

The Energy Queensland Group

Ergon Energy Corporation Limited Demand Management Outcomes Report 2016-17

August 2017



Part of the Energy Queensland Group

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Executive Summary

Ergon Energy's Demand Management (DM) program seeks to manage peak demand for our network, facilitate customer choice and lifestyle and build an understanding of new technology and market new and existing DM products and Services. In 2016-17 Ergon Energy restructured our demand management program to leverage the Optimal Incremental Pricing risk based valuation methodology. This enabled Ergon Energy to further develop our Ergon Incentives program and leverage geospatial online mapping of our programs.

Ergon Energy transitioned program metrics from capacity to efficiency in order to ensure the program continued to deliver an efficient program. Ergon Energy's efficiency target for demand management was \$500/kVA of contracted demand with the program achieving a favourable outcome of \$391/kVA for newly contracted demand and an overall program efficiency of \$107/kVA.

The program also had a target of \$0.50/kWh for initiatives which increased asset utilisation due to the changing electricity market environment. No significant asset utilisation projects were commenced.

The Demand Management program was under spent for the financial year with a total expenditure of \$3.99 million compared to a budget of \$9.3 million. The underspend was due several key factors, including:

- Program restructuring to align to risk based pricing
- Asset utilisation program delays
- Lower operational costs due to reduced demand response calls.

In addition, the Australian Energy Regulator (AER) approved a \$5.0 million Demand Management Innovation Allowance (DMIA) to spend over the 2015-2020 regulatory period. The purpose is for Ergon Energy to invest in understanding future demand management issues. The budget for 2016-17 was \$1.0 million. In 2016-17 Ergon Energy spent \$0.75 on a range of DMIA projects including:

- Home energy management systems trials and evaluations
- Technology as an enabler to cost reflective tariffs
- Large scale energy storage
- Alternative communications systems to enable demand management

The value of connected meters for network modelling and demand management

About Energy Queensland

On 1 July 2016 Energy Queensland was created with the merging of Ergon Energy and Energex. The combined business includes the two electricity distribution networks, Ergon Retail, the businesses' ICT provider SPARQ Solutions and a new energy services business.

Ergon Energy and Energex networks combined are the largest electricity distribution network in Australia, covering the entire state of Queensland with over \$24 billion in assets.

No. Connections Supplied	<p>We connect and supply electricity to 2.1 million customers across Queensland. Our network has:</p> <ul style="list-style-type: none">• 33 isolated power stations• 72 bulk supply points• 571 zone substations• 1.7 million km² geographic area covered• 205,000 km of electricity network (overhead and underground).
Annual Energy Delivered	<p>We sell electricity to more than 700,000 customers in regional Queensland. We sell electricity to more than 700,000 customers in regional Queensland.</p>
Summer Peak Demand	<p>The energy services business is key to ensuring that Energy Queensland is able to meet and adapt to changes and developments in the rapidly evolving energy market.</p> <p>The energy services business will provide a range of products and services to give customers greater control over their energy use and access to new and emerging technologies. The energy services business will build on existing partnerships and establish new partner relationships to deliver products and services to customers.</p>

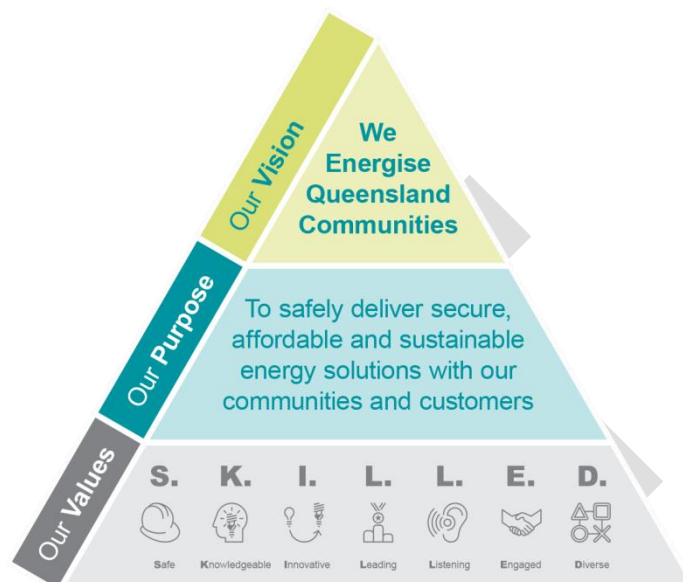
The driving force behind the merger is to make the electricity sector more efficient and to create an energy business ready for the future. Energy Queensland's vision is:

