

2011-12 Demand Management Innovation Allowance Annual Report To the Australian Energy Regulator

For the year ended 30 June 2012

Submitted 15 November 2012



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1. INTRODUCTION

We are pleased to provide Ergon Energy's Demand Management Innovation Allowance (DMIA) Annual Report for the 2011-12 regulatory year (2011-12 DMIA Annual Report). The report has been completed in accordance with paragraph 1.5 of Schedule 1 of the Regulatory Information Notice (RIN, the Notice) issued by the Australian Energy Regulator (AER) on 28 October 2011 .

The provision of information in this Report demonstrates compliance with Schedule 1, paragraph 1.5 (a)-(e) of the AER's RIN.

TABLE 1: COMPLIANCE WITH PARAGRAPH 1.5 OF SCHEDULE 1 OF RIN

No	Requirement	Compliance
a	Provide an explanation of each demand management project or program for which approval is sought	Refer to section 6 of this Report
b	Explain, for each demand management project or program identified in the response to paragraph 1.5(a), how it complies with the DMIA criteria detailed at section 3.1.3 of the DMIS, with particular reference to:	
i	the nature and scope of each demand management project or program,	Refer to section 6 of this Report
ii	the aims and expectations of each demand management project or program,	Refer to section 6 of this Report
iii	the process by which each demand management project or program was selected, including the business case for the project and consideration of any alternatives,	Refer to section 5
iv	how each demand management project or program was/is to be implemented,	Refer to section 6 of this Report
v	the implementation costs of the project or program, and	Refer to section 4 of this Report
vi	any identifiable benefits that have arisen from the project or program, including any off peak or peak demand reductions.	Refer to section 6 of this Report
c	Provide an overview of developments in relation to projects or programs completed in previous years, and any results to date.	Refer to section 6 of this Report
d	State whether the costs associated with each demand management project or program identified in the response to paragraph 1.5(a) are:	
i	are not recoverable under any other jurisdictional incentive scheme,	Refer to section 4 of this Report
ii	are not recoverable under any other Commonwealth or State government scheme, and	Refer to section 4 of this Report
iii	are not included in the forecast capital or operating expenditure approved in the AER's distribution determination for the current regulatory control period under which the scheme applies or under any other incentive scheme in that determination.	Refer to section 4 of this Report
e	The total amount of the DMIA spent in the previous regulatory year, and how this amount has been calculated	Refer to section 4 of this Report

Furthermore, as noted by the AER in its issuance of this Notice to Ergon Energy, information provided in accordance with paragraph 1.5 of Schedule 1 of the Notice is considered to constitute the provision of an Annual Report for the 2011–12 regulatory year in accordance with paragraph 3.1.4.1 of the AER's Demand Management Incentive Scheme (DMIS) for Energex, Ergon Energy and ETSU Utilities Part A – Demand Management Innovation Allowance (DMIA), October 2008.

2. SUBMISSION SUMMARY

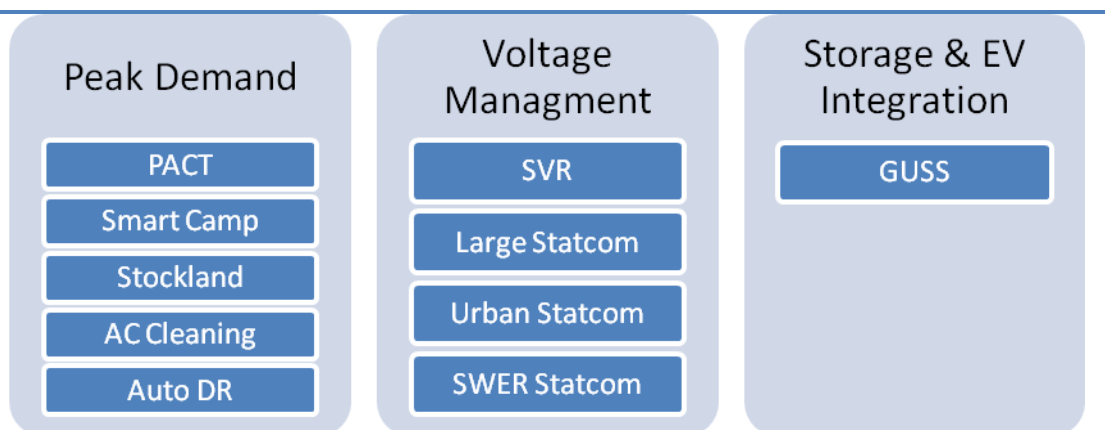
In the AER's Queensland Distribution Determination, 2010-11 to 2014-15, Final Decision (May 2009) for Ergon Energy (Distribution Determination)¹ for the current regulatory control period, an allowance of \$5 million over the period was made for a DMIA.

The DMIA is provided to investigate opportunities that are not yet commercial. It is in addition to any "business as usual" capital and operational expenditure allowances for demand management projects approved in Ergon Energy's distribution determination. This provides a direct incentive for Distribution Network Service Providers (DNSPs) to assess emerging opportunities for efficient non-network alternatives or to manage the expected demand for standard control services in some other way, rather than through network augmentation.

Ergon Energy's 2011-12 DMIA Annual Report provides detailed information associated with its DMIA program, comprised of four continuing projects from 2010-11 and six new projects added to the program during 2011-12.

The selected projects were subject to a screening and feasibility process consistent with the AER's DMIS² and a subsequent cost benefit analysis to identify the highest value projects based on factors including their ability to reduce demand and consumption and gain community acceptance. Illustrated in Figure 1 are the current DMIA projects categorised in Ergon Energy's identified network capacity drivers.

