

Report on the Performance of

**Energex's Demand Management Plan for
the period 1 July 2015 to 30 June 2016**

Energex Limited
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positive energy

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1 Executive summary

Energex operates a very successful Demand Management (DM) program which has facilitated the development of a market for DM products and services (including PeakSmart air-conditioning and power factor correction).

In 2015/16 Energex has successfully exceeded its MVA target of 18 MVA through its Residential and Business Demand Management programs as documented in the approved 2015/16 DM Plan. The actual peak load reduction achieved was 23.4 MVA. Refer to Table 1 for MVA and \$/kVA targets for each Demand Management program.

Table 1: 2015/16 Demand Management targets

Program	Indicative Target MVA	Actual MVA	Target \$/kVA	Actual \$/kVA
Residential Demand Management	10.5	17.0	\$711	\$497
Business Demand Management	3.5	6.4	\$626	\$257
Load Control Management	4.0	-	n/a	n/a
Total for program	18.0	23.4	n/a	n/a

The Demand Management program was delivered at a cost of \$12.9 million compared to the budgeted spend of \$13.0 million resulting in an underspend of \$0.1 million. The underspend in the program comprised a reduced operating expenditure of \$9.8 million through lower incentive rates for both residential and business customers and a lower uptake of hot water and pool incentives offset by an increased capital spend of \$3.1 million due to the ongoing strong customer response to the PeakSmart air-conditioning program.

The highlights in 2015/16 for each program include:

- Residential program: The total load under control achieved for the Residential Demand Management program was 17 MVA which exceeds the target of 10.5 MVA. This was mainly from the increased uptake of incentives for installation of PeakSmart air-conditioners. The Residential program was delivered at \$497/kVA which is lower than the \$/kVA target.
- Business program: The total load under control achieved for the Business Demand Management program was 6.4 MVA which exceeds the target of 3.5 MVA. The majority of the load reduction is through power factor correction for business customers on a demand tariff within targeted areas. The program was delivered at \$257/kVA which is lower than the \$/kVA target.
- Load Control Management: Analysis has identified a number of zone substations where there is an opportunity to reduce peak load by approximately 5 MVA. The revised switching program is under development and is planned to be deployed before summer 2016/17.

The Australian Energy Regulator (AER) approved a \$5 million Demand Management Innovation Allowance (DMIA) to spend over the 2015-2020 regulatory period. The purpose is for Energex to invest in understanding future demand management issues. The nominal annual budget is \$1 million per year. In 2015/16 Energex spent \$0.5 million on four DMIA projects:

- Battery energy storage systems (BESS) trial
- Real time tariff study
- Low voltage network power system static estimation project
- Small business customer load profile market segmentation research

Other activities undertaken in 2015/16 included summer preparedness, 12 capital projects were assessed for non-network options, and ongoing work with standards and regulatory bodies to influence demand management related standards and policies.

2 Background

2.1 About Energex

Energex delivers a safe and reliable electricity supply to customers in South East Queensland. The network spans approximately 25,000 square kilometres and provides distribution services to 1.4 million residential and business connections servicing 3.3 million people in the region (refer Figure 1 and Table 2).

At the core of the Energex business are high performing assets worth more than \$11.9 billion, the expertise of our employees and a drive to provide customers with energy solutions that are safe, reliable, economically affordable, socially and environmentally acceptable and sustainable. As a Government Owned Corporation (GOC) we operate under regulations established at both national and state levels.

