



DEMAND MANAGEMENT INNOVATION ALLOWANCE 2012-2013 REPORT

Submission to AER

Prepared by Network Technology Strategy

October 2013

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1.0 EXECUTIVE SUMMARY

Endeavour Energy currently has three Demand Management Innovation Allowance (DMIA) projects, the Rooty Hill Residential Demand Management Program, Glenmore Park Demand Response Trial and Data Analysis and Reporting that were approved in the previous regulatory year (FY 2011/12). An additional new project, Changing Controlled Load 2 Switching Schedule was subsequently developed and commenced in FY 2012/13. The total DMIA claim for 2012/13 is \$412,036.

Project	Operating expenditure (\$ nominal)	Capital expenditure (\$ nominal)	Total expenditure (\$ nominal)	New or Continuing
Rooty Hill Residential Demand Management Program	\$21,098	\$78,413	\$99,511	Continuing
Glenmore Park Demand Response Trial	\$61,293	\$193,421	\$254,714	Continuing
Data Analysis and Reporting	\$55,558	\$0	\$55,558	Continuing
Changing Controlled Load 2 Switching Schedule	\$2,253	\$0	\$2,253	New
Total	\$140,202	\$271,834	\$412,036	

2.0 BACKGROUND

This report has been prepared in accordance with the AER's Demand Management Incentive Scheme (DMIS) for the ACT and NSW 2009 Distribution Determination's Demand Management Innovation Allowance (DMIA) scheme, November 2008.

As per Section 3.1.4 of the scheme, Approval of Expenditure under the DMIA, Endeavour Energy is required to submit an annual report describing its expenditure and the nature of its demand management activities for review by the AER. The annual reporting requirements are outlined below.

A DNSP's 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.

3.0 PREVIOUSLY APPROVED PROJECTS

This section reports on the progress of projects previously approved by the AER.

3.1 ROOTY HILL RESIDENTIAL DEMAND MANAGEMENT PROGRAM

In August 2010, approval was given to implement phase 1 of the Rooty Hill Residential Demand Management Program and commence the acquisition of residential customers to the air conditioning program (*CoolSaver*) and the peak time rebate program (*PeakSaver*).

A Peak Time Rebate (PTR) was selected over Dynamic Peak Pricing as this product rewarded the customer by paying them \$1.50 per kWh for energy reduction below their forecast afternoon consumption rather than penalising them for using energy during the peak period. The reward approach has been tested successfully overseas and Endeavour Energy saw this as an opportunity for higher customer participation as the program will deliver a monetary incentive rather than increasing costs to their energy bills. This program was marketed as *PeakSaver* and was the first innovative peak time rebate demand management program offered in Australia.

The costs sought for this project consist only of the purchase and installation of metering, communications equipment and participant feedback survey. All other costs for this program are claimed through D-factor and tabled in the Report on Demand Management Projects for FY 2012/13.

3.1.1 NATURE AND SCOPE

Peak demand in Endeavour Energy's network area has grown significantly over the past decade, reflecting the transformation of rural and semi-rural land into new urban developments, and a sharp increase in the popularity and use of air conditioners.

Penetration of air conditioners across NSW was 59% in 2009 and significantly higher in Western Sydney. This is of particular concern because the peak demand from air conditioning loads can be both very large and of short duration, resulting in poor utilisation of fixed assets. In addition, the generation and distribution systems tend to be at their lowest capacity during very hot weather when air conditioner demands are likely to be at a maximum.

The Rooty Hill zone substation area was chosen due to network constraint and part of the overall Rooty Hill Demand Management Program outlined in the Report on Demand Management Projects for FY 2010/11.

3.1.2 AIMS AND EXPECTATIONS

The overall program is to be delivered over three years and two phases with phase 1 heavily focused on developing the systems and investigating the correct approach to adopt for implementing the broader campaign during phase 2.

