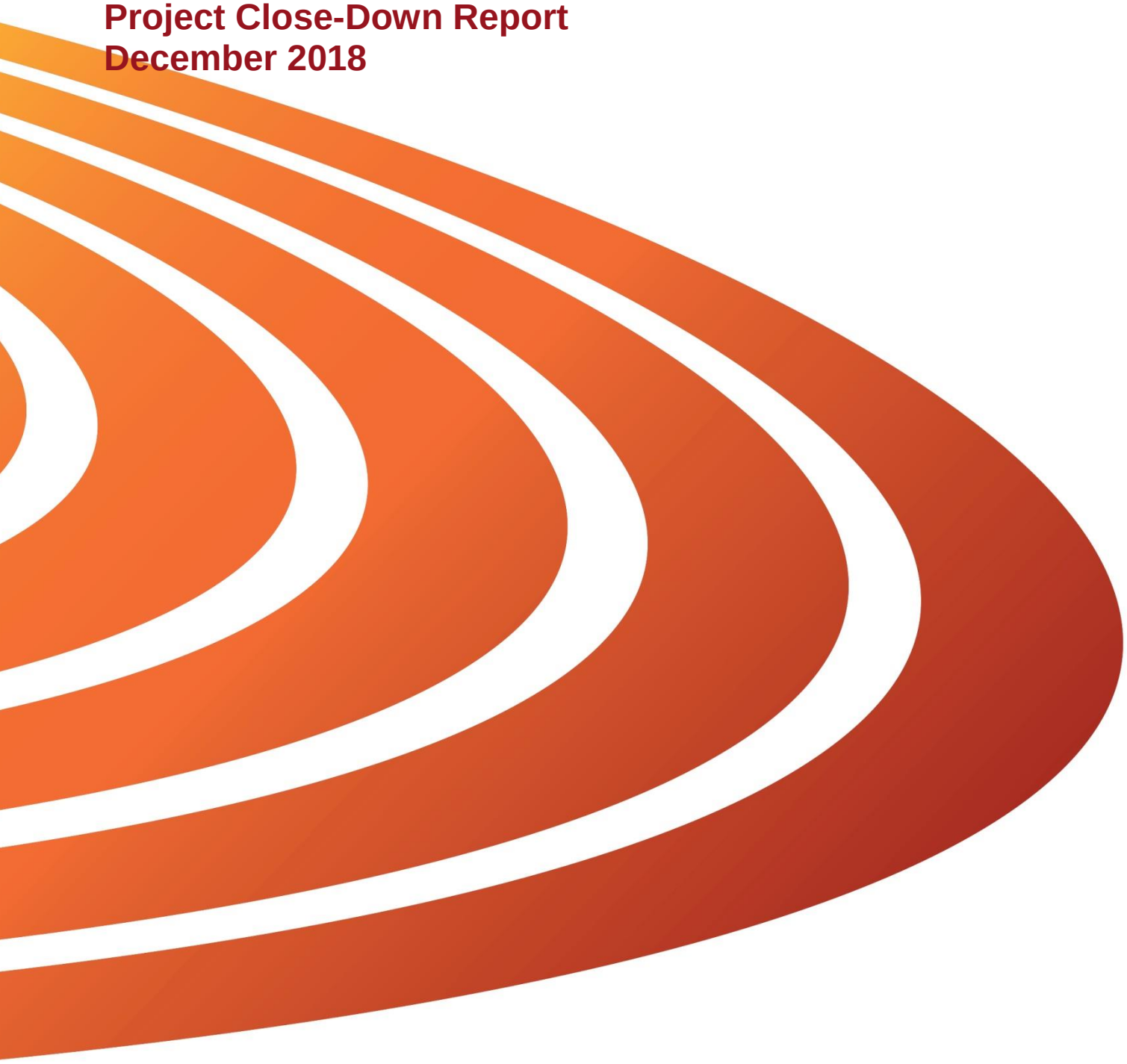
Vulnerable Customers & Energy Efficiency

Project Close-Down Report
December 2018



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Delivering your energy

Contents

"It's a very good project, it's very useful. You can manage your budgets much better. The meter helps me to know where I'm at."

"I'm on a pay as you go meter – it's great to see on the energy display how much energy I'm using, and when I need to top up."

"I just think you've got a lovely team that work well together; individually if I have any questions they are always explained really well; you have a majority of mixed ethnicities in your team which is good."

"Everything has run smoothly. I think the new meters are good. I've heard the scare stories, but I wouldn't want to change it."

"I'm using the standby saver on my TV, with the Sky set and consoles. The kids moaned a bit that they have to wait a bit in the morning for everything to come on, but I told them that we were wasting lots of money having it on all night, and they've got used to it now."

"**energy**wise has really come at the right time, it's a good thing, it's a helping hand, it's like a bonus thing, we're really pleased about it. We're going to carry on budgeting, it's really helpful"

"I've been going to the panel meetings; they cover a lot. Whatever has been raised in the meeting they seem to act on it, so I find that really useful. They do take notice, and I'm really happy with that."

"The people who came and knocked on my door were very nice; I don't usually like it when people come to her door, but they were very nice and it didn't take too much for them to persuade me to sign up."

"I wasn't sure of the offer when I read the letter, and had never heard of **energy**wise, but an amazing lady came and explained in detail the process and that it would fit around my schedule. I'd never go back."

*On this page: quotes from **energy**wise participants on their experiences with the project.*

1. Project background

The Vulnerable Customers and Energy Efficiency (VCEE) project, also known as **energy**wise, ran from January 2014 to September 2018. It carried out two trials to explore how residential customers who may be struggling with fuel bills can better manage their household energy usage and consequently their energy bills. This was done by changing the way they interact with and use electricity while simultaneously supporting Distribution Network Operators (DNOs) in managing (peak) load reduction.

The government's Low Carbon Transition Plan necessarily has an impact on customers' energy bills. Those with the potential to be hardest hit include the approximately 3.5 million fuel poor in the UK (2016)[1], of which a significant number are also vulnerable in some way. Separately, the DNOs are forecasting increasing and more uncertain demands on their networks as the result of the electrification of heat and transport and the increased reliance on micro-generation and distributed generation (DG). The more customers that participate in providing time-shifting or Demand Side Response (DSR) and the more customers that can achieve sustained energy savings, the more it will help to mitigate this substantial challenge.

energywise reflects UK Power Networks' desire to support these customer groups and allow them to fully participate in DSR and energy saving opportunities, reducing their own bills, accessing offers, and playing an important role in supporting the network. The project has provided DNOs with unique evidence-based learning on the extent that fuel poor can be engaged with the appropriate support and consequently how their move and reduction in demand benefits the network by deferring or avoiding network reinforcement.

The project successfully undertook a research study involving 538 households who may be struggling with their energy bills in the London Borough of Tower Hamlets. Firstly, the project has explored whether households benefit from smart metering solutions (smart meter and smart energy display) and from energy efficiency technologies such as energy efficient light bulbs, an eco-kettle and standby shutdown. Secondly, the project worked to understand households' appetites to change their behaviour when on a Time-of-Use (ToU) tariff or Critical Peak Rebate scheme.

Specifically, **energy**wise delivered key learnings on the following topics:

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

If the reductions observed in the **energy**wise trials were realised by all households classified as fuel poor within the UK Power Networks' license areas, an estimated annual reduction in electricity consumption of 86 GWh could be achieved in total (enough to provide electricity to more than 21,000 homes over a year) and a network peak reduction of 27 MW.

energywise was a partnership between ten organisations, led by UK Power Networks. Ofgem awarded the project funding of £3.32 million, under the Low Carbon Networks Fund (LCNF) competition scheme. UK Power Networks contributed an additional £0.8m to the project, which UK Power Networks social commitment in supporting our most vulnerable customers and the communities in which we operate.

[1] Note the estimated number of fuel poor has changed from 4.5 million (2011, DECC) at the time of the full bid submission to 3.5 million, based on combining the most recent data for England (Fuel Poverty Detailed Tables 2016, BEIS), Wales (Welsh Government Fuel Poverty Website), Scotland (Scottish House Condition Survey: 2016 Key Findings) and Northern Ireland (House Condition Survey 2016).

2. Executive summary

The transition to a low-carbon energy system, largely achieved via the electrification of transport and heating impacts both households, through higher energy bills, and DNOs, that need to incorporate higher (peak) loads into the distribution grids. Customers with the potential to be hit hardest include the 3.5 million fuel poor in the UK (2016)[1] of which a significant number are also vulnerable in some way.

The VCEE project, also known as **energy**wise, was started in 2014 to assess to which extent smart meters, energy efficiency technology and variable pricing could be leveraged to develop incentives and propositions that help fuel-poor households manage their energy use and bills while simultaneously providing DNOs peak load reduction opportunities that allow deferral of grid reinforcements.

The project budget was £5.49m, with £3.32m secured from Tier 2 funding under the Low Carbon Networks Fund (LCNF). The remaining funding was provided by UK Power Networks (£0.8m) and its project partners (£1.24m). The project partners included British Gas in the role of energy supplier and University College London (UCL) as research partner. For the full list of partners see Appendix D: Project Partners.

2.1 Scope and objectives

The overarching aim of **energy**wise was to understand the requirements of the fuel poor customers and explore the means to encourage their increased participation in energy efficiency and in variable tariffs. Such participation will have the effect of suppressing network loads and shifting part of their energy usage away from peak demand periods. The project's six core objectives were to research and build evidence-based learning on:

- How to identify and use existing trusted social resources to effectively engage fuel-poor customers.
- The amount of energy savings (in energy and monetary terms) arising from a set of intervention measures.
- The amount of energy shifting arising from a package of intervention.
- The impact on network reinforcement from reduction or shift in energy consumption.
- Improved demand profiling for these customers.
- What engagement material and communications channels were effective in reinforcing and supporting their behaviour.

2.2 Project outcomes

The project designed and executed two successful trials:

- Trail 1 identified the magnitude of energy savings and the impact on the electricity network when customers have access to smart metering solutions, affordable energy saving devices and energy saving advice. Participants saved an average of £14 annually and reduced their consumption by an average 3.3%[2]. These savings translate to an average reduction of 23W during the evening peak window (17:00 – 22:30), which represents about a 5.2% reduction in average evening peak demand per household and reflects the capacity for meaningful engagement with energy savings by the trial participants.
- Trial 2 focused on encouraging customers to shift their electricity use at certain times through Time of Use tariffs/rebates. The ToU tariff achieved a 2.2% reduction in evening peak demand but also a 22.2% increase in the weekend peak and yielded an average saving of £6.24 per year. The Critical Peak Rebate scheme earned customers rebates ranging from £3 to £111 per year, with the average rebate comprising £37 per year.

[2] Calculated by comparing the reduction of electricity consumption between an intervention group and a control group of residents. The result is statistically significant at the level set out in the full bid submission (0.75 statistical power level for differentiating between the intervention and control group).

In terms of potential replication, if the **energy**wise Trial 1 energy savings and Trial 2 Bonus Time peak reductions were realised by all households classified as fuel poor within the UK Power Networks licence areas, an estimated annual reduction in electricity consumption of 86 GWh could be achieved in total (enough to provide electricity to more than 21,000 homes over a year) and a network peak reduction of 27 MW[3].

The trials were supported by surveys to provide insight into many variables relating to participants' demographic information, ownership of energy-consuming devices and data collection on where participants find (trusted sources of) energy-related information.

2.3 Project performance

The project delivered evidence-based key learnings on how energy and monetary savings from smart meters, energy efficiency devices and advanced tariff structures can simultaneously benefit fuel-poor customers and DNOs. The project satisfied all of the original aims and objectives as listed in the Full Submission bid and all six SDRCs described in the Final Project Direction were delivered successfully. Performance against the aims, objectives and SDRCs is summarised in Section 5.

2.4 Project learning

From the project, three insights emerged that can contribute to future innovation projects effectiveness and impact.

- Contracts between project partners can have a material impact on trial designs and execution, e.g. when it comes to data availability. It is therefore strongly recommended to finalise the contractual arrangements between contract partners before the actual start of the project.
- To ensure statistically significant results in innovation projects that rely on a low number of participants, care should be taken to deploy only mature, proven technical equipment as technical equipment issues and can negatively impact trial participant retention and limit data collection.
- Multi-year innovation projects should be designed to be able to easily incorporate changing external circumstances that are so characteristic of the energy transition. This ensures their learnings will be robust against such changes and maximises their impact and relevancy.

2.5 Method learning

The project has produced an extensive set of learnings that can be found in Appendix of SDRC 9.6. The key learnings from the method related to the following topics:

- **Identifying eligible participants** – use proxies when data sources are unavailable and relax constraints when initially selecting potential trial participants to be able to accommodate a high number of drop-outs after sign-up.
- **Data quality and information security** – a consortium of many, very different partners requires close collaboration and project-specific information security policies.
- **Ensuring effective recruitment** – effective recruitment is labour-intensive and benefits strongly from using locally based field officers with knowledge of local culture and languages.
- **Ensuring effective installation** – information sharing and coordination between all involved parties and taking into account locally relevant festivals or traditions boosts success rates.
- **Minimising dropouts and ensuring effective ongoing engagement** – continuous clear and positive messaging as well as minimising unexpected customer interactions improves customer retention rates.

[3] It is important to note that for electricity networks to realise these potential benefits of load reduction, the fall in energy usage has to come in the same geographical areas where network investment is required. The potential to support the electricity distribution networks will also depend on customer uptake of the energy measures and on customer's ability to learn and maintain good habits about energy efficiency over time.

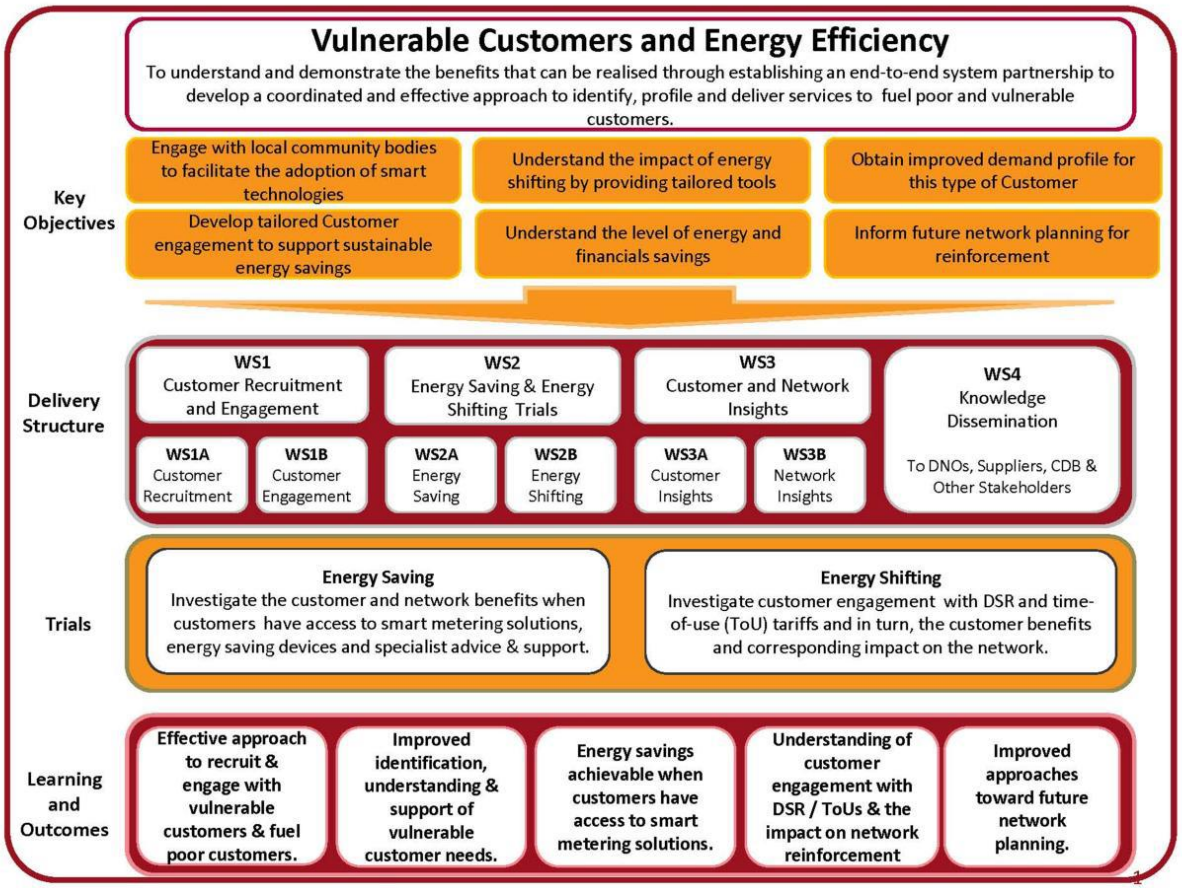
3. Details of the work carried out

3.1 Project structure and governance

3.1.1 Project structure

Complex multi-partner innovation projects like **energy**wise require a well-thought-out structure that is geared towards the project achieving its objectives in a controlled, predicable way. The **energy**wise project structure is presented Figure 1. The project has been broken down into four delivery workstreams which are described briefly below.

