



# Ausgrid Demand Management Cool/Saver Interim Report

February 2017



[www.ausgrid.com.au/cool saver](http://www.ausgrid.com.au/cool saver)

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# 1 Executive summary

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Air conditioners used to cool homes and businesses are a significant contributor to peak demand on hot summer days. They are the largest residential appliance with no load control option currently available to customers and offer significant potential for residential peak demand reductions. It is estimated that residential air conditioners contribute about 20-25% of the Ausgrid system summer peak demand. The Ausgrid *CoolSaver* trial aims to explore ways to reduce the impact of peak demand from residential air conditioners by partnering with customers and offering direct incentives for controlling their air conditioners on peak summer days.

The *CoolSaver* trial is funded through the Demand Management Innovation Allowance (DMIA) approved by the Australian Energy Regulator. This allowance provides funding to explore new innovative demand management solutions. It enables network companies to develop cost-effective demand management options that could potentially offer a lower cost option for addressing a network investment than supply side solutions. Delivering safe and reliable electricity at the lowest cost helps to keep power bills lower for all customers in the long term.

One of the main objectives of the *CoolSaver* program was to trial low cost technology and communications solutions that did not require a costly smart meter roll-out. The voluntary adoption of the Australian standard AS/NZS 4755 by a number of air conditioner manufacturers and the development of commercially available demand response enabling devices has also substantially lowered the potential cost to introduce direct load control to air conditioners.

The *CoolSaver* trial so far has progressed through four phases targeted at testing different objectives including technology options, customer response, incentives and sales approaches and different seasons.

**Phase 1:** During 2012/13 the trial was commenced by developing and testing demand response enabling device technologies and solutions applicable for Ausgrid's network. This included testing a commercially available ripple frequency signal receiver with Ausgrid control systems and the development of a new signal receiver based on mobile phone communications technologies and SMS commands. This phase of the trial also included the preliminary testing of this signal receiver on a small number of AS4755 air conditioners at the homes of Ausgrid staff.

Testing in Phase 1 confirmed the viability of the technology and the trial was extended to explore customer response and demand reduction outcomes to control of residential air conditioners.

**Phase 2:** In December 2013, a customer offer was made in parts of the Central Coast and Lake Macquarie areas with 109 households selecting to participate in the *CoolSaver* program. The primary aims of this phase of the trial were to further test the technology but more importantly to understand customer response and acceptance to a customer offer with a direct incentive for participation.

Over the course of three summer seasons, Ausgrid received consistently positive survey feedback from participating households with 107 participants 2014/15 and 90 in 2015/16. In 2015, a total of 90 participating households (84%) extended their participation in the trial to a third summer period in 2015/16; and in 2016, 79 households (88%) extended their participation through to the end of summer 2016/17. Of the 10 customers who have declined to continue with the trial, 70% were due to residents having moved out of their property and 30% did not wish to continue.

Analysis of customer energy use from monitoring equipment built into the demand response devices has shown that the average demand reductions achievable on hot summer days was 1.5 kVA average per customer for systems >10kW cooling capacity and 0.7 kVA per customer for systems with a cooling capacity between 4 and 10kW.

In the Central Coast, where participants have the option of overriding a dispatch event, very few participants chose to do so. Over the course of 2014/15 and 2015/16 summer seasons, customers selected to override on only 4.3% of customer dispatch events. There is a small reduction in the annual incentive payment to customers when they override an event.

While the results of the Phase 2 trial have consistently shown promise, the cost to identify and register customers into the program has been high. To explore a potentially lower cost customer acquisition model, a further Phase 3 was introduced.

**Phase 3:** Launched in February 2015, this phase has partnered with appliance retailers and air conditioner installers in Maitland to trial a sales model designed to reflect a possible future customer approach that might achieve the lower customer acquisition costs considered sufficient to successfully defer network investments. This phase of the trial was targeted at acquiring customers at the point of sale of new AS4755 compliant air conditioners with a full launch by retailers occurring in Spring 2015 and continuing throughout the 2015/16 summer period.

From February 2015 to May 2016, a total of three local Maitland retailers and two large, local air conditioner sales/installation companies were supplied with marketing materials, training and program support and financial incentives to both the business and sales associates. Incentives were made available to encourage participation from both new buyers of air conditioners and owners of existing, AS4755 compliant air conditioners. Over this period, a total of 27 customers joined the program and of these, 9 were for new air conditioners and 18 for existing air conditioners.

This take up rate was well below expectation. Analysis of the retail sales data over the period shows that of the 502 AS4755 compliant air conditioners sold, only 9 customers selected the *Cool/Saver* offer. Of the remaining 18 participants, 13 were acquired through an Ausgrid mail-out to 5,000 local households and 5 direct with our local installer partners.

A key finding from this phase was the difficulty in driving customer uptake for a local area through third party sales channels while adequately managing the risk and providing a least cost solution. It appears that the amount of money such a program can provide to third party facilitators (ie. retailers and installers) is not sufficient for them to divert from their business as usual activities.

**Phase 4:** In June 2016, the project was modified to explore the customer response to the use of the demand response technology in winter. Use of reverse cycle air conditioners for winter heating is increasingly common with 80% of survey respondents from our 2015/16 *Cool/Saver* survey indicating that they used reverse cycle air conditioners as their primary heating source. As about half of Ausgrid's zone substations are winter peaking or potentially winter peaking in the near future, this trial leverages current DMIA project activities and load control equipment already in place to explore a potentially cost effective demand management solution.

A customer offer was made in June 2016 to 55 existing *Cool/Saver* participants in the Central Coast area, with 27 accepting the offer to participate. Over the course of the winter period of June to Augusts, a total of 5 dispatch events were initiated on cold winter evenings when demand for electricity was high. Though all customers had the option of overriding the dispatch event, only one customer chose to override during 2 events.

After the trial concluded participants in the winter trial were invited to complete a survey asking them about their attitudes and experience during the winter trial.

The *Cool/Saver* trial will close at the end of the 2016/17 Summer. Following completion of the analysis of the results from the final season, a final consolidated report will be published on Ausgrid's website at [www.ausgrid.com.au/dm](http://www.ausgrid.com.au/dm).

## 2 Project background

### 2.1 Impact of residential air conditioners on peak demand

Peak electricity demand events occur when demand for electricity is significantly higher than the historical average. These events are relatively rare, occurring on average only about 20-40 hours in a year or less than 0.5% of the time. Peak demand is the primary driver of network augmentation investment, which can add to electricity prices paid by consumers through the network component of electricity bills.

To assess the impact of air conditioner use on peak summer days, Ausgrid analyzed the half hour meter data for 250,000 Ausgrid residential customers on key peak demand days. The results, described in Figure 1 below, show that on the historical peak day of 3 Feb 2011, electrical demand increased by an average of one and a half times (147%) in comparison with a moderate summer day a week later. This increase is equal to about 400 MW of electricity demand, or 1600 watts per household.

It is estimated that in 2011, residential air conditioners comprised about 1300-1700 MW of the overall Ausgrid system peak of 6300 MW, or about 20-25% of total peak demand.

