# Vulnerable Customers and Energy Efficiency
## Low Carbon Networks Fund
### Project Progress Report – July to December 2015

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 to December 2015.

## 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, and with funding from Ofgem, the national regulator. Ofgem awarded the project £3.3 million of funding, under the Low Carbon Networks Fund (LCNF) competition scheme in December 2013.

**energy**wise 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 their behaviour.

The project will do this by undertaking a research study with the aim to recruit households who may be struggling with fuel 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 energy spending, enabling them to make changes which may save them money on their energy bills.

Firstly the project will explore if households benefit from smart metering solutions (smart meter and smart energy display) and from energy efficiency technologies such as energy efficient light bulbs, an ecoKettle and standby saver.


Secondly understanding their appetite to change their behaviour by swapping to an 'off-peak' tariff, with favourable rates at off-peak times.

The project hopes to understand:

- the extent to which this residential customer group is able and willing to engage in energy efficiency and an 'off peak' tariff;
- 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
- consequently how their move and reduction in demand away from network peak periods may benefit the electricity network and whether it can defer or avoid network reinforcement.

## 1.2 Summary of Progress

Within the current reporting period, the project has completed the instrumental phase of recruitment and installation (with the exception of the install at three households that require the Multiple Dwelling unit Communicates Infrastructure for the smart meter sets to be successfully installed) with the key objective of gaining fully consented project participants that are willing to engage in the research trials.

The project approached 1,342 households (this includes the 36 homes that were approached within the pilot study). Households approached included credit and prepayment metered customers who require installation of the standard communications solution at the time of smart meter set installation and also a small number of households that reside in a tower block that requires a communications solution for installing smart meter sets in complex Multiple Dwelling Units (MDU) with challenging meter arrangements.

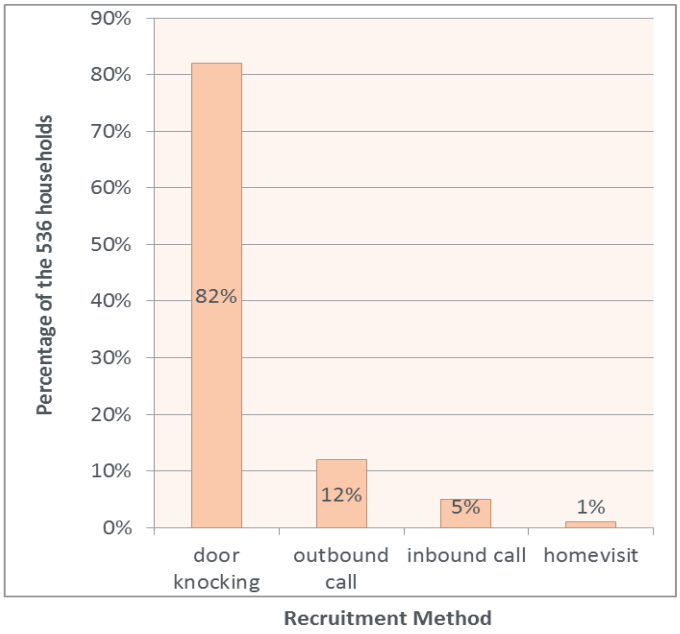
Key recruitment outcomes:

1,342 households have been approached and 536 households signed up => 'Yes' response rate of 40%

579 households not interested => 'Not Interested' response rate of 43%

167 households have dropped out; majority at install appointment booking or at point of install

369 active participants, of which 351 have had their installation

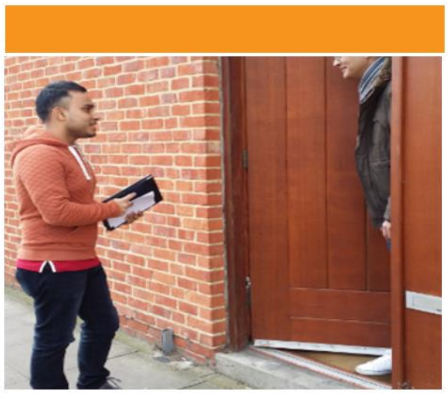


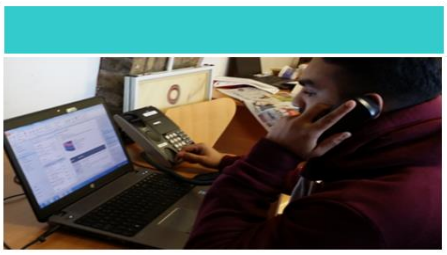

Of the 1,342 households approached, 536 households signed-up to participate in the project, representing a response rate of 40%, which is above the projects targeted response of 33%. This is a successful outcome for the project as it demonstrates that the developed customer recruitment and engagement approach, materials and proposition/campaign were fit for the target audience. Moreover, it is encouraging to observe this response rate amongst this group of residential households with regards to their willingness to be involved in an energy efficiency and demand side response campaign.

Examining the recruitment methods used that led to the 536 households saying 'Yes' to participating in the project highlighted the instrumental role of door knocking, which accounted for 82% of signed up households. Further assessment on the customer recruitment and engagement methods will continue to qualify and derive what approached and technique delivered the recruitment success.

The project participant numbers have since fallen due to drop outs which have been occurring largely during the install appointment booking or at the point of installation. For households to fully participate they have to provide an informed 'Yes' to signing-up and also allow access for the installation of project equipment. To date there have been 167 households that have dropped out of the project, therefore there are currently 369 active participants. Of these participants, 351 households have received their end-to-end installation. The 351 installations that are completed, the split between project customer group is as follows: group 1 contains 178 households – 112 credit and 66 prepayment – and group 2 contains 173 households – 112 credit and 61 prepayment. Please note the customer group allocation and meter type figures outlined have changed to that presented at the LCI conference by one household where British Gas identified through reviewing their data records that a group 2 credit customer had previously been misallocated as group 1 prepayment. Households that have dropped out have received project 'Thank You' vouchers, tokens and energy efficiency devices dependent on the timing of when they dropped out. Of the 167 drop outs, 166 received the £10 'Thank You' Love2Shop voucher, as one household dropped out before the Welcome pack had been issued. Moreover, 23 of these dropped out households received an ecoKettle and standby shutdown, with 22 also receiving a set of 3 LED lights. Additionally, 157 of the homes received a first class book of stamps which formed the 'Thank You' token accompany the energy social capital survey. Of these 157, three received replacements where they had highlighted they had not received the survey/token. Therefore, customers have subsequently benefitted from the project even although they are no longer active participants which the project views as a low risk as to date the cost of these customer benefits have been low.

Key installation, survey and customer benefit outcomes so far:





Of the 351 installations; 178 in group 1 in receipt of smart meter sets (112 credit and 66 prepayment) and temperature logger solution

Of the 351 installations; 173 in group 2, all in receipt of temperature logger solution with 112 receiving a credit smart meter without smart energy display and 61 with an electric loop/secondary electricity meter

Survey Responses:

- 204 energy social capital surveys
- 280 home energy surveys

Each participating household has received between ~ £15 - £80 (dependant on customer journey)

The project has been administering an energy social capital survey to collect information on where participants find energy efficiency information, and particularly which people they receive it from, and who they trust for advice. To date, 524 energy social capital surveys have been mailed, with 204 surveys being returned (as of 19 November 2015), giving a response rate of 38.9%. Assessment of returned surveys has been performed to gather key insights from this survey exercise. Early evidence suggests that almost a third would first turn to organisations like energy companies, local councils or landlords for information about electricity use in future. Survey administration continues therefore conclusions may be revised.

Moreover the project has been administering a home survey to take an electricity inventory of each participants' home and ask about socio-demographic information necessary for understanding more about each households e.g. size, ethnicity, confidence in English and income. So far it has been estimated that the project has administered 323 of the home surveys (including 59 left for self-completion) and it is known that 280 surveys have been received by University College London. Assessment of home surveys receive has been undertaken. Early insights on respondents have included increased understanding on their ethnic background; predominantly respondents to the survey so far are from Bangladeshi (55%) or White British (24%) ethnic groups.

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

Install and commission a Multiple Dwelling Unit (MDU) Communication Infrastructure at participating households who reside in a complex MDU with challenging meter arrangements.

Publish the SDRC 9.3 report in June 2016 and will outline Trial 1 observations, both household energy changes and the subsequent network impact.

Recruit active participants on to the project's customer panel.

## 1.3 Risks and Issues Summary

**Recruitment Risks and Issues**

Eligible Trial Participant Numbers: The project reported within the previous reporting period that the number of households identified to be eligible for participation was lower than the target number of 1,650 households. The project explored solutions to fill the shortfall of households that resulted in an increase to 1,342 households that the project had/could approach. The project then concentrated its efforts on approaching households and gaining a high response rate. The project successfully exceeded the targeted response rate, and which means that the external validity of the results will be as strong as planned[1]. From within the 1,342 households the project had originally intended to recruit two trial groups each of up to 275 households. This upper target was set based on a calculation of sample sizes required, and assuming the size of effect in a household's energy usage that we were likely to measure. Whilst the project has recruited a smaller number, with trial group 1 containing 178 households and group 2 containing 173 households, overall reliability of the results when calculated on the same basis set out in Appendix O of the full submission is around 74% therefore remains near the targeted 75%. The 74% figure was calculated by University College London by repeating Appendix O calculation with a revised input where the previous annual consumption of active participants were used therefore providing an improved estimate of existing energy usage of this type of household to that used previously. Please note assessment on statistical power continues. As such, as long as there is no significant attrition amongst trial participants within the project, the project is still confident of delivering the results to the level of confidence first planned.

Recruiters: Bromley by Bow Centre experienced delays in contracting an outsourced Recruiter team, therefore additional recruitment resource for door knocking activity was built into recruitment activity four weeks later than the project had planned. 'Groundworks' were the eventual appointed recruiter organisation that supported the projects recruitment and engagement activity. The project recognised that this delay against project timeline posed a risk to the project's recruitment capabilities. Therefore, the project team closely monitored this risk within reporting period and also responded in several ways to manage it by:

(i) Appointing a further recruiter firm, Sustainable Home Energy Survey Company, to provide additional recruitment resources;
(ii) Obtaining volunteers from UK Power Network supported by acting as 'buddies' to Groundworks and Bromley by Bow Community Centre recruitment staff to increase recruitment pairs working evenings and weekends,
(iii) Re-assigning door knocking rota management from Bromley by Bow Community Centre to CAG Consultants to improve successful resource allocation,
(iv) Providing a UK Power Networks project team resource on site at Bromley by Bow Community Centre and
(v) Conducting ongoing project meetings between UK Power Networks and Bromley by Bow Centre on delivery status and for risk/issue escalation to ensure delivery of project recruitment activity.

All the above listed mitigating actions along with the brilliant efforts of each recruitment staff member realised the successful recruitment rate.

Prepayment Inclusion: In the last progress report it was reported that the issue of prepayment inclusion still stood and the project was closely monitoring the progress of British Gas's smart prepayment programme. The project is now pleased to report that this issue has been successfully closed [Bid risk – R024]. The project approached, recruited and installed at prepayment metered households within the current reporting period. Of the current 351 end-to-end installations that have been completed, 127 of these are prepayment metered households. Of which, 66 of these homes have received a prepayment/pay as you go smart meter set as they have been randomly allocated to Group 1 and 61 have been allocated to Group 2 where they have had an electric loop/secondary electric meter installed to log their consumption use.

[1] External validity refers to the ability to say how likely it is that the energy savings and shifting observed in VCEE applies to a wider fuel poor population. This is required for statistical generalizability and for project reproducibility

Consent forms: The project has been working with tenants of two different housing associations, and has developed recruitment protocols which subtly differ in each case. For Tower Hamlets Homes consent was required only from the British Gas Account holder (who had the responsibility for getting the consent of the tenancy agreement holder), for Poplar HARCA both the British Gas Account holder and the tenancy agreement holder had to provide consent. An audit has identified that this second process of dual-consents for Poplar HARCA's residents was not rigorously followed. Moreover from further audit it was found that 23 consent forms were missing from participants who provided written consent face-to-face. Following further checks it was found that 14 of households out of the 23 had already dropped out from the project. The risk associated with missing consent forms is mitigated by having records in the project's recruitment database that the project asked for and was given consent, even if the actual 'written' consent is not available. Bromley by Bow Centre confirmed that records of consent (consent being 'Yes', Date of Consent, Time of Consent and recruitment method when customer signed-up) are held for all 23 households in the database where they were missing the physical evidence. The project will seek to close out these remaining consents, compensating customers/tenants for any disruption in having to disturb them once more.

**Installation Risks and Issues**

Trial 1 Control Group Install Challenge: As highlighted in the previous progress report, the project came across a challenge with households allocated to group 2 whom for trial 1 are part of the control group who receive a secondary electricity meter and a temperature logging solution installed. This was where the meter cabinet that contains the current meter and consumer unit had insufficient space for the secondary electricity meter to be mounted. To manage this challenge the project identified for households that were credit metered customers that a smart meter would be installed without the smart energy display. For prepayment metered customers an electric loop would be installed as some key prepayment functionalities are not accessible for prepayment customers if a prepayment smart meter is installed without the smart energy display. Therefore control group installs were successfully completed with this solution being in place.

MDU Install: The project has so far recruited three households that require a communications solution for installing smart meters and smart energy displays in complex Multiple Dwelling Units with challenging meter arrangements. The installation has yet to be completed due to outstanding permissions and consents required from the social housing landlord, Tower Hamlets Homes. Discussions continue and the project hopes to reach resolution to enable us to manage each of these recruited customers experience and demonstrate As part of **energy**wise, British Gas will be the first UK energy company to install and commission smart meters sets into tall and difficult buildings once this install along with the smart meter sets are completed.

Installation messaging to prepayment control group: On 23 September 2015 UK Power Networks observed that the message provided to prepayment control group households in relation to the type of installation participants should have expected was incorrect. The messaging had incorrectly stated which installer was expected on site, rather than stating that both British Gas and their subcontractor would be on site for this install. To avoid mismanagement of customers' expectations, Bromley by Bow Centre contacted these customers to rectify project messaging. However, some installation visits took place before all messages were rectified resulting in aborts due to customer's expectations on installation type and attendance being misaligned. As a mitigating action from 12 October Bromley by Bow Centre supported Passiv Systems to re-book all prepayment control group aborted appointments and all Passiv Systems' incomplete installations due to no access provided to the property, making sure that the right project's messages were provided.