Figure 1: energywise project structure. For a brief description of the workstreams see the main text.



- **Workstream 1: Customer Recruitment and Engagement** – This workstream has been responsible for recruiting trial participants on to the project trials and sustaining their engagement throughout.
- **Workstream 2: Energy Savings & Energy Shifting Trials** – This workstream has been responsible for the technical design and implementation of the Energy Saving and Energy Shifting trials.
- **Workstream 3: Customer and Network Insights** – This workstream has been responsible for the development of qualitative and quantitative research methods that enabled the project to gain insights of the impact of the trials' intervention measures on customer behaviour and potential to reduce peak demand on the network.
- **Workstream 4: Knowledge Dissemination** – The project featured a dedicated workstream focussed on knowledge dissemination to ensure the provision of appropriate and reliable information

to stakeholders, with the most appropriate methods and channels to maximise the effectiveness of dissemination activity and clear and consistent messaging provided to all audiences.

The remainder of this section predominantly reports on activities carried out in workstreams 1-3. The activities from workstream 4 are reported on in Section 12.

3.1.2 Governance model

The governance structure for the **energy**wise project covered three levels and two different streams, solution governance and project governance. This model facilitated a robust focus on identifying and developing the most effective solution, matched with an effective structure for delivering the solution to the project's time and cost constraints.

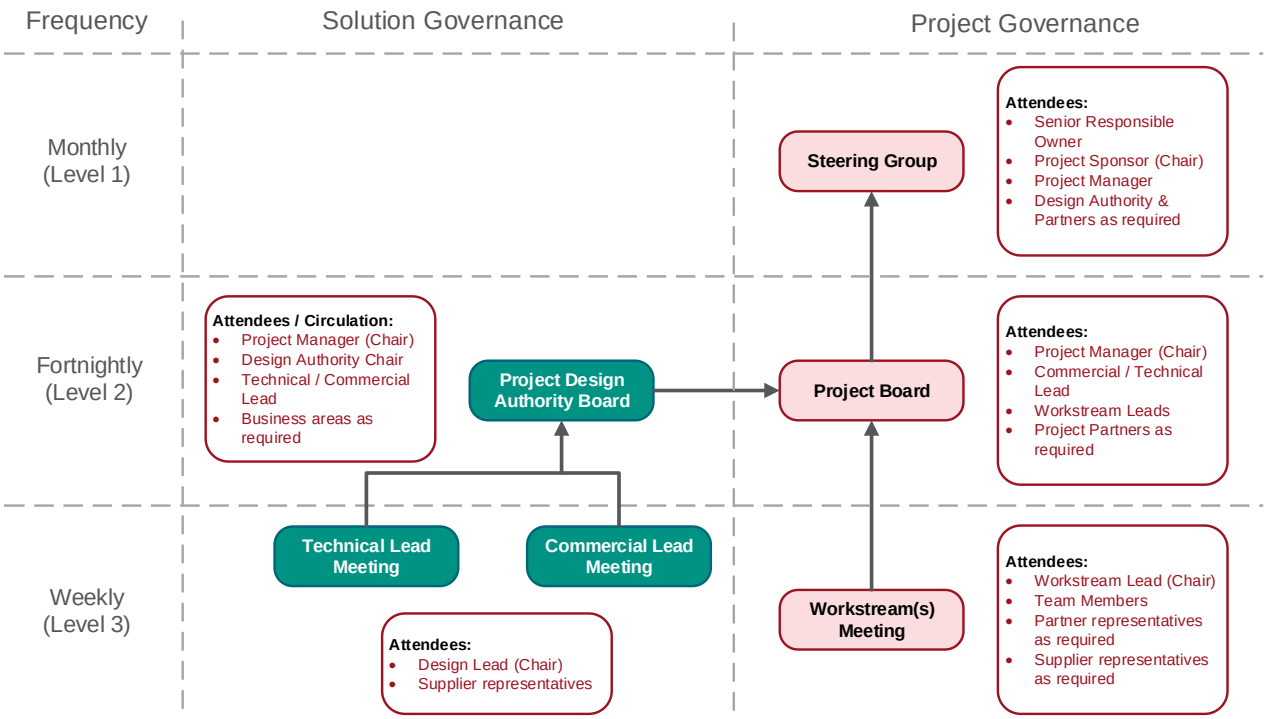
UK Power Networks' tried and tested project management and governance approach has been a vital ingredient for the delivery of **energy**wise within time and budget.

The structure is shown in Figure 2 and key roles and responsibilities are described:

- **Steering Group** – Responsible for setting the direction and guiding the **energy**wise project.
- **Project Board** – Responsible for the operational management of the project.
- **Workstream meeting** – Part of the operational management of the workstream
- **Project Design Authority Board** – Review and approve all key **energy**wise deliverables
- **Technical lead meeting** – Responsible for the technical design, architecture and implementation

For more information on the project structure, governance model, roles and responsibilities within the project please see the **energy**wise Project Handbook[4].

Figure 2: energywise project governance structure.



[4] Available on request.

3.2 Customer Recruitment

One of the objectives of the **energy**wise project was to recruit fuel poor customers through working with trusted local intermediaries who have a good understanding of the local area and culture. Fuel poverty is a complicated and ill-defined concept reliant on many modelling assumptions about the construction of the properties, technology performance (e.g. boiler efficiency) and occupant behaviour. It also requires knowledge of the household income. In the absence of knowing the full details of a household's income, housing quality, energy behaviour and energy costs in advance, proxies must be used to identify the fuel poor.

Prior to UK Power Networks' LCNF bid submission, CAG Consultants, on behalf of UK Power Networks, researched best practice in terms of recruiting and engaging fuel poor households, through undertaking a literature review, interviewing selected project partners, suppliers and critical friends (University College London, National Energy Action, Institute for Sustainability and British Red Cross) and identifying key lessons from other LCNF funded projects, to inform the engagement strategy with the targeted population.

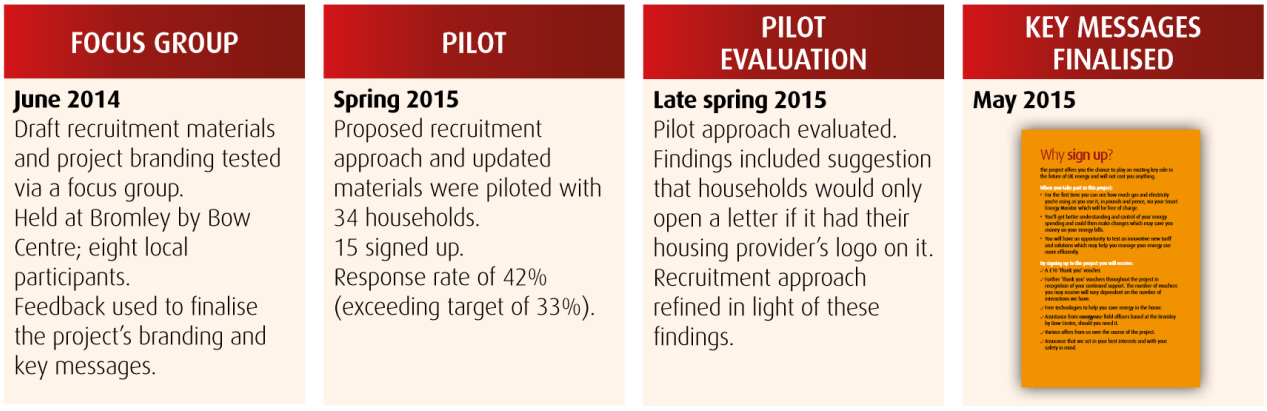
A set of inclusion criteria (British Gas customers who are also social tenants of Poplar HARCA or Tower Hamlets Homes and who live in a relatively inefficient property with Energy Performance Certificate band C or below[5]) was used to define the target group of potential trial participants.

The project subsequently applied a set of exclusion criteria aiming to exclude potential participants due to technical/technological and other constraints including, but not limited to households in dwellings that have had recent energy efficiency improvements, households for which British Gas does not have annualised electricity consumption data for the year before the start of Trial 1 and households that were deemed too vulnerable.

The intention was to identify 1,650 eligible participants to invite them to take part, assuming a 33% consent rate, thus reaching a trial size of 550 participants which was deemed necessary for statistical significance.

Recruitment materials were prepared in preparation of the actual recruitment process as summarised in Figure 3. Prior to the main project trials, a pilot study was undertaken with 36 eligible households to test recruitment strategy and material, operational processes and test the developed 'Home' and 'Social Capital' surveys.

Figure 3: Preparing for recruitment



[5] Changed from D or below during the execution phase, see also Section 6.2.

Recruitment for Trial 1

Best practice indicates that, for this target audience, face to face recruitment is the most effective. Therefore, once an invitation letter had been sent out (hand addressed, with a postage stamp rather than franking to encourage opening), the Customer Field Officers (CFOs) went out to knock on the doors of invited householders, with a view to encouraging them to sign up to the project. The recruiting process used CFOs, intermediaries with strong local and cultural connections to the target audience, to be the contact for participants, and the 'face' of the project and specialist recruiters to help sign-up participants within the required timeframe. Customers signing up received a Welcome Pack with a £10 voucher and were randomly allocated to either the Control or Intervention group.

Figure 4: Customer Field Officers.

Recruitment for Trial 2

The recruitment strategy for Trial 2 incorporated learnings from Trial 1 recruitment including streamlining the installation process to reduce the number of customer interactions, increased operational management of phase and offering extra Saturday appointments to enable installations to be completed within a relatively short period of time.

To take part in the Trial, credit customers had to provide consent to switching to the HomeEnergy FreeTime tariff and prepayment customers had to provide consent to receiving the Bonus Time notifications. Trial 2 participants were recruited from existing active Trial 1 participants. The recruitment for
Trial 2 commenced in December 2016 and was completed in March 2017. Recruitment was led by British Gas and Bromley by Bow Centre.

Prior to the start of the recruitment phone calls, some 'warm-up' marketing was carried out with the objective of increasing the likelihood of participants being receptive to taking part in Trial 2. Once participants consented to taking part in Trial 2, they were sent a Welcome Letter and a £10 Love2Shop voucher as a thank you for their ongoing involvement in the project.

3.3 Customer Engagement

3.3.1 Equipment installation

For Trial 1, British Gas installed smart meters with Smart Energy Displays into all credit and prepayment intervention group customer properties, and credit smart meters without Smart Energy Display into credit

control group households. Prepayment control group households had a Navetas loop monitor installed by British Gas's subcontractor, PassivSystems.

The majority of participants received two install visits, one from British Gas (for the smart meter install) and another from PassivSystems (for the temperature monitoring equipment), plus a third visit from the CFOs to carry out an energy survey (all participants) and deliver the energy efficiency devices (the Intervention group).

Before the start of Trial 2, British Gas visited control group customers who had signed up to Trial 2 (DSR active and non-active) to complete all smart meter installations. Customers were made aware of the installation and why it was happening; this was explained to them over the phone when they gave verbal consent to switch to the tariff and their appointment date is booked. When jobs were booked with the customer, landlords were notified of this at least 72 hours in advance so they could arrange for the caretaker visit for same time. The CFO team completed the delivery of the energy efficiency devices to control group ahead of Trial 2.

3.3.2 Ongoing engagement

Key to the success of the project was the ongoing engagement of participants throughout the duration of **energy**wise, to minimise dropout rates, whilst also improving participants' experience of the project and maximising their uptake of the energy efficiency and shifting interventions. The key mechanisms to achieve this are discussed below.

Participant panels

Two participant panels have been established, one for each group (Trial 1) or each meter type (Trial 2), which met regularly over the course of the project. The purpose of these panels was to provide a structure for participant feedback and a sounding board for participant views. Each panel had 6-8 participants.
Information on applying to join the panels was contained in the welcome pack and the project team actively targeted selected participants to ensure that the membership generally reflected the geographical spread and demographic makeup of the research participants. Participants were offered £30 in vouchers for each panel attended, as a thank you for their time. Panel meetings were initially run by facilitators from CAG Consultants, with this role being successfully handed over in early 2017 to the CFO Manager at the Bromley by Bow Centre. An attending researcher from University College London reported back the participant feedback and actions required from the wider project team.

Newsletters

Regular newsletters were sent approximately every three months, starting in September 2016, to all participants with different versions for different groups. The purpose of the newsletters was to keep participants informed about project progress and to provide additional information identified by the participant panels as being beneficial to participants. The last newsletter was sent out in March 2018.

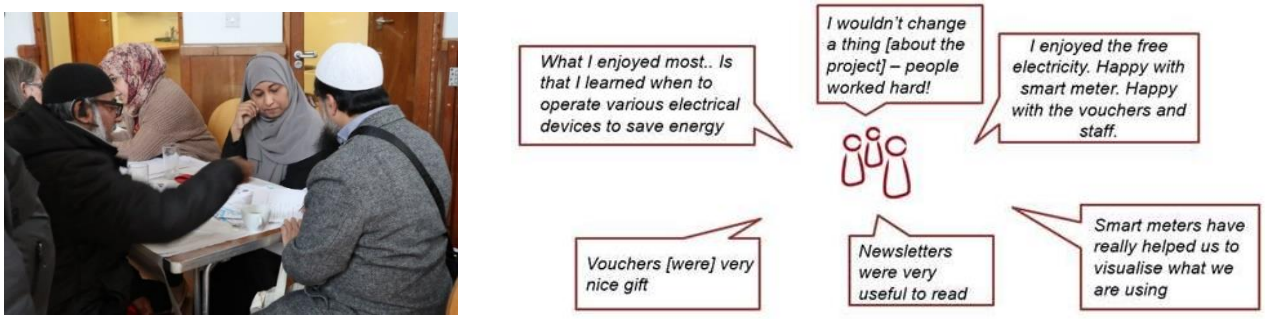
Thank You letter

A Thank You letter was sent to all active participants together with a £10 voucher in May 2016. This letter was both in response to the disruption from the temperature monitoring equipment and in response to the fact that those participants who were first to be recruited had not had any contact from the project for several months. This was due to the original project design which suggested that control group not receive any intervention and receive overall limited contact to avoid 'contamination'.

Decommissioning

The decommissioning activities consisted of the removal of the temperature monitoring equipment from the participants home as well as removal of the Siemens MDU solution[6]. Smart meter equipment was left in place and energy efficiency devices were gifted to the participants. Participants were sent clear communication about the process for the end of the project with a timeline provided as part of the end of project newsletter. Equipment was only collected from around half of participants; others no longer had the equipment or failed to respond to calls to schedule appointments. Decommissioning work was concluded in June 2018 after the Bromley by Bow Centre confirmed the remaining equipment was collected. The decommissioning letter which was posted to trial participants in March 2018 stated that **energy**wise accepts responsibility and liability of the kit only up to 31 March 2018.

Figure 5: Participants at the Thank You events and their captured feedback



Thank You event

Two separate Thank You events were organised on Saturday 28 April 2018 at the Bromley by Bow Centre: a morning event for prepayment customers and an afternoon event for credit customers. It was decided to have two events, split by meter type rather than group, as these participants had different customer journeys and received different tariff offerings (whereas the Intervention and Control groups were merged together for Trial 2). This ensured that participants' discussions and project learning remained focused around the type of tariff experienced by participants and helped to avoid confusion. In total 40 people attended these events. Positive feedback was captured during both events, see Figure 5. See also Section 12.4 for details on the customer learning event that was organised with the Thank You event.

