Ergon Energy Demand Management Innovation Allowance Report 2016-17

31 October 2017

Figures and tables

1. Introduction

Purpose and compliance

Ergon Energy is pleased to present the Demand Management Innovation Allowance (DMIA) Report for the 2016-17 regulatory year. The purpose of this report is to allow the Australian Energy Regulator (AER) to:

- assess Ergon Energy's 2016-17 DMIA initiatives and Ergon Energy's entitlement to recover the expenditure under the AER's Demand Management Incentive Scheme (DMIS)[1]
- confirm Ergon Energy's compliance with the annual reporting requirements of the AER's Regulatory Information Notice (RIN) issued to Ergon Energy on 3 February 2016.

This report has been completed in accordance with:

- Clause 6.6.3 of the National Electricity Rules, which allows the AER to develop and publish a DMIS that provides incentives for Distribution Network Service Providers (DNSPs) to implement efficient non-network alternatives, or to manage the expected demand for standard control services in some other way, or to efficiently connect Embedded Generators; and
- Schedule 1, paragraph 6 of the AER's RIN (refer to Table 1), which requires a DNSP to which the DMIS applies to submit an annual report to the AER on its expenditure under the DMIA.

Further, as noted in the RIN, information provided to demonstrate compliance with paragraph 6 of Schedule 1 of the RIN is considered to constitute the provision of an annual report for the 67-regulatory year, in accordance with paragraph 3.1.4.1 of the DMIS.

This report, and the information contained in the report, is suitable for publication by the AER.

[1] AER (2008), *Demand Management Incentive Scheme, Energex, Ergon Energy and ETSA Utilities 2010-15*, October 2008.

Table 1: Schedule 1, paragraph 6 – DMIA compliance

6	Requirement	Section
6.1	Identify each demand management project or program for which Ergon Energy seeks approval.	Section 4
6.2	For each demand management project or program identified in the response to paragraph 6.1:	
(a)	explain:	
	(i) how it complies with the DMIA criteria detailed at section 3.1.3 of the DMIS	Sections 3 and 4
	(ii) its nature and scope	Section 4
	(iii) its aims and expected outcomes	Section 4
	(iv) the process by which it was selected, including its business case and consideration of any alternatives	Section 2
	(v) how it was/is to be implemented	Section 4
	(vi) its implementation costs	Section 3
	(vii) any identifiable benefits that have arisen from it, including any off peak or peak demand reductions	Section 4
(b)	confirm that its associated costs are not:	
	(i) recoverable under any other jurisdictional incentive scheme	Section 3
	(ii) recoverable under any other Commonwealth or State Government scheme	Section 3
	(iii) included in the forecast capital or operating expenditure approved in the 2015-20 Distribution Determination or recoverable under any other incentive scheme in that determination	Section 3
(c)	state the total amount of the DMIA spent in the relevant regulatory year and how this amount has been calculated.	Section 3
6.3	Provide an overview of developments in relation to projects or programs completed in previous years, and of any results to date.	Section 4

Submission summary

In its Distribution Determination[2], the AER decided to apply Part A of the DMIS (i.e. the DMIA component) to Ergon Energy, approving an innovation allowance amount of $5 million over the 2015-20 regulatory control period.

The DMIA is provided to investigate opportunities that are not yet commercial, in addition to any business-as-usual capital and operating expenditure allowances for demand management and embedded generation projects approved in Ergon Energy's Distribution Determination. This provides a direct incentive for DNSPs to assess emerging opportunities for potentially efficient non-network alternatives, to manage the expected demand for standard control services in some other way or to enable more efficient connection of embedded generation other than through network augmentation.

Ergon Energy's 2016-17 DMIA program comprised ten projects. The total cost incurred for the DMIA initiatives during 2016-17 was $794,935. Table 2 summarises Ergon Energy's DMIA program expenditure recovery for the 2016-17 regulatory year.

Table 2: Ergon Energy DMIA program – 2016-17

Projects	Number	Expenditure
Closed	1	$0
Continuing	4	$181,191
New	5	$613,544
Total	**10**	**$794,735**

Ergon Energy seeks the AER's approval to recover the costs for the full amount of DMIA spent in the 2016-17 regulatory year.

