EE_1011APR_002
Ergon Energy's 2010-11 *Demand Management Innovation Allowance - Annual Report*
for the regulatory year ended 30 June 2011

# ERGON ENERGY CORPORATION LIMITED

## 2010-11 DEMAND MANAGEMENT INNOVATION ALLOWANCE ANNUAL REPORT TO THE AUSTRALIAN ENERGY REGULATOR

## FOR THE YEAR ENDED 30 JUNE 2011

**SUBMITTED**

**28 FEBRUARY 2012**

**Table of Contents**

## 1. Demand Management Innovation Allowance (DMIA) Requirements - Annual Report

Ergon Energy's 2010-11 Demand Management Innovation Allowance (DMIA) Annual Report (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 requirements of the RIN are as follows:

(a) provide an explanation of each demand management project or program for which approval is sought;

(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 Demand Management Incentive Scheme (DMIS), with particular reference to:
   (i) the nature and scope of each demand management project or program;
   (ii) the aims and expectations of each demand management project or program;
   (iii) the process by which each demand management project or program was selected, including the business case for the demand management project and consideration of any alternatives;
   (iv) how each demand management project or program was/is to be implemented;
   (v) the implementation costs of the demand management project or program; and
   (vi) any identifiable benefits that have arisen from the demand management project or program, including any off peak or peak demand reductions;

(c) provide an overview of developments in relation to the demand management projects or programs completed in previous years, and any results to date;

(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;
   (ii) are not recoverable under any other Commonwealth or State Government scheme; and
   (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; and

(e) provide the total amount of the *DMIA* spent in the previous regulatory year and how this amount has been calculated.

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

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 2010–11 regulatory year in accordance with paragraph 3.1.4.1 of the AER's Demand Management Incentive Scheme (DMIS) for Energex, Ergon Energy and ETSA Utilities Part A – Demand Management Innovation Allowance (DMIA), October 2008.

## 2. Executive 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 for the development and delivery of innovative demand management solutions that provide long-term benefits to Ergon Energy and its customers. The DMIA is in addition to any "business as usual" capital and operational expenditure allowances for demand management projects approved in Ergon Energy's distribution determination. It provides a direct incentive for Distribution Network Service Providers (DNSPs) to implement efficient non-network alternatives or to manage the expected demand for standard control services in some other way, rather than through network augmentation.

Prior to and during the 2010-11 financial year, Ergon Energy assessed a range of innovative projects against DMIA funding criteria developed by Ergon Energy and consistent with the AER's DMIS[2]. These projects were subject to a screening and feasibility process 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.

Five projects were selected for Ergon Energy's 2010-11 DMIA Program, following the DMIA criteria[3] assessment. These were:

- Residential Air Conditioning Cleaning and Maintenance Trial;
- Chilled Water Air Conditioning on Single Wire Earth Return (SWER) Network;
- Grid Utility Support System (GUSS) Phase 2;
- Commercial Building Management Network; and
- Stockland North Shore Living Display Centre.

Four of the above projects will continue in 2011-12, while the Chilled Water Air Conditioning on SWER Network project was discontinued after it became apparent that it was not anticipated to become an efficient demand management project.

Ergon Energy is seeking the AER's approval to recover the costs of all five projects.

---

[1] Ergon Energy Distribution determination 2010-11 to 2014-15, 4 May 2010. http://www.aer.gov.au/content/item.phtml?itemId=736349&nodeId=d492a72322184a60ecb57faade6c1b0c&fn=Queensland%20determination%20-%20Ergon.pdf

[2] Demand Management Incentive Scheme ENERGEX, Ergon Energy and ETSA Utilities 2010–15 October 2008 http://www.aer.gov.au/content/item.phtml?itemId=722621&nodeId=4947c2da6b587bef059e6db2a493eb6c&fn=Demand%20management%20incentive%20scheme%20for%20QLDSA%20(October%202008).pdf

[3] Ibid, section 3.1.3.

## 3. Purpose of Report

Ergon Energy's 2010-11 DMIA Annual Report has been prepared in order to allow the AER to:

- assess Ergon Energy's 2010-11 DMIA initiatives and Ergon Energy's entitlement to recover the expenditure under the DMIA; 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 implement (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.

### 3.1 Compliance

The Report demonstrates compliance with the specific requirements in Schedule 1, paragraph 1.5 (a)-(e) of the AER's RIN as follows:

***Table 1: Compliance with Paragraph 1.5 of Schedule 1 of the 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: | n/a |
| 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 and in Appendix 1 of this Report |
| 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 | n/a |

| No | Requirement | Compliance |
|---|---|---|
| | date. | 2010-11 is the first year of Ergon Energy's current regulatory control period and as such, this requirement is not applicable |
| (d) | State whether the costs associated with each demand management project or program identified in the response to paragraph 1.5(a) are: | n/a |
| 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 |

## 3.2 Structure of this Report

The remainder of this Report is set out as follows:

***Table 2: Remaining Report Structure***

| Section | Title | Description |
|---|---|---|
| 4 | DMIA Program Expenditure | Details the 2010-11 DMIA Program budget and actual expenditure |
| 5 | DMIA Project Selection Process | Describes the process by which each 2010-11 DMIA project was selected |
| 6 | DMIA Program | Provides details of Ergon Energy's 2010-11 DMIA projects |
| 7 | DMIA Program Future | Discusses the future of Ergon Energy's DMIA Program |

## 4. 2010-11 DMIA Program Expenditure

As with all of Ergon Energy's projects, for each of the five projects within Ergon Energy's DMIA Program, a dedicated project manager was assigned, with overall responsibility for the project including development and oversight of the budget and expenditure.

Budgets are prepared in accordance with Ergon Energy's standard Project Scope template which details information including the projects' goals, deliverables, project milestones and resources required[4]. Cost estimations were developed for the resources identified as being required for each phase of each project. These cost estimations drew upon various sources including the costs of similar projects undertaken by Ergon Energy, current goods supply and service panel contracts and market research.

