

Supporting vulnerable consumers to benefit from their smart meters

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Does an 'enhanced' installation and follow-up advice help vulnerable consumers optimise their energy usage and get the benefits from their smart meters?

To find out, we offered two householder types - people with arthritis and low income families - either a follow-up home visit or phone advice after a smart meter had been fitted in an installation 'enhanced' by a demonstration of the device and energy advice tailored to the property condition and household circumstances.

Key findings

People with arthritis or other long term health condition and living on a low income tread a fine line between keeping their home comfortably warm and feeling confident about their ability to pay their energy bills. Most participants of this trial already heated their homes to temperatures between 18-21°C when at home in the daytime and early evening - and continued to do so after advice. Nearly all reported reduced levels of worry about their energy bills following enhanced installation and follow-up advice.

Enhanced installer visits - in which installers demonstrated to the householder the functions of the in-home display (IHD) that accompanies a smart meter, and did so in step with their understanding, and delivered energy advice tailored to the property condition and household circumstances - contributed to consumer's confidence in how to use the IHD and their recall of energy advice.

Consumers who received follow-up home visits appreciated the face-to-face delivery of advice and a further demonstration of the different IHD functions which gave them reassurance and the confidence to try things for themselves rather than needing to read a guide. Follow-up home visits familiarised consumers with a variety of ways of using the IHD to understand their energy usage and enabled the delivery of more general energy advice, including the use of heating controls. This contributed to improved energy literacy and, for some, increased engagement with their energy usage.

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Executive summary

The rollout of domestic smart meters, including the offer of a free in-home display (IHD), to all households promises to transform the UK energy market and the way we all use energy in our homes.

Smart meters should enable more accurate billing, automated meter readings, greater visibility of energy usage, improved control over energy use, easier switching and better tariffs, combining to help households save money on energy. But vulnerable households, including those with long-term health conditions and low-income families, may require additional help to achieve the promised benefits. There are also questions about the realistic extent to which low-income households who are already low energy users can achieve meaningful energy savings.

This project explored how people with arthritis and low-income families can best be supported to achieve benefits from smart metering. The project trialled the combination of a more tailored installation visit and follow-up support by either phone call or by a home visit. The advice aimed to give people confidence in using their IHD to understand and be more in control of their energy usage. By tying this in with the energy advice tailored to the household's actual situation, it sought to help households to heat their home affordably and avoid unnecessary energy waste.

It also sought to use the smart meter installation as an opportunity to signpost vulnerable households to further sources of appropriate support, for example from their social housing provider or other agency.

Key findings

- People with arthritis or other long term health condition and living on a low income tread a fine line between keeping their home comfortably warm and feeling confident about their ability to pay their energy bills. Most participants of this trial already heated their homes to temperatures between 18-21°C when at home in the daytime and early evening - and continued to do so after advice.
- Nearly all participants reported reduced levels of worry about their energy bills following enhanced installation and follow-up advice delivery. It was notable, however, that individuals who were already particularly anxious about the costs of heating reported heightened anxieties in response to the increased visibility of their energy usage from their new IHD. There was some evidence that this led to more severe self-rationing of heating during a period of extreme cold. The decline of the offer of phone advice by these individuals meant no follow-up help could be offered to address their concerns, raising questions about how such consumers can be reached to offer support.
- Enhanced installer visits - in which installers paced the demonstration of IHD functions in step with the customer's understanding and delivered energy advice tailored to the property condition and household circumstances - contributed to the consumer's confidence in how

to use the IHD and their recall of energy advice. Awareness-training and prompts for installers may aid delivery of more tailored advice. This is likely to require longer install visits in the homes of vulnerable consumers.

- Consumers who received follow-up home visits appreciated the face-to-face delivery of advice and a further demonstration of the different IHD functions which gave them reassurance and the confidence to try things for themselves rather than needing to read a guide. Follow-up home visits familiarised consumers with a variety of ways of using the IHD to understand their energy usage and enabled the delivery of more general energy advice, including the use of heating controls. This contributed to improved energy literacy and, for some, increased engagement with their energy usage.
- The combination of an enhanced installation visit and follow-up home visit gave vulnerable consumers a further chance to absorb information and check understanding. Consumer perceptions that they are already doing all they can to avoid waste can result in scepticism and a reluctance to take up the offer of advice.
- Removing the need to physically access a meter in order to submit a meter reading was a benefit identified by people with health conditions, including those with arthritis. Prepayment customers appreciated the convenience of remote top-up.