The objectives of the residential DM program are to:

- Reduce peak demand from the residential initiatives by 1,000kVA by year 3
- Educate participants and the public on the benefits of these initiatives
- Gain an understanding of customer behaviour and acceptance of these initiatives for future expanded programs
- Develop systems and processes to make future programs cheaper to implement
- Put Endeavour Energy's network business in a solid position to offer cost-effective DM initiatives to accompany any potential smart meter roll-out if mandated by the Government

3.1.3 PROJECT JUSTIFICATION

The Rooty Hill Residential Demand Management program is part of the wider Rooty Hill Demand Management Program. The business case for the Rooty Hill Demand Management Program is based on network constraint.

3.1.4 IMPLEMENTATION PLAN

The *PeakSaver* program is based on providing a financial reward to customers that reduce electricity consumption rather than penalising them for consuming electricity during peak times. They are paid for the quantity of electricity not consumed. To calculate this quantity, a baseline forecast of what the customer would have consumed on a hot day needed to be developed.

For this program to operate, a number of systems needed to be developed to manage the following functions:

- Customer recruitment
- Event notification
- Customer record management
- Metering data acquisition and storage
- Payment calculation, monitoring and storage
- Baseline algorithm development

3.1.5 IMPLEMENTATION COSTS

Costs claimed under DMIA for the Rooty Hill Residential Demand Management Program in 2012/13 includes \$78,413 CAPEX covering the purchase and installation of metering and communications equipment. The OPEX cost of \$21,098 funded the research into customer feedback on the programs. All other costs incurred through this program are claimed under D-factor.

3.1.6 RESULTS

The Year 3 Program Plan was approved in July 2012. The *CoolSaver* target was 30 participants to achieve a 39kVA demand reduction and *PeakSaver* was 282 to achieve a 479kVA demand reduction.

The recruitment channel for *CoolSaver* was via air conditioning dealers who have databases of their customers, including details of the air conditioning type installed. The recruitment channel for *PeakSaver* was direct mail to 7,000 customers followed up with a telemarketing campaign to those customers that did not respond to the initial direct mail campaign.

There were 75 customers telemarketed for *CoolSaver*, which resulted in 31 participants, however after 10 cancellations, the net participant number was 21, correlating to a net conversion rate of 28%. The *CoolSaver* program concluded with a total of 61 participants (including those recruited in previous years).

For *PeakSaver*, the direct mail and telemarketing campaigns resulted in recruiting 293 participants. 31 participants subsequently cancelled or were declined from the program due to inability to install a smart meter at their premises. Unfortunately, there were also 118 customers with a pre-1988 meter board (deemed to likely contain asbestos) and hence unable to have a smart meter installed, leaving 144 net participants from the 2012/13 campaign. The *PeakSaver* program concluded with a total of 394 participants (including those recruited in previous years).

There were three load curtailment Event days during the 2012/13 summer period: Friday 30 November 2012, Tuesday 8 January 2013 and Friday 18 January 2013. The results showed positive participation from *PeakSaver* participants with a kVA demand reduction per participant of 1.6kVA. The *CoolSaver* program delivered a peak demand reduction of 1.5kVA per participant.

CoolSaver RESULTS SUMMARY

	30 November 2012	8 January 2013	18 January 2013
Participants	61	61	61
Metered Participants	39	39	52
Max. Temperature	38.1°C	40.8°C	44.9°C
Average kVA Reduction / Customer	0.7kVA	1.6kVA	1.1kVA
Peak kVA Reduction / Customer	1.6kVA	1.7kVA	1.3kVA

The size of AC's on the *CoolSaver* program ranged from 4kW to 6kW maximum electrical input power.

The average demand reduction was 1.1kVA per household and the average peak demand reduction was 1.5kVA per household. The expected reduction level was 2.5kVA per household but it was revised to 1.3kVA per household after the Year 1 results. The participant numbers in Year 3 were greater than Year 1 and therefore more reflective of what future programs could expect.