Table 3 shows the total approved budget costs (which were categorised into Internal Costs; External Costs; Travel; Materials and Other; and Contingencies) along with the actual expenditure and a comment on the variances.

***Table 3: Ergon Energy DMIA Program 2010-11 Budget vs Actual Expenditure***

| Project | Total Approved Budget | 2010-11 Approved Budget | | 2010-11 Expenditure | | 2010-11 Budget Spent | Comment |
|---|---|---|---|---|---|---|---|
| | ($) | Capital Exp. ($) | Operational Expend. ($) | Capital Exp. ($) | Operational Expend. ($) | (%) | |
| Residential Air Conditioning Cleaning Trial | 124,522 | | 124,522 | | 68,470 | 55% | It is believed that the low take-up of the offer was partly due to milder than expected temperatures and customers' lack of interest in air-conditioner efficiency. |
| Chilled Water Air Conditioning on SWER Networks | 465,602 | | 404,137 | | 24,180 | 6% | This project was discontinued after a review revealed that this project was no longer cost effective. |
| GUSS Phase 2 | 450,000 | | 341,500 | | 625 | 0% | This project could not be significantly started in 2010-11 due to Phase 1 being delayed. |
| Commercial Building Network Management | 480,000 | | 154,274 | | 340,673 | 221% | The accelerated procurement was undertaken to balance program budget underspending from delays and discontinuation of other DMIA initiatives. The 2010-11 expenditure remains within the total approved project budget of $480,000. |
| Stockland North Shore Living Display Centre | 179,000 | | 131,316 | | 24,200 | 18% | Delays in certain aspects of the project impacted on other deliverables (and costs being expended). |
| **Total** | **1,699,124** | | **1,155,749** | | **458,148** | **40%** | |

[4] Projects' Scope Reports which are akin to a project's business case can be provided to the AER upon request.

Of note, all costs associated with each of the five demand management 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.

As can be seen above, the 2010-11 budget consists of operational expenditure of which only 40 percent was spent in 2010-11. However, this under-spend is expected to be resolved in 2011-12 as continuing projects gain momentum. In 2011-12 outstanding budgets will be reviewed and closely monitored to ensure the variances between budget and actual spends are reduced considerably.

As discussed in section 6.2, the Chilled Water Air Conditioning on SWER Networks project aimed to implement cost-effective air conditioning for customers on SWER networks as a means to reducing peak demand. However, this project was discontinued after an updated estimate by an external design consultant resulted in the potential benefit being less than originally anticipated.

On a cost per kW basis, this project would have set a new benchmark cost of $28,000 per kW which is significantly more than the typical SWER non-network alternative project cost which has been less than $10,000 per kW.

Nevertheless, given that this project finding represents a contribution to demand management research and the fact that it met all of the DMIA criteria at its commencement[5], Ergon Energy considers that it should be entitled to recover this project's expenditure under the DMIA. Ergon Energy's claim for approval to recover its costs associated with the Chilled Water Air Conditioning on SWER Networks project is based on its understanding that:

- the DMIS is provided for DNSPs to explore potentially efficient demand management mechanisms[6] - 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.

[5] As demonstrated in Appendix 2.

[6] 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 http://www.aer.gov.au/content/item.phtml?itemId=722621&nodeId=4947c2da6b587bef059e6db2a493eb6c&fn=Demand%20management%20incentive%20scheme%20for%20QLDSA%20(October%202008).pdf

## 5. 2010-11 DMIA Project Selection Process

Ergon Energy's demand management activities focus on two streams:

- **Smart Asset Management Initiatives** - which aim to defer (or avoid) planned network capital investment. These initiatives are justified in their own right through the normal investment governance processes. These can be "self-funding" through positive NPV business cases; and

- **Network Vision of the Future Initiatives**[7] **-** these are initiatives to pilot or trial alternative smart network techniques, technologies or business processes to gather learnings and prepare Ergon Energy for its next regulatory control period and beyond i.e. the proposed "Network of the Future".

The DMIA is for projects which relate only to Network Vision of the Future Initiatives, which are not self-funding.

The selection of Ergon Energy's 2010-11 DMIA projects was a three stage process which consisted of:

1. An Eligibility Screening Process;

2. A Feasibility and Assessment Ranking Process; and

3. A Project Development and Approval Process.

### 5.1 Eligibility Screening Process

Potential DMIA projects were identified internally by Ergon Energy.

The Eligibility Screening Process was then performed on all nominated projects and was a high level assessment used to determine whether the projects met the objectives of the DMIA. Specifically, this tested 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

[7] http://esp/fss/cs/vsp/More%20resources/Joint%20Network%20Vision%20Outlook%20to%202030.pdf

- 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 were met then the project proceeded to the next stage. Table 4 shows the application of the above process to the potential 2010-11 DMIA projects.