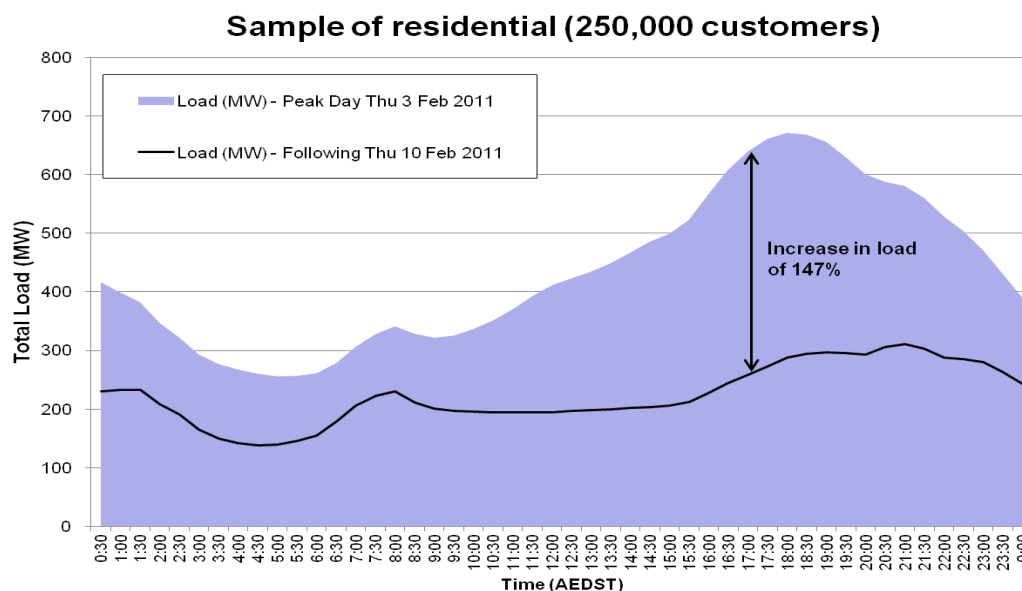
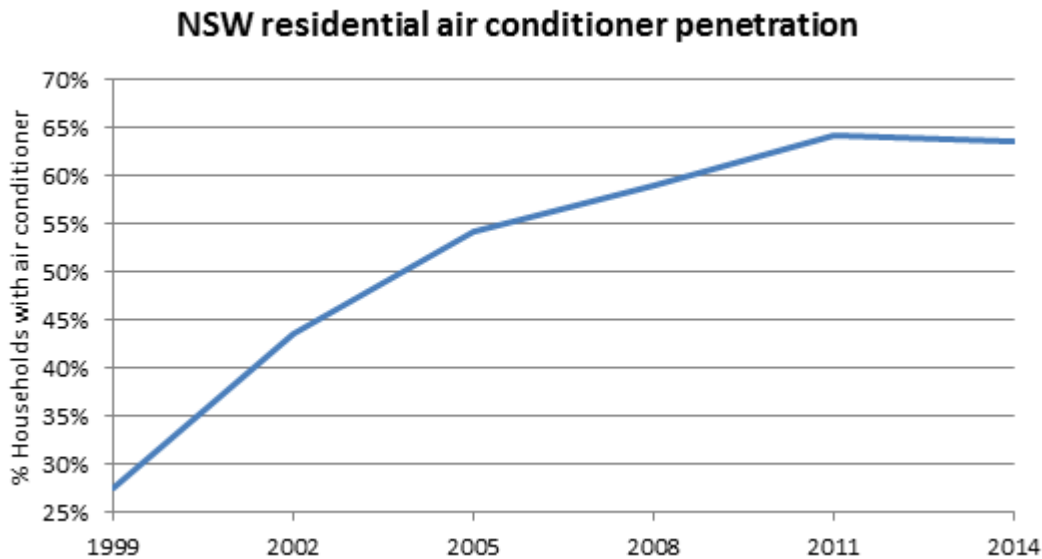


Figure 1: Electrical demand for peak day 3 Feb 2011

### 2.2 Penetration of residential air conditioners

In the past Ausgrid's distribution network was predominantly a winter peaking network; that is, most network assets reached their annual peak in the winter season. But since about 2000, the trend has been for an increasing number of network assets to reach their maximum demand in summer. This is due primarily to the increased use of air conditioners in homes and businesses and the replacement of electric resistance heaters with gas heaters and reverse cycle air conditioners for winter heating.

Survey data compiled by the Australian Bureau of Statistics (ABS) provides an estimate of the percentage of households with an air conditioner used for cooling in summer. According to the ABS survey data, in 1999, 28% of households in NSW had air conditioners. By 2014, 64% or about two thirds of households in NSW had an air conditioner. NSW air conditioner penetration is shown in Figure 2.



**Figure 2: NSW residential air conditioner penetration 1999-2014. Source: ABS survey data**

The most recent ABS reports indicate that this penetration rate has stabilised at about 64%. While this indicates that the share of households with air conditioners is not increasing, air conditioner sales data and anecdotal evidence from the air conditioning industry indicates that the total living area being cooled continues to increase. This shows that the current measure of penetration rate may be insufficient to forecast future electricity demand and that a new measure is required to adequately track the influence of air conditioners on peak electricity demand.

### 2.3 Australian Standard AS/NZS4755

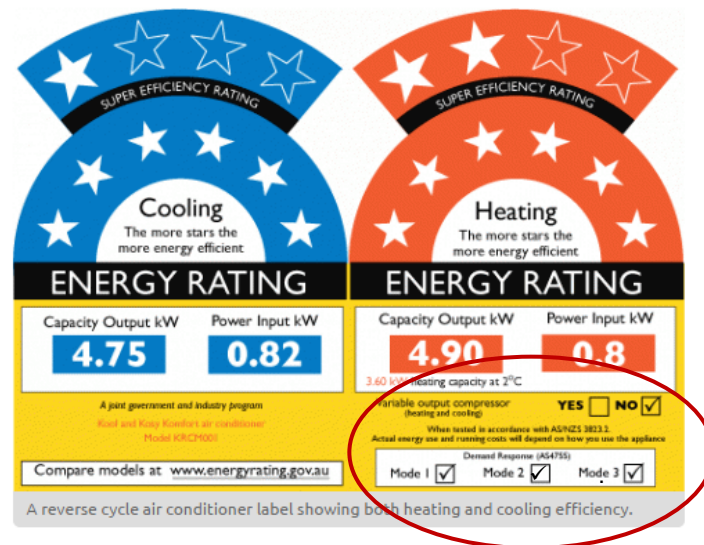
Australian Standard AS/NZS 4755 is the standard defining the framework for demand response capabilities and supporting technologies for electrical products. This standard has not been mandated as yet, but an increasing number of air conditioner manufacturers have voluntarily adopted the relevant demand response standard (AS/NZS 4755.3.1) and are offering compliant appliances in the Australian market.

A demand response enabling device, or signal receiver (figure 3), is an electronic device that is connected to an AS/NZS 4755 compliant air conditioner. It offers the ability to remotely switch the air conditioner into a demand response mode DRM1, DRM2 or DRM3 at times of peak demand to cap the rated input power consumption on hot days.



**Figure 3: Demand response enabling device/ Signal receiver (3G model used for Phase 3 of the trial)**

Figure 4 below shows a typical [energy rating](#) label that you would find on air conditioners. The air conditioner is AS/NZS 4755 compliant when the label indicates the availability of a demand response mode and has full capability under the standard when all three demand response modes 1, 2 and 3 are ticked.



**Figure 4: Energy rating showing demand response modes 1, 2 and 3**

Demand response mode 1 turns the air conditioner compressor off, mode 2 reduces the air conditioner capacity to 50% of rated capacity and mode 3 reduces the air conditioner capacity to 75% of capacity. The Ausgrid CoolSaver trial uses modes 2 and 3.

In total, there are over 500 models of air conditioners that are AS4755 compliant either out of the box or with an additional part supplied by the manufacturer that needs to be installed. Using demand response ready air conditioners also means that the manufacturer's warranty remains valid and the air conditioner is designed to operate in these modes.

## 2.4 Similar trials by network service providers

Earlier trials of air conditioning load control by SA Power Networks in South Australia, Energex in Queensland and Endeavour Energy in NSW explored customer acceptance and technical solutions prior to the development of the AS4755 standard.

These trials indicated that consumers would be willing to accept some level of external control of their air conditioner. However, a key barrier was that control modifications to existing residential air conditioners were costly and carried some risk as modifications were not supported by the air conditioner manufacturer potentially voiding warranties. The high costs and risk demonstrated by these earlier trials indicated that air conditioning load control did not offer a cost effective demand management solution under such a program model.

More recently, trials by Energex in Queensland and Endeavour Energy in NSW using AS4755 compliant air conditioners have shown more promising results. The use of existing network ripple control systems to signal the AS4755 demand response devices has offered a potentially cost effective solution for air conditioner load control to address peak demand. Ripple frequency control systems send a signal down the power lines and have traditionally been used to activate switches mounted on household meter boards to control off peak electric hot water storage systems.

There are over 2.3 million customers across NSW and QLD and over 500,000 in Ausgrid's network area on these controlled load tariffs that predominantly use a ripple frequency injection system to control electricity supply to domestic electric storage hot water systems. In return, customers receive lower electricity charges for their hot water system through off peak tariffs OP1 and OP2 in NSW and Tariffs 31 and 33 in Queensland.

Energex has been the most successful with air conditioner demand response programs reporting over 53,000 customers in their Peak Smart air-conditioner load control programs in their [2016/17 Demand Management Plan](#).