FIGURE 1: NETWORK CAPACITY DRIVERS



Of note, the 2010-11 projects are dominated by peak demand management opportunities to respond to increased air-conditioning customer take-up and the 2011-12 projects are dominated by voltage management opportunities to respond to increased photovoltaic customer take-up.

¹ Ergon Energy Distribution determination 2010-11 to 2014-15, 4 May 2010, www.aer.gov.au

² Demand Management Incentive Scheme ENERGEX, Ergon Energy and ETSA Utilities 2010-15 October 2008, www.aer.gov.au

3. PURPOSE

Ergon Energy's 2011-12 DMIA Annual Report has been prepared in order to allow the AER to:

- assess Ergon Energy's 2011-12 DMIA initiatives and Ergon Energy's entitlement to recover the expenditure under the Demand Management Incentive Scheme (DMIS); and
- confirm Ergon Energy's compliance with the annual reporting requirements of the AER's RIN issued to Ergon Energy.

The Report has been produced in accordance with:

- Clause 6.6.3 of the National Electricity Rules (NER) which allows the AER to develop and publish a DMIS which provides incentives for DNSPs to assess (potentially) efficient non-network alternatives or to manage the expected demand for standard control services in some other way; and
- Schedule 1, paragraph 1.5 (a)-(e) of the AER's RIN which requires a DNSP to which the DMIS applies to submit an annual report to the AER on its expenditure under the DMIA.

The following table summarises Ergon Energy's DMIA program expenditure recovery for 2011-12 financial year.

TABLE 2: DMIA PROGRAM 2011-12

Project	2011-12 Expenditure (\$)
<u>Existing Projects</u>	
1 Auto Demand Response Trial*	95,148
2 Residential Air Conditioning Cleaning Trial	5,040
3 Grid Utility Support System (GUSS) Phase 2	31,201
4 Stockland North Shore Living Display Centre	88,489
<u>New Projects</u>	
5 Passive Air Cooling Trial (PACT)	97,058
6 Smart Camp Feasibility Trial	30,125
7 Large Statcom	92,526
8 Urban Statcom	5,848
9 SWER Statcom	52,600
10 Smart Voltage Regulator (SVR) Validation Trial	42,072
Total	540,108

**formerly reported as Commercial Building Management Network*

4. DMIA PROGRAM EXPENDITURE

Ergon Energy's DMIA expenditure for 2011-12 was \$540,108, comprising of \$506,304 in operational expenditure and \$33,804 in capital expenditure. For the year the DMIA program comprised of ten projects with four continuing projects from 2010-11 and six new projects. All projects were developed and managed in accordance with Ergon Energy's established program management framework.

Table 3 summarises the actual expenditure for 2011-12 Ergon Energy DMIA program along with the total approved budget costs, actual yearly and program to date expenditure and any applicable comments.

TABLE 3: ERGON ENERGY DMIA PROGRAM 2011-12 EXPENDITURE

Project	Total Approved Budget (\$)	2011-12 Expenditure (\$)		Total Expenditure (\$)		Total Budget Spent (%)	Comments
		Capital	Operational	Capital	Operational		
Auto Demand Response Trial	480,000	-	95,148	-	435,821	91	
Residential Air Conditioning Cleaning Trial	124,522	-	5,040	-	73,510	59	Project has reached closure.
GUSS Phase 2	450,000	-	31,201	-	31,826	7	
Stockland North Shore Living Display Centre	179,000	33,804	54,685	33,804	78,885	63	Capital expenditure from meter purchases.
Passive Air Cooling Trial	190,475	-	97,058	-	97,058	51	
Smart Camp Feasibility	65,552	-	30,125	-	30,125	46	Project in finalisation stage.
Large Statcom	348,640	-	92,526	-	92,526	26	
Urban Statcom	206,570	-	5,848	-	5,848	3	
SWER Statcom	259,175	-	52,600	-	52,600	20	
Smart Voltage Regulator Trial	108,280	-	42,072	-	42,072	39	
Total	2,674,714	33,804	506,304	33,804	940,272	37	

Of note, Ergon Energy costs associated with each of the 10 DMIA projects, as identified in Table 3 above, 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 2010-15 distribution determination for the current regulatory control period under

which the DMIS scheme applies or under any other incentive scheme in that determination.

Of the 10 projects, the Residential Air Conditioning Cleaning Trial reached project closure during 2011-12. The project concluded that residential professional cleaning is not a viable solution for the customer or Ergon Energy to provide subsidies at an economically feasible rate. These findings represent a contribution to demand management research and the project met all of the DMIA criteria at its commencement.

Ergon Energy's claim for approval to recover its costs associated with the Residential Air Conditioning Cleaning Trial is based on its understanding that:

- the DMIS is provided for DNSPs to explore potentially efficient demand management mechanisms³ - with every intention that these are developed into successful programs which reduce or shift demand; and
- the rejection of DMIA funding for demand management related expenditure which does not result in a successful program being developed will reduce DNSP's desire to explore effective, innovative and potentially efficient demand management mechanisms in favour of more robust and proven technologies.

Summary of the project findings from Residential Air Conditioning Cleaning Trial are presented in Appendix 1.