No access/refused access for installations: The project began to see high rates of aborted installation visits, particularly for the visits required to install Passiv Systems' equipment, commencing in week commencing 12 October. At the time of booking the appointment with Bromley by Bow Centre customers seemed to have understood Passiv Systems' role and to be happy to provide access for the installation. However, access was still refused in some cases with the person at home being unaware of the appointment or having changed their mind about the installation or with no one being at home at the agreed time and date. The project reinforced the message that the Passiv Systems installers were part of the project, but also instituted a "buddy" system accompanying the installers with a colleague from Bromley by Bow Centre. This shown to be successful on occasions, and there is a significant learning point for future projects that the

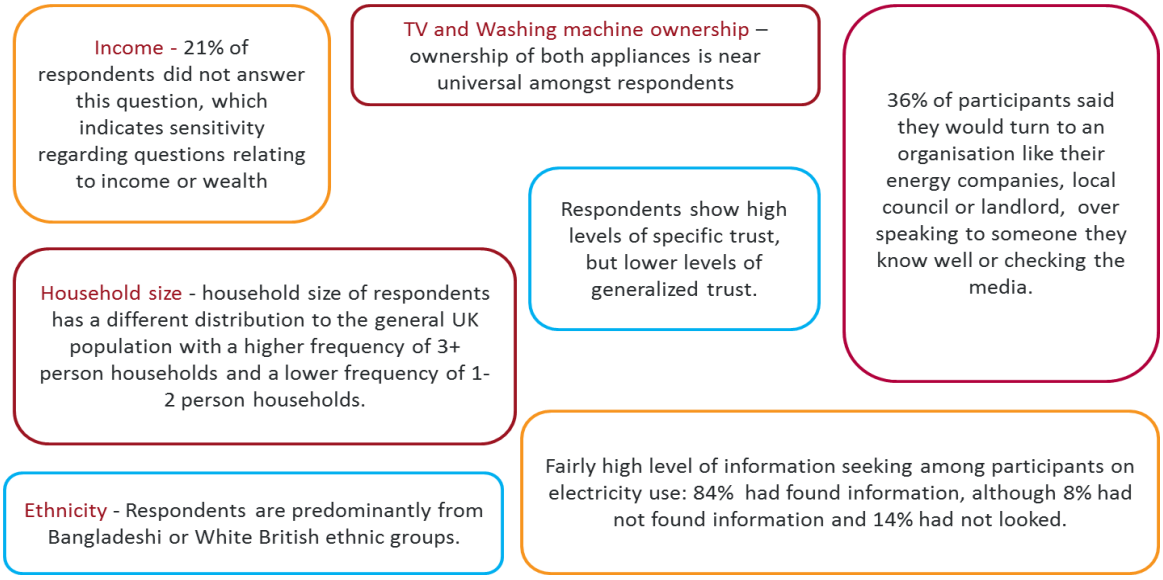
number of install visits required to get an individual customer up-and-running should be minimised; where possible a single brand presented to the customer by install Partners too to avoid any confusion between personnel (as demonstrated successfully where several parties within recruitment activity); and, if required, a buddy system should be instituted from the outset with the installer brought into it as a key part of the process.

Trial 1 interventions package: During the recruitment and installation phase of trial 1 some households received a different set of interventions compared to the package designed by the project. University College London has and is supporting in assessing the impact of such deviations from the original research trial design. The discrepancies were in relation to the following items:

- *energy efficiency devices:* some households have been delivered a different model of standby shutdown (with six sockets rather than five) in error by the **energy**wise field officer team (expect this to be trivial impact), while others have received an extra device, a water widget (a device that allows to reduce water flux in showers), as it was included in the package of some eco-kettles provided by British Gas. Clarifications on the volumes of those affected have been requested by UK Power Networks; while for the water widget it was not possible to retrieve the numbers issued to customers and the project is assessing whether to provide water widgets to all participants or not.
- *energy efficiency advice:* while the research design envisaged that only intervention group received energy efficiency tips (in the form of the energy efficiency advice leaflet), it was found that as part of British Gas' Business as Usual smart meter installation a folder of energy efficiency advice (ranging from gas to electricity saving tips) was handed to the customers for reading on course of the installations. As credit control group participants have received a smart meter installation without the Smart Energy Display, they have also seen the British Gas' energy efficiency advices booklet while their prepayment counter-part has not. This is introducing an imbalance between credit and prepayment control group. However, University College London has assessed that the impact should be minimal as the energy efficiency tips are standard information that is publicly available.
- *credit control group installations:* the field officer team observed during a home visit that three credit control group households received their Smart Energy Displays in trial 1 rather than getting them commissioned at a later stage in trial 2. This issue is currently being managed by British Gas and internal checks are in progress to verify with British Gas's records that all the other households have received the installation relevant to the group they were allocated to.

## 1.4 Learning and Dissemination Summary

Valuable lessons have been generated during the course of the main recruitment and installation activity. Please refer section 2.5 for the dissemination activity. Set out below are some interesting insights into the make-up of survey respondents to date on trust and household type, note that survey administration continues therefore conclusions may vary:



# 2 Project Manager's Report

## 2.1 Progress in the current reporting period

Within this reporting period, the project has focused on project recruitment and installation activity. The consortium has been successful in exceeding the targeted recruitment response rate, whereby 1,342 households were approached with 536 households signing-up to participate in the project, representing a response rate of 40%, which is above the project's targeted response of 33%. There have been 167 drop outs within the households that signed-up which have been observed to have mainly occurred during install appointment booking or at point of install. Therefore, currently the project has 369 active participants, and of these 351 have had their end-to-end installation completed.

As mitigation for the delay observed in the completion of the recruitment and installation phase a revised plan for trial 1 was discussed and agreed amongst UK Power Networks, British Gas, University College London and Element Energy and updates were shared amongst the consortium at project partner meetings. As a result of the collaborative discussion among the Partners, a 'feathered-in' approached was agreed for trial 1: instead of having all trial participants entering in trial 1 on the same date, the individual start date of trial 1 is now identified as the date of completed installation of the monitoring equipment. As shown in Figure 1 for some households in the intervention group of trial 1 started back in May 2015, while control group participants have generally started the trial from August onwards when a technical solution was determined to resolve the space constraint challenge of the secondary electricity meter installation in the meter cabinet.

Even although the approach introduces the risk of 'Seasonal effect' that cannot be removed from data analysis, higher benefits have been identified by University College London and Element Energy, as the revised plan enables further extension of the installation phase and a more accurate data analysis that will now be able to capture the behavioural change expected immediately after installation in the intervention group. Corrections in the data analysis can be also implemented to take into account for the different start dates.

Considering a gap of 10 weeks between trial 1 and trial 2 to enable the smart meter solution to be commissioned to control group and Time of use (ToU) tariffs installation to be completed, it is clear that with last installations occurring at the end of November 2015, the 'feathered-in' approach in trial 1 would result in trial 2 closing down beyond December 2017, which is a risk for the robustness of the research findings reported at the end of the project. Moreover, a 'feathered-in' approach in trial 2 may affect data quality as there is no way to correct for three effects that come into play in the response to ToU tariffs: 'Seasonal effect', 'Behavioural effect' and 'Drop-out effect'.

A revised plan for trial 2 is currently under discussion, with a preference by the research Partners for all participants to be realigned on the same trial 2 start date for data quality. If required, the project may consider a truncated data capture in trial 1 (shorter than 12 month data cut) for those customers that would complete trial 2 beyond December 2017 in order to ensure a 12 month analysis for the ToU tariffs where data quality is exposed to higher risk.

Alternative approaches have been considered, such as a 'feathered-in' approach in both trials or a reduction of the 10 week gap between trial 1 and trial 2, but while the former would still result in a project extension, the latter may affect the ToU tariff design/campaign and the successful installation of smart meter and commissioning of Smart Energy Displays to control group. The project continues to explore the revised trial 2 structure and will communicate its position once agreed with Partners and if necessary will undertake a Change Control if the agreed position is a material alteration to that which is detailed in the Project Direction or full bid submission.

Looking ahead to the next reporting period, the project's priorities are to resolve the remaining issues on the install of the MDU Communication Infrastructure and have it successfully commissioned. Moreover, deliver the SDRC 9.3 report that will outline trial 1 observations regarding household energy changes and the subsequent network impact.

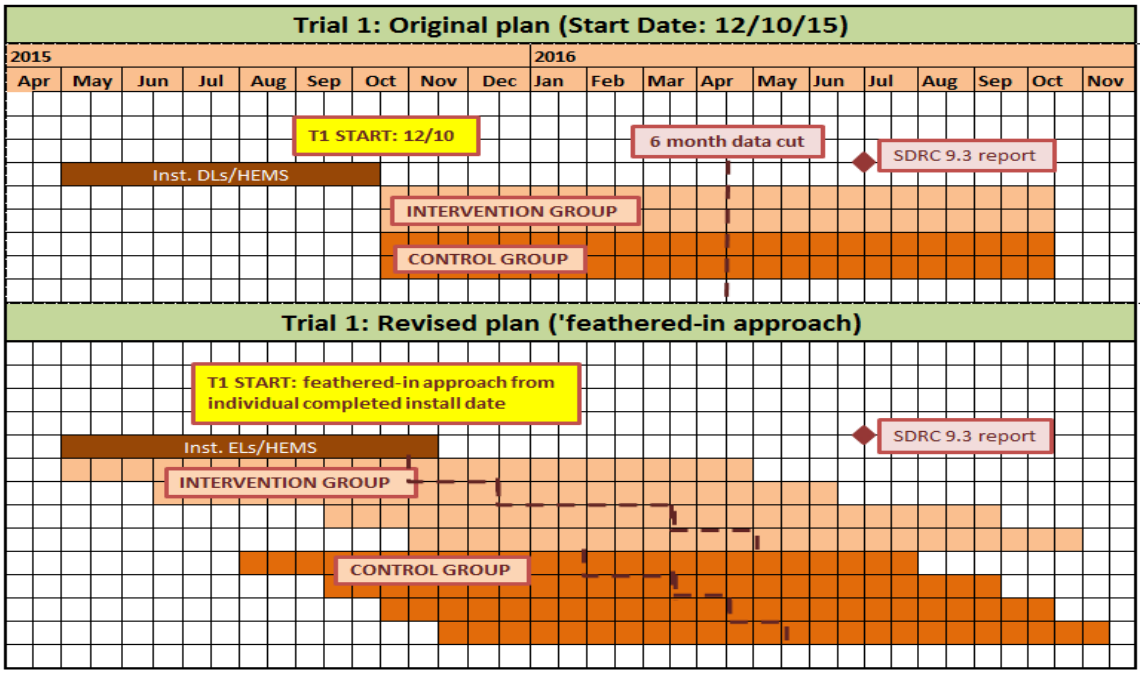



**Figure 1: Trial 1 revised plan**

Please note within the current reporting period there have been changes in the core team structure. The team structure has continued to have a Project Lead in place and a Workstream Manager. The changes have been in respect of the number of Workstream Managers working on the project has reduced, with one less since end of June 2015, where the Workstream 2 Manager took up a career opportunity externally from the organisation and it was decided that this role would not be re-recruited. In September 2015, the project received assigned office support in the form of a part time resource from the wider Future Networks Project Management Office (PMO) function. Previously PMO support had been undertaken since end of January to end of August 2015 by the Project Lead and Workstream Manager.

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

- For research partner, University College London (UCL), as detailed in the last reporting period a recruited candidate was planned to be in place during June 2015 to fulfil the vacancy where the previous Research associate had taken up a career opportunity externally from their academic institution. The Research Associate position has been in place since 29 June 2015. Following the recruitment process that took place in this reporting period the full time position has been split in two part-time roles in order to select different candidates with the required specific skill sets to better fulfil the twofold role that the research partner is covering in the project. A 0.6 FTE Research Associate with a strong expertise in qualitative research methods has been appointed to provide customer insights from a social science perspective, while a 0.4 FTE Senior Research Associate with an extensive experience in data science and data management will be responsible for the quantitative analysis of the electricity, network and temperature data. Both individuals have been previously involved in the project ensuring a full handover of UCL's tasks and a deep understanding of the project's background: the former as interim social scientist during the recruitment process, the latter as the energywise Data Manager developing, testing and maintaining the central UCL database for the project.
- For install partner, British Gas (BG), the main project contact has taken up a promotional opportunity within their organisation. A project contact who has been involved in the project has been promoted from the existing BG energywise project team with handover meetings being held.
- For recruitment partner, Bromley by Bow Centre (BbBC), the role of an interim Customer Field Officer Manager has been shared amongst senior managers at BbBC with support from UK Power Networks. This followed the transition of the previous Field Office Manager in July 2015.

The role of 'Recruiters' were resourced from the organisation Groundworks since the 4 June 2015 as highlighted in the previous report. To increase and manage the projects recruitment capacity further Recruiters were resourced from the organisation Sustainable Home Energy Survey Company who had also responded to the original tender for Recruiters

undertaken in March. Furthermore, volunteers were sought under a call ran at UK Power Networks, who acted as 'buddies' to Bromley by Bow Centre and Groundworks recruitment staff to increase recruitment pairs during evening and weekend recruitment operations.

## 2.1 Customer Recruitment and Engagement

**Customer Communication and Educational Materials**

As discussed in the previous reporting period the project partnership developed a series of customer communications materials using the developed project name **'energywise',** along with the slogan 'be **energy**wise' and the message of 'Little things to help you save energy'.

Following the learnings gained during the operational phase of the project a series of project materials have been updated before being issued to the targeted customers.

Disengagement strategy and disengagement letter

During this reporting period the disengagement strategy has been refined and improved to better reflect the needs of the project during the installation phase. However, repeated difficulties have been experienced with some householders in booking a British Gas or a Passiv Systems visit or in accessing their property to carry out the installation. Moreover, repeat technical aborts have had to be made due to no GSM signal being found. In order to resolve such difficulties and to ensure project resources are used in a cost-effective way, on the 28 October UK Power Networks and British Gas agreed on a set of cut-off rules for disengaging difficult-to-reach and difficult-to-access customers.

According to these rules participants falling in one of the following categories will be disengaged from the project:

- no access to the property provided to British Gas or Passiv Systems engineers for three or more times (no one at home, appointment cancelled within 48 hours, customers claiming they were not aware of the installation, etc.);
- two or more unsuccessful visits where no GSM signal could be found; and
- three or more unsuccessful attempts to book an installation visit via both outbound calls and door-knocking in different days and at different times (customer unreachable over a period of time).

To date 21 households out of the total 167 drop-outs have been screened out against these criteria. Out of these 21 customers, four have not even received the first installation visit, as Bromley by Bow Centre was unable to get in touch with them over several weeks both via outbound calls and door-knocking.

**Updates:** In order to reflect the refined disengagement strategy the disengagement letter has been updated to include the reasons for disengaging difficult-to-reach and difficult-to-access customers (in addition to technical reasons, non-eligibility to the trial, and consent withdrawal from the customer). The field officer team at Bromley by Bow Centre is carefully reviewing the customer journey and the drop-out reason for each customer to indicate the appropriate reason for disengagement in each personalised letter; this will also be checked by the project. Apart from those households that are removed due to technical reasons for a smart meter to be installed, the letter will also advise the customers to contact British Gas in case they still want a smart meter. All disengagement letters in conjunction with the 'Advice & Signposting' leaflet that the project also refers to as a Consumer Services Charter are expected to be posted out before the end of the current reporting period.