Figure 1: Energex network area



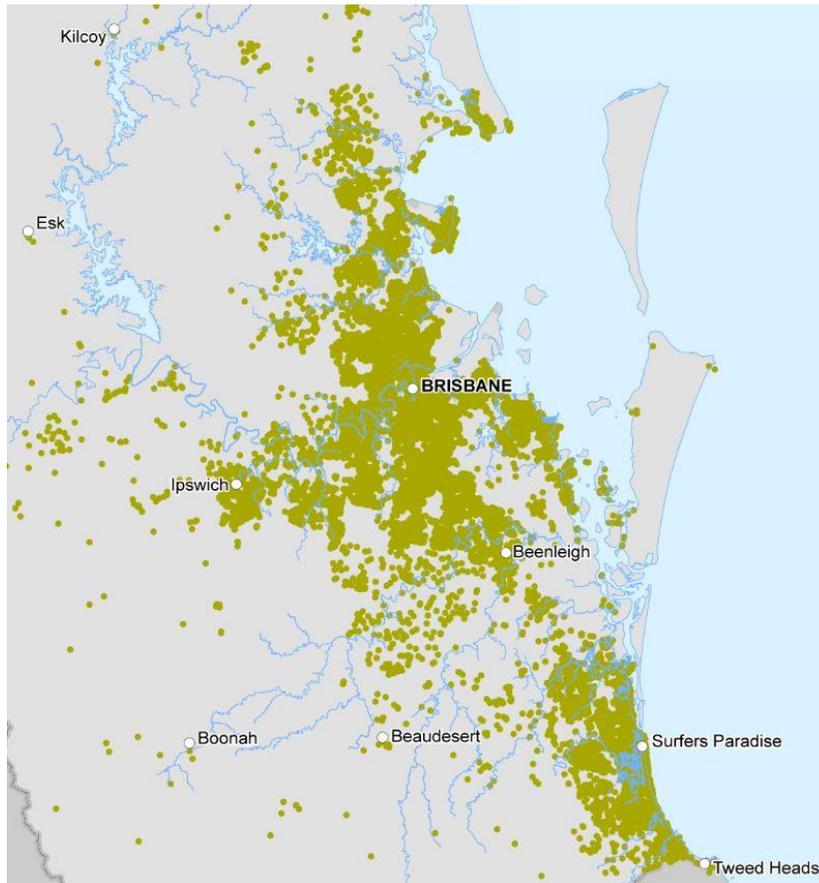
Table 2: Overview of Energex network

<i>Estimated population</i>	Around 3.3 million
<i>Customers</i>	Over 1.4 million residential, commercial and industrial customers
<i>Network area</i>	25,000 square kilometres
<i>Energy delivered</i>	21,256 GWh annually
<i>Summer peak demand</i>	4,506 MW
<i>Solar Photovoltaic (PV) connected to the network</i>	More than 298,000 solar PV systems, with a capacity of more than 1,000 MW (including approximately 2,300 commercial customers and 2 grid scale solar systems)
<i>Battery energy storage systems</i>	Currently there are over 100 batteries installed on the Energex network, mainly with residential customers located in rural areas
<i>Electric vehicles (EVs)</i>	It is estimated that around 240 fully electric and 230 plug in hybrid electric vehicles are being charged on the network

2.2 Demand Management at Energex

Energex operates a very successful Demand Management (DM) program which has facilitated the development of a market for DM products and services (including PeakSmart air-conditioning and power factor correction). Customers have responded strongly and embraced the choice and cost savings that Energex's Demand Management programs offer through discounted tariffs and direct incentives.

Figure 2: PeakSmart air-conditioners installed on the Energex network



Positive Payback program

Positive Payback is our flagship Demand Management program that rewards households and businesses who connect energy hungry appliances to economy tariffs or install technologies that reduce demand during peak periods. Over 83,000 installations or upgrades have been rewarded since the program commenced (refer Table 3).

Table 3: Positive Payback program

	<p>This broad based program provides incentives* for households that connect electric hot water systems, pool pumps and PeakSmart air-conditioners to the Energex load control system. The program operates using the support of manufacturers, retailers, installers and builders.</p>
<p><i>Peak Smart air-conditioning</i></p>	<p>Over 50,000 air-conditioners providing 38 MVA of load under control (diversified) – refer to Figure 2.</p>
<p><i>Hot water systems connected to a control load tariff</i></p>	<p>Approximately 770,000 residential customers with hot water connected to control load, providing a total of 550 MVA of peak loads in winter (diversified) and 350 MVA peak loads in summer (diversified).</p>
<p><i>Pool pumps connected to a control load tariff</i></p>	<p>Approximately 25,000 pool pumps providing 20 MVA of load under control (diversified).</p>
<p><i>Energy efficient pool pumps</i></p>	<p>Over 16,000 energy efficient pool pumps installed resulting in a 9 MVA load reduction. This initiative ceased in 2014/15.</p>
	<p>This program offers funding* to small, medium and large businesses that are located in an eligible area and install or upgrade equipment/appliances that reduce onsite peak electricity demand. Appliances and equipment include building management systems, air-conditioning, motors, lighting, refrigeration and power factor correction. Funding varies between large businesses and small to medium businesses. Energex works with suppliers, industry associations, aggregators, energy retailers and national brands (with multiple premises) to access businesses in eligible areas.</p>
<p><i>Power factor correction</i></p>	<p>Over 400 power factor correction installations resulting in a 52 MVA load reduction.</p>
<p><i>Energy efficiency</i></p>	<p>Approximately 200 installations or upgrades that lowered onsite peak electricity demand resulting in a 10 MVA load reduction.</p>