"We Energise Queensland Communities"

Increasingly, customers have choice in the way they have electricity services delivered. New energy technologies in batteries, renewables and energy management systems introduce customer choice and control over energy consumption that was previously not possible.

Energy Queensland must respond to customers' changing energy needs by focusing on innovative products and services that meet the needs of our customers. Energy Queensland's purpose is to safely deliver secure, affordable and sustainable energy solutions with our communities and customers and values are:

- Safe
- Knowledgeable
- Innovative
- Leading
- Listening
- Engaged
- Diverse



About Ergon Energy

Ergon Energy is a subsidiary of Energy Queensland. Ergon Energy supplies electricity to over 733,000 residential and business customers across a vast operating area of over one million square kilometres – around 97% of the state of Queensland – from the expanding coastal and rural population centre's to remote communities of outback Queensland and the Torres Strait. Our electricity network consists of approximately 160,000 kilometres of powerlines and one million power poles, along with a range of associated infrastructure such as major substations and power transformers. We also own and operate 33 stand-alone power stations that provide supply to isolated communities across Queensland, which are not connected to the main electricity grid.



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Table 1 Overview of Ergon Energy of network

Key network statistics	Current ¹	Forecast
No. Connections Supplied	733,000	Low growth
Annual Energy Delivered	14,997GWh ²	Steady
Summer Peak Demand	2.63GW	Low growth (record peak early 2017)
Demand Under Controlled Load Tariffs	250MW	Slow decrease due to changing customer values and needs
Demand Under Contractual Control	41MVA	Maintain where appropriate
Solar Energy Systems – Residential	>122,000 systems	Medium growth
Large Scale Solar Farms	228MW forecast connection 2017-18 821MW engaged ³ 4,473MW enquiry ⁴	Rapid growth
Energy Storage – Residential	322 systems ~2.5MWh 855 enquires ⁴	Emerging market
Energy Storage – Commercial	500kWh	Emerging market
Electric Vehicles ⁵	100	Emerging market

¹ As at end February 2017.

² 2015-16 total energy distributed.

³ Solar farms that are at the detailed response stage, formally engaged in the network connection process.

⁴ Initial enquiries to Ergon Energy, not formal applications, a large portion may not proceed to completion.

⁵ Approximation of Battery Electric Vehicles and Plug in Hybrid Electric Vehicles, January 2017

About Ergon Energy's Demand Management

Demand management has long been seen as a key tool to managing our costs and network risks, through non-network solutions.

Each year Ergon Energy publishes a Demand and Energy Management Plan to engage and inform our stakeholders of our activities and strategies for demand management. This process enables our stakeholders to participate actively in our planned programs.

Over recent years the demand profile on our network has changed dramatically, due to factors such as economic slowdown, solar energy penetration, the awareness and take up of energy efficiency behaviours and new more energy efficient appliances. Overall this has resulted in a 1.6% forecasted system-wide demand growth, down from previous trends.

However, due to the radial nature of our network, we still need to respond to localised and seasonal growth. We are also responding to a changing environment with an evolving energy management challenge associated with enabling solar energy into the network.

Due to our vast service area, and radial network, our demand management programs have traditionally been geographically focused. Our programs can be summarised into major categories, residential controlled load tariffs, commercial demand response, commercial demand reductions and residential promotions.

