Vulnerable Customers and Energy Efficiency
Low Carbon Networks Fund
Project Progress Report – July to December 2017

UK Power Networks
Delivering your electricity

Contents

1 Executive Summary

This report details the progress of UK Power Networks' Low Carbon Network Fund project, Vulnerable Customers and Energy Efficiency (VCEE), from July 2017 to December 2017.

1.1 Project Background

The Vulnerable Customers and Energy Efficiency (VCEE) project, also known as **energy**wise, is a partnership between ten organisations, led by UK Power Networks. Ofgem awarded the project £3.3 million of funding, under the Low Carbon Networks Fund (LCNF) competition scheme in December 2013. UK Power Networks contributed to the project an additional £0.8m, which reflects their social commitment in supporting their most vulnerable customers and the communities in which they operate.

energywise is exploring how residential customers who may be struggling with fuel bills can better manage their household energy usage and consequently their energy bills by changing the way they use electricity. The project is doing this by undertaking a research study with the aim of recruiting 550 households who may be struggling with their energy bills in the London Borough of Tower Hamlets and carrying out two trials. The trials will test different ways of helping households better understand and control their electricity spending, enabling them to make changes which may save them money on their energy bills.

Firstly, the project is currently exploring whether households benefit from smart metering solutions (smart meter and smart energy display) and from energy efficiency technologies such as energy efficient light bulbs, an eco-kettle and standby shutdown. Secondly, the project will work to understand households' appetites to change their behaviour when on a 'Time-of-Use (ToU)' tariff targeting electricity, with favourable rates within specific time windows.

The project plans to understand:

- the extent to which this residential customer group is able and willing to engage in energy saving campaigns and ToU tariffs;
- the benefits that they can realise from their change of behaviour in household energy management;
- the challenges and best approaches to engaging with these groups of customers to achieve these aims; and
- whether their reduction in demand, and shifting demand away from network peak periods may benefit the electricity network by deferring or avoiding network reinforcement.

1.2 Summary of Progress

This reporting period covered six months of trial 2, which began three months before the reporting period. Activities during this period included:

- continuing to send out Bonus Time notifications to the prepay participants; a total of 50 notifications were issued during this period. In response to feedback at the July participant panel, the range of periods/days on which Bonus Time periods fell was expanded to include additional weekday morning and midday events. During this period, Bonus Time participants also received their first rebate, on 3 July (and roughly monthly thereafter) as well as their first two quarterly statements (at the end of July and October) informing them how much money they had been reimbursed;
- submission of the SDRC 9.4 report on customer recruitment and engagement;
- a number of customer engagement activities including two participant panels for each customer group (credit and prepayment customers) in July and October respectively, three newsletters posted in June[1], October and December, a letter to all participants explaining the extension of trial 2 to March 2018 and two quarterly statements issued to prepayment customers on Bonus Time in July and October; and
- the commencement of interviews between University College London staff and participants, which will be used to inform the development of a suite of case studies. The case studies will be completed early in 2018 and will be included in the SDRC 9.5 report and in an updated lessons learned booklet.

[1] This was in the previous reporting period but was not reported in the previous biannual as it was so close to the end of that period.

Work also continued to analyse the data from trial 2. Initial findings are available for customers receiving Bonus Time notifications (as this is required to calculate their monthly rebates and provide their quarterly statements); findings for HomeEnergy FreeTime (HEFT) customers will be reported in the SDRC 9.5 report in July 2018. In the first six months of the Bonus Time trial:

- the average electricity rebated per households was 12kWh;
- each participating household on a prepayment smart meter earned an average credit of £16; and
- the total amount of electricity rebated for all prepayment households was 867kWh equivalent to 867 loads of laundry.

A key focus of this reporting period was the update of the contractual agreements with project partners following the confirmation of the extension of the project to 30 September 2018. On 19 October 2017 UK Power Networks and British Gas issued a joint communication of the extension of the Collaboration Agreement to all project partners. UK Power Networks have also worked closely with each project partner towards the extension of the individual Project Agreements. Finally, the **energy**wise business case has been updated during this period following the reassessment of the technical saving and shifting potential of the project's interventions carried out by Element Energy based on the latest data available and on the appliance ownership data reported by **energy**wise trial participants in the Home Energy Survey. The updated business case is reported in Section 7.

As of 1 December 2017, there are 270 participants active in the project, of whom 192 are credit and 78 are prepayment customers. Active participants are split across the two research groups, with 154 participants in the intervention group and 116 in the control group (which are now merged together). To date, the project has experienced 268 drop-outs, 23 of these since the last progress report. The number of participants choosing to leave the project remains very low with just one during this period (other dropouts are due to customers switching supplier or moving house plus some in the original control group who failed to respond to requests to make an appointment to install their smart meter for trial 2), the project is constantly monitoring the number of active participants and the reasons for additional drop-outs on a weekly basis to take actions to minimise project attrition where possible.

Out of 270 active participants, 236 have consented to trial 2 tariffs, with 165 credit customers signed up to HomeEnergy FreeTime and 71 prepayment customers registered for Bonus Time. The other 34 (all of whom have had a smart meter installed) remain participants in the project but are not taking part in the DSR trial.

A summary of the project's status is presented below.

Figure 1: Project summary

Looking ahead to the next reporting period, the project intends to:

- complete the DSR trial by the end of March 2018;
- close the customer journey by inviting trial participants to final thank you events and issuing an end-of-project thank you voucher of £30 and a copy of the Customer Services Charter;
- organise two thank you events (one for credit and one for prepayment customers respectively) where they can learn about the key outcomes of the project;
- decommission the remaining equipment in customer's properties when required;
- complete the analysis of the 12 month worth of data collected in trial 2; and
- continue dissemination planning activities to share the project learning across 2018.

1.3 Risks and Issues Summary

Project extension – update

As reported previously, following the half hourly meter data issue that resulted in the trial 1 completion date being delayed to mid-February 2017, UK Power Networks submitted a change request to Ofgem on 3 April 2017. This asked for a project extension of nine months and was supported by all project partners and the other five Distribution Network Operator (DNO) groups in GB. Ofgem confirmed that no approval is required on the basis that UK Power Networks do not consider that the proposed change would qualify as a 'material change' under the revised NIC governance definition.

In October 2017, a project extension letter was sent to all participants informing them that the trial was being extended by three months to March 2018. They have also been informed that they did not need to take any action to remain in the project, and that the **energy**wise terms and conditions remain unchanged, except that the trial period would end on 31 March 2018. Following discussion with project partners, it was agreed that participation in the project extension should be offered to participants on an opt-out rather than opt-in basis since extending the project term offers only benefits to participants, with no potential for them to be worse-off. The letter explained that anyone not wishing to remain a participant beyond December 2017 should contact the customer field officer team.

The Collaboration Agreement set up in 2015 among all project partners has been also extended until 30 September 2018 following written communication of the project extension provided by UK Power Networks and British Gas to project partners on 19 October 2017. The extension of the individual Project Agreements between UK Power Networks and each partner is also in progress.

Project attrition related to project extension

To encourage participants to remain in the project to the new end date, the project extension letter explained that all participants would receive a £30 Love2Shop voucher at the end of the project to say thank you for their participation. This has been communicated for the first time to trial participants, as the project has previously kept the decision open on the end-of-trial thank you voucher. No participant has chosen to drop-out because of the project extension, though through the process of issuing the letter, it was identified that four participants had moved house and therefore had to be disengaged from the project.

Project attrition in trial 2: Critical Peak Rebate (CPR) response

Bonus Time participants receive notifications on a (approximately) weekly basis for CPR events. Participants will receive two notifications of each event and it was previously identified that there is a risk that this increased level of interaction with participants will result in increased dropouts in the early stages of the trial. In order to mitigate this risk, during the trial 2 recruitment phase, the project focused on providing simple and clear explanations on how Bonus Time works and the benefits associated to it, both in written communication materials and in verbal communications with trial participants. To-date, no participants have dropped out as a result of the Bonus Time notifications.

Trial 2 smart meter data issue

As part of the October rebate calculations carried out by Element Energy for prepayment customers participating in Bonus Time, it was found that 22 out of 71 active prepayment meters are reporting a mix of positive and negative values since 22 September 2017. This is caused by a smart meter software issue known to British Gas. The issue seems to exists in small volumes for both credit and prepayment electric meters.

British Gas has addressed this problem and a fix for both meter types has been deployed to all the affected devices. As of 3 December 2017 the issue is resolved and British Gas has confirmed that all the smart meters involved in the project are returning positive readings.

The solution will only affect future reads (from 3 December 2017 onwards), which means that the calculations of the Bonus Time rebates for the 22 prepayment customers might not be accurate for the months of October and November. While British Gas was deploying the fix, the project partners have developed a mitigation strategy to calculate the October and November rebates. Element Energy is calculating Bonus Time awards for October and November, based on the available data. Extra checks will be carried out on those meters that report negatives. Ideally, their awards can be based on the positive values they report and Element Energy is checking if the corresponding awards are in line with previous behaviour of these customers. If this does not seem sensible, these customers will be awarded according to their previous response (earlier months), or according to October/November group average. Therefore, the impact on the customer's experience is expected to be minimal.

Element Energy and University College London are also checking of the potential impact of this issue on the analysis of credit meter data that will be carried out at the end of trial 2. As the issue is now resolved, only October and November data may be partially affected.

Accurate assessment of prepayment customers' savings in trial 2

A baselining method was developed by Element Energy in a previous reporting period in order to estimate the savings arising from Bonus Time in the absence of the historic baseline that should have been captured through the prepayment half hourly data in trial 1. Compared to 'intervention versus control group' comparison (where the electricity consumption was compared between two groups over the same period of time), this is done by comparison to the electricity consumption of each household during the same period on preceding 'similar days'.

As previously reported, while this is the most suitable method available to the project, it was envisaged that it would be difficult to estimate the savings arising during a CPR period due to the inherent variability of day-to-day energy consumption within any individual household. Therefore, there is a risk around the time of the provision of the first rebate that the amounts credited to prepayment participants' meters may not correspond with their expectations of the savings, and the amount of work they feel they have invested in reducing their consumption during the CPR periods. This arises partly because of the disparity between the level of credit being offered (ten units of energy for every unit of energy saved) and the translation of this into monetary units. This is compounded by the inherent uncertainty in the calculation process, which may dishearten some participants.

Rebate calculations to date in trial 2 are progressing well. For most households, there has been sufficient smart meter data available to appropriately determine consumption baselines and household responses for each CPR event, rebate calculations and customer communication have proceeded to plan. If the response to a CPR event cannot be determined for a household (due to lack of monitoring data), then the rebate is calculated according to the average response that was observed across other successful CPR events for this specific customer in the given payment period. (If that is not possible, then the reward is calculated according to group average performance). Checks were performed on the trial 2 data available to ensure that there weren't any households that had misunderstood the Bonus Time proposition and all households passed these checks (i.e. there were no households found to consistently increase demand during the CPR events or to reduce demand on the day preceding the CPR event when the first notification message is received).. There has not been any negative feedback or dissatisfaction expressed by participants in relation to the rebate amounts either through the participant workshops or other communication options, as such, communications around the CPR rebates have not needed to be altered significantly from their original design at trial commencement.

1.4 Learning and Dissemination Summary

As described in Section 2.5 the project has undertaken several dissemination activities over the current reporting period to ensure that all the learning gathered so far have been shared widely. In addition to these, valuable lessons summarised in Section 6.1 have been also captured through ongoing engagement including activities such as the July and October participant panels and initial findings from the data with regards to how prepayment participants are responding to the Bonus Time notifications and to the experience of credit participants on the HEFT tariff. Comments from energywise participants at the participant panels suggest that some participants are exploring different ways to benefir from their new tariff offering (Figure 2). The feedback has provided the following learning:

- participants are generally positive about the DSR trial and were enthusiastic about its extension;
- participants find it helpful and encouraging to hear others participants' electricity shifting experiences and tips; and
- not all participants feel they are able to shift, but those that are, find laundry and cleaning the easiest activities to shift.

Figure 2: energywise **participants' comments at the participant panels in July and October 2017**

2 Project Manager's Report

2.1 Progress in the Current Reporting Period

Within this reporting period, the project has focused on:

- informing the active **energy**wise participants of trial 2 extension to 31 March 2018 and extending the contractual agreements with the project partners;
- ongoing customer engagement activities including newsletters and participant panels;
- gathering customer insights through interviews with trial participants led by University College London with the support of the customer field officer team when required for translation purposes;
- trial 2 ongoing CPR calculations for prepayment customers, monthly rebates credited to the meters of those who earned credits and quarterly statements;
- planning activities for the final phase of the project including:
  - decommissioning;
  - end of customer journey and thank you events;
  - lessons learnt consolidation; and
  - project dissemination.

Project timeline

There have been no changes to the project timeline in the current reporting period. As reported in June 2017, trial 2 is expected to be completed on 31 March 2018, followed by a decommissioning phase and the end of the customer journey with two thank you events (one for credit and one for prepayment participants respectively) where participants can hear about the key project learning outcomes.

The 12 months' worth of data collected over the DSR trial will be analysed and results will be reported in the SDRC 9.5 report due by the end of July 2018. The report will also include the analysis of the third wave of the Energy Social Capital Survey that will be administered to trial participants in Q1 2018. The SDRC 9.6 report on project dissemination will be submitted to Ofgem by the end of September 2018, when the project ends.

Team structure and project resourcing

Please note within the current reporting period there have been changes in the core team structure. In October 2017 the Project Lead who has led the project since May 2016 took up a new role in UK Power Networks. UK Power Networks have assessed various options to ensure a continuity in the leadership of the project as well as to maintain the required focus and commitment to the project.

A new resource identified for the role of Project Lead will join UK Power Networks in early 2018. In the meantime, the following interim arrangements have been made:

- additional support on project management activities, internal project enquiries and regular project reporting within UK Power Networks has been provided by Element Energy since the end of November 2017;

- CAG Consultants will continue to support UK Power Networks on customer engagement activities; while
- UK Power Networks will maintain the overall leadership of the project, will remain the primary contact for external stakeholders and will continue to own and manage the contractual relationship with the project partners and the project finances.