PeakSaver RESULTS SUMMARY

	30 November 2012	8 January 2013	18 January 2013
Participants	237	281	310
Max. Temperature	38.1°C	40.8°C	44.9°C
Total Energy Reduction	351kWh	1,558kWh	1,997kWh
Average Demand Reduction compared to baseline	15%	33%	35%
Average kVA Reduction / Customer compared to baseline	0.30kVA	1.11kVA	1.29kVA
Peak kVA Reduction / Customer	0.42kVA	1.53kVA	1.59kVA
Median Payment	\$1.02	\$3.35	\$3.29
Average Payment	\$4.87	\$8.99	\$10.77

The highest kVA reductions achieved were after long spells of hot weather where it was anticipated that customers may not respond. This also occurred in Year 1 of the program. The average peak demand reduction was 1.2kVA per household. Without the artificially low figure on 30 November 2012, the average peak demand reduction would be 1.6kVA per household. The original anticipated reduction level was 1kVA per household but was revised to 1.7kVA per household after Year 1.

The total *PeakSaver* Bonus payment ranged from \$0 to \$149.22 and the total average payment was \$22.76, with the total median payment being \$10.99.

In conjunction with the Rooty Hill Energy Savers Program (managing commercial and industrial demand), the demand reduction achieved by the *CoolSaver* and *PeakSaver* programs, a slowing of growth and network switching, led to the North Glendenning ZS being deferred indefinitely, saving our customers and Endeavour Energy more than \$23 million.

Endeavour Energy engaged an independent research agency to conduct a quantitative survey with 61 CoolSaver and 305 PeakSaver participants. These participants were selected on the basis that they had received at least one Event day notification from Endeavour Energy. The objective of the survey was to obtain feedback in order to improve future programs and recruitment strategies.

The survey was conducted by telephone in May 2013. Participants who completed the survey received a \$25 prepaid EFTPOS card. A total of 140 participants completed the survey (40 CoolSaver and 100 PeakSaver participants).

As expected, the reasons for joining these programs were saving money on their energy bills and reducing household energy consumption. To a lesser extent, participants signed up to the programs because of environmental concerns.

"Firstly it is a win win situation – there's no cost to us and it's a worthwhile effort for the whole community." CoolSaver participant
"Because it's a necessity to reduce electricity usage and to save money." PeakSaver participant
"To save money, and because it feels good to save electricity and it's good for the environment." PeakSaver participant

Overall, satisfaction was quite good for PeakSaver (75%) and CoolSaver had met or exceeded expectations for the majority (88%) of respondents. For both programs, overall satisfaction had increased compared to 2011, where a similar survey had been conducted with a smaller sample (9 CoolSaver and 31 PeakSaver respondents).

CoolSaver SURVEY FINDINGS

Areas we did well	Areas to improve
<ul style="list-style-type: none">Product offering was seen as "a win win" with no cost to the customerLevel of information provided and registration process was generally goodInstallation of the new meter, where applicableInstallation of the energy reducing deviceCustomer satisfaction with the sign up and yearly bonuses was high (8.4 out of 10)88% said program had met or exceeded expectations	<ul style="list-style-type: none">Training of AC dealers and their technicians so they can answer customers' questions or refer them to Endeavour EnergySatisfaction with comfort levels by program participants on Event days increased compared to 2011 but was still low at 6.6 (out of 10) so better communication about the comfort levels is neededCommunicate the objectives and details of the program more

"The air conditioner provider should have more information. I did ask him a few questions that he didn't know and he couldn't provide me the information I needed."
"Inform us of the objectives; why do it on exceptional hot days, is it so the system does not overload?"

PeakSaver SURVEY FINDINGS

Areas we did well	Areas to improve
<ul style="list-style-type: none">• The level of information provided about the program – there was a notable increase in satisfaction compared to 2011, with the information provided on the website• Number of notifications was just right for the majority of participants (78%)• Installation of the new meter• 75% said had met or exceeded expectations	<ul style="list-style-type: none">• Length of telephone call for customers recruited via the telemarketing channel• More communication from Endeavour Energy throughout the program and longer notification periods were requested• 25% said did not meet expectations due to lack of impact the program had on their energy bills or they did not make as much money as they expected• Communicating how the <i>PeakSaver Bonus</i> is calculated and managing expectations• Not enough information on how to reduce energy usage on Event days• Provide additional tools to further engage participants and increase their knowledge and understanding of how to take action to reduce their energy consumption

"I had a very long phone call, if I was aware of online it may have been easier."