Consumer Services Charter (an advice and signposting leaflet)

In the previous report it was stated that the Consumer Service Charter leaflet would have been provided to all households approached who declined to participate and to those withdrawing from the project. Following a legal review of this protocol the project decided to not provide the leaflet to non-participants that explicitly asked for their personal data to be removed from the database and said they do not want to be contacted again. This will both respect customer's requests and minimise the risk of customer complaints.

**Updates:** Further to the reduction to a six page leaflet from the original 24 page pack, the Consumer Service Charter has been recently updated to improve the ease of consultation for the customers. Names of key national initiatives have been emphasised and additional clarifications on how and where to get support and advice have been included.

The 'Advice & Signposting' leaflet also referred as a Consumer Services Charter is expected to be posted out before the end of the current reporting period within the envelope that will include the disengagement letter.

Project Envelopes

The design of the project envelopes that will be used to send out the disengagement letter and Consumer Service Charter has also been modified to encourage non-participants and dropped out customers to open the **energy**wise correspondence that will positively close our a householders involvement in the project. UK Power Networks identified the risk that non-interested customers may not open the **energy**wise branded envelopes, therefore precluding themselves from accessing the enclosed supporting materials. Therefore in the case of non-participants it will simply include the Consumer Services Charter and a statement confirming that the project acknowledges that they are not interested in taking part and wishes to thank them for their time. For householders that are no longer part of the trials instead it will also include the disengagement letter that is informing them of the reason of disengagement and confirming that they have been disengaged from **energy**wise.

**Updates:** In collaboration with CAG Consultants UK Power Networks has developed the following messaging to be printed on project envelopes for the two specific scopes above mentioned:

- for households that have signed up and then dropped out, the envelopes will state 'Exiting **energy**wise – important information to help you save money on your energy bills enclosed';
- for non-participants it will simply say 'Information to help you save money on your energy bills enclosed'.

**Eligible Trial Participants – Selection**

In the last reporting period the project identified 1,119 households that met the project's defined eligibility criteria for pilot study and main trials. Within this reporting period this grew to 1,342 households. The project explored solutions to address the shortage of eligible participants (with 1,342 eligible households compared to 1,650 required to recruit 550 households with the expected response rate of 1:3). The project explored the relaxation of the eligibility criteria 'energy efficiency work at households that were completed since October 2013' as an option to identify the additional 308 households. In June 2015, Poplar HARCA provided a list of 327 households that were also British Gas customers and received energy efficiency improvements (double glazing) post October 2013. It is estimated that the introduction of double glazed windows can improve the SAP rating by an increase of 4 SAP points in average. As the actual EPC rating for these properties is not available, UK Power Networks and Poplar HARCA worked in collaboration to estimate the EPC rating of each property post energy efficiency works and carry out the screening against the project's eligibility criteria of 'the inclusion of properties with EPC rating between C to G'. Poplar HARCA first extrapolated the original EPC rating (when missing) against the surrounding properties or the entire building; then the new SAP rating and EPC grade were estimated by adding 4 SAP points to the original SAP rating. 307 Poplar HARCA's properties were identified in EPC bands from C to G and were transferred to British Gas for their screening process. Out of 244 properties only one was found eligible from the British Gas's analysis, while 63 properties were still under processing. Even though the analysis could have potentially identified a few more households to approach, it has been assessed that the benefit delivered to the project by the inclusion of those properties would have been marginal compared to the risk of compromising the fuel poverty indicators due to any relaxation of the **energy**wise eligibility criteria. Therefore the project decided to concentrate efforts on approaching and recruiting the eligible households.

**Main Trial Recruitment**

A total of 1,342 households have been approached as part of the recruitment phase between the beginning of May and mid-August 2015 following the protocols described in the SDRC 9.1 report and in the previous progress report. The planned 'recruitment in batches' of 161/165 households per batch over 10 weeks had to be altered due to:

- the change of project requirements with the first batch of prepayment customers being invited at the beginning of July when British Gas confirmed the readiness of the prepayment smart metering solution and provided a training specific to the prepayment customer approach to the field officer team at Bromley by Bow Centre on 27 July 2015;
- a reduction in the number of households to approach from the planned 1,650 to the reduced level of 1,342; and

- the project learning of a further eligible customer churn where households transitioned from a social housing tenant to leaseholder. Therefore checks had to be performed before the invitation letter was issued.

To date, out of the 1,342 households approached, 536 signed up to the project, resulting in a 40% response rate that exceeded the target of 33%. This means that for every five households approached two households said 'Yes' and provided their consent to take part to the project. As shown in Figure 2, 579 households (43% of the 1,342 approached) said they were not interested in the project, while 227 households never expressed a definitive decision about participating in **energy**wise. When calculating the response rate for each sub-category, a similar response rate was observed between Tower Hamlets Homes (40%) and Poplar HARCA (39%) tenants, while prepayment customers have responded slightly more positively to the project (44%) compared to credit metered households (38%). With 167 drop-outs to date the total number of active participants amounts to 369 households, of which are 311 Tower Hamlet Homes tenants and 58 Poplar HARCA tenants, while 230 are credit customers versus 139 prepayment customers. A full analysis of the stage in the process at which each drop-out occurred, and, where known, reasons, has been logged internally by the project is summarised in Figure 1below.

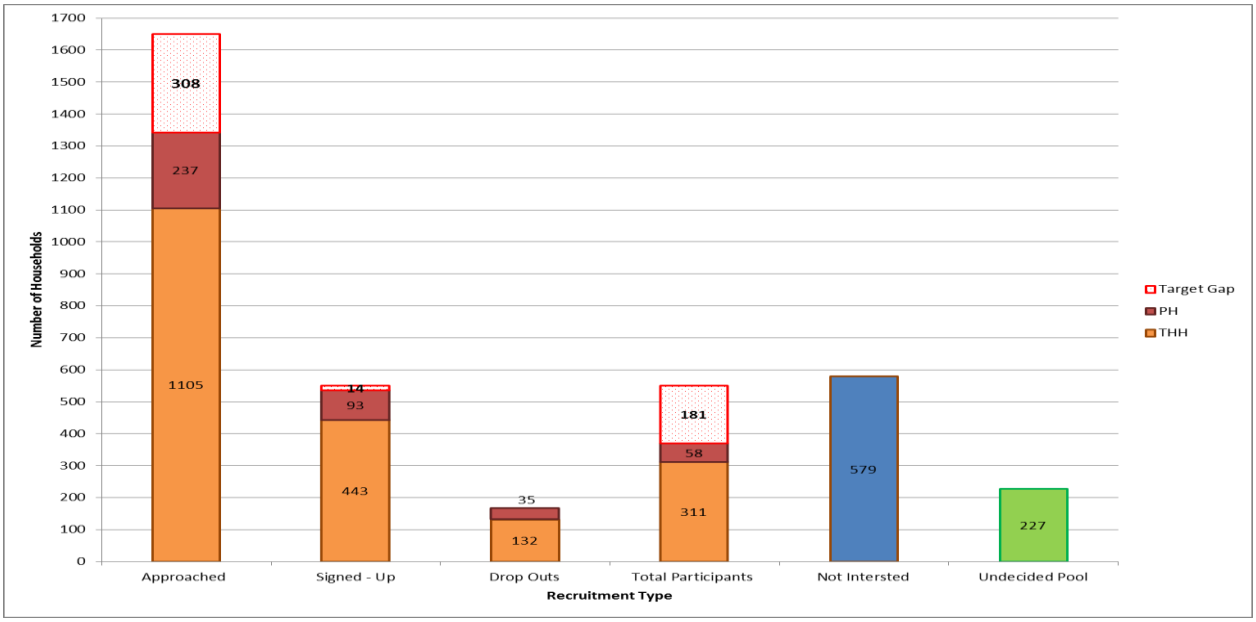



**Figure 2 Overview of project recruitment**

Even though the project had originally planned to approach 1,650 households, having reduced the targeted population down to 1,342 this will not have an impact on the robustness of the research findings. The scientific driver for recruitment is in fact the estimated number of participants required to satisfy the agreed levels of statistical power for internal and external validity. This was initially estimated at 550 participants (275 in each of the intervention and control groups) based on best available data at the time of writing the bid submission. This was translated into an estimate of the number of participants to be approached by multiplying by the estimated response rate of 1:3. It is excellent news that the consortium has exceeded this response rate. This reduces non-response basis in the sample thus improving external validity of the findings. In this context, reducing the sample from 1,650 to 1,342, whilst still achieving close to the original final sample size (536 versus the initial estimate of 550) has led to a strengthening of the external validity of the trial findings.

**Random Allocation**

A total of 537 Welcome Packs for main trial recruitment were randomly allocated by University College London following the protocol described in the last report, with the last batch of 38 being completed on 4 August 2015. The random allocation process designed by the research partner has proven to be successful with an almost even split of sign-ups observed between the intervention and control group. Out of 536 sign-ups, 268 were randomly allocated to customer group 1 which is trial 1 intervention group and 265 to group 2 which for trial 1 are the control group, while the three recruited eligible MDU households were being assigned to the intervention group in order to test the MDU

solution (detailed in next section). Also, the 167 drop-outs are evenly split between the intervention (83) and control (84) groups, resulting in fairly balanced active participants (188 in the intervention and 181 in the control group). This is an interesting result as it allows the project to rule out differential attrition (different drop-out rates between intervention and control groups) as a potential threat to internal validity of the trial findings. This preliminary finding will be confirmed at the beginning of the next reporting period when statistical analysis of attrition rates will be undertaken.

| Payment Method | Intervention | Control | Current Total |
|---|---|---|---|
| Credit | 112 | 112 | 224 |
| Prepayment | 66 | 61 | 127 |
| **Grand Total** | **178** | **173** | **351** |

**Table 1: Breakdown of completed installations into intervention and control group participants**

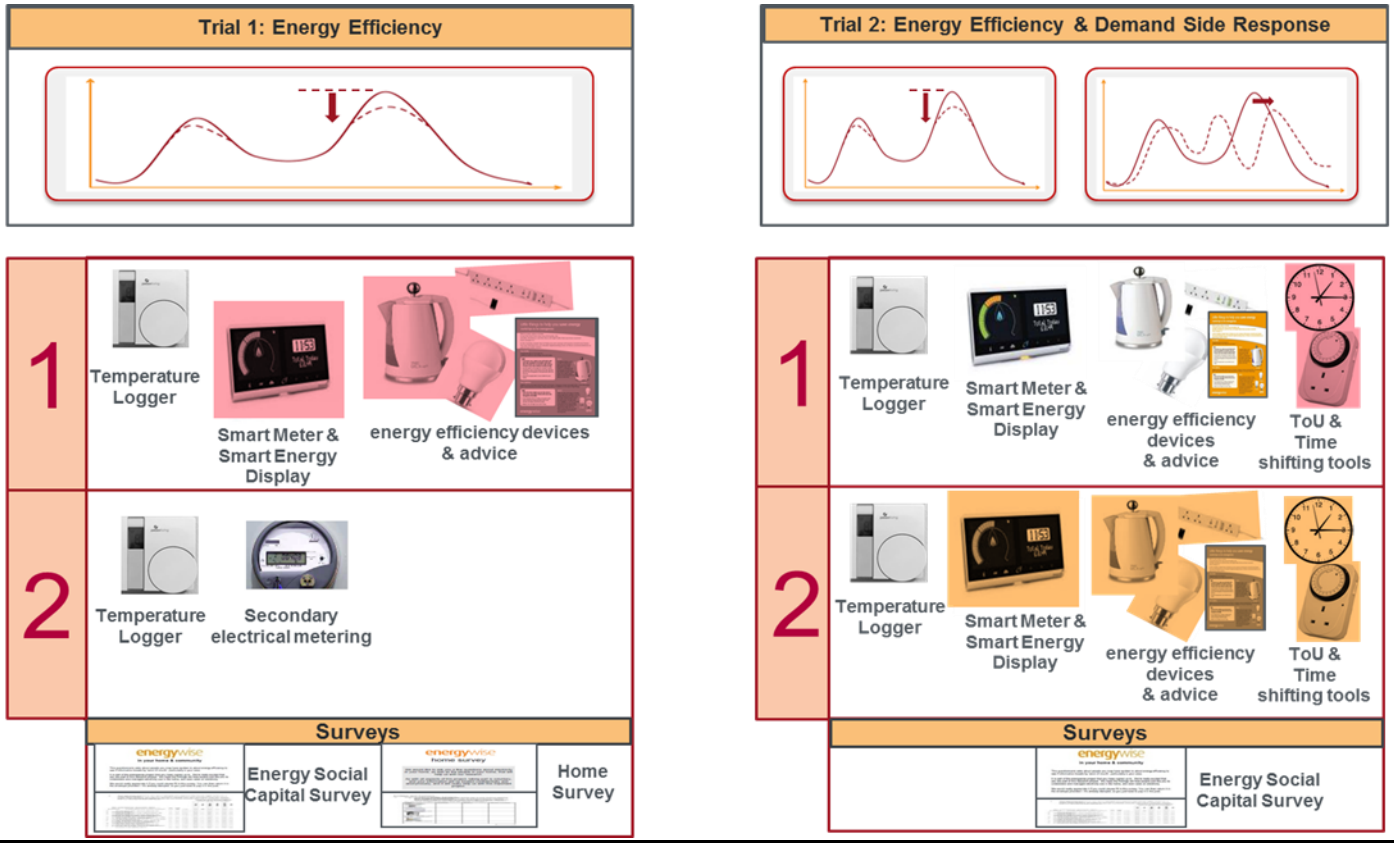



**Figure 3 Customer Journey within Project Trials**

## Multiple Dwelling Units

As part of the **energy**wise project, British Gas will be the first UK energy company to install and commission Smart meters sets into tall and difficult buildings, providing reliable HAN and WAN communications by utilising the Siemens MDU infrastructure network. These will be Britain's first functional Smart meter sets within these building types, in the production customer environment.

As previously reported, data from the social housing landlords and visual inspections undertaken by British Gas resulted in Padstow House (a tower block managed by Tower Hamlets Homes) to be targeted as the optimal environment for the MDU Infrastructure provider to test out the solution. To date (27 November 2015), the project has received install consent from three MDU customers residing in Padstow House via a revised, and more successful, recruitment strategy of sending British Gas energy experts to accompany the Bromley by Bow Centre recruitment team

to 'door knock' customers. The contract between British Gas and Siemens was finalised in August 2015. Since then the project has been trying to reach the necessary permissions and consents from Tower Hamlets Homes to proceed with installation. The MDU install is outstanding and currently the project remains in discussion on this point with the key Partners to fulfil the install commitment to the three MDU customers.