Residential controlled load tariffs	Our controllable load via this mechanism equates to approximately 250MW ⁶ .
Direct contracted demand response	Direct contracted commercial demand response controlling approximately 41MW.
Commercial demand reductions	Offers to commercial customers to improve power factor, install energy efficient appliances or other solutions.
Residential tariff/offer promotions	Offers to consumers to move loads to alternate tariffs or participate in PeakSmart incentive offers

This program of activities is supported by an investment in innovation, funded separately under the Demand Management Innovation Allowance. These projects will enable us to test and validate products, systems and capabilities to maximise the future value of our demand-side or supply-side solutions.

⁶ Diversified hot water load

Compliance and Regulation

This is Ergon Energy's report on its performance against Ergon Energy's Demand Management Plan 2016-17 (the Report).

Ergon Energy's 2016-17 Demand Management Plan was submitted to the Department of Energy and Water Supply (the Regulator, DEWS) on 14 April 2016 to comply with section 127C(4) of the Electricity Regulation 2006 (the Regulation).

In accordance with section 127D of the Regulation, DEWS approved Ergon Energy's 2016-17 Demand Management Plan on 20 May 2016.

The report has been drafted to ensure compliance with the Electricity Regulation 2006. Under section 127H of the Regulation, Ergon Energy, as the holder of a Distribution Authority is required to submit to the Queensland Energy Regulator an annual report comparing details of the following:

- The proposed initiatives stated in the entity's approved Demand Management Plan for the prior year.
- The actual initiatives the entity carried out in the year.
- The report satisfies all the requirements specified in the Regulation. Table 2 sets out where each requirement has been met in the Report.

Table 2: Regulation requirements

Section	Compliance obligation	Compliance
127G	The distribution entity must use its best endeavours to comply with its approved Demand Management Plan.	Requirement met. This is set out throughout the Report.
127H(1)	Ergon Energy must, for each financial year, prepare a report comparing: The proposed initiatives stated in the entity's Demand Management Plan. The actual initiatives carried out in each year.	Requirement met. The submission of this Report satisfies section 127H(1).
127H(2)	Ergon Energy must provide a copy of the report on or before 31 August in the following financial year.	Requirement met through lodgement with DEWS by 31 August 2017.