The current Project Lead will maintain the leadership of the project until the new resource is in place. The additional support provided by Element Energy will ensure the required attention is fully given to management activities, while the Project Lead is also fulfilling additional responsibilities as per the new role.

There have been changes and further updates within the wider project team in terms of resource:

- British Gas – the previous **energy**wise project manager has moved onto a different role and a replacement has been appointed. A full handover has been completed with the new project manager in September. The new project manager was introduced to the project partners in October.
- Bromley by Bow Centre – the customer field officer team will go from three to two members of staff at the end of December 2017. This is according to the contractual arrangements of the community centre with their resources and it is not expected to have an impact on the project activities given the reduced requirements on customer engagement activities in the last phase of the project. The Bromley by Bow Centre may utilise additional hoc resources involved in the project close to the end of trial 2 when project closing activities are expected (customer disengagement, equipment decommissioning and thank you events). The senior representative for the project at the community centre has also returned from maternity leave and will support the project at senior level as required.
- University College London – the academic partner has appointed a new Research Associate for the quantitative data analysis of trial 2 credit customer data and temperature data, with the researcher previously involved in this activity moving to a more senior and advisory role.

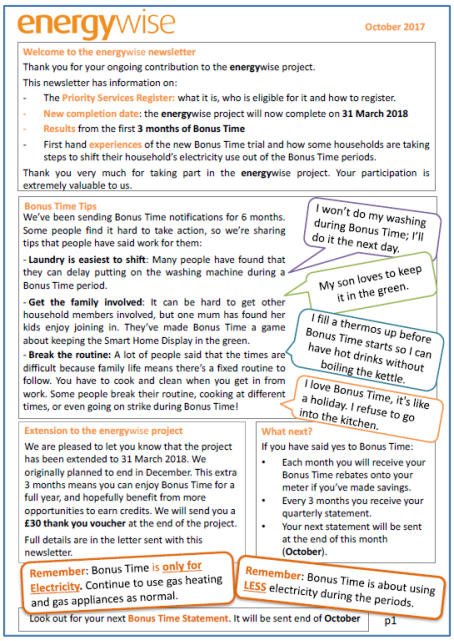
2.2 Customer Recruitment and Engagement

Customer recruitment and engagement analysis

During this reporting period, the SDRC 9.4 report covering customer recruitment and engagement was finalised and submitted to Ofgem. This involved gathering together and analysing information from the trial 1 and trial 2 recruitment and installation evaluation reports (which were based on recruitment data analysis, qualitative participant interviews, participant panel feedback and workshops with project partners and other key stakeholders). It also included an evaluation of the recruitment and engagement costs. Ongoing engagement plans to the end of the project are also presented in the report. All the learning outcomes related to recruitment and engagement are incorporated, covering the different stages of selection, recruitment, installation and provision of energy efficiency devices, ongoing engagement, participant attrition and insights from the Energy Social Capital survey.

Customer communication materials

As explained in Section 1.3, retention of trial participants is key to the robustness of the project findings. For this stage of the project, communication with participants has involved the quarterly newsletters and a project extension letter.


energywise October 2017

Welcome to the energywise newsletter

Thank you for your ongoing contribution to the energywise project.

This newsletter has information on:

- The Priority Services Register: what it is, who is eligible for it and how to register.
- New completion date: the energywise project will now complete on 31 March 2018
- Results from the first 3 months of Bonus Time
- First hand experiences of the new Bonus Time trial and how some households are taking steps to shift their household's electricity use out of the Bonus Time periods.

Thank you very much for taking part in the energywise project. Your participation is extremely valuable to us.

Bonus Time Tips

We've been sending Bonus Time notifications for 6 months. Some people find it hard to take action, so we're sharing tips that people have said work for them:

- **Laundry is easiest to shift**: Many people have found that they can delay putting on the washing machine during a Bonus Time period.
- **Get the family involved**: It can be hard to get other household members involved, but one mum has found her kids enjoy joining in. They've made Bonus Time a game about keeping the Smart Home Display in the green.
- **Break the routine:** A lot of people said that the times are difficult because family life means there's a fixed routine to follow. You have to cook and clean when you get in from work. Some people break their routine, cooking at different times, or even going on strike during Bonus Time!

I won't do my washing during Bonus Time; I'll do it the next day.

My son loves to keep it in the green.

I fill a thermos up before Bonus Time starts so I can have hot drinks without boiling the kettle.

I love Bonus Time, it's like a holiday. I refuse to go into the kitchen.

Extension to the energywise project

We are pleased to let you know that the project has been extended to 31 March 2018. We originally planned to end in December. This extra 3 months means you can enjoy Bonus Time for a full year, and hopefully benefit from more opportunities to earn credits. We will send you a **£30 thank you voucher** at the end of the project.

Full details are in the letter sent with this newsletter.

What next?

If you have said yes to Bonus Time:

- Each month you will receive your Bonus Time rebates onto your meter if you've made savings.
- Every 3 months you receive your quarterly statement.
- Your next statement will be sent at the end of this month (October).

Remember: Bonus Time is only for Electricity. Continue to use gas heating and gas appliances as normal.

Remember: Bonus Time is about using LESS electricity during the periods.

Look out for your next Bonus Time Statement. It will be sent end of October

p1

Figure 3: energywise **newsletter (Oct prepay)**

Newsletters

Three newsletters were sent out during this period. These were drafted by University College London and posted by the **energy**wise field officer team.

- in June 2017: two versions were produced: credit and prepay. This newsletter informed participants of trial 1 energy saving results, provided participants' first experiences of shifting energy for trial 2, advertised further opportunities to gain vouchers through taking part in research and feedback activities, and informed everyone that the Freephone number was back in operation after a temporary fault.
- in October 2017; two versions were produced: credit and prepay (Figure 3). This newsletter included information on the new completion date, feedback on how some participants are responding to their Bonus Time notifications or HEFT tariff (tailored by group), results from the first three months of Bonus Time (only for prepay participants) and information on the Priority Services Register.

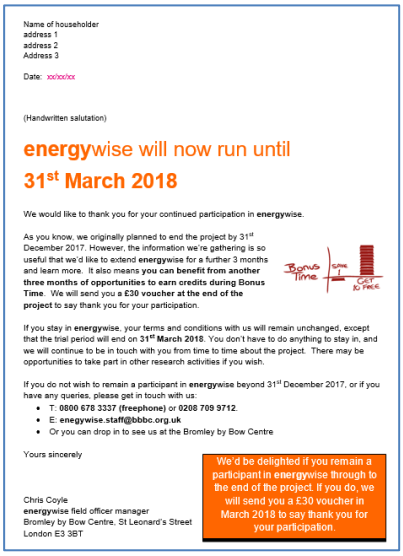
- in December 2017; again, two versions (credit and prepay). This newsletter is informing participants of the Christmas closure of the Bromley by Bow Centre and was posted to all active participants during week commencing 13 December.

Project extension letter

All participants received a letter explaining the project extension, which was sent with their October newsletter (Figure 4). The letter explained that that the project was being extended by three months to March 2018. It stated that participants didn't need to take any action to remain in the project until the new end date and that the original terms and conditions would still apply except with a completion date of 31 March 2018. To encourage participation to the end of the project, the letter stated that participants would receive a £30 Love2Shop voucher at the end of the project. Three version of the letter were produced:

- one for those taking part in HEFT;
- one for those receiving Bonus Time notifications (pictured); and
- one for those still part of the project but who are not actively taking part in the DSR trial.

The letter also encourage participants to contact the customer field officer team if they do not wish to remain a participant or if they have any queries.



Name of householder
address 1
address 2
Address 3

Date: xx/xx/xx

(Handwritten salutation)

energywise will now run until
31st March 2018

We would like to thank you for your continued participation in **energy**wise.

As you know, we originally planned to end the project by 31st December 2017. However, the information we're gathering is so useful that we'd like to extend **energy**wise for a further 3 months and learn more. It also means **you can benefit from another three months of opportunities to earn credits during Bonus Time**. We will send you **a £30 voucher at the end of the project** to say thank you for your participation.

If you stay in **energy**wise, your terms and conditions with us will remain unchanged, except that the trial period will end on **31st March 2018**. You don't have to do anything to stay in, and we will continue to be in touch with you from time to time about the project. There may be opportunities to take part in other research activities if you wish.

If you do not wish to remain a participant in **energy**wise beyond 31st December 2017, or if you have any queries, please get in touch with us:

- T: **0800 678 3337 (freephone)** or **0208 709 9712**.
- E: **enegywise.staff@bbbc.org.uk**
- Or you can drop in to see us at the Bromley by Bow Centre

Yours sincerely

Chris Coyle
energywise field officer manager
Bromley by Bow Centre, St Leonard's Street
London E3 3BT

We'd be delighted if you remain a participant in **energy**wise through to the end of the project. If you do, we will send you a £30 voucher in March 2018 to say thank you for your participation.

Figure 4: energywise project extension letter

The Services Charter

The Services Charter is provided to participants who have disengaged from the project. It is a leaflet designed specifically for fuel poor customers, which outlines an agreed list of services available to participants after the project in relation to further support. The charter, which has been developed by UK Power Networks and National Energy Action, is regularly reviewed and updated by National Energy Action (where necessary).

The Services Charter was last reviewed in October 2017. One change was identified: a new email address for the Bromley by Bow Centre service, East End Energy Fit. However, project partners agreed to delay updating the Services Charter and printing new copies until the next and final review (March 2018). This was because minimal dropouts are expected between October 2017 and the final charter review. The leaflet will be updated and printed again before the end of trial 2 in order to be issued to all active participants at the end of their customer journey. The previous version will be used with a notification detailing the correct email address in the meantime.

Cold Homes Leaflet

The Cold Homes Leaflet is issued to participants if any trial effect is identified (see 'Temperature monitoring protocol' below). It informs participants of the risks around under heating their homes and provides them with information and advice on how to keep safe and warm in their homes. To date, the project has not had to issue the Cold Homes Leaflet to participants as no trial effect on temperature has been observed. National Energy Action has developed the Cold Homes Leaflet in collaboration with UK Power Networks and reviews and updates it (where necessary) before each winter heating season.

In this reporting period the Cold Homes Leaflet was reviewed and updated in November 2017. This review was undertaken following a decision at the **energy**wise project partner meeting in October that the leaflet was required for the trial 2 winter heating season because the project would continue monitoring for trial effects on temperature. As per trial 1 arrangements, the Cold Homes Leaflet will only be issued to participants if a trial effect is observed.

Trial 2 active participants

Table 1 presents an overview of the numbers of active participants currently in **energy**wise (as of 1 December). Of the total of 538 sign-ups, 270 are still active in the project while 268 have dropped out. Out of the 270 active participants, 236 are taking part to the DSR trial, with 165 credit customers on the HomeEnergy FreeTime tariff and 71 prepayment customers on the Bonus Time tariff.

Table 1: energywise participants as of 1 December 2017

	Approached	Signed up	Declined	Undecided	Drop-outs	Active participants	Active participants in DSR trial
TOTAL	1352	538	582	232	268	270	236
CR		329			137	192	165
PP		209			131	78	71
PH		93			53	40	36
THH		445			215	230	200
Intervention		273			119	154	129
Control		265			149	116	107

Please note that:

- out of the 192 credit active participants, 27 participants have not been switched to HomeEnergy FreeTime, as previously reported (15 said no to the tariff, 10 were uncontactable, one was felt too vulnerable to be switched and one could not be switched for technical reasons).
- out of the 78 prepay active participants, seven active participants are not receiving Bonus Time notifications (five of whom stated they did not want to receive the notifications and two of whom were uncontactable about the offer), as reported previously.

Since the last reporting period, 23 participants have dropped out. One of these effectively chose to leave the project as they requested for their smart meter to be removed. None of the others had chosen to drop out – they have been disengaged because they either moved house or changed supplier (making them ineligible to remain in the project), or because they failed to respond to requests to book in an installation appointment (or failed to keep the appointment) for their smart meter at the start of trial 2 (a smart meter is a key requirement to continue their participation to the project).

The project has seen slightly higher numbers of drop-outs in the control group with the result that the intervention group currently has 38 more participants than the control group. This difference does not have any impact on trial 2 data analysis as the two groups are now merged together. The proportion of prepay customers has remained roughly constant at around a third of participants.

Feedback on project communication

In line with the **energy**wise engagement strategy, all communication materials are tailored to the specific demographics and needs of participants and are tested with a group of participants at the participant panel meetings. Participants taking part in participant panels sometimes request clarifications, re-ordering of information, simplified descriptions or visuals and this feedback is used to amend pilot communications. At these meetings, those attending are also asked whether they have any general feedback on the **energy**wise communication they are receiving, in terms of the frequency, content and format. Participants at both the July and October panel meetings reported being happy with the level and quality of communication they receive from **energy**wise, though not all panel members can remember receiving the communications; for example in July's panel some attendees did not remember receiving the newsletter.

Participants at these panels provided useful feedback on the project extension letter and the newsletters. For example, on the project extension letter, participants on the HEFT tariff suggested that it should contain information on when the HEFT tariff ends and what happens at that point.

Customer protection

The project's communications plan makes a number of commitments related to customer protection including:

- participant vulnerability would be checked once consent to share their data has been obtained, and at points throughout the project, to see whether their status has changed and whether their ongoing participation in the project is appropriate;

- procedures for handling complaints and enquiries; systems are in place to ensure that any complaints or enquiries are dealt with promptly by the appropriate partners. Any issues related to safety would be escalated to a Disclosure Board to consider; and
- participant wellbeing; the temperature of customers' homes is being monitored to ensure both that the project does not adversely affect participants as a group, and also to flag up any dangerously low temperatures in the homes of any participant.

As an ongoing commitment of **energy**wise, customer protection has been the centre of attention on the project. During this period, there have been no updates to the customer protection information held by the project, as explained below.