### 3 Trial objectives

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The overall objectives of *CoolSaver* are to:

1. Explore and trial an innovative way to partner with residential customers to reduce peak demand by activating the demand response modes of AS4755 compliant air conditioners;
2. Build upon the learnings from similar trials by Energex, Ergon and Endeavour Energy; and
3. Verify the costs and benefits of air conditioner load control so as to determine whether the solution offers a viable cost effective alternative to expanding the network.

The operational trial program objectives were staged with specific trial activities introduced as performance milestones. When these were achieved, this warranted continuation of the trial. The phases of the trial program are as follows:

1. Develop and trial different technology options not reliant on a smart meter interface to verify the reliability and performance of the equipment used to enable the demand response mode of air conditioners;
2. Identify levels of customer response and acceptance to an offer designed to reflect a likely future network offer or electricity retailer tariff; and
3. Trial a program sales model designed to reflect a likely future customer approach that would achieve both lower customer acquisition costs and lower complexity for customers.
4. Explore the customer response to the use of the demand response technology in winter.



## 4 Trial overview and results

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The trial program so far has consisted of four phases as outlined below:

Phase 1: Develop and test demand response devices (including staff trial)

This phase started in summer 2012/13 and included lab testing and a small Ausgrid staff trial. The staff trial was continued until summer 2014/15 and has now been completed.

Phase 2: Customer trial in Central Coast and Lake Macquarie (109 customers)

This phase started in summer 2013/14 and has since been extended to the end of summer 2016/17.

Phase 3: Customer trial in the Maitland area (28 customers)

This phase started in summer 2014/15 and was preliminary launched in stores in the Maitland area late in summer 2014/15. The full launch occurred in Spring 2015 and the trial program will conclude at the end of summer 2016/17.

Phase 4: Winter trial in the Central Coast area (27 customers)

This phase was implemented for winter 2016 and is now complete.

### 4.1 Phase 1 – Develop and test demand response device

#### 4.1.1 Overview

As outlined in Section 3, the objective of the trial was to develop and trial technology options for managing peak demand from residential air conditioner that were not reliant on the installation of a smart meter and associated communications system.

While previous trials by other network service providers had tested the use of a ripple signal demand response device to enable the power savings modes on AS4755 compliant air conditioners, there had been no trial of a direct telecommunications link to operate the demand response device.

There are some aspects of air conditioner load control that would benefit from the two way communications offered by a telecommunications link with the signal receiver. In particular, the ability for a customer to override an individual peak event was recognised as a possible key barrier to higher customer take-up.

A further important consideration relates to future deactivation of signal receivers and the need for an electrician to visit the site to remove ripple signal receivers in order to deactivate. In comparison, devices operated via a telecommunications signal can be deselected from a peak event or permanently deactivated remotely.

The trial also tested a ripple signal receiver device to verify reliability and functionality with Ausgrid's ripple control system.

Further detail is presented in the *CoolSaver Interim Report September 2015* available at [www.ausgrid.com.au/dm](http://www.ausgrid.com.au/dm).

## 4.2 Phase 2 – Test customer response to an offer

### 4.2.1 Overview

In this second phase, the trial sought to identify the level of customer response and acceptance to an offer designed to reflect a likely future network offer or electricity retailer tariff. Other objectives were to understand the number of AS4755 compliant air conditioners already installed at existing homes and test the two preferred technology options; (1) ripple signal receivers and (2) signal receivers that utilized the existing mobile phone network using SMS protocols for activating demand response modes. Both signal receiver options allowed us to remotely activate the air conditioners in-built power saving modes.

For this phase, two separate areas were selected to trial each of the technology options. For the ripple signal receiver component of the trial, 7 adjacent suburbs around the Cardiff and Mount Hutton zone substations in the Lake Macquarie area were selected. For the telecoms signal receiver component of the trial, 8 adjacent suburbs around the Charmhaven zone substation in the Central Coast area were selected. Selection of the trial areas were not based on any forecast network needs but on a number of factors related primarily to trial operations, including choosing zone substations that had a residential summer peaking load profile. All customers made an offer were able to participate in the trial program provided they were the owner of the property and they had an eligible AS4755 air conditioner.

The offer to customers was developed from Choice modelling completed to test various demand management program offers and was composed of two separate elements; an initial payment and annual reward payments over two summers. The initial payment was designed to offer an immediate reward to customers for signing onto the program while the annual reward payments reflected an estimate of a cost effective annual deferral value to the network for the average air conditioning system.

Offer terms and conditions set out that there would be a maximum of 8 peak events per season of between 4 and 6 hours per event. Peak events were selected when the electricity network experiences high demand on hot summer days on working weekdays.

The customer payment details of the offer made to customers is listed in the table below. Payment was via Coles Group and Myer or Woolworths WISH gift cards.

Offer element	Customer payment maximum
Installation reward	\$160
Summer 2013/14 rewards	\$120
Summer 2014/15 rewards	\$120
<b>Total Initial Offer (3 years)</b>	<b>\$400</b>

**Table 1 – Central Coast and Lake Macquarie initial offer**

The signal receivers and any additional parts required to enable the demand response modes were installed by a qualified air conditioner technician at Ausgrid's cost. Aided by learnings from phase 1 of the trial, installation of the signal receivers progressed smoothly with few issues, which was recognised in our survey of participants (survey reports available at [www.ausgrid.com.au/dm](http://www.ausgrid.com.au/dm)).

From the survey results (Section 5), onerecipient said: *“everything was simple and easy. Installation was done when they said it would be done and it just works, nothing to be done by me”*.

### Central Coast area

For the Central Coast component of the trial, an upgraded 3G compatible signal receiver was developed by Ausgrid to enable the demand response modes.

The upgraded 3G signal receivers included a current sensor that was installed on the air conditioner to verify the peak event operations and determine the actual demand reductions from individual participants. Due to the small scale of the program, measurement of demand reductions at the network level was not viable.

On the morning of a *CoolSaver* peak event, participants were notified by SMS to their nominated mobile number, detailing the *CoolSaver* peak event start time and duration. Participants confirmed in the survey that notification was a positive aspect to the trial operation.

From the survey results (Section 5), one recipient said: *“while not necessary it was nice to be notified when the CoolSaver trial was on”*.

A feature of the trial for Central Coast participants was the option to opt out of a *CoolSaver* peak event using the capability of the 3G signal receiver installed. This capability was featured in the original customer offer to the Central Coast participants and required customers to send an SMS response back to Ausgrid at the time of the peak event to enable the override feature. As a condition of the offer, where participants opted out of a peak event, the total summer rewards were reduced by \$20 each time they opted out.

### Lake Macquarie area

Lake Macquarie participants did not have the option to opt out of individual peak events because the ripple signal receiver does not allow this functionality. Customers did have the option to opt out of the *CoolSaver* trial in its entirety at any time (as did Central Coast participants). These participants did not receive any notifications of the peak demand events, but could call Ausgrid if they noticed any significant difference in air conditioner performance.

### Summer 2015/16 trial extension

As peak event days in 2013/14 and 2014/15 included few high temperature days, the trial was extended to 2015/16 to potentially better understand the response by customers under these conditions and test the willingness of customers to participate over an extended number of seasons.

The program extension also included a reduction in the annual summer reward payments to reflect a better understanding of the likely future payment levels and a further refinement to the annual rewards based on the size of air conditioner. The revised 2015/16 offer is detailed in the table below.

Offer element	Customer payment maximum (Air conditioner <10kW*)	Customer payment maximum (Air conditioner >10kW*)
Summer 2015/16 rewards	\$50	\$100

\* kW is the rated cooling capacity output of the air conditioner.

**Table 2 – 2015/16 Extension offer**

### **Summer 2016/17 trial extension**

To more acutely test perceptions of peak events for participants who receive no notifications and to further refine the diversified demand reductions data, the trial was extended for one final year to the end of summer 2016/17.

Offer conditions and reward payments were established at the same rate as for Summer 2015/16.

## **4.2.2 Participation results**

### **Initial customer participation (summer 2013/14)**

To identify levels of customer response and acceptance to the original offer, the *CoolSaver* trial was direct marketed to 16,141 households in selected areas of the Central Coast and Lake Macquarie using personalised letters and telemarketing. The direct marketing invited householders to register their interest to participate in the *CoolSaver* trial via an online form. Registration of interest letters were sent out during December 2013 and January 2014 with a closing date in February 2014 to submit a registration of interest. The letters sent out were targeted at separate houses in the selected suburbs with a medium to large annual energy consumption on the primary tariff (>4MWh per year) thereby targeting domestic customers that were more likely to have an air conditioner.

