing demand and building network assets is completed. The goal is to find the lowest cost solution that meets the required reliability standards. To ensure a thorough investigation, Ausgrid consults with the community on larger projects about the network requirements and the potential demand management options available.

3.1 Peak demand

Peak electricity demand events occur when demand for electricity is significantly higher than the historical average. These events are relatively rare, occurring on average about 20-40 hours in a year or less than 0.5% of the time.

Peak events occur typically during periods when the weather is very hot or very cold. Peak events that occur in colder weather are called winter peak events, and those that occur in hot weather are called summer peak events.

In the past Ausgrid's distribution network was predominantly described as a winter peaking network, but in recent years the majority of network assets reach their peak demand in the summer. Currently, about two thirds of Ausgrid's network zone substations peak in summer. This is due primarily to the increased use of air conditioners in homes and businesses and the replacement of electric resistance heaters with gas and reverse cycle air conditioners for winter heating.



3.1 Peak demand continued

Summer peak events occur on the hottest working weekdays in summer, typically between 2:00 pm and 8:00 pm. A summer peak event is primarily influenced by the demand for cooling from homes and businesses.

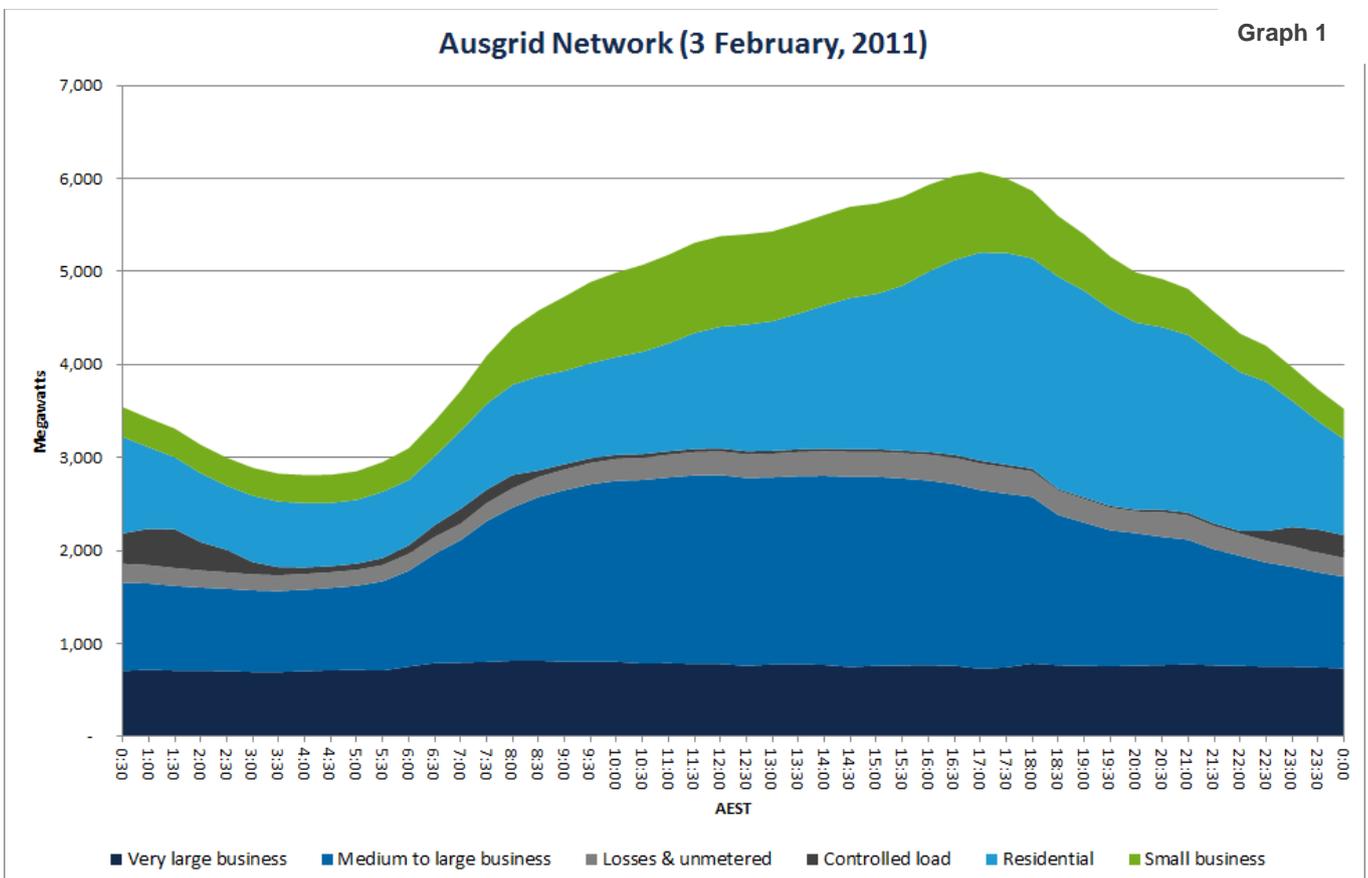
Winter peak events occur on the coldest working weekdays in winter, typically between 6:00 pm and 8:00 pm. A winter peak event is often driven by high demand for heating of residential homes.