Conclusions

The modest scale of the trial in terms of size and duration limits the ability to conclusively answer the research questions set out. The findings nevertheless add to the growing body of knowledge of how vulnerable customers can be supported to share in the promised benefits of the smart meter rollout.

The project findings point to the importance of an unrushed, step-by-step and face-to-face demonstration of IHD functions by the installer and for energy advice that takes into account the householder's circumstances and the condition of their home. It also provides some evidence to support the case that vulnerable households should be offered a follow-up home visit which combines a further demonstration of IHD functions with more energy advice. However, the limited scale of the trial meant that no hard evidence was generated to show what energy or financial savings would result for households.

The research exposes tensions between the promise of smart metering as an enabler of greater control and the limited energy-saving options low-income households feel are available to them once their heating needs and other routine energy-using practices that they value are taken into account. It also generated some evidence that, for vulnerable individuals with particularly acute anxieties about their energy use, the IHD display may act as a trigger for increased anxiety rather than as a useful aid for making energy choices, potentially raising the risks of harmful self-rationing. This could mean that the installation visit, rather than being an opportunity to access additional support, leads people to decline associated opportunities for help from third parties.

Implications for practice

Policy makers and industry bodies

BEIS should work with Smart Energy GB and energy suppliers to consider how to promote and frame the offer of smart metering related support to vulnerable households so that it feels relevant.

BEIS and Ofgem, in discussion with industry actors, should consider what can be done to guarantee that automated switching will bring financial benefits to low-income households. This is particularly important given the expectation that price caps on variable tariffs and prepayment tariffs will no longer be needed once widespread uptake of smart metering has been achieved. Amongst low-income households, risk aversion and a low trust in switching as a solution to high energy bills are likely to limit the appeal of ease of switching as a promised benefit of smart metering.

The Smart Metering Installation Code of Practice (SMICOP) remains a crucial reference for what the installer is required to do, and this includes demonstrating the IHD and providing energy efficiency advice tailored to the needs of the householder. This tailoring should be understood in terms of the actual circumstances of the householder, including the condition of their dwelling. It should *not* be solely based on the customer's initial level of interest.

Suppliers

The smart meter rollout provides a strong driver for greater integration of customer-focused services for vulnerable customers; vulnerable customer support teams should be able to view consumption data that the consumer has consented to share with their supplier so that they can offer more tailored energy advice and trigger appropriate referrals.

As part of an installer training programme, suppliers should enhance the awareness and skills of installers to identify signs of vulnerability among the people they visit and to help vulnerable customers to get the most out of their smart meter and IHD. This includes recognition of fuel poverty risks, cold-home related health conditions and support on selecting relevant advice according to the dwelling condition and household circumstances of the householder.

The framing of energy-saving advice should recognise the importance of energy use for activities, entertainment and comfort that people consider to be part of their everyday life – not luxuries that they can willingly do without. Similarly, for people with cold-related health conditions, particular care is needed to deliver advice that enables them to achieve affordable warmth. Advice that consists solely of energy saving tips is likely to be inappropriate.

Support for vulnerable households should use messaging that balances the encouragement of active engagement with the IHD with an understanding that this can lead to heightened anxiety among some vulnerable individuals who may respond by harmful self-rationing of energy, particularly heating.

Advice delivery at the installation

Suppliers should consider including a checklist of vulnerability risk factors and circumstances for installers to look out for, with links to appropriate advice messages. Such a checklist could be integrated into the tablet device typically used by installers when offering tailored energy advice to vulnerable consumers. This can help set the tone of the visit and provide an opportunity for customers to ask energy-related questions. It can also prompt the installer to flag up customers may be eligible for the supplier's priority services register or the Warm Home Discount.

The installation visit is the primary opportunity to deliver face-to-face advice and support to vulnerable customers. In the delivery of energy advice, installers should consider the circumstances of the household and select appropriate advice messages in addition to addressing specific issues that the householders themselves raise. It may require an additional 15-30 minutes to deliver an enhanced install visit to vulnerable consumers to allow for a thorough demonstration of the IHD functions and for more time to discuss energy efficiency issues.