***Table 4: 2010-11 DMIA Projects Screening Process***

| ID | Initiative | Reduces Demand | Recoverable from Jurisdictional scheme | Recoverable from Government scheme | Included in capex/opex forecast current regulatory determination | Technically viable | Pass/ Fail |
|---|---|---|---|---|---|---|---|
| **1.0** | **Air Conditioning** | | | | | | |
| **1.1** | Solar air conditioning | Yes | No | No | No | Yes | Pass |
| **1.2** | Ground loop condensor | Yes | No | No | No | Yes | Pass |
| **1.3** | Gas fired air conditioning | Yes | No | No | No | No | Fail |
| **1.4** | **Air Con Clean & Maintenance** | **Yes** | No | No | No | Yes | Pass |
| **1.5** | Air Con Cleaning & Maint. (C&I) | Yes | No | No | No | Yes | Pass |
| **1.6** | Refrigerant Storage | Yes | No | Yes | No | Yes | Fail |
| **1.7** | Solarventi | Yes | No | No | No | Yes | Pass |
| **1.8** | Temperature limiting air con remote | Yes | No | No | No | Yes | Pass |
| **2.0** | **Thermal Storage** | | | | | | |
| **2.1** | **Chilled water storage** | **Yes** | No | No | No | Yes | Pass |
| **2.2** | Ice storage/phase change storage | Yes | No | No | No | Yes | Pass |
| **2.3** | ERAC thermal storage | Yes | No | Yes | No | Yes | Fail |
| **2.4** | Climate Well | Yes | No | Yes | No | Yes | Fail |
| **3.0** | **Small Generation** | | | | | | |
| **3.1** | Combined Heat & Power | Yes | No | No | No | Yes | Pass |
| **3.2** | Wind energy | Yes | No | No | No | Yes | Pass |
| **4.0** | **Storage (other)** | | | | | | |
| **4.1** | Electric Vehicle Storage | Yes | No | No | No | Yes | Pass |
| **4.2** | **Grid Utility Support Sys (GUSS) P2** | **Yes** | No | No | No | Yes | Pass |
| **5.0** | **Energy Mgt Systems** | | | | | | |
| **5.1** | Smart home | Yes | No | No | No | Yes | Pass |
| **5.2** | **Commercial Building Mgt Network** | **Yes** | No | No | No | Yes | Pass |
| **5.3** | Smart GPO | Yes | No | No | No | Yes | Pass |
| **6.0** | **Regulation & Community** | | | | | | |
| **6.1** | Active load rating system | Yes | No | No | No | Yes | Pass |
| **6.2** | Simple building footprint tool | Yes | No | No | No | Yes | Pass |
| **6.3** | Split Incentives | Yes | No | No | No | Yes | Pass |
| **6.4** | C & I customer connection process intervention | Yes | No | No | No | Yes | Pass |
| **6.5** | Small customer connection process intervention | Yes | No | No | No | Yes | Pass |
| **6.6** | **Stockland North Shore Living Display Centre** | **Yes** | No | No | No | Yes | Pass |
| **7.0** | **Measure & Verification** | | | | | | |
| **7.1** | Measure & Verification Protocol | Yes | No | No | No | Yes | Pass |
| **8.0** | **Energy Recovery** | | | | | | |
| **8.1** | Air-conditioning compressor fans | Yes | No | No | No | No | Fail |
| **9.0** | **Other** | | | | | | |
| **9.1** | Floatron | Yes | No | No | No | Yes | Pass |
| **9.2** | Halogen for LED swapout | Yes | No | No | No | Yes | Pass |
| **9.3** | Occupancy/proximity sensor | Yes | No | No | No | Yes | Pass |
| **9.4** | Power factor correction | Yes | No | No | No | Yes | Pass |
| **9.5** | Customer analytics platform | Yes | No | No | No | Yes | Pass |

* Stockland North Shore Living Display Centre was screened for the DMIA program after the initial program formation.

## 5.2 Feasibility Assessment and Ranking Process

Potential projects that passed the Eligibility Screening Process were then subjected to a feasibility assessment and ranking process which examined the costs and benefits of each project.

Each potential DMIA project was scored and ranked according to the criteria in Table 5.

***Table 5: 2010-11 Feasibility Assessment and Ranking Process Categories and Scoring Options***

| Category | Criteria | Scoring Options | | | Weighting* |
|---|---|---|---|---|---|
| Reduces Demand | MW reduction achievable | < 10% | 10% - 20% | > 20% | 34 % |
| Reduces Consumption | MWh reduction achievable | < 10% | 10% - 20% | > 20% | 21 % |
| Deliverability | Available Ergon Energy resources to deliver the project | < 12 months | 12 - 24 months | > 24 months | 10 % |
| Technology Stage | Early stages or in market | Research | Development | Commercial | 7 % |
| Community / Customer Acceptance | Expected willingness based on benefit vs lifestyle and or cost impact | Low | Medium | High | 14 % |
| Implementation Risks | Complexity of the project including the number and degree of factors which could negatively impact the deliverables | Low | Medium | High | 14 % |

* The average weighting is based on Ergon Energy's judgment as to the category's importance with respect to the DMIA's criteria and objectives of the DMIS.

The above categories and criteria were derived to align with the objectives of the DMIA and to provide for an assessment on the degree to which these objectives could be achieved.

A weighted score was assigned to each scoring option for each of the above categories and the summation of these, as a proportion of 100, equated to the project's benefits score.

The ranking of projects was based on the (benefit cost) ratio of each project's benefits score to its total cost with the higher the ratio, the greater the chance of the project being selected to progress to the Project Development and Approval Process stage (Stage 3).

Table 6 shows the ranking of projects for Ergon Energy's 2010-11 DMIA program.