On 23 September 2015 Siemens performed a full building survey at Padstow House in order to identify the building's characteristics, metering arrangements and any potential risks and issues. Siemens and British Gas have also created and supplied a RAMS (Risk Assessment Method Statement) document for Tower Hamlets Homes and British Gas has supplied a full consumption cost model for the MDU equipment to the housing association.

Padstow House is a challenging building for smart metering as there are six meter rooms spread across the site (there are usually one or two in these building types), with gas and electric meters not always being located in the same meter room. There are also significant challenges caused by the distance between meter rooms and flats and the building fabric. As a result, Padstow House is a good candidate for the Siemens MDU solution.

There are some limitations highlighted through work to date; Siemens current MDU solution uses a fixed Zigbee bridge channel and does not listen for multiple Zigbee channels and coordinate the traffic accordingly. The British Gas solution has channel agility (that allows the HAN to roam and choose the clearest channel). Also, Siemens are only targeting British Gas customers within Padstow House, meaning this is not a true shared solution for all tenants residing in the building. Siemens also have to attend installations with British Gas which was not envisioned at the planning stage.

**Recruitment of MDU customers:** Originally 11 households in eligible buildings for the MDU solution installation were identified by British Gas. At the end of August 2015 one household was found out to be in a category B building, therefore eligible for standard smart meter installation and recruitment. The remaining 10 households eligible for MDU solution were invited to the project in mid-August and a standard recruitment process was initially in place. Following the standard door-knocking protocols one household signed up, while three households declined their participation. Recruitment of the remaining six households was then paused until a targeted strategy for MDU customers was agreed with British Gas in October 2015. The MDU recruitment strategy was developed in collaboration with CAG Consultants and consists of a hand-delivered **energy**wise-branded invitation letter tailored specifically to the MDU customers (explaining why it is so important for these households to take part), followed by door knocking undertaken by one of the most experienced field officers together with a British Gas Smart Energy Expert. The letters were delivered on 21 October and a first interaction took place on the same day if the British Gas's account holder was at home; otherwise, the face-to-face interaction started on the next day. The key messages to be delivered during MDU recruitment are that:

1. It would be really helpful that the householder takes part in the project;
2. Blocks like Padstow House present difficulties in terms of meter upgrades;
3. British Gas wants to test out a new approach and has chosen this block to test it in; and
4. The customers' involvement would be really helpful to ensure that everyone living in similar blocks has a good service when their meter is upgraded.

The field officer should also stress the benefits they will get in trial 1 as incentives (smart meter, energy efficiency devices and £10 voucher) and that they won't have to do anything apart from providing a convenient appointment time for the smart meter installation and access to the property for the meter commissioning.

Out of the six households recruited following the MDU strategy three signed up (one household on the ground floor and two on the first floor), one declined and two are still undecided as they have been unreachable on all four occasions they have been visited (including an evening visit). As the project is only currently looking to test the MDU solution in Padstow House, the customer that originally signed up following standard recruitment had to be disengaged as they were living in a different MDU eligible building. Recruitment of the two remaining undecided households is being reviewed as contact has proven difficult and there is limitations whereby outbound calls cannot be performed as contact phone numbers are not available therefore making it difficult to find out a suitable time for a home visit via outbound calls first before the recruiter and the Smart Energy Expert are deployed again for door knocking. The three MDU participants that have signed up to date will be distinguished in the database and not included within the analysis

of the wider trial due to the different nature of the recruitment and treatment they have received. The MDU participants effectively form a ring-fenced sub-trial within **energy**wise.

**Project installations**

The project began installations at the end of May 2015 at households who had signed-up within the pilot study and the installation work was then continued with main trial participants recruited since the beginning of May. An issue was identified in the previous reporting period where several technical aborts were registered within control group due to space constraints for the installation of the secondary electricity meter in the meter cabinet: in fact for control group households within building category B (the building type which the majority of the projects' eligible households reside within) the meter cabinet containing the current meter and consumer unit had insufficient space for the secondary electricity meter to be mounted. Two different solutions have been implemented depending on the meter type:

- **Credit customers in control group:** credit smart meter installed provided that the Smart Energy Display was not commissioned to the household; the smart meter would simply work an electricity monitoring equipment, while no customer engagement will be 'activated' until trial 2 when the Smart Energy Display will be delivered to control group participants.
- **Prepayment customers in control group:** as some key prepayment functionalities are not accessible for prepayment customers if a prepayment smart meter is installed without Smart Energy Display, a different solution has been implemented for prepayment customers in the control group, in the form of a device called an electric loop being installed by the British Gas's subcontractor, Passiv Systems. As an electric loop consists of a clamp connected to the standard meter and does not require additional secondary units to be installed in the meter cabinet, this technical solution was proven to be successful in the resolution of any space challenge.

Installation numbers: as shown in the installation report produced by British Gas

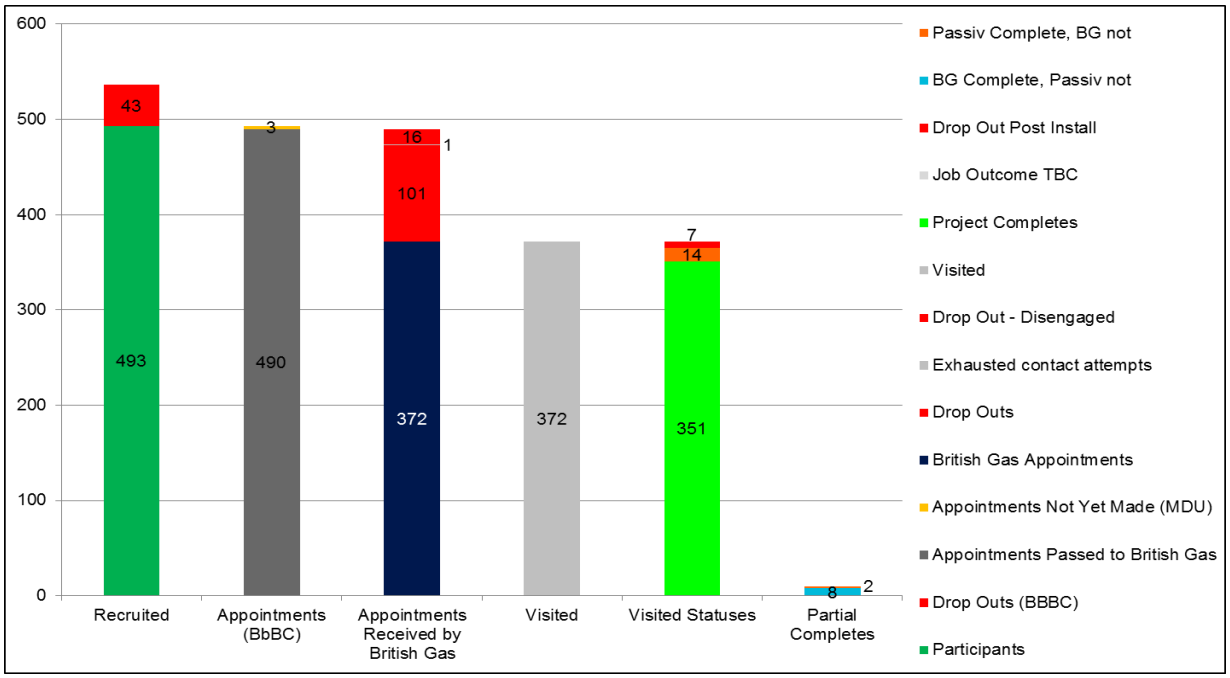



**Figure 4 Overview of Project Installation**

Of the 536 households signed up, 167 have dropped out (please refer to column components highlighted in red). It can be observed that the majority of drop outs occurred at point of booking installation being confirmed with the householder with British Gas. Therefore, currently there are 369 active participant households, of which 351 have had their end-to-end installation completed. The install gap is 18, of which three are MDU households that are dependent on the resolution of the install and commissioning items with the social housing provider. For the remaining 15 homes the proposed plan is to send them a disengagement letter explaining the reason why it is not possible for them to continue to take part in **energy**wise (the project has tried to install at least once for each of these households); the

letter will also inform them that, if they are willing, British Gas may still be able to offer them a full smart meter installation regardless of their allocated group under the British Gas business as usual activity.

**External Control Group**

The previous project progress report outlined an approach to selection of the external control group based on DECC sub-regional statistics on fuel poverty for England. This approach has been revised in light of the geographic remit of the LCN Fund (Great Britain rather than England) and the absence of comparable sub-regional statistics for Scotland and Wales. In addition, after consultation with statistical experts at University College London, it was realised that data collected in the Home Survey completed by participants once they had joined the trial would provide a substantially better basis for drawing a statistically comparable external control group from the British Gas smart meter customer pool. After consultation with British Gas it was identified that they hold historic half-hourly data for all smart-meter customers and (once consent is given) this historic data can be used for external control group purposes. Thus the external control group can be constructed after the initial recruitment period with no impact on the project. In light of the significant scientific benefit gained it was decided to defer construction of the external control group until after the Home Survey data was collected, entered, cleaned and analysed. Additional resources have been allocated at UCL for data-entry of the Home Surveys and external control group construction can now proceed in accordance with the revised plan.

**Disclosure Board**

The disclosure board is an important project control mechanism in relation to customer protection, which provides an escalation route to the customer field officer team in relation to safeguarding items observed while interacting with the households and a mechanism for the project Partners to obtain decisions on best course of action aiming to maximise the safety both to customers and the customer field officer team. Within the installation phase, three disclosure boards had been held aiming to address matters that arose from the installation appointment booking process or during the installation visits.

The first two boards had been requested and chaired by UK Power Networks under exceptional circumstances as they identified specific circumstances that required the attention and prompt decision of the disclosure board. UK Power Networks has handed back chairing activity to Bromley by Bow Centre for escalation protocols and in the administration of the board as per the agreed disclosure board terms of reference and a refresher on the disclosure procedures has been also provided to the filed officer team.

**Lesson learnt:** As a result of the learnings from the operational phase of the project, where it was observed that a faster and more direct escalation protocol may be required in specific circumstances (e.g. in case of technical matters), the terms of reference are currently under review by Bromley by Bow Centre, which is responsible for the updates required to improve the escalation process and make it more effective.

**Recruiters**

Bromley by Bow Centre experienced delays in contracting an outsourced Recruiter team, therefore additional recruitment resource for door knocking activity commenced four weeks later that the project had planned. Groundworks were the appointed first outsourced Recruiter organisation that supported the project's recruitment and engagement activity. The project recognised this delay against project timeline posed a risk to the project's recruitment capabilities. Therefore, the project team closely monitored this risk within reporting period and the project responded in several ways:

- A further Recruiter, Sustainable Home Energy Survey Company, was appointed by the project. Both Groundworks and Sustainable Home Energy Survey Company staff presented themselves as 'energywise' Recruiters working at Bromley by Bow Centre to households that the customers approached. Sustainable Home Energy Survey Company had been the other vendor that had responded to the invitation to tender that had run at the beginning of March 2015.
- On the 31 July 2015, UK Power Networks undertook a call for volunteers across the company to provide 'buddies' to Groundworks and Bromley by Bow Centre recruitment staff to enable an increase in the number of recruitment pairs operating in evenings and weekends which were found to be the most successful recruitment times in the pilot study. This was in response to identifying that experienced recruitment staff were being paired together at these times when it would be best if they were split and allocated with a 'buddy' for safety measures to enable an increase in recruitment capacity for door knocking that was yielding the highest sign-ups. A course of training over

the phone and workshops were run by CAG Consultants and UK Power Networks with volunteers. In total 10 UK Power Networks staff were actively involved in recruitment activity.

- The project also sought support from Partners, this included the energy Supplier, social housing landlords and other staff within the community centre, Bromley by Bow Centre. UK Power Networks shared their call for volunteers messaging and accompanying project leaflet. In total five staff were actively involved in recruitment activity.
- UK Power Networks collaboratively decided with Bromley by Bow Centre to appoint CAG Consultants as the lead on coordinating the door knocking rota (for the Bromley by Bow Centre energywise field officer staff, Groundworks staff and UK Power Networks volunteers); the rota had previously been operated by Bromley by Bow Community Centre. CAG Consultants where possible within rota organisation took into account for example the balance between experience, gender and linguistic skills. The Sustainable Home Energy Survey Company Recruiters rota was coordinated by their own dedicated project manager that aligned to project needs and was revised in accordance of best performance was observed in successful sign-ups. The Sustainable Home Energy Survey manager reported sign-up outcomes to the **energy**wise Project Lead (who shared on to CAG Consultants) and Bromley by Bow Community Centre.

## 2.2 Energy Saving and Shifting Trials

**Energy Efficiency Devices and 'Thank You' items**

As previously indicated, during the recruitment and installation phase the project has provided trial participants with the following 'Thank You' vouchers, tokens and energy efficiency package:

- £10 Love2Shop voucher as a 'Thank You' included in the Welcome Pack sent to all customers who have signed up;
- a' Thank You' token in the form of a book of six first class stamps accompanying the Energy Social Capital Survey administered to trial participants;
- energy saving devices as part of the set of interventions tested with intervention group participants:
  - a Wahl 1.5L Eco-kettle;
  - 3 Philips 9.5W LED GSL lights with a choice between E27/B22 cap;
  - an Energenie Standby Shutdown for Audio-Visual Equipment.

Together with energy efficiency kit intervention group has also received the energy efficiency advice leaflet providing tips and advice on how to manage electricity consumption in the household and on how to use the devices received from the project.

## 2.3 Customer & Network Insights

**Research Surveys**

In the previous progress report the different surveys developed by UCL have been discussed together with their scope, the administration protocols and early insights captured during the pilot study. The following sections present the preliminary analysis and the research findings from the Energy Social Capital Survey and the Home Energy Survey completed by active participants and returned to UCL to date. Data capture is still in progress; therefore any results must be treated as preliminary observations as final results may still change.

At this point in time the data collected via the Energy Social Capital Survey shows that most respondents (61%) feel people in their local area can be trusted and almost half of them (45%) have had a conversation about electricity with someone they know in the last six months. In the future 36% would turn to an organisation to find information about electricity first, over speaking to someone they know well or checking the media. The Home Energy Survey also reveals that respondents are predominantly from Bangladeshi (55%) or White British (24%) ethnic groups. Key insights indicate that on average, large households are involved in the project, with the average household size in the UK (ONS 2014) being 2.38 whereas the average household size for **energy**wise respondents is 3.54. Also almost all respondents own TVs (99%) and washing machines (98%).

Energy Social Capital Survey

The objectives of the Energy Social Capital survey are to:

- Collect information on where participants find energy efficiency information;
- Collect information on which personal (and non-personal) sources they receive the information from; and

- Collect information on who participants trust for advice.