3.4 Energy Saving Trial

Trial 1 was the first of the two **energy**wise trials conducted within Tower Hamlets and it focused on energy saving. The aim of Trial 1 was to identify the magnitude of energy savings and the impact on the electricity network when customers have access to smart metering solutions, affordable energy saving devices and energy saving advice. The trial featured an Intervention and a Control group, with random allocation of participants between groups. A package of interventions (see Figure 6) was provided to an 'intervention group' against a 'control group' that did not have access to them, as per the requirements of a randomised control trial.

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 and was completed in November, see Table 1 for details. A feathered-in approach was chosen where individual trial start dates were determined by the first successful meter read after installation. This approach maximised the amount of captured data and better matched the customer compared to a synchronised trial start after completing the installation for the entire intervention group.

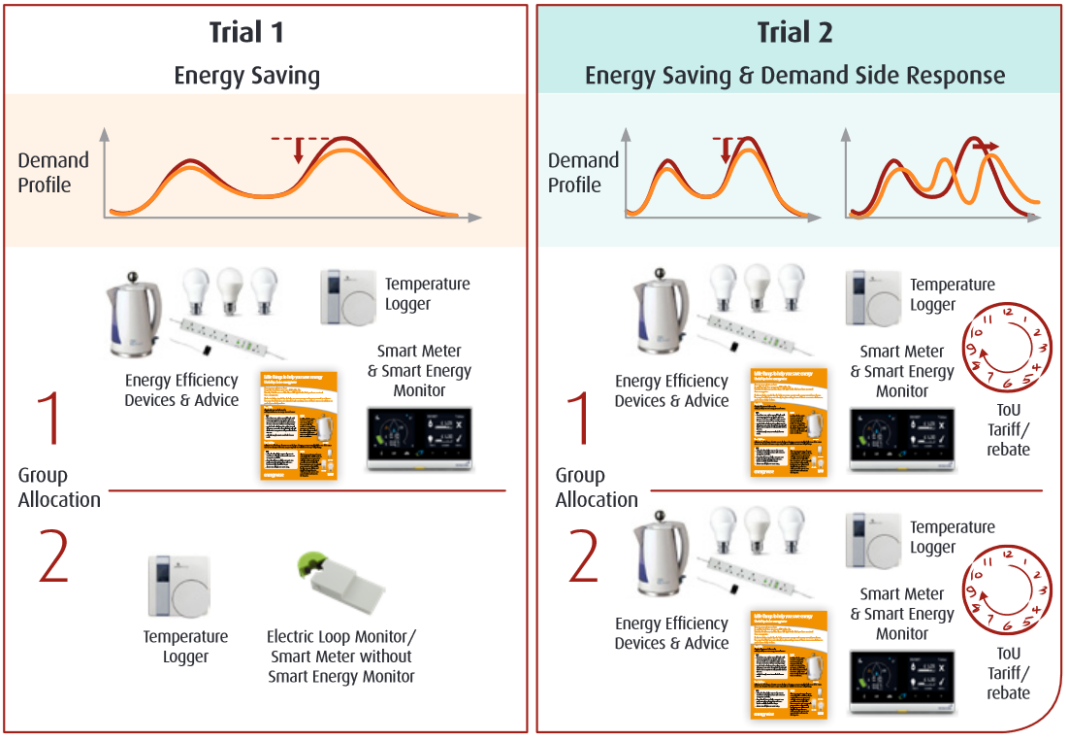
[6] The Smart Meters of the participants connected via the MDU were no longer operational as a result of this.

Table 1: Cumulative installs and trial starts for energy savings trial equipment.

Month	May	June	July	Aug.	Sept.	Oct.	Nov.
Cumulative installs	10	29	103	142	222	278	284

Control group participants 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.

Figure 6: Interventions and installations for both groups in both trials.



In January 2016, British Gas identified an error within the technical configuration of the head end system affecting half-hourly meter readings for 48% of the project's smart meter credit installations. This issue was rectified in February 2016 with the half-hourly data from credit smart meters being successfully returned to the read repository since then. While this had no impact on the assessment of the energy saving analysis that is based on daily reads, it had an impact on the network modelling and benefit assessment for the Trial 1 winter period. To complete the 12-months of data capture of credit customers' half-hourly data and carry out the associated network modelling, Trial 1 was therefore extended until 14 February 2017.

A similar defect affected all 65 smart prepayment meters installed in the project, which equated to 52% of the project's total prepayment meters. Following an investigation with British Gas' meter manufacturer and the head end service provider, the root cause was identified, and a solution was successfully developed. This solution was delivered at the end of 2016 and allowed transfer of half-hourly consumption data along with the daily consumption data from **energy**wise participants equipped with prepayment smart meters. As the historical data could not be recovered, the half-hourly data of customers with smart prepayment meters are missing for Trial 1.

The data collected for analysis at the end of the energy savings trial is summarised in Table 2.

Table 2: Summary of electricity usage data captured during Trial 1.

Meter type	Readings	Available data at the end of the trial
Smart meter	Daily Reads	• Daily smart meter data for 284 participants, after correcting for dropouts and faulty readings 241 meters provided data suitable for further analysis. • 124,484 valid daily read records from active participants • The fulfilment rate (valid daily reads received/possible daily reads) was approximately 92%
	Half-Hourly Reads	• After applying a fix for technical issues with some smart meters in February data being has been recorded from 186 active participants (with 182 participants still active in Feb 2017). • 3,974,595 half-hourly read records from active participants. • The fulfilment rate (HH reads received/possible HH reads) is approximately 95%
Navetas electric loops	Quarter-Hourly Reads	• Approximately 45 participants (prepayment customers in the control group) have their electricity consumption recorded by Navetas Loop Sensors • After dropouts, 30 participants were eligible for inclusion in the analysis.

3.5 Energy Shifting Trial

Trial 2, the Energy Shifting Trial, focused on DSR which involves customers being encouraged to lower or shift their electricity use at certain times through various methods (e.g. financial incentives). Different tariffs and rebates were offered to credit and pre-payment customers. Trial 2 participants were recruited from existing **energy**wise participants.

Prepayment customers were offered Bonus Time, a dynamic non-punitive Critical Peak Rebate designed specifically for **energy**wise. Under this programme, customers who reduced/shifted electricity consumption during predefined periods (DSR events) were rewarded with monetary rebates. The price for electricity during these periods remained the same but the customer was rewarded a credit of 10 units for every unit of energy reduction in consumption relative to the consumption recorded in previous 'equivalent days' (see Figure 7).

Figure 7: Bonus Time

Credit customers were offered a static free time ToU tariff. This non-punitive tariff offered the smart credit metered customers free electricity on Saturdays or Sundays between 09:00-17:00 (Figure 8). Compared to the HomeEnergy FreeTime offers commercially available, the tariff did not have exit fees, was available also to customers that are on paper billing and to those who are supplied gas by another supplier, to ensure that all the **energy**wise participants could benefit from it.

Figure 8: HomeEnergy FreeTime

Prior to the start of Trial 2, all active participants were invited to take part by either:

- Agreeing to receive Bonus Time notifications (prepayment customers); or
- Agreeing to switch to the HomeEnergy FreeTime (HEFT) tariff (credit customers).

Customers not wishing to do this remained **energy**wise participants (provided they either already had or agreed to have a smart meter installed), but they were not active in the Energy Shifting Trial.

The recruitment for Trial 2 commenced in December 2016 and was completed in March 2017. Half-hourly smart meter data of each participant was collected from April 2017 to March 2018 inclusive. The smart meter data was stored in the British Gas reading repository, some basic processing was carried out, then the data was transferred to University College London and Element Energy every month for further data cleaning and analysis and calculation of monthly rebates. The data was analysed on a monthly basis over the course of the trial. Checks were implemented that revealed erroneous data which did not accurately represent customer behaviour.

Bonus Time analysis focused on how much a household reduced their electricity, expressed in Wh per event. This is determined against a hypothetical baseline derived from historic customer data. The analysis is limited to weekday evening Bonus Time events of six hours' duration since these are particularly relevant from a peak demand perspective and hence were the most frequently tested event timeslot to ensure a sufficiently large sample size for appropriate impact analysis. The weekday evening events (17:00 – 23:00) accounted for 52 of the total 66 Bonus Time events that took place across the 12 months of the trial.

HomeEnergy FreeTime analysis looked at the kWh per week shifted from the paid period into the free period. In a similar manner to the Bonus Time calculation, it was necessary to make a prediction of the counterfactual electricity consumption in the absence of the HEFT tariff to ascertain shifting. A reference year (April 2016-March 2017) was used as a baseline, correcting for autonomous changes in consumption, due to e.g. change in behaviour and/or more energy efficient devices, derived from the change in consumption during paid periods compared to the reference year.

3.6 Customer Insights

3.6.1 Home Energy Survey

A Home Energy Survey (HES) was conducted to provide insight into many variables relating to ownership of energy-consuming devices (e.g. wet and cold appliances and white goods, TVs, computing, lighting, etc.) and socio-demographic variables relating to the household (e.g. household size, ethnicity, primary language, income).

95% of HES were completed with CFOs assisting participants (e.g. counting lightbulbs, identifying appliance-types) with completion of the survey during visits to participants' homes in the installation phase of the project. A small number of surveys (5%) were left with participants for self-completion.
A total of 341 HES have been returned to the project. The analysis used a dataset from 31 January 2016 and used 278 surveys eligible for inclusion in the analysis with 138 in the control group and 140 in the intervention group.

3.6.2 Energy Social Capital in the trial area

Energy Social Capital (ESC) is defined as the information resources related to household energy use embedded in social networks (see McMichael 2011[7]). ESC is measured through collecting data on:

- Where participants find energy efficiency information;
- Which personal (and non-personal) sources they use to find information; and
- Who participants trust for advice on energy.

In the **energy**wise project this data was collected through a short self-completion survey designed for the project. Additional insights on trusted networks have been collected through a process of local stakeholder engagement.

[7] McMichael, M. (2011) Social capital and the diffusion of energy-reducing innovations in UK households. University College London Energy Institute, Bartlett School of Graduate Studies. London, University College London. PhD: 280.

energywise participants received three Energy Social Capital surveys during the project. The first survey (ESC1) was administered at the beginning of Trial 1. The second (ESC2) and third (ESC3) were administered at the beginning and close to the end of Trial 2, respectively. The purpose of these iterations was to:

a) investigate changes over time in participants' ESC resources and how they are used;
b) investigate perceptions of the project overall and how these have changed over time;
c) generate additional insights on participants' Energy Social Capital; and
d) follow up on additional questions raised in ESC2 such as knowledge of Priority Services Register.

The ESC response rates are shown in Table 3 below.

Table 3: Summary of ESC response rates.

Survey	Sent	Received	Left project	Analysed	Control	Intervention
ESC1	526	209	30	179	92	87
ESC2	310	141	5	136	63	73
ESC3	265	110	0	110	105[8]	5[9]

3.6.3 Case studies

University College London has created a series of nine case studies based on qualitative data from participants interviews. The case studies can be used by different stakeholders (e.g. DNOs, energy companies, housing providers or fuel poverty non-governmental organisations) to communicate key project learnings to their different audiences and are published in a report on the **energy**wise website.

3.7 Network Insights

As one of the ways to model future loads across its three licence areas, UK Power Networks makes use of a load forecasting scenario tool developed by Element Energy that is specific to their network structure and is capable of forecasting load growth resolved to the level of individual distribution substations. The Element Energy Load Growth (EELG) model combines detailed data on the mix of domestic properties and business types, resolved to postcode sector level, with an accurate representation of the networks, in terms of the locations and connectivity of assets, in each licence area. This allows the load connected to each substation to be modelled on the basis of a highly resolved understanding of the customer mix. The EELG model also incorporates a comprehensive set of scenarios informed by a combination of historical trends, government projections and Element Energy's modelling of the uptake of energy efficiency measures and low carbon technologies.

The EELG model is regularly updated to incorporate new network, consumer and trial datasets as they become available as well as to account for changes in the economy, government policies and the cost and performance of various technologies. For the **energy**wise project, the EELG model was further modified to also address fuel poor household archetypes in the domestic sector.

The appliance ownership data obtained from the household surveys conducted in the **energy**wise project was also applied to the appliance ownership characteristics of the fuel poor consumer archetypes in the EELG model. Based on these model additions, it was possible for UK Power Networks to integrate additional visibility and understanding of fuel poor customers, and how they respond to energy saving and demand shifting interventions, into its network planning processes where appropriate.

[8] DSR active
[9] DSR inactive

To understand how network loads are impacted by fuel poor customers and their engagement with energy efficiency and demand shifting interventions, the average demand profiles of **energy**wise trial participants were compared with the network load at the secondary and primary substations that the trial participants were connected to. Primary and secondary substations are key nodes on the electricity distribution network at which network voltages are transformed.

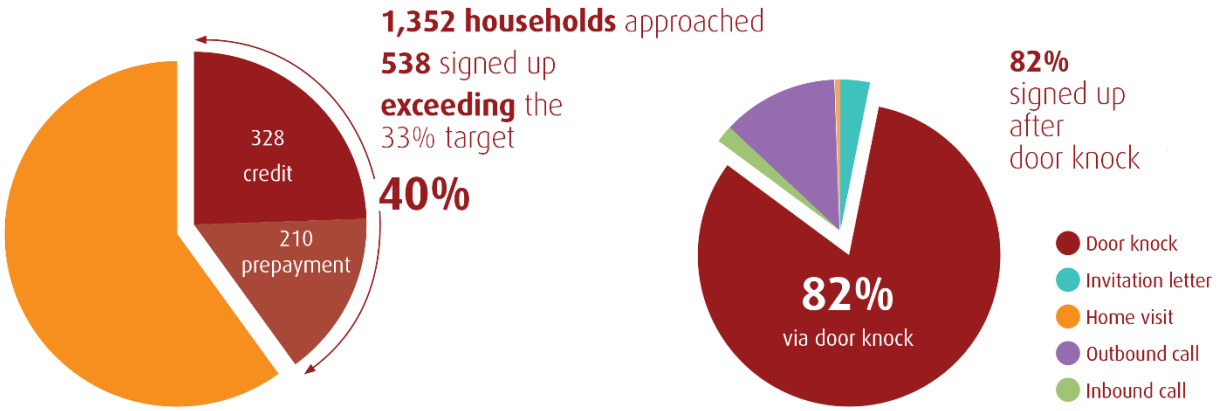
111 secondary substations were identified within the trial area associated with all the 538 recruited households, which are connected to seven different primary substations. Screening out any customer drop-outs by the end of Trial 1 and 2, active participants were connected to 81 and 60 secondary substations, respectively, out of the 111 identified secondary substations in the trial area. Half-hourly load data has been extracted from all monitored secondary (kW) and seven primary substations (MW) from May 2015 onwards and datasets have been transferred to Element Energy to perform the network modelling and subsequent network impact analysis of both trials.

4. Project outcomes

4.1 Customer Recruitment

Customer recruitment for both trials was successful, yielding sufficient participants to ensure external validity of the results. The local field officer approach was very successful in ensuring inclusive recruitment, resulting in a diverse mix of participants. Many participants said that the invitation letter was an important precursor to this, but not enough on its own to persuade them to sign up. Most participants said that it was talking to the CFOs when they visited that persuaded them to take part. Most felt the recruitment materials were well designed and easy to understand and gave positive feedback on the CFO team (friendly, professional and persuasive). A high proportion of participants were Bangladeshi; many of this cohort appreciated being able to speak to the CFOs in their main language (Bengali), and others stated that they felt most comfortable when the door-knocking team included a woman. Figure 9 and Figure 10 show the results of the recruitment for Trials 1 and 2, respectively.