Graph 1 shows the historical maximum summer peak demand, broken down by sector, for the overall network and is broadly representative of a typical summer peak demand day for the overall Ausgrid network.

Over the course of a summer peak demand day, electricity demand increases steadily throughout the day before peaking in the late afternoon. At this time, demand for cooling from homes is rising as families return home from work and school, while demand from businesses remains strong.

Note that the change in demand is most pronounced with residential customers, while demand from very large business customers (typically industrial) remains relatively unchanged over the entire day.

Note that demand profiles vary for different network assets. For example, an electricity feeder supplying a predominantly residential area will peak later than for a predominantly business area.



4.0 Demand Management process

4.1 Overview

When network reviews indicate that a network need for an asset replacement or network expansion investment is required, Ausgrid will investigate and where viable, develop and implement demand management options to maintain network reliability standards. The demand management investigation is comprised of five separate stages. A detailed description of each stage is in the sections following.



For all projects where the network expansion component of any credible network options have a capital cost in excess of \$5 million, the Regulatory Investment Test for Distributors (RIT-D) process will be followed to assess demand management solutions.

For augmentation projects with a capital cost less than \$5 million, the RIT-D process is not required. The likelihood of finding suitable cost effective demand management solutions is instead assessed on a case by case basis taking into account the nature of the constraint and the characteristics of the supply area. While non-network options will be considered, a simplified process is used for these smaller projects.



4.2 Demand and capacity forecasts

Demand and capacity forecasts for the electricity supply system are developed as part of the network planning process and detailed in the Distribution and Transmission Annual Plan Report (DTAPR).

The Report describes the Ausgrid network, forecasts for the forward planning period, Ausgrid's reliability performance, planned replacement projects and other information describing the network's performance and future needs. It replaces the previously published Electricity System Development Review which has been discontinued. A copy of the latest report is found [here](#)

4.3 Demand Management screening

The screening test is a desktop study used to establish Ausgrid's expectation of whether demand management options are technically and economically feasible.

The screening test considers the reasons or drivers for the network investment and the reduction in demand that is required including the year, time of day, duration and season the reduction is required, the rate the demand is growing, and the characteristics of the load to be reduced.

Each investment is screened to determine if it is reasonable to expect that a demand management solution could allow for a deferral or avoidance of the network investment.

The cost of demand management options are estimated based on currently available knowledge, and past experience in implementing these types of programs under similar circumstances. Assumed costs are based on a best case (i.e. lowest likely cost) view.

Important considerations include: the amount of demand reduction required (especially as a proportion of the current demand), the value of deferral, the complexity of the demand management requirements and the time available for implementation of likely demand management solutions.



Cash flow scenarios are developed that compare the construction of a network solution alone to the implementation of indicative demand management options followed by construction of a network solution at a later date.

A net present value analysis is conducted considering all of the likely costs and benefits associated with each option over at least a 15 year period. If the option that includes demand management has a lower net present value, then it is considered reasonable to expect that a demand management option may be viable, and form part of the least cost solution

For the RIT-D process, if the screening test concludes that a demand management solution may be viable, a Non-network Options Report will be issued and the options investigation process will begin. If the screening test concludes that it is not reasonable to defer the proposed project a Screening Test Report will be issued and no further investigation of demand management is conducted. Non-network Option Reports and Screening test reports are published on the Ausgrid website [here](#).

