

Electric Ireland
Customer Innovations

Power Off & Save Pilot

Project Progress Report 2

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Executive Summary

The purpose of this document is to report on the progress of the Power Off & Save project from February 2017 to October 2017.

'Power Off & Save' Overview

Power Off & Save is a pilot project, which aims to investigate if a test group of some 1,500 residential consumers can significantly reduce their consumption on request for approximately 30 minutes to allow EirGrid to manage the grid at peak times.

EirGrid designed the project and Electric Ireland is the delivery partner. Over 1,400 residential consumers were recruited to take part in up to 10 Power Off & Save demand events. During each event, a text and push notification (via an app where possible) are sent to participants asking them to reduce their usage for the following 30 minutes. We then record the change in usage and analyse the data to measure the overall reduction. Some participants have received smart control technology enabling them to control certain appliances remotely. Others will only be able to reduce usage manually. IPSOS MRBI will carry out consumer research to gain an understanding of participants' behaviour and their experience of the project.

Progress to Date

The project has achieved a number of key deliverables and milestones over the past number of months. The key achievements are:

- **Recruitment of participants** - The recruitment phase is now complete with over 1,400 homes taking part in the project.
- **Technology installation** - The smart control technology for event delivery is complete and operational for current participants. It is worth noting that there are a number of gateway devices required for the Glen Dimplex cylinders to facilitate remote control of the cylinder. We anticipate the gateways installation to be complete by the end of April 2018.
- **Communication channels established** - Electric Ireland established a communication service to enable communication with participants and project partners.
- **Six events delivered** (up to October 2017) - Since the previous update, there have been a further four 'Power Off & Save' events successfully delivered. In total six events have taken place, the highest reductions were achieved in the winter events at evening times.
- **Data Analysis** - The table below outlines the results for the six events. The results reflect that there is a greater potential to respond at times of high load. The reductions achieved at 9-17% (which are deemed statistically reliable) with no notice period, demonstrates residential demand response has significant potential to offer flexibility to the system operators.

Overview of Trial Group Event Data Vs Historical Data	
Event 1 Thurs 3rd Nov 2016 @ 19:30 - 20:00 620 Participants	93.4 kW reduction (17% reduction at time of event)
Event 2 Mon 5th Dec 2016 @ 18:30 - 19:00 785 participants	119 kW reduction (14% reduction at time of event)
Event 3 Tues 7th Feb 2017 @ 12:30 - 13:00 1,081 participants	57 kW reduction (12% reduction at time of event)
Event 4 Wed 26th April 2017 @ 09:00 - 09:30 1,082 participants	65 kW (15% reduction at time of the event)
Event 5 Sat 24th June 2017 @ 18:30 - 19:00 1,094 participants	74.5kW (11% reduction at time of the event)
Event 6 Sun 16th July 2017 @ 18:30 - 19:00 1,054 participants	54.7kW (9% reduction at time of the event)

Key Learnings to Date

There have been a number of key learnings on the project to date.

- We have successfully installed smart connected switches on immersions, solar PV generators & diverters and electric vehicles. It is worth noting that this is the first time electric vehicle owners in Ireland have had the ability to monitor, control and schedule their EV charge times.
- For the Smarter Home (formally Smart Energy Controller) participant group where we have five-minute data, it was observed that 30 – 40 % of participants are reacting within the first five minutes. This is in line with the first two events.
- In general, over 50% of homes tend to take part in Power Off and Save events.
- Utilising novel innovative technology below TRL 9 has challenges.
- Results from the independent survey, show that participants believe being at home, advance notification and willingness to interrupt power requirements in the home for a long period are the key attributes for participating in the demand response events. The overall demand reduction per home is small to date as customers are generally reducing demand from low energy usage devices in the home (manually). There is a need for additional consumer education and engagement because of the learnings from this project for manual interruption participants. It is worth caveating that as more automated appliances (such as immersions, electric vehicles etc.) come on stream, there is far more potential for demand reduction.

Communications & Stakeholder Engagement

Project communications have been effective to date. The communications strategy and consumer engagement plan ensure that communications are consistent and timely. There has also been significant engagement with external stakeholders and presentations made by the Project Manager to key industry stakeholders such as SEAI, ESB Networks, EurElectric, ETIP (European Technology & Innovation Platform) and Engineers Ireland. Other key project engagements include:

- Power Off & Save YouTube animation of the mid-point results – there are over 38,000 views of the animation to date – see [here](#).
- IPSOS MRBI carried out a detailed Customer Insights survey.
- The project was also shortlisted in the 2017 Engineers Ireland Excellence Awards within the Technical Innovation Category.

Risks to Project Delivery

The project is progressing on target. A number of low risks are being managed which are not expected to impact on project timelines:

- Panellists are being distributed a re-designed smart plug. The delivery of this newly designed and tested plug could delay the next events.
- It is evident from the analysis that less than 10% of the participants opt in for automatic switch off for smart plugs. This in turn reduces the capability to test the potential of residential DSM to provide System Services.

Next Steps

As the report will show, all areas of 'Power Off & Save' are on track against the project plan. The next steps in the project are:

- Further implementation of automated technology including redeployment of new smart plugs,
- Carry out an event at night in the absence of SMS messaging,
- Put in place measures to increase the amount of customers opted in to enable automatic switch off of the plugs,
- Recruitment of Solar PV homes to potentially switch off generation load (a different form of Power Off and Save but beneficial in terms of grid balancing),
- Further evaluate and demonstrate capability of POAS scheme to deliver system services.

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Abbreviations & Acronyms

- DSM – Demand Side Management
- EED – Energy Efficiency Directive
- PID – Project Initiation Document
- POAS – Power Off and Save
- PPR – Project Progress Report
- SEC – Smart Energy Controller
- SPAYG – Smart Pay As You Go

1. Introduction

This is the second progress report from the Electric Ireland 'Power Off & Save' project team. Launched in June 2016, 'Power Off & Save' is a pilot Demand Side Management (DSM) project focusing on residential consumers. The project will investigate the ability of a group of households to reduce electricity use for specific time-periods on request.

The purpose of this document is to report on the progress of the Power Off & Save project from February 2017 to October 2017. It will detail key deliverables during this period and the associated learning outcomes. It will also outline plans for the coming months.

1.1 OBJECTIVES OF 'POWER OFF & SAVE'

The primary goal of Power Off & Save (POAS) is to establish and operate a residential consumer based demand response project. POAS has engaged with over 1,400 residential homes, with participants asked to reduce their electricity consumption for 30 minutes on up to 10 separate occasions. This has been achieved by both automated and manual response by the consumers. The project is gaining understanding into potential for technology scalability in the home. The conclusions will help determine how residential DSM can be facilitated and fully utilised in a future energy or services market, contributing to the facilitation of renewables.