An unrushed IHD demonstration and a check that the customer understands each function of it are important quality-control aspects of the installation visit and can help consumers feel more confident about their smart meters and how to use their IHD. Customers who felt the installer took time to demonstrate and explain how to use the in-home display were more likely to recall the demonstration, feel satisfied with the overall installation and be confident in their ongoing use of the IHD.

Installers should encourage regular but not excessive usage of the IHD as a monitoring tool. The demonstration of the IHD should lead into tailored energy advice that consumers can act on; this is to safeguard against increased worry triggered by the new visibility of energy use shown on the IHD.

Advice offered to consumers with an existing cold-related health condition and identified as at risk of under-heating should include effective use of their heating controls and other measures to keep warm affordably. Installers should be wary of advising vulnerable customers to turn down their thermostat or heat their homes for shorter periods as a way to save money. Advice offered should be to heat the home to at least 18°C in the daytime when at home, preferably higher - current recommendations typically suggest 21°C - in the main living space. Older people, or those with cold-related health conditions or who are inactive, may require it even warmer. All advice needs to be balanced with recognition of personal preferences for what is a comfortable level of warmth.

Suppliers should equip installers with well-presented energy advice materials, such as the BEIS energy factsheets, to leave with vulnerable consumers. The offer of such materials, particularly regarding no-cost measures, can help trigger conversation about energy efficiency.

Vulnerable and low-income households who are already low energy users (based on their historic annual usage) may feel they are already limiting their energy usage as much as possible and be unreceptive to generic tips on cutting back their energy usage further.

The demonstration of budget setting by the installer may be of particular benefit to cost-conscious prepayment customers who are keen to actively manage their spending on energy but who are uncomfortable with reading a user guide.

Follow-up advice

Suppliers should develop a systematic plan for offering follow-up advice of different types. This should recognise the fact that some vulnerable consumers may feel the need for more than one IHD demonstration and prefer face-to-face demonstrations over reading materials left behind. This is particularly important for consumers who experience installer advice as too rushed or containing too much information to recall.

For consumers in vulnerable situations, suppliers should develop efficient onward referral routes to third-party advice providers and to schemes for funded energy efficiency and heating measures. Vulnerable consumers in fuel poverty will require help to address underlying issues such as bad housing, outdated appliances and wider financial problems so they can realise the benefits of their smart meters.

Home visits should be offered to low-income families and to low-income households containing people with arthritis or other cold-related health conditions, so that advice can be tailored to their complex circumstances and needs. Visit length, structure and behavioural messaging require further tailoring to the different circumstances of vulnerable consumers.

Amongst low income households, people with arthritis or other cold-related health conditions and families should be offered a home visit so that advice can be tailored to their complex circumstances and needs. Visit length, structure and behavioural messaging require further tailoring to the different circumstances of vulnerable consumers.

Timing of early follow-up support 10-14 days after the installation appears to be appropriate for most participants who received a home visit. Suppliers should also consider how they can best deliver smart metering related support to vulnerable consumers over the longer term.

Pre-booking follow-up phone advice calls and setting clear expectations of what this will cover may support uptake of advice by vulnerable consumers. Enabling call centre advisors to view a customer's smart meter data can support the delivery of relevant advice.

Social landlords

Maintenance and upgrades to improve the energy efficiency performance and heating systems of their housing stock is the most important way social housing providers can support tenants to manage their energy costs.

Housing providers' energy advice services to leaseholders and tenants with smart meters should seek to link advice on how to use the IHD with more general energy advice.

1 Introduction

The smart meter rollout has the potential to transform energy retail markets and the way we all use energy in our homes. The immediate benefits include removing the need for meter readings and improving visibility of actual energy usage, whilst promised benefits include better home energy control and automatic switching to the cheapest suitable tariff. Some of these benefits may be of particular value to households struggling on low incomes and to people with health conditions, particularly those conditions affecting heating or electricity requirements.

But whilst all households will be paying through their fuel bills for the rollout, and all households in Britain will be offered an In Home Display (IHD), there is increasing recognition that certain groups of vulnerable households may require additional support to accept, understand, use and fully benefit from their smart meter and IHD.

This project trialled how the delivery of more tailored energy advice at the point of smart meter installation and in follow-up advice calls or visits can help people living with arthritis and low income households to get the most out of their smart meters, improve their energy literacy, make best use of their heating controls to achieve healthy indoor temperatures and make energy efficiency choices that are appropriate to their own circumstances. Eligible British Gas customers in York and Bristol were invited to have smart meters installed, to receive tailored advice at the installation and then to receive follow-up advice, either in the form of a home visit or a telephone advice call from an experienced advisor. This project considers how far the support enables these groups to have improved confidence in use of their IHD, feel more in control over their home energy usage and be empowered to optimise their energy use, particularly to keep their home warm.