For a non RIT-D project, if the screening test is positive, the process moves to the investigation phase. The screening test result will be published on the Ausgrid website.

4.4 Investigation of Demand Management options

The investigation process seeks to identify potential cost effective demand management options that could defer the network investment, and to identify the size, timing and budget costs of these feasible options.

Options are identified using Ausgrid's existing knowledge, via the public consultation, field visits to customer sites and discussions with major customers.

The investigation identifies the amount of demand reductions available and the likely cost of each demand management option identified. The various elements for the demand management investigation are described as follows in 4.4.1 to 4.4.8.

4.4.1 Community consultation

The first formal interaction from Ausgrid with potential demand management providers is when a Non-network Options Report is released. These reports are uploaded to Ausgrid's website and distributed to the parties registered on the Demand Side Engagement Register and other key stakeholders.

Further details on the content in the Non-network Options Report and how to respond are provided in Section 5 Consultation Overview.

4.4.2 Assessment of submissions

Ausgrid will respond to all submissions to a Non-Network Options Report or community consultation.

All demand management options identified are assessed according to the following criteria:

- demand reduction (kVA – effective at the point of forecast constraint);
- cost (NPV and \$/kVA);
- time of day/seasonality demand reduction available;
- timeframe for implementation;
- reliability of demand reduction (risk of non-delivery or non-performance).

If there is insufficient detail provided in a submission to allow a reasonable level of confidence in a solution, Ausgrid will contact the potential demand management provider to request further information.

Once sufficient information is obtained to assess all viable demand management options provided via the community consultation process, they are compared with other known solutions.

Those options that are determined to offer insufficient confidence of delivery, cannot be implemented in the required timeframe or do not provide demand reductions during the required time period are excluded. Where a submission details an option which has been assessed as not viable, Ausgrid will identify to the proponent why it will not be considered further.

The remaining demand management options are ranked on cost effectiveness from lowest to highest \$/kVA. A strategy for deferring the network investment based on implementing one or more of those options is prepared, giving preference to options with lower \$/kVA where other considerations are equal.

A solution can comprise a number of demand management options to produce the required demand reduction provided the combined NPV of the relevant demand management scenario is higher than the NPV of the alternative network solution.

For information on the connection of embedded generation units, refer to Section 6.0.

See an example assessment of viable demand management solutions to a network need on page 8.



Example assessment of submissions

A network need has been identified in which the preferred network solution is a new 11kV feeder at a total cost of \$3.8m. In order to defer the network need, a reduction of 1400 kVA between 2pm and 6pm on working weekdays in summer is required in year one.

To be considered the least cost solution, the combined demand management solution would need to cost less than \$230,000.

The demand management investigation, including community consultation, has identified six viable demand management options, ranked by \$/kVA in Table 1 below.

Implementation of the first three least cost options achieves a demand reduction of 1500 kVA at an estimated total cost of \$170,000.

As this is sufficient to achieve the required reduction of 1400 kVA at a cost less than the target of \$230,000, Ausgrid would progress implementation of these three demand management solutions.

Analysis of possible deferrals of two or more years would also be completed.

Table 1

| No. | Proposal | Demand Reduction (kVA) | Option Cost (\$) | Option \$/kVA | Cumulative Demand Reduction (kVA) | Cumulative Cost |
|-----|---------------------------|------------------------|------------------|---------------|-----------------------------------|-----------------|
| 1 | Power Factor Correction | 250 | \$12,500 | \$50 | 250 | \$12,500 |
| 2 | Embedded Generation | 1000 | \$120,000 | \$120 | 1250 | \$132,500 |
| 3 | Load curtailment | 250 | \$37,500 | \$150 | 1500 | \$170,000 |
| 4 | Air conditioner cycling | 100 | \$50,000 | \$500 | 1600 | \$220,000 |
| 5 | Energy efficient lighting | 250 | \$150,000 | \$600 | 1850 | \$370,000 |
| 6 | Energy Storage | 100 | \$180,000 | \$1,800 | 1950 | \$550,000 |

4.4.3 Demand Management Investigation Report

When the assessment of demand management options is complete, a Demand Management Investigation Report is published which describes:

- the investigation process followed;
- identifies all demand management options considered;
- lists the cost and impacts for each; and
- any feasible demand management options that are to be considered alongside network augmentation options.