Of the 16,141 households approached, 1205 (or 7.5%) registered their interest in participating in the trial. Of the 1205 customers who registered their interest online, only 134 (11%) were found to have an eligible air conditioner installed in their home with most of these models requiring an additional part to be installed to activate the demand response interface. From the 134 eligible customers, offers were made to the 129 customers who resided inside the trial areas. A total of 112 (87%) households accepted the offer and 109 installations were completed successfully; three installations not being completed due to safety and technical issues. Of the 109 trial participants, there were 69 households in the Central Coast trial area and 40 households in the Lake Macquarie trial area.

A total of 82 participants had a system with greater than 10kW cooling capacity, 25 participants had a system with a cooling capacity between 4kW and 10kW and 2 participants had a system with a cooling capacity less than 4kW.

Further detail is presented in the *CoolSaver Interim Report September 2015* available at [www.ausgrid.com.au/dm](http://www.ausgrid.com.au/dm).

### **Customer Opt-outs during initial trial**

Over the 2013/14 and 2014/15 trial periods there were a total of four participants who opted out of the trial. In three instances, this was due to the customer moving out of the home. The signal receivers were removed and no attempt was made to contract the new residents of the home. There was one customer who removed and returned the signal receiver due to a technical issue with the air conditioner potentially caused by the signal receiver. After further investigation and discussion with the customer it was concluded that the technical issue was due to the original installation of the air conditioner system and not related to the installation of the signal receiver. The signal receiver was not re-installed.

### **Summer 2015/16 trial extension**

In April 2015, an offer was made to the remaining 105 participants to extend the trial to the end of summer 2015/16. Of these, one customer was planning to move house in September 2015 and another 14 customers decided not to continue in the trial for summer 2015/16. This left a total of 90 customers (86%) continuing in the trial for another summer. Of the 90 remaining participants, 34 were in the Lake Macquarie trial area and 56 were in the Central Coast trial area. Both areas have similar continuation rates of 86-88% when excluding customer move-outs.

### Summer 2016/17 trial extension

In April 2016, an offer was made to the remaining 34 participants in the Lake Macquarie trial area to extend the trial for another summer. All of the remaining participants (100%) of the participants accepted the offer.

In October 2016, an offer was made to the remaining 56 participants in the Central Coast trial area to extend the trial for another summer. A total of 45 (80%) of the participants accepted the offer. Of the 11 customers who do not continue, 7 had moved out of the property (or 12% of the total participant numbers).

Including customers moving home, the resultant retention rate is 65% (45 of 69) for the Central Coast trial area and 85% (34 of 40) for the Lake Macquarie trial area over the entire four year customer trial period.

### 4.2.3 Peak event results

Through to the end of Winter 2016 there have been 15 summer peak dispatch events and 5 winter peak dispatch events using both Demand Response Modes 2 and 3. DRM2 reduces the input power to 50% of rated input power and DRM3 reduces the input power to 75% of rated input power.

Summer peak events were initiated when the maximum temperatures at a local weather station was forecast to exceed about 30-32°C on working weekdays. In some instances, actual maximum temperatures were lower than forecast. Table 3 below has a summary of all 15 summer peak dispatch events. Note that in 2014/15 there were only three peak events due to fewer days where the maximum temperature was forecast to exceed 30-32°C on working weekdays.

Winter peak events were initiated when the minimum temperature at a local weather station was forecast to be below about 5-6°C on working weekdays. In some instances, actual minimum temperatures were higher than forecast. Table 10 below has a summary of all 5 winter peak dispatch events.

Date	Day of week	Start Time	Finish Time	Mode	Max. Daily Temp (°C)	Participants	Number of Overrides
<b>2013/14 Dispatch events in Central Coast (SMS)</b>							
15/01/2014	Wednesday	3:30pm	7:30pm	DRM2	31.5	3	-
16/01/2014	Thursday	3:30pm	7:30pm	DRM2	30.4	3	-
31/01/2014	Friday	3:30pm	7:30pm	DRM2	29.9	9	-
19/02/2014	Wednesday	3:00pm	7:00pm	DRM2	28.9	26	-
25/02/2014	Wednesday	3:00pm	7:00pm	DRM2	27.0	33	-
18/03/2014	Tuesday	3:00pm	7:00pm	DRM2	28.8	69	-
<b>2013/14 Dispatch events in Lake Macquarie (Ripple Receivers)</b>							
15/01/2014	Wednesday	3:30pm	7:30pm	DRM3	30.8	9	N/A
16/01/2014	Thursday	3:30pm	7:30pm	DRM3	33.7	11	N/A
31/01/2014	Friday	3:30pm	7:30pm	DRM3	33.0	13	N/A
19/02/2014	Wednesday	3:00pm	7:00pm	DRM3	32.0	22	N/A
20/02/2014	Thursday	3:00pm	7:00pm	DRM3	27.3	22	N/A
25/02/2014	Wednesday	3:00pm	7:00pm	DRM3	29.3	30	N/A
18/03/2014	Tuesday	3:00pm	7:00pm	DRM3	29.5	36	N/A

Date	Day of week	Start Time	Finish Time	Mode	Max. Daily Temp (°C)	Participants	Number of Overrides
<b>2014/15 Dispatch events in Central Coast (SMS)</b>							
3/12/2014	Wednesday	3:00pm	7:00pm	DRM2	35.8	66	1
17/02/2015	Tuesday	3:00pm	7:00pm	DRM2	28.3	66	1
20/03/2015	Friday	2:00pm	7:00pm	DRM2	33.9	66	1
<b>2014/15 Dispatch events in Lake Macquarie (Ripple Receivers)</b>							
17/02/2015	Tuesday	3:00pm	7:00pm	DRM2	29.2	40	N/A
20/03/2015	Friday	3:00pm	7:00pm	DRM3	37.3	40	N/A
<b>2015/16 Dispatch events in Central Coast (SMS)</b>							
20/11/2015	Friday	4:00pm	8:00pm	DRM2	40.8	56	3
26/11/2015	Thursday	2:00pm	6:00pm	DRM2	39.0	56	5
14/01/2016	Thursday	2:00pm	6:00pm	DRM2	39.9	56	6
25/02/2016*	Thursday	3:00pm	7:00pm	DRM3	39.0	56	6
10/03/2016	Thursday	3:00pm	7:00pm	DRM2	29.7	56	0
<b>2015/16 Dispatch events in Lake Macquarie (Ripple Receivers)</b>							
20/11/2015	Friday	4:00pm	5:15pm (Cancelled)	DRM3	39.7	34	N/A
12/01/2016	Tuesday	3:30pm	7:30pm	DRM3	38.0	34	N/A
14/01/2016	Thursday	2:30pm	5:40pm (Cancelled)	DRM3	38.2	34	N/A
25/02/2016*	Thursday	3:00pm	7:00pm	DRM3	39.0	34	N/A
10/03/2016	Thursday	3:00pm	7:00pm	DRM3	32.0	34	N/A

**Table 3 – Summer peak dispatch events**

**\* 25 Feb 2016 was the maximum peak demand day in 2015/16 for the Ausgrid network at 5488 MW**

Air conditioner load information is collected from all participants in our *CoolSaver* Central Coast trial with load information being measured by a current sensor that had been installed on the electrical input power supply to the air conditioner. Analysis of the data to the end of 2014/15 indicates an estimated average reduction of 1.5 kVA per customer for the 44 participants with ducted air conditioners >10kW cooling capacity and about 0.70 kVA per air conditioner for the 2 customers with non-ducted air conditioners between 4-10 kW cooling capacity. Further detail on this analysis can be found in the *CoolSaver Interim Report September 2015* available at [www.ausgrid.com.au/dm](http://www.ausgrid.com.au/dm).

Additional analysis was completed at the end of Summer 2015/16 for a sample of 29 customers in the Central Coast trial area that had an air conditioner with greater than 10kW cooling capacity. Figure 5 shows the results of the aggregated and averaged household load profiles comparing the results of a DRM2 (50% load cap) and DRM3 (75% load cap) activation. The Demand Response Mode 2 activation decreased the average load of the customers by around 1.5kW whereas the Demand Response Mode 3 activation decreased the load initially by around 1.0kW on average.