The high-level objectives for this project are:

- Establish and operate a residential consumer-based demand response project, recruiting and engaging the targeted number of customers.
- Operate the scheme with no adverse effects on the comfort of the consumer in their home due to their involvement in the scheme.
- Utilise a range of smart home technology types in the home with accurate measurement capability to determine the capability of Irish residential customers to provide demand response and potentially DS3 System Services.
- Develop a methodology for analysing the outcome to provide statistically reliable results.
- Providing a flexible cost effective messaging and Service solution with appropriate performance monitoring solutions.
- Investigate how to incentivise customers to take part in the demand response events.
- Probe consumers' attitudes to such a scheme and their willingness to participate in demand response events.
- Engage professional consumer research to seek customer behavioural insights into:
 - Testing manual vs automatic controllability of technologies,
 - Acceptability of new smart technologies, including customer willingness and capacity to change their consumption behaviour,
 - Responses to various signals or incentives by participants,
- To establish the end-to-end processes required to deliver Power Off and Save events.
- To provide learnings for an enduring Residential Demand Response Scheme.

2. Project Schedule and Progress against Plan

This section outlines progress against the project plan. The project is being rolled out in a phased approach with each phase building on the next. The next section summarises key deliverables to date for each phase.

2.1 KEY DELIVERABLES AND MILESTONES FOR THE REPORTING PERIOD

There are eight phases with key deliverables and milestones as agreed in the Project Initiation Document. The following table outlines progress to date for each phase.

Table 1: Key Deliverables by Project Phase

Key Deliverables	No. Participants	Update
Phase 1 - Project Set Up		Delivered
Phase 2 - Establishment of Smarter Home Group (i.e. Smart Energy Controller)	544	Delivered
Phase 3 - Establishment of Smart Pay As You Go (SPAYG) Group	830	Delivered
Phase 4 - Extension of Smarter Home Group to include remote immersion control	70	Delivered
Phase 5 - Glen Dimplex Quantum Hot Water Cylinder Group Note - Glen Dimplex has not delivered Gateway & App delivery at time of writing this project progress report.	50	Cylinders only Installed
Phase 6 - Climote Hot Water Control & DSM control Group	100	Delivered
Phase 7 - Electric Vehicle/Micro Generation homes Group <ul style="list-style-type: none"> Homes with Solar PV technologies will be recruited as required 	13	Delivered
Phase 8 - Project Close Down Report		

Note some customers may have more than one technology e.g. Smarter home Kit & Climote Immersion. Accounting for this, the total amount of customers signed up to Power Off & Save is approximately 1,400.

2.2 KEY ACTIVITIES AND ACHIEVEMENTS

The main activities since the previous project progress report have focussed on recruiting additional participants with more automated technologies and putting the necessary technical framework in place to deliver the Power Off & Save events.

2.2.1 Participant Recruitment

Participant recruitment for automated technology was an important activity for this period. The recruitment process has been effective with approximately 1,400 participants signed up to Power Off & Save.

2.2.2 Location of Power Off & Save Participants

The location of all participants is spread throughout Ireland. There has been no focus on a particular cluster location or specific area of weak electricity network infrastructure.

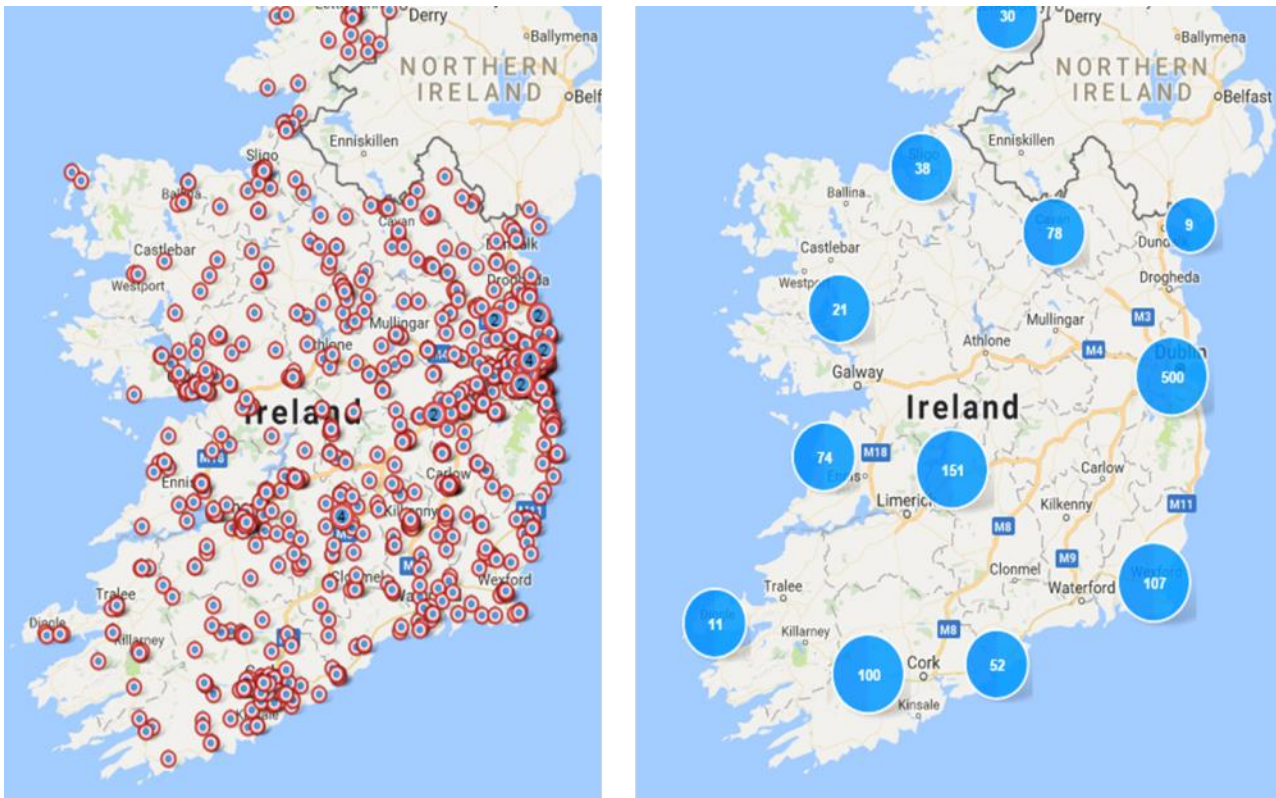
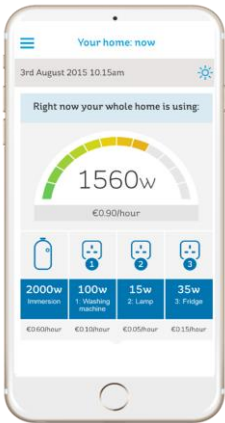


Figure 1: High-level locations of dispersed population of participants on the Power Off & Save Programme

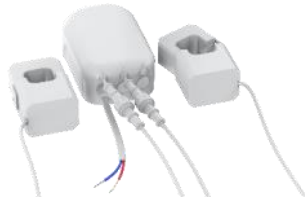
2.2.3 Technology Delivery

A proportion of participants have received specific smart home control technology to help them control electrical appliances more easily. This is made up of the following:

Smarter Home Technologies - The smarter home allows participants to see exactly how much electricity they are using at any time in real-time and to remotely control the appliances from their smart phones. During this reporting period, we have successfully installed smart switches on immersions, solar PV generators & diverters and electric vehicles. It is worth noting that this is the first time electric vehicle owners in Ireland have had the ability to monitor, control and schedule their EV charge times. This is especially useful if the homeowner has night rate electricity.