In line with all Ergon Energy investments, the DMIA program follows Ergon Energy's standard gated governance framework, with built-in review for prudency and efficiency at each gate, as the project moves through the investment lifecycle.

For the 2016-17 DMIA program, all nominated DMIA projects were subject to a screening and feasibility processes, consistent with the AER's DMIS, and a subsequent cost-benefit analysis to identify the highest value projects, based on factors including their ability to shape energy load profiles, to enable demand management and support our customers.

Budgets were also prepared in accordance with Ergon Energy's standard project methodology, detailing information including the projects' goals, deliverables, project milestones and resources required. Cost estimations were developed for the resources identified, as required for each phase of each project. These cost estimations drew upon various sources including the costs of similar projects undertaken by Ergon Energy, current preferred contractor panel contracts and market research. For projects with co-contributions from industry partners and research institutions, the total project budgets were inclusive of such amounts and assessed on this basis.

Ergon Energy's DMIA program is delivering strongly against its DMIA objectives, with several of the projects moving to a business-as-usual operation.

[2] AER (2015), *Final Decision, Ergon Energy determination 2016-17 to 2019-20, Attachment 12 – Demand management incentive scheme,* October 2015.

2. DMIA program of work

Program development

Ergon Energy considers DMIA investments an important component of its commitment to delivering customer value over the longer term. The DMIA program complements our non-network alternative program, which is geared towards providing a more efficient solution to network augmentation. The DMIA initiatives have enabled Ergon Energy to investigate and test innovative approaches to a range of network issues, such as improvement of load factors, customer behaviours, renewable integration, capacity limitation solutions, tariff enablement, customer and community engagement and power quality solutions. Our DMIA program has five focus areas, as detailed in Figure 1, to support the criteria of shifting reducing demand through non-network alternatives rather than increasing supply through network augmentation.

Figure 1: DMIA focus areas

Ergon Energy considers that over the longer term, innovation in the core DMIA focus areas highlighted above will aid in the reduction of network augmentation by addressing network constraint challenges through collaborative partnerships between networks, markets and customers. This offers the entire supply chain the opportunity to reduce costs through finding solutions that better fit all stakeholder needs. As such the diversity of initiatives across the DMIA program reflects this commitment to lowering capital investments through finding alternatives for limitations driving network investments.

Program cycle

Identifying innovation opportunities

The DMIA program has enabled Ergon Energy to place greater emphasis on the importance of innovation for demand management opportunities. By drawing on its own experience and examples of industry practice, Ergon Energy has developed an environment that characterises solutions beyond the traditional network solution.

To identify and increase the innovation opportunities, Ergon Energy's innovation environment comprises three key groups to funnel innovation ideas into the DMIA program, as illustrated in Figure 2:

- the DMIA program team, providing opportunity for anybody in Ergon Energy to contribute
- the Smart Network Reference Group, providing senior management representation and oversight from across the business
- co-contributions from external parties such as universities, research partners and industry partners.