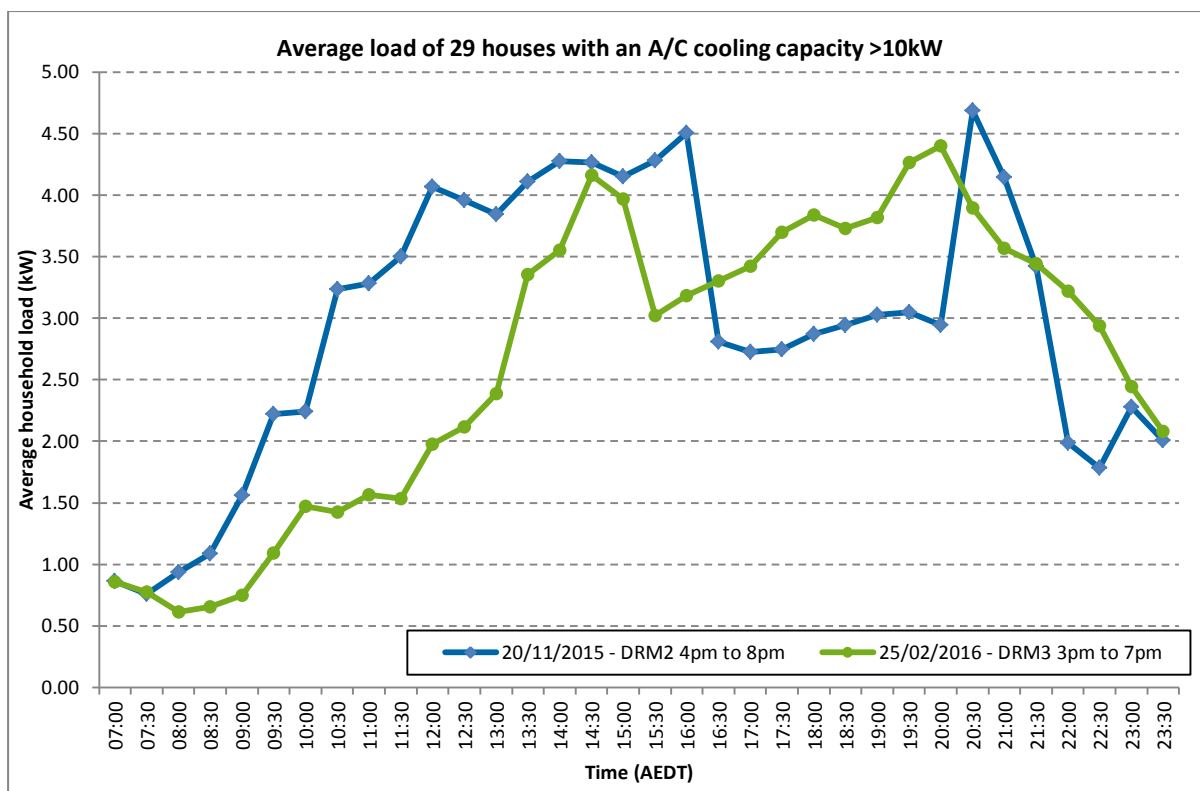


Figure 5 – Summer peak dispatch events

#### 4.2.4 Participant survey results

An important element of the trial has been to identify the level of customer satisfaction with the program and ways to improve the customer experience. *CoolSaver* is dependent on the willingness of participants to provide demand reductions and a poor customer experience can significantly impact the cost effectiveness of demand management programs.

As a new concept for Ausgrid customers (and a type of offer that is rare in Australia), it is important to measure the level of interest and satisfaction with the program and build positive advocates for similar innovative offers in future.

Initial surveys were sent out to all participating customers in April 2015, with a total of 35 questions. The first 7 questions covered customer demographics and the remainder covered aspects of the trial. Customer responses were generally positive about their experiences throughout the trial. Detailed results of this survey are covered in the *CoolSaver Interim Report September 2015* and in a separate survey report available on Ausgrid's website at [www.ausgrid.com.au/dm](http://www.ausgrid.com.au/dm).

However, it was not clear at that point whether or not the customer experience would remain as positive during a summer period with extended periods of very hot weather and more peak event dispatches. The hotter summer weather in the 2015/16 Summer provided such an opportunity.

In April 2016, the survey was re-run with all questions largely the same to allow for a comparison of the responses. See Table 4 below for a snapshot of the responses, comparing the two summer periods.

	Summer 2014/15		Summer 2015/16	
	Central Coast	Lake Macquarie	Central Coast	Lake Macquarie
Response rate	53%	52%	68%	75%
Rated as a very positive experience (8+ out of 10)	98%	99%	87%	88%
Experienced slight or no difference to cooling	95%	90%	58%	92%
Found override feature useful	54%	N/A	45%	N/A
Participated due to financial incentive	50%	33%	53%	50%

**Table 4– Participant survey results**

A sample of survey responses from the 2015/16 *CoolSaver* survey are provided below.

### Central Coast

- 68% of participants (38 of 56) responded to the survey.
- 95% of respondents only used the air conditioner that had the signal receiver installed. 5% did use another air conditioner as well.
- Participants reported they used the air conditioner in the summer (Nov-March):

Almost every day >61 days	24%
Most days (31 to 60 days)	11%
On very hot days (16 to 30 days)	55%
Sometimes (6 to 15 days)	5%
Hardly ever	5%

- 87% of survey respondents rated their experience with the sign up process and communications received as 7 or above (with 10 being the highest).
- The main reasons they participated in the trial were the financial incentive (53%), overall reduction in network charges (26%) followed by interested in technology (21%).

A feature of the trial for Central Coast participants was the option to opt out of a *CoolSaver* peak event using the capability of the 3G signal receiver installed, so we surveyed the response to this option for Central Coast only.

- 45% said they found the opt out option useful.

37% of respondents did not notice a difference in their air conditioning cooling experience on the very hot days where the power saving mode was activated.

A further 21% only noticed a slight difference.



- When we asked would they participate in a future CoolSaver trial that had no opt out option, 100% answered that they would not participate.
- 55% said they would participate in a future CoolSaver trial that has no notifications at all
- 95% of those surveyed, said that they would repeat the trial again if it was offered in 2016/17

### Lake Macquarie

- 76% of participants (26 of 34) responded to the survey.
- Participants reported they used the air conditioner in the summer (Nov-March):
 

Almost every day >61 days	8%
Most days (31 to 60 days)	27%
On very hot days (16 to 30 days)	58%
Sometimes (6 to 15 days)	4%
Hardly ever	4%

88% of respondents did not notice a difference in their air conditioning cooling experience on the very hot days we activated their power saving mode.

- 88% of survey respondents rated their experience with the sign up process and communications they received as 8 or above (with 10 being the highest).
- The main reasons they participated in the trial were in similar proportion to the Central Coast respondents, and were primarily driven by the financial incentive offered(50%), overall reduction in network charges (31%) followed by their interest in the technology (19%),
- 100% of those surveyed, said they would repeat the trial again if it was offered in 2016/17.

Participants who completed the survey were also offered the opportunity to comment on their experiences with the trial. These responses reflected the strong levels of satisfaction in the responses to specific survey questions. A snapshot of their comments is given below:

Survey comments across all three geographic areas:

- Everything was well organised. Notification was timely. We are comfortable with the whole process
- There was no fuss or inconvenience and we were rewarded
- Keep the process as is. Works fine for us.
- Was a seamless exercise. All the people we have spoken to about the trial have been very helpful
- Professional, painless and no trouble at all for our household
- Installation appointment was on time. My questions were answered adequately and we have had no noticeable impact from the unit as it was fitted not long after we had the air conditioning installed.
- Feels like it is worthwhile, money incentive good, communications and occasional attendance on site well managed and effective.
- Excellent service by all involved - no problems.

## 4.3 Phase 3 – Trial alternate customer acquisition model

### 4.3.1 Overview

In phase two of the trial, the Lake Macquarie and Central Coast trial areas set out to test the customer response to an offer to customers with an already installed air conditioner. However, the marketing approach and acquisition model was relatively high cost due to the need to retrofit existing air conditioners.

The objective of phase three of the trial was to test an alternative approach that would leverage the initial purchase and installation of new compliant air conditioners and so lower the cost of customer acquisition and participation. Furthermore, this approach would simplify the process for customers.

The marginal cost of each unit of demand reduction (\$ per kilowatt) is a key metric in determining the viability of this approach to deferring network investment. Therefore, the lower the cost for each kW of demand reduction can be, the more effective a tool it can be in deferring the need for network augmentation and the greater the number of network projects it can potentially defer.