Vulnerability review

As reported in the previous reporting period, the customer field officer team has developed an anonymised spreadsheet that collates data held by project partners in relation to vulnerability for all participants. As previously reported, initially, 300 households with any indication of vulnerability were listed on this spreadsheet. Following the initial review, conducted in April – May 2016, it was agreed that all these participants could remain in the trial. A revised vulnerability review was completed in May 2017. As reported previously, this found that:

- seven households were identified as high risk (i.e. blind/visually impaired, dependent on electrically operated equipment, or where there is a concern that the customer may not have given their informed consent due to learning difficulties or mental health issues), of whom:
  - four were identified as high risk in the May 2016 review;
  - three were previously categorised as low or no risk (and have therefore not been discussed previously).
- seven were categorised as medium risk. This may include those categorised as 'mental health issues' or 'long term illness', of whom:
  - three were flagged as medium risk in the May 2016 review; and
  - four were previously flagged as low risk.

A meeting was held in June 2017 with relevant project partners to discuss the risk assessments and whether any action was necessary. At this meeting, the risk assessments were agreed and 13 participants were assessed as being medium or high risk in terms of vulnerability.

It was also agreed that risks from trial 2 to participants are minimal as both the time of use tariffs are non-punitive. Two minor risks were identified:

- prepay customers who are blind or visually impaired (of which there are two) may not be able to read their Bonus Time notifications. However, all customers have consented to receiving Bonus Time notifications. It was agreed that Bromley by Bow Centre would check whether these customers had responded to the text message sent in May 2017 asking them to verify their understanding of how Bonus Time works. One had responded to confirm correct understand and one had not; the customer ID for the latter was passed to University College London to enable them to monitor whether and how they are responding to Bonus Time. University College London has established that this customer earned a relatively high rebate in one month and a very small rebate in other months, potentially suggesting random rather than intentional responses. It was planned that University College London plan would interview this participant as part of the case study work to help more accurately gauge their understanding. However, this participant has indicated that she feels there is too much contact from the project and has asked not to be contacted unless absolutely necessary. Therefore it has been agreed that University College London will not contact this participant.
- there is a small risk that some customers may have misunderstood how the tariffs work. Of the 13 participants identified as being medium or high risk:
  - two said no to taking part in trial 2 and therefore this does not pose an issue to them.
  - four said yes to receiving Bonus Time and all have received credits, two consistently above average, suggesting they have not misunderstood how the tariff works. (If they had misunderstood the tariff, then they would be trying to use more electricity during Bonus Time periods rather than less and would earn zero credits);
  - seven are credit customer who said yes to HEFT. HEFT data analysis is only just beginning; these seven participants will be prioritised so that an understanding of their responses can be gained.

If, for any of these 13 participants, there is any indication of misunderstanding, University College London will alert UK Power Networks and CAG Consultants who will organise a phone meeting with relevant partners to discuss appropriate next steps.

Disclosure board

There have been no cases referred to the disclosure board during the current reporting period.

Customer issues and complaints

During this period, no complaints relating to the project have been received. However, the following issues have required attention:

- two customers require Passiv to visit and remove their temperature monitoring equipment. (As explained below, as part of the decommissioning process, a visit from Passiv is required wherever there has been damage to a property that needs to be put right.) This is because the temperature sensors in this household were screwed into the walls and the customers required the holes to be repaired.
- one faulty kettle was replaced, as it had stopped boiling the water despite the kettle's light being on.
- one customer is experiencing known problems with their gas smart meter due to communication issues. British Gas are directly managing this matter to resolution.

Participant panel

The purpose of the **energy**wise participant panel is to provide a structure for participant feedback and a sounding board for participant views. Membership is open to all **energy**wise participants, with information contained in the welcome pack, although the project team endeavoured to ensure that the membership generally reflects the geographical spread and demographic makeup of the research participants as a whole. The first meetings, held in 2016, were split by group, with one panel for the intervention group and another for the control group. From January 2017, this changed to being split by meter types, due to the different nature of the trial 2 offer for credit and prepay customers.

July 2017 panel meetings:

the credit panel was attended by six participants and the prepay panel by five. The meetings were facilitated by the **energy**wise customer field officer manager, with support provided by CAG Consultants, with University College London taking notes at the credit panel and CAG Consultants at the prepay panel. Questions at this meeting focused on early experience of HEFT or Bonus Time, feedback on the design of the quarterly statement (Bonus Time panel only) and feedback on the most recent newsletter, as well as general feedback on project communication and the equipment they have had installed.

- key findings from these meetings were:
  - the credit group were positive about their experience of HEFT with five of the six reporting having taken steps to benefit from the Free Time, for example arranging their weekly chores so they could do electricity consuming tasks on their free day. For two participants, taking advantage of the tariff meant increasing their consumption during the free time, for example by doing things they wouldn't otherwise do, such as using a tumble dryer. For others it meant it shifting their consumption into the free time. Running the washing machine, doing the ironing were the most common activities.
  - one participant had also changed her household's cooking routine.
  - in the household not actively taking advantage of the free time, this was because the wife had a set laundry routine that fell outside of the HEFT hours and was not prepared to change this.
  - four of the five prepay participants have made efforts to cut electricity use during Bonus Time periods, ranging from turning out unneeded lights or postponing doing the washing to avoiding almost all electricity-using activities during the period (including unplugging the TV). All were looking forward to finding out what they had saved and provided useful advice on the draft statement design.
- as a result of the feedback received at these meetings, partners agreed to:
  - slightly redesign the newsletter to include participant feedback on the first page;
  - introduce a more varied range of Bonus Time periods to include additional weekday morning and lunchtime events but making the wording very clear for these different periods to draw attention to this;
  - include the unit cost on the Bonus Time statement and provide an indication of what an individual's households savings equate to in terms of (e.g.) loads of laundry.

October 2017 panel meetings:

- the credit panel was attended by eight participants and the prepay by five. These meetings were facilitated by the **energy**wise customer field officer manager with University College London again taking notes. Questions at this meeting focused on gathering feedback on the experiences of HEFT and Bonus Time, getting feedback on the draft project extension letter and newsletter, plus general feedback on project communication and the equipment they have had installed.
- key findings from these meetings:
    - credit participants in general reported becoming habituated to take advantage of their HEFT hours. One participant had misunderstood HEFT, thinking that it applied for a 24-hour period rather than only between 9-5 (it was agreed this would be restated in the next newsletter). Six of the eight participants had seen a reduction in their electricity bills, three of whom attributed this saving in part to HEFT whilst one attributed this to more accurate billing due to the smart meter and to changes in their household and another attributed it to changes in their appliances. The extension of the project was viewed positively by all.
    - prepay participants were all aware of the recent 'different' Bonus Time periods (weekday morning and weekends). All had received their statements and knew the rough amount they had been credited. Four had taken action to reduce their electricity use during Bonus Time periods and felt the credit was justified; in two cases it was higher than expected. In one case the participant reported that the statement had helped bring the rest of the household on board in terms of reducing electricity consumption during Bonus Times. One participant had not been able to act and had not expected credit; they were not surprised at getting less than £1. All were happy at the extension of Bonus Time with one commenting, "I wish it could go on forever."
- as a result of the feedback received at these meetings, partners agreed to:
    - add details to the HEFT extension letter about the end of the tariff and what will happen next;
    - in the newsletter, make a number of small changes including adding the 9-5 icon to the HEFT newsletter and simplifying the PRS information clarifying that support is not related to financial need or financial benefit.

No customer protection issues were highlighted at these meetings. Each participant received a £30 Love2Shop voucher as a thank you for their time. British Gas followed up with customers experiencing problems with their smart energy display and with topping up. The general reassurances that were asked for in the panel groups were conveyed to the rest of the participants through the project's newsletters and adjusted processes.

<u>Temperature monitoring protocol</u>

A component of the project's approach to customer protection is the monitoring of temperature in participants' homes. Temperatures are being monitored both for trial effect (a significant different in temperature between the two groups – control and intervention) and condition effect (low temperatures in individual homes).

Trial effect

There was no evidence of a trial effect in trial 1. Average temperatures for control and intervention groups were found not to have a statistically significant difference.

For trial 2, a trial effect could, theoretically at least, manifest itself in the temperatures during CPR events for prepayment customers arising from them taking measures to reduce their electricity consumption. There is no longer a control group so measuring any such effect directly is impossible. The short duration of the CPR event also means that the thermal inertia of the property is very likely to mask any such effect should it exist. In an attempt to quantify any such effect an indirect method of measurement is proposed. This method is methodologically flawed, but it is the best available. In this method, temperature comparison is made with credit customers not participating in CPR events.

The metric proposed is based on detecting a temperature difference between CPR periods and similar but non-CPR periods for each group, similar to the method used to estimate the kWh shifted. Evidence for a trial effect could only be observed if a positive and statistically significant difference is found between the size of a temperature drop in the prepayment group compared to that in the credit group.

Numbers of remaining participants in each group mean it is not likely that any statistically significance evidence will be produced. However, if a difference were to be detected, project partners will discuss the best course of action to take.

This will include acknowledging the complexity in correctly interpreting any such difference due to the following two reasons:

- it will not be possible to identify the proportion of the effect that is unintended and causing households to experience cold conditions, rather than the intended response to a CPR event which does not cause households to experience cold conditions. For example, during CPR events, participants may intentionally reduce overall household temperature by reducing secondary heating and turning off appliances such as ovens, but mitigate for this drop in temperature by leaving the house, or by using non monitored ways of staying warm (additional clothes for example). Other participants may unintentionally reduce overall household temperature and not mitigate for this, therefore suffer from a trial effect.
- it will not be possible to investigate and control for any between-group differences that may exist between credit meter and prepayment meter household heating strategies. That is, people on credit meters may act differently with respect to home energy use practices to those on pre-payment meters – thus making interpretation of any unintended trial effect differences impossible.

While flawed, the partners have agreed to implement this approach on the basis that it is the best course of action to investigate the existence of a trial effect.

Condition effect

The customer field officer manager is responsible for the temperature monitoring protocol, using temperature exception report data provided by British Gas and with University College London. These reports include, for identified properties, aggregated temperature data plus any vulnerability data they hold from the Energy Social Capital surveys. The field officer manager completes the risk assessment once the necessary data has been collated, with CAG Consultants then reviewing this. Both British Gas and University College London then review and agree any planned action to be carried out as a result of the risk assessment.

During the current reporting period, no exception reports have been received (up to 1 December 2017). Please note that not all active participants are transmitting temperature data; as reported in previous reports, due to recurring problems with the temperature monitoring equipment (caused by a mixture of technical issues and participant behaviour). Due to the frustration of some participants at having repeat visits to rectify problems, it was agreed that no further interventions would be carried out to rectify problems unless participants specifically requested it. For those participants for whom the project are still receiving data, exception reports continue to be monitored and agreed protocols followed.

Customer disengagement and decommissioning

During this period, a process for decommissioning equipment after a customer is disengaged from the project was agreed by project partners. The process is shown in Table 2.

Table 2 - energywise **equipment decommissioning protocol**

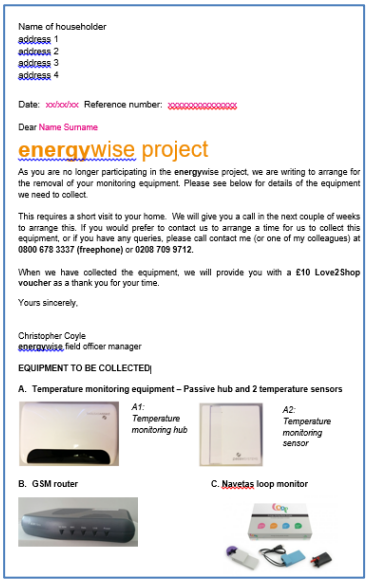
Step	Tasks
Tracker	British Gas and Bromley by Bow Centre jointly create a spreadsheet listing: • all customers who require the monitoring equipment decommissioning; • the equipment installed in each customer's home; • the drop out reason; and • which customer should receive which letter.
Step 1: Letter	For customers yet to be disengaged from the project but who require disengagement: disengagement letter to be sent, along with the updated **energy**wise Services Charter, tailored according to: • reason for disengagement; and • equipment to be decommissioned. For customers who have been previously disengaged but equipment not yet removed: • for those who have moved house – no further action. (In these cases, the social housing providers will have removed and disposed of the equipment as part of their tenancy-change process); and • for all others – decommissioning letter sent (Decommissioning Letter A in Figure 5) should be sent, tailored according to equipment.

Step	Tasks
Step 2: Follow up phone calls	If customers do not get in touch within three working days of letter being sent, the customer field officer team will follow up with a phone call to arrange a convenient time to collect the equipment. Up to three attempts. A messages is left on the third attempt inviting them to get in touch
Step 3: Collection of equipment	Where an appointment is made, the customer field officers will visit to collect equipment (up to two visits – i.e. if customer is not home first time, seek to rearrange); £10 voucher provided at end of appointment once equipment is collected. • the customer field officers will remove all equipment (temperature hub, sensors, GSM router, Navetas loop energy monitor); this includes unscrewing equipment where necessary. • if the customer states there is damage, the customer field officer should explain that the original installer, PassivSystems, will come to fix it and will take some details about when the customer is most likely to be in the property. The customer field officer will then get back to the customer to book an appointment having liaised with British Gas. • the customer field officer team will gather the equipment and send it in batches to PassivSystems once a week.
Step 4: Final letter for those uncontactable	For those uncontactable after three phone calls/two visit attempts, a follow up letter (Decommissioning Letter B) will be sent explaining that if the project doesn't hear from them within two weeks, the project will no longer responsible for the equipment.

As a result of implementing this protocol 57 households have been contacted about their equipment being decommissioned, of whom:

- 16 properties have had equipment collected by the customer field officer team;
- 10 properties cannot have equipment collected as the participant has moved home;
- four properties no longer have their equipment;
- two required a PassivSystems visit (these were completed on 11 November 2017); and
- there are 25 properties with whom it has not been possible to make contact; for seven, the contact number had changed, 16 have had the maximum three call attempts and two have either missed their appointment or requested a call back but have not answered on the call back attempts.