**Administration:** The Energy Social Capital (ESC) survey was mailed to respondents two weeks after they had signed up to the project, starting in April 2015 and ending in November 2015. To date 524 Energy Social capital surveys have been mailed and 204 have been received, giving a response rate of 38.9%. 373 participants remain active in the trial, and from these we have received surveys from 178 (91 Control, 87 Intervention), giving a response rate of 48.5%[2]. The pilot response rate was 73%, however non-responders are still being contacted by Field Officers and asked to return their surveys. The trial response rate will be known once this final stage has been completed.

**Key findings:**

***Trust*** – The survey identifies two forms of trust; Specific (neighbourhood) trust and generalised trust. The respondents show high levels of specific trust, but lower levels of generalised trust.

***Finding information*** – Amongst the participants there is a fairly high level of information seeking about electricity use. 84% (149) participants had found information from the following sources, although 8% (15) had not found information and 14% (25) had not looked (**Error! Reference source not found.**. When asked whether they actively look for advice on electricity and energy efficiency, or find it by chance, the results are less clear. **Error! Reference source not found.** shows that only 13% (23) said they usually look for advice, while 22% (39) said they find it by chance, and for 32% (58) they looked and found it by chance. 20% (36) said they did not get tips or advice.

Respondents were asked to think whether they'd discussed electricity with people they know in the past 6 months. 45% (80) had had a conversation with one or more people they know in the last 6 months about electricity, 47% (83) had not spoken about electricity in the past 6 months.

When asked where in future they'd look for information on electricity, 36% (64) of participants said they would turn to an organisation like their local council, landlord or energy company, 29% (51) said they would ask someone they know, like a friend, relative or acquaintance

Home Survey

The objectives of the Home Energy Survey are to:

1) Take an electricity inventory of each participants' home; and
2) Ask about socio-demographic information necessary for understanding more about households, asking about household size, ethnicity, confidence in English and income.

**Administration:** The Home Energy Survey is administered by the **energy**wise field officer team, and is filled in by the field officer with the participant during the installation visit. In cases where the participant does not have time or want to go through the survey with the field officer, the survey can be left with the participant, with a stamped addressed envelope to return the survey to UCL.

UCL has a database of Surveys received, and has received estimates from BbBC of how many have been left with participants. In summary:

- 323 surveys administered (including 59 left for self-completion) – BbBC estimates
- 280 surveys received (4 returned by participants)
- 244 surveys received from active participants
- 373 active participants
- 129 currently outstanding

**Key findings**

[2] It needs to be borne in mind that the response rate for the trial (536 initial participants /1342 invited to participate) is 40%, thus the ESC response rate at the population level is 0.40*0.38 ≈15%.

**Ethnicity** – The respondents are predominantly from Bangladeshi (55%) or White British (24%) ethnic groups. The high proportion of Bangladeshi respondents is clearly not representative of the overall population in the UK, nor that of households in fuel poverty. Energy consumption data will need to be carefully examined alongside and income and other socio-demographic variables to investigate whether the social and cultural practices of this ethnic group lead to significantly different energy consumption profiles from other ethnic groups.

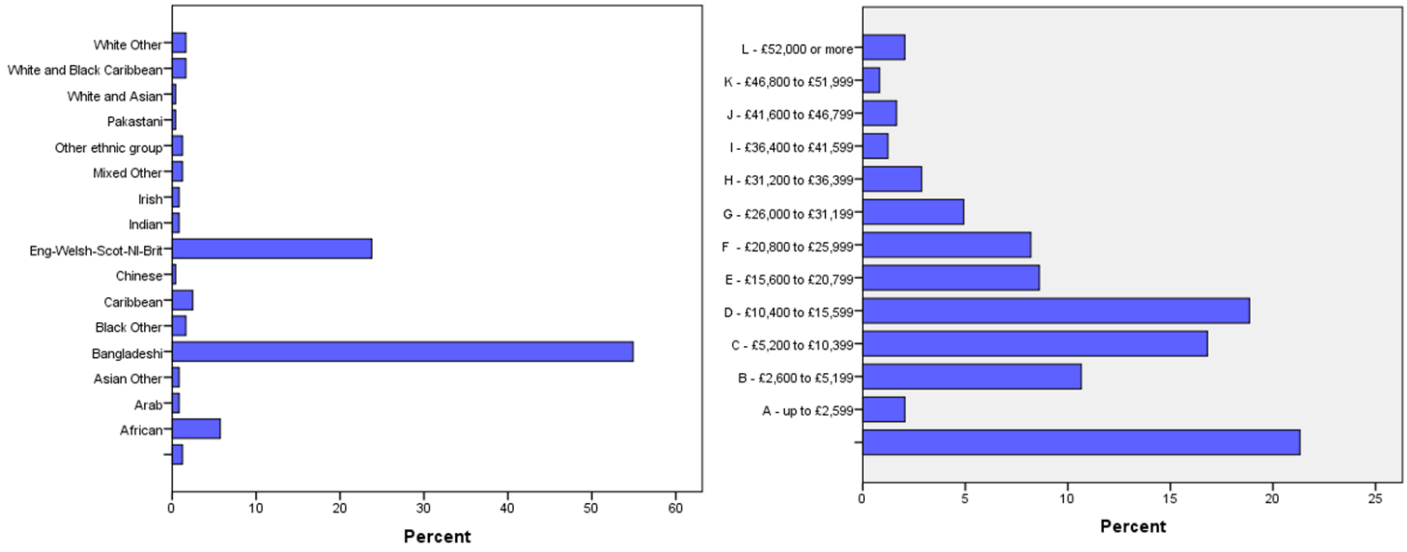



**Figure 5 Ethnicity and income distribution**

**Income** – 21% of respondents did not answer this question, which indicates sensitivity regarding questions relating to income or wealth. The responses to this question will be analyses alongside energy consumption data to investigate the incidence of fuel poverty amongst the trial participants.

**Household size** – The household size of respondents to the Home Energy Survey has a different distribution to the general UK population with a higher frequency of 3+ person households and a lower frequency of 1-2 person households. The average household size in the UK (ONS 2014) is 2.38 whereas the average household size for **energy**wise respondents is 3.54.

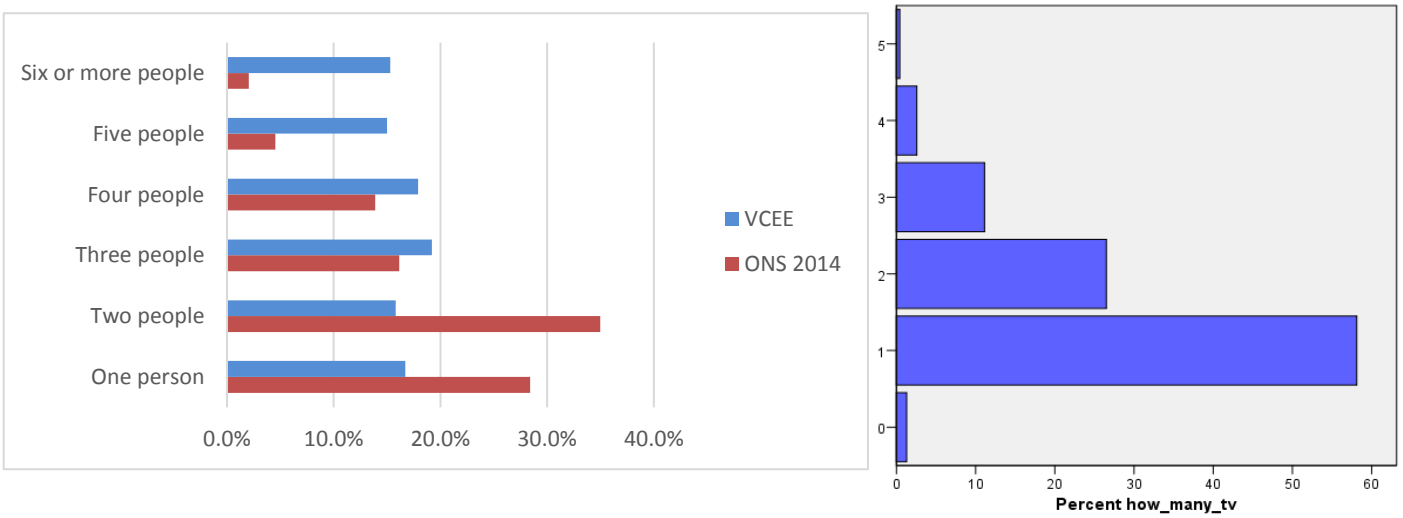



**Figure 6 energywise household size versus the average household size in the UK and TV ownership**

**TV ownership** – TV ownership is near universal with 98.8% of respondents owning 1 or more TVs.

**Washing machine ownership** – As with TVs, washing machine ownership is near universal with 98% of respondents owning a washing machine.

Qualitative notes

When carrying out home surveys, the field officers and buddies have been asked to record observational data on the home and any qualitative insights they get through their informal interaction with household members. The objective is to create a set of qualitative notes that provide qualitative data on:

1) engagement with the VCEE project (recruitment channels, materials, experiences etc.); and
2) lifestyles and impact on energy use in the home (e.g. family routines, health, use of appliances)

The qualitative notes collected so far from 139 participants provide insights on occupancy and use patterns, social norms towards energy, attitudes towards energy suppliers and awareness of energy costs and budgeting strategies.

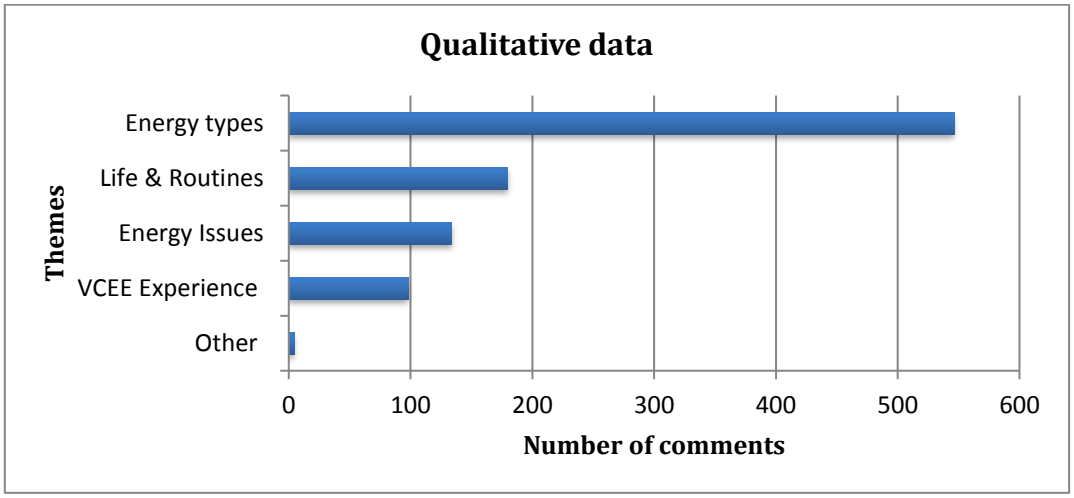



**Figure 7 Number of comments made per theme on the qualitative notes**

**Administration:** The field officers and buddies take have a qualitative notes sheet printed with thematic headings:

- Energy types
- Life & Routines
- Energy Issues
- VCEE Experience
- Other

Training on the process of qualitative data was included in the day training session. The field officers or buddies have been asked to makes notes under these thematic headings immediately after carrying out the home survey. They document any comments the household members make on these areas, or any observations that they themselves noticed. These notes are compiled into a spreadsheet database, shared following data protection protocol with UCL and will be analysed qualitatively.

**Early review of content:** 139 participants have had qualitative notes recorded following home visits between August and November 2015, with a total of 964 comments entered in the database. Figure 7 shows the distribution of these comments by theme.

*Thematic analysis*

Some themes are noticeable from a quick review of the data. These are highlighted below; however the analysis has not yet started.

*Energy types*

Most information collected has been under the heading energy types which covers cooking, lighting, hot water use and TV use. Comments relating to cooking are the most frequent and have been recorded for 119 participants. These include comments on **pattern of use** for example "*cooks about 2 times a week using cooker. Makes snacks everyday using oven and steamer*." The comments also include **normative statements**, which indicate the social expectations surrounding energy use, for example "*only 3 people live here, as a result we don't cook as much as other families*". Some comments include an awareness of energy **costs and budgeting**, this is occurs more noticeably in the heating section, for example "*customer [says they] often use electric fire and not central heating as it 'costs too much'".*

*Life & Routines*
Fewer comments have been made under the life and routines heading, although there is some overlap between the comments recorded under the different energy types above. The notes do provide useful insights into **occupancy patterns** that can be cross referenced with the demographic information collected in the Home Energy Survey. For example one participant commented "*one child is at college, one at university and works part time. They are hardly home. [I am] home most of the time".* Another explained *"daughter comes round everyday, family visits regularly and they have guests every two weeks that stay over*".

*Energy issues*
Comments recorded under this heading include **attitudes towards the supplier**. For example there are 19 comments about British Gas, 2 on billing, 10 positive statements for example '*Happy with BG*'. There are 47 comments about bills and meters, which indicate **budgeting strategies**, particularly around prepayment meters. For example *"£40 gas and £30 electric a week. Never go on emergency".*

***energy****wise*
Few comments have been recorded about **participants' experience** of the project, or thoughts on the materials produced. However none of the comments that have been made give cause for concern. All comments on the **surveys** found it to be '*straightforward'* or '*fairly easy to understand'*. There have been a couple of positive statements about the **incentives** '*happy about the free goodies'* for example and about **the recruitment staff** '*everyone has been great & friendly'.*

There are some **less positive statements** '*only thing that was annoying [us] was people still knocking on their door after [we'd] signed* up' and **some concerns** '*When asked what she thought of the project, she said she wasn't sure, she'd done it all on the phone and was waiting to see. She commented that she hopes her bills won't rise because of the project".*

There too few of these comments to adequately gauge the participants' experience and therefore the participants' panel may offer a better method of generating these insights.

<u>Stakeholder Mapping</u>
Local organisations can be valuable to the trial. In the trial design, local organisations were identified and categorised to provide a ranked set of stakeholders that might be able to support the project by verifying the core project messages as a trusted local organisation. This exercise was referred to as 'stakeholder mapping'. The process of consulting these stakeholders was initiated, and two organisations were contacted before the recruitment phase of the trial took up all field officer resources. Following the recruitment phase, the rationale for contacting these stakeholders was reviewed and the decision was taken to restart the process of contacting them.

The rationale for this decision was that the three of the key functions that could be provided through the contact were still valid. These are:

- **Relay the key message:** stakeholders do not have a significant role in relaying the key message of the project. However, by briefing other stakeholders about the project message and encouraging them to relay this, we are increasing the possibility that amongst the participants' social networks other people are aware of the project and confirm its value.
- **Raise confidence:** participant's confidence in the trial and their willingness to remain in the trial is a concern, as drop out numbers have risen. Participants may turn to alternative groups for advice and if the project has briefed these stakeholders about the project, they can play a role in building confidence.