*refer to www.energex.com.au/positivepayback for full terms and conditions, program details and reward values

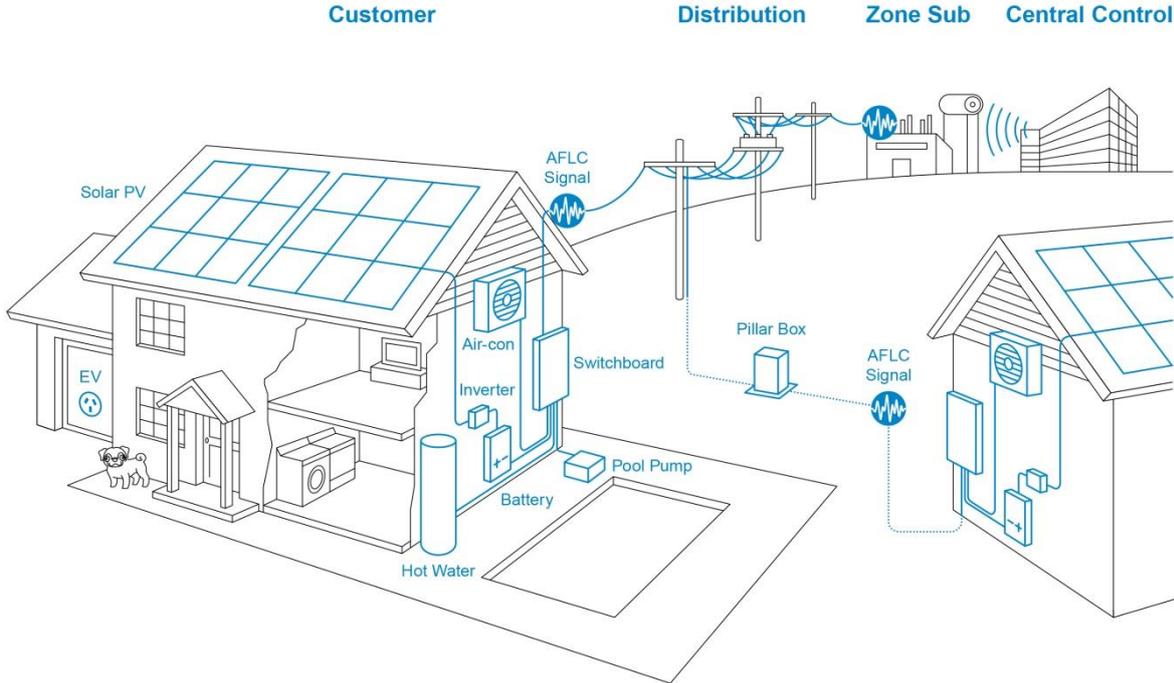
Load control system (LCS) using audio frequency load control (AFLC)

Current demand management solutions rely on Energex's AFLC system, which operates by the injection of a high frequency (1042 Hz) coded signal onto the high voltage network at Energex zone substations, to send signals to participating households. Through AFLC, loads at the customers'

premises are controlled (turned off and on, or their consumption managed) from a centralised system for the purpose of managing localised demand at a zone substation level (refer Figure 3).

This AFLC system has been used to control hot water load since 1956 and more recently to control pool pumps and air-conditioners. The LCS is integrated with Energex’s Distribution Management System (DMS) and is able to deliver scheduled and ad hoc control signals to manage peak demand. This LCS is robust, capable of meeting the needs of the network business at a very low cost and expected to maintain an operational life for a considerable time to come. This also allows Energex to deliver DM without the need for smart meters. Energex continually assesses new technologies to determine if they are able to complement or potentially replace the AFLC system.

Figure 3: Sending Demand Management signals to customers



3 Compliance and regulation

This is Energex's Report on the Performance against Energex's Demand Management Plan 2015/16 (the Report). The 2015/16 Demand Management Plan was originally submitted to the Department of Energy and Water Supply (the Regulator, DEWS) on 30 April 2015 to comply with section 124C(4) of the Electricity Regulation 2006 (the Regulation).