"Because it was extremely hot so I thought I would rather be comfortable than save a few dollars."

"We turned off all air con and all fans. We tried not to use any electricity at this time except the fridge, no washing machine everything."

"We did not put on the air conditioning, and we waited until seven to cook the rice, and usually we cook at five. We did the washing in the day."

"Other than more time with notification more time to plan with the children; also more information on energy consumption saving."

"When I first entered the program I was led to believe I would save about fifty dollars in each event but I didn't see the savings at the end of the program."

3.2 GLENMORE PARK DEMAND RESPONSE TRIAL

The Glenmore Park Demand Response trial will provide an insight into how smart meters can be used to reduce peak demand through time-based financial incentives, information from in home displays (IHDs), and direct control of air conditioners. The technology for the trial, including IHDs and AS4755 DRED controllers for air conditioners, was acquired and tested in a laboratory environment prior to a small field test for evaluation, followed by a mini trial in the Glenmore Park area prior to a larger implementation.

3.2.1 NATURE AND SCOPE

The scope of the work is to deploy the Glenmore Park Demand Response Trial to Glenmore Park residents who have existing smart meters installed at their premises (which were installed as part of a previous smart meter trial) or are within range of smart metering communications infrastructure. Under this project the following tasks are to be completed:

- Laboratory tests of vendor equipment
- Implement a small field trial of equipment for evaluation
- Perform an initial analysis of energy consumption within Glenmore Park
- Conduct targeted marketing campaign in order to sign up participants located within the Glenmore

- Park smart metering area
- Create a robust control group
- Develop a productionised demand response management system
- Test IHD and air conditioning control technology
- Validate the demand response outcomes from the trial

3.2.2 AIMS AND EXPECTATIONS

The purpose of the project is to assess:

1. The technical/usability performance of IHDs with the general public
The advancements in IHD technology are rapidly developing, with new and continued improvement in both functionality and performance. The main focus of this trial is to test the usability and technical performance of IHDs in the homes of customers in Endeavour Energy's network area.
2. The perceived benefit of IHDs to the general public
IHDs allow customers to view their household consumption in real time and also view historical usage. The IHD provides customers with a tool in which they can use to learn more about their energy usage. The IHD provides customers with a tangible interface with which they may relate to better use information communicated to it from the smart meter. The trial will qualitatively assess, via customer surveys, the perceived benefit of IHDs and the amount of electricity customers believe they may have saved as a result of its use.
3. The quantity of energy/demand reduction from IHDs (to the extent possible given small sample size)
The trial aims to quantify the energy/demand reduction from the use of IHDs by comparing the electricity use/demand reduction of IHD users with a control group (non-trial participants). Whether this is possible and to what level of statistical robustness given the relatively small sample size will depend on the size of behavioural change and other factors such as variance across customer groups.
4. The demand reduction from time-based financial incentives
The Peak Time Rebate program (marketed as *PeakSaver*) has been successfully deployed in Rooty Hill as part of a live demand management program. This program provides customers a financial incentive to reduce peak demand on selected peak days by paying \$1.50 per kWh the customer saves over the peak period compared to a forecast of their consumption over that period.

No control group was set up as part of the Rooty Hill program given that program's aim of deferral of a substation augmentation, so although it is clear that customers responded compared to a forecast of their usage, the calculation of demand reduction from a holistic network point of view requires that comparisons be made against a control group. This Glenmore Park trial aims to address this issue by determining a robust control group for Glenmore Park program participants.
5. The ability to productionise demand management initiatives for a broader rollout
The systems Endeavour Energy currently use for the *PeakSaver* program depend heavily on manual processes on systems such as Microsoft Access databases and Excel spreadsheets. One of the deliverables in this project is a Demand Response Management System which aims to address this issue by providing better integration with existing systems to reduce the chance of errors and streamline the approach to managing customers on the *PeakSaver* program.
6. The level of demand reduction achievable from one marketing campaign
Marketing campaigns involving *PeakSaver* thus far has been to achieve a set target number of participants. Although minimum targets have been set for the Glenmore Park program, the objective is to allow continued recruitment above the set minimum target number (removal of target capping), until marketing channels are fully exhausted of customer take-ups. The required investment associated with this customer recruitment will be modest, due to the relatively small volume of smart meters available in the area.