- **Allay concerns:** having this feedback loop is valuable. Speaking to people now (rather than prior to the main recruitment drive) may mean we hear about the project so far, and learn of any concerns or grumbles. We can therefore respond to them, either via the stakeholder, or by reflecting on our processes that may be resulting in any adverse reactions or worries.

Following the decision to restart contact, the list of stakeholders was reviewed with Bromley by Bow Centre staff and reprioritised using the criteria adopted in the original mapping exercise (expertise, willingness and value) but updated with new categories, reflecting BbBC staff insight on the roles of the organisations. The 35 organisations were put into four tiers:

- Tier 1: original contacts
- Tier 2: advice service
- Tier 3: ethnic group focus
- Tier 4: local to participants

A fresher training session was held with the field officer team taking responsibility for contact, and the process restarted on 17 November 2015.

## 2.4 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.

The key learning delivered in this reporting period consists of operational delivery of the customer recruitment and engagement. Within the next reporting period the project will undertake lessons learnt workshop facilitated by project Partner Institute for Sustainability.

The main dissemination and communication activity that took place within the current reporting period was an external presentation at the LCNI conference, to share early insights with fellow distribution network operators and conference attendees.

## 2.5 Project outlook onto the next reporting period

During the next reporting period workshops will be held instead of individual interviews with the project Partners that will be facilitated by the Institute for Sustainability in order to collect further lessons learnt; this was delayed beyond the current reporting period as all project Partner resources that would be involved in this exercise were focused on recruitment and installation delivery.

Further activities within the next reporting period are planned to include:

- Installation and commissioning of the MDU Communication Infrastructure and the smart meter set install for the MDU households recruited.
- Research activities: assessment of further respondents to the Energy Social Capital Survey and Home Survey.
- Recruitment of the external control group.
- Further undertaking of the stakeholder mapping exercise.
- Recruitment of active participants to the customer panel.

Moreover, the production of the SDRC 9.3 report that will outline Trial 1 observations regarding household energy changes and the subsequent network impact.

# 3 Consistency with full submission

The following has been noted to have changed since the full bid submission:

Household Participant numbers approached and recruited (First outlined on Page 6 and with further mention throughout bid document): Within the full bid submission the project outlined two key aspirational aims on household volumes. This included the number of households to that the project aimed to approach and recruit and have continued participation throughout trials. The aspirational volumes were 1,100 homes to be approached which had been superseded with the update in the June 2014 report to 1,650 against a response rate of 33%. Moreover, the project aimed to recruit and maintain the participation of 550 households. The project has completed significant operational delivery within the recruitment and installation phase. The project to date can confirm that it has approached 1,342 households and of these 536 signed-up to participate in the project, representing a response rate of 40%, which is successful outcome as the project exceeded the targeted response of 33%. This means that the external validity of the results will be as strong as planned. From within the 1,342 households the project had intended to recruit two trial groups each of up to 275 households. This upper target was set based on a calculation of sample sizes required, and assuming the size of effect in a household's energy usage that the project was likely to measure. Whilst the project has recruited a smaller number, currently trial group 1 contains 178 households and group 2 contains 173 households, overall reliability of the results when calculated on the same basis set out in Appendix O of the full submission is around 74% – this is close to the 75% target with assessments still taking place. This revised calculation repeated by University College London used the previous annual consumption of active participants therefore providing an improved estimate of existing energy usage of this type of household. As such, as long as there is not significant attrition amongst trial participants, the project is still confident of delivering the results to the level of confidence first planned. The project plans to manage attrition through responding to customer feedback collected in qualitative notes on surveys, comments shared with the field officer team or in customer panel sessions. The next project phase should involve fewer burdens on participants that can lead to drop outs as the project has learnt that the majority of drop outs occurred within the high intensity contact period of install appointment booking or at the point of install.

Business Case (Section 3: Project Business Case): The project business case was calculated using assumptions for the energy saving and shifting technical potential using best available data at that time from DECC and DEFRA's Household Electricity Usage Study (HEUS). Reassessment has taken place with project Supplier Element Energy using new data from the Low Carbon London project that has subsequently changed the value of technical potential of the households this project is engaging with. Please refer to Appendix A.

# 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.

## 4.1 Full Submission (BID Risks) – update

| Ref# | Risk & Impact Description | BID Mitigation | Mitigation (update) | Status |
|---|---|---|---|---|
| BID-R001 | At the bid stage the appropriate UK Power Networks' staff does not engage adequately or in a timely manner with the project. Resulting in poor engagement and delays in getting internal buy in for the project. | | Internal buy-in during the bid stage was successfully obtained. | CLOSED |

| Ref# | Risk & Impact Description | BID Mitigation | Mitigation (update) | Status |
|---|---|---|---|---|
| BID-R002 | Final Funding may not be awarded. Therefore, the project would not be able to be carried out in 2014. | Ensure quality bid submission through regular review, clear differentiation and stakeholder engagement. | The project successfully secured funding from the LCNF competition run by Ofgem in November 2014. | CLOSED |
| BID-R003 | Project partner(s) withdrawing their participation at the start of the project, leading to delays. | (a) Letter of intent from British Gas and in discussion on MoU<br>(b) Letters of support from each local community actor<br>(c) Other partners engaged and attended two project partners meetings<br>(d) Project partner sessions during evaluation process to invite local community actor partners on to partner meetings<br>(e) MoU discussions with all partners during evaluation process<br>(f) NDAs in place for most partners, need to get an NDA in place with local community actors | **Update May 2015:**<br>All partners have signed the respective Project Agreements and the Collaboration Agreement of the project. The date of the contract signature is the 20 March 2015 | CLOSED |
| 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<br>(b) Invite representatives who deliver and interface directly with vulnerable and fuel poor<br>(c) Draw upon the learnings from literature review and LCN Fund factsheet<br>(d) Expert partner secured to lead on recruitment and engagement<br>(e) Appropriate pre-engagement testing included in plan | **Update November 2015**<br>The outcomes achieved during the main trial recruitment phase confirmed that the recruitment strategy developed by the project is sound and fit for the customer audience. As observed in the pilot study, the achieved response rate of 40% exceeded the 33% target. The project is currently analysing the reasons for non-participation and additional feedback will be captured from a group of trial participants that will be invited to a customer panel taking place at the beginning of the next reporting period. Any lessons learnt from customer interfaces will be used to improve the project engagement strategy. | |
| BID - R009 | Poor response to energy social capital surveys. Therefore dilutes quality of findings. | (a) Application of best practice survey administration ("Dillman method")<br>(b) Use of trusted intermediaries to deliver follow-up survey reminders<br>(c) Face to face reminders through engagement events | **Update November 2015**<br>As of the 19 November the response rate to the energy social capital survey was 48.5%, slightly below the expected response rate of 50%-70% predicted by the Dillman method when the recommended survey administration method is followed. However follow-up survey reminders still have to be completed with some participants. The follow up calls undertaken so far identified that several households have not received or have lost the survey, therefore a replacement survey has been sent out. The final response rate will be assessed when all the reminder and replacement activities will be completed. Moreover lessons learnt from the administration of the first energy social capital survey will be implemented where possible to improve the administration of the two following waves (beginning of trial 2 and end of trial 2). | |

| Ref# | Risk & Impact Description | BID Mitigation | Mitigation (update) | Status |
|---|---|---|---|---|
| BID - R010 | Poor turn-out rate to focus group trialling customer acceptability of recruitment materials. Therefore communication materials have a higher likelihood of not being well received by customer audience and not being effective. | (a) Use of trusted intermediaries to host focus groups<br>(b) Use of non-trial vulnerable and fuel poor to participate in focus groups | **Update November 2015:**<br>The outcomes achieved during the main trial recruitment phase with a final response rate of 40%, (which exceeded the 33% target) confirmed that the recruitment materials developed by the project and tested both in the focus group and during the pilot study are effective and fit for the customer audience. | CLOSED |
| BID - R011 | Poor response to non-participation questions during recruitment process. Therefore, limited understanding / learning for recruitment strategy not being effective | (a) Follow-up a sample of non-participants with telephone interviews<br>(b) Invite non-participants to engagement events and discuss reason for non-participation<br>(c) Discuss reasons for non-participation with community leaders and key members of trusted intermediary groups. | **Update November 2015:**<br>To date 43% of the 1,342 households approached said they are not interested to the project. When possible, the customer field officers have conducted interviews with non-participants (either in person or over the phone) at the time that people indicate they do not want to participate. The project is currently analysing the reasons for non-participations captured so far, but early findings shows that main reasons include 'do not want a smart meter', 'not interested in energy saving' and 'overall trial is too much hassle'. It appears also that some households cannot participate as they are moving home or changing supplier.<br><br>As indicated in the previous reporting period, in future non-participants may be invited to engagement events and discuss reason for non-participation, or reasons for non-participation may be discussed with community leaders and key members of trusted intermediary groups. | |
| 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")<br>(b) Use of best practice in panel survey maintenance<br>(c) Use of trusted intermediaries to deliver follow-up survey reminders<br>(d) Face to face reminders through engagement event | **Update November 2015:**<br>Reminder calls are currently conducted by the field officer team for the first wave of the energy social capital survey. Lessons learnt from this activity will be captured to implement them, when possible, in the two successive waves of energy social capital survey that will be administered at the beginning of trial 2 and at the end of the project. | |

| Ref# | Risk & Impact Description | BID Mitigation | Mitigation (update) | Status |
|---|---|---|---|---|
| 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.<br>(b) Piggy-backing interviews onto wider participation engagement events to minimise participant disruption. | **Update November 2015:**<br>The response rate to interviews of 67% achieved during the pilot study suggests that participants are generally willing to provide feedback to the project.<br><br>CAG Consultants will carry out the evaluation of the main trial recruitment process at the beginning of the next reporting period. This will include support from UK Power Networks, Bromley by Bow Community Centre. Plus insights gathers at lessons learnt workshops.<br><br>The project also plans to include further telephone surveys (as had been used as part of the pilot study evaluation which was found to be effective). The sampling framework will be designed in a way that interviewees will cover both intervention and control groups, the two landlords, different recruiters, different ages, genders etc. In the next reporting period UK Power Networks will be exploring with British Gas and CAG Consultants the approach to this customer engagement and ownership of activity amongst Partners. | |
| 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<br>(b) Invite trial leavers to engagement and thank-you events and discuss reasons for leaving the trial<br>(c) Discuss reasons for trial attrition with community leaders and key members of trusted intermediary groups. | **Update November 2015:**<br>To date 167 consented customers have withdrawn from the project. For each dropped out customer the field officer team or British Gas (depending on the attrition circumstances) have captured the reason for attrition. A full statistical analysis of drop-outs and reasons for attrition is currently in progress and outcomes are expected in the next reporting period in order to capture the project lessons learnt and inform the project's engagement strategy. | |
| 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. | **Update November 2015:**<br>To date 167 consented customers have withdrawn from the project. However, a very well balanced split of drop-outs between intervention (83) and control (84) groups has been observed and suggests that similar attrition is observed across the two groups. Therefore, no bias in the project findings is expected so far.<br><br>During the installation booking process some participants in the control group appeared not to be fully aware of the differences in the project timeline between the two groups. Their expectations have been managed carefully by the field officer team reinforcing the messaging around smart meter installation and energy efficiency devices delivery as indicated in the communication materials. | |

| 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. | **Update November 2015:** Early findings from the conversations with trial participants opting out from the project captured by British Gas and the field officer team show that only one customer dropped out due to his allocation to control group. There have also been instances whereby a customer had planned to drop out due to group allocation and this was managed through further explanation and guidance provided by the field officer which led to the household being retained, However, a full statistical analysis of drop-out rate and reasons for attrition combined with lessons learnt workshops with recruiters will provide further insights in the participants' willingness to be randomly allocated to intervention and control groups. | |
| 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 (see under-recruitment risk scenarios- Appendix E) | **Update November 2015:** The project has exceeded the target response rate of 33%, achieving a response rate of 40% with 536 households signing up to the project. Moreover, reducing the sample from 1,650 to 1,342, whilst still achieving close to the original final sample size (536 versus the initial estimate of 550) has led to a strengthening of the external validity of the trial findings. University College London is currently calculating the statistical power associated to the active participants post attrition using the average annual energy consumption from the previous year extracted for the **energy**wise trial participants. | |
| 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 9.4. | 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 missings on network modelling findings. | **Update November 2015:** The mitigation remains as per the previous reporting period. In addition, a full data transfer test including quality checks on the electricity data and the production of fulfilment reports from both British Gas and Passiv Systems will be undertaken by the end of 2015/beginning of 2016. It will enable the project Partners to run a first assessment and analysis of missing data. | |
| 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. | **Update November 2015:** To date 167 consented customers have withdrawn from the project. However, a well-balanced split of drop-outs between intervention (83) and control (84) groups has been observed and suggests that similar attrition is observed across the two groups. So far there are no early indications that differential attrition between the two within-trial groups should be expected in trial 2. | |

| 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. | **Update November 2015:**<br>At the beginning of the next reporting period, the project will run several activities to capture feedback on trial 1 recruitment from both recruiters and trial participants to better inform the pre-engagement campaign and the recruitment phase of trial 2. | |
| 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 maximization (EM) methods. Estimation of the biasing effects of missings on network modelling findings. | **Update November 2015:**<br>The mitigation remains as per the previous reporting period. In addition, a full data transfer test including quality checks on the electricity data and the production of fulfilment reports from both British Gas and Passiv Systems will be undertaken by the end of 2015/beginning of 2016. It will enable the project partners to run a first assessment and analysis of missing data. | |
| 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<br>(b) Instruct Customer Field Officers who have built a trusted interface to rally customers for attendance<br>(c) Send a thank-you and learning update leaflet at the end of each trial | **Update November 2015:**<br>The trusted intermediaries and the customer field officer team will approach the invited customers in order to participate in thank you events.<br><br>In addition, out of the 75 trusted organisations or catalytic individuals in the community identified by the stakeholder mapping exercise two organisations were contacted before the recruitment phase of the trial took up all field officer resources. Following the recruitment phase, the rationale for contacting these stakeholders was reviewed by University College London and the decision was taken to restart the process of contacting them. The list of stakeholders was reviewed by UCL in collaboration with Bromley by Bow Centre staff which led to 35 organisations grouped into four categories (original contacts, advice service, ethnic group focus and local to participants). A refresher training session was held with the field officer taking responsibility for contact, and the process restarted on 17 November 2015.<br><br>Finally, the social energy capital survey will indicate other communication channels that the project could employ for advertising events. Early findings show that respondents will turn to organisations like their local council, landlord or energy company for information on electricity and that main sources of information to lower their electricity use are internet first followed by the energy supplier and someone they know well.<br><br>Further analysis of the energy social capital survey will provide deeper insights on where the **energy**wise participants turn to for information. | |