³ In accordance with Criteria No. 3, Section 3.1.3 of the Demand Management Incentive Scheme ENERGEX, Ergon Energy and ETSA Utilities 2010–15 October 2008, www.aer.gov.au

5. DMIA PROGRAM CYCLE

Selection Process

DMIA projects are selected and scoped to respond to current & emerging network instrument drivers and enable the Ergon Energy transition to the network of the future⁴. 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:

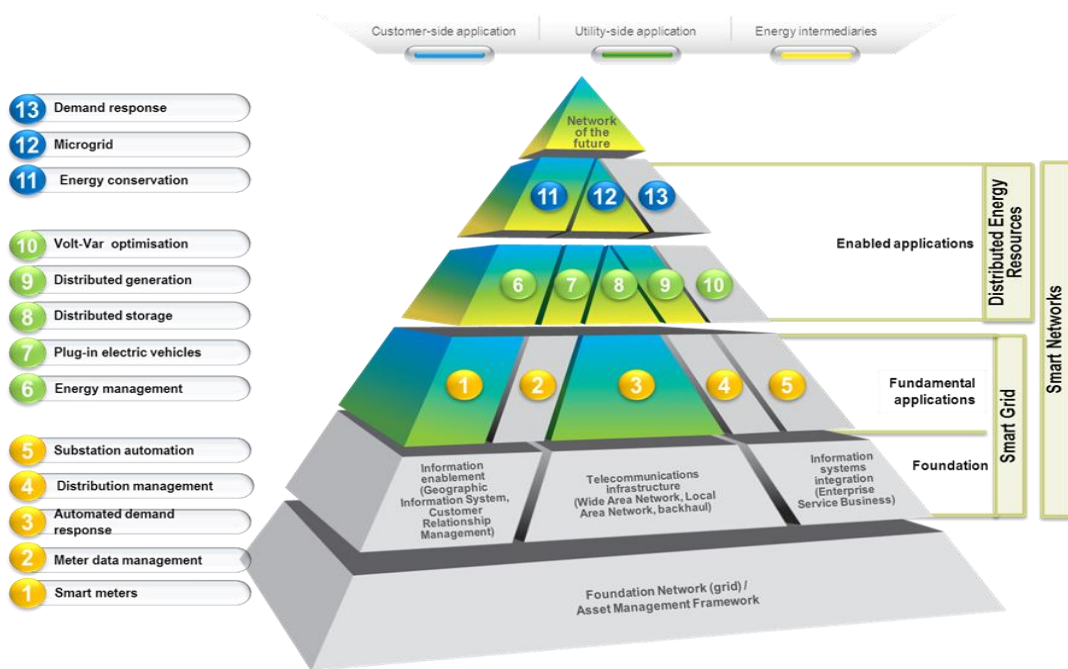
- Reduces and or shifts the electricity demand (to off-peak periods) of parties affected;
- Has costs which are not recoverable under any other jurisdictional incentive scheme;
- Has costs which are not recoverable under any other state or Commonwealth Government scheme;
- Has costs which are not included 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; and
- 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).

Provided all of the above conditions are met then the project proceeds to the feasibility assessment, ranking and approval stages.

Projects are prioritised based on their potential to reduce network investments and the role it will play in building the foundation for Network of the Future as illustrated below.

FIGURE 2: ERGON ENERGY INNOVATION TECHNOLOGY DEVELOPMENT

⁴ Network Vision Outlook to 2030, Ergon Energy and Energex Shared Network Vision, December 2009

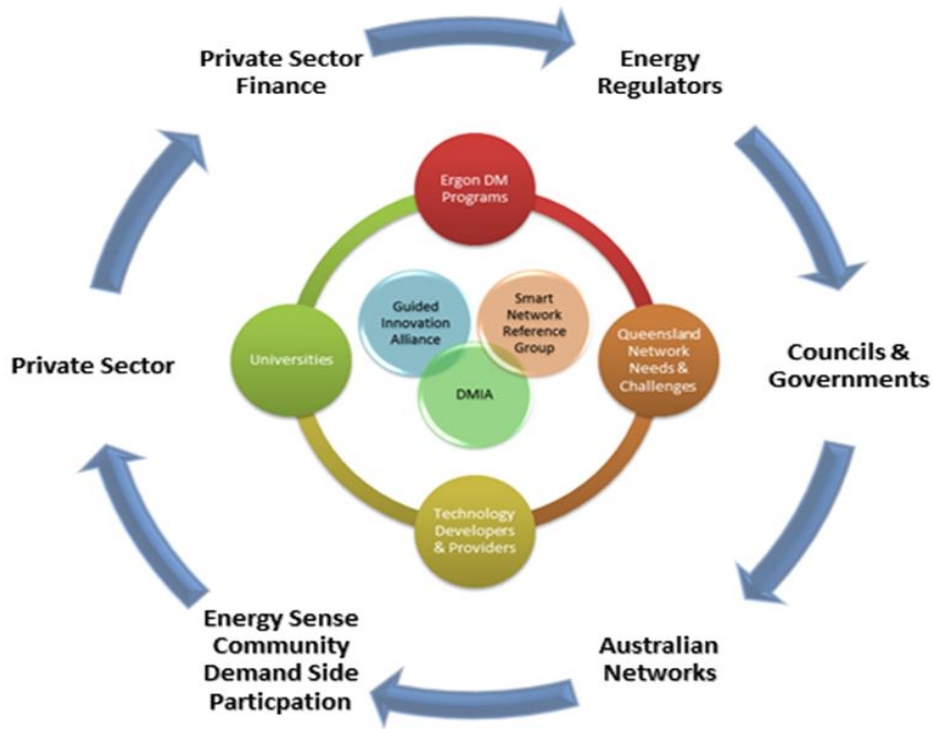


Identifying innovation opportunities

Innovation can be found in any locations. To identify and increase the innovation opportunities, Ergon Energy's innovation environment comprises of three key groups to funnel innovation ideas into the DMIA program, as illustrated in the below figure:

1. The DMIA program team, providing opportunity for anybody in Ergon Energy to contribute;
2. The Guided Innovation Alliance (GIA), providing input and co-contribution from Universities/researchers and Industry; and
3. The Smart Network Reference Group providing senior management representation and oversight from 12 teams across the business.