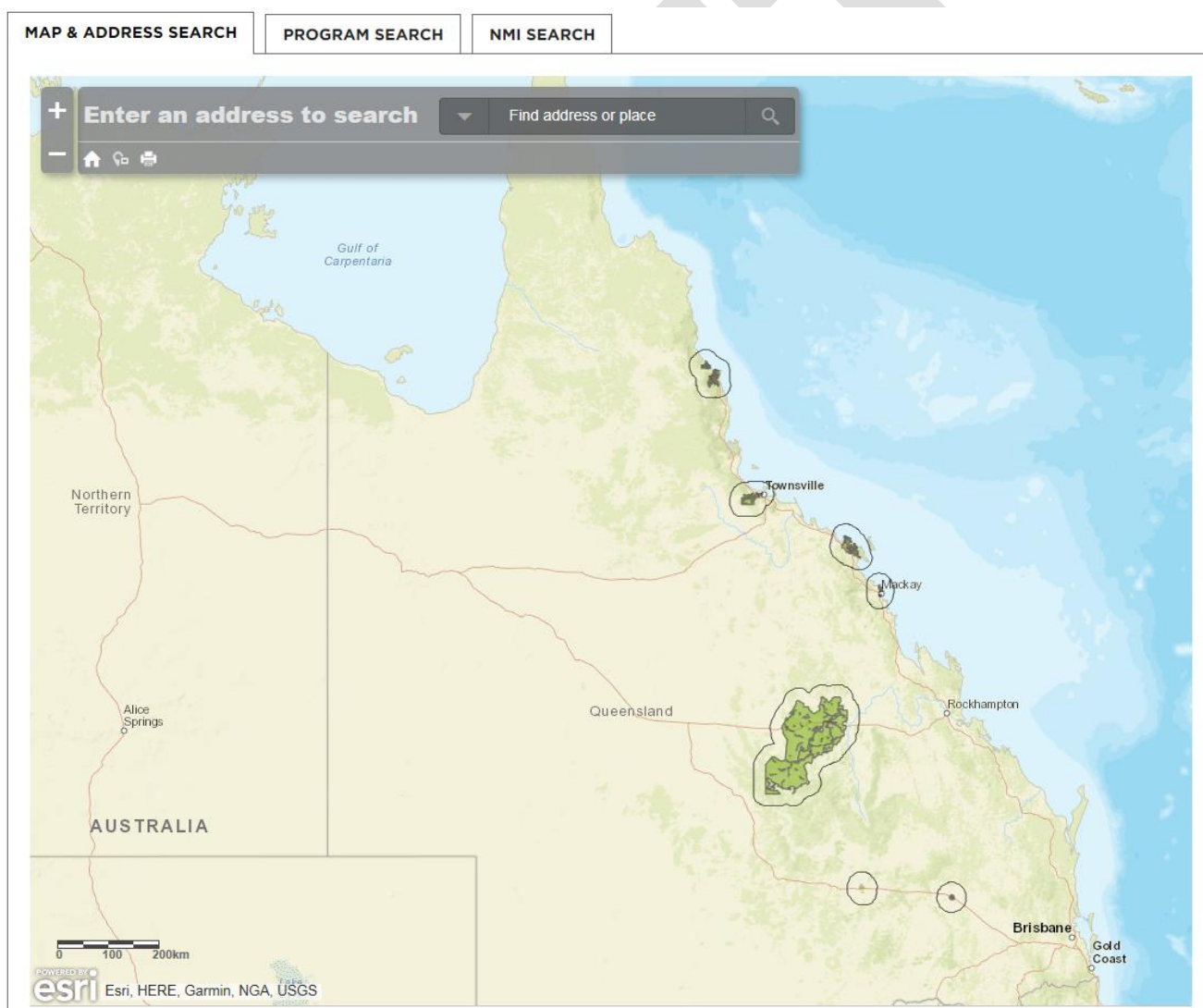
2016-17 Performance

Ergon Energy is delivering the yearly DM targets at a lower cost than originally budgeted with a 2016-17 expenditure of \$3.99 million against a budget of \$9.3 million. The program for 2016-17 was delivered at a program efficiency of \$391/kVA favourable to the program efficiency target of \$500/kVA for new demand.

Performance Against Planned Initiatives

Ergon Energy successfully transferred all our existing programs to the Optimal Incremental Pricing (OIP) methodology for valuing the demand for our programs. This entailed a significant restructure of our program operations and involved the transfer of all programs to the methodology and publishing all the active areas on the Ergon Energy Incentives map.

<https://www.ergon.com.au/network/manage-your-energy/incentives/search-incentives>



Our 2016-17 demand management program exceeded the efficiency target however did not contract the levels of demand as forecast for two primary reasons.

1. The transitioning of the program to the OIP methodology occurred throughout the year with some programs only becoming active in the market toward the end of the 2016-17 period.
2. The market did not respond as strongly as hoped to the pricing incentives placed in the market through the Ergon Energy Incentives map.

Under these circumstances the OIP risk based pricing mechanism provides us significant advantages over traditional direct asset deferral demand management programs due to the inherent feedback in the calculation methodology. The OIP is recalculated on an annual basis taking into account the performance of the existing demand management program and any changes in network risks. If the demand management program is successful or the network risk reduces, the OIP price will decrease. However if the demand management program is not successful or the network risk increases, the OIP price will increase. In this our first partial year of OIP operation, the program has not successfully contracted the forecasted demand. However due to the program construction this does not necessarily trigger network investment. Rather the OIP will be rerun with a new demand pricing outcome reflecting the new network risks. This enables us significant flexibility in our program to develop new marketing and promotional programs while managing network risks as they evolve.