*Table 6: 2010-11 DMIA Project Feasibility Assessment and Ranking*

| ID | Initiative | Reduces Demand | Reduces Consumption | Deliverability | Technology Stage | Community / Customer Acceptance | Implementation Risks | Benefits Score | Total Cost $M * |
|---|---|---|---|---|---|---|---|---|---|
| 1.1 | Solar air conditioning | 10%-20% | 10%-20% | < 12 months | Development | High | Low | 0.190 | 0.720 |
| 1.2 | Ground loop condensor | 10%-20% | 10%-20% | 12 - 24 | Development | Medium | Medium | 0.165 | 0.720 |
| **1.4** | **Air Con Clean & Maintenance** | **10%-20%** | **10%-20%** | **< 12 months** | **Commercial** | **High** | **Low** | **0.200** | **0.072** |
| 1.7 | Solarventi | <10% | <10% | < 12 months | Commercial | Medium | Low | 0.150 | 0.324 |
| 1.8 | Temperature limiting air con remote | <10% | <10% | 12 - 24 | Development | Low | Medium | 0.115 | 0.744 |
| **2.1** | **Chilled water storage** | **>20%** | **<10%** | **< 12 months** | **Commercial** | **Medium** | **Low** | **0.190** | **0.720** |
| 2.2 | Ice storage/phase change storage | >20% | <10% | < 12 months | Commercial | Medium | Low | 0.190 | 0.720 |
| 3.2 | Wind energy | <10% | <10% | < 12 months | Commercial | Low | Medium | 0.130 | 0.120 |
| 4.1 | Electric Vehicle Storage | 10%-20% | <10% | < 12 months | Commercial | Low | Medium | 0.150 | 0.456 |
| **4.2** | **Grid Utility Support Sys (GUSS) P2** | **10%-20%** | **<10%** | **< 12 months** | **Commercial** | **Low** | **Medium** | **0.150** | **0.456** |
| 5.1 | Smart home | 10%-20% | <10% | < 12 months | Commercial | Low | Medium | 0.150 | 0.720 |
| **5.2** | **Commercial Building Mgt Network** | **>20%** | **>20%** | **< 12 months** | **Commercial** | **Medium** | **Medium** | **0.220** | **0.960** |
| 5.3 | Smart GPO | >20% | >20% | < 12 months | Research | Low | Medium | 0.190 | 0.600 |
| 6.1 | Active load rating system | 10%-20% | 10%-20% | < 12 months | Research | Medium | High | 0.150 | 0.660 |
| 6.2 | Simple building footprint tool | <10% | <10% | < 12 months | Development | Medium | High | 0.120 | 0.144 |
| 6.3 | Split Incentives | <10% | <10% | < 12 months | Research | Medium | High | 0.110 | 0.144 |
| 6.4 | C & I customer connection process intervention | 10%-20% | 10%-20% | < 12 months | Commercial | High | Low | 0.200 | 0.144 |
| 6.5 | Small customer connection process | 10%-20% | 10%-20% | < 12 months | Commercial | High | Low | 0.200 | 0.108 |
| **6.6** | **Stockland North Shore Living Display **** | **<10%** | **<10%** | **< 12 months** | **Commercial** | **High** | **Low** | **0.160** | **0.187** |
| 7.1 | Measure & Verification Protocol | <10% | <10% | 12 - 24 | Commercial | Low | Low | 0.135 | 0.240 |
| 9.1 | Floatron | <10% | >20% | > 24 months | Commercial | High | Low | 0.190 | 0.054 |
| 9.2 | Halogen for LED swapout | 10%-20% | 10%-20% | 12 - 24 | Commercial | Low | Medium | 0.165 | 0.528 |
| 9.3 | Occupancy/proximity sensor | <10% | <10% | 12 - 24 | Development | Medium | Medium | 0.125 | 0.240 |
| 9.5 | Customer analytics platform | >20% | >20% | > 24 months | Development | Medium | Medium | 0.200 | 0.480 |

* Costs are preliminary estimates for initial ranking and may differ to the subsequent approved detailed cost estimates.
** Stockland North Shore Living Display Centre was included in the DMIA program after the initial Project Feasibility Assessment and Ranking due to its strong performance against other projects.

## 5.3 Project Development and Approval Process

Following the Feasibility Assessment and Ranking Process, a workshop was held (attended by representatives from numerous areas within Ergon Energy) to discuss the merits of each of the projects in Table 6 (above) and to finalise the top projects to proceed to the Project Development and Approval Process[8] stage.

The finalisation of the project list was based on those projects that:

- best aligned with the objectives of the DMIA; and
- were suitable for deployment in 2010-11.

[8] This process can be seen in Figure 1 in Appendix 3.

Table 7 shows the decisions that were reached for each of the top ranked projects[9]:

***Table 7: 2010-11 DMIA project short-list***

| Initiative | Benefits Score | Total Cost $M | Benefit Cost Ratio | Rank | Decision |
|---|---|---|---|---|---|
| Air Con. Cleaning & Maintenance | 0.200 | 0.072 | 2.778 | **1** | **Proceed** |
| Occupancy/proximity sensor | 0.125 | 0.240 | 0.521 | **3** | **Proceed** |
| Solarventi | 0.150 | 0.324 | 0.463 | **4** | **Proceed** |
| Electric Vehicle Storage | 0.150 | 0.456 | 0.329 | **5** | **Defer** |
| Grid Utility Support Sys – P2 | 0.150 | 0.456 | 0.329 | **5** | **Proceed** |
| Stockland Living Display Centre * | 0.160 | 0.187 | 0.855 | **2** | **Proceed** |
| Smart GPO | 0.190 | 0.600 | 0.317 | **7** | **Abandon** |
| Halogen for LED swapout | 0.165 | 0.528 | 0.313 | **8** | **Proceed** |
| Chilled water storage on SWER | 0.190 | 0.720 | 0.264 | **9** | **Proceed** |
| Ice storage/phase change storage | 0.190 | 0.720 | 0.264 | **9** | **Proceed** |
| Commercial Building Mgt Network | 0.220 | 0.960 | 0.229 | **11** | **Proceed** |
| | **TOTAL** | **5.263** | | | |

* Stockland North Shore Living Display Centre was included in the DMIA program after the initial Project Ranking due to its strong performance against other projects.

As can be seen above, the total of the short-listed projects was approximately $5 million, in line with the total DMIA over Ergon Energy's regulatory control period. It was agreed that eight projects progress to the Project Development and Approval Process stage. Four of these projects were then selected to be implemented based on ensuring there was an even mix of commercial, industrial and residential projects. These being:

- Residential Air Conditioning Cleaning and Maintenance Trial;
- Chilled Water Air Conditioning on SWER;
- GUSS Phase 2; and
- Commercial Building Network Management.