Smarter Home App



Sub meters



Smart Switch



Gateway

Smart Hot Water Cylinders - a group of participants are testing smart hot water cylinders from Glen Dimplex. These cylinders are highly insulated and retain heat for a significantly longer period of time than standard cylinders.



Smart Cylinder App



Smart Cylinder



Gateway

Smart Immersion Controllers - another group of participants are testing a retrofit solution to the existing on/off immersion switch from Climote. This allows them to turn on/off and time the immersion remotely and monitor how much hot water they have available.



Smart Immersion Controller App



Smart Immersion Controller Hub

Additional customers have been recruited to participate in Power Off & Save events since the previous project progress report. These are as follows:

Technology Type	Additional Participants	Total
Smarter Home Group (i.e. Smart Energy Controller)	100	544
Smart Pay As You Go (SPAYG) Group	60	830
Smarter Home Group to include remote immersion control	70	70
Glen Dimplex Quantum Hot Water Cylinder Group	25	50
Climote Immersion Control	90	100
Homes with Electric Vehicles	13	13

2.2.4 Delivery of the additional four events since Progress Report One

Electric Ireland following notification from EirGrid delivered four additional Power Off & Save events. All participants were sent a SMS text message and push notifications on a smart app where possible on time and their usage data was captured. The results of the analysis for the events are discussed in the learning outcomes section.

The four events were strategically planned to investigate participant response and were carried out on specific times of the day, week and season to test the customer behaviour and appetite for a Power Off & Save event at certain times of the day.

Event 3 - Tues 7th Feb 2017 @ 12:30 - 13:00 – Winter weekday midday

Event 4 - Wed 26th April 2017 @ 09:00 - 09:30 – Spring weekday morning

Event 5 - Sat 24th June 2017@ 18:30 - 19:00 – Summer weekend evening

Event 6 - Sun 16th July 2017 @ 18:30 - 19:00 – Summer weekend evening

2.2.5 Data Analysis & Statistical Methodologies

In Phase 1, the statistically reliable analysis methodology was developed following a study on the numbers involved in the trial. There are two comparison methods used to measure the change in usage during an event.

Method 1 - Control Group	Method 2 - Participant Historical Data
The first method compares participant usage during the event to usage of a group of customers who are not taking part in the programme for the same period - a control group.	The second method compares participant usage during the event to their five-week historical usage data of each participant.

Both methods are being used for the duration of the pilot and an evaluation of their effectiveness will be carried out at the end of the programme.

There also have been further analyses techniques carried out such as:

- Focus on the Climate Immersion Data.
- Five second data on homes that have a Smarter Home kit.
- System Services reaction times and provision capability.

2.3 COMMUNICATIONS AND STAKEHOLDER ENGAGEMENT

2.3.1 Communications Strategy

A communications strategy for the project was developed to ensure clear and co-ordinated communication between all stakeholders on the project. To date the strategy has proven to be a useful framework to ensure effective communications.

2.3.2 Consumer Engagement Plan

A Consumer Engagement Plan was developed in Phase One. It was based on the existing Electric Ireland framework for the Smarter Living Programme. This includes a comprehensive customer support facility, which ensures any issues are addressed promptly. To date customer engagement has gone smoothly and there have been no significant negative issues from a communications perspective.

2.3.3 Stakeholder Engagement Plan

A stakeholder management plan was developed to ensure all key internal and external stakeholders were identified and communicated with appropriately. Information on the project has been disseminated to the following external stakeholder groups:

General public - Social media coverage via Twitter, LinkedIn and YouTube including dedicated webpages on both EirGrid and Electric Ireland websites. It is worth noting that there over 38,000 views of the EirGrid Power Off and Save mid-point results video that was launched on YouTube in July 2017 – see [here](#)

Industry Stakeholders - Several presentations to key industry stakeholders such as CER, SEAI, DS3 Advisory Council and the EurElectric Conference have taken place. EirGrid also carried out a presentation at CIGRÉ Symposium in Dublin in June 2017.

2.3.4 Market Research & Customer Behaviour

Understanding the underlying drivers of participant behaviour in relation to reducing electricity usage is an important part of this project. IPSOS MRBI is the professional research partner to Electric Ireland and has carried out a research survey during the summer on almost 600 participants. This particular survey was carried out to gain a deeper understanding of participants' experience of the programme so far and how easy or difficult they found it to reduce usage. See learning outcomes to date in Section 3 for more information.

2.4 RISKS AND CONSTRAINTS

Over this reporting period, the project team identified a number of risks and constraints to the programme. They mainly related to the re-design of the smart plugs on the smart home trial, migration of the Smarter Home to another platform and delay in delivery of the Glen Dimplex platform, gateways and app for that particular participant cohort. However, given the above constraints, the project still managed to carry out four additional events and gain significant learnings.

3. Learning Outcomes to date

To date six 'Power Off & Save' events have taken place, with more participants being recruited and more smart home technologies being rolled out. Four additional POAS events were successfully delivered with message notifications (via SMS and App push notifications) sent to all participants on time and electricity usage data was captured and analysed for the appropriate time periods. As discussed in Section 2.2.5 Data Analysis, there has been two separate ways in reporting the results of each event:

1. Looking at the Trial Group Event Data against the Trial Group Historical Data.
2. Looking at the Trial Group Event Data against a Control Group that did not get the event notification.

Reporting Option 1	
Event	Overview of Trial Group Event Data Vs Historical Data and Control Group Data
Event 1 Thurs 3rd Nov 2016 @ 19:30 - 20:00 Post Filter - 620 Participants (370 SEC & 250 SPAYG)	Historical Data, 93.4kW reduction (17% reduction at time of event) equates to 152 Watts per participant. Against a Control Group, 81kW reduction (14% reduction at time of event), equates to 124 Watts per participant.
Event 2 Mon 5th Dec 2016 @ 18:30 - 19:00 Post Filter - 785 participants (366 SEC and 419 SPAYG)	Historical Data, 119kW reduction (14% reduction at time of event) equates to also 152 Watts per participant. Against a Control Group, 160kW reduction (18% reduction at time of event), equates to 205 Watts per participant.
Event 3 Tues 7th Feb 2017 @ 12:30 - 13:00 Post Filter - 1,081 participants (336 SEC and 745 SPAYG)	Historical Data, 57kW reduction (12% reduction at time of event) equates to also 53 Watts per participant. Against a Control Group, 64kW reduction (13% reduction at time of event), equates to 59 Watts per participant.
Event 4 Wed 26th April 2017 @ 09:00 - 09:30 Post Filter - 1,082 participants (345 SEC and 737 SPAYG)	Historical data, 65kW (15% reduction at time of the event) which represents 59 Watts per Participant. Against a Control Group, 63.94kW (14% reduction at time of event) represents 59 Watts per Participant.
Event 5 Sat 24th June 2017 @ 18:30 - 19:00 Post Filter – 1,094 (376 SEC and 718 SPAYG)	Historical data, 74.5kW (11% reduction at time of the event) which represents 68 Watts per Participant. Against a Control Group, 66.7kW (10% reduction at time of event) represents 61 Watts per Participant.
Event 6 Sun 16th July 2017 @ 18:30 - 19:00 Post Filter – 1,054 participants (390 SEC and 664 SPAYG)	Historical data, 54.7kW (9% reduction at time of the event) which represents 46 Watts per Participant. Against a Control Group, 48.9kW (7% reduction at time of event) represents 46 Watts per Participant.

