Demand Management Innovation Allowance Submission

2010-2011 Report to the AER

February 2012

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1 Introduction

This submission has been prepared under the Demand Management Innovation Allowance (DMIA) scheme applied to Ausgrid by the AER in the 2009 regulatory determination.

Under Section 3.1.4.1 of the AER's final determination for The Demand Management Incentive Scheme for the ACT & NSW 2009, Ausgrid is required to submit an annual report on expenditure under the DMIA for each regulatory year. The annual report must include:

1. The total amount of the DMIA spent in the previous regulatory year, and how this amount has been calculated.

2. An explanation of each demand management project or program for which approval is sought, demonstrating compliance with the DMIA criteria detailed at section 3.1.3 with reference to:

    a. the nature and scope of each demand management project or program,

    b. the aims and expectations of each demand management project or program,

    c. the process by which each project or program was selected, including the business case for the project and consideration of any alternatives,

    d. how each project or program was/is to be implemented,

    e. the implementation costs of the project or program, and

    f. any identifiable benefits that have arisen from the project or program, including any off peak or peak demand reductions.

3. A statement signed by a director of the DNSP certifying that the costs of the demand management program:

    a. are not recoverable under any other jurisdictional incentive scheme,

    b. are not recoverable under any other state or Commonwealth government scheme, and

    c. are not included in the forecast capex or opex approved in the AER's distribution determination for the next regulatory control period, or under any other incentive scheme in that determination (such as the D–factor scheme for NSW).

4. An overview of developments in relation to projects or programs completed in previous years of the next regulatory control period, and any results to date

Accordingly, this submission details DMIA projects undertaken by Ausgrid in the 2010/11 financial year.

2 Summary of Submission

There were two DMIA projects for which we incurred costs or revenue forgone in 2010/11. Ausgrid's submission identifies claimable costs incurred of $52,963. All costs incurred were opex.

Actual costs incurred are collected by project in the Ausgrid financial system. The amounts claimed are those actually booked to each project in the applicable year. Costs include implementation costs, project management and other directly related costs, but exclude costs related to development of projects prior to the approval to proceed.

The subsequent information in this submission is arranged by project. Details are provided addressing each of items 2 (a) - (f) from Section 3.1.4.1 of the AER's final determination for The Demand Management Incentive Scheme for the ACT & NSW 2009.

3 Project 1 – Reliability Improvements for Large Embedded Generators

3.1 Project Nature & Scope

The purpose of this project is to test whether a combination of technical improvements and commercial incentives can improve the reliability performance of large, parallel connected embedded generators in providing network support in an interconnected system.

3.2 Project Objectives

The project seeks to demonstrate that technical improvements to protections/control systems and other processes, coupled with commercial incentives, are able to provide a sufficiently reliable outcome for large parallel connected embedded generators to be considered as effective network support in n-1 systems.

For the purpose of this project, satisfactory reliability will be taken to be demonstrated if the generation delivers more than a specific target demand reduction quantity (measured in MVA) during all critical or potentially critical peak demand periods and does not disconnect during any simulated network abnormalities.

Specific objectives include:

- To achieve better than 99.5% effective availability during key network peak periods and demonstrate robustness to network disturbances.
- To achieve 14MVA of demand reduction at less than $100/kVA.

3.3 Project Selection Process

Ausgrid has developed templates & guidelines for the preparation of project proposals for potential funding under the DMIA allowance.

When opportunities are identified for new projects, Ausgrid uses the following methodology when assessing projects for funding under the DMIA allowance:

A project proposal is prepared according to the Ausgrid DMIA template and guidelines

The project proposal is reviewed by the Manager – Demand Management to ensure it meets the funding criteria specified under the DMIA Scheme.

The project proposal is also assessed against further criteria specified by Ausgrid, including repeatability, suitability to geographically specific network constraints, and potential to be cost effective (in $/kVA).

Checks are also made to ensure that budget projects costs are within the DMIA allowance.

This project was assessed to meet the specified criteria for DMIA funding. It was also considered that this type of DM initiative could be applicable to around five major generator locations. It also has the potential to be geographically focussed, with estimated costs of between $100-400/kVA.