If necessary, it repeats the demand management requirements and network augmentation option details from the Screening Test Report with updates due to changes in load forecasts or the default network solution. It also provides a summary of the public consultation process and presents results of the comparison of cost to demand management value.

In the event that no demand management options are found to be feasible then this is clearly stated.

Non-Network Options Reports and Demand Management Investigation Reports are made public via the Ausgrid website [here](#), and shared with those parties that made submissions in the consultation, and those parties listed in the [Demand Side Engagement Register](#).

4.4.4 Project assessment

For the RIT-D process only, following the evaluation of the credible network and non-network solutions, a project assessment report is published. This report details the identified need, both network and non-network options considered and other relevant information. Depending upon the estimated capital cost of the preferred solution, a draft project assessment report may be published for further consultation. Once a preferred solution is selected, a final project assessment report is published in all cases.

4.4.5 Procurement process

Where a non-network option has been selected to form part of the solution, at the completion of the final project assessment process, Ausgrid will commence procurement processes. These processes will contract for the preferred non-network solution while ensuring both probity and prudent purchasing practice. This may include negotiating agreements with the selected demand management service provider(s) based on the submission from the service provider as part of the consultation process, other tenders or invitations to bid, or internal project development.

Payments for network support will be negotiated on commercial terms to achieve the lowest cost outcome for Ausgrid's customers. The values in the cost effectiveness analysis form an upper bound. Service levels, performance targets and milestones will be negotiated in any agreements.

4.4.6 Incentive payment schemes

Demand management incentive payments from Ausgrid to a customer or service provider may form part of a demand management project where it is deemed appropriate. These can include payments to customers or third party providers.

Consultation and information about specific incentive payments may be provided as part of the Non-Network Options Report or be released as part of the implementation of a selected demand management solution.

Incentives to manage demand are also included in the structure of network tariffs including residential off-peak tariffs, time of use tariffs and peak demand kVA tariffs for larger customers. Off-peak hot water tariffs for example are a longstanding tariff initiative aimed at shifting peak demand.



4.4.7 Determining payment levels

Determining the payment level for each demand management solution is determined by:

- the total deferral value;
- the magnitude of the demand reduction requirement;
- the duration and number of occurrences of expected demand reductions;
- the reliability of the demand management solution;
- the co-incidence between the solution, time and season; and
- the proportion of the solution to the demand reduction requirement.

The demand management alternative needs to be cheaper than the cost saving from deferring the project. The lowest cost option is calculated using cash flow analysis to determine the NPV of the base case and the alternate case for a deferred project and the demand management alternative.

4.4.8 Access to incentives

To be paid demand management option incentives, specific criteria needs to be met to demonstrate that demand has been reduced during nominated peak times for all or part of a demand management solution. The primary criteria for accessing incentives against include:

- reduction of demand on a constrained asset in a peak period
- reliability of the solution
- prior knowledge of costs
- Ausgrid experience with similar solutions
- persistence of the demand reduction
- deferral value of the network solution

4.5 Demand Side Engagement Register

Ausgrid's Demand Side Engagement Register is a list of stakeholders who are interested in being notified of developments in relation to Ausgrid's distribution network planning and expansion. The Register helps stakeholders stay informed about when, where and how Ausgrid invests in the network and how demand management alternatives can contribute.

Stakeholders receive updates on our Distribution and Transmission Annual Planning Review and information related to proposed network investments including screening tests, Non-network Options Reports, and draft and final project assessments reports.

Interested parties are invited to register their interest via the Ausgrid website [here](#).



5.0 Consultation overview

The public consultation overview aims to uncover demand management solutions that are not known to Ausgrid. It is the first formal interaction from Ausgrid with potential demand management providers.

A Non-Network Options Report is publicly advertised seeking information from interested parties on demand management options in the geographical area of the constraint.

This Report is uploaded to the Ausgrid website, issued to AEMO and distributed those registered on the Demand Side Engagement Register.