In total, adding up all the events, the total energy reduction amounted to 232.35 kWh.

3.1 EVENT 3 - WINTER WEEKDAY MIDDAY

On Tuesday the 7th February 2017 between 12:30 and 13:00, event three took place with approximately 1,240 homes participating in the event. The results of this event were significantly lower due to the midday timing of the event. There was a 57kW reduction (12% reduction at time of event), which equates to approximately 53 Watts per home when comparing the Trial Group against their Historical Data.

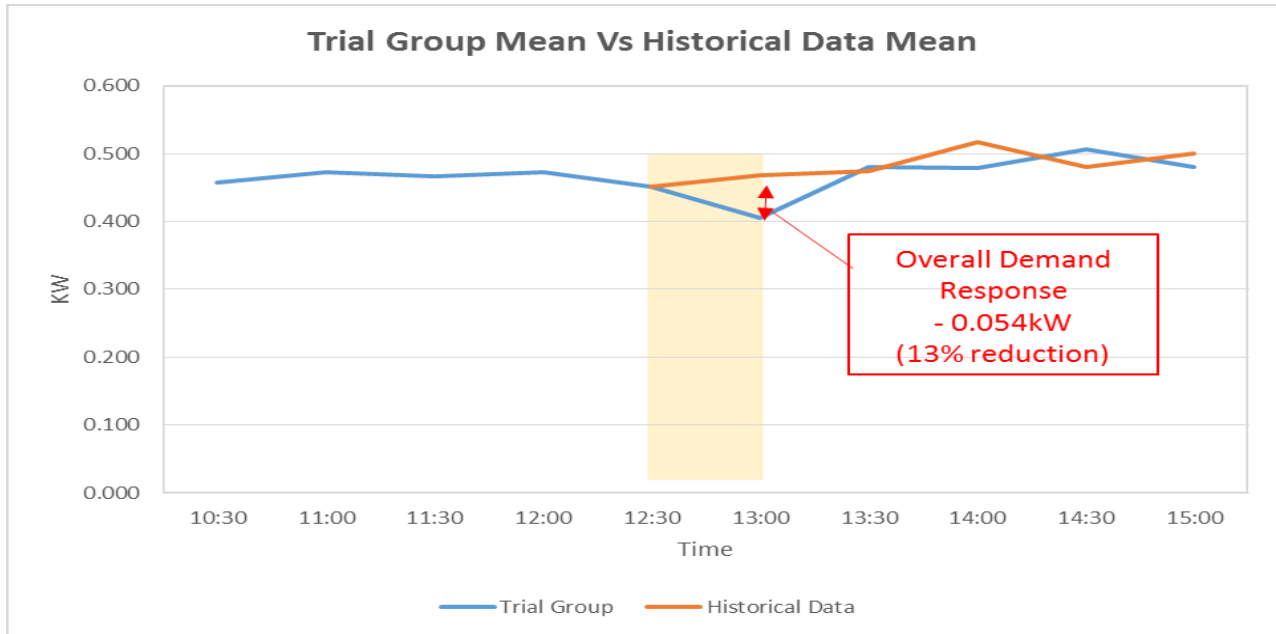


Figure 2 comparing the average Trial Group participant against their Historical Data for event 3

Comparing the Trial Group against the Control Group, there was a total of 64kW reduction (13% reduction at time of event), which equates to approximately 59 Watts per home.

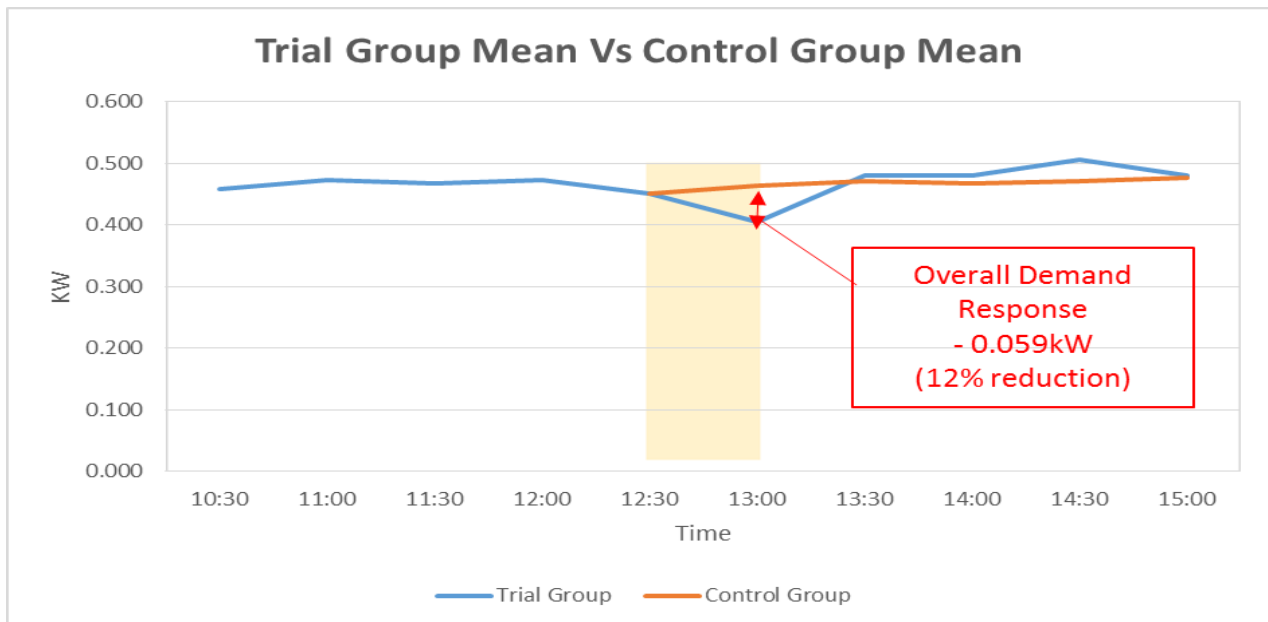


Figure 3 comparing the average Trial Group Participant against the average Control Group Participant for Event 3

As expected, the learnings from this event shows that having an event during the day (majority made up of homes with manual interruption) naturally results in a lower return of Power Off and Save participation.

3.2 EVENT 4 – SPRING WEEKDAY MORNING

Event 4 was held on a Wednesday morning 26 April 2017 between 09:00 and 09:30 hours. Approximately 1,260 homes took part in the event. The results of the event were slightly better than Event 3 where there was a higher overall reduction. Comparing the Trial Group against their Historical data, there was a total reduction of 65 kW (15% reduction at time of the event) which represents approximately 59 Watts per home.