Going forwards, British Gas will advise the field officer team if any drop-outs require a collection although there may be exception scenarios where the field officer team inform British Gas.


Name of householder
address 1
address 2
address 3
address 4

Date: xx/xx/xx Reference number: xxxxxxxxxxxxxx

Dear Name Surname

energywise project

As you are no longer participating in the energywise project, we are writing to arrange for the removal of your monitoring equipment. Please see below for details of the equipment we need to collect.

This requires a short visit to your home. We will give you a call in the next couple of weeks to arrange this. If you would prefer to contact us to arrange a time for us to collect this equipment, or if you have any queries, please call contact me (or one of my colleagues) at 0800 678 3337 (freephone) or 0208 709 9712.

When we have collected the equipment, we will provide you with a £10 Love2Shop voucher as a thank you for your time.

Yours sincerely,

Christopher Coyle
energywise field officer manager

EQUIPMENT TO BE COLLECTED

A. Temperature monitoring equipment – Passive hub and 2 temperature sensors

A1: Temperature monitoring hub

A2: Temperature monitoring sensor

B. GSM router

C. Navetas loop monitor

Figure 5: Decommissioning letter

2.3 Energy Saving and Shifting Trials

Energy efficiency devices

As of 1 December 2017, six of the 116 active control group participants had not received their devices yet. One of these declined to accept the devices and one was due to collect the equipment at the most recent participant panel, but failed to attend. Attempts at contacting the other four have been exhausted; they have been invited to come into the Bromley by Bow Centre at any time to pick up their devices if they wish to.

Work also continued to deliver the fourth LED lightbulb to the intervention group. Out of the 154 active intervention group participants, 78 have received their additional lightbulb and 76 yet to receive their bulb (with 11 participants having received their fourth LED lightbulb in this reporting period). However, out of the remaining 76, one customer said that she does not want to receive it. Project partners have agreed there should be no further active approach to participants about their lightbulbs; all participants who have not yet received their lightbulbs have been invited to get in touch with the customer field officer team if they wish to arrange collection or delivery.

One eco-kettle and one standby shutdown have been replaced during this period as they appeared to stop working.

One issue has been reported in relation to a smart meter and smart energy display; this has been referred to British Gas to be followed up.

Multi-dwelling unit (MDU) equipment

One of the objectives of the project was to complete one of the UK's first end to end installations of residential smart meter sets operating across a MDU/tall and difficult building solution. An MDU is a building housing more than one premises with physical disparate metering such that a wireless MDU Communication Infrastructure is required. The project initially recruited two participants who would be reliant on this infrastructure.

At the start of this reporting period, there was only one MDU participant remaining who is being served by the Siemens equipment. The Siemens contract ends at the end of December and partners agreed that it is not worth extending the contract by three months for this one participating household as they only use their smart energy display occasionally.

Customer incentives

Between July and December 2017:

- those attending the participant panels received £30 Love2Shop vouchers for each meeting attended;
- those interviewed by University College London for the case studies received a £10 Love2Shop voucher as a thank you for their time;
- those who have left the project and who had their equipment successfully decommissioned by the field officer team received a £10 Love2Shop voucher as a thank you for their time.

It was agreed that all participants still in the project at its end date, 30 March 2018, would receive a £30 Love2Shop voucher. This was communicated in the project extension letter sent in October 2017.

Bonus Time design

Following the initial participants' feedback and in order to refine the event schedule, it was decided to include additional events at different times of the day. The updated events cover a mix of morning, midday and evening events and do not affect the baseline calculations.

Notifications are sent to participants for each DSR event, as previously reported, on the day before the event. It was previously reported that a reminder notification would be sent out two hours before each event; this is the case for the midday and evening events but has been modified to half an hour for the morning events (to avoid participants receiving text messages too early in the morning).

2.4 Customer & Network Insights

Energy shifting trial

There have been 50 Bonus Time events so far in trial 2, comprising a mixture of evening, morning, midday and weekend events.

The first five months of Bonus Time data show that:

- the average credit earned by households is £13.10 (£2.62 per month). It is worth noting that households receive this credit for Bonus Time events in which they reduce their electricity consumption. No reward (or penalty) is applied for Bonus Time events in which the electricity consumption of a given household remains the same or increases, which reflects the non-punitive design of the Bonus Time trial.
- the total amount of electricity rebated for all households participating in Bonus Time is 698.28kWh. These figures exclude the five participants who are taking part in trial 2 who left the trial during this period, all of whom also earnt some credits.

There are a few consistent high performers who achieve high reductions month after month, while other households show consistently low responses.

Data was checked for any indication that particular customers had misinterpreted the trial design. No customer has consistently increased consumption during the CPR events so far, suggesting that there is no misunderstanding.

Customer insights

Qualitative insights

In terms of general liaison with participants, the customer field officer team has not been contacted by any participant since trial 2 began (except in connection with the participant panels), with the exception of one participant who has twice called to express her delight at receiving her Bonus Time credits.

The participant panels run during this period generated a number of qualitative insights, as follows:

HEFT participants (credit customers):

- July panel:
  - all six participants were positive about the HEFT and all but one had made changes to take advantage of their chosen Free Time day.
    - one discussed specifically arranging their weekly chores so they could do electricity consuming tasks on their free day.
    - for two participants taking advantage of the tariff meant increasing their consumption during the free time. For example by doing thing they wouldn't otherwise do, such as using a tumble dryer.
    - for others it meant shifting their consumption into the free time. Running the washing machine, doing the ironing were the most common activities. One participant had also changed her households cooking routine.
    - in the household not actively taking advantage, this was because their wife had a set laundry routine that fell outside of the HEFT hours (laundry early on a Saturday morning, ironing late on a Sunday evening) and she was not prepared to change this.
- October panel:
  - participants reported that routines were becoming established. In general participants felt that they are becoming habituated to take advantage of their HEFT hours and it is becoming easier. No participants felt that there had been an initial enthusiasm to respond which had since fallen away.
  - one participant had misunderstood HEFT, thinking that it applied for a 24-hour period rather than only between 9-5. (A reminder on this was added to the next newsletter).
  - seven of the eight participants were motivated by the idea of saving money. One of the participants was more motivated by the idea of saving electricity and contributing 'ecologically'.
  - three of the eight participants had recently bought new appliances. One bought an electric cooker to take advantage of HEFT. One bought an air fryer to roast on electricity rather than on gas. Another had bought new white goods and had looked specifically for a high energy rating due to increased awareness overall of electricity use at home.
  - six of the eight participants had seen a reduction in their electricity bills. Three attributed this saving in part to HEFT. One attributed this to more accurate billing due to the smart meter and to changes in their household. One attributed it to changes in their appliances.
  - two of the eight participants had not seen a reduction in their electricity bills. One due to faulty meters, although this participant felt they would see a reduction in their bill when the meter was corrected. One had not checked their bill, but also felt they may see a saving.
  - all participants would be interested in continuing in a HEFT type of tariff. Two felt they might be able to take advantage of a punitive ToU, but six felt this would not be a good offer.

Bonus Time participants (prepayment customers)

- July panel:
  - four out of five participants had made efforts to cut their electricity use during these periods;
    - one turns out unneeded lights. Her son (age seven) is very keen to keep the smart energy display in the green when it's Bonus Time and is really engaged with it.

        - one postpones doing her washing.
        - one is doing everything she can, e.g. refusing to go into the kitchen to cook ("I love Bonus Time, it's like a holiday for me!"), not doing her washing until 11.30pm, unplugging the TV and even switching off the freezer; but she fears all her efforts are outweighed by her daughter's cunning ability to use electricity without her knowing (e.g. hiding a cable behind her bed and hiding her phone and iPad under her duvet)[2].
        - the fourth said his wife gets the notifications and tells everyone to reduce their use but hasn't really enforced it and, again, their children take no notice. He was determine to be stricter about enforcing it going ahead.
    - the person who hasn't changed anything said her washing machine is broken, so it's not an option to change that, and feels there isn't really anything else she could change.
    - all expressed frustration that the timing of the evening Bonus Time events makes it difficult for them to cut energy use, e.g. commenting that they get home at e.g. 6pm and 'have to cook'.
    - none had noticed receiving a rebate (though all remembered getting the text about this; no-one really knew how they might use their monitor to find out how much this was.) All were keen to know whether they'd saved – most thought they probably hadn't saved anything – and all were looking forward to getting their statements.
    - in terms of statements:
        - three participants would like to see a graph about their own consumption and one comparing their consumption with the average of all participants, while two were only interested in their own consumption.
        - four weren't interested in seeing a figure about total energy savings (across all participants) and would rather get an idea of what their own personal saving means in terms of e.g. number of washing machine loads. However, one participant really liked it and felt it would motivate them to carry on even if their own saving was very small.
- October panel:
    - three out of the five panel participants had had some issues with topping up their smart meters. Two of five are having ongoing issues with their smart energy display (one losing connection to the meter, one beeping with no identifiable fault). Four of five have had to manually vend. One has had no issues and described the smart meters as 'the best thing to have happened to me all year'.
    - all were aware of the different Bonus Time periods, when occurring in the morning or during the weekend and had read the SMS highlighting the different time.
        - two participants found the morning event hard, three found it easy as they and their household were out or they were home alone.
        - four found the evenings hard as get home from work, and other family members around.
        - three found the Saturday afternoon easy, two found it difficult.
    - all had received their statements and all knew the rough amount they had been credited. Four had taken action and felt the credit was justified, in two cases it was higher than expected. In one case it helped bring the rest of the household on board. One is not able to act, had not expected credit and was not surprised at getting less than £1.
    - when asked if money was the main motivation for responding to Bonus Time, three participants said it was also about reducing waste and being disciplined; both were motivating and gave a sense of satisfaction.
    - other household members were seen as the key factor in undermining the ability to respond to Bonus Time. Two participants had partners or children who would not participate, although one was actively trying to gain their participation and one was not. One participant attributed the fact she lived alone to gaining the highest credit in the group.
    - the role of appliances was felt to be less manageable. No one felt more efficient or different appliances would help their strategy to respond. In general, it is household members' use of appliances that is to blame for low response, not the appliance or lack of appliance. However one participant had bought a thermos flask for her husband to have tea and coffee throughout Bonus Time. Three others thought this was a great idea and should be shared. One participant's washer dryer has broken and he felt this may mean his household will earn credit during this period.

[2] Comments from the participant panel are anonymised. However, if it is possible for the panel's administrators that have interacted with them to link the comment to a specific participant, they will advise them to be aware of the London Fire Brigade's guidance on fire safety at home.

- all were happy at the extension of Bonus Time. One participant said, "I wish it could go on forever". When asked if they felt capable of/interested by a punitive structure (on-peak, off-peak pricing), one was very positive about this idea, one felt they could make it work but three did not like the idea.

Insights from these panel meetings can be summarised as follows:

- participants are generally positive about the shifting trial and were enthusiastic about its extension.
- participants find it helpful and encouraging to hear others' experiences and tips. These have therefore been included in the two newsletters that have been mailed during trial 2.
- not all participants feel they are able to shift, but those who are find laundry and cleaning the easiest activities to shift.
- participants who are shifting are motivated not only by financial rewards, but by the challenge of doing something new, by the attempt to be disciplined and by making a contribution to the project or electricity network.
- most panel participants would be interested in continuing with a time-of-use tariff or programme, and two would even consider moving onto a punitive tariff structure because they feel capable of assessing their potential to benefit from off-peak pricing.

Case studies

In addition, University College London are in the process of interviewing participants in order to produce a set of case studies. The interviewees are selected according to a purposive sampling strategy designed to incorporate as many diverse experiences as possible. The interviewees include Bengali-language only households, whose participation has been enabled through the field officer team. Bengali-speaking members of the customer field officer team have recruited these households and provided simultaneous translation during the interviews. The interviews are semi-structured and follow a protocol that allows participants to discuss their experiences of the technologies, the trials and the project, as well as any concerns or expectations they have for the future. The protocol has been designed in consultation with project partners to probe key areas of interest such as differences between control and intervention groups, experiences of particular groups (elderly people, people with sensory impairments), and experiences of households with smart meter data showing high and low DSR activity. The qualitative data will be analysed to create case-studies of participants' experiences. These will be written up and designed for use by different stakeholders (e.g. DNOs, energy companies, housing providers or fuel poverty non-governmental organisations) to communicate key project learnings to their different audiences.

Research surveys

There was no research survey activity during this reporting period. The next survey will be conducted before the end of trial 2.

2.5 Knowledge Dissemination

Throughout a project's life cycle, lessons are learnt and opportunities for improvement are discovered. The aim is to:

- identify ways of refining and improving ways of working as a partnership;
- capture valuable and constructive insights and lessons from the project in order to develop and share good practice and recommendations; and
- bring together the different feedback and perspectives of the partnership to highlight gaps in industry knowledge and research.

During the current reporting period the project has undertaken several dissemination activities:

- Dissemination events
  Project members have presented the project, key achievements and findings to date at the following events:
  - 'Domesticating Energy: Energy Environments Inside and Outside the Home'. An international colloquium co-organized by Birkbeck College, Pembroke College, University of Cambridge and the Joint Centre for History and Economics at Cambridge and Harvard University. Cambridge, 25-26 May 2017[3]
  - Regen SW-ENA Community Energy event, Electricity Networks Innovation, London, 1 November 2017;
  - National Energy Action London and South East Fuel Poverty Forum, London, 7 November 2017;

[3] Reported here as it was not included in the previous reporting period.

- Low Carbon Networks & Innovation Conference, Telford, 6-7 December 2017.

In addition, project members informally provided information onto the project (through Q&A discussions and general networking) at the following events:

- Citizens Advice Time Well Spent: Assessing the value of time of use energy tariffs, London, 10 July 2017.
- National Energy Action Conference, September 2017
- Ofgem's Future Consumer's Conference, July 2017

- Press coverage

The following press activity has taken place during this reporting period:

- UK Power Networks have published a press release[4] on **energy**wise on 10 August 2017 highlighting the key project outcomes, particularly the response rate to trial 1 recruitment and to the DSR offerings, and the savings achieved on average by the participating households in the energy saving trial.
- following the press release, the Utility Week published an article on **energy**wise, illustrating how hundreds of households have benefitted from the smart energy interventions.
- the project was also mentioned in the periodical 'Networks' September issue (No 015) as part of an article on fuel poverty.