Ergon Energy's fifth 2010-11 DMIA project, being the Stockland North Shore Living Display Centre project was approved for inclusion in December 2010 after Stockland approached Ergon Energy with an offer to take part and the assessment that:

- this would be a cost-effective DMIA project to engage with residential customers on the virtues of demand management and energy conservation because the "channel

[9] See Appendix 1 for details of the initiatives considered but not selected for Ergon Energy's 2010-11 DMIA Program.

to market" would have been largely established by Stockland. This assessment was confirmed by Ergon Energy's DMIA Project Development and Approval Process (above) where this project scored a high benefit to cost ratio and would have ranked second in the DMIA project short-list (Table 7); and

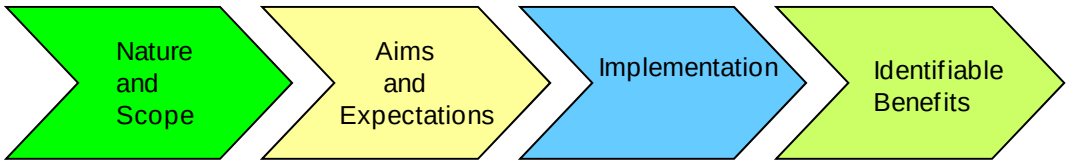
- there would be sufficient funding in the 2010-11 DMIA budget to take on board another DMIA project.

The above process is incorporated in Ergon Energy's DMIA Project Development and Approval Process as detailed in Appendix 3.

## 6. 2010-11 DMIA Program

Ergon Energy's 2010-11 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 provides an overview of each of the DMIA projects initiated by Ergon Energy during 2010-11 by setting out for each project:




These projects were:

### 6.1 Residential Air Conditioning Cleaning and Maintenance Trial

| | |
|---|---|
| Nature and Scope | This project is based in Cannonvale (near Airlie Beach) and involves Ergon Energy paying for the professional cleaning of residential participants' split system air-conditioners of over 2kW rated load (5kW cooling capacity) used in a residential living space.<br><br>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. In addition, the trial should provide an indication of the value proposition for some small business customers who run air-conditioning for long periods of the day, for a significant part of the year.<br><br>In order for the impact of the cleaning to be determined, the load on the network will be measured prior to and after the cleaning. |
| | 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. |

| | |
|---|---|
| Aims and Expectations | It is expected that this broad-based demand management project will reduce network demand as more efficient air conditioners require less electricity to operate.<br><br>The data collected will be used to understand the ensuing demand impact delivered – the value proposition to Ergon Energy. |
| Implementation | The implementation of this project was / is to be undertaken as follows:<br><br>• Aug 2010 - Nov 2010:<br>o Preparation and issue of a tender to engage a contractor to carry out the cleaning;<br>o Purchase of seven HOBO® U12-012 data loggers; and<br>o Engagement of Decoder Pty Ltd to design and distribute first round of promotional material to customers for the beginning of December.<br><br>• Dec 2010 - Mar 2011:<br>o First round of promotional material distributed to customers in the target area to be offered the free service, provided they meet the eligibility criteria for participation. This criteria included the need to have installed an air conditioner at least 12 months prior and not have this professionally cleaned before;<br>o Second promotional activity posted to customers, including a deadline to create a call to action;<br>o Metering audit completed of all customers signed up for the trial. Three new EM210 meters installed to replace faulty ones;<br>o A recording of customers' electricity consumption was not required. Each interval meter allows for 170 days worth of data to be stored. A meter read for all participants was completed on 10 March 2011. As the date and time of the air con clean was known we were able to complete a comparison of electricity consumption without having to do an initial baseline;<br>o Installation of HOBO® U12-012 data loggers against air conditioner electric circuit for two customers;<br>o The professional cleaning of split system air-conditioning systems and external compressor units;<br>o Collection of customers' electricity load and usage to determine the impact of the cleaning; and<br>o Personal call to participating customers to gauge customer satisfaction and feedback, but also to understand if any changes in behaviour had occurred during the trial period ie the purchase of any new electrical appliances which may have effected consumption levels.<br><br>• Apr 2011 – Aug 2011:<br>o Analysis of the trial's results and cost/benefit review undertaken; and<br>o Completion of a Final report detailing outcomes, lessons learnt and recommendations. |
| | The benefits of the Residential Air Conditioning Cleaning Trial are as follows:<br>• 36 customers registered an interest, of which 32 customers participated;<br>• Average energy reduction per customer was 10.8%, equating to a 0.25kW saving. |

| | |
|---|---|
| Identifiable Benefits | • Cost of each professional clean and subsequent 0.25kW saving was approximately $593.06. The cost per 1kW is therefore $2,381;<br>• Estimated dollar saving per annum for each customer is $67.66;<br>• Based on the expected cost per professional clean and including an Ergon Energy incentive payment of $50, the customer would still experience a shortfall of $54.15;<br>• The cost/benefit analysis suggests that residential professional cleaning is not a feasible solution.<br>• However professional cleaning of small businesses appears to be a viable solution, with an expected annual dollar saving between $165 to $536*. An Ergon Energy incentive payment would not be required for this type of promotional work; and<br>• Qualitative feedback found that 53% of customers would now consider cleaning their air conditioner every 12 months.<br><br>* Calculated savings have been determined using the energy reductions from the Cannonvale Trial (10.8%) and the Townsville Study (35%). |

## 6.2 Chilled Water Air Conditioning on Single Wire Earth Return (SWER) Networks

| | |
|---|---|
| Nature and Scope | The project was to involve:<br><br>• Installing two Chilled Water Storage Air Conditioning (CWSAC) systems, one each in the context of a rural "homestead" (multiple residential dwellings) and a remote "roadhouse" or "hotel" (commercial business with accommodation) before 30 June 2011;<br><br>• Monitoring the operation of the systems for a period not less than six months, including a full summer;<br><br>• Reviewing and reporting outcomes, including cost savings (both capital and operational), customer acceptance, energy and demand reduction performance; and<br><br>• Informing future business cases, particularly with respect to cost/benefit and risk. |
| Aims and Expectations | The aim of this project was to assess the demand management efficiency of small-scale CWSAC systems on SWER networks and to gain an understanding of the costs, benefits, risks, and operational and user acceptance characteristics.<br><br>It was expected that CWSAC systems could be deployed to specific network constraint areas to shift and reduce peak demand by using electricity overnight, in off-peak periods to chill water for use in an air conditioner system during the peak, high demand periods. |
| | The implementation of this project was to be undertaken as follows: |