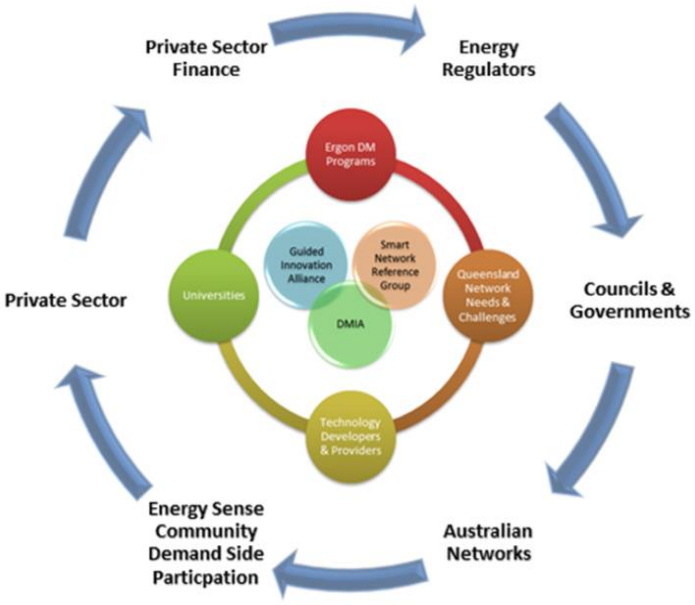

Figure 2: Ergon Energy innovation environment

Selection process

To ensure prudent investment choice and project delivery efficiency, all Ergon Energy investments adhere to our standard gated governance framework. The DMIA projects follow the same methodology, with particular emphasis placed on meeting the DMIA criteria and objectives. Accordingly, once projects are identified and nominated through the above-mentioned innovation environment, the eligibility-screening process is performed on nominated projects as a high level assessment, to determine whether the projects meet the objectives of the DMIA. Specifically, this tests whether each potential project is in accordance with paragraph 3.1.3 of the DMIS. Table 3 outlines the criteria in detail.

Provided all the specified conditions are met, then the project proceeds to the feasibility assessment and approval stages, as per the gated governance framework. All Ergon Energy DMIA projects are selected and scoped to respond to current and emerging network limitation drivers. Information from the development activities undertaken enables implementation scheduling, milestone planning and confirmation of resources.

Table 3: Ergon Energy DMIA project selection criteria

Selection criteria
• Reduces, shifts or manages electricity demand through non-network alternatives or projects or programs designed to build demand management capability and capacity and explore potentially efficient demand-management mechanisms, including but not limited to new or original concepts, that support a reduction in network risk through means other than network augmentation.
• Has costs which are not recoverable under any other jurisdictional incentive scheme
• Has costs which are not recoverable under any other state or Commonwealth Government scheme
• Has costs which are not included in Ergon Energy's forecast capital or operating expenditure approved in the AER's distribution determination for the regulatory control period under which the scheme applies, or under any other incentive scheme in that determination
• Is technically feasible (based on whether, in Ergon Energy's assessment, the project is suitable for its intended application and whether it can be theoretically and physically integrated with Ergon Energy's infrastructure).

3. Budget management

DMIA program expenditure

Ergon Energy's DMIA total expenditure for 2016-17 was $794,735. The costs incurred on the DMIA program for the year were all operating expenditure with no capital expenditure. Ergon Energy seeks the AER's approval to recover the costs for the full amount detailed in the 2016-17 expenditure column of Table 4. These costs are all Ergon Energy's contribution to the projects and are over and above any external funding received from industry or government grants.

For the year, the DMIA program comprised of ten projects, with one closed project (carry over costs from 2015-16), four continuing projects from 2015-16 and five new projects. All projects were developed and managed in accordance with Ergon Energy's established program management framework as outlined in the previous section.

Table 4 summarises the actual expenditure for the 2016-17 Ergon Energy DMIA program, along with the total approved budget costs, actual annual costs, program-to-date incurred costs, and any applicable comments.

Table 4: Ergon Energy DMIA program expenditure 2016-17

Project	Budget ($)		2016-17 expenditure ($)		Project to date expenditure ($)		Comment
	Total Project Budget	Ergon Energy Project Budget	Capital	Operating	Capital	Operating	
LED Streetlight removing barriers	182,000	182,000	-	0	-	173,524	Closed
Centralised Energy Storage	450,000	450,000	-	20,663	-	250,738	Continuing
Internet of Things (IoT) Load Control	263,833	263,833	-	114,398	-	148,683	Continuing
Feeder of the Future Research	20,000	20,000	-	975	-	23,005	Continuing
ARC Customer response and risk management	1,202,644	281,911[3]	-	45,155	-	89,125	Continuing
Feeder of the Future – baselining							
• Probe reads		195,000		35,187		35,187	New
• Connected meters		926,000		352,279		352,279	New
ADMD Calculator Pilot		94,160		29,653		29,653	New
Grid Advocacy		365,000		175,887		175,887	New
Home Energy Management Systems		50,000		20,538		20538	New
Total	**2,118,477**	**2,827,904**	**0**	**794,735**	**0**	**1,298,619**	

Of note, Ergon Energy costs associated with each of the DMIA projects, as identified in Table 4, are not:

- recoverable under any other jurisdictional incentive scheme
- recoverable under any other Commonwealth or State Government scheme
- included in the forecast capital or operating expenditure approved in the AER's 2015-20 Distribution Determination or recoverable under any other incentive scheme in that determination.