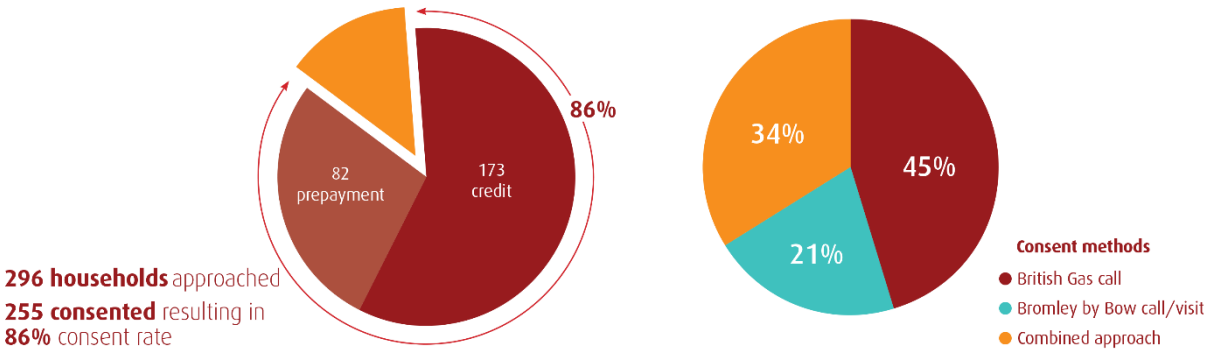
Figure 9: Recruitment results for Trial 1



The recruitment approach for Trial 2 built on learnings from the Trial 2 recruitment process for example in terms of coordination of activities (with a daily call between key partners) and in terms of the best time of day to call (after 10am and avoiding the afternoon school run). This resulted in a smoother recruitment process.

Because of the CFO's excellent knowledge of the project's participants obtained during Trial 1, the recruitment approach could for Trial 2 be tailored to the participant (for example phoning or door knocking at

Figure 10: Recruitment results for Trial 2



times of day the participant was most likely to be in). A high proportion of participants – 86% – signed up to take part in trial 2 (with similar levels for the two different offers), showing that the two propositions were well received and the project's ability to quickly incorporate learning for previous project stages.

4.2 Customer Engagement

The project has experienced a higher number of participants dropping out than was envisaged; it is important to understand the reasons for this in order to inform future projects and options for improving the project's engagement strategy. An ongoing programme of engagement, as described in Section 3.3.2, was designed to minimise the numbers of participants opting to leave the project before its completion. Nevertheless, 128 participants changed their mind about wanting to be in the project and 145 were disengaged by the project. A breakdown of the reasons why participants dropped out is provided in Table 4.

Table 4: Participant drop-outs

Top reasons for participants leaving the project	Top reasons for disengagement by the project
1. Changed their mind about wanting to be in the project or wanting a smart meter 2. Perceived hassle of installation process	1. Changed supplier or moved house, becoming ineligible 2. Technical problems with install, e.g. meter was inaccessible, or a signal could not be established 3. Customer failed to respond to requests for install appointment or did not provide access at time of appointment

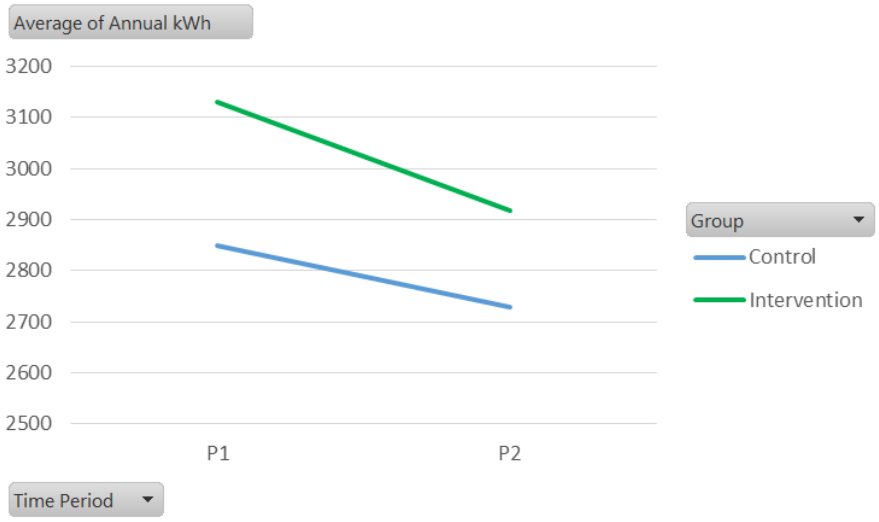
4.3 Energy Savings Trial

The project successfully completed the Energy Savings Trial (Trial 1) which involved the installation of smart meters in participants' homes, as well as the provision of energy efficiency devices and advice (LED lightbulbs, an eco-kettle, a 'standby saver', and an energy efficiency advice leaflet). Electricity consumption in the intervention group was compared to consumption in the control group (who did not receive the intervention measures) to calculate energy savings.

The data collected during the trial was analyzed using the difference-in-difference method, a method that is designed for use where the two groups being compared do not have to have the same starting values. The method assesses whether the difference between the groups has changed over time and addresses main analytical challenges of the project and does so in a comparatively simple way.

The method is illustrated in Figure 11 that shows that both groups reduced their energy consumption during the trial. This aligns with the UK trend over the previous decade of year on year reduction in domestic energy consumption. However, the relative gradient of the lines clearly show that the intervention group has reduced electricity consumption more than control group.

Figure 11: graph showing the pre-trial (P1) and in-trial (P2) annual electricity consumption (kWh) by Group.



From the analysis, the following key results for participants were obtained:

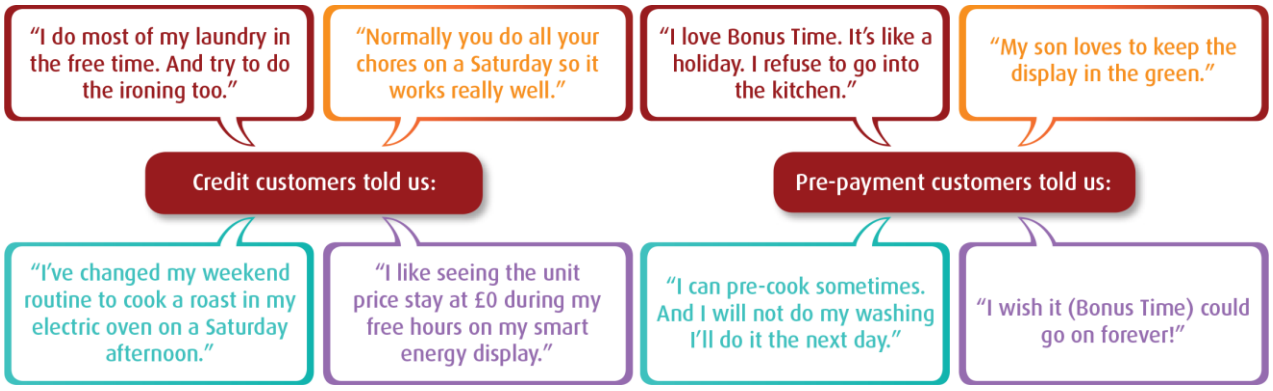
- Participants reduced their energy consumption by an average of 3.3%[10] (including both meter types), corresponding to average annual savings of £14 per household.
- Additionally, participants with prepayment meters benefited from easier top-up options.

4.4 Energy Shifting Trial

The Energy Shifting Trial (Trial 2) focused on encouraging customers to shift their electricity use at certain times through Time of Use tariffs/rebates. The trial was successfully completed by the project in March 2018.

The shifting advice was well received with feedback that this is useful in helping participants to respond to price signals and change their behavior, see Figure 12 for specific feedback comments.

Figure 12: Feedback from participants on the energy shifting propositions.



[10] This is statistically significant at the level set out in the project bid and in line with the national average for households with smart meters.

The evaluation of the two energy shifting intervention types (Bonus Time and HEFT) used different metrics of 'shifting' and required different methods to calculate each participant's response. Both methods were devised to enable per-household responses to be ascertained solely using historic data from the household in question, without the need for other participants or a control group: as part of the trial design, it was decided for participant equity reasons that in Trial 2 all participants should receive the advantages of the energy saving and energy shifting interventions. Therefore, an analysis needed to be made by comparing pre and post intervention data for the same participant.

From the analysis the following key results were derived:

Critical Peak Rebate (Bonus Time) results

- Customers earned on average £37 per year, witch rebates ranging from £3 to £111 per year, by shifting on average 7 Wh per Bonus Time event.
- The top 10% of households achieved average demand reductions of 18.7%.

Static Time of Use Tariff (HomeEnergy FreeTime) results

- Customers achieved average annual savings of £6.24 per year by shifting on average 0.92 kWh per week into the free time.
- The top 10% of households achieved average savings of £33 per year, with savings ranging from £0 to £52 per year
- These results refer to energy shifted out of the paid time into the free time. In addition, participants enjoyed the benefits of higher energy use in the free time period.
- The highest shifting from the paid to the free time was 8 kWh per week.

Note that fuel arbitraging was observed to a limited extent by static ToU participants, where electric cooking or heating equipment was used during Free Time, instead of gas-fired alternatives that would normally be used. This form of comfort taking could increase household energy consumption if participants continued to use more electricity outside the free hours, or after the end of the tariff. Also, CO_2 emissions can decrease (electricity from clean, renewable sources) or increase (current fuel mix for generating electricity).

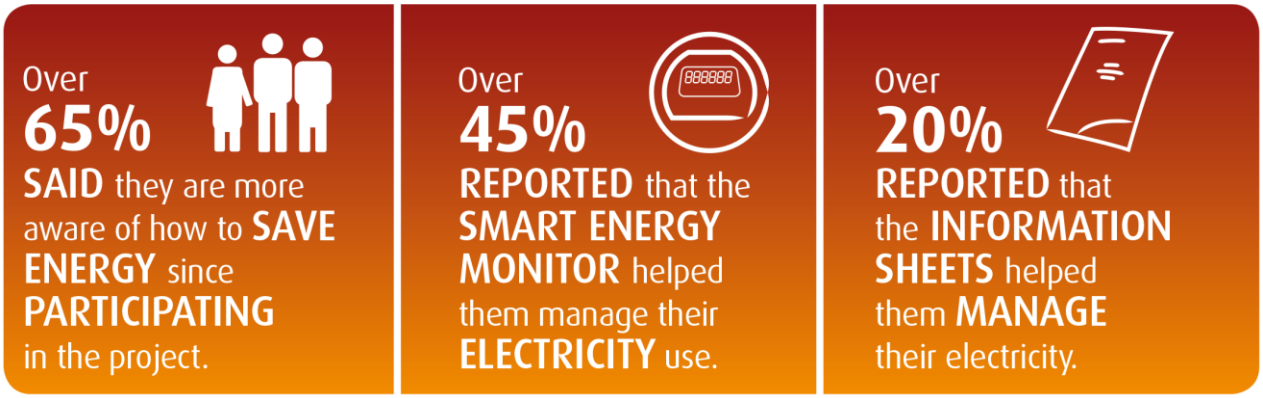
4.5 Customer Insights

The HES and ESC surveys that were conducted during the project greatly contributed to its success by providing valuable data and insights that were used in the trial data analysis, network modelling and in assessing the project's impacts across both trials.

- Energy social capital has increased over the course of the **energy**wise project
- Participants were very satisfied with the project and felt it has benefited them
- The number of people stating they had at least one person to ask about various energy saving and shifting issues increased throughout the project to 90%
- Family members were most frequently identified as suitable to ask for advice
- After the shifting trial, more conversations were reported about shifting the times at which energy is used.

The key findings from the ESC Survey are summarized in Figure 13.

Figure 13: Key findings from the final ESC Survey.



The project has examined qualitatively how participants use energy. Participants' attitudes and behaviours towards energy saving during Trial 1 and 2 of the project can be summarised as fitting one of three modes:

- Those who feel that they were already energy conscious and the project has not had a big impact on their energy saving habits.
- Those who feel the project has helped them understand more about electricity use in their homes and are actively taking steps to save.
- Those who feel confused about how electricity is used at home and how they can or are making savings.

4.6 Network Impacts

The **energy**wise interventions of Trial 1 achieved an average reduction in evening peak demand (taken to be between 17:00 to 22:30) of 23 W per household. This represents about a 5.2% reduction in average evening peak demand per household and reflects the capacity for meaningful engagement with energy savings by the trial participants.

To assess the impact of Trial 2 on the network the load profiles of the **energy**wise trial participants were compared to the network load profiles at the primary and secondary substations connected with Trial 2 of the **energy**wise project.

Critical Peak Rebate (Bonus Time) network impacts:

- The Bonus Time offering was associated with a 1.5% reduction in average weekday evening peak demand for all households involved in this trial.
- The level of reduction observed from different households varied considerably, with the best performing households (top 10%) achieving average demand reductions of 18.7% during Bonus Time events.
- Much of the Bonus Time demand reduction was concentrated in the first three hours of the six-hour weekday evening events most frequently tested (17:00-23:00). This front-loading of demand reduction aligned well with the average peak demand period (18:00-19:00) of the Bonus Time participants and the flexible nature of the Bonus Time approach means that events could easily be tailored to the specific peak time of each network asset.

Static Time of Use Tariff (HEFT) network impacts:

- The HEFT tariff was associated with an average 2.2% reduction in the weekday evening peak demand of the monitored households.

- This tariff was also associated with an average 22.2% increase in the peak demand for the weekend day containing the HEFT free period. This has important implications for local network assets.
- At high HEFT tariff uptake levels, analysis found that many of the secondary substations involved could be subject to an increase in peak demand centred around a new substation peak during the HEFT free period. This impact was less severe for higher voltage level assets (e.g. primary substations) in which the impact is less apparent due to the contribution of industrial and commercial loads at these voltage levels.

The project found that If the **energy**wise Trial 1 energy savings and Trial 2 Bonus Time peak reductions[11] were realised by all households classified as fuel poor within the UK Power Networks licence areas, an estimated **annual reduction in electricity consumption of 86 GWh** could be achieved in total and a **network peak reduction of 27 MW**.

[11] The Bonus Time impact on peak reduction was used rather than that of HomeEnergy FreeTime due to the potential creation of new secondary substation peak loads during the free electricity periods of the HomeEnergy FreeTime tariff. Please see SDRC 9.5 for further details.

5. Performance compared to original project aims, objectives and SDRCs

The project satisfied all its original aims and objectives as listed in the full submission bid. They are summarised in Section 5.1, respectively, and delivered all SDRCs as per the final Project Direction, as discussed in Section 5.2.