- Industry recognition

energywise was shortlisted for the Residential Building Energy Project of the Year category of the Energy Awards 2017. The Energy Awards is one of the industry's biggest and most respected awards event that champions the excellence and the recognition of the intelligent use of energy.

Figure 6: The Energy Awards 2017 energywise **has been shortlisted for**

- Dissemination plans for the end of the project

Project partner National Energy Action is developing an '**energy**wise events diary' as part of dissemination plans for the end of the project. This includes events aiming at the following target audiences:

- industry
- policy
- practice
- academia
- advocacy

The diary includes events that are both local and national. National Energy Action will be finalising the diary during the next reporting period with the prioritisation and selection of the events that are key for the project dissemination. UK Power Networks, National Energy Action, Bromley by Bow Centre and CAG Consultants are also finalising the strategy for the end-of-project dissemination events, including thank you and learning events for trial participants.

- Dissemination materials

During this reporting period the project has produced a video animation summarising the key challenges addressed by **energy**wise, the innovative approach and the savings achieved by trial participants across the first trial.

2.6 Project outlook onto the next reporting period

The key activities planned in the next reporting period include:

- the ongoing calculation of the rebate entitlement of prepayment customers responding to the CPR events;
- ongoing customer engagement activities including final quarterly newsletters (March) and participant panels (January);
- independent participant panel run by National Energy Action (February);

[4] http://www.ukpowernetworks.co.uk/internet/en/news-and-press/press-releases/Pioneering-community-project-helps-cut-energy-use.html

- a Smart Meter report produced by National Energy Action, summarising the project learning outcomes that are specifically relevant to the ongoing smart meter roll-out;
- finalisation and write-up of case studies by University College London;
- trial 2 data analysis by Element Energy and University College London;
- implementation of the project closing phase activities including end of project letter, thank you events, decommissioning activities;
- implementation of knowledge dissemination activities.

3 Consistency with Full Submission

As per the full bid submission, expected secondary project learnings included:

- the impact of self-disconnection of prepayment meters on the network; and
- the identification of trends to the periods of the self-disconnect of prepayment meters and the reasons why participants were self-disconnecting.

It was not possible to undertake a quantitative analysis of self-disconnection events as this would have required disaggregated data about disconnection of individual smart prepayment meters. Upon extensive investigations by the project partners, it was found that British Gas were not able to provide this dataset under the project contractual arrangements.

Asking prepayment participants to record all their self-disconnection events was also considered as an alternative option. However, due to concerns over participant attrition resulting from extensive interactions and additional requests from the project, it has been decided to address the issue of self-disconnection qualitatively. University College London are using three sources for the qualitative analysis of self-disconnection:

1. the qualitative notes recorded by customer field officers during the Home Energy Survey;
2. the participant panels with prepayment participants, and
3. the semi-structured interviews run as part of the qualitative research by University College London.

This has provided insight on attitudes towards disconnection during trial 1 (most people stated they managed to avoid self-disconnection). The qualitative interviews carried out at the start of trial 2 indicated that some people have inadvertently disconnected when they first switched to smart meters due to a lack of familiarity with topping up and some confusion about finding the emergency credit option.

As disaggregated data from smart prepayment meters is not available, University College London will not be able to specifically target individual households that show evidence of disconnection for qualitative research. Therefore, they are investigating how they can use aggregated data to explore how many households disconnected in the first days of having a smart prepayment meter, and how many households continue to disconnect through the monitored period. Another option under consideration is also to ask British Gas to provide data on the proportion of households who disconnected with a non-smart prepayment meter that continue to disconnect with a smart prepayment meter and the proportion of households that disconnect with a smart prepayment meter, but did not with a non-smart prepayment meter. British Gas are currently investigating whether this data is available and can be produced within the required timeframe.

University College London will continue to use the qualitative interviews to gain further insights into the reasons and experiences of disconnecting through trial 2.

4 Risk Management

The project has established a risk management process, as described in detail in the VCEE Project Handbook. It allows for the communication and escalation of key risks and issues within the project, and defines where decisions will be made and how these will be communicated back to the workstream where the risk or issue has arisen.

To ensure risks are objectively identified, managed and ultimately mitigated, the Innovation team at UK Power Networks deploy a four stage Risk Management process shown in Figure 7. Project risks are recorded in a Project Risk Log and then aggregated in a centralised Risk Log. UK Power Networks' Innovation team has recently migrated to a new project management system (P6). All project risks that are still open have been migrated to the new system, restarting the numbering for simplicity. Major risks can be escalated to the Cyclical Portfolio Review meeting (a monthly meeting arranged between the Project Lead and the Innovation Delivery Manager to review project progress and performance since September 2017) to support the appropriate response.

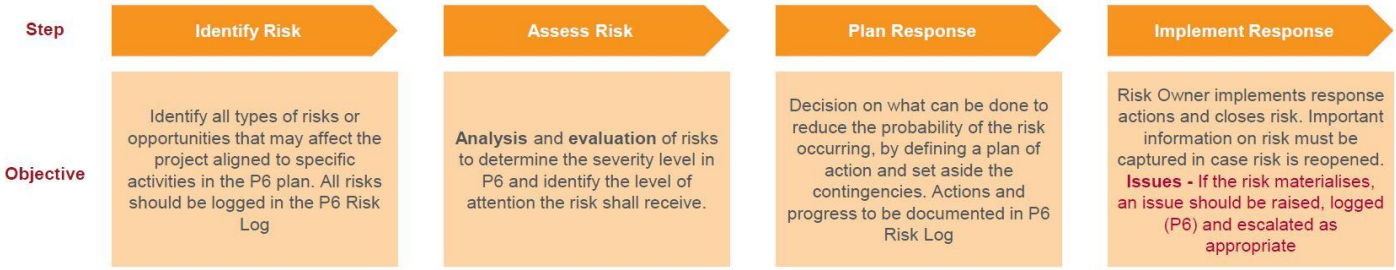


Figure 7: Risk Management process

4.1 Full Submission (BID Risks) – update

Please note that BID risks that were closed in the previous reporting periods have been removed from the table.

Ref#	Risk & Impact Description	BID Mitigation	Mitigation (update)	Status
BID - R008	Recruitment and engagement strategy not adequately tested with wider industry. Therefore not fit for customer audience.	(a) Advanced invite to review workshops, following UK Power Networks stakeholder processes (b) Invite representatives who deliver and interface directly with vulnerable and fuel poor (c) Draw upon the learnings from literature review and LCN Fund factsheet (d) Expert partner secured to lead on recruitment and engagement (e) Appropriate pre-engagement testing included in plan	The project engagement strategy has been updated following the learnings from recruitment and installation phase and the customer engagement activities are regularly monitored with the relevant partners. Trial 1 learnings have informed the detailed recruitment strategy for trial 2. Trial 2 recruitment strategy was proven successful with 86% participants consenting to the new ToU tariffs. The effectiveness of this strategy as well as of the overall **energy**wise engagement strategy was discussed at the lessons learnt workshop on 4 May 2017; the learning outcomes on customer engagement were reported in the SDRC 9.4 report and have informed the engagement approach to adopt during the last phase of the project. During this reporting period the project partners have decided to provide a £30 thank you vouchers to trial participants at the end of the customer journey in March 2018 for their commitment and time spent on the project.	
BID - R009	Poor response to energy social capital surveys. Therefore dilutes quality of findings.	(a) Application of best practice survey administration ("Dillman method") (b) Use of trusted intermediaries to deliver follow-up survey reminders (c) Face to face reminders through engagement events	The mitigation remains as per the previous reporting period.	

Ref#	Risk & Impact Description	BID Mitigation	Mitigation (update)	Status
BID - R012	High attrition to successive waves of energy social capital survey. Therefore, limited understanding/ learning for where the customer audience looks to for energy advice.	(a) Application of best practice survey administration ("Dillman method") (b) Use of best practice in panel survey maintenance (c) Use of trusted intermediaries to deliver follow-up survey reminders (d) Face to face reminders through engagement event	The mitigation remains as per the previous reporting period.	
BID - R013	Poor participation in interviews by trial participants during the trials. Therefore, limited understanding/ learning of customer journey.	(a) Use of data from social capital surveys to identify participants' trusted parties for energy advice and engaging trusted parties in interviews enrolment. (b) Piggy-backing interviews onto wider participation engagement events to minimise participant disruption.	25 interviews with trial participants have been completed by CAG Consultants in this reporting period. This is a similar proportion of active participants to the 30 that were conducted at the end of trial 1 recruitment (30/329 = 9.1%, 25/272 = 9.5%; note that CAG has only approached those taking part in the DSR trial for the interviews). On top of project interviews, participants' feedback is constantly captured through the regular participant panels. During this reporting period University College London has also conducted interviews with trial participants as reported in Section 2.4. The approach to encourage participation was to 1) use the field officer team's knowledge of different households including their language and support needs, and their schedules (e.g. avoid Eid, avoid clashing with the school run etc.). 2) offer incentives, £10 per 60 minute interview. 3) be flexible, offering evening and weekend interview times and visiting participants in their homes at times that suited them.	
BID - R014	Poor response to reasons for attrition questions when participants' elect to leave the trial. Therefore, limited understanding/ learning of their drop in interest.	(a) Follow-up a sample of trial leavers with telephone interviews (b) Invite trial leavers to engagement and thank-you events and discuss reasons for leaving the trial (c) Discuss reasons for trial attrition with community leaders and key members of trusted intermediary groups.	For each of the 268 drop-outs to date the customer field officer team or British Gas have captured reasons for attrition, which are analysed on a regular basis by University College London through the course of the project. As per the previous reporting period, with one exception, the latest drop-outs have been associated to only to non-project related reasons, such as people moving home or changing supplier (therefore becoming ineligible under the project criteria).	
BID - R015	Differential attrition between the within-trial intervention and control groups. Therefore, could bias findings.	Telephone interviews with participants who withdraw from the trial for their reasons. Analysing these interviews to see if there are substantial differences in reasons for withdrawal from the intervention and control groups. Mapping these reasons onto existing explanatory theories of energy demand to see if they are likely to bias the findings from the study. Estimating the magnitude of any such potential biases from the findings of previous studies.	Intervention and control groups are merged into one within-trial group in trial 2. This risk is now closed.	

Ref#	Risk & Impact Description	BID Mitigation	Mitigation (update)	Status
BID - R016	Participants being unwilling to be randomly allocated to intervention and control groups. Selection bias introduced.	Interviews with participants requesting allocation to either the intervention or control group to determine the reason for their request. Mapping these reasons onto existing explanatory theories of energy demand to see if they are likely to bias the findings from the study. Estimating the magnitude of any such potential biases from the findings of previous studies.	The mitigation remains as per the previous reporting period.	
BID - R017	Failing to meet recruitment targets for the intervention and control groups. Impacts generalisation of findings.	Use post-hoc statistical power estimation to determine the statistical confidence with which results can be generalised.	The project has exceeded the target response rate of 33%, achieving a response rate of 40% with 538 households signing up to the project. Moreover, reducing the sample from 1,650 to 1,352, whilst still achieving close to the original final sample size (538 versus the initial estimate of 550) has led to a strengthening of the external validity of the trial findings. University College London has calculated a ~91.5% statistical confidence for the external validity (i.e. generalisation of findings) associated to the 297 participants active at the end of trial 1 as reported in the Final Energy Saving Trial report, which exceeds the 90% stated at bid. At the point of trial design, the intention was to have all participants on a single, unspecified, time of use tariff. Because the tariff design and effect size were not known at trial design, calculations of external validity ware based on trial 1 design. The external validity of trial 2 energy shifting findings will be done using post-hoc statistical power estimations using the final groups sizes for the HEFT and CPR trials.	
BID - R018	Metering failures resulting in higher than expected levels of missing data for network modelling. Network model findings compromised. For the delivery of SDRC 9.3.	Analysis of missing data to check for systematic versus random errors. Imputation of missing values using expectation maximization (EM) methods. Estimation of the biasing effects of missing data on network modelling findings.	SDRC 9.3 report and Final Energy Saving Trial report submitted to Ofgem in June 2017 and June 2017. This risk is now closed.	
BID - R019	Differential attrition between the two within-trial intervention and control groups in trial 2. Introduction of bias.	Telephone interviews with participants who withdraw from the trial for their reasons. Analysing these interviews to see if there are substantial differences in reasons for withdrawal from the intervention and control groups. Mapping these reasons onto existing explanatory theories of energy demand to see if they are likely to bias the findings from the study. Estimating the magnitude of any such potential biases from the findings of previous studies.	Intervention and control groups are merged in one within-trial group in trial 2. This risk would have been relevant only when comparing the drip-feed and the big bang approaches in delivering the project interventions to intervention and control group respectively. As reported in December 2016, it will not be possible to assess the differences between the two approaches. Therefore, there's no longer any risk of differential attrition in terms of the statistical analysis of energy shifting. This risk is now closed.	