| Ref# | Risk & Impact Description | BID Mitigation | Mitigation (update) | Status |
|---|---|---|---|---|
| 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<br>(b)use pre-testing activities and customer focus group to test learning materials and discover their preference | **Update November 2015:**<br>The mitigation remains as per the previous reporting period, with the activities undertaken to date summarised in section 2.5. | |
| 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<br>(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 | **Update November 2015:**<br>- To date the project has install consent from three MDU customers residing in Padstow House via a revised, and more successful, recruitment strategy of sending British Gas energy experts out with the Bromley by Bow Centre recruitment team to "door-knock" customers.<br>- The contract between British Gas and Siemens was finalised in August 2015.<br>- Further installation agreement between British Gas and Tower Hamlets Homes is currently under discussion with support from UK Power Networks.<br>- Siemens have performed a full building survey on Padstow House that identified key building features and potential risks and issues.<br>- Siemens and British Gas have created and supplied a RAMS (Risk Assessment Method Statement) document for Tower Hamlets Homes, together with a full consumption cost model developed by British Gad for the MDU equipment. | |
| BID - R024 | Availability of smart metering equipment not realised, therefore delay to trial 1. | (a) Supplier project partner has confirmed that smart metering equipment with necessary functionality will be available by Q4'14, and installation planned for latter part of Q4'15 and early part of Q1'15 to allow for some delay<br>(b) UK Power Networks engaging with British Gas to monitor progress of Prepay Change Programme for early warning signs. Also key milestones to be built in the project plan as project has no influence on Prepay Change Programme delivery and should be treated as an external dependency | **Update November 2015:**<br>This risk was closed at the beginning of July 2015 when British Gas confirmed that smart meters with prepayment capability were ready to be installed and prepayment households could be approached as part of the trial recruitment phase. The first batch of invitations to prepayment customers went out on 10 of July. 112 credit smart meter sets and 66 prepayment smart meter sets have been successfully installed by British Gas to date. Moreover, 112 credit smarts meters have been installed without a smart energy display where they have been allocated to the control group. | CLOSED |
| BID - R025 | MoU cover with all partners. | (a) Obtained the support and letter of intent from British Gas<br>(b) Obtained the support from the other partners and all have been working collaboratively<br>(c) Pursue the agreement of mutually acceptable contract terms with all partners | **Update May 2015:**<br>All project agreements and the collaboration agreement have been signed with all partners and therefore the MoU has become redundant. | CLOSED |

## 4.2 Risks and Issues that have arisen in the reporting period

| Ref# | Risk or Issue & Impact Description | Mitigation (update) | Learning | Status |
|---|---|---|---|---|
| R0015 | External Group does not constitute a representative sample, therefore results are not able to be replicated and the project won't deliver as expected.<br>**Update:** the approach for the external control group selection proposed in May 2015 had to be revised in light of the geographic remit of the LCN Fund (Great Britain rather than England) to ensure the external group is a representative sample and that findings are generalisable to the whole Great Britain. This has introduced delays in the recruitment of the external control group participants. Even though the external group can be constructed after the initial recruitment period with no impact on the project, further delays may affect data quality and robustness of the findings if consent for data processing is not obtained before the SDRC 9.3 report submission. | a) University College London to consult with statistical experts to identify the best selection strategy that will satisfy the project's requirements for the external control group.<br>b) UCL to allocate additional resources to analyse the Home Energy Survey data that will be used for the external control group construction.<br>c) Proceed with recruitment of external control group participants.<br>d) Once consent is given, retrieve and extract historic half-hourly data for all smart-meter customers recruited for the external control group. | The project requirements for each research group have to be reviewed carefully before proceeding with the design of the selection strategy of each group to make sure that the selected participants are fit for purpose since the beginning of the trial, avoiding unnecessary delays. | |
| R0138 | The required extension of the trial 1 installation phase resulted in the adoption of a 'feathered-in' approach for trial 1 data analysis.<br><br>Considering a gap of 10 weeks between trial 1 and trial 2 to enable the smart meter solution to be commissioned to control group and ToU tariffs installation to be completed, the 'feathered-in' approach in trial 1 would result in trial 2 closing down beyond December 2017 for the tail of those households who have got trial 1 installation completed as last. This is a risk for the robustness of the research findings reported at the end of the project as the data capture phase has to be completed by the end of 2017 to allocate enough time for quality data analysis and for the interpretation of the findings to be reported in the close down report. | a) Assess the impact on trial 2 completion according to the last completed installation in trial 1<br>b) Discuss a revised plan for trial 2 with the relevant project Partners<br>c) Assess the feasibility of the realignment of all participants on the same trial 2 start date for data quality<br>d) If required, consider a truncated data capture in trial 1 (shorter than 12 month data cut) for those customers that would complete trial 2 beyond December 2017 in order to ensure a 12 month analysis for the ToU tariffs where data quality is exposed to higher risk. | Alternative approaches to trial design may be possible and even beneficial to the research findings (e.g. better understanding of behavioural change post installation with the 'feathered-in' approach). All relevant Partners, technical and research partners first of all, have to be involved in a collaborative discussion to assess the risks and impacts of all the explored alternative approaches to identify the most suitable for the project's purposes and constraints. | |

| Ref# | Risk or Issue & Impact Description | Mitigation (update) | Learning | Status |
|---|---|---|---|---|
| R0139 | During the main trial installation phase individual trial participants or subgroups have received a different set of interventions compared to the package designed by the project. The differences included different energy efficiency devices package (with some households having received an additional device, a water widget, or others having received a different model for the standby shutdown), British Gas' business as usual energy efficiency advices (provided to all households who have got a smart meter installation, including credit control group, apart from prepayment control group) and Smart Energy Displays provided to three credit control group participants. Such deviations from the original research trial design may result in uncertainty of interventions provided and may affect the robustness of the findings observed via the comparison between intervention and control groups. | a) Bromley by Bow Centre and British Gas to support identifying the volumes of those affected.<br>b) University College London to support the project in assessing the extent and the impact of such deviations from the original research trial design on the research findings.<br>c) UK Power Networks to discuss collaboratively with relevant Partners if further action has to be taken.<br>d) Households that have received a different intervention package to be flagged up in the project's databases to inform research analysis. | Projects should make sure in the early stage that appropriate checks are in place at each Partner organisation.<br><br>Project partners should provide accuracy statements that project design has been followed and should flag up any discrepancy promptly to enable quick resolution of the issues that have arisen. | |
| R0140 | Data loss. In order to identify potential issues and resolve them at early stage, a pre-live data transfer (electricity, temperature sensor and network data) was planned for the months of August and September 2015, with following data transfers expected on the fifteenth day of each month. This had to be postponed due to the extension of the installation phase, the resource constraints at different project Partner organisations and the continuous focus on the prompt resolution of the issues incurred during the operational phase of the project. Once consent is obtained, historic data can be always retrieved from both British Gas/Passiv Systems and UK Power Networks databases, so the risk on data extraction and data transfer of electricity and network data is marginal. However, the delay of the first full data transfer also resulted in postponing the analysis of the alert signals received from faulty or disconnected Passiv Systems' monitoring equipment, which may have an impact on the quality of data extracted from those households affected. | a) Set up the first full data transfer for the end of 2015/beginning of 2016.<br>b) Passiv Systems to produce a full report of the alert signal received from the monitoring equipment and follow-up with those households directly to resolve the issue.<br>c) Bromley by Bow Centre to support Passiv Systems to arrange remedial visits in case of language barriers, hard to reach customers or in case of reinforcement of project messages required. | Extra resources should be allocated as contingency management in case the key project contacts are unexpectedly involved in resolution of issues incurred during key project phases, to make sure that all project activities are progressing and the project is fully set up for data analysis at the end of the installation period. | |

| Ref# | Risk or Issue & Impact Description | Mitigation (update) | Learning | Status |
|---|---|---|---|---|
| I0070 | MDU installation has yet to be completed due to outstanding permissions and consents required from the social housing landlord, Tower Hamlets Homes. The project has so far recruited three households that require a communications solution for installing smart meters and smart energy displays in complex MDUs with challenging meter arrangements. Therefore current impact is that these homes cannot yet have their smart set install fulfilled. | Discussions continue and the project hopes to reach resolution to enable us to manage each of these recruited customers experience and demonstrate Britain's first functional smart meter sets in these building types. Discussions have been escalation a senior level between Partners.<br><br>Other key preparation work for the MDU installation has continued – on the 23 September 2015 Siemens (the MDU Supplier) performed a full building survey at Padstow House in order to identify the building's characteristics, metering arrangements and any potential risks and issues.<br><br>Siemens and British Gas have also created and supplied a RAMS (Risk Assessment Method Statement) document for Tower Hamlets Homes and British Gas has supplied a full consumption cost model for the MDU equipment to the housing association. | Stakeholder management is necessary to navigate the delivery of new installs on trial. | |
| I071 | The project has been working with tenants of two different housing associations, and has developed recruitment protocols which subtly differ in each case. An audit has identified that this second process of dual-consents for Poplar HARCA's residents was not rigorously followed. Moreover from further audit it was found that 23 consent forms were missing from participants who provided written consent face-to-face. Following further checks it was found that 14 of households out of the 23 had already dropped out from the project. The risk associated with missing consent forms is mitigated by having records in the project's recruitment database that the project asked for and was given consent, even if the actual 'written' consent is not available. | Bromley by Bow Centre confirmed that records of consent (consent being 'Yes', Date of Consent, Time of Consent and recruitment method when customer signed-up) are held for all 23 households in the database where they were missing the physical evidence.<br>The project is seeking to close out these remaining consents, obtaining future and retroactive written consent from those affected that are still active participants and compensating them for any disruption in having to disturb them once more. | Project Partners need to ensure they are undertaking delivery and performance reviews on work activity. Moreover putting in pace audits to ensure accuracy and quality against project protocols and identifying any incompleteness to resolve any identified discrepancies at the earliest. | |

# 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<br>• 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 |
| 9.2 | **Customer Recruitment** Effective recruitment of fuel poor customers | • A review of best practice in fuel poor customer recruitment.<br>• Identification of trusted intermediaries within the trial area community and their relationships with trial participants.<br>• 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.<br>• Findings from customer focus group testing of clarity and acceptability of recruitment communication materials.<br>• Statistics on recruitment success rates and reasons for non-participation.<br>• 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 |

| SDRC | Criteria | Evidence | Date | Progress |
|---|---|---|---|---|
| 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.<br>• Quantitative analysis of trial 1 control-group contamination effects through within-trial control-group to external to trial control-group comparison.<br>• Statistical generalisation of the energy savings to the wider UK Power Networks, and national fuel poor customer base.<br>• Representation of network impacts through half-hourly network modelling within the trial area.<br>• Comparison of realised energy savings against previous estimates of technical potential energy savings in fuel poor customer group.<br>• Insights on customer protection during the trial. | By end of June 2016 | Completed:<br>• Assessment of best research design to construct an internal control group.<br>• Energy saving devices for trial 1 selection completed: Eco-kettle, three LED lights and a standby shutdown for audio-visual equipment both for the pilot group and trial 1.<br>• Selection of suppliers for LED lights and standby shutdown and commercial agreement completed.<br>• Customer Protection: temperature monitoring solution selected.<br>• 351 households have received the project end-to-end installation. Of these 178 have received the Trial 1 suite of project interventions.<br>• Disclosure Board has been activated and currently improvements are being explored for item to be resolved swiftly.<br><br>In progress:<br>• Customer Protection: temperature monitoring meeting held and strategy under development.<br>• A full data transfer test including quality checks on the electricity data and the production of fulfilment reports from both British Gas and Passiv Systems will be undertaken by the end of 2015/beginning of 2016.<br>• In the next reporting period the project will deliver the SDRC 9.3 report. It currently is on schedule to be delivered successfully. |
| 9.4 | **Customer Engagement** Effective engagement with fuel poor customers | • A review of best practice in fuel poor customer engagement.<br>• A review of best practice in trial panel maintenance (i.e. methods to minimise participant dropout), particularly in trials with vulnerable participants.<br>• Quantitative analysis of longitudinal survey of participants' energy knowledge resources (energy social capital) within their social networks and how these have changed over time.<br>• Findings from interviews with trial participants on the efficacy of different engagement activities conducted throughout the trials.<br>• Statistics on participation attrition and reasons for participant drop-out. | By end of August 2017 | Completed:<br>• Review of best practice in fuel poor customer recruitment.<br>• The energy social capital survey has been completed by University College London and the administration protocol has been tested during the Pilot Study.<br>• The exit survey has been completed by University College London and been approved by the Ethics committee.<br>• As of 19 November 2015, 524 energy social capital surveys have been mailed, with 204 surveys being returned, giving a response rate of 38.9%. Early assessments of respondent's surveys have been undertaken.<br>• As of 19 November, there have been 167 drop outs and reasons for drop out have been recorded which the project will assess in further detail.<br><br>In progress:<br>• Method of trial participant interview protocol under discussion. |

| 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.<br>• 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.<br>• Statistical generalisation of the energy shifting to the wider UK Power Networks, and national fuel poor customer base.<br>• Representation of network impacts through half-hourly network modelling within the trial area. | By end of October 2017 | Completed:<br>• Assessment and identification of devices that the project may consider for trial 2.<br>• Customer Protection: temperature logger solution selected.<br>• Recruitment of Research Associate for development of quantitative analysis tools at UCL.<br>• Early assessment and identification of the use of the Home Survey for external control group.<br><br>In progress:<br>• Method for external control group selection.<br>• Customer Protection: temperature monitoring meeting held and strategy under development. |
| 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<br>• 2x internal learning events carried out per SDRC, and presentation materials shared<br>• 2x thank-you events carried out for trial participants<br>• 1x end of project customer learning event completed for trial participants, and presentation materials shared<br>• Presentation of the project at least twice a year at external seminars / workshops, with presentation materials shared | By end of December 2017 | • Please refer to section 2.5. |

# 6 Learning outcomes

## 6.1 Learning in this reporting period

Community Initiative Partnerships: The project has been establishing the branded community initiative with local Partners that have not previously undertaken a similar research scope. The project has learnt of the critical local personnel skill sets that should be recruited as part of future community initiative schemes – strong project and performance management, project reporting and auditing capabilities, rota scheduling and data analysis. These were areas where UK Power Networks and other consortium Partners provided support to local Partners.

Disclosure Board: As a result of the learnings from the operational phase of the project, the terms of reference of the Disclosure Board are currently under review by Bromley by Bow Centre. It was observed during the installation phase of the project that a faster and more direct escalation protocol may be required in specific circumstances (e.g. in case of technical matters). Bromley by Bow Centre is leading the review of the protocols and will provide suggestions on any updates required to improve the escalation process and make it more effective.