The content of the Report will include:

- a description of the identified network need;
- assumptions used in identifying the need;
- technical characteristics of the identified need including the size, location and time period required;
- a map clearly identifying the geographical boundaries of the constrained area;
- a description of the potential credible network and demand management solutions;
- electricity demand profile data for the need;
- a load profile showing the peak time;
- duration of the required demand reduction;
- the deferral value for the identified need; and
- likely characteristics of suitable Demand Management options.

Responses to the Non-Network Options Report generated from the consultation process should include:

- name, address and contact details of the company or person making the submission and responsible for the load or alternate supply;
- size, type and location of load(s) that can be reduced, shifted, substituted or interrupted;
- size, type and location of generators that can be utilised if required;
- type of action or technology proposed to reduce peak demand and provide alternate supplies;
- time required to implement these measures and any period of notice required before loads can be interrupted or generators started;
- cost to implement these measures and any cost savings that would accrue to the owners or operators of the equipment; and
- cost of any contribution or assistance that Ausgrid may be required to make in order to make use of this measure for demand management;

Responses are emailed to:
demandmanagement@ausgrid.com.au

6. Embedded generation

6.1 Connections

The supply of electricity from embedded generation units can offer a cost effective solution to a network need.

To connect or alter the connection for an embedded generation unit, Ausgrid requires information about your proposed generator and connection. You will need to fill in and submit the appropriate application form.

Application Forms

- NECF-02 Residential and small commercial connections
- NECF-03 Large multiple and remote connection
- NECF-04 Embedded and standby generation
- NECF-05 Installation of Micro Embedded Generation

Use Table 2 below to assess your situation and determine the correct application form to use. These forms, further information and how to submit are found on Ausgrid's website [here](#).

Table 2

| Proposed Embedded/Standby Generator Size | | | | | |
|--|----------|----------|-----------------|-----------------|----------------------------------|
| | | | <5kW | >5kW and <5MW | >5MW |
| Network Connection | New | <100Amps | NECF02 + NECF04 | NECF02 + NECF04 | Application as per NER Chapter 5 |
| | | >100Amps | NECF03 + NECF04 | NECF03 + NECF04 | |
| | Existing | <100Amps | NECF05 | NECF02 + NECF04 | |
| | | >100Amps | NECF05 | NECF03 + NECF04 | |

6.1 Connections continued

All embedded generation connections that are installed as part of a new connection application to our network need a bidirectional meter to be installed. Before we can issue you a meter, you must first have a contract with an electricity retailer for that property.

Once we have assessed the application, we will send you a connection offer, which includes costs, requirements and timeframes.

If your proposed embedded generator is larger than 30kW, a more comprehensive enquiry process is necessary prior to the application, to ensure Ausgrid fully understand your requirements.



6.2 Transmission use charges

Ausgrid connects to the TransGrid transmission network at multiple connection points.

TransGrid, as a regulated Transmission Network Service Provider, recovers its revenue from directly connected customers and Distribution Network Service Providers connected to its network.

In accordance with the connection agreement with TransGrid, Ausgrid is required to pay transmission use of system (TUOS) charges to TransGrid.

Under the National Electricity Rules, owners or operators of eligible embedded generators can receive Avoided TUOS (ATUOS) payments from Distribution Network Service Providers.

ATUOS payments recognise that energy supplied to the distribution network by the embedded generator would have otherwise been supplied from the state's transmission network. The method for calculating the avoided TUOS is as follows:

$$\text{ATUOS} = \text{TUOS}_{\text{without EG}} - \text{TUOS}_{\text{with EG}}$$

$$\text{where: } \text{TUOS}_{\text{without EG}} = \text{Demand Tariff X Transmission Peak Demand}_{\text{without EG}}$$

$$\text{TUOS}_{\text{with EG}} = \text{Demand Tariff X Transmission Peak Demand}_{\text{with EG}}$$

or combining the above

$$\text{ATUOS} = \text{Demand Tariff X (Transmission Peak Demand}_{\text{without EG}} - \text{Transmission Peak Demand}_{\text{with EG}})$$

Contact us

For further information on Ausgrid's Demand Management process, recently completed screening tests, and reports, refer to: www.ausgrid.com.au/dm.

To join the Demand Side Engagement Register of interested parties, please fill in and submit the [form](#) on our website.

For general enquiries contact Ausgrid's Demand Management team at:
demandmanagement@ausgrid.com.au

or write to us at:

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