5.1 Project aims and objectives

Aim	Objective	Evidence	Status
Work closely with suppliers and community actors to better identify and assist these groups and explore synergies with existing obligations.	Identify and use existing trusted social resources to effectively engage fuel poor customers in the adoption and use of smart metering technologies.	The project successfully brought together a unique set of project partners, including a supplier, social housing landlords, local community actors and charitable bodies to work with and support fuel poor customers. The full list of partners and their roles in the project is documented in SDRC 9.1.	✓
• **Understand and develop the specific customer engagement measures required to ensure that fuel poor customers are effectively assisted as smart technology and energy saving and shifting devices evolve.** • **Explain and provide tools to these customers to ensure that they fully understand what they can do to reduce their energy consumption and energy bills.** • **Validate the current Priority Service Register (PSR) data and processes that rely on it.** • **Pro-actively identify how the quality and completeness of the PSR can be improved in the process of the low carbon transition.**	Assess what engagement material and communications channels are effective in reinforcing and supporting fuel poor customers' behaviour.	The project conducted a review of best practice for customer recruitment and engagement with households who may be struggling with fuel bills. The learnings from this were tested and refined in a pilot study. The review is described in Section 3 of SDRC 9.2. Moving from pilot to Trail 1 to Trial 2, communications means were continuously monitored and improved. For details see Sections 7 and 8 of SDRC 9.2 and Sections 4 to 6 of SDRC 9.4. PSR data was used to inform the vulnerability review and the risk assessment related to the temperature monitoring procedure and customer awareness of the PSR was surveyed as part of project and project outcomes were used to inform UK Power Networks' PSR team. See Section 3 of SDRC 9.5 for survey details.	✓

Aim	Objective	Evidence	Status
Realise the potential contributions and benefits of energy efficiency and load shifting from these domestic customer groups in a sustained manner to help DNO management of increasing and uncertain demands on the network.	Assess the amount of energy savings (in energy and monetary terms) arising from a set of intervention measures tailored to the specific resources and needs of the trial area community.	A successful 18-month energy efficiency trial was completed with 297 participants. The 161 participants in the intervention group were provided with a Smart Meter and In-Home Display as well as Energy Efficiency devices and advice to reduce energy consumption. The trial results are described in SDRC 9.3 and the Final Energy Savings Trial Report.	✓
	Assess the amount of energy shifting arising from a package of intervention measures tailored to the specific resources and needs of the trial area community; the impact on network reinforcement from reduction or shift in energy.	For the first time a Critical Peak Rebate scheme has been trialled in the UK with 255 participating households, two energy shifting proposition that required very different responses from participants were successfully tested. Energy and monetary savings as well as peak demand reductions were demonstrated and compared against the technical potential. See Sections 5-7 of SDRC 9.5 for details.	✓
Identify what opportunities there are for Time of Use tariffs and load shifting for this customer group, and hence what network reinforcement can be avoided.	Assess the impact on network reinforcement from reduction or shift in energy consumption;	Both trials showed sizeable peak reductions, demonstrating the viability of energy efficiency measures and demand shifting as a means to defer grid investments. Effects were quantified and extrapolated and documented in Section 7 of SDRC 9.5.	✓
Explore and understand the specific needs of fuel poor with regard to their energy usage.	Improve demand profiling for fuel poor customers.	The technical potential of the main interventions in the trials was estimated and compared to the observed energy savings and demand shifting as well as the potential network impacts, as is described in Section 6 of the Final Energy Savings Report and Section 7 of SDRC 9.5. Additionally, qualitative insights from participants were gathered and analysed, and documented in case studies.	✓

5.2 Project Successful Delivery Reward Criteria

The **energy**wise project successfully delivered all SDRC commitments outlined in the bid submission to a high quality and on time, as per the final Project Direction, and shown in Table 5.

- SDRC 9.2, describing the project findings from customer recruitment activities, was approved for a change request extension of two months. This change request was submitted as the project had incurred delays with contractual signatures amongst the project partners which delayed the start of the projects' customer recruitment.
- A nine-month project extension, necessitated by smart meter data issues in Trial 1, was submitted to Ofgem as 'non-material' (as it only concerned a time extension only). It changed the delivery date of SDRC 9.5 and this caused a knock-on effect for SDRC 9.6 and the overall project completion.

Table 5: Timeliness of SDRCs

SDRC Number	SDRC Title	Timeliness
SDRC 9.1	Detailed design of energy saving and energy shifting trials incorporating definition and identification of fuel poor customers	On time
SDRC 9.2	Effective recruitment of fuel poor customers	On time
SDRC 9.3	Impact of energy saving trial interventions – level of fuel poor participation and network impacts	Two weeks early
SDRC 9.4	Effective engagement with fuel poor customers	On time
SDRC 9.5	Impact of energy shifting trial interventions - level of fuel poor participation and network impacts	On time
SDRC 9.6	Effective dissemination of new knowledge generated from the project's captured learning	On time

Appendix B: Successful Delivery Reward Criteria contains the criteria met for each SDRC and detailed matrices of the evidence can be found in the individual SDRC overview reports.

6. Required modifications to the planned approach during the course of the project

6.1 Role of British Red Cross

In the full bid submission, **energy**wise expressed the ambition to explore opportunities for enhancing the services of the British Red Cross (BRC) during power outages. The BRC is a critical friend of the project and already provides services to UK Power Networks' customer base. During the execution phase of the project it was agreed that the project needed a locally based community partner to lead the customer engagement resulting in the appointment of the Bromley by Bow Centre and reduced the active role of the BRC.

6.2 Household Participant numbers approached and recruited

Recruitment was planned to take place from a sample frame of 1,100 customers, assuming a recruitment success rate of 50% thus giving the sample size of 550. After exploring what response would be achievable, acknowledging that a 1:2 response rate was ambitious, the project team took the decision in the trial design phase to increase the sample frame size to 1,650 customers[12]. This allowed for a response rate of 1:3 to recruit 550 participants. The project identified and approached 1,352 households. Of these, 538 signed-up to participate in the project, representing a response rate of 40%, which was a successful outcome as the project exceeded the targeted response of 33% that was required for the external validity of the results to be as strong as planned.

6.3 Cooling off period

The original design envisioned a 14-day cooling off period for participants at trial-sign-up. For the pilot study this period was set to seven days alongside the trial participant being able to provide notice to leave the project at any time. Feedback showed customers expressing confusion to the CFO team: 'why there was a cooling off period when they could leave at any point?' The project therefore removed the cooling off period for the main trial recruitment. The project still provided the ability for a participant to opt out at any time through notification, maintaining excellent customer service.

6.4 Critical Peak Rebate offer for prepayment customers

British Gas was unable to provide a static ToU tariff to smart prepay customers for Trail 2 due to technical, market and customer experience reasons. This has not affected the broader learning around how fuel poor and vulnerable customers may respond to a static ToU tariff, as the **energy**wise credit customer base already includes fuel poor and vulnerable customers. A Critical Peak Rebate for prepayment customers was developed and deployed instead that allowed investigation of their response to DSR events and consequently their willingness and ability to change behaviour and move their electricity consumption away from the requested period. As agreed with Ofgem on 2 May 2018, the evidence criteria for SDRC 9.5 were adjusted to reflect this non-material change. See also Appendix B: Successful Delivery Reward Criteria.

6.5 Drip feed versus big bang approach

Part of Trial 2 as described in the bid submission was testing roll-out approaches. The Control group would experience the 'big-bang' approach (provide all interventions simultaneously), while the Intervention group would be subjected to the 'drip feed' method (provide interventions staggered). To mitigate the risk of attrition the Control group was provided the energy efficiency devices ahead of the smart meter installations, effectively not being able to test the 'big-bang' approach with Control group participants. The benefits of this change outweighed the drawbacks: increasing customer retention improved the robustness of the research findings, while research considerations suggested that the expected impact of the devices by themselves on energy consumption is minimal, so it is unlikely that any difference would have been detected.

[12] The target EPC band of E-D was enlarged to include C-rated properties to increase the number of eligible customers in the target locations.

6.6 Quantitative analysis of self-disconnection events

One of the aims of the project was to understand why the pre-payment participants were self-disconnecting. It was not possible to undertake analyse this quantitatively as this would have required disaggregated data about disconnection of individual smart prepayment meters which British Gas was not able to provide under the project contractual arrangements. Asking prepayment participants to record all their self-disconnection events was also considered as an alternative option but discarded as too intrusive and thus carrying a too-high attrition risk. Instead, a qualitative analysis has been conducted leveraging CFO notes, participant panels, the Home Energy Survey and semi-structured interviews run as part of the qualitative research by University College London.

7. Significant variance in expected costs

The budget for the project was based on the financial information provided at the bid submission in the 'Full submission financial spreadsheet'. It was used to inform the budget and create the position of all costs as described in the budget section of the Funding Direction. The table below presents the view of the actual spend against bid budgeted spend to the end of the project (September 2018). Commentary is provided to supplement the budget overview table and explain any variances.

7.1 Budget overview

energywise Financials	Budget in project funding direction (£)	Actual Expenditure (£)	Variance (£)	(%)
Labour Total	1,006,548	981,719	24,829	2% Underspend
Equipment Total	639,472	532,793	106,679	17% Underspend
Contractors Total	1,917,043	2,246,977	-329,934	-17% Overspend
Travel & Expenses Total	85,394	29,209	56,185	66% Underspend
Payments to users	96,960	29,589	67,371	69% Underspend
Contingency Total	501,000	64,974	436,026	87% Underspend
Grand Total	**4,246,417**	**3,885,261**	**361,156**	**9% Underspend**

- The project underspent on Labour costs by 2% compared to the Project Direction. This underspend is due to project management efficiencies being achieved. The difference in Labour costs between now and the September 2018 progress report is due to additional resources required for the closeout of the project.
- The project underspent on Equipment by 17% mainly due to reduced installation and decommissioning costs.
- The project overspent on Contractors by 17% and commentary has been provided in the confidential Appendix of the September 2018 progress report.
- The project underspent on Travel & Expenses by 66%, mainly due to several meetings being undertaken using teleconference facilities.
- The project utilised additional costs of £64,974 related to: dissemination support over the final reporting period, design and printing of leaflets, venue for final event and consultancy to help with the project closedown report. These costs were not originally accounted for in the Equipment and Labour budget and have therefore been assigned to the Contingency category.

As reported in the Financial progress update of December 2015, the project will also contribute an additional of £10,000.00 against the LCN Funding. Therefore, the total value of the LCNF monies to be returned to customers is £371,156, as shown below:

	Total Underspends (£)
Additional contribution	10,000
Underspend (budget vs actuals)	361,156
Total	**371,156**

Overall, the project has delivered all of the key objectives and outputs whilst underspending by 9%. This underspend can be mainly attributed to reduced Equipment, reduced Payments to users and reduced Travel & Expenses.

8. Update to the business case and lessons learnt from the method

8.1 Update to the business case

The premise of the **energy**wise project has been to explore whether the domestic customer group and fuel poor are able and willing to respond to DSR and energy efficiency; mobilising such campaigns through common and trusted third party intermediates. The more fuel poor customers respond to these campaigns – providing time-shifting services and achieving sustained energy savings – the more it will mitigate the substantial challenges facing DNOs from increasing and more uncertain demands.

The **energy**wise business case has focused on two key areas, network benefits and customer benefits. In addition, wider, not immediately quantifiable, benefits are identified and acknowledged.

Network benefits

The network benefits were calculated against two key categories:

- Energy Shifting – Incentivising DSR through the introduction of a ToU tariff to encourage the fuel poor to shift their energy usage away from periods of peak demand.
- Energy Saving – Reduction in the overall energy consumed by the fuel poor through energy saving advice and access to energy saving devices. Resulting in the suppression of network loads and an impact on asset utilisation.

Customer benefits

The business case underpinning the full bid submission identified bill savings from participating in energy efficiency as the main customer benefit. Additional monetary benefits from participating in energy shifting were not quantified.

Wider benefits

- **energy**wise fills a gap in present research and demonstration, as it targeted involvement from a customer groups that have not been subject to previous trials.
- Trial area residents live in multiple dwelling unit buildings and a number are on prepayment services. Therefore, technical solutions for 'hard-to-reach' customers were trialled and invaluable learning gained on customer protection in the interaction with smart metering solutions.

A more detailed description of the method as well as a breakdown of the costs and benefits is provided in Section 3 and Appendix H of the full bid submission which can be downloaded from the **energy**wise project website.

8.1.1 Benefits of a wider roll-out

There are an estimated 3.5 million fuel poor in the UK[1], of which a significant number are also vulnerable in some way. These customers are dispersed across the country's DNOs and electricity suppliers, therefore the learnings from **energy**wise are widely applicable.

8.1.2 Carbon benefits

In the full bid submission, the **energy**wise project projected to deliver 93.51 tCO_2 emission savings by 2017, on average 0.11 tCO_2 emission per customer. Scaling this up to 4.5 million fuel poor in the UK (estimate at the time of full submission[13]) of which a significant number are also vulnerable in some way, emission savings could equate to 153,017 tCO_2. The assumptions and calculations behind this assessment can be found in Appendix N of the full bid submission which is available on the **energy**wise project website.

[13] Department of Energy and Climate Change (DECC), "Annual Fuel Poverty Statistics Report, 2014," London, 2014.

However, several assumptions underpinning this number changed during the project, mandating an update of the calculation:

- The number of fuel poor changed from 4.5 million to 3.5 million, of which 0.92 million reside in UK Power Networks' licensed areas.
- The set of deployed energy efficiency devices differed from what was originally foreseen. Most significantly, participants were provided with an energy-efficient eco-kettle instead of a plug-in thermostat and LED light bulbs (as opposed to CFL), increasing the savings potential.
- The potential savings calculation used a synthetic mix of household types that was different from the households ultimately participating in the trials.
- The carbon intensity of the electricity sector dropped significantly faster than was foreseen in the original calculation. As an example, the original estimate for 2018 was just over 300 g/kWh whereas British Gas now reports 225 g/kWh on average for the UK. Although this in itself is a great achievement, it negatively impacts the per-kWh CO_2 savings that can be achieved by the method.

Using the data above and the reported trial results of 86 GWh of annual savings for a roll-out across all of UK Power Networks, the project now reports and estimated emission reduction of 76,755 tCO_2/year. This is roughly half of what was estimated in the full bid submission. Two-thirds of the difference is accounted for by the reduced number of fuel poor customers and the reduced carbon intensity of the UK power mix. The rest of the difference can be attributed to the change in device set and the use of actual realised reductions compared to the technical potential[14].

8.1.3 Revisiting assumptions and identified benefits

Throughout the project the assumptions underpinning the business case and the identified benefits were monitored with respect to their validity, both qualitatively as quantitatively and discussed in the bi-annual reports to Ofgem. Updates informed by the project's results are briefly discussed below.

- **Methods costs** – The project was completed in time and within budget. The most significant source of underspent results from lower than expected equipment costs for British Gas.
- **Technical potential** – The impacts of the trials have been updated and are now based on actual appliance ownership data reported by **energy**wise trial participants in the HES conducted at the beginning of Trial 1, replacing assumptions for the energy saving and shifting technical potential using data from DECC and DEFRA's Household Electricity Usage Study (HEUS).
- **Network benefits** – The potential network impacts are based on scaling up the actual trial results observed in the **energy**wise trials across all fuel poor customers in the three UK Power Networks licence areas. Note that although the total number of fuel-poor customer numbers in the UK has dropped[1], it has risen in the UK Power Networks license areas.
- **Benefits at scale** – The bid submission business case was assuming the network benefits estimated for the London Power Networks (LPN) area as a proxy for the three license areas. In the updated business case, the benefits are estimated separately for each license network to provide a better understanding of scalability of the DNO benefits to the three license areas[15].

The waterfall graph shown in Figure 14 shows a low and a high estimate of the energy saving and shifting benefits when rolled out across all three of UK Power Networks' license areas:

- **Low side** – Assuming reinforcement deferral for 10 years. The business case for this estimate has slightly deteriorated compared to the full bid submission.
- **High side** – Basically assuming behavioural changes are permanent, leading to indefinite reinforcement deferral. The business case for this estimate has markedly improved.

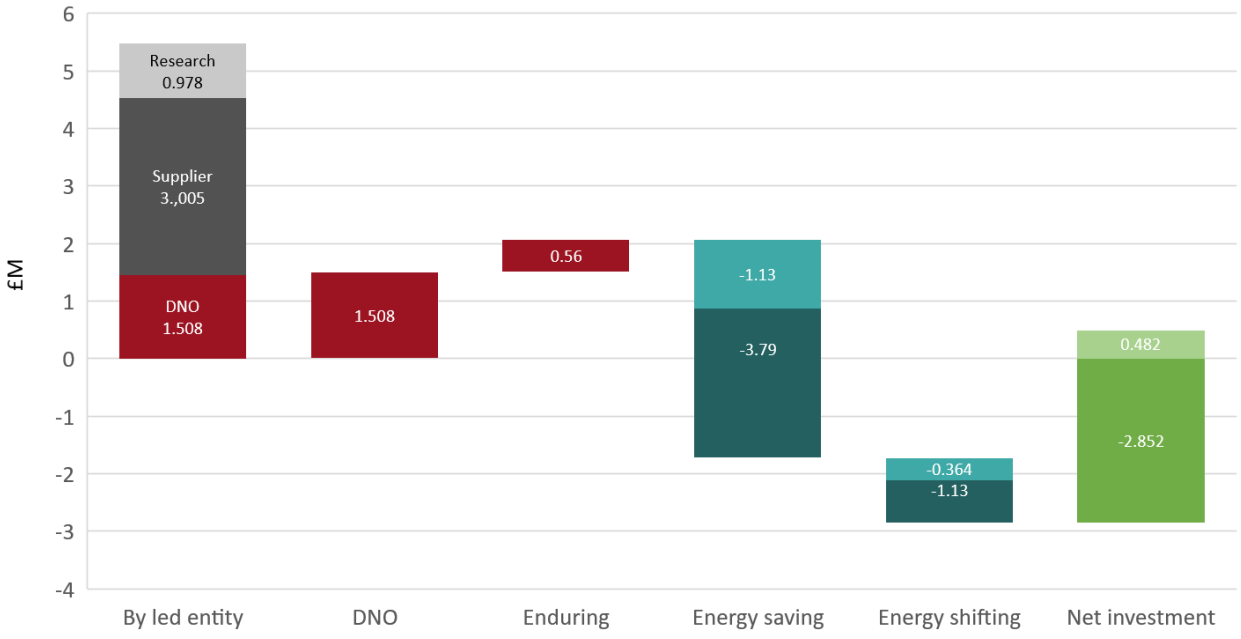
[14] The observed arbitraging of electricity and gas by customers in the DSR trial increased electricity consumption and thus impacted CO_2 emissions. This effect could not be quantified by the project and has therefore not been included in the calculation.