Ref#	Risk & Impact Description	BID Mitigation	Mitigation (update)	Status
BID - R020	Significant participant dropout between trial 1 and trial 2 and its impact on sample sizes. Impacts generalisation of findings.	Use post-hoc statistical power estimation to determine the statistical confidence with which results can be generalised.	No significant attrition between trial 1 and trial 2 with 86% of all active participants signing up to the new tariffs. This risk is now closed.	
BID - R021	Metering failures resulting in higher than expected levels of missing data for network modelling. Network model findings compromised. For the delivery of SDRC 9.5	Analysis of missing data to check for systematic versus random errors. Imputation of missing values using expectation maximisation (EM) methods. Estimation of the biasing effects of missing data on network modelling findings.	As a result of the technical error identified in February 2016, the project is missing the half hourly data from 48% of the credit smart meters from the installation date to February 2016 and all the half hourly data within the 65 prepay smart meters installed in trial 1. To ensure 12 months of half hourly data are captured at least for all credit customers and in order to have a baseline for credit customers' trial 2 data analysis, the project decided to extend trial 1 to February 2017. The issue was rectified in February 2016 for all credit meters and it is now fixed for prepayment meters. For credit customers the project has put in place two levels of data quality checks: (1) British Gas run some pre-checks, data cleansing, and validation on the smart meter reading data; (2) University College London undertake additional quality checks following a quality assurance process that ensures that both the quantity and quality of data available for analyses are maximised. Some of these checks include the identification of duplicate readings, missing data, potentially erroneous data and potentially faulty meters and dubious/suspect data. In addition to these checks, for prepayment customers additional data quality checks are carried out by Element Energy over the first three months of trial 2 in order to develop the various CPR protocols for data cleaning before using the baselining methodology for rebate calculations (e.g. what to do when there is missing or limited data under various scenarios).	
BID - R022	Poor turn-out rate at customer thank-you/learning events. Learning not disseminated effectively to the customer audience.	(a) Use of trusted intermediaries and communications channels to promote event (b) Instruct customer field officers who have built a trusted interface to rally customers for attendance (c) Send a thank-you and learning update leaflet at the end of each trial	The mitigation remains as per the previous reporting period.	
BID - R023i	Learning not disseminated effectively to all stakeholders as different parties will have different interests and learning styles. Leads to learning being lost.	(a) Design of a dissemination roadmap that identifies targeted stakeholders and their preference in style and interest (b) Use pre-testing activities and customer focus group to test learning materials and discover their preference	The mitigation remains as per the previous reporting period, with the activities undertaken to date summarised in section 2.5 of this report.	

Ref#	Risk & Impact Description	BID Mitigation	Mitigation (update)	Status
BID - R023ii	Due to the nature of the buildings in which the smart meters will be installed, communications difficulties are encountered	(a) Supplier project partner has already successfully completed trials of communications solutions specifically for difficult buildings (tower blocks) and has strong interest in further enhancing the solution to inform smart meter rollout (b) Significant time and effort allocated in the project plan to identify and resolve any difficult building communications issues prior to installation of smart meters	The mitigation remains as per the previous reporting period. MDU communications infrastructure has been successfully installed and demonstrated. The project has only one participant remaining who requires the MDU infrastructure. However, this participants is only using their smart energy display intermittently. The contract with Siemens (who provide the communications infrastructure) ends at the end of December 2017 and project partners agreed it was not worth extending the contract for just one participants. The Siemens MDU equipment will not be decommissioned until post project end to enable continued customer participation in the trial.	

4.2 Risks and Issues that have arisen in the reporting period

Ref#	Risk or Issue & Impact Description	Mitigation (update)	Learning	Status
R026[5]	Participant attrition due to project extension communication. Attrition impacts on both internal and external validity calculations. As numbers reduce in both the HEFT and CPR trials, the capacity to detect an effect at the levels of statistical confidence stipulated in the proposal, and generalise this to the population, reduce.	a) Continued participation in the project offered as opt-out rather than opt-in. b) Participants offered £30 voucher at the end of the project if they remain in the project to the new end date. c) Customer benefits of ongoing participation to trial 2 clearly illustrated in the project extension communication letter.	No-one has, to-date (1 December 2017), dropped out due to the project extension so the mitigation approaches proved successful.	

[5] UK Power Networks' Innovation team has recently migrated to a new project management system. All project risks that are still open have been migrated to the new system, restarting the numbering for simplicity. The risk reference number reported here refers to the new numbering.

Ref#	Risk or Issue & Impact Description	Mitigation (update)	Learning	Status
R020[5]	Prepay customers using plug in electric heaters switch off their heaters during Bonus Time periods and could therefore be vulnerable to ill health due to low temperatures. Although all **energy**wise participants have gas central heating, it has been identified that a few participants don't use this and may use plug in electric heaters instead (or as well).	In trial 1, a trial effect was monitored for by comparing intervention and control group. No significant difference found. This is not an option for trial 2 as there is no longer a control group. Partners gave consideration to two options: 1. Comparing 2017/18 temperatures with those observed in 2016/17. This was considered not to be feasible due to external weather factors. 2. Comparing temperatures in the homes of Bonus Time participants with those of HEFT participants, looking at the average percentage change in temperatures between normal times and Bonus Times, and comparing this between Bonus Time participants and HEFT participants (the latter effectively acting as the 'control' for this purpose). It would need to exclude any HEFT weekend events. This was considered to be feasible but with limitations: • Volume and quality of remaining temperature data unlikely to be support statistically meaningful results. • Credit and prepay customers may have different heating patterns and indoor temperatures in any case. • Prepay customers may choose not to use appliances during Bonus Time periods which would impact on indoor temperatures. It was agreed that, while not perfect, Option 2 is the best option and will be implemented in trial 2. Initial analysis testing for statistical differences will be conducted and, if a difference is detected, project partners will discuss the best course of action to take	It has proved challenging to develop a protocol for taking action related to evidence of dangerously low temperatures in individual homes. Partners were in agreement that to accurately assess the risk to a household, a household visit would be necessary, but this was deemed too intrusive. Projects should give careful attention in design phase on how to use temperature data in absence of other datasets that will support the interpretation of indoor temperature values.	
R017[5]	In trial 2, the project is planning to test the response of credit customers to a Free Time tariff with similar structure to the HomeEnergy FreeTime tariff currently available to British Gas' smart credit customers that are also British Gas dual fuel customers and on paperless billing. Given the number of trial participants remaining in the credit group (~200) and the potential size of the between-day shifting, there is a risk for the project to deliver lower than expected statistical significant findings.	Considerable additional qualitative research has been added to reinforce the learnings from the project. This takes the form of additional semi-structured qualitative interviews with participants on their experience of, and response to, the Time of Use (ToU) Tariff structures offered. This will allow the project to both better interpret participants' understanding, acceptance, and behavioural responses to the ToU Tariffs, and support better interpretation of the quantitative findings from analysis of their smart meter data.	Alternative trial designs can be considered to mitigate uncertainties around the level of statistical confidence of project findings.	

Ref#	Risk or Issue & Impact Description	Mitigation (update)	Learning	Status
I0082	Some prepay participants may be confused about how Bonus Time works. Despite testing the messaging at participant panels, the project has identified one instance of a participant thinking they would benefit by increasing their electricity consumption rather than reducing it. This participant has received communication from the field officer team to ensure their understanding is now correct. Analysis of data shows that no participant is consistently increasing their consumption during Bonus Time periods suggesting that there is no misunderstanding.	a) Bonus Time notification text altered to emphasise that participants should be looking to reduce their consumption during Bonus Time periods b) A text message was sent to all 71 Bonus Time participants asking them to confirm whether their understanding is that they should seek to reduce electricity consumption during Bonus Time periods (answer Y or N), and encouraging them to call the field officers with any queries. (Only 16 participants responded to this text, of whom 15 had understood correctly. The other person was sent a text to further clarify the aim is to reduce electricity consumption during Bonus Time, and to call the Bromley By Bow Centre if they needed to discuss further, which they didn't). c) The June newsletter to prepay customers stressed how the Bonus Time periods work. (It was reported in the previous biannual report that letters would be sent to all participants who did not respond to the text. However, participants subsequently agreed that this might be more communication than some participant would like to receive and that reiterating this message via the newsletter would be sufficient.) d) Data is being monitored for any suggestion that particular participants have misunderstood how Bonus Time works. If any participant is identified (none have been to-date), the field officers will follow up as soon as possible with a phone call to talk this through with them.	Critical peak rebate designs can be complex for customers to understand, particularly where levels of literacy may be low. Messages need to be carefully designed and tested to ensure that participants haven't misunderstood the offer.	
I0083	Some credit participants may be confused or forget the timing of HEFT, e.g. believing that it operates for 24 hours on a Saturday. This could lead to increased electricity consumption during that period with a consequential impact on the participant's energy bill. One participant panel mistakenly believed that HEFT ran for 24 hours.	a) It was explained to her in the panel meeting that it in fact runs from 9am – 5pm. b) The October newsletter for credit participants reiterated that HEFT runs form 9am – 5pm on the chosen day. c) It is anticipated that any negative impact on bills caused through misinterpretation of HEFT to be minimal.	Time of use tariffs can be complex for customers to understand. Regular reminders may be needed of how and when they operate.	

Ref#	Risk or Issue & Impact Description	Mitigation (update)	Learning	Status
I0084	As part of the October rebate calculations carried out by Element Energy for prepayment customers participating in Bonus Time, it was found that 22 out of 71 active prepayment meters are reporting a mix of positive and negative values since 22 September 2017. This is caused by a smart meter software issue known by British Gas. British Gas has addressed this issue and a resolution is in progress to fix the affected devices. The issue is affecting in small volumes both credit and prepayment electric meters and a fix for both meter types is currently under deployment. Once the fix is deployed, the issue will not be experienced in future reads. However, the calculations of the Bonus Time rebates for these 22 customers might not be accurate for the months of October and November. One credit meter with negative value has been identified so far by Element Energy in September data so far. This may also have an impact on the analysis of the credit meter data at the end of trial 2.	a) British Gas has investigated the best solution to deploy, the causes of the software issue and the extent of the issue within the wider trial participants' meter population. b) A fix has been deployed to all affected smart meters and as of 3 December 2017 the issue has been resolved. c) The project partners have developed a mitigation strategy to calculate the October and November rebates that might have been affected by the issue until it was resolved. Element Energy is calculating Bonus Time awards for October and November, based on the available data. Extra checks will be carried out on those meters that report negatives. Ideally, their awards can be based on the positive values they report and Element Energy is checking if the corresponding awards are in line with previous behaviour of these customers. If this does not seem sensible, these customers will be awarded according to their previous response (earlier months), or according to October/November group average. Therefore, the impact on the customer's experience is expected to be minimal. d) Element Energy and University College London are also checking the potential impact of the issue on trial 2 data analysis for credit meters. As the issue is now resolved, only October and November data may be partially affected.	Data quality checks are key to energy saving and energy shifting trials, as well as to business as usual activities. It is important to identify any data quality issue at early stage to allow the research partners to develop a mitigation strategy to analyse the data without impacting the project deliverables.	

5 Successful Delivery Reward Criteria (SDRC)

SDRC	Criteria	Evidence	Date	Progress
9.1	**Trial Design and Identification of Customer Participants** Detailed design of energy saving and energy shifting trials incorporating definition and identification of fuel poor customers	• Approved Trial Design Report • Agreed set of fuel poverty / vulnerability indicators and targeted customer pool.	By end of October 2014	Completed – the SDRC 9.1 was submitted to Ofgem on 31 October 2014

SDRC	Criteria	Evidence	Date	Progress
9.2	**Customer Recruitment** Effective recruitment of fuel poor customers	• A review of best practice in fuel poor customer recruitment. • Identification of trusted intermediaries within the trial area community and their relationships with trial participants. • A quantitative mapping of participants' energy knowledge resources (energy social capital survey) within their social networks i.e. where they turn to, and who they trust, for knowledge about energy. • Findings from customer focus group testing of clarity and acceptability of recruitment communication materials. • Statistics on recruitment success rates and reasons for non-participation. • Qualitative evidence on the efficacy of different recruitment channels, strategies and materials.	By end of April 2015	Completed – the SDRC 9.2 was submitted to Ofgem on 30 June 2015.
9.3	**Energy Saving** Impact of energy saving trial interventions – level of fuel poor participation and network impacts	• Quantitative analysis of trial 1 energy savings through within-trial intervention-group to control-group comparison. • Quantitative analysis of trial 1 control-group contamination effects through within-trial control-group to external to trial control-group comparison. • Statistical generalisation of the energy savings to the wider UK Power Networks, and national fuel poor customer base. • Representation of network impacts through half-hourly network modelling within the trial area. • Comparison of realised energy savings against previous estimates of technical potential energy savings in fuel poor customer group. • Insights on customer protection during the trial.	By end of June 2016	Completed – the SDRC 9.3 was submitted to Ofgem on 30 June 2016 and the Final Energy Saving Trial report was issued to Ofgem on 16 June 2017.

SDRC	Criteria	Evidence	Date	Progress
9.4	**Customer Engagement** Effective engagement with fuel poor customers	• A review of best practice in fuel poor customer engagement. • A review of best practice in trial panel maintenance (i.e. methods to minimise participant dropout), particularly in trials with vulnerable participants. • Quantitative analysis of longitudinal survey of participants' energy knowledge resources (energy social capital) within their social networks and how these have changed over time. • Findings from interviews with trial participants on the efficacy of different engagement activities conducted throughout the trials. • Statistics on participation attrition and reasons for participant drop-out.	By end of August 2017	Completed: the SDRC 9.4 was submitted to Ofgem on 31 August 2017.

SDRC	Criteria	Evidence	Date	Progress
9.5	**Energy Shifting** Impact of energy shifting trial interventions – level of fuel poor participation and network impacts	• Quantitative analysis of trial 2 energy shifting difference between Group 1 and Group 2 through within-trial intervention-groups comparison. • Quantitative analysis of trial 2 energy shifting through pairwise comparison between intervention Group 1 and the external trial control-group, and intervention Group 2 and the external trial control-group comparison. • Statistical generalisation of the energy shifting to the wider UK Power Networks, and national fuel poor customer base. • Representation of network impacts through half-hourly network modelling within the trial area. • Comparison of realised energy shifting against previous estimates of technical potential energy shifting in the fuel poor customer group. • Insights on customer protection during the trial.	By end of July 2018	Completed: • Early assessment and identification of the use of the Home Survey for external control group. • External control group selection and recruitment. • Literature review of previous UK static ToU tariff trials and international dynamic DSR trials/commercial offers. • Energy shifting devices – decided not to provide any to maximise ToU tariff uptake and shifting realisation. • Design and provision of time shifting advice leaflet. • ToU tariff selected for credit customers. • Design of dynamic DSR trial for prepayment customers CRP schedule and notification provider selection. • 236 participants taking part in DSR trial. • Switching of credit customers to HomeEnergy FreeTime tariff on 1 April 2017. • Dynamic DSR trial for prepayment customers started on 14 April 2017 with the first CPR event. • 50 CPR events to date. • Two quarterly statements issued to prepayment customers. summarising the credits earned in the first six months of trial 2. • Customer Protection: temperature monitoring strategy finalised based on observations from trial 1. • Update of technical potential and business case (see Section 7) In progress: • Trial 2 data capture. • Customer protection activities including ongoing temperature monitoring and next vulnerability status review. • Ongoing analysis of electricity consumption data from prepayment customers and calculation of rebate. • Analysis of credit customers' trial 2 data kicked off

SDRC	Criteria	Evidence	Date	Progress
9.6	**Knowledge Dissemination** Effective dissemination of new knowledge generated from the project's captured learning.	• 1x external learning event carried out for SDRC 9.1 – 9.5, and presentation materials shared. • 2x internal learning events carried out per SDRC, and presentation materials shared. • 2x thank-you events carried out for trial participants. • 1x end of project customer learning event completed for trial participants, and presentation materials shared. • Presentation of the project at least twice a year at external seminars / workshops, with presentation materials shared.	By end of September 2018	• Please refer to section 2.5.