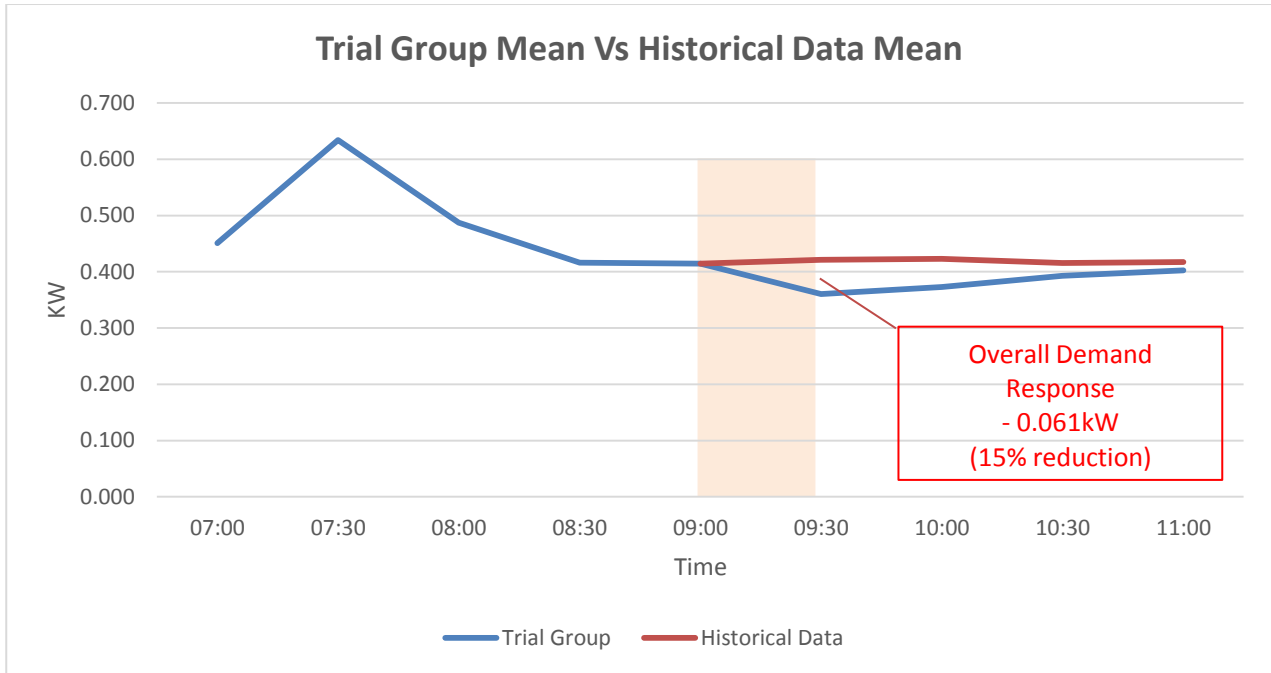


Figure 4 comparing the average Trial Group Participant against their Historical data for event 4

Comparing the Trial Group against the Control Group, there was a total reduction of 63.94 kW (14% reduction at time of event) which represents approximately 59 Watts per home.

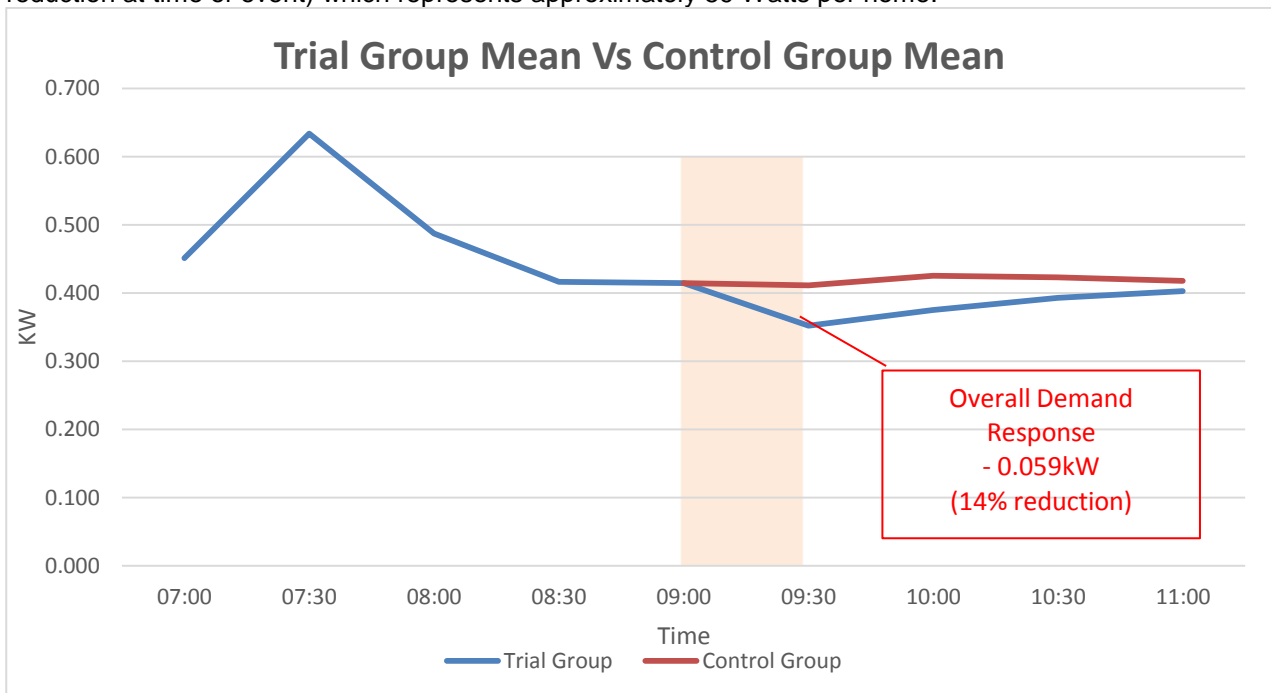


Figure 5 comparing the average Trial Group Participant against the average Control Group Participant for event 4

The learnings from event 4 in the morning were comparable to event 3, which was a weekday at midday.

3.3 EVENT 5 – SUMMER WEEKEND EVENING

Event 5 was held on a Saturday evening between 18:30 and 19:00 hours. Approximately, 1,270 homes took part in the event. Comparing the Trial Group against their Historical data, there was an overall reduction of 74.5kW (11% reduction at time of the event) which represents approximately 68 Watts per home.