FIGURE 3: INNOVATION ENVIRONMENT



The DMIA program will continue to use collaborations to identify opportunities and share innovation costs. Ergon Energy would welcome collaboration with other Network Service Providers for DMIA projects and opportunities.

6. PROGRAM DELIVERY PROGRESS




Ergon Energy's 2011-12 DMIA projects were developed to constrain the growth in peak customer demand by shifting or reducing demand for standard control services through non-network alternatives, or the management of demand in some other way.

This section of the report details the status of Ergon Energy's DMIA projects in 2011-12 by describing each project's objectives, progress against defined milestones and findings to date.

To measure the DMIA implementation progress, Ergon Energy uses a Red-Amber-Green (RAG) rating system against the defined targets. For the 2011-12 DMIA program, **21** deliverables were defined across the 10 projects.

Brief explanation of the RAG ratings and a summary of the 2011-12 implementation progress presented in the table below:

TABLE 4: ERGON ENERGY'S 2011-12 DMIA IMPLEMENTATION PROGRESS

Definition	Rating	Number achieved
Green flag indicates that the target was substantially or fully achieved		17
Amber flag indicates that the target was partly achieved		4
Red flag indicates that the target was not achieved		-

As can be seen above, implementation progress against all DMIA project milestones was achieved for the 2011-12 year.

Further details on each initiative are outlined in the following project updates.

Automated Demand Response Trial

Nature & Scope

There are numerous opportunities for working with customers to reduce their peak demand or indeed to reduce their consumption when the network is under a constraint. There are many cases where customer equipment may be shut down or “dialed back” for short periods of time in order to reduce peak load with minimal or no impact on the customer. Working in conjunction with our customers will empower them to make better energy choices that benefit their business and climate change, while better utilising network assets and reducing the need for network augmentation.

Aims & Expectations

The aim and expectation of this broad-based demand management project is that at the end of the trial, Ergon Energy will be able to determine the effectiveness of Auto DR in interacting with legacy energy systems on customers’ premises such as heating, ventilation, and air-conditioning management systems in such a way that material peak demand and energy reductions can be achieved.

Implementation Progress

As at 30 June 2012,

2011-12 Deliverables	Rating	Comment
1. Verify the functionality of a Demand Reduction Automation Server (DRAS) based on the OpenADR protocol and the use of OpenADR capable communications and control systems in customer premises to gain an understanding of customer acceptance, communication capabilities, load shifting or removal and response time frames.	■	9 sites installed and commissioned including, including water pumping on The Strand, Townsville RSL Stadium, Civic Theatre and Level 4, 22 Walker St. Two demand events have been called. The maximum demand reduction to date was 20%.

■ Target is fully achieved within the timeframe. ■ Target is partly achieved within the timeframe. ■ Target is not achieved within the timeframe.

Highlights

PROJECT



PHASE

★ Indicates current phase

BENEFITS & OUTCOMES

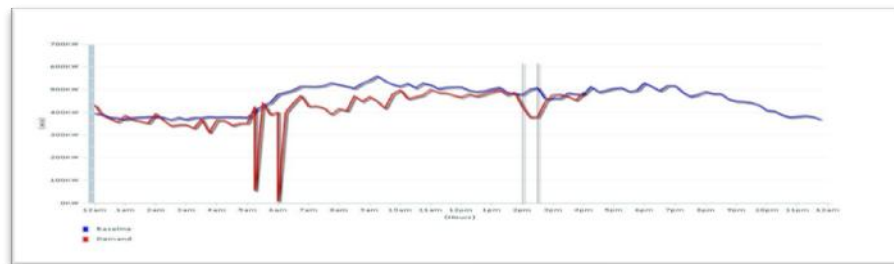
- ▲ MAXIMUM 20% DEMAND REDUCTION TO DATE
- ▲ RETAIL AND NETWORK BENEFIT POTENTIAL
- ▲ LOW COSTS AND BARRIERS FOR CUSTOMER PARTICIPATION
- ▲ TARGETED DEMAND REDUCTION
When and where demand reduction is required.

▼ ISSUES

Integration investigation required prior to Business as Usual Product. Including server integration, customer incentive, internal processes, measurement and verification etc.



■ The maximum demand reduction recorded to date was 101kW from a baseline of 495kW.



Residential Air Conditioning Cleaning Trial

Nature & Scope

The goals of the project are to discover the market opportunity for professional cleaning of residential refrigerative, split-system air conditioning (how many companies offering the service, where and at what cost). Professional cleaning means effective cleaning of header unit coils and fins to remove all dirt and fungal/bacterial growth (through use of an effective cleaning agent) and addition of a protective layer. It should be noted that cleaning the header unit filter does not constitute a professional clean.

Aims & Expectations

The aim and expectation of this project is that on its completion, Ergon Energy will gain an understanding of the energy reduction achieved (return of efficiency) for cleaning the coils and fins of a header unit in split system air-conditioners.

It is expected that this broad-based demand management project will reduce network demand as more efficient air conditioners require less electricity to operate. The data collected will be used to understand the ensuing demand impact delivered – the value proposition to Ergon Energy.

Implementation Progress

As at 30 June 2012,

Highlights

PROJECT



PHASE

★ Indicates current phase

BENEFITS & OUTCOMES

▲ FINDINGS

- ✓ Energy savings for customers is 10% to 28%, depending on the A/C dirtiness condition. The resultant demand outcome was similar.
- ✓ For residential customers the full cost of the A/C clean is not saved through energy reduction customers participation

▲ INDUSTRY INTEREST

- ✓ Significant interest with large number of A/C cleaning businesses tendered for the work.