Operational arrangements during the installation phase: While daily calls between British Gas and Bromley by Bow Centre were in place since May 2015 to discuss daily activities and resolve any issue arising from the recruitment and

installation phase, a daily review of critical items was introduced on 15 October 2015 as soon as a drop of successful installation rate was observed. During such meetings UK Power Networks were acting the role of chair, facilitator and secretary and the following key items were reviewed and discussed with the project's community centre and the energy supplier:

- status of new appointments booked/to be booked by Bromley by Bow Centre
- status of incomplete visits re-booked/to be re-booked by Bromley by Bow Centre
- review of full utilisation of capacity for future appointments
- outcome of installations occurred on previous day.

This activity turned out to be extremely helpful to allow prompt re-booking when required, to resolve issues and implement lessons learnt from previous installations quickly and allocate actions between the relevant project partners.

Data accuracy: Over the installation phase of the project it was observed that Bromley by Bow Centre's records were not always accurate. Accuracy issues were found with the delivery of the energy efficiency kit (to intervention group) and the administration of the home energy survey (to intervention and control groups) during the installation visit. This was due to the fact that a centralised and consolidated database was missing as records were kept in different places by the individual field officers and this arrangement was introducing uncertainty in determining which households still had to be visited in the future to complete these activities. An installation visit checklist was therefore introduced in order to capture which field officer was attending the installation visit, which devices were delivered and when the home energy survey was administered (whether completed with the field officer and returned to UCL by Bromley by Centre or left for self-completion). As host of all the energy efficiency devices purchased by the project, the community centre was also requested to keep an asset register where all movements and volumes of project's equipment were recorded and cross-checked with the volumes in stock on a weekly basis. Bromley by Bow Centre is currently reviewing the databases to confirm the accuracy of all data captured and the current status of the energy efficiency kit delivery and of the home survey administration.

Energy Social Capital Survey

**Response rate:** The Total Design Method recommended by Dillman should produce a response rate of between 50% - 70%. The pilot exceeded this; the trial has not yet reached this target (48.5%). However survey responses are still being followed up, six respondents have only received three points of contact, and the remaining two designed for the trial from the adapted Dillman method (follow up call and replacement survey), are ongoing. Of the 209 follow up calls made, only 99 resulted in contact, while 110 follow ups did not work due to wrong number, no answer etc. The project expects to reach the 50% response rate, but the implications from the delay between thank you reminder and follow up are yet to be known.

**Self-completion & design:** The majority of questions have been filled in correctly by all respondents who returned their surveys. This suggests the survey design was easy to understand and not too onerous to complete. Q. 6 'in future, if you had a question about electricity use in your home, what would be the FIRST thing you'd do to get information' proved the most problematic. Seven respondents left this blank, and nine ticked two options where the question specified ticking only one. More consideration of how to phrase this question, and its position on the page would be useful in future.

The difference in levels between neighbourhood and general trust could benefit from further research to check that this is an expected result. If it is not, it could be one of the topics to explore further with the participants' panel.

Home Survey

**Field officer training:** A one-day field officer training session was provided to the original team by UCL in August 2014. The field officers and buddies recruited to support the trial recruitment phase received a one-day training session by UCL and UK Power Networks in July 2015. This discussed the research project, the objective and function of the survey and how to carry out the survey with the participants in their homes and the qualitative information to be recorded (see next section).

The survey design was reviewed following the pilot with the one field officer who was responsible for all initial home surveys. This led to a redesign, detailed below.

**Survey Redesign:** Following feedback, two elements of the survey were redesigned to make it easier for field officers to complete quickly and accurately in the home. The first element was removing the requirement to record serial numbers of appliances. This decision was taken based on the partial data we were receiving in these fields and on feedback from the field officers that this was a time consuming and inconvenient task to carry out in participants' homes.

The second element was to improve the clarity of the survey and the information being requested. The field officers and participants struggled to understand some of the appliances being asked about in the survey. In particular there was confusion over light fittings, TV types, hot water equipment, air conditioning and dehumidifiers. Additional training was provided to the field officers to explain these technologies and new images and descriptions were added to the survey to help with the data collection.

**Further opportunities to improve data collection:** After completing the initial phase of the data entry process, some further opportunities for improving data collection have been identified. By way of an example, Q.26 primary language in the home – some field officers/buddies have ticked two primary languages (usually English and Bengali) where only one primary language was requested. it is possible speculate that, in these instances, respondents felt that two languages were spoken equally and thus could not pick a primary language**.**

**Field officer shadowing and retraining:** Field officers and buddies were shadowed on home visits and their approach to filing out the surveys was observed by a UCL researcher. Through this process it became apparent that:

- Accuracy varied according to field officer/ buddy, with some being less able to accurately fill in the forms.
- Some appliances and technologies were still not well understood by the field officers / buddies (e.g. hot water circulation pump, dehumidifier).
- Some questions were not being asked, but were being assumed by the field officers/buddies (e.g. ethnic group). Some field officers/buddies have ticked boxes where a numerical response was required e.g. "How Many xxxx?"

Following this shadowing, an additional one hour training session was held by UCL to discuss some of the data accuracy concerns and hear feedback. The re-training focused on the need to accurately read out and answer the questions as written in the survey and to explain the technologies that were not well understood. The feedback raised the concern over the income related questions, which some participants found sensitive. The importance of the income related data to the research project overall was emphasized, but the voluntary nature of the survey was also confirmed. There was an improvement in the accurate recording of number of appliances.

The field officers and buddies have valuable language skills and awareness of the community in which they are working. This helps them to negotiate access to the participants and interpret the survey in way the participant can understand. However their limited training in survey data collection has meant that data accuracy concerns remain around whether or not there is any electrical equipment being used to provide hot water or hot water pressure.

**Survey administration:** Linking the survey administration to the installation of the smart meter/temperature logging equipment proved problematic. Immediately following the end of the pilot and the start of the trial installation phase, not all installations were able to be attended by a field officer, meaning some households were not surveyed. Problems also occurred through the cancellation and rebooking of installations. On two occasions both aborted and rebooked installation were attended by different field officers leading to two home surveys being carried out for the same homes.

Qualitative notes: Collecting observational data, being able to build rapport and generate informal interactions that can be turned a set of qualitative data are skills which the field officers have only received very minimal training in. Furthermore the field officers have a limited understanding of energy technologies and how energy is used in the home themselves. Consequently the notes collected are dependent on which field officer was in the home, the rapport they established and their ability to interpret what they saw as significant or relevant to the project. Despite these limitations

the material provides some basic themes that can be analysed and used to consider information collected in the next round of surveys (do we include something on routines for example), or topics to raise in a focus group setting.

### 6.2 Learning and Dissemination activities in the next reporting period

Learning activities for the next reporting period will focus on the following project milestones: evaluation of the customer recruitment and installation operational delivery.

## 7 Business case update

**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 DECC and DEFRA's Household Electricity Usage Study (HEUS) 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 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 projects response to Question 16 in the Q&A response:

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 energywise is targeting.

Moreover a further third limiting factor was identified, where 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 energywise as the project would provide valuable insight through a research and trial demonstration to update the project's understanding of customers' ability to save and shift their energy. The project therefore recognised that data from the project and from other sources within project delivery would support the revision of the business case.

**Beyond Full Bid Submission**
Since the full bid submission, new data from the LCN Fund project, Low Carbon London (LCL), has become available. energywise has therefore reassessed the technical potential for energy saving and energy shifting among households struggling with their fuel bills in the UK using the larger LCL sample size from 'Adversity' households (842 households versus 6 households in the HEUS Study) and is targeting those specific appliance categories that are in scope for the project in conjunction with the HEUS data enabling the project to overcome some of the previous limitations.

Project Supplier Element Energy supported the calculation using the LCL and HEUS 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. The output of this assessment found the following:

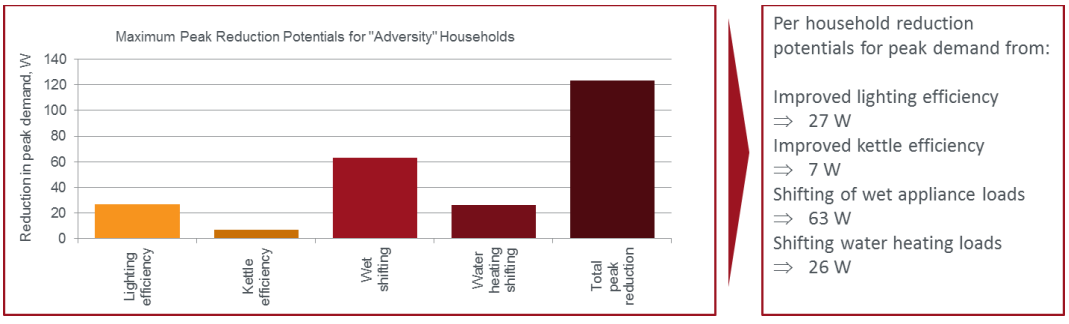



**Figure 8 – Output of Assessment Combining LCL and HEUS data**

- **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 = 123 W

Moreover, a weighted average technical savings potential for an average "Adverse" household of 196 kWh/year has been calculated by Element Energy using the maximum annual savings technical potentials for appliance efficiency improvements for the three categories targeted in energywise (lighting, kettle and TV & entertainment). The analysis based on the larger and more accurate LCL database value 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.

With this revised position, the full bid submission waterfall chart was re-generated with revised assumptions. Previously low estimates and high estimates were provided for energy saving and shifting separately. Where the low-side estimate assumed 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. The high-side estimate assumed behaviours were essentially permanent. The waterfall chart was re-run against a revised approach: de-coupled savings and shifting by each trial, where trial 1 focused on energy savings and trial 2 focused on energy savings and energy shifting. The revised approach is also targeting appliances that are in the scope of the project within each trial rather than aggregated savings and shifting overall. Moreover both trial views have been assessed against the assumption that customers' behaviour is maintained for ten years therefore 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.

Therefore the revised waterfall chart is as follows:

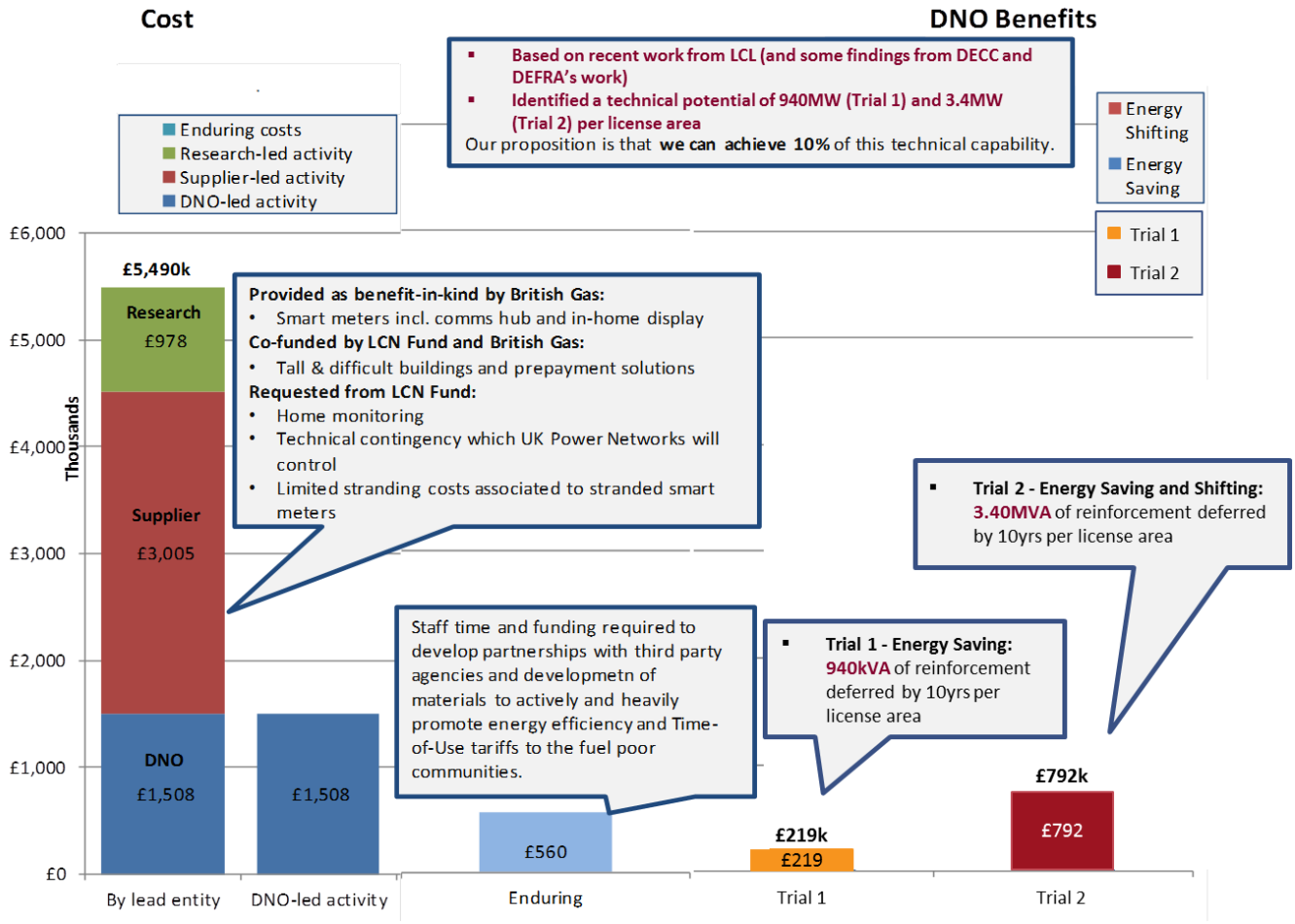



**Figure 9 – Revised Waterfall Diagram**

**Network Benefit Summary:**

- **Trial 1 – Energy Efficiency:** £219k (assuming the network benefits of £73k estimated for the London Power Networks (LPN) area as a proxy for the three license areas)
- **Trial 2 – Energy Efficiency & Demand Side Response:** £792k (assuming the network benefits of £264k estimated for LPN as a proxy for the thee license areas)

In general the network benefits are reduced compared to the bid submission. The project will continue to review the business case and revise appropriately with refined assumptions and the actual peak reduction readings from project participants from their engagement in each trial.

# 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 products have been produced by the project. The project will register these and provide an updated IPR log within the next reporting period. This had to be postponed due to the extension of the installation phase, along with the resource constraints at different project Partner organisations and the continuous focus on the prompt resolution of the issues incurred during the operational phase of the project.

# 11 Other

N/A

# 12 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 June to December 2015 and is an accurate view of our understanding of the activities for the next reporting period.

Signed ……

Date ……

Suleman Alli
Director of Strategy & Regulation
UK Power Networks