6 Learning Outcomes

6.1 Learning in this Reporting Period

In the current reporting period the project has gained valuable learnings from ongoing engagement including activities such as the July and October participant panels as well as initial analysis of the trial 2 data for prepay customers.

Project attrition, customer issues and ongoing engagement

As reported previously, partners have identified a number of key learnings to minimise project attrition and maximise ongoing engagement of participants including regular communication with participants, minimising customer interactions and 'hassle' and using the regular participant panels to identify issues and test communications. This has proved successful; since May 2016, only one participant has chosen to leave the project through requesting that their smart meter be removed. However, a further 22 participants have been disengaged during this reporting period, as follows:

- 13 were reported as being in the process of disengaged in the last biannual report (12 because they didn't have a smart meter and one because they had had a solar installation post smart meter install which made their smart meter inoperable);
- seven have been disengaged because they moved house;
- two have been disengaged because they changed supplier.

Equipment

Feedback from the participant panels confirms what was previously reported, that:

- the LED lightbulbs continue to be very popular;
- several panel participants have stopped using their eco-kettle because they find it heavy or awkward, or do not like the way it looks; and
- the smart energy display is popular with prepay customers who use it regularly to check their credit levels;
- some prepay customers have experienced problems with topping up; these customers are referred to British Gas.

Early learning from trial 2

The July and October panels have provided some practical, anecdotal insights into how the **energy**wise participants are responding to their time of use tariff. In particular:

- some loads are easier to shift than others, such as washing;
- participants found it useful to share tips on how to get the most out of the offer;
- participants attending these panels are in general positive about non-punitive tariffs and therefore all have been favourable to the project extension; and
- feelings about punitive tariffs are mixed.

There are currently 34 **energy**wise participants who are not taking part in trial 2. One of these was felt to be too vulnerable to take part in the DSR trial whilst the others said they did not want to take part (or would not respond to communications inviting them to take part). Where reasons were given for not taking part, these were either lack of time (particularly on Bonus Time) or existing low bills (particularly on HEFT). One customer stated that they believed the HEFT tariff was some kind of trick.

Additional events at different times

The updated CPR schedule covers a range of events including: weekday evening, weekday morning, weekday midday and weekend.

A number of lessons have been learned during the design and implementation of additional events:

- the additional events should minimise any impact on the baseline.
- it is useful to highlight non evening peak events as participants might get used to the same text message format. As bold font is not possible in a text message, an effective way is to use "**" to highlight the time. For example: "**energy**wise: Your next Bonus Time is TOMORROW Sat 26 Aug, **12PM to 3PM**…";
- sending the notifications two hours before an early morning event might be considered antisocial. As a result the initial notification continues to be sent on the morning of the previous day but the reminder notification has been changed from two hours before the event to 30 minutes before the event.

ToU tariff design

As previously reported, the project has overcome a significant challenge through the design of the CPR ToU tariff for prepayment smart meter customers. These non-tariff structures offer the potential to have both social and energy system benefits while remaining commercially viable to suppliers. This new class of ToU tariffs has significant potential to both deliver network benefits and alleviate potential adverse distributional impacts of the smart metering programme.

Citizens Advice ran an event in July 2017 presenting their report (prepared for them by the Brattle Group and University College London) on time of use tariffs[6]. This report identifies CPRs, "As a potentially attractive tariff design option for domestic GB customers" and states that "CPR tariffs have received relatively little attention as a tariff option in GB thus far". Those discussing CPR (including a representative from BEIS) at the event noted the lack of CPR trials in the UK, and were interested in knowing the findings from **energy**wise. **energy**wise is pioneering this tariff structure in the UK and the learning outcomes from the CPR trial are expected to inform the viability of non-punitive ToU tariffs for the GB's domestic customers.

6.2 Learning and Dissemination Activities in the Next Reporting Period

Learning activities for the next reporting period will focus on the feedback from both prepayment and credit customers on their experience on the DSR trial, calculations of the rebates that will be credited to prepayment meters for those responding positively to the CPR tariff, trial 2 ongoing engagement and closing phase of customer journey. The project will also report any significant learning outcomes from the decommission of project equipment and from the thank you events that will be organised with trial participants at the end of trial 2.

7 Business Case Update

The project is regularly revising the business case by refining the assumptions it is based on, as more data becomes available. The business case is based on the technical potential for energy saving and energy shifting amongst households struggling with their fuel bills in the UK.

To obtain a better sense of the scale of energy savings that could be realised in trial 1 and 2, the technical savings potentials for each of the trial 1 and 2 intervention devices have been reassessed. The business case has been also reviewed in light of the latest project developments, and in conjunction with the completion of the 12 month data analysis of trial 1 data and the final design of trial 2.

[6] www.citizensadvice.org.uk/Global/CitizensAdvice/Energy/The%20Value%20of%20TOU%20Tariffs%20in%20GB%20-%20Volume%20I.pdf

7.1 At Full Bid Submission

The business case was calculated at full bid using assumptions for the energy saving and shifting technical potential using data from the Department for Energy and Climate Change (DECC) and the Department for the Environment, Food and Rural Affairs' (Defra's) Household Electricity Usage Study (HEUS[7]) on two of the Experian Mosaic Groups identified to be most relevant to the households the project was targeting. These groups were: (i) households dependant on benefits and (ii) households dependant on the state pension. This data used at full bid submission was the best available at the time. The project recognised it had limitations against two key factors as declared in the project's response to Question 16 in the bid Q&A[8]:

1. Fairly low representation from the two Experian Mosaic Groups which were most similar to the customer type the project was focusing on; and the
2. HEUS households were limited to easily accessible owner-occupiers in England. Therefore, no social hosing tenants were captured which **energy**wise is targeting.

Moreover a further third limiting factor was identified, relating to aggregated data that could not be broken out by appliance categories. As this was the best available data in the UK for research for households struggling with fuel bills, it reinforced the importance of **energy**wise. The project is indeed providing valuable insight through a research and trial demonstration to update the understanding of customers' ability to save and shift their energy. The project therefore recognised that data from the trials and from other sources identified within the project delivery period would have supported the revision of the business case.

7.2 Beyond Full Bid Submission

Since the full bid submission, new data from trial 1 and the final design of trial 2 has become available. **energy**wise has therefore reassessed the technical potential for energy saving and energy shifting among households struggling with their fuel bills in the UK using the trial data. Early estimates of the technical potential impacts of the trials made use of appliance ownership data from the Low Carbon London (LCL) trial. The technical potential figures reported in this section are based instead on the appliance ownership data reported by **energy**wise trial participants in the Home Energy Survey conducted at the beginning of trial 1.

In October and November 2017 project partner Element Energy supported the calculation using the best available literature data combined with **energy**wise data under a series of assumptions to determine the maximum peak reduction potential specifically looking at trial 1 and trial 2 (along with the relevant appliance categories) rather than looking at saving and shifting in isolation.

Technical potential estimate – energy saving intervention devices

To obtain a sense of the scale of energy savings that could be realised by the energy saving measures provided to participants of the **energy**wise project, the technical savings potential for each of the intervention devices was estimated. These interventions included:

- Four light-emitting diode (LED) lightbulbs[9];
- An Eco-Kettle;
- A standby-saver device (i.e. standby shutdown); and
- The provision of a smart meter and smart energy display (i.e. a real-time display).

It is worth noting that an energy efficiency booklet and support advice were also provided as part of the interventions of **energy**wise. However, the impact of these additional measures is not considered in this technical potential analysis.

The technical potential energy savings for each device were determined using appliance level load profile data from DECC and Defra's Household Electricity Usage Study, household appliance ownership data obtained from the

[7] DECC, Defra and the EST (2012), "Household Electricity Survey: A study of domestic electrical product usage".
[8] LCN Fund Full Submission Supplementary Answer Form, Q16 (CBA)

[9] Note that at the end of Trial 1, participants received a fourth LED light bulb. The fourth LED light bulb is introduced as an additional intervention in Trial 2; the additional LED bulb has now been included in the technical potential calculations.

energywise Home Energy Survey, real-time display impacts on household consumption from the Energy Demand Research Project (EDRP) and appliance performance data from manufacturers. The estimated technical savings potential during the evening peak (i.e. maximum likely savings that could be realised during the evening peak if each appliance was used as intended) are shown in Figure 8.

It is worth noting that relative to the "adversity" group in the LCL trial, **energy**wise trial households reported a higher proportion of incandescent light bulbs. The greater incidence of low efficiency light bulbs in **energy**wise households increases the potential savings that can be achieved with the introduction of LED lights. Overall, the **energy**wise participants consume less electricity than the "adversity" group in LCL, which has led to a reduction of the estimated savings potential calculated for the **energy**wise project.

Technical potential estimate – demand side response interventions

During trial 2 of the **energy**wise project, two different Demand Side Response (DSR) interventions are trialled. Depending on the electricity meter type, customers are offered the following interventions:

- Prepayment customers: Participants who have a prepayment meter are able to take part in the Bonus Time offering – a non-punitive Critical Peak Rebate in which customers who are able to reduce their demand during pre-notified time periods are rewarded with additional credit on their meters.
- Credit customers: Customers with a credit meter are offered the HomeEnergy FreeTime (HEFT) tariff, on which customers can consume electricity at no unit price during certain times on weekends (09:00-17:00 on Saturday or Sunday – depending on each customer's choice).

Given the limited availability of literature data on the HomeEnergy FreeTime tariff, the technical potential for shifting of demand from the evening peak period has been modelled for the DSR intervention tested with prepayment customers (Bonus Time tariff).

Bonus Time

In the absence of any previous CPR trials in the UK, the potential impact of the Bonus Time offering was assessed using data from the Californian Save Power Day program (an extensive implementation of a CPR offering in the USA). Southern California Edison (SCE) offered the program to 206,000 residential customers in 2013. The program structure was similar to the CPR offering that is being trialled for **energy**wise participants with a prepayment meter[10]. Customers received a notification the day before an event and were encouraged to reduce consumption during a specific time window (14:00-18:00). SCE awarded the customer response by accrediting customers with a $0.75 rebate (which equates to roughly 5 kWh awarded for each kWh reduction).

The program observed an average reduction in customer demand of 4% during the CPR events. All CPR events that were triggered by SCE occurred in summer as the Save Power Day program is targeted at reducing air-conditioning load during summer. To best translate this finding into the context of UK domestic demand, Element Energy identified the proportion of total Californian electricity demand that is due to air-conditioning (4% of annual consumption, based on U.S. Energy Information Administration data[11]) and they discounted the likely reduction in demand during a CPR event to account for the low incidence of air-conditioners among domestic customers in the UK. On this basis, it is estimated that the average potential for demand reduction across each Bonus Time CPR event is approximately 1.6% of household demand.

Peak demand impacts from all energywise interventions

Adding in the impact of the **energy**wise DSR interventions (assuming prepayment customers only) to the peak demand impacts from the energy saving intervention devices gives the total peak demand impacts as shown below in Figure 8.

[10] 2013 Load Impact Evaluation of Southern California Edison's Peak Time Rebate Program, Nexant, 2014, available from https://library.cee1.org/sites/default/files/library/12425/2013_SCE_PTR_Load_Impact_Evaluation_-_Final.pdf

[11] EIA, 2013, Household Energy Use in California, available from https://www.eia.gov/consumption/residential/reports/2009/state_briefs/pdf/ca.pdf

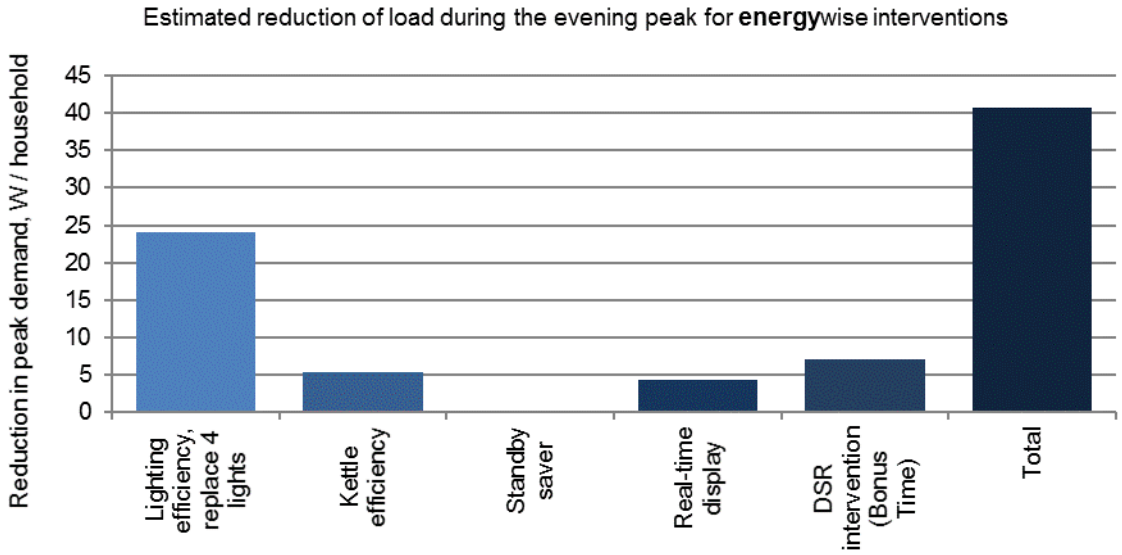


Figure 8: Trial 2 estimated technical potentials for reductions in peak demand that are possible for the energy saving intervention devices and DSR interventions in the energywise **project (relative to the control group)**

- **Trial 1 – Energy Efficiency:** Total technical potential for reducing demand during the evening peak in an average "Adversity" household = 34 W
- **Trial 2 – Energy Efficiency & Demand Side Response:** Total technical potential for reducing demand during the evening peak in an average "Adversity" household = 40.7 W

Moreover, a weighted average technical savings potential for an average "Adverse" household of 204 kWh/year has been calculated by Element Energy using the maximum annual savings technical potentials for appliance efficiency improvements for the four categories targeted in **energy**wise (LED lightbulbs[12], eco-kettle, standby shutdown; and the provision of a smart meter and smart energy display). The analysis based on the more accurate and granular data available to date shows a reduction in the average technical saving potential per household compared to the one estimated at bid stage (353-655 kWh/year) for the two HEUS Experian Mosaic Groups.