Vulnerability and affordability

Vulnerability in the energy sector has received growing attention as a matter of importance, with a particular concern to identify how the needs of people in vulnerable situations can be better addressed by suppliers and others. Ofgem's consumer vulnerability strategy understands vulnerability to occur when a consumer's personal circumstances and characteristics combine with aspects of the market to create situations where they are:

significantly less able than a typical consumer to protect or represent his or her interests and/or significantly more likely than a typical consumer to suffer detriment, or that detriment is likely to be more substantial.¹

Arthritis is a known risk factor for vulnerability to the harm to health from cold homes. People with arthritis make up a significant share of British Gas' Priority Service Register customers. Low income households with children are another group who can experience vulnerability in the energy market.

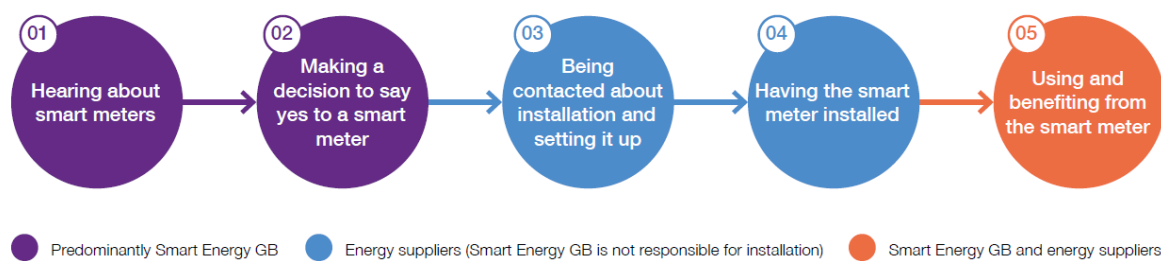
¹ Ofgem, Consumer Vulnerability Strategy. Available at <https://www.ofgem.gov.uk/about-us/how-we-work/working-consumers/protecting-and-empowering-consumers-vulnerable-situations/consumer-vulnerability-strategy>

Affordability in the energy sector is principally framed in terms of fuel poverty, for which the UK government has committed targets to address. Fuel poverty is a key form of vulnerability which cross-cuts with other forms of vulnerability. Households with prepayment meters or on variable tariffs have also been identified as at risk of paying over the odds for their fuel bills.² These potentially interacting characteristics and circumstances were considered in the research.

Smart metering

The UK smart meter rollout intends to offer every household in Great Britain a smart meter by the end of 2020. Suppliers are responsible for undertaking installation of smart meters whilst Smart Energy GB is the body responsible for promoting awareness and understanding of the rollout. The start of the rollout using new SMETS2 meters that allow consumers to switch their smart meter to new suppliers connected to the Data Communications Company has been repeatedly delayed. Smart Energy GB identifies key stages in the smart meter journey. These are shown in Figure 1.

Figure 1: Smart Energy GB visual showing the smart meter journey for consumers



At each stage of this smart meter journey there are moments where vulnerable households may not be able to achieve the same benefits as the wider population. This study involved an enhanced support offer at the point of having the smart meter installed and follow-up support in the early stages at which customers are beginning to use and benefit from their smart meter.

As well as benefiting householders, the switch to smart meters is intended to achieve wider system benefits - enabling the transition to a low carbon economy - as well as benefits for suppliers and communities. Consumer benefits are expected to include:

- An end to the need for meter readings.
- Accurate billing.
- Improved ease of switching.
- Improved visibility of energy usage.
- Control over energy use and financial savings by cutting out wastage.³

Smart meters are an enabling technology for time of use tariffs which would enable people who use energy at off-peak times to benefit from lower prices. The projected benefits are somewhat uncertain, particularly for people who are already low energy users. There are risks that some

² Citizens Advice, 2017, Frozen Out: Extra costs faced by vulnerable consumers in the energy market.

³ Smart Meter Benefits www.smartenergygb.org/en/about-smart-meters/benefits-for-you

consumers, particularly those affected by one or more vulnerability risk factors, may miss out on the benefits or even pay more whilst others benefit.