▼ CUSTOMER PARTICIPATION

Low level of interest: Of 500 customers targeted the trial, 33 (6%) participated for the free A/C



2011-12 Deliverables	Rating	Comment
2. To understand the value to Ergon Energy of the energy reduction achieved (return of efficiency) for cleaning the coils and fins of a header unit in a split system of over 2kW rated load (5kW cooling capacity) used in a: <ul style="list-style-type: none"> • residential living space: It is important to undertake the trial on air conditioners used in residential living spaces as these are the units most often used during peak load times; and • Small business operation. Including some small business operations will allow for an understanding of the value proposition with customers who are running air-conditioning for long periods of the day, for a significant part of the year 	■	Target residential living space. It is important to undertake the trial on air conditioners used in residential living spaces as these are the units most often used during peak load times; and Small business operation. Including some small business operations will allow for an understanding of the value proposition with customers who are running air-conditioning for long periods of the day for a significant part of the year
3. To understand the value proposition to the end customer (kWh reduction and the bill and CO2 savings) of a professionally cleaned split system header unit and the potential for Ergon Energy to encourage/sponsor this type of activity	■	Completed

■ Target is fully achieved within the timeframe. ■ Target is partly achieved within the timeframe. ■ Target is not achieved within the timeframe.

GUSS Phase 2

Nature & Scope

The aim of the project is to further develop the Grid Utility Support System (medium scale storage, grid interface inverter, system control and monitoring) to allow for the connection of renewable energy systems – in particular photovoltaics, in such a way as to optimise the value that the renewables can present both to the network and to the customer. Appropriate integration will allow renewable energy generated to be stored, when it is not of value, and released at times of need.

The project specifically addresses integration of PV into our SWER networks and enabling the generation of PV energy to be stored and shifted to peak demand and network need times.

Aims & Expectations

The aims and expectations of this project are to:

- Improve the value renewable energy can provide to the distribution network and low voltage connection points;
- Reduce the impact peak demand has on specific network constrained areas through the combined use of renewable energy and storage; and
- Ensure the equipment is grid ready, and there are processes to support their connection to the network.

Implementation Progress

As at 30 June 2012,

2011-12 Deliverables	Rating	Comment
4. Improve the value renewable energy can provide to the distribution SWER network and low voltage connection points	■	During 2011-12 the emphasis was on appropriate project design, towards the defined overall targets. Deliverables to date include: Completion of functional specifications, relevant contractual agreements and the commencement of product build.
5. Reduce the impact peak demand has on the network through the combined use of renewable energy and storage	■	
6. Ensure the equipment is grid ready, and there are processes to support their connection to the network	■	

■ Target is fully achieved within the timeframe. ■ Target is partly achieved within the timeframe. ■ Target is not achieved within the timeframe.

Highlights

PROJECT



PHASE

★ Indicates current phase

BENEFITS & OUTCOMES

▲ FUNDING AGREEMENT

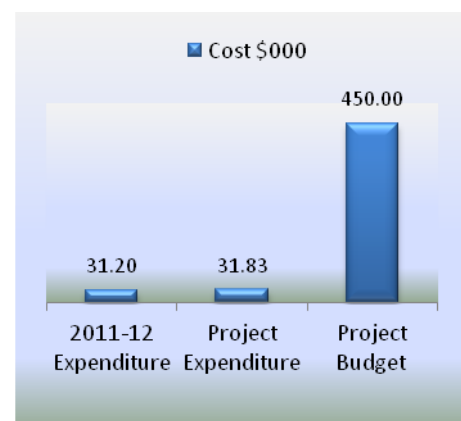
- ✓ Completed with Industry partner

▲ PRODUCT BUILD

- ✓ Major equipment awaiting delivery
- Software developed
- ✓ Completion of Solar design
- ✓ Site selection complete

▼ DELIVERY DELAY

Supply of batteries delayed from overseas manufacturers



Stockland North Shore Living Display Centre Residential DM

Nature & Scope

This project emerged from an offer made by Stockland to Ergon Energy to promote energy sustainability in Stockland's new Living Display Centre at their North Shore residential development in Townsville.

The North Shore master planned community will eventually comprise 5,200 lots and around 15,000 people. Around 1,300 lots have been built on with another 3,900 to be occupied over the next ten years. North Shore is located in close proximity to the Energy Sense Community project's study area around Bohle Plains and Mount St John. The Stockland offer provides Ergon Energy an ideal opportunity to work with a keen developer partner to develop pathways to reduce network requirements in a greenfield estate.

Aims & Expectations

The aims and expectations of this broad-based demand management project are to:

- utilise the Living Display Centre to educate prospective new home buyers on what they should include in their home package to reduce their energy usage and electricity charges (e.g., building features, use of off-peak tariffs, etc.);
- educate and encourage local builders to include energy conservation and demand management features in their product offerings;
- establish a working relationship with Stockland that assists Ergon Energy to have influence over their other developments across Queensland to promote energy conservation and demand management; and
- measure the impact on network demand of concentrated installations of inverter systems within a residential environment.

This project had the dual aim of shifting and reducing demand on the network.

Implementation Progress

As at 30 June 2012,

Highlights

PROJECT



PHASE

★ Indicates current phase

BENEFITS & OUTCOMES

▲ SUSTAINABILITY HANDBOOK

- ✓ The Handbook was launched in early October 2011. The majority of 2,000 copies have been distributed to visitors to the Sales Centre and individual display homes.

▲ DISPLAY HOMES

Twenty-five homes were constructed.

▲ METERING

Interval metering was installed in all homes to remotely upload data on home consumption and solar PV generation.

▲ DEVELOPER ENGAGEMENT

- ✓ The relationship with Stockland Developments has become very collaborative and positive. They are keen to continue the relationship.

▼ MEASUREMENT

Homes used as builders' sales offices were not suitable to indicate normal residential patterns.