Network benefits

Business case assumptions

UK Power Networks have updated the project business case using the revised technical potentials and have consequently re-generated the bid submission waterfall chart. Similarly to the business case reported in the bid document, low estimates and high estimates are provided for energy saving and shifting separately:

- the low-side estimate assumes customers' behaviour is maintained for ten years and therefore that the effect of suppressing demand through energy efficiency and shifting peaks is maintained for ten years (i.e. assuming the project has deferred network reinforcement costs for ten years from 2016 to 2026 and then having the network investment uniformly spread from 2026-2035);
- the high-side estimate assumes behaviours are essentially permanent.

However, in contrast with the bid submission, the revised approach is targeting appliances that are in the scope of the project within each trial rather than aggregated savings and shifting overall.

Finally, the bid submission business case was assuming the network benefits estimated for the London Power Networks (LPN) area as a proxy for the three license areas. Here two scenarios are provided:

[12] Note that at the end of trial 1, participants received a fourth LED light bulb. The fourth LED light bulb is introduced as an additional intervention in trial 2; the additional LED bulb has now been included in the technical potential calculations.

a) LPN network benefits used as a proxy for the three license areas – for comparison with the bid submission business case
b) network benefits estimated separately for each license network – to provide a better understanding of scalability of the DNO benefits to the three license areas.

Waterfall charts

Case a) – LPN network benefits used as a proxy for the three license areas

Figure 9 shows the project costs and the enduring costs to replicate the project in the future on one side, and network benefits on the other side.

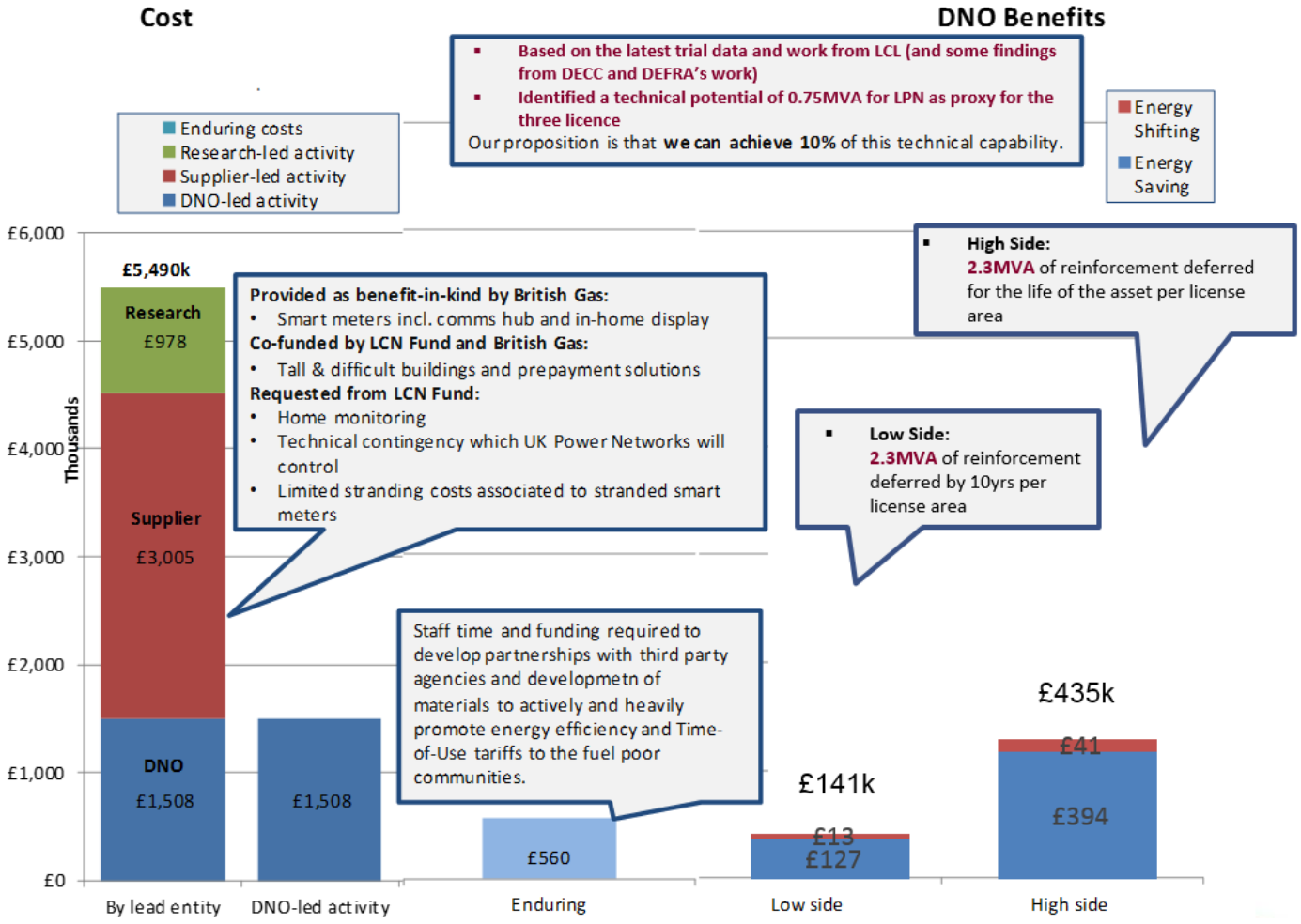


Figure 9: Revised waterfall chart for case a)

Network Benefit Summary:

- **Low side** (assuming reinforcement deferral for 10 years):
  A total of £141k benefits made up of the following components form trial 1 and trial 2 respectively
  - **Energy Efficiency:** £127k (assuming the network benefits of £42k estimated for the LPN area as a proxy for the three license areas)
  - **Demand Side Response:** £13k (assuming the network benefits of £4k estimated for the LPN area as a proxy for the three license areas)

- **High side** (assuming indefinite reinforcement deferral):
  A total of £435k benefits made up of the following components form trial 1 and trial 2 respectively
  - **Energy Efficiency:** £394k (assuming the network benefits of £131k estimated for the LPN area as a proxy for the three license areas)
  - **Demand Side Response:** £41k (assuming the network benefits of £14k estimated for the LPN area as a proxy for the three license areas)

Case b) – Network benefits estimated separately for each license network
Similarly to case a), Figure 10 shows the project costs and the enduring costs to replicate the project in the future on one side, and network benefits on the other side.

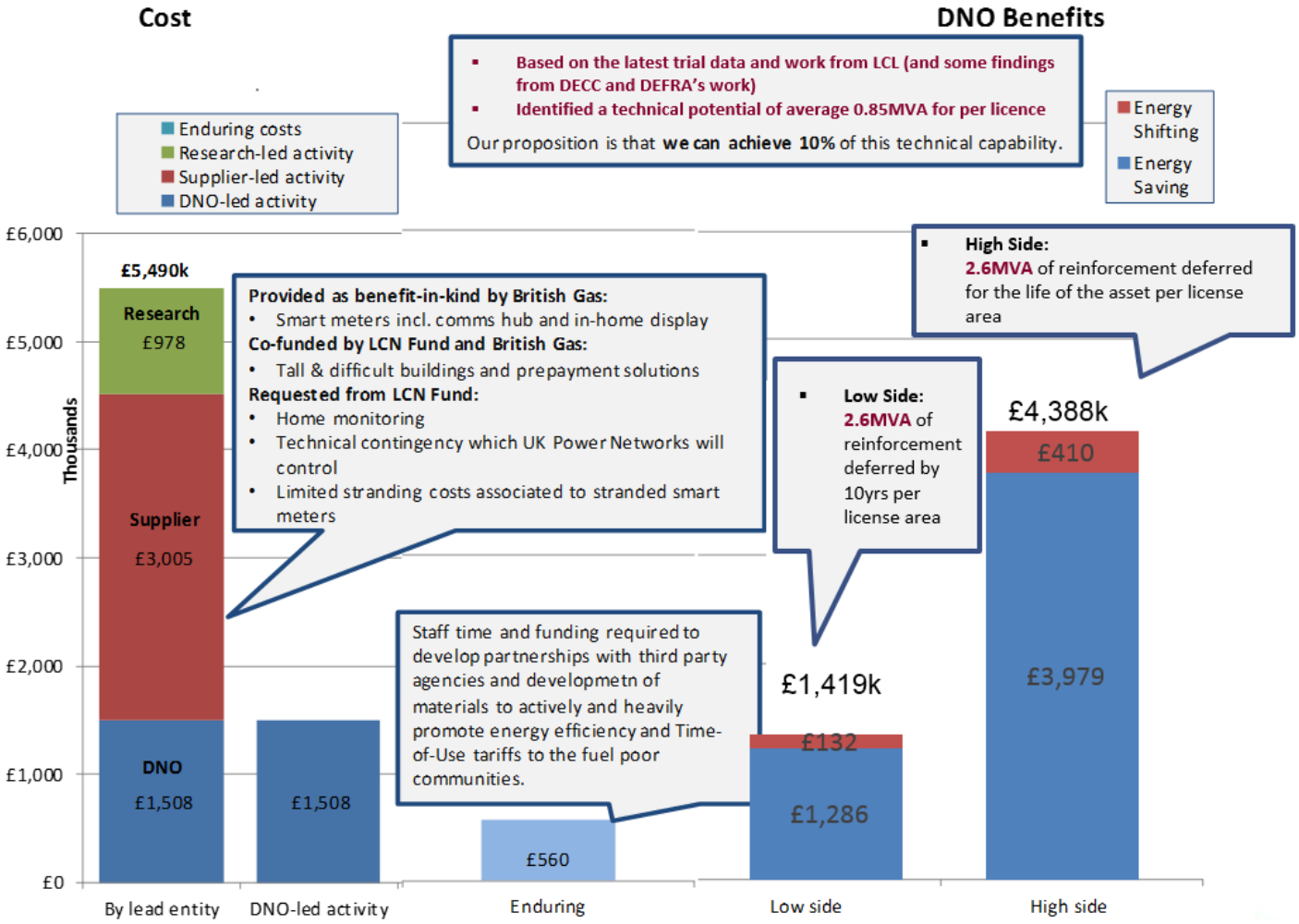


Figure 10: Revised waterfall chart for case b)

Network Benefit Summary:

- **Low side** (assuming reinforcement deferral for 10 years):
  A total of £1.4m benefits made up of the following components form trial 1 and trial 2 respectively
  - **Energy Efficiency:** £1.3m (with £42k estimated for the LPN area, £927k for the Eastern (EPN) area and £316k for the South Eastern (SPN) area)
  - **Demand Side Response:** £132k (with £4k estimated for the LPN area, £95k estimated for the EPN area and £33k estimated for the SPN area)

- **High side** (assuming indefinite reinforcement deferral):
  A total of £4.4m benefits made up of the following components form trial 1 and trial 2 respectively

- **Energy Efficiency:** £4m (with £131k estimated for the LPN area, £2.8m estimated for the EPN area and £978k estimated for the SPN area)
- **Demand Side Response:** £410k (with £14k estimated for the LPN area, £295k estimated for the EPN area and £101k estimated for the SPN area)

Conclusions

Figure 9 and Figure 10 show the variability of the network benefits that could be realised from replicating the project across UK Power Networks. When LPN network benefits are taken as a proxy for the three license areas, the network benefits are reduced compared to the bid submission due to the refined procedure based on the more granular data now available compared to bid time (2013). However, when the network benefits are scaled up to each license area individually, larger benefits could be observed across UK Power Networks. This is due to the different reinforcement unit costs per license area and the number of fuel poor customers expected in each network area.

The business case will be reviewed at the end of the project when more accurate information will be available on the energy shifting potential of the DSR interventions, including the HomeEnergy FreeTime tariff offered to credit customers.

8 Progress Against Budget

This section is provided in Appendix A.

9 Bank Account

This section is provided in Appendix B.

10 Intellectual Property Rights (IPR)

During the current reporting period the project has initiated a consolidation of all Relevant Foreground IPR in a new format that will provide a description of each Relevant Foreground IPR item and how it can be used in order to replicate the trials. A consolidated version with inputs from University College London, Element Energy, CAG Consultants and National Energy Action has been issued to UK Power Networks on 7 December 2017. The list is currently under review and will be discussed at an IPR Group in early 2018.

11 Other

N/A

Accuracy Assurance Statement

We hereby confirm that this report represents a true, complete and accurate statement on the progress of the Vulnerable Customers and Energy Efficiency project in the six month period from July to December 2017 and is an accurate view of our understanding of the activities for the next reporting period.

Signed ……

Date ……

Suleman Alli
Director of Strategy, Safety & Support Services
UK Power Networks