Program	Description	Sub-programs	Status
Optimal Incremental Pricing (OIP) Program	All programs were transferred to the Optimal Incremental Pricing methodology and published on our Ergon Energy Incentives map.	Townsville North and West area	Active
		Program actively contracting demand throughout 2016-17.	
		Two operational programs currently active.	
		Mackay South area	Active
		Program actively contracting demand throughout 2016-17	
		Cannonvale area	Active
		Program actively contracting demand throughout 2016-17	
		Cairns Northern Beaches	Active
		Program actively contracting demand throughout 2016-17	
		Cairns South	Introduced
		Program introduced after risk reviews	
		Mackay Northern Beaches	Active
		Program actively contracting demand throughout 2016-17	
		Rockhampton Central area	Cancelled
		Program cancelled after network risk reviews	
		Emerald	Active
		Program actively contracting demand throughout 2016-17	
		Boyne Island	Cancelled
		Program cancelled after network risk reviews.	

Program	Description	Sub-programs	Status
		Harvey Bay Program remained pending subject to other proposed research initiatives.	Pending
		Broxburn Program cancelled after network risk reviews.	Cancelled
		Chinchilla Program actively contracting demand throughout 2016-17	Pending
		Roma Program pending with network risk reviews and customer demographic modelling.	Pending
Safety Net Program	Develop the practices, contracts and products to support Safety Net risk mitigation in conjunction with network operations.	The Demand Management component of the safety net program is pending the outcome of final safety net program of works and the network risk review.	Pending
Voltage Program	Develop and implement a product that enables business-as-usual demand side responses to voltage risks as an alternative to network augmentation. These programs will include: Local programs, specific to individual customers and Large scale programs, leveraging solar farm inverters to provide network voltage support.	Significant work was under taken to explore the use of demand side resources to enable field crews to respond quickly to voltage issues. Ergon Energy will continue to work toward clearly identifiable solutions for leveraging demand side resources for managing local voltage.	Continuing
		Solar farm investigations for replacing Static Var Compensators (SVC) has been completed with a range of other activities occurring as a result.	Complete

Utilisation initiatives to support efficient use of the network

Utilisation initiatives aim to influence energy volumes and customer load profiles to improve network utilisation. As the initiatives are focused on moving energy volume they will be based on an efficiency metric surrounding increased volume of \$0.50/kWh. The utilisation program is on hold pending a strategic review in alignment with the new merged Energy Queensland Corporation.

Program	Description	Objective	Outcomes	Status
Utilisation Program Establishment	Increase the utilisation of the network by encouraging shaped customer load profiles.	Develop products including pricing, systems and practices for enabling increased utilisation through using the network in off-peak times. Develop products suitable to encourage commercial and industrial usage with shaped load profiles to optimise the network.	Complete program development is pending review and alignment with the corporate Energy Queensland strategy.	Pending strategic review
Electric Vehicles	Electric vehicles provide a unique opportunity for increasing the utilisation of the network while providing our customers choice of transport.	Support initiatives that increase the adoption rate of EVs and off peak charging, such as the Energy Queensland electric vehicle charger roll out.	Low cost opportunities such as market engagement and website information was developed. Other projects pending review and alignment with Energy Queensland strategy.	Pending strategic review
Focused Utilisation Program	Increasing the use of network assets in areas where new connections can improve utilisation.	Develop incentive pricing methodology, product offerings to enable new load where there is available network capacity.	Low cost opportunities developed including the Developers Capacity Map. Other projects pending review and alignment with Energy Queensland strategy.	Pending strategic review

Maintain the operation of existing contracts

These initiatives support existing contracts where there is an on-going network support contract with a customer or aggregator in operation. These programs have demand under management that is available for dispatch at any time for network risk mitigation. Much of this demand is large embedded customer generation and is supporting large capacity constraints.