The smart meter rollout has triggered attention on the potential barriers and risks for vulnerable customers. The government's Early Learning Project notably highlighted that older people, low income households, people with a disability or long term health condition and those with no formal qualifications are the least likely to engage with information from their smart meter.⁴ BEIS, Citizens Advice and Smart Energy GB have driven further research efforts to develop insights into how the smart meter installation journey can be made suitable to address the needs of vulnerable consumers.⁵

Policy measures to support vulnerable customers

The smart meter implementation programme requires each household to be offered a free in-home display. The Smart Meter Installation Code of Practice (SMICOP) specifies minimum standards for suppliers to follow in the customer-facing aspects of the installation of smart metering systems.⁶ This includes a range of requirements to protect the interests of vulnerable customers and to enable them to get the most benefit from their smart meters. It requires demonstration of the in-home display and the provision of energy efficiency guidance, including materials suitable for vulnerable customers. A BEIS-convened process has also led to the development of a set of voluntary principles for adoption by suppliers to help vulnerable customers access support following a smart meter installation.⁷

Supporting vulnerable customers during the smart meter journey

A literature review conducted to inform the trial design identified evidence on opportunities to improve the smart meter journey for vulnerable customers during the installation visit and following installation. This included identification of messages specific to people with arthritis, older people, low income households, social renters and households with children at risk of fuel poverty.

Pre-installation

The literature suggests that suppliers should have in place a special pathway for customers in vulnerable situations, tailored to their needs. (RS Consulting and NEA, 2013) and that efforts should be made to identify vulnerabilities prior to the installation visit (NEA, 2014, BEIS 2017). Making customers aware of the advice aspect of the visit and sending advice in advance can improve customers' receptiveness (Ipsos MORI and EST, 2017, DECC 2014). The insights below were used to inform the design of the trial.

⁴ DECC, 2014, Smart Metering Early Learning Project: DECC Policy Conclusions report.

⁵ Optimisa Research, 2017, Research into the optimisation of the smart meter installation experience for audiences with additional barriers.

⁶ Smart Meter Installation Code of Practice (SMICoP) www.smicop.co.uk/SitePages/Home.aspx Accessed 01/05/2018.

⁷ See Each Home Counts: An Independent Review. Smart Meters: An update on current status of the Review recommendations. www.eachhomecounts.com/implementation/smart-meters/ Accessed 01/05/2018.

Installation visit

Face-face advice and demonstrations during the installation visit present the main opportunity to engage customers. The tailoring of advice is particularly important for consumers who may be less confident with using technology and, therefore, the functions of the IHD (DECC, 2014, Smart Energy, 2015). The installer has a key role to play in tailoring the advice to the customer. It is important that there is enough time allocated for explanation (DECC, 2014). Well-designed supporting materials provide an important and cost-effective means of engaging consumers. These should be available in a format suited to the customer's needs (DECC, 2014). A mix of written and verbal advice and demonstrations is likely to be most effective at helping vulnerable customers remember the advice (Ipsos MORI and EST, 2017). Energy advice must be delivered by a trusted messenger: whilst energy suppliers are not always trusted by consumers, installers are consistently considered trusted experts as are third sector energy advice providers (Ipsos MORI and EST, 2017).

Post-installation support

Consumers, notably lower income households, may experience 'information overload' during the installation visit. Follow up advice soon after installation provides a further opportunity to give advice and reinforce messages. (Citizens Advice, 2015). (DECC, 2014). (RS Consulting and NEA, 2013) (Ipsos MORI and EST, 2017). Support should facilitate learning and behaviour change and not focus solely on technical information. Post-installation support should be provided by appropriately trained individuals or through referral to relevant, trusted organisations. In previous trials, delivery of direct face-to-face engagement resulted in more people claiming to have made a change in their energy behaviour (DECC, 2014). The majority of empirical evidence reviewed shows little or no difference in success of energy efficiency advice delivered by installers or by third party organisations. (NEA, 2014; BEIS, 2017).

2 Approach

Research Aims

The aims of this research project were:

- To identify what additional support during the smart meter journey enables target vulnerable households to realise the benefits of smart metering and IHDs for their wellbeing.
- To contribute to wider learning and thus inform support to vulnerable households delivered during the smart meter rollout. Target audiences for sharing learning are BEIS policymakers engaged in the smart meter rollout, Ofgem, energy suppliers, housing providers and community and voluntary organisations, particularly as providers of advice and support.