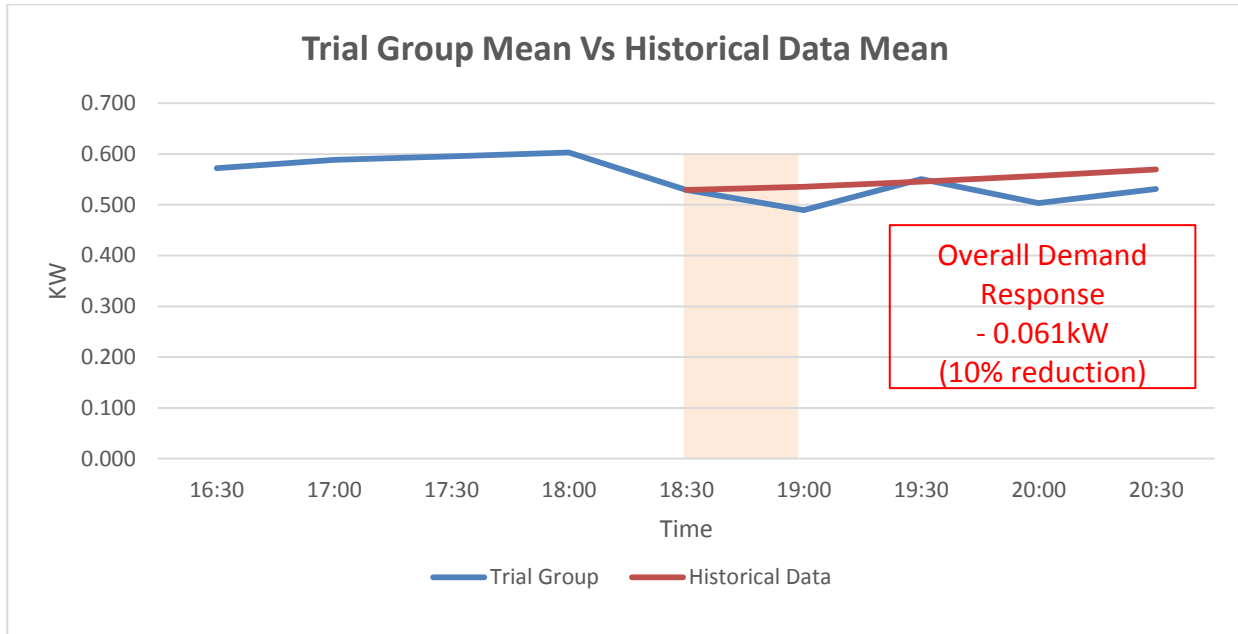


Figure 6 comparing the average Trial Group Participant against their Historical data for event 5

Comparing the Trial Group against a Control Group, there was an overall reduction of 66.7 kW (10% reduction at time of event) which represents approximately 61 Watts per home.

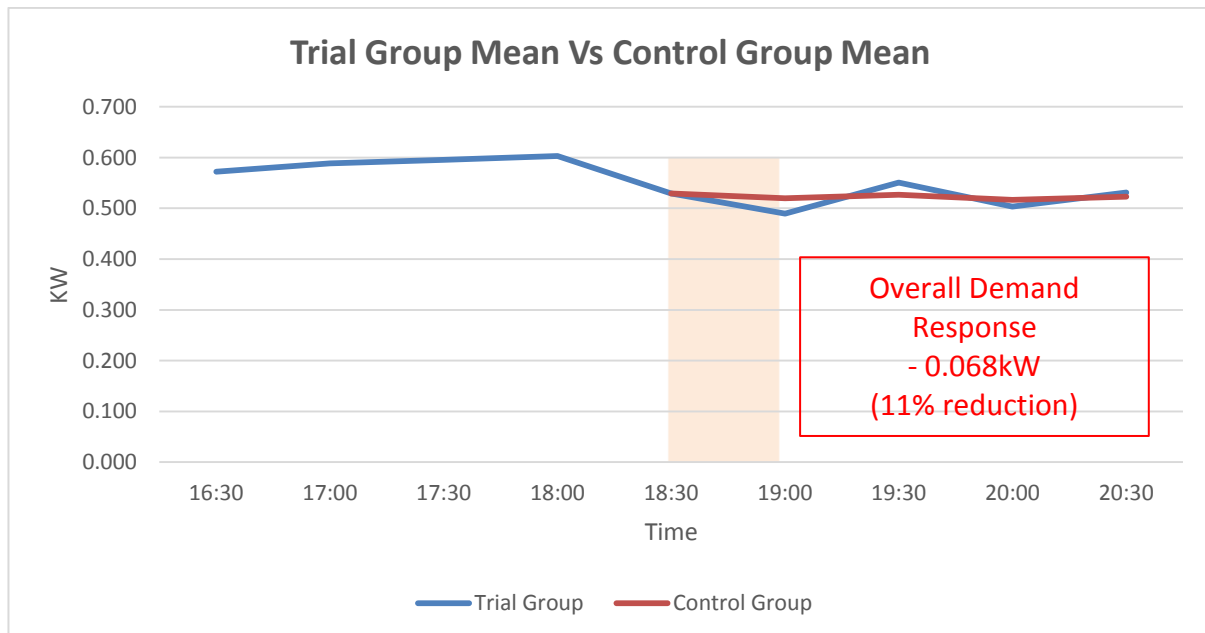


Figure 7 comparing the average Trial Group Participant against the average Control Group Participant for event 5

This was the first event at a weekend and it was held in the evening during a time of the day that has a relatively high electricity demand. It is felt that there was a slightly lower return in participation than expected for an evening event. This may be attributed to the following:

- Lower return on %reduction from Smart Pay As You Go (SPAYG) participants.
- On a Saturday evening, people are not as engaged or in the home to take part.

3.4 EVENT 6 – SUMMER WEEKEND EVENING

Event 6 was held on a Sunday evening between 18:30 and 19:00 hours. Approximately, 1,295 homes took part in the event. Comparing the Trial Group against their Historical data, there was an overall reduction of 54.7kW (9% reduction at time of the event) which represents approximately 46 Watts per home.

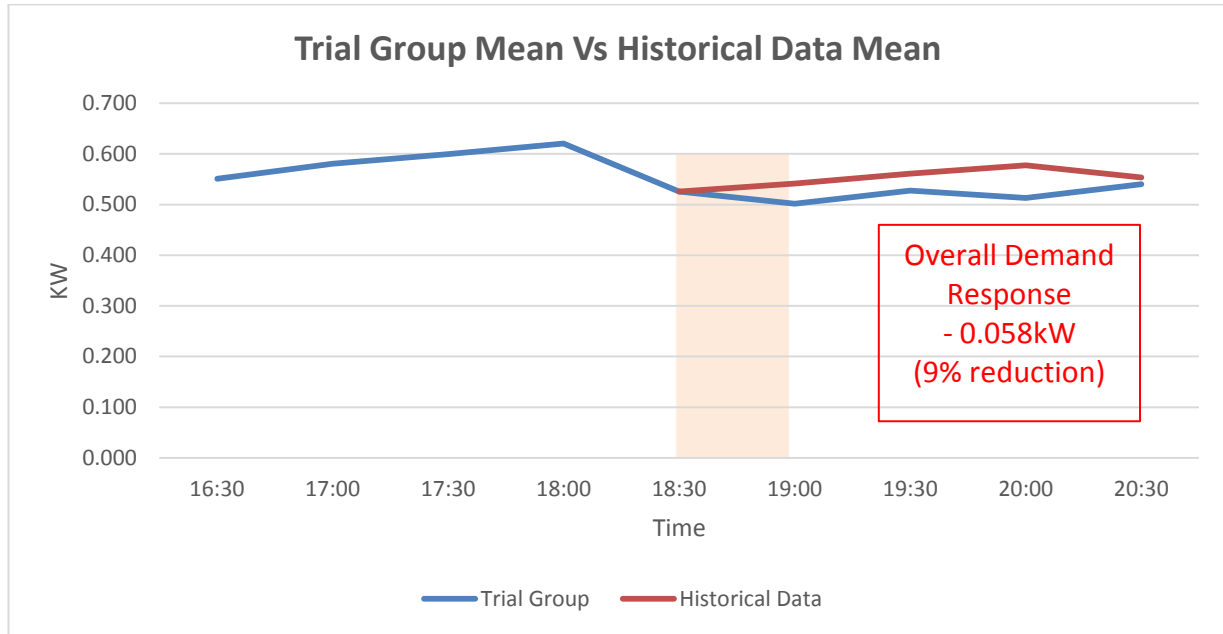


Figure 8 comparing the average Trial Group Participant against their Historical data for event 6

Comparing the Trial Group against a Control Group, there was an overall reduction of 48.9 kW (7% reduction at time of event) which represents approximately 46 Watts per home.