Program	Description	Outcome	
Gordonvale	Contracted demand at the sugar mill in the Gordonvale-Mt Peter area to support peak demand and load growth in the southern Cairns growth corridor.	Objective maintained	2.47MVA
Dingo	Support of voltage constraints on the Dingo network derived from customer contracted embedded generation.	Objective maintained	0.07MVA
Mt Isa	Network support for the Mt Isa network derived from customer and network embedded generators.	Objective maintained	1.743MVA
Alpha	The Alpha network from Barcaldine has voltage constraints and is supported by an integrated network embedded generator.	Objective maintained	1MVA
Malanda	Customer embedded generator contracted to support the reduction of load in the Malanda area for network contingency requirements.	Objective maintained	1.4MVA
Moranbah	Customer embedded generators to support reduction from the Moranbah substation.	Objective maintained Contract expired in 2016-17	10MVA

Program	Description	Outcome	
Barcaldine	Network embedded generator enabled to support the Barcaldine area during network outages.	Objective maintained	20MVA
Dajarra	Network embedded generator in the Dajarra area for supporting voltage and outages.	Objective maintained	0.25MVA
Kajabbi	Network embedded generator in the Kajabbi area for supporting voltage and outages.	Objective maintained	0.10MVA
Renewable energy investigations	Investigations for voltage complaints from renewable energy systems.	Transition to BAU – seek efficiency	

Capability initiatives to support the future program of work

Capability building initiatives are designed to enable the future activities of the demand and energy management program by testing new concepts, building the necessary systems and processes and evaluating options that support future network risk reductions. These initiatives are designed to enable our Demand and Energy Management program to continue to evolve with the changing operation environment.

Program	Justification	Objective	Outcomes
Cost Reflective Tariffs	Enable and encourage consumer uptake of cost reflective tariffs.	500 customers on new cost reflective tariffs.	Promotion of price reflective tariffs delayed due to introduction of tariffing capabilities. Small business tariffs promoted.
Wholesale Products	Enable retailers and market participants to leverage wholesale demand value to participate in demand outcomes.	Deploy one wholesale product.	Wholesale energy storage product has been developed and is pending industry consultation.
230Volt Trial	Evaluate use of international standard 230V (+10/-6%).	Acceptance by stakeholders and 230V supply implementation as standard.	230V trial is continuing with urban feeders transition and rural feeders pending.
Alternative Supply Arrangements	Investigate using alternative supply arrangements for some network elements.	Engagement of key internal and external stakeholders in the potential use of alternate supply and development of business model.	Business case developed complete with legal and regulatory review, overall project is pending current rule change request consultations.
ADMD Phase 2 Calculator	Development and validation of a tool to model expected After Diversity Maximum Demand (ADMD) in greenfield developments.	Recommendations and options for business integration of the calculator, including other uses.	ADMD calculator under review via external subject matter expert in order to validate the outcomes.
Greenfield Developers Program	Embed demand capabilities within housing stock and other urban developments.	Implementation plan. Promotion through key industry channels.	Greenfield developers programs created and deployed, including developers handbook and other demand response incentives.
Energex / Ergon Energy Alignment	Align Ergon Energy and Energex programs and develop joint capabilities to deliver future programs.	Bi-monthly meetings of working group, program redevelopment.	Develop plan of works to align Ergon Energy and Energex program of work and identify core capabilities that can be transposed across the businesses.

Expenditure against target for 2016-17

Demand and Energy Management Plan	Forecast Expenditure (\$'000)	Actual Expenditure (\$'000)	Plan Measure	Outcomes
Current risk-related initiatives	\$1,650	\$671	\$500/kVA ⁷	\$391/kVa
Utilisation initiatives	\$1,500	\$22	\$0.50/kWh ⁸	-
Maintenance initiatives	\$4,700	\$2,347	Maintain demand under control	Maintained in accordance with contracts
Capability initiatives ⁹	\$475	\$198		
DMIA initiatives ¹⁰	\$1,000	\$747		
TOTAL	\$9,325	\$3,986		

Our program in 2016-17 had significant underspends as compared to the forecast budget due to several reasons as indicated below.

Current risk-related initiatives program:

1. All projects in the program were transferred to the new OIP risk based pricing throughout the year, this restructure limited the time in market for many of the projects.
2. The program is still developing appropriate marketing and promotion activities to raise awareness with our market providers and customers in these areas, as this marketing program matures we expect the awareness in market to increase the uptake of incentives.
3. The design mechanism of the OIP value creation enables more risk with delivery provided the costs of delivery are managed, a year of low demand contracting will influence the price in future years therefore maintaining network risk profiles.