While this approach has been used by Energex in Queensland as part of their PeakSmart program, their program has been introduced to the entire Southeast Queensland area. As future network investment needs for Ausgrid are commonly isolated to much smaller geographic areas, we identified a single area to test the viability of using this approach in a localised area. For this element of the *CoolSaver* trial, Ausgrid selected the Maitland area with participation restricted to the Maitland local government area.

Similar to the Lake Macquarie and Central Coast elements of the trial, this was not based on any near term forecast network needs but on a number of factors related primarily to trial operations. All customers residing in the Maitland local government area were eligible to participate in the *CoolSaver* trial program. The *CoolSaver* Maitland trial uses a pre-commercial 3G signal receiver technology similar to that which was field-tested in the Central Coast trial so as to offer customers the override functionality. This new version of the 3G signal receiver also works using SMS commands and was supplied by an external provider rather than developed by Ausgrid internally (as per phase 1 & 2 of the trial program).

To simplify the offer, two levels of customer incentive were introduced comprising air conditioner cooling capacities of 4 to 10 kW and greater than 10 kW. Air conditioners with cooling capacities less than 4 kW were not eligible to participate. The exclusion of lower capacity air conditioners was due to the lower potential demand reductions available from smaller air conditioners.

So as to explore any change in administration costs or customer satisfaction levels, an alternative payment method was trialed. Instead of the gift card payment method used in the Central Coast and Lake Macquarie trial areas, payments to participants in the Maitland trial are made using a reloadable Visa gift card. The offer structure is detailed in the Table 5 below.

Offer element	Customer payment maximum (Air conditioner 4kW to 10kW*)	Customer payment maximum (Air conditioner >10kW*)
Installation reward 2015	\$150	\$300
Summer 2015/16 rewards	\$50	\$100
Summer 2016/17 rewards	\$50	\$100
<b>Total CoolSaver rewards</b>	<b>\$250</b>	<b>\$500</b>

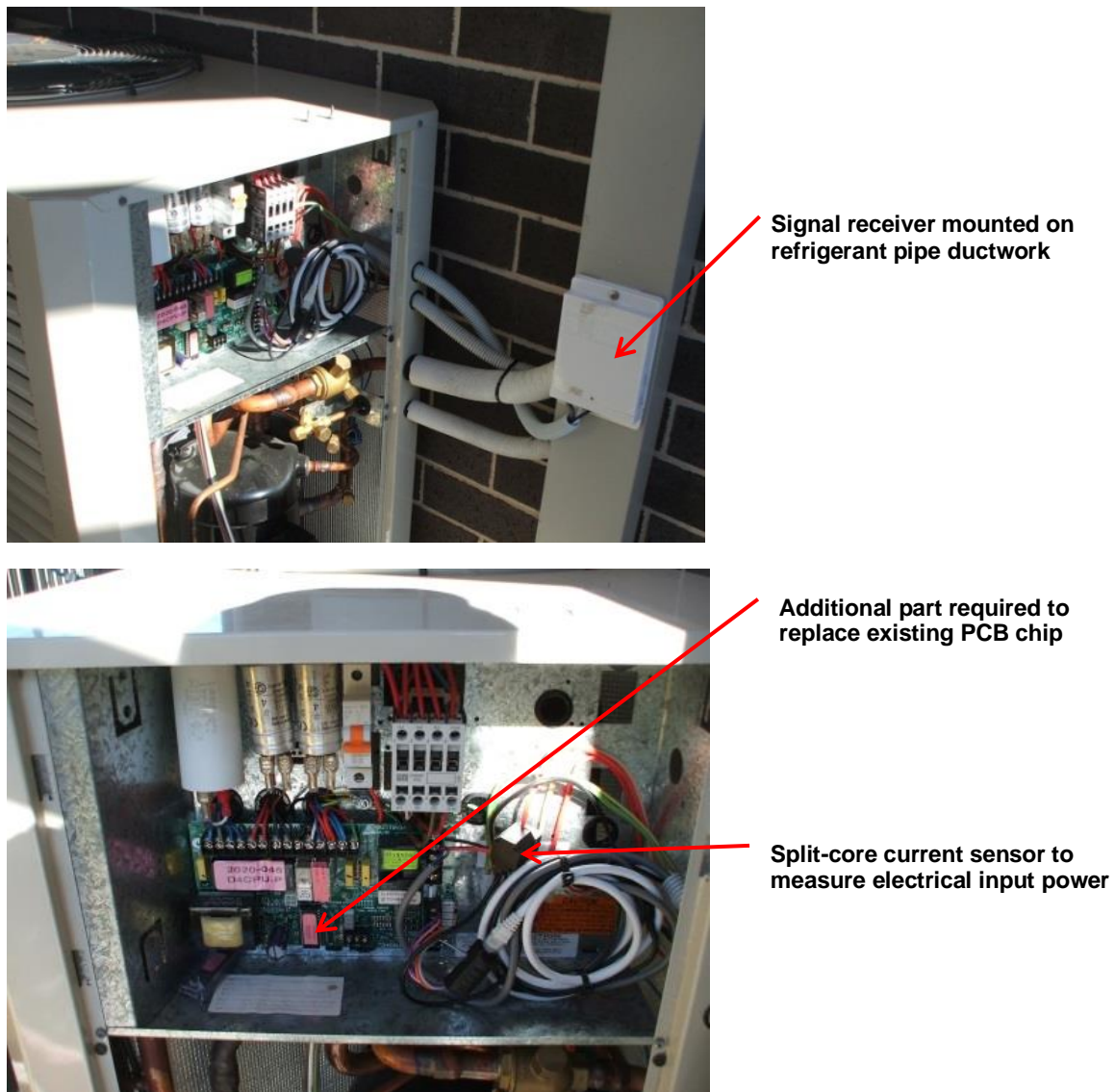
\* kW is the rated cooling capacity output of the air conditioner.

**Table 5 – CoolSaver Maitland offer schedule**

To leverage the initial purchase and installation of eligible air conditioners, we partnered with five air conditioner retailers and installers in the Maitland area (three appliance retail stores and two specialist air conditioner supplier/installers). These Industry Partners were rewarded for their efforts in promoting the program to customers through a modest incentive made for each customer registered with the program.

Signal receivers were again provided free of charge to customers via Industry Partners who were also provided with sales and marketing materials and training for sales staff. Signal receivers were installed at time of installation of the new air conditioner at the customers' cost. Local air conditioner technicians were also trained to ensure the proper installation of the signal receivers.

Figure 6 shows the installation of one of the new 3G signal receivers used for the Maitland trial.



**Figure 6: Installation of the signal receiver on an Actron Air ducted system**

The offer was also extended to customers with an already installed eligible model of air conditioner. For these customers, the installation of the signal receiver and any additional parts, if required, was organized by the customer through an Industry Partner. The marketing and point of sale material to support this offer are shown in Figure 7.

# CoolSaver Point of Sale Support



**Earn Cool Hard Cash**  
with an approved CoolSaver air conditioner

Welcome to the CoolSaver program. CoolSaver is an initiative that will more efficiently manage the power consumption of your CoolSaver air conditioner so you get less and earn you cool hard cash. What's more, it helps us maintain our network efficiency throughout demand periods, keeping electricity prices down in the future for you and the entire community.

Find out more about CoolSaver and you are on your way to earning some cool hard cash!

**How does it work?**  
Find out everything you need to know about getting started with the Ausgrid CoolSaver program.

**How much can I earn?**  
See how much you can earn with an approved CoolSaver air conditioner.

**Eligible air conditioners**  
Choose from the list of approved CoolSaver air conditioners including ceiling and split systems.

**How do I join CoolSaver?**  
Earn cool hard cash in 5 simple steps.

**Further information**

- Approved air conditioners
- Participating retailers and installers
- Install information
- Faqs
- Apply online

**CoolSaver Program**

- Centre Cool
- Like@Home

**Download our CoolSaver eBook**  
Includes more information on the CoolSaver Program.

**Download an application form**

**Contact Details**  
cool.saver@ausgrid.com.au | 1300 361 800  
CMTY Box 4000 North East 15178 Sydney NSW 1501

Website: [www.ausgrid.com.au/cool saver](http://www.ausgrid.com.au/cool saver)



**Earn \$250 Cool Hard Cash**  
with an approved CoolSaver air conditioner

**ASK US HOW**

Ausgrid

Floor Decals



**Earn \$250 Cool Hard Cash**  
with an approved CoolSaver air conditioner

**ASK US HOW**

Ausgrid

Wobblers



**Earn Cool Hard Cash**  
with an approved CoolSaver air conditioner

**CoolSaver Application Form**

Thank you for your interest in the approved CoolSaver air conditioner program. CoolSaver can increase the efficiency of your air conditioner, reduce your electricity bills, help you save money and help us manage our network more efficiently during demand periods, keeping electricity prices down in the future for you and the entire community.