7. Technical capability to use smart metering for control of air conditioners using AS4755 interfaces
Wireless communications from the smart meter to AS4755 interfaces are new technology. The reliability through different installations are variable due to several factors that are potentially site specific such as the distance of the air conditioner to the meter, the construction material of the home, line of sight and positioning of the interface. This trial will assess these issues in real life scenarios.

3.2.3 PROJECT JUSTIFICATION

This project aims to deliver a study into *PeakSaver* as a viable option in the demand management arsenal within a network business. *PeakSaver* was run as part of the Rooty Hill Residential Demand Management program.

The deliverables of this project are as follows:

- Demand Response Management System
- Report on the peak demand reductions achieved with the various programs
- Report on the technology of IHDs and air conditioner control through smart metering communication

3.2.4 IMPLEMENTATION PLAN

The first step in this trial (Phase 0) was to select and test the technology prior to deploying the project to the public of Glenmore Park. A pilot mini-trial was established for selected staff members residing in the program area, to test the devices and their overall suitability for extended trials.

The second step (Phase 1) of this trial will only involve the Glenmore Park residents with existing smart meters installed at their residence. The total number of existing households with smart meters in Glenmore Park is 2,222. In order to achieve the target numbers specified of 150 *PeakSaver* and 200 IHD customers, each with their own control groups, the target area may need to expand beyond the current smart metering pilot area to target up to 5,328 customers (Phase 2). The expanded areas marked Areas 1-7 will not require every home to have a smart meter but to install smart meters on households that have signed up to a program such as *PeakSaver*, *CoolSaver*, IHD or have been selected as part of the control group. This measure will significantly reduce metering and installation costs.

Figure 1: Trial area and proposed phase 2 (Areas 1-7) expansion areas if required



3.2.5 IMPLEMENTATION COSTS

Expenditure claimed in 2012/13 financial year is \$61,293 OPEX and \$193,421 CAPEX covering the costs for marketing and communications, customer recruitment, customer payments and development of the Demand Response Management System.

3.2.6 RESULTS

The recruitment results showed a net conversion rate (less customer cancellations and rejections) for *PeakSaver* was 4.99%, higher than the Rooty Hill *PeakSaver* program. The net conversion rate for the IHD program was 2.15%, and unfortunately no customers were recruited for the *CoolSaver* program yet due to AC dealers either not being available for telemarketing and installations or not having eligible and contactable customers on their databases. The target numbers for the program were set as stretch targets due to the limitation placed on the projects with the small pool of potential participants deemed as customers with smart meters in Glenmore Park.

GLENMORE PARK RECRUITMENT RESULTS SUMMARY

Program	Number of Participants	Target Number	Target Achieved (Net)
<i>PeakSaver</i>	109	150	72.67%
<i>CoolSaver</i>	0	10	0%
IHD	49	200	24.50%
Demographic Survey	85	700	12.14%
Total Customers (Net)	243	1060	23.14%