Since the submission of the 2015/16 Demand Management Plan to DEWS:

1. The Australian Energy Regulator (AER) published its preliminary decision on Energex's 2015-2020 regulatory proposal on 30 April 2015.
2. DEWS subsequently requested that Energex amend its 2015/16 Demand Management Plan in light of the AER's preliminary decision and resubmit to DEWS by 20 July 2015.

Energex submitted a revised 2015/16 Demand Management Plan to DEWS on 16 July 2015 and this was approved by DEWS on 28 July 2015.

The Report has been drafted to ensure compliance with the Electricity Regulation 2006. Under section 127H of the Regulation, Energex, as the holder of a Distribution Authority is required to submit to the Queensland Energy Regulator, Department of Energy and Water Supply 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 4 sets out where each requirement has been met in the Report.

Table 4: Regulation requirements met

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)	Energex must, for each financial year, prepare a report comparing: <ol style="list-style-type: none"> a) The proposed initiatives stated in the entity's Demand Management Plan. b) The actual initiatives carried out in each year. 	Requirement met. The submission of this Report satisfies section 127H(1).
127H(2)	Energex 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 2016.

4 2015/16 performance

In Energex's amended 2015/16 Demand Management Plan, Energex had committed to achieving 133.66 MVA for the 2015-2020 regulatory period with expenditure budgeted to be \$82.5 million for the five year period. Continuing the strong progress in the previous regulatory period, Energex is delivering the yearly DM targets at a lower cost than originally budgeted. In 2015/16 Energex budgeted to spend \$13.0 million, comprising of operating expenditure of \$11.6 million and capital expenditure of \$1.4 million, to deliver a peak load reduction of 18 MVA.

4.1 Peak load reduction

Energex has successfully exceeded its peak load reduction target of 18 MVA for the Demand Management program in 2015/16. The actual peak load reduction achieved for 2015/16 is 23.4 MVA. A breakdown of the indicative target and actual MVA delivered are included in Table 5. Load Control Management is expected to be delivered in the coming years. There was a great focus on Residential and Business rather than realising the load control management improvements.

Table 5: MVA for 2015/16 Demand Management program

Program	Indicative Target MVA	Actual MVA
Residential Demand Management	10.5	17.0
Business Demand Management	3.5	6.4
Load Control Management	4.0	-
Total MVA	18.0	23.4

4.2 Operating expenditure

The operating expenditure budget for the Demand Management program was \$11.6 million compared with actual spend of \$9.8 million for 2015/16. The breakdown of operating expenditure by program is detailed in Table 6.

Table 6: Operating expenditure for 2015/16 Demand Management program

Program	Budget (\$,000)	Actual (\$,000)
Residential Demand Management	6,139.2	5,382.5
Business Demand Management	3,827.4	2,541.2
Load Control Management	1,640.9	1,834.6

Program	Budget (\$,000)	Actual (\$,000)
Total operating expenditure	11,607.5	9,758.3

4.3 Capital expenditure

For 2015/16, the capital expenditure budget for the Demand Management program was \$1.4 million compared with actual spend of \$3.1 million. While the actual spend exceeds the budget, it reflects the continued strong growth of the Peaksmart program, which has led to an increase in the number of Demand Response Enabling Devices (DRED's) purchased and issued to the distribution channels. The breakdown of capital expenditure by program is included in Table 7.

Table 7: Capital expenditure for the 2015/16 Demand Management program

Program	Budget (\$,000)	Actual (\$,000)
Residential Demand Management	1,353.5	3,060.2
Load Control Management	56.9	88.4
Total capital expenditure	1,410.4	3,148.6

4.4 Cost to serve

Energex's Demand Management Program for 2015/16 was delivered efficiently with both the Residential and Business programs delivered at a lower cost to serve than the budgeted target cost to serve. This is shown in Table 8.

Table 8: Cost to serve for the 2015/16 Demand Management program

Program	Target \$/kVA	Actual \$/kVA
Residential Demand Management	\$711	\$497
Business Demand Management	\$626	\$257

5 Residential program

5.1 Program description

The Residential Demand Management program provides residential customers with demand management options for appliances that have been identified as having the most significant impact on residential peak demand.

The program provides incentives to residential customers in the form of a cash reward for:

- Installation of a PeakSmart air-conditioner.
- Connecting their pool pump to a control load tariff.
- Connecting their electric hot water system to a control load tariff.

The program provides customers with options to address the major drivers of residential peak demand.