2011-12 Deliverables	Rating	Comment
7. To seek to reduce overall network requirements at North Shore by: <ul style="list-style-type: none"> • educating prospective home buyers about the value of energy conservation and demand management features in reducing their home's operating costs; • influencing builders to incorporate or offer energy conservation and demand management features in their product suite; and • developing relationship with a major Queensland developer that will provide Ergon Energy an opportunity to work with their other developments to reduce network requirements. 	■	<ul style="list-style-type: none"> • Buyer education has shown great promise. • Builders have mostly responded well. • The relationship with Stockland is very positive and constructive.

■ Target is fully achieved within the timeframe. ■ Target is partly achieved within the timeframe. ■ Target is not achieved within the timeframe.

The main task remaining was to conduct a detailed survey of residents and builders to determine the impact of

marketing on buyers' decisions and builders' attitudes. A final report from consultants is expected from early-to-mid November.

Passive Air Cooling Trial

Nature & Scope

The Passive Air Cooling Trial (PACT) has been developed to determine the commercial potential of a current market product that may help to reduce air conditioning load.

As both the manufacturer and the supplier lack scientific data to support the efficacy of the product, the PACT seek to determine if this product can demonstrate energy and demand saving that can be actively promoted in the residential market, thereby reducing network peak demand.

Aims & Expectations

The purpose of the trial is to determine the energy benefit per installed in ground cooling unit. The data findings will enable Ergon Energy to consult, in terms of energy saving capacity with government agencies, the Australian product supplier and other interested parties to promote the product's benefits and wider residential and commercial application.

Highlights

PROJECT



PHASE

★ Indicates current phase

BENEFITS & OUTCOMES

▲ PRODUCT

Product quality from supplier has been high, however, in an effort its efficacy, minor modifications were made to each system prior to its installation.

▲ INSTALLATION

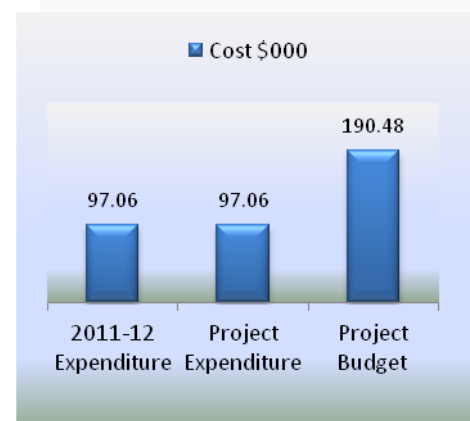
Although all sites were eventually installed and connected, many issues resulted from prolonged wet weather, changing of key installation supervisors and lack of installation resources in smaller towns.

▲ DATA EXTRACTION

A Measurement and Verification expert has installed monitoring equipment at all five sites. Data from these devices will be used to develop an energy report.

▼ ISSUES

Due to long installation times, as previously mentioned, there will be a reduced dataset from which to develop a final report.



Implementation Progress

As at 30 June 2012,

2011-12 Deliverables	Rating	Comment
8. Development & approval of Project Management Plan & detailed budget	■	Project tracking well, with data now being actively collected from 5 sites in Townsville, Blackall, Rockhampton and Dalby.
9. Trial participants engagement	■	
10. Installation of Units	■	
11. Data gathering commencement	■	

■ Target is fully achieved within the timeframe. ■ Target is partly achieved within the timeframe. ■ Target is not achieved within the timeframe.

Smart Camp Feasibility

Nature & Scope

The purpose of this project is to identify energy efficiency and demand management measures and to develop a cost/benefit model for evaluating efficiency improvements that result in a demand reduction, in camp type loads. A 'camp' load refers to a construction or mining type camp that comprises multiple demountable buildings for accommodation, with shared common areas. The idea is to draw together all existing and applicable technologies that may be suitable, and to evaluate their cost/benefit in both a Greenfield and Brownfield application.

Aims & Expectations

- Review current camp loads, demand drivers based on an assessment of up to 6 sites through 3 regions;
- Review existing camp loads and customer needs, and ascertain opportunities to improved energy efficiency/ demand management outcomes;
- Canvass market for existing, applicable technologies that target demand drivers, and that could result in a demand reduction in Greenfield applications
- Canvass market for existing, applicable technologies that target demand drivers, and that could result in a demand reduction in Brownfield applications
- Compile a report highlighting energy efficiency and demand management opportunities, costs, benefits, barriers to implementation application and risks for consideration.

Highlights

PROJECT



PHASE

★ Indicates current phase

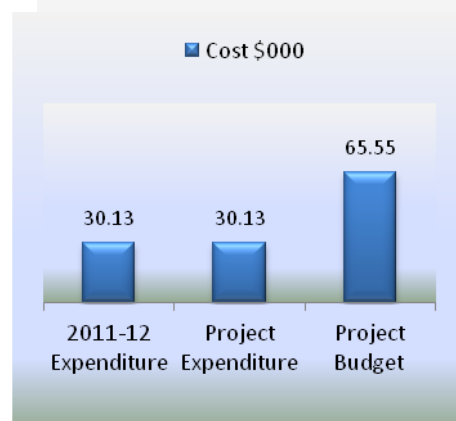
BENEFITS & OUTCOMES

▲ KEY REPORT FINDINGS

- ✓ Air-conditioning makes up between 50-64% of typical camps consumption.
- ✓ Using currently available technology, 20%-50% improvements in energy consumption and up to 250kVa demand reduction is possible, for a standard 500 person camp.
- ✓ Centralised cooling system for 24 hour operation gives simple payback of 6 years compared to split systems.

▲ KEY MEASURES MATRIX

- ✓ A matrix of recommended technologies (Greenfield and brownfield sites) has been developed.