3.4 Implementation Plan

The main elements of the project implementation plan are summarised below:

Develop Network Support Agreement

A network support contract will be developed with the candidate large embedded generator site.

The contract requires network support from the generator between the peak hours of 5:00pm and 9:00pm during winter. The agreement also involves the generator owner undertaking improvements to the generation and control systems and scheduling maintenance works to ensure they can reliably generate and export at least 14MVA during the winter peak period.

The support is to occur during network peak periods of 5:00pm and 9:00pm on working weekdays during May & September 2011. The generator owner will be compensated for expenses incurred for implementing pre-network support modifications and a monthly fixed network support fee.

Performance will be tracked using monthly generation profiles of the generators and a record of disturbances during network peak periods mentioned above.

Implement Technical Modifications

Works will be initiated to implement technical reliability improvement options at the generator site including:

1. Replacement and adjustment of Loss of Mains relay

2. Implementation of plant technical modifications:

    - Installation of a standby air compressor to reduce risk of landfill gas interruptions to both stations.
    - Installation of a standby cooling water booster pump to duplicate existing cooling system
    - Addition of 24VDC power supply to replace existing old sources of supply which have caused substantial downtime in the past
    - Surge protection to reduce the probability of downtime of electronic equipment
    - Additional isolation valves to improve flexibility of gas supply
    - Upgrade of paging system to mitigate the risk of failure of paging system, noticed in the past and improve response time.

3. Installation of new fibre-optic communication (comms) system

Monitoring & Verification

Basic performance monitoring will be via the normal market meters at the generator stations, with backup form Ausgrid's SCADA system.

A process will be put in place for collecting the necessary data in the event of any abnormal operation, including:

- All data available from protection relays and measuring devices at the generating station
- All data available from protection relays and measuring devices on Ausgrid's network.
- Measurement of faults or abnormal switching operations on the 132 kV network – based on control room logs and SCADA data collection
- Records of any attempts to simulate network disturbances by network switching

3.5 Summary of Budget & Actual Costs

A summary of the project budget and actual cost incurred in 2010/11 are shown below. All costs incurred for this project are categorised as opex.

Projects budget:

	2010/11		2011/12		2012/13
$	425,000	$	625,000	$	1,050,000

Actual project costs 2010-11:

	2010/11
$	37,667

3.6 Identifiable Benefits

At this stage there are no material peak demand reductions achieved from this program.

3.7 Recovery of Costs

In submitting this program for inclusion in the DMIA Scheme, Ausgrid confirms that the program costs:

a. are not recoverable under any other jurisdictional incentive scheme

b. are not recoverable under any other State or Commonwealth Government scheme

c. are not included in the forecast capex or opex approved in the AER's distribution determination for the next regulatory control period, and

d. are not eligible for recovery under the D-Factor Scheme.

4 Project 2 – Dynamic Load Control of Small HW Systems

4.1 Project Nature & Scope

The project consists of a trial of implementing dynamic load control of small and medium sized hot water systems. The nature of the dynamic load control will be to control the hot water cylinders off for periods of typically three to five hours (or as may be found appropriate), and only as necessary to actively manage network demand.

4.2 Project Objectives

The primary objective of this project is to determine the level of technical and financial viability for the dynamic control of small and medium sized hot water cylinders. Specific objectives can be summaries as follows:

- To determine a dispatchable control regime for application to small hot water heaters that provides satisfactory customer service and reductions in relevant peak demand.
- To determine the proportion of customers for whom this would likely be acceptable, and what level of marketing effort would be needed to achieve various take-up rates. Also to test the relationship between the take-up rate and the size of reward offered.
- To determine the level of diversified demand reduction per customer, referenced to typical zone substation peak demand characteristics.
- To accurately estimate the costs of such a program for local, commercial implementation. A scenario analysis exploring a base-case, best-case and worst-case set of assumptions is given in the following sections. The model business case indicates that for ordinary base case cost assumptions the cost per kW of demand reduction is above the level that is currently economic. However, the model business case equally indicates that for the best case scenario the cost per kW of demand reduction is within the range of what may be economic, particularly if several years of value could be attained. Therefore, during the trial significant effort will be focussed on developing opportunities to drive the cost structure down toward the best case scenario.