Longer term trends

Ergon Energy's DMIA program progressed well over the previous regulatory control period, providing valuable knowledge and creating opportunities. We expect this to continue throughout the current regulatory control period. The DMIA program continues to collaborate with innovation

[3] The project is part funded by an Australian Research Council grant, Queensland University of Technology and Ergon Energy via the Demand Management Innovation Allowance as such Ergon Energy's contribution is a fraction of the overall project budget.

partners who are willing to contribute to DMIA projects and trials. Ergon Energy has found co-contributions are a useful way to lower Ergon Energy's innovation costs, share risks and identify collaboration opportunities, share knowledge and capabilities, and gain valuable insights into emerging markets.

Table 5 presents a summary of co-contributions into Ergon Energy DMIA funded projects. It demonstrates how Ergon Energy is leveraging industry, research organisations and other development funds to lower our DMIA costs. Importantly, the parties value these projects or programs as they are willing to make contributions towards these costs. The costs Ergon Energy is seeking to recover do not include the co-contributions received for the project.

Table 5: Ergon Energy DMIA co-contributions

DMIA Project	Funding Source	Project total budget ($)	Co-contributions Cash Total ($)	Ergon Energy Project Cash Budget ($)	Project Total Cash Amount ($)
ARC Customer response and risk management	QUT ARC	525,000	525,000	281,911	806,911[4]
	Ergon Energy	527,644[5]			
Total		**1,052,644**	**525,000**	**281,911**	**806,911**

[4] The DMIA 2014-15 Outcomes report included the total project budget, the reporting this year is for the total project cash contributions

[5] Includes financial contribution and non-financial in kind contributions, such as access to data and expert advice.

4. Program delivery progress

Program delivery

This section of the report details the status of Ergon Energy's DMIA projects in 2016-17 by describing each project, its objectives, progress and findings to date.

Centralised Energy Storage System (CESS)

Nature and scope

Distributed storage has a significant role on our electricity networks as energy storage technology improves and price continues to falls. Ergon Energy and Energex have a range of potential applications for larger-scale distributed energy storage, particularly for micro-grid applications, network support and also off-grid applications (mainly for Ergon Energy).

The Centralised Energy Storage System (CESS) is a joint Ergon-Energex project to develop and evaluate a 100kW/200kWh energy storage system. The CESS is a test platform to enable further control systems development. The system will be tested, trialled and integrated in a controlled, generation test environment in the workshops to develop functionality and verify its effectiveness and reliability. It is anticipated that the CESS project will seed other projects to develop advanced control systems to enable higher penetrations of customer-owned renewable generation and also develop micro-gridding functionality.

Project phase

Indicates current phase

Benefits and outcomes

- Enable higher penetrations of PV on the network using centralised energy storage
- Investigate micro-gridding functions to seamlessly transition between on and off grid.
- Provide a test platform for further development of advanced control systems

Aims and expectations

The project aims to:

- develop integration strategies for traditional generation, energy storage and renewable energy,
- enable higher penetrations of renewable energy using centralised energy storage systems, and;
- understand the how to achieve seamless transitions between on-grid and off-grid, and the ability of centralised storage to support islanding (micro-grids).

DMIA alignment

Energy storage and combined generation and storage are a promising demand management solution for reducing peak demand. As this technology develops a key barrier for broader implementation will be the integration of the many control systems in a seamless manner.

Update summary

A key area of interest lies in enabling effective integration of diesel generation and renewable energy, alongside inverter/battery technologies. Stage 1 of the CESS project involved the procurement of a 83kVA/200kWh energy storage system as a flexible test and development platform. This was successfully completed and commissioned in May 2016, at the Cairns, 308 Hartley Street depot, alongside 60kW of solar PV. This project is currently in Stage 2 which involves utilising the CESS platform for the development of advanced control algorithms for network and isolated applications.

IoT

Nature and scope

This is a capability enablement project to utilise the potential offered by Internet of Things (IoT) technologies for demand response applications.