Implementation Progress

As at 30 June 2012,

2011-12 Deliverables	Rating	Comment
12. Research Industry Stakeholders	■	Project has reached completion stage with a final report circulated and receiving positive feedback from industry and other key stakeholders.
13. Camp site selections	■	
14. Camp site visits	■	
15. Identifying opportunities	■	
16. Finalise report	■	

■ Target is fully achieved within the timeframe. ■ Target is partly achieved within the timeframe. ■ Target is not achieved within the timeframe.

Large Statcom

Nature & Scope

Ergon Energy has extensive networks of long rural and remote feeders which are being stressed by the increasing demands placed on them by modern customer electricity needs and by the increasing prevalence of distributed generation particularly residential PV.

The Large LV STATCOM project will trial a three phase 400kVAR unit on the Ergon Energy network. The main application is to support the voltage on a long medium voltage rural feeder with voltage regulation issues, partially due to higher penetration of PV, and avoid the conventional network upgrade which may otherwise be required.

Aims & Expectations

Distributed LV STATCOMS are low voltage power electronic products which have the ability to inject both capacitive and inductive reactive power into the electricity network. Project expectations are,

- Confirmation (or not) of the learning hypothesis;
- Identification of the control methodology for large LV Statcom to optimise voltage profile while avoiding deleterious impacts such as inter-unit hunting;
- Broad brush investigation of optimal placement of these devices;
- Evaluation of product capability to provide the desired performance.

Highlights

PROJECT



PHASE

★ Indicates current phase

BENEFITS & OUTCOMES

▲ PRODUCT BUILD

- ✓ Hardware build completed.
- ✓ Software & Communications currently under testing.

▲ PRODUCT INSTALLATION

- ✓ Council approval for trial site.
- ✓ Civil works in December schedule.
- ✓ System Modeling Performed.

▼ ISSUES

Unable to witness Factory Acceptance Testing as it will be performed in NZ;
Voltage Transformers may cause delay.



Implementation Progress

As at 30 June 2012,

2011-12 Deliverables	Rating	Comment
17. Project Management Plan and detailed budget developed.	■	PMP completed. Work underway with relevant teams to prepare for the installation and commissioning of the project.

■ Target is fully achieved within the timeframe. ■ Target is partly achieved within the timeframe. ■ Target is not achieved within the timeframe.

Urban Statcom

Nature & Scope

The increasing prevalence of residential PV systems and non-linear load is starting to have a significant impact on our network and customer supply.

The URBAN LV STATCOM project to laboratory tests one STATCOM and field trial two STATCOMs on the Ergon Energy network. The units are three-phased 15kVA low voltage static compensators. The main purpose is to assess their performance and ability to regulate the low voltage network, in residential areas with high penetrations of solar photovoltaic systems and non-linear loads (e.g. inverter air conditioners, computers and entertainment systems).

Aims & Expectations

- Confirmation (or not) of the learning hypothesis;
- Broad brush investigation of optimal placement of these devices;
- Evaluation of product capability to provide the desired performance.
- Ability to further contribute to policy development issues in the growing area of distributed energy generation, particularly Policy, Regulation and Standards requirements for effective network connectivity.

Highlights

PROJECT



PHASE

★ Indicates current phase

BENEFITS & OUTCOMES

▲ SITE SELECTION

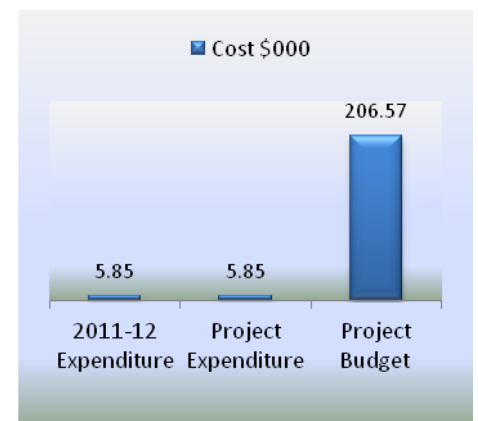
- ✓ Two field trial sites have been selected and community engagement has commenced to obtain approval

▲ REACTIVE POWER TESTING

- ✓ Related reactive power testing has confirmed the ability of reactive power to impact the voltage levels on the Low Voltage network.

▼ DELIVERY DELAY

Delivery of the units has been delayed, because of manufacturing production schedule issues and supplier lead time on key components.



Implementation Progress

As at 30 June 2012,

2011-12 Deliverables	Rating	Comment
18. Project Management Plan and detailed budget developed	■	PMP completed.

■ Target is fully achieved within the timeframe. ■ Target is partly achieved within the timeframe. ■ Target is not achieved within the timeframe.

SWER Statcom

Nature & Scope

The SWER LV STATCOM project will laboratory test and the field trial two 20kVAR single phase low voltage static compensators unit on the Ergon Energy network. The main purpose is to assess their performance and ability on SWER networks to provide reactive power support to assist with the network voltage management.

In addition the capability of the STATCOM to mitigate harmonics will be tested on SWER networks.

Aims & Expectations

- Comprehensive system simulation studies to be conducted prior to installation of the units to develop and verify the control methodology;
- A comprehensive test program to be developed prior to installation. It is expected that units to be trialed for a period of at least 1 year;
- Confirmation (or not) of the learning hypothesis;
- Identification of the control methodology;
- Evaluation of product capability to provide the desired performance.