Utilisation initiatives:

The merger of Ergon Energy and Energex into Energy Queensland has resulted in a review of the strategic need of utilisation programs to ensure that the program meets the broader Energy Queensland strategies. However the operation of existing contracts continues to increase utilisation.

Maintenance initiatives:

These initiatives generally involve the direct contract of generation whereby the cost of the program is impacted directly by per-use agreements. Over the past 12 months the individual projects in the program were not operated extensively resulting in an overall lower program cost.

⁷ Incentive efficiency

⁸ Based on forecast annual additional volume enabled without augmentation, excluding program establishment costs.

⁹ Capability building programs do not have targets or goals as they enable future program efficiencies and capabilities.

¹⁰ Demand Management Innovation Allowance programs do not have targets as the programs are research programs.

Innovation

Our demand management innovation program is funded under our Demand Management Innovation Allowance, which is set by the AER for the development of demand management capabilities and knowledge.

While it is reported on separately, we are presenting a snapshot of the innovation activities below, as planned for the coming years. These will help develop our demand and energy management capabilities and will inform future initiatives.

Activities	Scope	Outcomes
Residential Home Energy Management	To develop a standard residential home energy management product and test the interaction, business models and performance of the systems under various tariff arrangements and validate the demand benefits from the systems and the interface capabilities between the systems and the network's control systems.	
	End to end bench testing of home energy management systems to determine their capability.	Several home energy management systems tested and evaluated for their ability to respond to network signals and be integrated into network control systems.
	Development of next generation of DRED for support of our demand management programs.	Development started on next generation DRED for deployment across Ergon Energy programs
	Grid advocacy project to test in real world the impacts of customer side technology and cost reflective tariffs.	Project deployed testing customer response.
LED Streetlights	To investigate the demand benefits and associated barriers for installing LED streetlights within our network area.	Project complete
Centralised Energy Storage	To develop the integrated network control systems and to test and validate those control systems for utilising network connected large scale storage for enabling renewable energy systems.	Large scale storage system developed and in testing.
	Lakeland solar storage is an ARENA funded project which Ergon Energy is participating in the knowledge sharing aspects.	Network modelling and validation of the large scale storage capability continuing.
Feeder of the Future	This project will apply in a real network environment many of our planned activities to validate the interactions between technologies, go to market methodologies, capability gaps and systems interactions.	
	Home energy management systems real world customer acceptance pilot.	Project is continuing with lower than forecast customer uptake of home energy management systems.
	Communication connected meters to enable advanced network modelling.	Project has deployed connected meters for network modelling.

Activities	Scope	Outcomes
	Probe reads from electronic meters prior to deployment of connected meters.	Project complete probe reads performed prior to installation of connected meters.
Residential Energy Storage	To test the price uptake points and the ability for energy storage to deliver network, consumer and retail benefits.	This project is on hold until a review of the combined Ergon Energy and Energex energy storage trials is complete.
Solar Education	Test using a customer education approach to maximise customer use of the energy generated during the day from solar rather than exporting back to the grid.	Project developed web content collateral for customer education, broader program to be reviewed as in line with merged Ergon Energy and Energex strategy.
Integrated Customer Network Control	To develop and validate control algorithms for controlling network performance on a localised basis and protecting against voltage and capacity excursions.	This project is on hold until a review of the combined Ergon Energy and Energex demand management activities.
Customer Islanding Modelling	To model the ability to island and re-join customers from the network in order to ensure network stability. The project will investigate both singular and micro-grid scenarios.	This project is on hold until a review of the combined Ergon Energy and Energex demand management activities.
Advanced Communications	To test the use of emerging internet based low costs communications systems for demand and energy management systems and to validate the cost benefit of such systems.	Project is deployed and is currently in testing.
Direct Inverter Control	To develop a control method and business model for interfacing to customer inverters in order to manage network security and stability.	This project is on hold until a review of the combined Ergon Energy and Energex demand management activities.
ADMD Developers Pilot	To test the application of the ADMD calculator with a developer in a real world environment.	Project is continuing with 3 developers to determine the acceptability of the ADMD calculator model.