The project aims to establish, at a minimum a Proof of Concept (PoC) deployment of an IoT enabled demand response system and is funded via DIMA under the category of capability enablement. Once the PoC stage is complete the project would continue to be funded via BAU activities.

Project phase

Indicates current phase

Benefits and outcomes

- Utilise IoT technologies to enhance demand response abilities
- Explore alternative demand response communications options
- Enable more complex load control interactions

Aims and expectations

The project aims to:

- evaluate the suitability and applicability of a Low Power Wide Area Wireless Network, belonging to the family of IoT, to provide transport services for signalling and reporting of demand response enabling devices (DRED), and;
- develop an end-to-end solution and evaluate it in a PoC deployment.

DMIA alignment

IoT is a promising low cost interconnection of appliances and devices in the home, this project will explore the emerging IoT technologies and validate the cost, operational and technical benefits for managing consumer side devices for reducing peak demand.

Update summary

The project has established an IoT network and installed IoT load control devices in selected homes in Townsville. Testing has commenced with the testing of load control response, communications reach and other ancillary systems.

Feeder of the Future Initial Research

Nature and scope

This project aims to gain a better understanding of customer loads and modelling based on individual customer metering data that was recently obtained.

To achieve this, the project will perform data analytics and machine learning techniques so that a model of customer load, based on variables such house size, temperature, solar irradiance etc., can be developed. This model will then be used to estimate the effect customer battery systems would have on overall feeder loads.

Project phase

Indicates current phase

Benefits and outcomes

- Initial model established to enable customer loads to be simulated with batteries and other emerging technology on a diversified feeder basis.

Aims and expectations

The project aims to:

- develop a model of individual customer loads based on a number of relevant parameters, and;
- use this model to gain a better understanding of aggregate customer load when battery systems and other modern devices are installed.

DMIA alignment

Enabling more accurate models of the consumer side technologies that may be leveraged for managing peak demand enables our demand management program to better quantify the benefits of a program and to develop products which consumers may adopt that support a reduction in peak demand.

Update summary

The project was successful in developing a preliminary customer load model that can be used to simulate the effects of battery systems and other loads on aggregate feeder load profiles. The project as continued to utilise data from the baselining project for modelling and to further develop Feeder of the Future strategies. The project has delivered a report recommending least cost solutions for managing forward network risks and leveraging demand side capabilities.

Feeder of the Future Baselining

Nature and scope

To obtain network and load profile data to enable detailed baselining and modelling of the network for supporting future projects and the Feeder of the future research. The project will develop the data from Hervey Bay area which has some of the highest penetrations of residential solar systems in Australia.

The first phase of the project was to probe read all meters that have data storage capabilities to capture historic data.

The second phase was to install a range of connected meters to enable continuous data collection for future network modelling. The installation of connected meters also enables future anticipated projects such as:

1. testing cost reflective tariff uptake rates and customer acceptance of these new tariffs,
2. Provide measurement and verification for new technology market based trials of Home Energy Management Systems and Energy Storage

Project phase

Indicates current phase

Benefits and outcomes

- Establishes data collection capabilities in an area of very high residential solar PV penetration levels.
- Supports detailed network modelling
- Supports the development of strategies to manage next generation customer technologies

Aims and expectations

The project aims to:

- establish a baseline data set for complex network modelling, and;
- enable other technology based trials delivered through market mechanisms

DMIA alignment

Provides a baseline set of data for network modelling to determine the most efficient combination of network side and demand side technologies to manage future network risks.
The project removes barriers for customer adoption of cost reflective tariffs and with a historic baseline the demand impacts of cost reflective tariffs can be modelled.
The project provides a baseline data set which can be used for determining the demand impacts of emerging customer technologies, Home Energy Management Systems and Energy Storage, which may form part of future trials in this area.

Update summary

The project has completed the two components, probe reads and installation of connected meters and is continuing to collect data for network modelling purposes.

ADMD Calculator Pilot

Nature and scope

To pilot and assess the utility and acceptance of the After Diversity Maximum Demand Calculator (Ergon Energy's version of the Kinesis CCap Precinct Model) between Developers and Ergon to benefit both parties.