[15] Note that to facilitate comparison with the full bid submission, two cases are presented in the final bi-annual report: one with LPN as a proxy for all license areas and one where benefits have been estimated separately per license area. In this closedown report we use the latter case as it more accurately reflects the costs and benefits for a wider roll-out.

The customer benefits from energy savings were estimated to be from £38 to £61 bill saving potential for households when participating in energy efficiency. Incorporating the changes to the original assumptions discussed above, specially the changes in deployed energy efficiency devices and the mix of participating households, the bill saving potential is now estimated to between £12 and £47 per year. Note that the average observed annual savings of £14 from Trial 1 are in line with these estimates, yielding great confidence to the method.

The overall business case is therefore still in line with the business case presented in the full bid submission, as we have reported in the SDRCs and the bi-annual project reports. As can be seen in Figure 14, the overall business case for the **energy**wise method across all UK Power Networks' license areas is very likely positive. Note that the energy saving and shifting benefits for the low-side case are superimposed on those for the high-side case (as opposed to stacked), with the numbers in the bars indicating the full benefits for the individual cases. Although the low-side case indicates that there might be a scenario where a net investment might be required, the high-side case indicates the potential for a substantial net gain of £2.8m.

Figure 14: Graphical representation of the energywise business case, updated from the full bid submission as discussed in the text.



8.2 Lessons learnt from the method

The project has produced an extensive set of learnings that can be found in Appendix of SDRC 9.6. Table 6 below lists key learning for various aspects of the project.

Table 6: Key lessons learned from the method

Identifying eligible participants
• Where public data on income and fuel bills is not available, proxies can be used to identify fuel poor customers such as social housing tenants living in lower efficiency homes in areas of high deprivation. • Minimise exclusion criteria to maintain the biggest possible pool of potential participants. • Issue clear expectations to partners at the project outset about the required data and format.

- Allow for high numbers of drop-outs after sign-up. For long-duration projects take into account that people may change supplier or move house.

Data quality and information security

- When multiple organisations are involved in data exchange, issues with data integrity and quality are likely to arise. Frequent touch points between the parties involved should be established in order to resolve issues as soon as they emerge.
- Project-specific information security policies are recommended for projects with partners that have very different backgrounds and organisation sizes to ensure these policies are fit for purpose.

Ensuring effective recruitment

- Locally based field officers with knowledge of local culture and languages can be very effective in recruiting hard to reach groups.
- Having recruiters working in pairs, involving a diverse team, is effective. (Some customers are more comfortable talking to a woman.)
- In addition to project badges, use of uniforms can increase recognition and trust.
- Bringing in specialist recruitment organisations can be effective in getting people to sign-up. However, the local team may have a deeper understanding of the community and may result in more effective long-term customer engagement.
- Keep the team of recruiters small with regular refresher training, meetings to share learning and quality assurance of the door knocking.
- Door-knocking is effective but time consuming, particularly when a project is not area-based. Evenings and weekends work particularly well.
- The recruitment partner should have excellent data management and analytical skills to enable high levels of data accuracy and the ability to amend the recruitment schedule as necessary based on the success of different approaches.
- An appropriately skilled field officer manager should be in post for the full duration of the recruitment and installation phases to ensure effective management of these critical phase.
- Low income customers are likely to be primarily motivated by the prospect of saving money on their bills. The offer of free energy saving devices and shopping vouchers can also encourage people to take part.
- Better visibility of energy costs and easier top up methods for prepay customers are the key features that make them attractive.
- Professional, well designed materials are essential. Customers in this group like highly visual materials with limited text.
- Clear indication about an energy supplier's involvement will limit any misconception that a project is about energy switching.

Ensuring effective installation

- Where installations need to be completed within a short timeframe, this can be facilitated by ensuring that plenty of weekend appointments are available.
- Involving a community partner can increase appointment booking success rate.
- Ensure that customers have a single point of contact.
- Minimise customer disruption by liaising with third parties to ensure meter access (where necessary) and coordinating installation and equipment delivery into one appointment if possible.
- Urge householders present at the point of install to brief others living in the household about the smart meter and smart energy monitor, otherwise the benefits from the smart meter technology will be limited.
- Provide clear information to participants about what will be installed, by whom and how long it will take.
- Planning should take into consideration any locally relevant festivals or traditions, such as Ramadan.

Minimise dropouts and ensuring effective ongoing engagement
• Provide very clear messages about what is involved in the project, possibly including a video, and ensure consistency of messages across different recruiters to effectively manage participants' expectations. • Avoid equipment that is outside the scope of the project, which may cause further disruption to the participants. • Streamline the installation process to reduce the number of interactions with customers. • Minimise the number of unexpected interactions with customers in general. • Keep participants as a whole informed of what is happening in the project. • Provide participants with an opportunity to get together to share their experiences and learn from each other. Listen to participants about their experiences and take action based on their feedback. • Keep in regular communication with participants to remind them of how useful their involvement is and to thank them for their time – with vouchers where appropriate (e.g. where customers have faced disruption).
Energy Shifting Trial
• Non-punitive tariffs may be more suitable for fuel poor customers as they cannot be worse off when switching to ToU tariffs; • Communicating Critical Peak Rebates to customers can be challenging particularly in the case of vulnerable participants and/or those with limited English. • Educational materials on how best to shift the energy consumption away from peak hours and access the benefits of different pricing signals should be developed and made available to customers on ToU tariffs

9. Lessons learnt for future innovation projects

UK Power Networks recognises the importance of continuous structured innovation as it transitions from a traditional DNO into a Distribution System Operator (DSO) role. To ensure innovations are successful, disseminated throughout the organisation and provide measurable value, UK Power Networks has developed an Interactive Innovation Procedure (IIP) which describes the end-to-end innovation journey, from idea generation to the idea becoming a reality and making UK Power Networks' service more reliable. The five-step procedure provides innovators with the tools and knowledge to help them contribute to UK Power Networks' vision of being the "Most Innovative DNO". Lessons learned from innovation projects like **energy**wise are used to continuously update and improve UK Power Networks IIP.

energywise delivered a significant amount of learning that has been documented in the various reports created across the project life and is contained in the Appendix of SDRC 9.6. In this section we present three key lessons learnt that contribute to future innovation project's effectiveness and impact.

9.1 Finalise contractual arrangement prior to starting the project

Innovation projects like **energy**wise require a broad consortium of partners, each fulfilling a crucial role in a multi-year project that contributes to a vitally important part of the energy transition. Partners contribute substantially, both financially and in-kind, and solid contractual agreements are required to safeguard investments, assign responsibilities and manage IPR. As a result, contract negotiations often take longer than expected and this is exacerbated by the widely different sizes and levels of administrative maturity of the partners. However, the outcome of these negotiations can have a material impact on trial designs and execution, e.g. when it comes to data availability. It is therefore strongly recommended to finalise the contractual arrangements between contract partners before the actual start of the project.

9.2 Separate technology development from proposition trialling

Mixing the development and/or testing of new technology with the testing of innovative value propositions for end-users can negatively impact the ability to capture learnings from the latter if the deployed technology is not performing as planned. Malfunctions can either result in unplanned additional interventions or impact data quality and availability, depending on whether they occur in front-end or backend systems. To ensure significant results in an already statistically challenging situation, proposition trialling should therefore be separated from technology development in innovation projects like **energy**wise.

9.3 Robust trial design in a rapidly changing landscape

A lot can, and will, change between the conception of an innovation idea and the completion of the resulting multi-year project, especially in a sector undergoing such profound change as the energy sector. Choices that might have seemed obvious at bid submission might be seen as less self-explanatory near the end of the project. The vendor and supplier landscape might have changed, the view on the feasibility of certain types of interventions might have changed, and aspects of trials might have become obsolete due to changing regulation. Multi-year innovation projects should therefore design for change, and devise trial designs which can easily incorporate changing external circumstances to ensure their learnings are robust against such changes to maximise impact and relevance.

10. Project replication

The **energy**wise project explores how residential customers who may be struggling with fuel bills can better manage their household energy usage and consequently their energy bills by changing the way they use electricity. Its research study across two trials with households who may be struggling with their energy bills yielded one of the largest sets of incremental learning outputs of any LCNF project. The replication potential of these learnings is also the widest possible from an LCNF project, as the learnings are applicable to any stakeholder with an interest and/or an obligation towards fuel poor and vulnerable customers.

The disseminated learning contains principles that each DNO and supplier can implement into its business, and that the smart metering programme's Central Delivery Body can use for the smart metering rollout. UK Power Networks has facilitated stakeholder workshops to present, and answer questions on the project findings, tailored to each audience.

Note that although the methodology and communication means developed are generally applicable, each targeted grid area and/or customer segment is likely to require a tailored approach. The varying local context should inform the detailed project approach. Local trusted partners with a deep understanding of the target customers are a prerequisite for a successful project.

An extensive list of useful tips from **energy**wise that can be leveraged by DNOs seeking to replicate parts of the project can be found in Appendix C of SDRC 9.4 covering the following topics:

- Identifying households to invite to take part
- Ensuring effective recruitment
- Ensuring effective installation
- Minimising dropouts and ensuring effective ongoing engagement
- Achieving smart meter benefits and energy savings
- Achieving benefits from time of use tariffs

Templates such as commercial agreements for any DNO partner services in relation to additional support services provided for the fuel poor, as well as guidelines and templates for interacting with the fuel poor are available on request. This enables other parties to replicate the **energy**wise processes e.g. for resolving issues encountered from multiple dwelling unit building installations, typical/specialist engagement required for when installing smart meters.

Further testing of energy efficiency and dynamic Time of Use tariffs in the UK appears warranted with a broader customer demographic, targeting customers with large flexible appliance loads. The uptake of EVs, HPs, AC and smart appliances in the UK offers new opportunities here.

SSEN extends the body of knowledge on the use of energy efficiency measures as a cost effective, predictable and sustainable tool for managing peak demand as an alternative to network reinforcement in its SAVE project, leveraging learnings from **energy**wise.

10.1 Intellectual Property Rights

The project recognises the importance of knowledge sharing as a vehicle for widespread adoption of its learnings to facilitate replication. The project conformed to LCNF IPR requirements, and this has been formalised via the collaboration agreement between all partners that reflects acceptance of these arrangements in full. The newly generated intellectual property from the project is documented in Section 10 of each six-monthly report (see Table 9) and summarised in Appendix E: Intellectual Property Rights.

Sections 12 and 13 also contain links to documents that facilitate project replication.

11. Planned implementation

The **energy**wise project executed two trials to assess the feasibility and potential of delivering energy efficiency devices and ToU tariffs and CPRs to fuel poor customers. The successful trials generated a large amount of learning in how to recruit and engage fuel poor and vulnerable customers, next to measurable network benefits. These learnings are now widely applied in UK Power Networks outside the **energy**wise project and the specific initiatives leveraging them are introduced below and discussed in more detail in the Stakeholder Engagement and Consumer Vulnerability Incentive[16].

11.1 Engaging with vulnerable customers

In partnership with CAG Consultants, UK Power Networks delivered eight energy efficiency workshops with five housing associations that leveraged learnings from **energy**wise on how to engage and communicate with fuel-poor customers. The workshops were attended by 63 customers and 13 social housing staff. Customers were given energy efficiency advice and social housing staff educated to be energy efficiency champions to spread energy efficiency advice. As a result, the total grouped annual savings for participants to the sessions were estimated to total over £16,000. Additionally, the 'You and Your Home' leaflet that details energy saving measures and has been developed, paid for and distributed by UK Power Networks to 12,800 homes outside the **energy**wise trial area.

11.2 Flexibility and the fuel-poor

UK Power Networks Smart Grid Development team have opened up flexibility markets, enabling local authorities, local energy communities and social housing collectives to monetise the flexibility their members can provide to the market. The learnings from **energy**wise will play a pivotal role in getting them engaged and participating in (local) energy markets. Specific initiatives include the publication of the flexibility roadmap where demand for flexibility services is estimated to exceed 200MW from now to 2023 and match-making site where 26 locations have been advertised and UK Power Networks are asking for the market/ customers to provide flexibility as an alternative to network upgrades.

11.3 Delivering energy efficiency at scale through community actors

UK Power Networks' Customer Services' approach to energy efficiency for the fuel-poor is strongly informed by learnings from the customer engagement efforts in **energy**wise. UK Power Networks' approach is now wholly based on partnering with local organisations that have an existing interface with target customers to deliver energy and monetary savings at scale to fuel poor and vulnerable customers.

11.4 The future of fuel-poverty – avoiding an 'energy divide'

energywise has taught that the group of customers classified as fuel-poor or vulnerable represents a diverse, dynamic part of UK Power Networks' customer base. Changes brought about by the energy transition, such as the electrification of space heating and transport and the introduction of new tariff schemes, might not affect all consumers in the same way. To assess how future energy impacts vulnerability and avoiding an energy divide', UK Power Networks has commission a study from the Energy Saving Trust. The study is expected to be completed in December 2018.

[16] Stakeholder Engagement and Consumer Vulnerability Incentive 2016/17

12. Learning dissemination

The **energy**wise project has generated a wealth of knowledge and benefits for the wider DNO community and energy industry. In order for the full value of the project to be realised, the project has taken great care to share and make available all the learnings of the project by organising, and taking part in, a wide range of dissemination activities, summarized in this section.

The project partners intend to continue dissemination of key project learnings to the wider energy industry and policy makers. Specifically, the UK Power Networks Innovation team will continue to disseminate the project learning and explore potential elements which could be implemented into the business. UK Power Networks will be engaging with other DNOs to ensure key learnings around energy efficiency can be replicated and potentially made available to customers across Britain.

12.1 Learning dissemination mechanisms

Lessons from the project have been shared via the SDRCs and biannual reports which are available on the project website, as well as through presentations and briefings, social media and media coverage. For each mechanism the number of instances is provided in Table 7. Specific dissemination activities and documents are described in detail in SDRC 9.6.

Table 7: Learning dissemination mechanisms

Mechanism	Number of instances/occurrences
Project website	1
Progress Reports	6
SDRC reports	6
Booklets and factsheets	7
Internal UK Power Networks meetings	42
Partner dissemination events	3
Conferences, fora, industry briefings and presentations	26
Briefings for policy makers and responses to consultations	8
Media coverage	9
Social media coverage and web posts	10

12.2 Industry recognition and awards

The project has won or been shortlisted for a number of industry awards, as shown in Figure 15.

Figure 15: Industry awards

12.3 Partner workshops on lessons learnt

Three partner workshops were held over the course of the project to discuss and identify learnings from the different phases of the project, as follows:

- May 2016 – a two-day workshop involving representatives from all partners as well as the recruiting organisations focusing on learnings related to participant selection, recruitment and installation.