By taking a few simple steps, you can join the program.

To be eligible for the CoolSaver program, you must:

- Own an approved CoolSaver air conditioner
- Install the air conditioner in a split system or ceiling
- Connect the air conditioner to a power supply of 240V
- Have a valid and working power supply connection to the air conditioner
- Have your air conditioner registered on the CoolSaver program

Download this form now to get started with the program. For more information, visit [www.ausgrid.com.au/cool saver](http://www.ausgrid.com.au/cool saver) or contact us on 1300 361 800.

Brochures and Application forms



**Earn \$500 Cool Hard Cash**  
with an approved > 30kW CoolSaver air conditioner

**ASK US HOW**

Ausgrid

A1 and A3 Posters and Pull up banners

Figure 7: Marketing and point of sale support material

The following initiatives were deployed in the lead up to the 2015/16 summer period with the aim of maximizing customer acquisition through third party, market channels:

- In store marketing collateral was provided to retailers, including brochures, floor decals, posters and on unit wobblers
- Training was provided to sales floor staff, including provision of a process pocketbook
- Installer training videos were created and posted online
- Cash incentives were made available to:
  - Customers – upon installation and for participation in peak event dispatches
  - Industry participants – for successful customer sign up and installation
  - Sales staff - for successful customer sign up and installation
- Web site materials were made available, such as:
  - Eligible air conditioner makes and models
  - Information about how the program works and possible customer incentives
  - Information around how to join the program
  - FAQs
  - Industry participants (ie. participating retailers and installers)
- Face to face contact with industry participants to address concerns and questions and keep the program top of mind

#### 4.3.2 Participation results

Phase 3 of the trial was initiated in February 2015 with a full launch by air conditioner retailers and installers occurring in September 2015 and continuing over the course of the 2015/16 air conditioner sales season and up until September 2016. A total of 30 trial participants were recruited to the program. Of these, 11 were new units and 19 were existing air conditioner units. There were 10 units with 4-10kW in cooling capacity and 20 air conditioners with more than 10kW in cooling capacity.

##### Participants recruited through new air conditioner sales

Of the 11 participants that were recruited into the program as a result of a new air conditioner purchase, 2 were signed up through an appliance retail store while 9 were signed up by a specialist air conditioner store/ installer. This take up rate was well below expectation and is detailed in the Table 6 below showing program sign ups as a proportion of overall sales up to the end of September 2016.

Industry Participant	Sign-ups from new sales	Total sales of AS4755 compliant air conditioners	% of total AS4755 compliant sales	Total sales of all AC units
Retailer 1	2	247	0.8%	417
Retailer 2	0	110	0%	204
Retailer 3	0	43	0%	153
AC Specialist 1	9	102	8.8%	526
AC Specialist 2	0	Data not available	N/A	Data not available
<b>TOTAL</b>	<b>11</b>	<b>502</b>	<b>2.2%</b>	<b>1,300</b>

## **Table 6 – CoolSaver Maitland sign-ups**

There are a range of possible causes for the low customer participation rates experienced through new air conditioner point of sale channels, including;

1. It was generally difficult to maintain a consistent approach to customer recruitment due to the nature of the retail sales environment. This was due to a number of factors including:
  - a. Generally high level of staff turnover in retail outlets
  - b. The offer had to compete with a lot of other priorities and sales offers within stores and was seen by staff and customers as overly complex
  - c. There were anecdotal reports that customers were suspicious of central control of air conditioners
  - d. Different in store processes for staff briefing and information dissemination meant more facilitation was required at the store level than was originally anticipated
2. The incentive levels available to offer to industry participants and sales floor staff do not seem to be sufficient in order to consistently promote the program to customers.
3. There are over 500 air conditioning units that were eligible for the program (>4kW) across 13 manufacturers. However, 39% of these required an additional part in order to be compliant with the AS4755 standard with the technical features, installation procedure and price of these parts varying widely across the manufacturers and models. This introduces further complexity to the program for both the sales staff and customers.

The most successful customer recruitment channel of the five industry partners was a local Maitland air conditioning specialist company who sold one main brand of air conditioner that had various eligible models, most of which did not require additional parts to be fitted. Of the customers who were recruited through the industry partners, only 1 of the 11 required an additional part to be fitted.

A key finding to date from the Phase 3 component of the trial is that we found it difficult to drive customer uptake through third party sales channels while adequately managing the risk and providing a least cost solution. It appears that the amount of money such a program can provide to the third party facilitators (ie. retailers and installers) is not enough to make it worth diverting from their business as usual activities.

### **Participants with an existing air conditioner**

To further boost awareness and encourage customer take-up, a letter mail out was undertaken in November 2015. This was done by targeting approximately 4,100 customers in suburbs that have shown significant new housing growth in the last five years. It was assumed that the dwellings in these suburbs would have high rates of installed air conditioning. Customers were invited to register their interest and have their air conditioner assessed for eligibility and then put in touch with one of the industry partners/ installers to organize the installation of the signal receiver.

Of the approximately 4,100 letters sent, there were 51 responses (1.2%), 23 of which (0.56%) had eligible AS4755 compliant air conditioners. This ultimately resulted in 14 (0.34%) of the 23 completing an installation. The final participation of 0.34% (participants/ number of letters) was lower than that of the Central Coast and Lake Macquarie trial areas, which was of 0.67%. However, there could be several reasons for this including:

- Differing demographics and climates between the trial areas

- In the Central Coast and Lake Macquarie trial areas, the signal receiver installation process was coordinated by Ausgrid with the use of a single sub-contractor, whereas in the Maitland area it was left up to the customer to contact one of the industry partners.
- In the Central Coast and Lake Macquarie trial areas, the use of a second offer reminder letter significantly increased the initial response rate.

Of the 19 participants with existing air conditioners, 14 were as a result of the letter mail-out with the remaining 5 requesting installation through participating installers of their own volition. A total of 17 of these 19 were air conditioning systems that required an additional part to be purchased and fitted before the signal receiver was installed.

Testing the customer acquisition of both existing owners and new purchasers of eligible AS4755 air conditioners was an important part of the *CoolSaver* trial. In order to maximize participation rates and therefore potential peak demand reductions in a geographically defined area, both existing owners and new purchasers need to be considered. From the results of the Central Coast, Lake Macquarie and Maitland trials, it appears that existing owners of eligible air conditioners offer the biggest potential for peak demand reductions.

#### Customer Opt-outs during trial

During the 2015/16 season, one customer from the Maitland trial area opted out of the program, because they moved house. Going into 2016/17 there was a total of 28 participants continuing for the second season of this trial area, as another customer opted out during Spring 2016.

#### 4.3.3 Peak event results

During the 2015/16 summer period, there were 6 summer peak dispatch events using Demand Response Modes 2 (DRM2) only. DRM2 reduces the input power to 50% of rated cooling capacity power of the air conditioner. Summer peak events were initiated when the maximum temperatures at a local weather station was forecast to exceed about 30-32°C on working weekdays. Table 7 below has a summary of all summer peak dispatch events.

Date	Day of week	Start Time	Finish Time	Mode	Max. Daily Temp (°C)	Participants	No of Overrides
14/01/2016	Thursday	2:00pm	6:00pm	DRM2	38.5	3	0
15/02/2016	Monday	2:00pm	6:00pm	DRM2	33.2	12	0
25/02/2016	Thursday	3:00pm	7:00pm	DRM2	39.5	13	0
3/03/2016	Thursday	3:00pm	7:00pm	DRM2	33.4	16	0
9/03/2016	Wednesday	3:00pm	7:00pm	DRM2	34.8	18	1
10/03/2016	Thursday	3:00pm	7:00pm	DRM2	34.8	12	0

Table 7 – CoolSaver Maitland dispatch events

#### 4.3.4 Participant survey results

As with the *CoolSaver* trial areas of Central Coast and Lake Macquarie participants were surveyed after the conclusion of the 2015/16 summer period. And similar to the other trial areas, responses were generally positive about customer experiences throughout the trial. Some key insights from the survey found that:

- a high proportion of trial participants were satisfied with their overall experience in the trial with 84% rating their experience as being 8/10 or higher;
- just over half (53%) of the participants did not notice or only noticed a slight difference in their cooling experience during the power-saving activation periods; and
- the largest motivator for participants to take part in the trial was the monetary incentive (63%), then reduction in overall network charges (26%) followed by interest in new technology (11%).