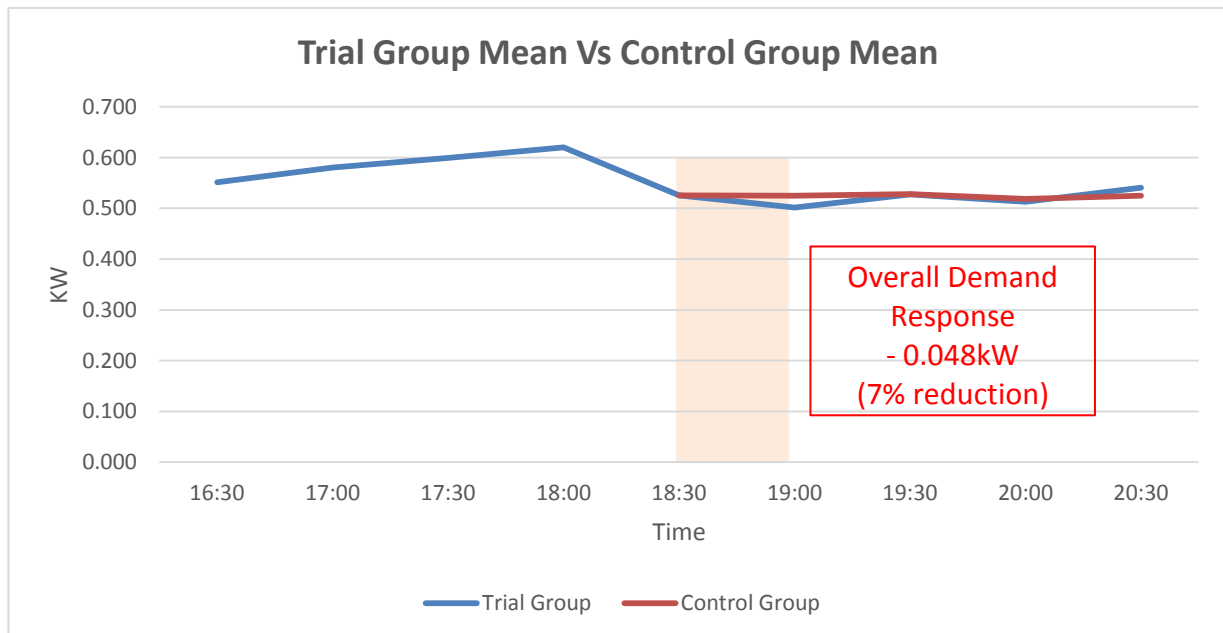


Figure 9 comparing the average Trial Group Participant against the average Control Group Participant for event 6

This was the second consecutive POAS event on a weekend day and was triggered at a time in the day when aggregate demand is considered high. As per the previous weekend event, it was felt that there was a lower return in participation compared to the weekday evening event. This could be due to the following:

- Lower return on %reduction from SPAYG cohort
- On a Sunday evening, people are not as engaged or in the home to take part.

Another interesting learning was the ‘Interrupted Load’ from the nine homes with a Climote Immersion Controller. This type of interruption has the potential to realise great benefits for residential demand response.

- a. Energy reduction benefit due to the interruption of the POAS event six was 9.9 kWh from nine homes that had data.
- b. Power reduction benefit was 19.80 kW from nine homes. This equates to 2,200 Watts per home on average

In addition, there were other learnings in terms of electric vehicle participation from our 12 homes with electric vehicles. For example, the below graph is an electric vehicle charge profile during the day of event six. Unfortunately, none of the 12 homes took part in this event, although three electric vehicle charge points were used on the day. By encouraging participants to charge their electrical vehicles at certain times throughout the day or night, there may be greater reduction in demand reduction.

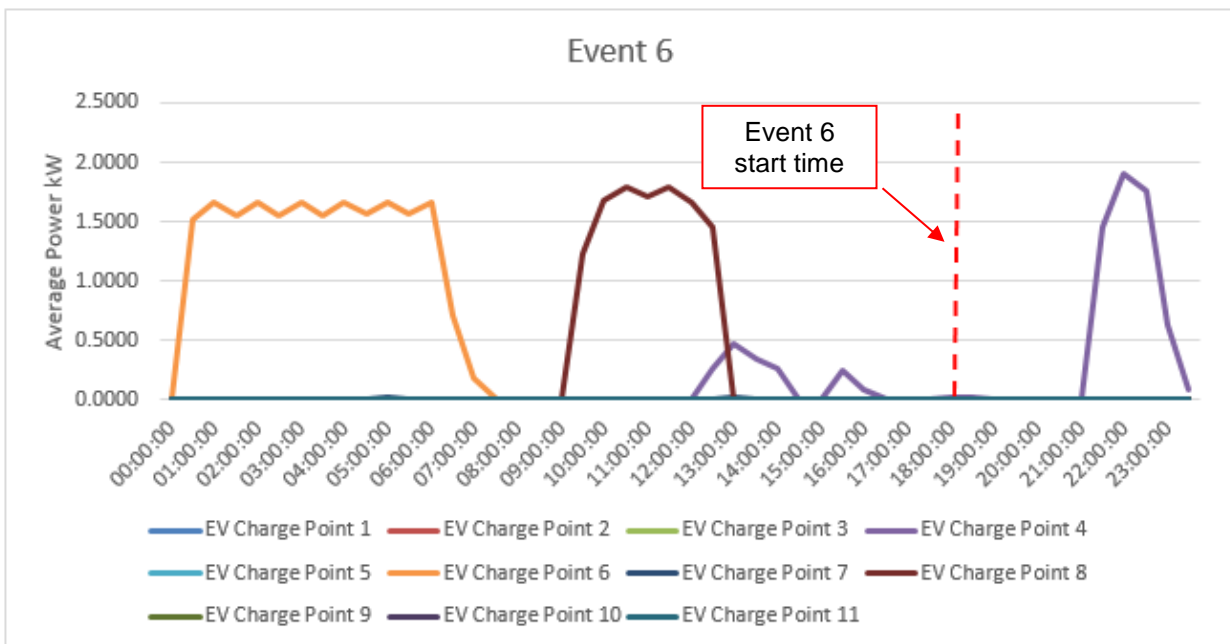


Figure 10 Profile of electric vehicles charging during the day of event 6

3.5 PARTICIPANT PARTICIPATION

Analysis of the results for all six events has shown that generally between 50% and 60% of all participants reduced their consumption when compared against their historical data. This correlates closely with the text message survey following each Power Off & Save Event as can be seen in Figure 11 below.