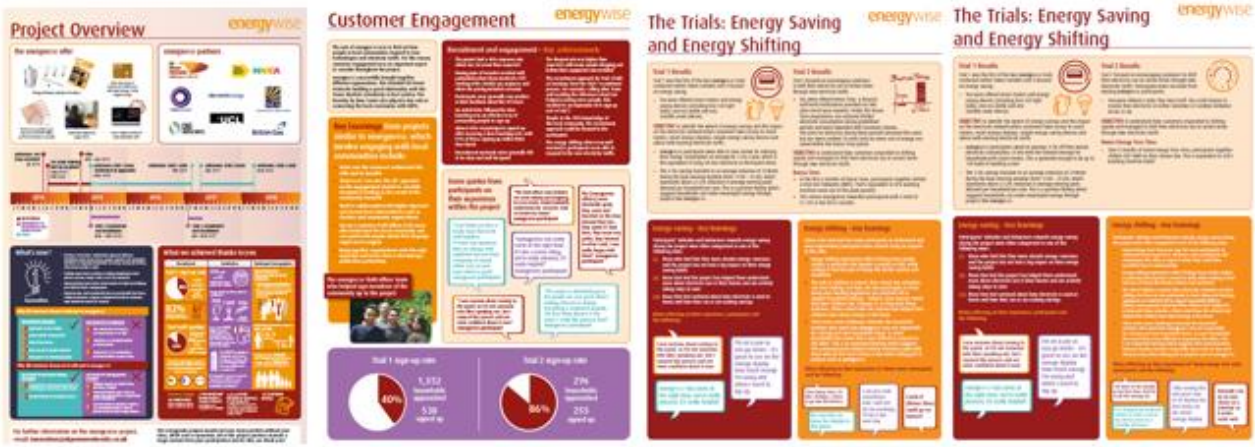
- May 2017 – a partner workshop involving representatives from all partners to discuss learning related to Trial 2 recruitment as well as ongoing engagement through Trial 1.
- June 2018 – a final partner workshop involving representatives from all partners (except Poplar HARCA whose representative was unable to attend but was invited to feed in to the workshop separately). This focused on identifying learnings related to ongoing engagement through Trial 2, the project closedown process and final project party, and the overall impacts of the project.

The workshops were held at Bromley by Bow Centre and facilitated by CAG Consultants.

12.4 End of project customer learning event

Within the Thank You events, a customer learning event was organised. This was kept clearly separate from the 'fun part' but it was decided to be combined on the same day to maximise attendance and reach the highest number of participants to share the learning. The session included an introduction from the Bromley by Bow Centre CFO team, followed by an overview from UK Power Networks. University College London presented learnings from both the trials. An interpreter was on hand to assist participants where English was not their first language. Presentations were kept simple to allow all participants to follow them. Four different flyers were produced for the event and given away to all participants as part of their goody bags. The materials were designed to be highly visual and project learning was explained with simple language and can be seen in Figure 16.

Figure 16: Flyers handed to participants at the end of project customer learning event.



12.5 Final dissemination event July 2018

In July 2018, a final dissemination event was held to share learnings from **energy**wise with relevant stakeholders. Hosted at the Institution of Engineering and Technology, it included presentations from a range of project partners and a panel discussion, hosted by National Energy Action and involving representatives from British Gas, Smart Energy GB, UK Power Networks and the Bromley by Bow Centre.

The event was attended by nearly 90 participants from a range of sectors including local and national government, charities and NGOs, academia and the energy industry.

Figure 17: Selected photos from the close down event (from the left – the energywise project team; Q&A with project partners; panellists from British Gas, Smart Energy GB, National Energy Action and UK Power Networks)

Overall, the dissemination event was very well received. When asked to rate the event on a scale of 1 to 5, with 1 being 'poor' and 5 'excellent', respondents gave the event an average rating of 4.06. Almost all participants (97%) felt the event was 'good', with over 75% rating it as 'very good' or 'excellent'.

Respondent observations were also largely positive, with the comments reflecting the high levels of satisfaction. Participants highlighted that the event itself was informative and engaging with speakers felt to be well-informed and enthusiastic. The venue location, facilities and event organisation were also cited as being "*excellent"*.

12.6 Peer review of Close-down report

This report was peer reviewed by Northern Powergrid who has confirmed that UK Power Networks have successfully met the objectives and deliverables as agreed in the Project Direction. The letter from Northern Powergrid containing their feedback on the report can be found in Appendix A: Peer Review Supporting Letter.

13. Key project learning documents

Key **energy**wise learning documents and project progress reports are tabulated below. More project documents can be found on the **energy**wise project website.

13.1 SDRC reports

Table 8: energywise SDRC reports and supporting documents

Document Title	Publication Date	Document Description
SDRC 9.1	October 2014	Detailed design of energy saving and energy shifting trials incorporating definition and identification of fuel poor customers
SDRC 9.2	June 2015	Effective recruitment of fuel poor customers
SDRC 9.3	June 2016	Impact of energy saving trial interventions – level of fuel poor participation and network impacts
Final Energy Trial Savings Report	May 2017	This report is the final Energy Saving Trial report addressing a full year of monitoring data from the first trial
SDRC 9.4	August 2017	Effective engagement with fuel poor customers
SDRC 9.5	May 2018	Impact of energy shifting trial interventions - level of fuel poor participation and network impacts
SDRC 9.6	September 2018	Effective dissemination of new knowledge generated from the project's captured learning

13.2 Project progress reports

During the project, progress reports have been submitted to Ofgem every six months. The progress reports track progress against plan for the individual workstreams as well as the project as a whole, discuss deliverables and learning & dissemination activities and list identified risks and mitigation measures. Table 9 lists these reports and their location on UK Power Networks' innovation website[17].

Table 9: List of six-monthly energywise progress reports for Ofgem.

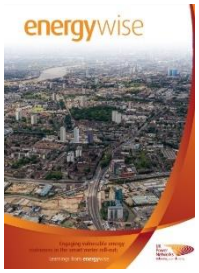
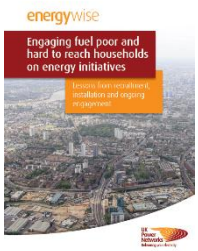
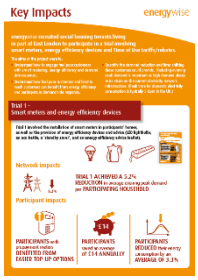
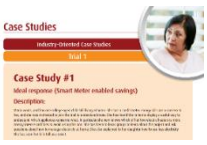
Progress reports		
19 June 2014	15 June 2016	19 December 2017
18 December 2014	15 December 2016	15 June 2018
18 June 2015	30 May 2017	30 October 2018
17 December 2015		

13.3 Miscellaneous additional reports

Various other documents that contain key learnings and insights have been produced as part of the **energy**wise project. They are listed in Table 10. For more information see Section 12 and references therein.

[17] Note that the confidential financial appendix is not included in the downloadable versions of these reports.

Table 10: Key dissemination documents that complement the SDRC and biannual reports.

Document Title	Description	Submission date and cover
energywise video	Video animation summarising the key challenges addressed by **energy**wise, the innovative approach and the savings achieved by trial participants across the first trial	 December 2017
Engaging fuel poor customers in the smart meter rollout: learnings from energywise	Key learnings from the smart meter roll out, from the pre-installation, to installation and post-installation stages	 June 2018
Engaging fuel poor and hard to reach households on energy initiatives	Illustrated booklet with lessons from recruitment, installation and ongoing installation	 July 2018
Key Impacts	The Key impacts sheet summarising key project findings from Trial 1 and 2.	 July 2018
Case studies	Case studies document summarising trial participants' responses	 July 2018

14. Contact details

Details of the project and its learnings can be found on the **energy**wise website.

For further details, please contact:

Angeliki Koulouri
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UK Power Networks
237 Southwark Bridge Road
London
SE1 6NP

Or
innovation@ukpowernetworks.co.uk

Appendix A: Peer Review Supporting Letter

NORTHERN POWERGRID

Angeliki Koulouri

Project Lead- energywise

UK Power Networks

Newington House

237 Southwark Bridge Road

London

SE1 6NP

Dear Angeliki,

Energywise Close- Down Report- DNO Peer Review

Further to your request for Northern Powergrid to review and comment on the Close Down Report produced in respect of UK Power Networks energywise, LCNF funded project, I can confirm that we have undertaken this review and consider that the objectives and deliverables as agreed in the Project Direction have been satisfied by UK Power Networks.

In addition, subject to the requirements of the LCNF funding governance, we can confirm that we consider that the Close Down Report as reviewed by Northern Powergrid is clear and understandable and contains sufficient detail and information to enable a DNO to make use of the learning generated to implement their own network solution and test similar intervention with fuel poor and vulnerable customers.

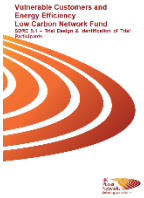
Should you wish to discuss anything further or have any additional requirements that you need to address in respect of the energywise project, please do not hesitate to contact me.

Yours sincerely,

Andrew Webster

Innovation Project Manager NPg

Appendix B: Successful Delivery Reward Criteria

SDRC		Description of SDRC	Deadline	Result & Evidence
9.1	***Detailed design of energy saving and energy shifting trials incorporating definition and identification of fuel poor customers*** 	• Approved Trial Design Report • Agreed set of fuel poverty / vulnerability indicators and targeted customer pool.	31 October 2014	**Completed on time** • The SDRC 9.1 report "Trial Design & Identification of Trial Participants" was submitted to Ofgem on 31 October 2014. • SDRC 9.1 is published on the energywise website.
9.2	***Effective recruitment of fuel poor customers*** 	• A review of best practice in fuel poor customer recruitment. • Identification of trusted intermediaries within the trial area community and their relationships with trial participants. • A quantitative mapping of participants' energy knowledge resources (energy social capital survey) within their social networks i.e. where they turn to, and who they trust, for knowledge about energy. • Findings from customer focus group testing of clarity and acceptability of recruitment communication materials. • Statistics on recruitment success rates and reasons for non-participation. • Qualitative evidence on the efficacy of different recruitment channels, strategies and materials.	Original 30 April 2015 Revised 30 June 2015	**Completed on time as per approved change request** • Due to incurred delays with contractual signatures amongst the Project Partners the project submitted a change request to extend SDRC 9.2 deadline by two months. This change request was approved by Ofgem. • The SDRC 9.2 report "Customer Recruitment" was submitted to Ofgem on 30 June 2015 • SDRC 9.2 is published on the energywise website.

9.3	***Impact of energy saving trial interventions – level of fuel poor participation and network impacts*** 	• Quantitative analysis of trial 1 energy savings through within-trial intervention-group to control-group comparison. • Quantitative analysis of trial 1 control-group contamination effects through within-trial control-group to external to trial control-group comparison. • Statistical generalisation of the energy savings to the wider UK Power Networks, and national fuel poor customer base. • Representation of network impacts through half-hourly network modelling within the trial area. • Comparison of realised energy savings against previous estimates of technical potential energy savings in fuel poor customer group. • Insights on customer protection during the trial.	30 June 2016	**Completed on time** • The SDRC 9.3 report "Results from the first six months of the energy saving trial" was submitted to Ofgem on 30 June 2016 and the "Final Energy Saving Trial report" was issued to Ofgem on 16 June 2017. • SDRC 9.3 is published on the energywise website. • The "Final Energy Savings Trial Report" can be found here.
9.4	***Effective engagement with fuel poor customers*** 	• A review of best practice in fuel poor customer engagement. • A review of best practice in trial panel maintenance (i.e. methods to minimise participant dropout), particularly in trials with vulnerable participants. • Quantitative analysis of longitudinal survey of participants' energy knowledge resources (energy social capital) within their social networks and how these have changed over time. • Findings from interviews with trial participants on the efficacy of different engagement activities conducted throughout the trials. • Statistics on participation attrition and reasons for participant drop-out.	31 August 2017	**Completed on time** • The SDRC 9.4 report "Customer Engagement" was submitted to Ofgem on 31 August 2017. • SDRC 9.5 is published on the energywise website.

9.5	***Impact of energy shifting trial interventions - level of fuel poor participation and network impacts*** 	• Quantitative analysis of Trial 2 energy shifting through aggregated within-subject pre-post intervention comparison of energy use for Credit customers. • Quantitative analysis of Trial 2 energy shifting for Pre-payment customers through aggregated within-subject consumption within Bonus Time period compared with a baseline constructed from previous similar days. • Statistical generalisation of the energy shifting to the wider UK Power Networks, British Gas and national fuel poor customer base. • Representation of network impacts through half-hourly network modelling within the trial area. • Comparison of realised energy shifting against previous estimates of technical potential energy shifting in the fuel poor customer group. • Insights on customer protection during the trial.	Original: 31 October 2017 Revised: 31 July 2018	**Completed on time** • A 9-month project extension, necessitated by smart meter data issues in trial 1 and deemed 'non-material' changed the delivery date of SDRC 9.5. • A letter regarding the non-material change to the project with respect to the wording on the first two evidence criteria for SDRC 9.5 was sent to Ofgem on 4 May 2018. • The SDRC 9.5 report "The Energy Shifting Trial Report" was submitted to Ofgem on 30 July 2018. • SDRC 9.5 is published the energywise website.
9.6	***Effective dissemination of new knowledge generated from the project's captured learning*** 	• 1x external learning event carried out for SDRC 9.1 – 9.5, and presentation materials shared • 2x internal learning events carried out per SDRC, and presentation materials shared • 2x Thank You events carried out for trial participants • 1x end of project customer learning event completed for trial participants, and presentation materials shared • Presentation of the project at least twice a year at external seminars / workshops, with presentation materials shared	Original: 31 December 2017 Revised: 30 September 2018	**Completed on time as per approved change request** • SDRC 9.6 delivery date changed due to the 9-month project extension. • The SDRC 9.6 report "Knowledge dissemination" was submitted to Ofgem on 27 September 2018. • SDRC 9.6 is published on the energywise website.

Appendix C: Glossary

Term	Description
AC	Air Conditioning
Bonus Time	The time-of-use tariff offered to prepayment **energy**wise participants, which operates as a Critical Peak Rebate. It provided customers with notice of 'Bonus Time' periods during which time, for every unit of electricity they reduced their consumption by (compared to their average for that time), they were refunded the cost of ten units
BRC	British Red Cross
Campbell Systematic Review[18]	Campbell Systematic Reviews follow structured guidelines and standards for summarising the international research evidence on the effects of interventions in crime and justice, education, international development, and social welfare.
Control Group	The group that does not receive the interventions in Trial 1, and is used for comparison to the intervention group to see if the interventions had any effect.
Critical Peak Rebate (CPR)	When energy utilities observe or anticipate high wholesale market prices or power system emergency conditions, they may call critical events during pre-specified time periods. The price for electricity during these time periods remains the same but the customer is refunded at a predetermined value for any reduction in consumption relative to what the utility deemed the customer was expected to consume.
Customer Field Officer (CFO)	The intermediary hired by the project to be the contact for participants, and the 'face' of the project. The Field Officers duties will include recruiting and engaging participants along with gathering data.
Datalogger	A non-fiscal meter that measures electricity consumption. It also referred to as secondary electricity meter.
DNO	Distribution Network Operator, responsible for managing one or more of the fourteen electricity distribution networks in Great Britain, delivering electricity to customers.
Demand Side Response (DSR)	Demand Side Response is a change in electricity consumption in response to a signal (e.g. financial incentives)
Energy Social Capital	Context-specific social capital: purposively seeking information from people known to the respondent on the topic of energy efficiency in a home.
EPC	Energy Performance Coefficient
EV	Electric Vehicle
External Control Group	A group that does not receive an intervention as part of the project but has had a smart meter installed previously. The external control group will enable generalisations to the wider population and enable understanding of influence of external factors on energy consumption, for example fuel price changes.
HAN	Home Area Network.
HEFT	HomeEnergy FreeTime- the trial 2 time-of-use tariff offered to credit participants, providing free electricity from 9am to 5pm on their choice of either Saturday or Sunday
HES	Home Energy Survey
HP	Heat Pump
IIP	Interactive Innovation Procedure
IPR	Intellectual Property Rights
Intervention Group	This is the group exposed to the treatments (interventions) in Trial 1.
LCL	Low Carbon London

[18] http://www.campbellcollaboration.org/artman2/uploads/1/C2_Protocols_guidelines_v1.pdf

LCNF	Low Carbon Networks Fund, administered by Ofgem. Designed to support projects sponsored by DNOs to try out new technology, operating and commercial arrangements. The aim of the projects is to help all DNOs understand how they can provide security of supply at value for money as Britain moves to a low carbon economy
LED	Light-Emitting Diode
MDU	Multiple Dwelling Unit meaning a building housing more than one premises with physical disparate metering such that a wireless MDU Communication Infrastructure is required.
MDU Communication Infrastructure	The wireless communication infrastructure that will be tested, installed and commissioned in certain categories of buildings.
NEA	National Energy Action
Pilot study	A small-scale preliminary study that usually takes place before full investigation in order to test certain elements of the main study e.g. a research design.
QA	Quality Assurance
Sampling Frame	Sampling frame is “the listing of all units in the population from which a sample is selected.
Self-disconnection	Means a scenario where a customer is unable to use power because they have run out of credit on their traditional meter.
Smart Energy Display (SED)	The display unit that accompanies the Smart Meter that displays the energy consumption and cost of energy unit. It is also known as In-Home Display (IHD)
Smart Energy Expert	The appropriately trained engineer of British Gas tasked to install smart meters according to the Smart Meter Installation Code of Practise (SMICoP) and internal British Gas processes.
Smart Meter	The advanced meter offered by British Gas as part of their business as usual activities offering advanced functionality compared to a traditional meter.
SMETS	Smart Meter Equipment Technical Specifications
SSEN	Scottish and Southern Electricity Networks
ToU	Time-of-use tariff- a tariff that encourages consumers to use electricity at times when it is available cheaply. This can support a more flexible and sustainable electricity system
VCEE	Vulnerable Customers and Energy Efficiency, the official title of this project as registered with Ofgem

Appendix D: Project Partners

energywise is a partnership between ten organisations led by UK Power Networks.