Survey item	Summer 15/16 - Maitland
Response rate	90%
Rated as a very positive experience (8+ out of 10)	84%
Experienced slight or no difference to cooling	53%
Found override feature useful	58%
Participated due to financial incentive	63%

**Table 8 – CoolSaver Maitland survey results**

The *CoolSaver* Maitland trial continues through to the end of the 2016/17 summer in order to build a more accurate and reliable dataset with regard to:

- Customer take up of the offer
- Customer retention/drop-out rate
- Customer response to peak event dispatches
- Diversified demand reductions



## 4.4 Phase 4 – Winter peak trial in Central Coast

### 4.4.1 Overview

The customer survey conducted at the end of the 2015/16 summer season showed that there is a high instance (approx. 80%) of reverse cycle air conditioning comprising the predominant heating source in the homes participating in the trial. In addition, 74% of survey respondents indicated they would participate in a winter season air conditioner load control program, with 23% being unsure if they would participate. This was an unexpected result and the decision was made to further explore the potential winter demand reductions. Approximately 20% of Ausgrid's zone substations are winter peaking and a further 30% have similar summer and winter utilisation factors (meaning they could potentially be winter peaking).

Ausgrid initiated a winter peak demand trial with the aims of testing customer acceptance of winter peak demand management events and verifying the actual peak demand reductions achieved. The Central Coast was chosen as the trial area to conduct this trial. Offer conditions and reward payments were established at the same rate as for Summer 2015/16.

### 4.4.2 Participation results

In June 2016, an offer was made to the participants in the Central Coast trial area to participate in a winter *Cool/Saver* trial. A total of 27 (48%) accepted the offer and participated in the trial. The winter period ran from late June until the end of August 2016.

### 4.4.3 Peak event results

During the 2016 winter period, there were 5 dispatch events using Demand Response Modes 2 only. Winter peak events were initiated when the minimum temperature at a local weather station was forecast to be below about 5-6°C on working weekdays. Table 9 below has a summary of all winter peak dispatch events. Figure 8 also shows the results of an aggregated and averaged household load profile on the winter dispatch day of August 22, 2016. The Demand Response Mode 2 activation decreased the average load of the customers by around 0.5kW.

Date	Day of week	Start Time	Finish Time	Mode	Min. Daily Temp (°C)	Participants	No of Overrides
<b>2016 Dispatch events</b>							
27/06/2016	Monday	5:00pm	8:00pm	DRM2	6.8	23	1
14/07/2016	Thursday	5:00pm	8:00pm	DRM2	2.5	20	0
29/07/2016	Friday	5:00pm	8:00pm	DRM2	2.8	25	0
12/08/2016	Friday	5:00pm	8:00pm	DRM2	4.9	25	0
22/08/2016	Monday	5:00pm	8:00pm	DRM2	5.3	24	1

**Table 9 – Winter peak dispatch events**

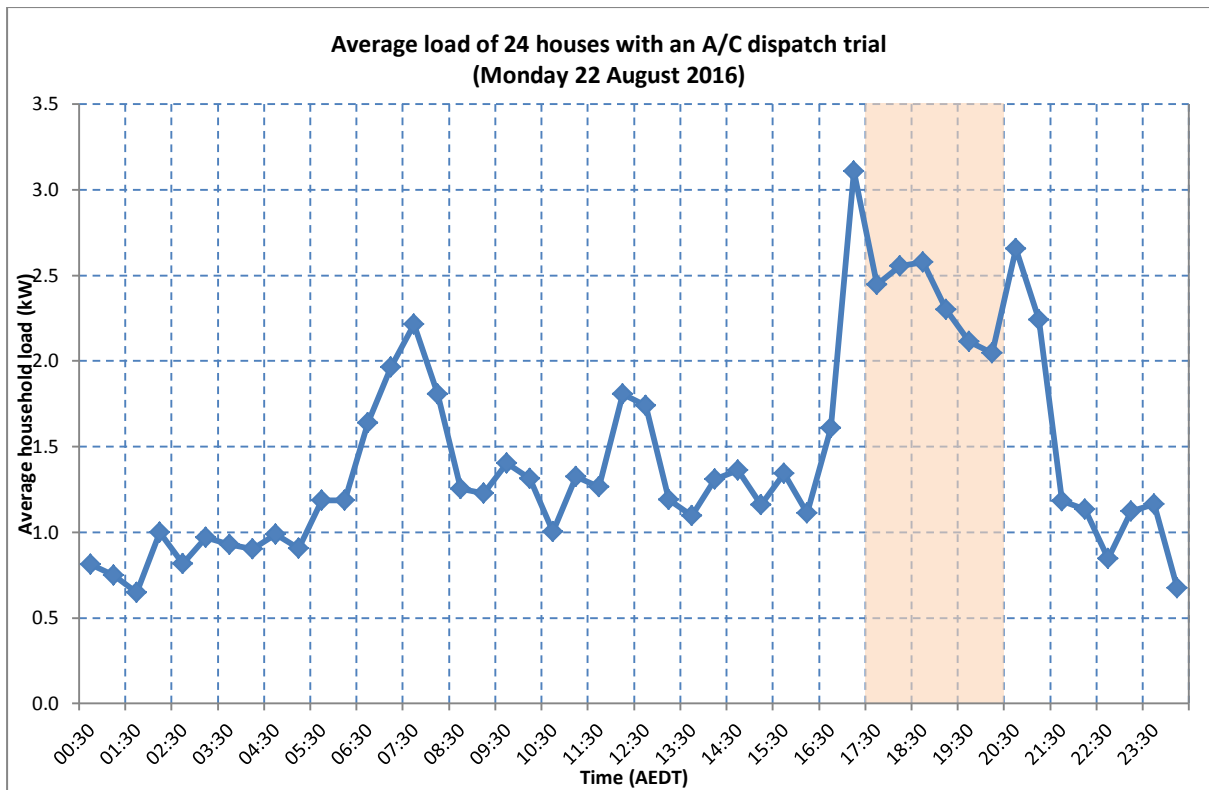


Figure 8 – Winter peak dispatch events

#### 4.4.4 Participant survey results

To test customer satisfaction levels for the winter trial, a slightly modified survey to reflect the different season was prepared and sent to the winter trial participants in October 2016. A total of 19 (70%) customers responded to the winter survey, with responses also indicating a very high level of satisfaction with the program.

#### Central Coast

##### Winter Peak Demand Trial Survey Insights:

- Nearly three quarters of the participants (14) did not notice a difference or noticed only a slight difference to the heating output to their air conditioning heating during the activation periods;
- Half of the participants surveyed said that they wore more layers of clothing during the activation periods, rather than turning on other forms of heating (eg. gas heaters or other electric heaters)
- Almost half of the participants (9) surveyed said the main reason for participating in the trial was for the money incentive, followed by the reduction in network charges (7).

53% of respondents did not notice a difference in their air conditioning heating experience on the very cold days we activated their power saving mode.

- Just over half of the participants (11) felt the override option was useful when they received the SMS notification, and a strong majority of them (17) felt that even if there was no override option available to them, they would still participate in the trial;
- All the participants surveyed rated their experience with participating in the winter trial above 7 out of 10, with half rating it a 10 out of 10.

## 5 Next Steps

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The *CoolSaver* trial in the Central Coast, Lake Macquarie and Maitland areas will continue into the summer of 2016/17 but is closed to new participants. We will continue to verify the reliability and functionality of the two different demand response technologies deployed and aim to get a better understanding of the average demand reductions achievable on hotter summer days. We will also continue to monitor customer participation and satisfaction in the program during and after these periods.

At the end of the 2016/17 summer peak demand period, the trial will be closed out and final analysis completed. A final report on the outcomes from all stages of the trial will be published in mid-2017 on Ausgrid's website at [www.ausgrid.com.au/dm](http://www.ausgrid.com.au/dm).



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