In addition, the program also provides incentives to appliance retailers and installers for their support in encouraging customers to install PeakSmart air-conditioners. These incentives have been instrumental in getting 'buy-in' from industry partners to promote the PeakSmart program and are scaled from \$20 to \$80 depending on the size of the PeakSmart air-conditioner.

5.2 Performance targets

The target deliverable for 2015/16, the Residential Demand Management program was 10.5 MVA peak load reduction from hot water, pool pumps and PeakSmart air-conditioners. Energex successfully exceeded its peak load reduction target for its Residential program with actual peak load reduction of 17 MVA in 2015/16.

5.3 Achievements in 2015/16

The Residential Demand Management program cost to serve target for load under control was exceeded due to efficiencies from lower operating expenditure than originally budgeted.

The program achieved the following:

1. **Load under control:** The total load under control achieved for the Residential Demand Management program was 17 MVA. This is made up of:
 - PeakSmart air-conditioners 15.8 MVA
 - Swimming pools 0.5 MVA
 - Electric hot water systems 0.7 MVA
2. **Rebates:** The total number of appliances rebated through the Positive Payback program in 2015/16 was 18,769. This consists of:

- PeakSmart air-conditioners 17,044
 - Swimming pools 760
 - Electric hot water systems 965
3. **Cost to serve:** The Residential Demand Management load under control of 17 MVA was delivered at \$497 /kVA which is lower than originally budgeted.
 4. **Channel management:** Engaged with builders and developers to expand the Positive Payback program to allow builders and developers to participate in the program.
 5. **Partnership advertising:** Energex has continued to partner with major air-conditioning retailers, installers and commercial sales representatives.
 6. **Media advertising:** Energex has carried out specific Positive Payback program media advertising. In addition it has increased its online presence, revised the in-store materials, continued to support partner advertising initiatives and leveraged existing customer and supplier relationships.

Details on operating expenditure (budget and actual) for the Residential Demand Management program are shown in Table 9. The actual operating expenditure of \$5.4 million was lower than originally budgeted resulting in efficiencies in the cost to serve.

The underspend in operating expenditure can be attributed to:

- A slow-down in customer uptake of hot water and pool incentives to connect to economy tariffs, primarily due to increased metering charges.
- A reduction in incentive rates for PeakSmart air-conditioners.

Table 9: Residential Demand Management program operating expenditure for 2015/16

Cost category	Budget (\$,000)	Actual (\$,000)	Variance (\$,000)
Labour	1,057.3	989.1	(68.2)
Customer payments	3,958.0	3,486.1	(471.9)
Contractors	115.0	63.6	(51.4)
Advertising	300.0	176.4	(123.6)
Other	-	16.3	16.3
Overheads	708.9	651.0	(57.9)
Total operating expenditure	6,139.2	5,382.5	(756.7)

The capital expenditure for the Residential Demand Management program of \$3.1 million was greater than budget due to growth in the number of air-conditioners installed being greater than expected. The breakdown of capital expenditure is included in Table 10.

Table 10: Residential Demand Management program capital expenditure for 2015/16

Cost category	Budget (\$,000)	Actual (\$,000)	Variance (\$,000)
Materials	934.9	2,005.2	1,070.3
Overheads	418.6	1,055.0	636.4
Total capital expenditure	1,353.5	3,060.2	1,706.7

6 Business program

6.1 Program description

The Business Demand Management program is aimed at business customers in targeted area with incentives to reduce peak demand through demand response (DR), energy efficiency (EE) and power factor correction (PFC) with the reductions captured in planning and forecasting tools. EE and PFC both provide permanent load reductions.

All targeted areas are developed through a rigorous assessment of the difference in the net present value of building capital projects with and without demand management. Targeted areas are reviewed bi-annually to ensure alignment with network characteristics, to reflect changes in planning criteria and to account for load reductions achieved.

6.2 Performance targets

The target deliverable for 2015/16 for the Business Demand Management program was 3.5 MVA load reduction through energy efficiency and power factor correction. Energex has successfully exceeded its peak load reduction target for its Business program with actual peak load reduction of 6.4 MVA.

The performance targets and opportunities for the Business Demand Management program for 2015/16 are outlined in Table 11.