Highlights

PROJECT



PHASE

★ Indicates current phase

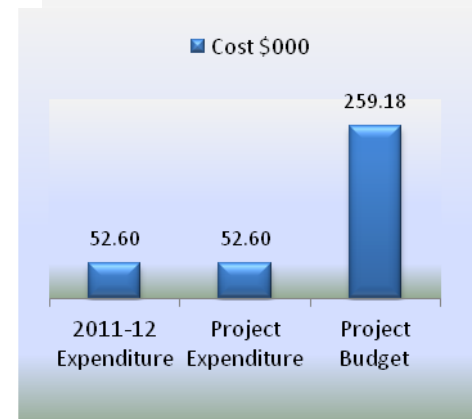
BENEFITS & OUTCOMES

▲ VOLTAGE

- ✓ An improvement in Voltages seen on SWER Lines

▼ ISSUES

Ability to accurately model the unit's performance;
Units stability operation;
Equipment required to connect to the network; and
Unit's ability to influence voltage on networks which are highly resistive.



Implementation Progress

As at 30 June 2012,

2011-12 Deliverables	Rating	Comment
19. Project Management Plan and detailed budget completed.	■	PMP completed. Project tracking on target with development of modelling report and completion of the Factory Acceptance Testing.

■ Target is fully achieved within the timeframe. ■ Target is partly achieved within the timeframe. ■ Target is not achieved within the timeframe.

Smart Voltage Regulator Trial

Nature & Scope

The Smart Voltage Regulator (SVR) Validation project will laboratory test the effectiveness of three phase SVRs in maintaining distribution network power quality in light of increasing penetration of renewable generation.

The full validation will need to be conducted in a phased way, roughly split between single device testing and validating and a subsequent larger scale deployment in selected areas of the network depending on the agreed application of the device.

Aims & Expectations

A staged process is proposed to effectively assess the SVR and enable an informed commercial decision to be made:

- A full functional test of the SVR will be firstly conducted by QUT at their Banyo test laboratory.
- A network model of the SVR be developed by QUT suitable for use within Ergon Energy Network Modelling tools
- If the above mentioned laboratory testing shows that the SVR's performance is suitable, a study will be performed to compare cost/benefit/performance against other competitor technologies (such as the regulating transformer, STATCOM etc.).

Highlights

PROJECT



PHASE

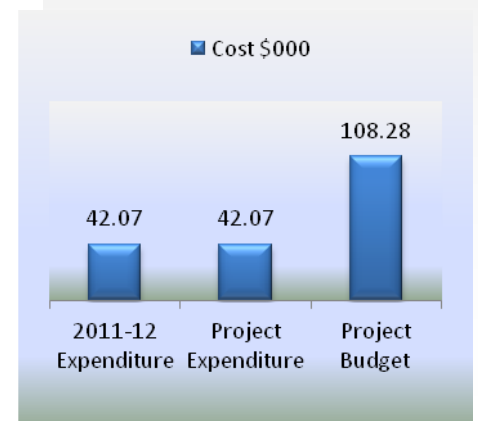
★ Indicates current phase

BENEFITS & OUTCOMES

- ▲ CO-CONTRIBUTIONS FROM GUIDED INNOVATION ALLOWANCE (GIA)
- ▲ POWER QUALITY
 - ✓ Improvement of voltage seen by customers on the network.
 - ✓ Assist to compensate for some voltage rise issues seen from PV systems.

ISSUES

Testing has been delayed due to transport damage.



Implementation Progress

As at 30 June 2012,

2011-12 Deliverables	Rating	Comment
20. Finalisation of Testing Plan	■	
21. Completion of QUT Banyo laboratory	■	Completed

■ Target is fully achieved within the timeframe. ■ Target is partly achieved within the timeframe. ■ Target is not achieved within the timeframe.

APPENDIX 1 – Residential Air Conditioning Cleaning Trial Findings

As part of a post implementation review, internal and external stakeholders were invited to provide feedback relating to the trial, including the Townsville Feasibility Study component. Throughout the trial lessons learnt were captured and documented.

LESSONS LEARNT

Item	Description	Consequence	Outcome
Metering	Metering records not accurate.	3 new data meters had to be installed. For these customers no historical data will exist.	Request metering audit well in advance of the trial to ensure data records are accurate or allowing new meters to be installed.
Stakeholder	Project plan continued despite Cyclone Yasi arriving the week before commencement of the trial.	Internal and external stakeholder engagement required to ensure no objections existed before continuation of the trial despite disruptions and safety issues.	Good stakeholder engagement but a list of key stakeholders not identified until after an issue had arisen.
Stakeholder	No queries were received from customers contacting the NCC.	NCC satisfied with the level of communication provided and being updated when new marketing material was being released.	Although no contact was made with the NCC, the production of a FAQ would prove beneficial.
Customers	Customers contacted to gauge feedback for the trial.	Customers were extremely complimentary of the service received.	53% of participants reported the trial had made them consider their electricity use and behaviour.
Suppliers	Lack of response to marketing campaign.	Larger trial population would have been beneficial. Number of customers targeted only 422.	Future trials will need larger populations to achieve desired customer numbers. Setting the expectations of the supplier will limit their disappointment to low response rates.
Marketing	The rental market required approval from landlord before being eligible for the trial.	This may have excluded potential customers from participating.	Consider legal implications to ensure that the eligibility criterion is easier for the rental market to participate in future trials.
Suppliers	Small businesses and tradesman will be able to refer to Ergon Energy's outcomes/results.	Research findings to be documented.	Generates interest in the residential market.
Benefits	Trial predominantly targeted residential customers.	The inclusion of commercial customers has huge potential as the market has a tendency to use air conditioners regularly.	Future projects can examine the benefits of the commercial market.
Customer	Data from Cannonvale backed up through customer contact.	Ensured that no unexpected behaviour or purchases of new appliances could possible affect	Greater confidence and validation with the data analysis.

		electricity consumption.	
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