4.3 Project Selection Process

Ausgrid has developed templates & guidelines for the preparation of project proposals for potential funding under the DMIA allowance.

When opportunities are identified for new projects, Ausgrid uses the following methodology when assessing projects for funding under the DMIA allowance:

A project proposal is prepared according to the Ausgrid DMIA template and guidelines

The project proposal is reviewed by the Manager – Demand Management to ensure it meets the funding criteria specified under the DMIA Scheme.

The project proposal is also assessed against further criteria specified by Ausgrid, including repeatability, suitability to geographically specific network constraints, and potential to be cost effective (in $/kVA).

Checks are also made to ensure that budget projects costs are within the DMIA allowance.

This project was assessed to meet the specified criteria for DMIA funding. It was also considered that this type of DM initiative could be applicable to around 20 zone substations and many 11kV networks. It also has the potential to be geographically focussed, with estimated costs of $990/kVA, and potentially as low as $500/kVA.

4.4 Implementation Plan

The main elements of the project implementation plan are summarised below:

Phase 1: Pilot Trial

The concept of the pilot trial is to trial control of small hot water cylinders at approximately ten customer's premises. This pilot trial will test primarily the workability of controlling such cylinders, and this will be demonstrated by the customer experience. Assuming the majority of installations pass the customer experience test then additional data from the trial will be evaluated in terms of, demand impact, metering profiles – pre and post control, percentage of time reset button used, etc.

Phase 1 will also include having the data read and analysed for 30 random cylinders that had dedicated interval meters installed as part of a previous research project . This data will be used to provide an initial view of the load profile and diversity of usage of continuously supplied hot water cylinders; be the basis of analysis of the potential for contol and design of the control regime; provide an element of the control group for analysis of impact of control on coincident demand. Some of these customers may become members of the pilot trial.

Phase 2: Market Research

Assuming that the pilot trial meets Phase 1 customer acceptability requirements, the next stage is to conduct survey / market research to refine product offerings. Typically a market survey would be undertaken to better understand; what the take-up rate of such a product may be, what reward structure would be required and how sensitive would the take-up rate be on the exact reward structure. Also additional understanding would be sought as to demographic differences.

Phase 3: Larger Trial

If the results of the pilot trial are positive, and the results of the market survey indicate that a satisfactory take-up rate could be achieved, then a larger trial will be undertaken to further prove the product viability as well as establish better information on performance and cost structure. This trial will cover in the order of 100 participating customers and will fully mimic the product, including enabling communications to the devices, doing realistic dispatching, having several channels to despatch independently, and recovering metering data.

Following this trial, results will be analyzed and any issues arising from the trial will be addressed to determine how and if a further trial should proceed.

Phase 4: Full Scale Trial

A final optional phase is to undertake a full scale trial comprising in the order of 1,000 participating customers to provide statistically significant results for the concept being tested. Such a trial would also test all operational aspects as well as technical aspects of an actual deployment.

4.5 Summary of Budget & Actual Costs

A summary of the project budget and actual cost incurred in 2010/11 are shown below. All costs incurred for this project are categorised as opex.

Projects budget:

2010/11	2011/12	2012/13	Contingency	Total
$ 40,000	$ 215,000	$ 854,000	$ 166,000	$ 1,275,000

Actual project costs 2010-11:

2010/11
$ 15,296

4.6 Identifiable Benefits

At this stage there are no material peak demand reductions achieved from this program.

4.7 Recovery of Costs

In submitting this program for inclusion in the DMIA Scheme, Ausgrid confirms that the program costs:

a. are not recoverable under any other jurisdictional incentive scheme

b. are not recoverable under any other State or Commonwealth Government scheme

c. are not included in the forecast capex or opex approved in the AER's distribution determination for the next regulatory control period, and

d. are not eligible for recovery under the D-Factor Scheme.