Table 11: Performance targets for the Business Demand Management program for 2015/16

Programs	Description
Targeted business program	<p>For 2015/16, this program will continue to focus on the following areas with a view to securing project deferrals:</p> <ul style="list-style-type: none">• Permanent demand management opportunities such as power factor correction and energy efficiency.• Identifying temporary solutions such as demand response from embedded generators or customer load curtailment agreements and utilising network connected generators. <p>Customer enrolment plans will be developed for each targeted area and non-network providers consulted on all promising DM opportunities.</p> <p>Incentives offered to business customers to reduce network peak demand in targeted areas are advertised on the Energex website at https://www.energex.com.au/residential-and-business/commercial-and-industrial-initiative/eligible-areas. Both the areas and offers are revised bi-annually to ensure alignment with network characteristics, to reflect changes in planning criteria and to account for load reductions achieved.</p>

Programs	Description
Bromelton project	Generators at the Bromelton zone substation have provided network support for the Beaudesert area since March 2006 with this network requirement remaining for 2016/17.

6.3 Achievements in 2015/16

The Business Demand Management program target for load under control was exceeded due to efficiencies from lower operating expenditure than originally budgeted. The cost to serve for the Business Demand Management program was delivered at a lower cost to serve.

The program achieved the following:

1. **Targeted business program**
 - a. **Cost to serve:** The Business program for 2015/16 was delivered at \$257/kVA which is lower than the budgeted cost to serve of \$626/kVA. This is due the MVA target having been exceeded at a lower cost than budgeted.
 - b. **Permanent load reduction:** The total load under control achieved for the Business Demand Management program was 6.4 MVA. The majority of the load reduction was achieved through power factor correction for business customers on a demand tariff within targeted areas.
 - c. **Demand response:** A demand response opportunity was identified at Peregian Zone Substation and is currently under review.
 - d. **Incentives for business customers in targeted areas:** In 2015/16 Energex continued to offer business customer incentives in targeted areas as per the developed customer enrolment plans. The eligible areas and incentive rates were reviewed during 2015/16. The targeted areas are available on Energex's website: <https://www.energex.com.au/residential-and-business/positive-payback/positive-payback-for-business/eligible-areas>
2. **Bromelton project:** Generators at Bromelton were dispatched several times for network support purposes.

Details on operating expenditure (budget and actual) for the Business Demand Management program are shown in Table 12. The actual operating expenditure of \$2.5 million was lower than originally budgeted resulting in efficiencies in the cost to serve.

The underspend in operating expenditure is due to reductions in incentive rates for business customers.

Table 12: Business Demand Management program operating expenditure for 2015/16

Cost category	Budget (\$,000)	Actual (\$,000)	Variance (\$,000)
Labour	911.9	666.7	(245.2)
Customer payments	1,263.2	549.0	(714.2)
Bromelton Project	1,084.6	903.0	(181.6)
Overheads	567.7	422.5	(145.2)
Total operating expenditure	3,827.4	2,541.2	(1,286.2)

7 Load control, strategy and compliance

7.1 Description

There are a number of functions within the business which support the Demand Management programs. These include:

- Load control management: concerned with the day-to-day management of the Energex load control system, monitoring of its operational integrity, system equipment issues, and development of future life cycle management strategies.
- Strategy, compliance and reporting: development of strategies for the future, involvement in national standards and industry groups, and compliance and reporting at a national and jurisdictional level.

7.2 Performance targets

The performance targets for load control, strategy and compliance are outlined in Table 13.

Table 13: Performance targets for load control, strategy and compliance for 2015-2020

Programs	Description
Load control management	Load Management includes: <ul style="list-style-type: none">• Ongoing monitoring of load profiles, allowing for seasonal changes to network loads.• Optimising load control schedules for residential zone substations.
Signal monitoring and management for load control	Signal monitoring includes: <ul style="list-style-type: none">• Establishing a regular audit program of AFLC signal injection quality at all zone substations.• Establishing measures of system performance, which will provide data on system integrity and will contribute to future asset management decisions about the system.
Standardise demand response enabled devices	<ul style="list-style-type: none">• Develop a new type of demand response enabling device which will align with anticipated national standards.• Roll out and adoption of new standard device.

Programs	Description
Strategy, compliance and reporting	<p>The Demand Management team is responsible for:</p> <ul style="list-style-type: none"> • Ongoing development of DM strategies. • High level design of Demand Management programs. • Involvement in national standards and working groups that have influenced DM development. • Engaging with industry groups to develop viable product delivery models. • Compliance and reporting at both a national and jurisdictional level.

7.3 Achievements in 2015/16

The Demand Management team had a budget of \$1.7 million consisting of \$1.6 million for operating expenditure and \$57,000 for capital expenditure for load control, strategy and compliance activities. The actual expenditure on load control, strategy and compliance was \$1.9 million. Although the expenditure for load control, strategy and compliance was overspent in 2015/16, overall the DM program was underspent and the DM targets were exceeded.