The AER approved an allowance of \$5 million for the 2015-2020 regulatory period. DMIA projects are funded through the corporate budget subject to approval by Ergon Energy's standard investment review process.

Expenditure 2016-17

The budget for DMIA projects for 2016-17 was \$1.0 million. Actual expenditure on DMIA projects was \$0.75 million. Details on actual spend for each project is included in Table 3 along with the progress to date for each project.

Table 3: DMIA expenditure for 2016-17 and progress to date

Demand Management Innovation Allowance Activities	2016-17 Expenditure (\$'000)
ADMD calculator developer pilot	\$30
Feeder of the future	\$389
Demand Management Innovation Allowance Activities	2016-17 Expenditure (\$'000)

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Alternative communications LoRa	\$114
Technology and cost reflective tariffs. Grid advocacy	\$172
Large scale energy storage. Central energy storage	\$21
Large scale energy storage Lakeland	\$0
Home energy management systems	\$21
Alternate Demand Response Enabling Device	\$0
TOTAL	\$747

Appendices

Appendix A. 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
ARENA	Australian Renewable Energy Agency
ASI	Australian Solar Institute
ASL	Applied Superconductivity Lab
AUSTELA	Australian Solar Thermal Energy Association
AutoDR	Automated Demand Response – or another name for the commercial energy management system, which is the process of managing customer demand automatically
BAC	Brisbane Airport Corporation
CBD	Central Business District
CSIRO	Commonwealth Scientific and Industrial Research Organisation
Constraint	A condition whereby a limit, that has been pre-set to a declared criteria, is exceeded.
CSP	Concentrated Solar Power
CST	Concentrating Solar Thermal
CTIP	Clean Technology Innovation Programme
CVR	Conservation Voltage Reduction
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 Side Management (DSM)	Demand Side 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.
DF	Distribution Feeder
DLC	Direct Load Control
DMIA	Demand Management Innovation Allowance
DMIS	Demand Management Incentive Scheme
DNSP	Distribution Network Service Provider
DR	Demand Reduction – amount of electrical load that can be removed for a period of time
DRED	Demand Response Enabling Device
GIA	Guided Innovation Alliance
GUSS	Grid Utility Support System
HID	High Energy Discharge Light usually Mercury Vapour or High Pressure Sodium
HTS	High Temperature Superconducting
ICC	Ipswich City Council

LCoE	Levelised Cost of Energy
LED	Light Emitting Diode
LRL	LED Roadway Lighting
LV	Low Voltage – 240V or the voltage used in residential houses
MD	Maximum or Peak Demand
NEM	National Electricity Market
NER	National Electricity Rules
NPV	Net Present Value
Network Limitations	<p>A network limitation can be defined as a situation when the high voltage network is unable to supply electricity to the customer in accordance with the following supply standards.</p> <p>Network limitations which relate to system peak loading are:</p> <ul style="list-style-type: none"> (i) Acceptable standards of reliability of supply cannot be maintained. (ii) Acceptable network voltage levels cannot be maintained. (iii) The thermal rating of plant and equipment is exceeded. (iv) The fault rating of equipment is exceeded. (v) The age, condition or specifications of equipment renders its continued use operationally unsafe, unreliable or uneconomic
PF	Power factor. The ratio of active power to apparent power. A unity power factor indicates no reactive power in the element.
PV	PV stands for Photo Voltaic which is a technical term for solar power generation.
QUT	Queensland University of Technology
RAG	Red Amber Greed, project rating
RIN	Regulatory Information Notice
SEM	Solar Energy Management System
Statcom	Static VAR compensator
SVR	Smart Voltage regulator
SWER	Single Wire Earth Return. Distribution to customers using a single wire conductor with the greater mass of Earth as the return path.
TCC	Townsville City Council
UG	Underground electrical network construction.
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