It will establish additional development improvements and assess the developers acceptance of the model, likely uptake of demand side interventions and identify any needed improvements.

If successful the calculator will provide Developers with a greater range of tools enabling more innovative network connections.

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Project phase

Indicates current phase

Benefits and outcomes

- Establishes a methodology for dynamically calculating demand
- Can enable the construction of low demand new housing stock.
- Can potentially enable alternate network designs for connecting housing estates.
- Can potentially provide housing stock that has lower demand profiles and therefore supports emerging cost reflective tariffs.

Aims and expectations

The project aims to pilot the ADMD calculator with developers in order to assess:

- any product improvements to enable developers to accept the modelling tool,
- the likely uptake of demand side initiatives by developers, and;
- commence integration into BAU activities, if appropriate.

DMIA alignment

An ADMD calculator provides developers a defined methodology to determining the value of a demand side intervention, such as energy storage, controllable loads etc. This tool if accepted may provide developers a methodology for building low demand housing stock, which in the longer term will support cost reflective tariffs, lower network infrastructure and reduce the pressure on electricity prices.

Update summary

The project is complete and was universally accepted as a significant opportunity in guiding, informing and educating Developers and their Consulting Electrical Engineers as to the interventions in greenfield homes that will improve costs for them, save customers money and improve network outcomes. The project has identified a range of improvements required from the calculator prior to it being a business as usual tool.

Grid Advocacy

Nature and scope

To test in a real world environment the customer impacts of cost reflective tariffs with the addition of emerging technologies such as Battery Energy Storage Systems (BESS), Home Energy Management Systems (HEMS) and Solar PV systems.

The Grid Advocacy project aims to enable learnings that set directions that will inform BESS connection requirements, determine additional BESS operational opportunities with respect to demand management and determine level of customer engagement and support for such devices.

Commercially available BESS, HEMS and solar PV systems are used in the field trial.

Project phase

Indicates current phase

Benefits and outcomes

- Develop understanding of the impacts of new cost reflective pricing when combined with technology.
- Determine barriers for the uptake of new technology
- Understand customer acceptance and interactions of emerging technology.
- Evaluate the network impacts of the technology under differing conditions.

Aims and expectations

The project aims to:

- Demonstration of the value of increased enablement of BESS and HEMS for the network and our customers – this will provide significant learning for Ergon Energy, the BESS and HEMS industry and will enable increased industry engagement;
- Demonstration of an integrated approach to customer connection management which can either utilise remote controllers for action, or have low impact connections of customers to the network;
- Demonstrate the ability of advanced control system to achieve a demand cap at distribution transformer.

DMIA alignment

It is critical to understand the extent to which cost reflective tariffs and demand side technology can reduce peak demand and network risks. The uptake or not of cost reflective tariffs can alter the forward network risk profiles and change the need and types for demand management.

Update summary

The project has deployed and tested in a real world environment a combination of energy storage, home energy management systems, and cost reflective tariffs (Time of use energy and time of use demand).

Home Energy Management Systems

Nature and scope

This project was to test next generation Home Energy Management Systems in a laboratory environment to determine:

1. The capability of the market segment.
2. The likely interface mechanisms for the network to interface and communicate to such systems.
3. Potential barriers for consumer adoption.

Project phase

Indicates current phase

Benefits and outcomes

- Evaluate the capabilities of emerging Home Energy Management Systems for reducing network impacts and customer bills.
- Determine network interaction methods for communicating with Home Energy Management Systems.
- Evaluate barriers and opportunities to remove barriers for customer adoption.

Aims and expectations

The project aims to:

- laboratory test the functionality of Home Energy Management Systems,
- determine the communications mediums,
- evaluate the ability for the systems to interface to consumer appliances,
- evaluate the interaction opportunities for networks to communicate to such systems, and;
- evaluate the likely barriers for consumers to uptake Home Energy Management Systems.

DMIA alignment

Home Energy Management Systems are expected to deliver value to consumers through the ability to manage appliances, minimising their energy costs. To date the Home Energy Management market has been a slow to gain traction with consumers. Understanding the Home Energy Management Systems capabilities and barriers to uptake can enable the network to develop product offerings for consumers.