The achievements for load control strategy compliance during 2015/16 are detailed below:

1. **Load control management:**
 - a. **Load profile analysis:** Identified a number of zone substations where there is an opportunity to reduce peak load by approximately 5 MVA. Switching program is under development and is anticipated to be deployed next year.
 - b. **PeakSmart hot water:** Energex partnered with one of Queensland's largest builder/developers to operate a trial of installing load control relays on 285 individual hot water systems across four sites where electricity was bulk metered. This trial demonstrated:
 - Developers are willing to connect electric storage hot water systems.
 - Technical viability of the demand response functionality including installation of the load control relays and effectiveness of AFLC signals in a bulk metered environment.
 - Viability of process for executing a new product.
2. **Signal monitoring and management for load control:** Energex has continued to monitor functionality of AFLC signals in specific zones across the network. In addition, with the increased uptake of PeakSmart air-conditioners installed, Energex continues to develop the PeakSmart Measurement Program. Customers that are part of the program will have their air-conditioning usage monitored to determine the load reduction during events to manage peak demand.

3. **Standardise demand response enabled devices:** Energex continually works with standards and regulatory bodies to influence demand management related standards and policies. Through Energex's active participation in a range of industry working groups and committees, it gained support for development of a standard for demand response in electrical energy storage systems. Further information on this work is provided at Section 9.3.
4. **Strategy, compliance and reporting:** In accordance with section 127C of the Queensland Electricity Regulation 2006, Energex submitted its 2016/17 Demand Management Plan to DEWS on 14 April 2016. In addition, the Australian Energy Regulator issues a number of Regulatory Information Notices (RIN) where Energex provides the information requested. The RIN includes information on Energex's Demand Management program which is provided by the Demand Management team.

Operating expenditure for load control, strategy and compliance is outlined in Table 14. The overspend in operating expenditure is due to additional labour resources working on the battery trial projects which was not included in the original budget.

Table 14: Load control, strategy and compliance operating expenditure for 2015/16

Cost category	Budget (\$,000)	Actual (\$,000)	Variance (\$,000)
Labour	961.0	1,098.6	137.6
Customer payments	-	2.6	2.6
Contractors	-	12.1	12.1
Materials	54.2	17.4	(36.8)
Other	-	7.6	7.6
Overheads	625.7	696.3	70.6
Total operating expenditure	1,640.9	1,834.6	193.7

The capital expenditure overspend for load control, strategy and compliance was due to purchasing of meters for the PeakSmart Measurement program which was not in the original budget. The breakdown of capital expenditure is included in Table 15.

Table 15: Load control, strategy and compliance capital expenditure for 2015/16

Cost category	Budget (\$,000)	Actual (\$,000)	Variance (\$,000)
Materials	37.8	57.0	19.2
Overheads	19.1	31.4	12.3
Total capital expenditure	56.9	88.4	31.5

8 DMIA

8.1 Program description

The Demand Management Innovation Allowance (DMIA) is an allowance provided by the AER to invest in understanding future demand management issues. 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 Energex's Investment Review Committee and so this is separate from Energex's Demand Management Program.

Energex aims to apply its learnings from the DMIA projects in a way that improves and benefits Energex's Demand Management capabilities.

8.2 Performance targets

The performance targets detailed in the amended 2015/16 Demand Management Plan are outlined in Table 16.

Table 16: Performance targets for DMIA 2015-2020 period

Programs	Description
Residential initiatives	<p>Residential initiatives will be applied to:</p> <ul style="list-style-type: none">• Explore how to integrate residential battery storage, smart appliance, distributed generation and EV technologies into Demand Management programs.• Explore how to integrate home area network and home energy automation technologies into Demand Management programs.• Improve load management modelling to optimise load management programs across a range of smart DM products.
Emergent demand management technologies	<p>Explore opportunities and feasibility for emergent technologies to build and improve upon current DM capabilities including:</p> <ul style="list-style-type: none">• Development of a demand response management system that integrates effectively with Energex's load control system (LCS).• Analysis of potential DM available by targeting the Small and medium enterprise sector.• Analysis of changes and advancements in load management technologies.