| | |
|---|---|
| Implementation | • Jul 2010 - Sep 2010:<br>o Identify candidate trial locations and enrol customers in trial.<br>o Prepare and issue tender, and receive responses for EPC (engineer/procure/construct) contract for small-scale CWSAC systems at two sites (one “roadhouse” and one “homestead”).<br>• Oct 2010 - Jan 2011:<br>o Install interval metering at trial locations and award contract.<br>• Jan 2011 - Jul 2011:<br>o Design, construct and install systems at trial locations.<br>• Sep 2011 - Jan 2012:<br>o Operational phase over spring/summer period.<br>• Feb 2012 - Apr 2012:<br>o Acquire data and report on trial outcomes.<br>• Beyond Apr 2012:<br>o Operationalise use of CWSAC on SWER (if indicated by trial outcome) in locations of network constraint, access funding via the Regulatory Test mechanism.<br><br>**Progress to 30 June 2011:**<br>Unfortunately, this project was discontinued in May 2011 due to revised estimates that indicated that the project was no longer cost efficient. |
| Identifiable Benefits | No MW reduction benefits could be identified given the project’s discontinuation.<br><br>The revised final project estimate of $554,000 included estimates on the comprehensive customer engagement and equated to a project benchmark estimate of $28,000 per kW. This exceeds previous benchmarks where for example, on other SWER network projects, the highest marginal cost of demand was $24,000 per kW.<br><br>Furthermore, typical SWER non-network alternative project costs have been less than $10,000 per kW. |

## 6.3 Grid Utility Support System – Phase 2

| | |
|---|---|
| Nature and Scope | Phase 1 of GUSS was a research and development project that was funded through a Regional Asset Management capital budget.<br><br>Phase 2 is a separate and distinct project to develop the GUSS (medium scale storage, grid interface inverter, system control and monitoring) to allow for the integration of battery storage and renewable energy systems - in particular photovoltaics - to optimise the value that renewables can provide to the network and to customers. |

| | |
|---|---|
| Aims and Expectations | The aims and expectations of this project are to:<br>• Improve the value renewable energy can provide to the distribution network and low voltage connection points;<br>• Reduce the impact peak demand has on specific network constrained areas through the combined use of renewable energy and storage; and<br>• Ensure the equipment is grid ready, and there are processes to support their connection to the network. |
| Implementation | The implementation of this project was to be undertaken as follows:<br>• Feb 2011:<br>o Development of functional specification;<br>• Mid Mar 2011:<br>o Contract provision to develop product;<br>• Mid May 2011:<br>o Product development; and<br>1. Mid Mar 2012:<br>o Product trial and refinement – including installation.<br>**Progress to 30 June 2011:**<br>Unfortunately, this project (Phase 2) could not be progressed significantly during 2010-11 because Phase 1 - which was to install the first battery - was six months behind schedule and only commissioned in late June 2011.<br>Phase 2 will therefore begin in 2011-12. |
| Identifiable Benefits | The benefits of GUSS Phase 2 cannot be identified at this early stage.<br>Phase 2 which involves adding the photovoltaics will begin as soon as the results of Phase 1 are analysed.<br>Once the analysis determines the quantity of photovoltaics that should be installed, they will be ordered and are expected to be installed in March and April 2012. |

## 6.4 Commercial Building Management Network

| | |
|---|---|
| Nature and Scope | This project, also known as the Commercial Energy Management Systems (CEMS) – Automated Demand Response (AutoDR) project, will trial technologies and business models to enable critical peak demand reduction by virtually aggregating controlled load at multiple sites with three host customers.<br><br>Automated dynamic control of customer load will enable integrated contingency response to network events and also facilitate permanent demand reduction interventions. |
| Aims and 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 CEMS 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 | The implementation of this project included and includes:<br><br>• Conducting Level 2 Audits at each of the candidate sites;<br><br>• Installing OpenADR compliant control interface devices and DRAS;<br><br>• Undertaking workshops to:<br>o maximise Ergon Energy's understanding of customer and technology issues;<br>o understand and inform customers' requirements;<br>o maximise knowledge gained and transferred to Ergon Energy;<br>o ensure trial activities are shaped for success and for mutual benefit; and<br>o ensure trial learning outcomes are aligned with a potential for future pilot and deployment business models and architectures; and<br><br>• Operating the trial over a period of eighteen months including two summers and evaluating:<br>o Deployment and installation issues;<br>o Communications links and demand response communications; Response to automated signalling with and without human intervention;<br>o Cyber security standards;<br>o Technology suitability;<br>o Customer incentives and acceptance; and<br>Demand management outcomes, including demand request customer response (eg opt-in opt-out).<br><br>The milestones for this project includes:<br><br>• Jun 2011:<br>o The hosting agreements are in the hands of the host sites (ie, customers) and are waiting approval. |

| | |
|---|---|
| | • Jul 2011:<br>  o Hardware provisioned.<br>• Nov 2011:<br>  o Designs and workshops<br>• 2013:<br>  o Project completion<br><br>**Progress to 30 June 2011:**<br>Once the hosting agreements are signed, it will be two weeks for designs, and workshops will be in November 2011. |
| Identifiable Benefits | A benefit of CEMS is its potential to integrate other commercial and residential demand response trial projects including the electric vehicle trial projects.<br><br>Another benefit is that this project has provided insight into the time frames and resources which should be allocated to address legal issues which for this project, have taken more effort to overcome than first anticipated. |