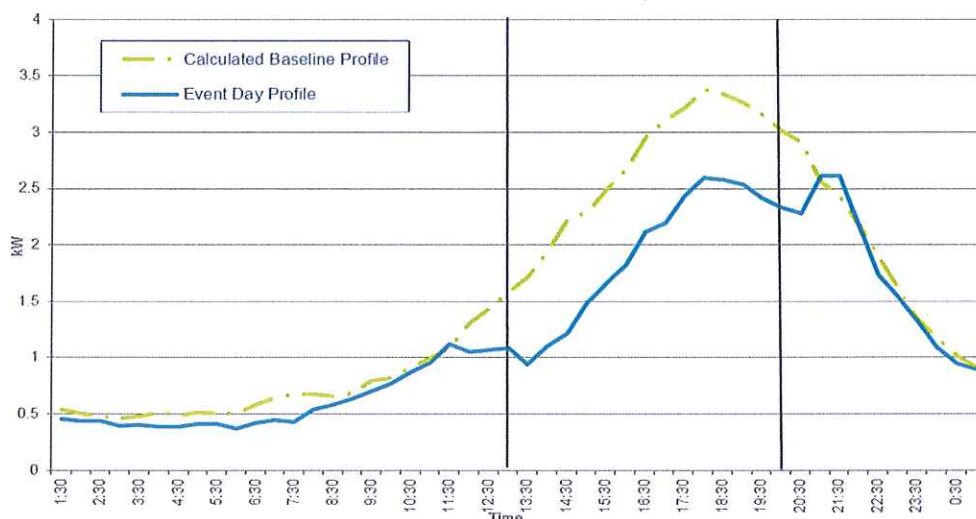
The summary of results from the three Event days during the 2012/13 summer.

PeakSaver RESULTS SUMMARY

	8 January 2013	17 January 2013	18 January 2013
Participants	20	89	89
Max. Temperature	42°C	36°C	46.5°C
Total Energy Reduction	1,220kWh	2,025kWh	2,691kWh
Average Demand Reduction compared to baseline	51.3%	29.3%	29.5%
Average kVA Reduction / Customer compared to baseline	2.18kVA	0.81kVA	1.32kVA
Peak kVA Reduction / Customer	3.45kVA	0.92kVA	2.35kVA
Median Payment	\$15.22	\$6.22	\$7.16
Average Payment	\$18.95	\$11.09	\$15.25

The average peak demand reduction was 1.4kVA per household.

Average of PeakSaver Load Profiles on 17 January 2013, Max Temp = 36°C



The full report and detailed statistical analysis will be conducted after the program has completed.

3.3 DATA ANALYSIS AND REPORTING

3.3.1 NATURE AND SCOPE

Provide statistical and data analytical services to continue analysis and reporting of Blacktown Solar City project, *PeakSaver* and *CoolSaver* Residential Demand Management Programs, pilots and trials of current energy efficiency and demand management programs, including the Smart Grid Pilot

3.3.2 AIMS AND EXPECTATIONS

Comprehensive analysis to include the following:

- Analysis and reporting of Blacktown Solar City project with detailed statistical studies into changes in customers behaviours to respond to peak demand
- Analysis and reporting of our demand side alternatives to network augmentation in Rooty Hill - *PeakSaver* and *CoolSaver* Residential Demand Management Programs
- Analysis and evaluation of recruitment test groups and control groups of energy efficiency and demand management programs proposed for the Smart Grid Pilot
- Ad-hoc energy efficiency, demand management statistical and data analysis

3.3.3 PROJECT JUSTIFICATION

There was an urgent requirement for data analytical services for a number of demand management programs. The engagement of an external service provider, with broad experience utilising a team of statisticians, provides certainty and independence of the trial results. The requirement to develop statistically robust trials by providing target numbers for specific demand management trials requires additional skills that were provided externally.

3.3.4 IMPLEMENTATION PLAN

Western Sydney Pricing Trial and Blacktown Solar City Load Control Trial de-identified data was provided for approximately 5,000 households down to a granularity of 30 minute load profile intervals. Data for the analysis was supplied in a secured format using encryption software.

Deep level analysis was required in the areas of demand response:

- Change in behaviour on an extreme hot summer day
- Change in behaviour on an extreme cold winter day
- Response according to temperature

- Relative demand in relation to maximum daily temperature
- Response over time
- Response in relation to notice period of a pricing event
- Response over consecutive price event days
- Response in relation to having an IHD monitor

Energy savings analysis was to include customer energy savings from pricing trial participation.

This project also covers pre-trial design work involving sample size analysis and demographic breakdown of participants for our current demand management projects, and planning for future projects.

3.3.5 IMPLEMENTATION COSTS

In 2012/13, costs totalled \$55,558, all of which was OPEX.