8.3 Achievements in 2015/16

Following the submission of the amended 2015/16 Demand Management Plan, a number of projects were scoped, developed and received endorsement by Energex's Investment Review Committee, as detailed in Table 17. In 2015/16 Energex spent \$0.5 million on DMIA projects. Table 17 provides details on the DMIA projects undertaken in 2015/16 including the costs incurred.

Table 17: DMIA projects undertaken in 2015/16

Project	Description	Costs incurred (\$,000)
Residential initiatives		
Battery energy storage systems (BESS) trial¹	The objectives of this trial are focused on gaining a better understanding of the customer value proposition and expectations from the electricity network in taking up BESS; how Energex can leverage off the load control system and existing tariffs to benefit both Energex and the customer, and investigate how the BESS technology will integrate with the electricity network.	207.1
Real time tariff study²	The objective of this project is to research the impact of the new demand tariffs and complimentary load control tariffs on small, low voltage customers. This research will be conducted through partnerships with retailers, customer representatives, market participants and the Queensland Government.	9.1
Emergent demand technologies		
Low voltage network power system static estimation project	The project objective is to provide timely control inputs to a number of low voltage connected devices to improve the efficiency of the network, improve dispatch of Distributed Energy Resources (DER), improve DM response and minimise future network investment.	5.4

¹ The BESS trials, which include the demonstration sites at Rocklea and Eagle Farm as well as a staff pilot commenced in 2015/16 and is not expected to be completed until 2017/18.

² The real time tariff study commenced in 2015/16 and will be completed in 2016/17.

Project	Description	Costs incurred (\$,000)
Small business customer load profile market segmentation research	The project examines the impacts of demand based tariffs on small business customers connected to the low voltage network and the impacts on network demand profiles.	250.8

9 Other activities

9.1 Summer preparedness

The Summer Preparedness Plan provides details of the preparations that Energex carries out for the summer period to provide South East Queensland with a reliable network, to minimise interruptions during extreme weather events. It has the planned operating and capital projects to be undertaken prior to the end of the calendar year.

Demand Management contributes to summer preparedness in a number of ways including assessment of requirements for demand response contracts with business customers, management of controlled load tariff appliance programs, and customer education and awareness of peak demand by messages deployed through various forms of media.

The 2015/16 Summer Preparedness Plan was published on 28 August 2015. This can be found on Energex's website:

https://www.energex.com.au/_data/assets/pdf_file/0007/280096/FINAL-Summer-Preparedness-Plan-2015-16.pdf

Whilst Demand Management contributed to Energex's Summer Preparedness program through a range of activities, no specific budget was allocated by Demand Management for Summer Preparedness activities in 2015/16.

9.2 Network planning and regulatory obligations

In accordance with chapter 5, part B of the National Electricity Rules (NER) Energex has:

- Developed a Distribution Annual Planning Report (DAPR) for 2015/16 which can be found on Energex's website under network plans and reports: <https://www.energex.com.au/the-network/network-plans-and-reports>
- Published a copy of its Demand Side Engagement Strategy, updated on 1 July 2015: https://www.energex.com.au/_data/assets/pdf_file/0003/162273/Demand-Side-Engagement-Strategy.pdf
- Provided a Demand Side Engagement Facility to allow non-network providers, aggregators and other parties to register to receive information on network planning and expansion

projects.

<https://www.energex.com.au/the-network/demand-side-engagement>

- Assessed 12 capital projects in 2015/16 with one non-network option being identified as credible. The identified non-network solution to defer capital expenditure will be explored further in 2016/17. None of the remaining 11 projects met the threshold requiring a Regulatory Investment Test for Distribution (RIT-D) to be undertaken, as outlined in section 5.17.3 of the NER.

9.3 Standards and regulations

Energex works with a range of standards and regulatory bodies to ensure that standards and regulations are developed in a way that assists the cost effective management of peak demand.

During 2015/16 Energex continued to work with standards and regulatory bodies to influence demand management related standards and policies. One of the standards critical to the ongoing sustainability of Energex Demand Management is the suite of AS4755 standards which outline demand response capabilities for residential appliances.

Through Energex's active participation in a range of industry working groups and committees it gained support for development of a standard for the demand response in electrical energy storage systems. Consequently Energex has championed this through the support of the development of a new part of AS4755 for demand response in electrical energy storage systems (AS/NZS 4755.3.5). It is through this development work, a standard electrical energy storage system specification has been created to allow a plug-and-play approach between parties who may wish to enable demand response in electrical energy storage systems. This approach has led to the development of new equipment and the capacity to unlock value from energy storage systems for all participants.