Update summary

The project has been completed with the successful installation and testing of a next generation Home Energy Management System in the Cairns Innovation Laboratory. The project has identified an improvement in the capabilities of HEMS technology and the requirement for a standard communication methodology for the network to interface with HEMS technology. .

ARC Customer response and risk management

Nature and scope

The project is an Australian Research Council (ARC) project and, in collaboration with QUT, will research the customer response and risks associated with demand management, direct control of appliances and tariff signals.

The project will perform detailed research in Townsville with existing customers to gain an understanding of:

- the customers' tolerance to changes in utility service levels
- enablement of the utility to directly control appliances in the home
- the application of essential services circuits
- the utilisation of efficient technologies in rental properties.

This research will provide a platform for our future development of demand management products and the integration of tariffs with technology.

Project phase

Indicates current phase

Benefits and outcomes

- Understanding the customer tolerance to changes in utility service levels
- Understanding how to enable the control of appliances in the home
- Developing an understanding of the benefits of essential services circuits that can be backed up by energy storage
- Understanding how to engage with the rental market and enable this market to participate in energy markets

Aims and expectations

The project aims to identify:

- the customers' willingness or not to use energy at specific times based on tariff signals,
- the customers' acceptance for purchasing demand response enabled appliances,
- what tariffs and incentives are most likely to gain customer favour, and;
- what demographic segments are least likely to be able to respond to market signals.

DMIA alignment

This project aims to develop a quantitative understanding of a consumer's value of the services that energy provides and how that changes with direct control of appliances, price signals, comfort and behavioural changes. The project will inform our future demand management products and services and help to create efficiencies in our program.

Update summary

- Scope and survey requirements in order to meet the project aims established.
- Initial surveys completed, initial data acquisition commenced, survey design commenced.
- High level survey summaries received, survey results being coded into analysis model.
- Further research opportunities being assessed by QUT.

Abbreviations, definitions and units of measure

A, kA, MA	Amps, unit of measure of electrical current, kA 1000s of amps, MA 1,000,000 of amps
AER	Australian Energy Regulator
ARC	Australian Research Council
BAU	Business as usual
CESS	Centralised Energy Storage System
CSIRO	Commonwealth Scientific and Industrial Research Organisation
Constraint	A condition whereby a limit, that has been pre-set to a declared criteria, is exceeded.
CTIP	Clean Technology Innovation Program
Demand (Maximum Demand MD)	The maximum electrical load over a set period of time. The figure may be for use with tariff calculations or load surveys and the units may be in either kVA, kW or amps.
Demand reduction	The amount of electrical load that can be removed for a period of time.
Demand Management	Demand Management is the design and implementation of programs designed to influence customer use of electricity in ways that will produce desired changed in system load shape.
DMIA	Demand Management Innovation Allowance
DMIS	Demand Management Incentive Scheme
DNSP	Distribution Network Service Provider
DRED	Demand Response Enabling Device
GUSS	Grid Utility Support System
IoT	Internet of Things
LED	Light Emitting Diode
LGA	Local Government Authority
LV	Low voltage – 240V or the voltage used in residential houses
PoC	Proof of Concept
PV	Photovoltaic – a technical term for solar power generation.
QUT	Queensland University of Technology
RIN	Regulatory Information Notice
SEM	Solar Energy Management System
Statcom	Static VAR compensator
SWER	Single Wire Earth Return. Distribution to customers using a single wire conductor with the greater mass of Earth as the return path.
TMR	Department of Transport and Main Roads
V, kV, MV	Volts, kV kilo volts 1000s volts, MV mega volts 1,000,000s volts
VA, kVA, MVA	Volt amps, kVA kilo volt amps 1,000s volt amps, MVA mega volt amps 1,000,000 volt amps

VAR, kVAR, MVAR	Volt amps reactive, kVAR kilo volt amps reactive 1,000s VAR, MVAR mega volt amps reactive 1,000,000 VAR
W, kW, MW	Watts, kW kilo watts 1,000s watts, MW mega watt 1,000,000s watts
Wh, kWh, MWh	Watt hours, kWh kilo watt hours 1,000 watt hours, MWh mega watt 1,000,000s watt hours

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