3.3.6 RESULTS

The Blacktown Solar City project was established and co-funded by the Australian Government to help inform energy policies and programs. It was launched on 27 July 2007 for a period of 6 years and involved residents and businesses in the 47 suburbs of the Blacktown local government area.

The project included 15 elements including solar photovoltaic and energy efficiency offerings. Endeavour Energy was responsible for delivering the residential energy efficiency, pricing and load control trial elements as well as data management and metering. The objectives of the Endeavour Energy-led elements were to demonstrate the economic and environmental impacts of integrating cost reflective pricing with concentrated uptake of energy efficiency and smart metering technologies, and to identify and implement options for energy efficiency and electricity demand management in urban areas.

MAJOR RESULTS FOR ENDEAVOUR ENERGY OF BLACKTOWN SOLAR CITY AND WESTERN SYDNEY PRICING TRIAL PROJECTS SUMMARY:

Program	Avg Peak Demand Reduction (kW)	Peak Demand Reduction (%)	Bill Impacts (average savings)*
AC Load Control	0.50	19	Insignificant (not analysed)
Pool Pump Control	0.23	7.4	Insignificant (not analysed)
BSC DDP Light	0.50	31	8.1%
BSC DDP Medium	0.42	20	9.2%
BSC STOU	0.06	5.4	5.4%
WSPT with IHD	0.71	43	27.6%
WSPT without IHD	0.64	37	27.3%
WSPT STOU	0.03	3.0	7.2%

*The percentage paid under the specific program tariff compared with the amount paid under the standard inclining block.

Another significant result arising from the program was that the IHD was popular and used for tracking peak periods, energy use and cost. Customers on the WSPT dynamic peak pricing trial with an IHD achieved 43% peak energy reduction during the summer load control events compared to 37% without IHDs. The results arising from the Blacktown Solar City and WSPT projects have assisted Endeavour Energy develop its current and future demand management programs. Full analysis reports will be available and released by Endeavour Energy during the current financial year.

4.0 NEW PROGRAMS FOR APPROVAL

This section outlines the projects for approval by the AER.

4.1 CHANGING CONTROLLED LOAD 2 SWITCHING SCHEDULE

The purpose of this project is to change the current Controlled Load 2 (CL2) summer heating times so that the energy supply does not coincide with the summer afternoon peak. CL2 switching times operate up to 5pm. Endeavour Energy system peak usually occurs between 1pm and 8pm during the summer period.

The cost benefits analysis indicates network wide shift of over 8,000MWh of energy per year away from peak times and a minimum demand reduction of 10MW. This translates to over \$3.5m benefits per year using the current LRMC figure of \$331/kVA/annum.

4.1.1 NATURE AND SCOPE

The purpose of the project is to trial the new CL2 switching program using the existing hot water AFIC control system. The new program restricts CL2 operation between the hours of 1pm and 8pm during weekdays, resulting in an increased capacity during the peak demand periods.

Changing the CL2 switching times to incorporate:

- Winter Weekdays: continuous 7.5 hours commencing 10pm and continuous 6.5 hours commencing 9am staggered with various CL2 channels
- Summer Weekdays: continuous 13.5 hours commencing at 10pm staggered with various CL2 channels
- Weekends: continuous 18 hours commencing at 10pm staggered with various CL2 channels

Stage 1 in the summer of 2012/13 is a trial involving the zone substations of Marayong, Leabons Lane and Kingswood. Stage 2 network wide deployment will follow, pending successful trial results.

4.1.2 AIMS AND EXPECTATIONS

Demand management is ever more increasingly becoming a part of Endeavour Energy's arsenal in tackling the issue of rising peak demand growth. The realignment of the CL2 switching to match network capacity is seen as a simple project that nets large benefits from a comparatively small expenditure.