Project Partner	Role in Project
UK Power Networks	UK Power Networks owns, operates and manages three of the fourteen electricity distribution networks in Great Britain, delivering electricity to over eight million customers in London, East and the South East of England. UK Power Networks is a network operator and does not generate or buy electricity nor does it sell to end customers. It takes electricity at high voltages from the National Grid and transforms it down to voltages suitable for commercial and domestic use. UK Power Networks operates in the most challenging, fastest growing, and highest cost part of the country.
British Gas	British Gas is the largest UK energy and home services company. British Gas supplies gas and electricity, boilers and boiler cover as well as other home services, serving millions of homes across the country, as well as providing energy to hundreds of thousands of UK businesses. British Gas prides itself on being at the heart of the communities it serves and is committed to making a difference in local communities.
UCL	Since its foundation in 2009 UCL-Energy has developed a strong national and international reputation for research in energy demand and energy systems. University College London is the research authority of the project and its aim is to ensure that the results of the trials are statistically rigorous and the findings could be replicated in future.
Tower Hamlets Homes	Tower Hamlets Homes is the arm's length management organisation of the London Borough of Tower Hamlets, managing the council's housing stock on its behalf. Tower Hamlets Homes has provided a list of eligible tenants, along with insights into the area and local intelligence that has shaped the customer engagement strategy.
POPLAR HARCA	Poplar HARCA is a registered social landlord that operates as an independent non-profit charity in the London Borough of Tower Hamlets, separate from the local authority. Poplar HARCA has provided a list of eligible tenants. They will also provide insights into the area and local intelligence that has shaped the customer engagement strategy.
bromley by bow centre	Bromley by Bow community Centre is a local charity established in 1984 by Andrew and Susan Mawson and has built up considerable goodwill in the area. They are the employer of the project's customer field officer (CFO) team, which is going to be a team dedicated to the recruitment and engagement with the trial participants (prospective and actual).
CAG CONSULTANTS	CAG Consultants is a sustainability, climate change and community engagement consultancy which is going to represent the voice of the customer in the project. CAG Consultants will provide specialist support, guidance, mentoring, training and evaluation of recruitment and engagement with vulnerable and fuel poor customers.
NEA Action for Warm Homes	NEA is the national fuel poverty charity which aims to eradicate fuel poverty and campaigns for greater investment in energy efficiency to help those who are poor and vulnerable. NEA will provide expertise in energy efficiency and customer focus due to its continuous engagement with fuel poor customers.
elementenergy	Element Energy is a strategic energy consultancy specialising in the intelligent analysis of low-carbon energy across the sectors of power generation and distribution, transport and buildings. Element Energy will provide the analysis of the network impacts of the energy saving and energy shifting interventions through network modelling within the trial area.

Appendix E: Intellectual Property Rights

WS	Project partners	Foreground IPR	Type of file	Type of IPR (Foreground/Relevant Foreground)	Description	Year
1	CAG, UCL, UKPN, NEA	WS1_Temperature Monitoring Protocol	Process	Relevant Foreground IPR	Process for assessing risk based on temperature monitoring data and taking action	2015 (updated 2016)
1	CAG	WS1_Participant Panel Set Up	Process, presentation, document	Relevant Foreground IPR	Materials related to the setup of the participant panel; terms of references, panellist recruitment, appointment letters, CFO briefing and role play	2015
1	UKPN, NEA	WS1_Energy Advice Leaflet	Customer engagement materials	Relevant Foreground IPR	Energy efficiency advice leaflet provided to participants with their energy efficiency devices	2015 (updated 2016; different version produced for control group split into 2 leaflets, one focused on smart meter the other on energy efficiency devices)
1	UKPN, NEA, BbBC, THH, PH	WS1_Services Charter	Customer engagement materials	Relevant Foreground IPR	Leaflet designed for fuel poor customers which outlines support services available to participants post-project, required to replicate customer disengagement process	2015 (updated 2016, 2017)
1	UKPN, NEA	WS1_Cold Homes Leaflet	Customer engagement materials	Relevant Foreground IPR	Leaflet issued to customers in case temperatures recorded in the intervention group are statistically significantly lower than those in the control group, contains information about keeping safe and warm at home, required to replicate customer protection/temperature monitoring	2015 (updated 2016, 2017)

WS	Project partners	Foreground IPR	Type of file	Type of IPR (Foreground/Relevant Foreground)	Description	Year
1	CAG, UCL, UKPN, NEA	WS1_Time Shifting Advice Leaflet_Bonus Time	Customer engagement materials	Relevant Foreground IPR	Advice for prepayment participants on how to shift their electricity consumption away from Bonus Time events, required to replicate Bonus Time trial and customer interventions	2016
1	CAG, UCL, UKPN, NEA	WS1_Time Shifting Advice Leaflet_HomeEnergy FreeTime	Customer engagement materials	Relevant Foreground IPR	Advice for credit participants on how to shift their electricity consumption to FreeTime periods, required to replicate the HEFT trial and customer interventions	2016
1	UCL, CAG, BG, UKPN, BbBC	WS1_Newsletters	Customer engagement materials	Foreground IPR	A set of quarterly newsletters informing participants about project activities and news. These are recommended, but not essential to replicate the trial.	2016-2018
1	UCL, CAG, BG, UKPN, BbBC	WS1_Quarterly Statements_Bonus Time	Customer engagement materials	Relevant Foreground IPR	A template statement used to inform participants on the CPR trial how much credit they have earnt.	2017
1	ALL	WS1_SDRC 9.1	Report	Relevant Foreground IPR	Includes eligibility criteria, identification and selection of trial participants process, trial design, pilot study, trials architecture and customer journey.	2014

WS	Project partners	Foreground IPR	Type of file	Type of IPR (Foreground/Relevant Foreground)	Description	Year
1	ALL	WS1_SDRC 9.2	Report	Relevant Foreground IPR	Includes pilot study, review of best practice of recruiting fuel poor customers, identification of trusted intermediaries in trial area (stakeholder mapping), design of Energy Social Capital Survey and Focus Group, eligibility criteria and process for selecting trial participants, evaluation methodology of pilot recruitment, recruitment strategy and early engagement.	2015
1	ALL	WS1_SDRC 9.4	Report	Relevant Foreground IPR	Update on recruitment and customer engagement strategy, detailed recruitment and engagement approach for Trial 1 and 2, evaluation method of different engagement activities, assessment and strategy to minimise attrition, dissatisfaction and complaints, findings from the Energy Social Capital survey No2, update of best practice of engaging fuel poor customers, useful tips for replication	2017
1	BbBC, UKPN, THH, PH, UCL, BG	WS1_Disclosure board Terms of Reference	Document	Relevant Foreground IPR	Three protocols to reflect technical issues, customer issues and complaints and sensitive issues	2015
1	UKPN, BG	WS1_Disengagement strategy	Report	Relevant Foreground IPR	As described in biannual report December 2015	2015

WS	Project partners	Foreground IPR	Type of file	Type of IPR (Foreground/Relevant Foreground)	Description	Year
1	CAG, BG, THH	WS1_Recruitment strategy for MDU customers	Document	Relevant Foreground IPR	As described in biannual reports for December 2015 and June 2016	2016
1	BG, UKPN	WS1_Consent forms to opt out from temperature monitoring equipment	Document	Relevant Foreground IPR	As described in biannual report June 2016	2016
1	BbBC, CAG	WS1_Vulnerability review protocol	Spreadsheet	Relevant Foreground IPR	Spreadsheet that collates data held by project partners in relation to vulnerability for all participants	2016
1	UKPN, CAG	WS1_Communications Plan	Document	Relevant Foreground IPR	Available for both Focus Group (Lightweight Comms Plan) and for Pilot Study and Project Trials (Heavyweight Comms Plan)	2014
1	UKPN, UCL, BG, THH, PH, BbBC	WS1_Data Privacy Strategy	Document	Relevant Foreground IPR	Available for both Focus Group (Lightweight DPS) and for Pilot Study and Project Trials (Heavyweight DPS)	2014
1	BbBC	WS1_Job descriptions for Customer Field Officer team	Document	Relevant Foreground IPR	Job descriptions developed for Project officer, Field officer and Field officer assistant positions	2014
1	CAG	WS1_Customer Field Officer handbook	Document	Relevant Foreground IPR	Meant to offer practical experience and guidance to other organisations to scale up or replicate the VCEE project.	2014

WS	Project partners	Foreground IPR	Type of file	Type of IPR (Foreground/Relevant Foreground)	Description	Year
1	CAG, UKPN	WS1_Communications Plan for Focus Group	Report	Relevant Foreground IPR	Communications Plan which sets out the approach taken by the Project Partners to run a customer focus group, planned for June 2014, to test the communication materials and messages for the Project.	2014
1	CAG, UKPN, BbBC, BG, UCL, THH, PH, NEA (led mainly by CAG, UKPN and BbBC - involvement of others depends on materials)	WS1_Project brand, Communications and Engagement materials	Presentation, document, report	Relevant Foreground IPR	Additional communication and engagement materials, not listed as separate IPR items: Customer T&Cs and Key Facts, sign-up website, project name, project brand, project flyers, letters (invitation, reminder, confirmation, disengagement, thank you for staying in the project, postcards, trial 2 warm-up, project extension, decommissioning and end of project), welcome pack folder (Trial 1 and 2), illustration guide, Trial 2 T&Cs	2014-2018
2	EE	WS2_CPR schedule	Spreadsheet	Relevant Foreground IPR	The schedule for critical peak rebate (CPR) events used for the Bonus Time intervention in Trial 2 (time of use tariffs)	2017
2	BG, BbBC	WS2_Installation and decommissioning processes	Process	Relevant Foreground IPR	Detailed process for equipment installation and decommissioning at the end of trial 2 or following customer's drop out and disengagement	2015-2018

WS	Project partners	Foreground IPR	Type of file	Type of IPR (Foreground/Relevant Foreground)	Description	Year
2	EE, UCL	WS2_Design of CPR notifications	Process	Relevant Foreground IPR	As described in biannual report June 2017	2017
2	UKPN	WS2_Requirements for selection of CPR notification provider	Process	Relevant Foreground IPR	As described in biannual report June 2017	2017
2	BG, BbBC	WS2_End of project disengagement and decommissioning protocol	Document	Relevant Foreground IPR	As described in biannual report December 2017	2017
2	BG	WS2_MDU Communication Infrastructure design	Process	Relevant Foreground IPR	As described in biannual report December 2014	2014
2	BG, THH	WS2_MDU contractual arrangements and business model	Commercial and legal	Relevant Foreground IPR	Contractual arrangements between energy supplier and social housing associations required to support the installation and operation of the MDU comms infrastructure	2015
2	BG, UKPN	WS2_Technical trials report	Report	Relevant Foreground IPR	Aimed to define the technical design of the trials' equipment being installed into customers' homes and the desired electrical parameters for used in analysis of energy demand behaviour.	2014
2	UCL	WS2_ Instructions for energy saving and energy shifting devices	Document	Relevant Foreground IPR	An asssessment of energy saving and energy shifting devices suitability for testing with fuel poor and vulnerable customers	2014

WS	Project partners	Foreground IPR	Type of file	Type of IPR (Foreground/Relevant Foreground)	Description	Year
3	UCL	WS3_Semi-structured Interview Protocol_HEFT	Qualitative research protocol	Foreground IPR	interview schedule for semi-structured interviews to check participants' understanding of TOU tarrif.	2017
3	UCL	WS3_Semi-structured Interview Protocol_Bonus Time	Qualitative research protocol	Foreground IPR	interview schedule for semi-structured interviews to check participants' understanding of CPR offer	2017
3	ALL	WS3_SDRC 9.3 -Final Energy Saving Trial report	Report	Relevant Foreground IPR	Includes the analysis of the EPC rating and of the HES (demographics information and electricity appliances ownership), the analysis of the ESC survey No1, quantitative analysis of energy savings (including contamination effect), modelling of network impacts of energy savings, statistical generalisation methodology and External Control Group design, reassessment of technical potential of energy saving interventions, customer protection strategy and detailed data quality processes	2017

WS	Project partners	Foreground IPR	Type of file	Type of IPR (Foreground/Relevant Foreground)	Description	Year
3	ALL	WS3_SDRC 9.5	Report	Relevant Foreground IPR	Includes findings from ESC Survey No3, design of Trial 2 (energy shifting) offers and interventions, quantitative analysis of energy shifting, modelling of network impacts of energy shifting, statistical generalisation method and results, update of technical potential of energy shifting interventions	2018
3	UCL	WS3_Case studies	Leaflet	Foreground IPR	A document summarising trial participants responses and defining archetypes of fuel poor customers	2018
3	UCL	WS3_UCL Data management plan	Document	Foreground IPR	A document outlining data management and sharing practices, responsibilities, ethics and compliance	2014
3	UCL	WS3_Random allocation process	Process	Relevant Foreground IPR	Included in the Research Trial Design Report below	2014
3	UCL, UKPN	WS3_Research trial design report	Document	Relevant Foreground IPR	Detailed description of the research trial design as per UCL's initial view at the beginning of the project. Despite several elements of the research trial design has evolved over time, the document illustrates how research trials can be set up with academic rigour. The report includes an in-depth explanation of how the random allocation process has been done in practice.	2014

WS	Project partners	Foreground IPR	Type of file	Type of IPR (Foreground/Relevant Foreground)	Description	Year
3	UCL	WS3_Criteria for External Control Group construction	Process	Relevant Foreground IPR	The process for selection and recruitment of the external control group was refined and simplified to maximise the similarity with the participants in the Tower Hamlets study area.	2017
3	UCL	WS1_Non-participation and exit survey	Document	Relevant Foreground IPR	Survey looking into reasons that participants chose to leave the project	2015
3	UCL	WS1_End of customer journey	Document	Relevant Foreground IPR	As described in biannual report June 2018	2018
4	UKPN, CAG	WS4_Lessons from trial 1	Report	Foreground IPR	Report identifying learnings from trials 1 and 2; recruitment, installation and engagement	2017
4	UKPN, CAG, EE, UCL	WS4_Lessons from both trials	Report	Foreground IPR	Report identifying learnings from trial 1; recruitment, installation and engagement	2018
4	NEA	WS4_Smart meter roll-out learnings report	Report	Foreground IPR	Report identifying learnings from the energywise project for smart meter roll-out	2017
4	ALL	WS4_SDRC 9.6	Report	Foreground IPR	Includes knowledge dissemination strategy	2018