## 6.5 Stockland North Shore Living Display Centre

| | |
|---|---|
| Nature and Scope | This project emerged from an offer by the Stockland Corporation to Ergon Energy to promote energy sustainability in their new Living Display Centre at their North Shore residential development in Townsville.<br><br>The North Shore master-planned community will eventually comprise 5,200 lots and around 15,000 people. Approximately 1,300 lots have been built on with another 3,900 to be occupied over the next 10 years.<br><br>North Shore is located in close proximity to Ergon Energy's Smart Communities project's study area around the Bohle Plains and Mount St Johns substations.<br><br>The Stockland offer provides Ergon Energy an ideal opportunity to work with a property developer to reduce average daily maximum demand in a greenfield estate. |
| Aims and Expectations | The aims and expectations of this broad-based demand management project are to:<br><br>• 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 (through use of off-peak tariffs);<br><br>• educate and encourage local builders to include energy conservation and demand management features in their product offerings;<br><br>• 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<br><br>• measure the impact on network demand of concentrated installations of inverter systems within a residential environment.<br><br>This project had the dual aim of shifting and reducing demand on the network. |
| Implementation | The implementation of this project included / includes:<br><br>• Jun 2011:<br>o Began installing smart-meters in the display homes. These are also the revenue meters which are read manually by Ergon Energy's Metering Group.<br><br>• Jun-Aug 2011:<br>o Provide content for North Shore Green Book (marketing opportunity to showcase energy conservation and demand management technologies in printed material which will be distributed to all centre visitors.<br><br>• Jul 2011:<br>o Install presentation system in the sales office to demonstrate the value of energy conservation and demand management features in terms of reduced energy usage.<br><br>• Aug 2011:<br>o Provide presentations to sales staff on relevant energy conservation information.<br><br>• Feb 2012:<br>o On-going involvement (to be determined) in community engagement activities at North Shore.<br><br>• Feb 2013:<br>o On going monitoring of metering output.<br><br>**Progress to 30 June 2011:**<br>Unexpected delays in finalising the content for the information Handbook resulted in the dates for a staff training workshop to be delayed to 18-19 August 2011. The Handbook's official launch is expected to occur on Friday 7 October (VIP and media event) and Sunday 9 October (Family Day). |
| Identifiable Benefits | A major benefit of this project is the demonstration of the successful relationship that Ergon Energy can build with private sector home builders. By leveraging off each others' expertise and resources, the promotion of energy conservation and demand management can be undertaken efficiently and effectively.<br><br>It is too early in this project to determine the MW peak demand reductions. |

## 7. Ergon Energy's Future DMIA Program

All of Ergon Energy's 2010-11 DMIA projects, with the exception of the Chilled Water Air Conditioning on SWER Networks project will continue in 2011-12. It is expected that these projects will have sufficiently progressed in 2011-12 to enable the measurement and verification of MW demand reductions.

In addition, Ergon Energy will also undertake its next round of assessments for new DMIA projects. The development of these projects will build upon the work carried out in 2010-11 and be informed by learnings from demand management projects in Ergon Energy's DMIA program and from its broader demand management program.

Specifically, the learnings from the 2010-11 DMIA projects, which are shown in Table 8 below, will be considered when scoring each project's "Deliverability" and "Implementation Risk" in the Feasibility Assessment and Ranking Process.

***Table 8: Summary of 2010-11 DMIA Project Learnings***

| Project | Learnings |
|---|---|
| Residential Air Conditioning Cleaning and Maintenance Trial | Professional cleaning of air conditioners is not cost effective for residential customers but is beneficial for small businesses. |
| Chilled Water Air Conditioning on SWER Networks | Projects need to be constantly monitored and assessed not only in isolation but also as part of Ergon Energy's broader demand management program. |
| Grid Utility Support System – Phase 2 | Where projects are dependent on other projects, an allowance should be made for delays and contingency measures should be developed to minimise the impact. |
| Commercial Building Management Network | There should be ample resource allowances in project scopes to address potential legal issues. |
| Stockland North Shore Living Display Centre | The relationship with external partners should be well documented including responsibilities and deadlines to meet key milestones. |

## Appendix 1 – Projects considered but not selected for the 2010-11 DMIA Program

Ergon Energy considered alternative projects and the details of the top ranked projects not selected for Ergon Energy's 2010-11 DMIA Program are shown in Table 9 below.

***Table 9: Ergon Energy's 2010-11 Top Ranked Projects not selected for DMIA Funding***

| Project | Description |
|---|---|
| Occupancy/proximity sensor | Sensing device that recognises occupancy of a room or area and controls electricity supply to selected or all appliances based on that occupancy. |
| Solarventi | Trialling of passive, earth cooling technology in the residential market to precondition air in a room. Should be used to mitigate use of, or potentially replace, refrigerative air con. |
| Electric Vehicle Storage | Understand and define the requirements necessary to allow and control the flow of energy from an electric vehicle battery into the grid as a distributed energy resource to support the network |
| Smart GPO | Home area network for residential properties that provide the customer with access to real time information. |
| Halogen for LED swapout | Run programs to swap out 50W halogens with 5W LEDs. Load reduction for peak load in residential sector and base load in light commercial/small business. Programs to concentrate on areas of network constraint. Customers to be charged $5 per bulb. |
| Ice storage/phase change storage | Ice storage air-conditioning on SWER - target schools and businesses. |