	SMS Text Message Survey			Data Analytics
	No. of Customers Texted	No. of Customers Responded	No. of Customers that responded and said they took part in POAS Event	No. of Customers who reduced their consumption against their historical data
Event 3 Tuesday 7th Feb, 2017 @ 12:30 - 13:00	1,241	394	214 out of 394 i.e. 54 %	609 out of 1,081 i.e. 56%
Event 4 Wed 26th April, 2017 @ 09:00 - 09:30	1,262	614	337 out of 614 i.e. 55%	575 out of 1,083 i.e. 53%
Event 5 Sat 24th June at 18:30 - 19:00	1,286	456	264 out of 456 i.e. 58%	579 reduced out of 1,094 i.e. 53%
Event 6 Sun 16th July 2017 @ 18:30 - 19:00	IPSOS Survey			

Figure 11: Text Message Survey participation Vs Actual data participation

3.6 REACTION TIMES WHEN EVENT IS TRIGGERED

When reviewing the reaction times of the Smarter Home participants from all the events (as we have five minute data for this participant cohort), a clear pattern has emerged on the reaction times for reducing home consumption. Generally between 30% and 40% of homes attempt to reduce their home consumption, within the first five minutes of an event notification. Conversely, between 30% and 40% of homes do not attempt to reduce their home electricity consumption.

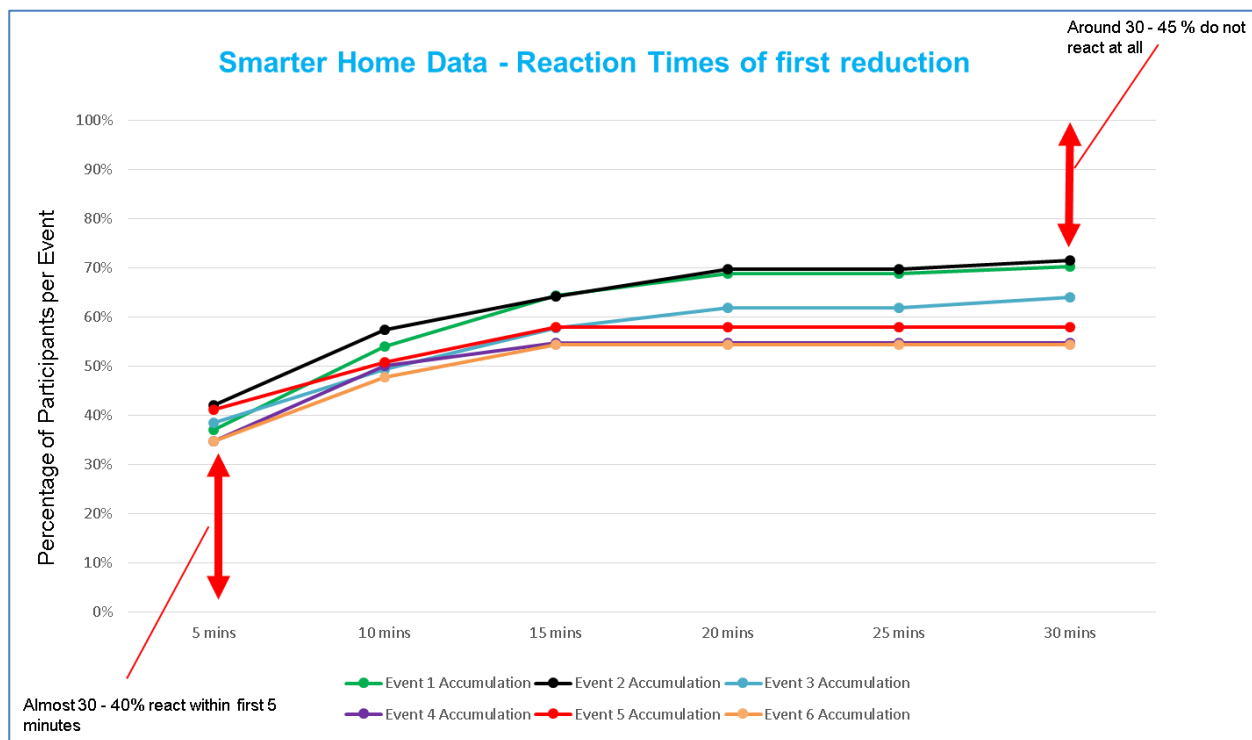


Figure 12: Smarter Home Reaction times of both events together

3.7 IPSOS CUSTOMER RESEARCH

Our customer research partner - IPSOS MRBI - carried out participant research in August 2017 for the first time on Power Off and Save participants. A survey request was sent to 1,345 homes with 595 homes filling out the survey – a response rate of 44%. The survey mainly focused on the previous two events for the participant which were events five & six respectively (both also happen to be weekend events).

The results from the survey show that that participants believe that being at home, advance notification and willingness to interrupt for a long period are the key attributes for participating in the demand response events. The overall demand reduction per home is small to date as customers are generally reducing demand from low energy usage devices in the home (manually). This has limited commercial value at scale in its current form, as tens of thousands of homes would be required to justify the investment required to participate in the market systems or as a DS3 System Services provider. There is a need for consumer education and engagement because of the learnings from this project for manual interruption participants.

The key findings from this research are as follows:

- Provided respondents are at home at the time and aware of the notification, participation in Power Off & Save events tends to be strong and a clear willingness to participate is evident.
- There is openness to more frequent, longer duration events, and to participants taking place at peak periods. However, not all are aware of the finer details such as payment mechanisms and how best to take advantage of benefits.

- Satisfaction and NPS scores for the POAS project are generally positive, with potential to increase if improvements are implemented. Specifically, prior notice of the events and a return of the recalled smart plugs could drive higher scores.
- According to the survey, just under three in five have participated in each of the last two events with two in five participating in both Event five & event six.
- Over half (53%) of 18 – 34 year olds participated in both events five & six, with lower participation (in both events) amongst older age groups.
- There is evidence of several household members participating in the POAS events, including children. The TV, kettle, and phone charger are all popular appliances being cited by participants to being powered off when notification arrived.
- The main reason for non-participation is that the individual was not at home at the time of the POAS event. Other than that, not noticing the text or having nothing to switch off was also cited but there is no evidence of any strong resistance to participation.

4. Next Steps

As detailed earlier in the report, all areas of 'Power Off & Save' are on track against the project plan. The next steps in the project are:

Implementation of further 'Power Off & Save' events using more automated technology - Events focussing on automated technology will be carried out. We will investigate technology such as immersions, electric vehicles and appliances using smart plugs.

Night time event - In early 2018, a night-time event will be planned in the absence of SMS messaging with a focus on the automated technology.

Recruitment of Solar PV Customers - An additional customer cohort with a different testing mechanism is of interest to the project team. The customer will power off their generating technologies for the 30 minutes of an event,