4.1.3 PROJECT JUSTIFICATION

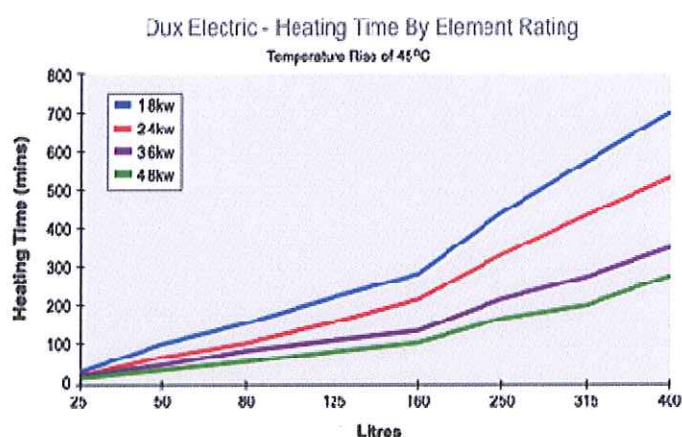
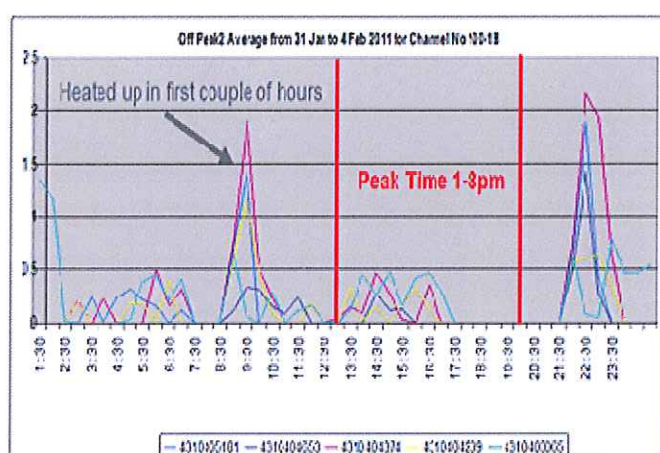
The current operational hours of CL2 range between 12-19 hours per day including the peak time periods of 1pm to 5pm on weekdays with extended heating on Sundays.

The operation of CL2 during peak periods undermines the intention of CL2, which is to supply electricity during off-peak periods, and also reduces the attractiveness of using CL2 for other demand side management (DSM) initiatives. This situation needs to be addressed, and it is proposed that Endeavour Energy trials a revised CL2 timing schedule at Marayong, Leabons Lane and Kingswood in 2012/13, followed by network wide implementation.

The Endeavour Energy network has around 102,000 customers with CL2 storage heating consuming a total of 106,000MWhr of energy during the summer period of November to March each year.

November to March	Controlled Load 2 (MWh)	Controlled Load 2 (Customers)
2011/12	106,365	102,683
2010/11	108,941	103,355
2009/10	106,328	102,978
2008/09	112,424	102,978

An example of the peak consumption of CL2 can be seen below, the graph clearly shows energy consumption between the peak period of 1pm to 8pm:



The above graph also shows that the peak consumption of CL2 is during the initial one to two hour period when the power is restored to the hot water system. The worst case scenario for a large hot water system with a full tank of cold water is 6 hours of heating for a 3.6kW system. The changes in the proposed switching program will allow for 13.5 hours of continuous heating in summer and 2 blocks of 7.5 hours and 6.5 hours in winter ensuring enough time for hot water systems to heat.

4.1.4 IMPLEMENTATION PLAN

It is expected that Stage 1 will commence in November 2012 and Stage 2 will commence in 2013 pending the successful outcome of Stage 1. The deployment of the new CL2 switching for the 150 zone substations will be targeted to be completed by the end of 2015.

- A trial at three zone substations (Marayong, Leabons Lane and Kingswood) be conducted, shifting the CL2 switching times outside the peak period of 1pm to 8pm during the summer months (November to March) at a cost of \$24,000;
- If stage 1 proves successful, approval will be requested to implement the new CL2 switching times in all zone substations.

4.1.5 IMPLEMENTATION COSTS

Expenditure claimed in 2012/13 financial year for stage 1 of the trial was \$2,273 OPEX.

4.1.6 RESULTS

The results from the trial in 2012/13 will be analysed prior to the implementation to all zone substations.

5.0 STATEMENT

Endeavour Energy confirms the funding of the projects contained in this report:

- 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).