## Appendix 2 - DMIA criteria achievement: Chilled Water Air Con on SWER

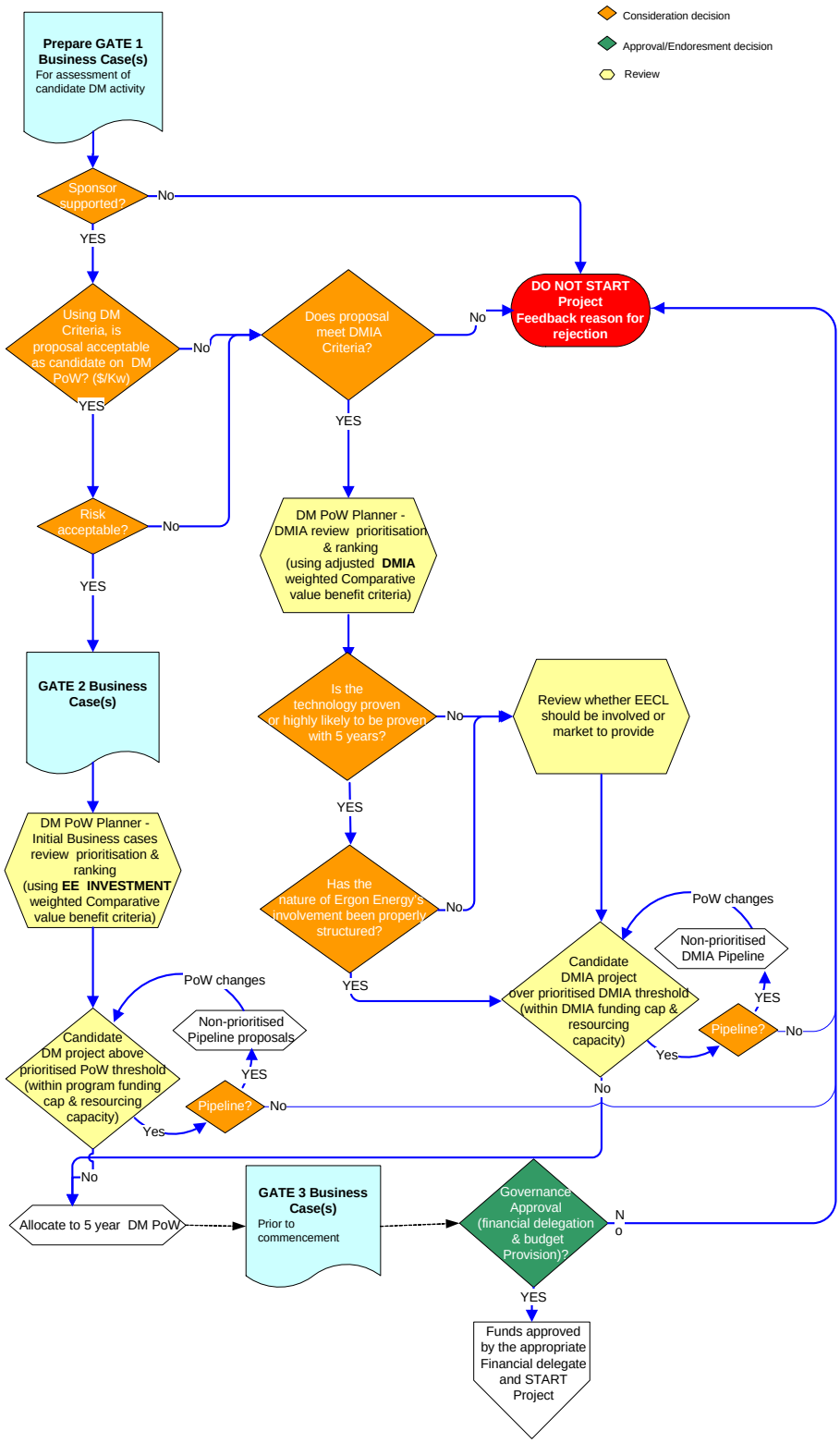
The Chilled Water Air Conditioning on SWER Networks project met all of the relevant DMIA criteria as per Schedule 1, paragraph 1.5 (a)-(e) of the AER's RIN, as demonstrated in Table 10 below.

***Table 10: Achievement of DMIA criteria: Chilled Water Air Conditioning on SWER Networks project***

| | DMIA Criteria | Achievement |
|---|---|---|
| (a) | Provide an explanation of each demand management project or program for which approval is sought | Refer to section 6.2 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: | n/a |
| i | the nature and scope of each demand management project or program, | Refer to section 6.2 of this Report |
| ii | the aims and expectations of each demand management project or program, | Refer to section 6.2 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 and in Appendix 1 of this Report |
| iv | how each demand management project or program was/is to be implemented, | Refer to section 6.2 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 6.2 of this Report |
| (c ) | Provide an overview of developments in relation to projects or programs completed in previous years, and any results to date. | n/a |
| (d) | State whether the costs associated with each demand management project or program identified in the response to paragraph 1.5(a) are: | n/a |
| 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 |

## Appendix 3 - DMIA Development and Approval Process

### *Figure 1: Ergon Energy's DMIA Development and Approval Process*



Ergon Energy's investment governance process has three stages of gate-keeping as a project moves through the planning process.

The purpose of these gates is to ensure transparency, prudence and appropriate approval on project development and required deliverables. For effective management of the transition through the stages it is essential that the handovers between workgroups are clear, documented and agreed. These gates are detailed in Table 11 below.

***Table 11: Description of Ergon Energy's Gated Business Process***

| Gate | Title | Description |
|---|---|---|
| 1 | **Investment Application**<br>(formerly Strategic Business Case) | The **Investment Application** relates to developing and assessing opportunities or risks that are typically three to ten years in the future. This gate screens options, risks and opportunities for strategic and regulatory fit, regulatory fit and identifies preliminary investment requirements at a ± 30 - 50% confidence level.<br><br>The gate will be based on defining the problem or opportunity and at a high level, assessing if investing to solve the problem or take the opportunity is viable, by assessing alternatives to do nothing. |
| 2 | **Gate 2 Business Case** (formally Concept Business Case) | The Gate 2 Business Case is an **Asset Management output stage gate** requiring investment governance approval to progress beyond the concept stage. The concept stage commences when the Recommended Work (recommended preferred option) is identified and handed over to the concept manager.<br><br>Within the concept stage the options will be further developed and validated to address the risk or opportunity following the undertaking of a more detailed analysis of the options and the financial and resource commitments required. The concept stage is aimed at looking at projects 18 months to five years in advance. |
| 3 | **Gate 3 Business Case** (formerly Detailed Business Case) | The Gate 3 Business Case is an **Asset Management output** which is triggered when the estimate confidence of financial commitment and resource requirement narrows to ±10%. This is not a stage gate as the design may be incomplete, but is driven by the reduction in uncertainty.<br><br>The authority to approve the Gate 3 Business Cases is based on the full investment value and schedule of financial delegations. To provide the appropriate review mechanism over investment decisions all Gate 3 Business Cases should be endorsed by the relevant committee/s prior to seeking higher approval from the authorised officer/body. |