The project investigated the effectiveness of enhanced support during the smart meter journey for vulnerable consumers:

- An enhanced installation visit.
- Follow up advice delivery, either as a home visit or a phone advice call, to support vulnerable consumers to realise the potential benefits of smart metering and benefit from additional tailored energy advice.

The research particularly sought to generate learning for energy suppliers and others in the sector and for housing associations regarding support needs and potential benefits of smart metering for people with arthritis and for low income households, especially those with children.

People with arthritis

Arthritis affects over 10 million people in the UK: there are over 200 types of arthritis. After people of pensionable age, the next largest Priority Services Register group amongst British Gas customers is people with arthritis. People living with arthritis can experience pain, joint stiffness, swelling and inflammation of the joint. This can lead to loss of mobility and dexterity, poor sleep and fatigue, impacting on everyday living tasks and ability to work. It can also give rise to depression, loss of confidence and social isolation.

Warmth and avoidance of damp can be important to help minimise flare-ups and joint stiffness. Staying warm is also important to maintain strength and to minimise risk of falls. This research sought to develop further understanding of how, for people with arthritis, their condition affects their heating practices and the associated effects for their health and energy costs.

Low income families, particularly those with children aged under five

Low income is one of the major dimensions of fuel poverty risk, as well as fuel prices and the energy requirements of the dwelling. Children aged under five living in low income households can be particularly vulnerable to the harmful health effects of living in a cold home. Low income households may face additional barriers to accessing energy efficiency advice and have been identified as a group likely to require additional support to understand and use their in-home display with confidence.

Research questions

The research sought to understand the effect of offering an enhanced installation visit and follow-up support for their ability of these groups to feel in control of their energy use and the effects on their actual patterns of energy usage.:

1. What benefits are achieved by vulnerable customers whose smart meter journey involves an enhanced installation visit and follow up support? This included consideration of changes to their energy consumption and heating patterns.
2. What is the specific contribution of the enhanced installation visit to the achievement of benefits?
3. What is the difference in benefits for customers who receive follow-up support in the form of a home visit or over the phone?

Hoped-for benefits

The project identified a set of benefits that were considered important for vulnerable customers to achieve, shown in Table 1. These benefits were identified by the project delivery team, drawing on evidence from relevant literature and previous projects as well as from the team's own experience from household energy advice delivery and previous related research.

Table 1: Intended benefits for participants - and measures of success

Benefit	A positive experience of the installation experience
Measure(s)	• Self-reported experience of installation visit
Benefit	Customer's understanding and confidence in how to use their IHD as an aid to monitor their energy usage and to feel more in control of their household energy costs. Appropriate adjustments to energy usage and costs following installation from wasteful energy usage to usage that is in line with needs.
Measure(s)	• Self-reported knowledge, understanding and attitude to IHD. • Self-reported knowledge of energy usage. • Self-reported energy-related behaviours, including appropriate changes to optimise their energy use.
Benefit	Use of their IHD as an aid to optimise their energy use for heating their home in accordance with their needs and to avoid wasteful heating patterns (i.e. when not at home). Heating rooms to a safe temperature when at home, minimising periods below 16°C and keeping within guideline temperatures of 18-21°C or higher for people with health conditions (up to 25°C). It is hoped that by being able to keep track of the cost of heating by using the IHD, this will help reassure consumers they can afford to heat according to their needs.
Measure(s)	• Self-reported heating behaviours. • Room temperature data in daytime periods when likely to be at home - before and after install and follow-up advice. • Changes in degree-day adjusted heating fuel (gas) consumption following enhanced install and follow-up advice.

Benefit	Comfort and wellbeing associated with appropriate home heating and energy consumption patterns (including reduced worry about bills)
Measure(s)	• Self-reported comfortable heating level • Self-reported worry about bills • Self-reported comfort and confidence to manage bills
Benefit	Access further support to address issues related to their energy use
Measure(s)	• Customer recall of advice provision and follow-up • Installer or advisor records of onward referral to third parties

Research methodology

The project centred on a quasi-experimental trial in which existing vulnerable British Gas customers received an enhanced smart meter installation and follow-up support, either as a home visit or phone advice. The trial took place between September 2017 and February 2018. The latter end of the trial period included a period of extremely cold weather in the UK - the 'Beast from the East'. Participation was with the informed consent of individuals.

Those invited to take part were British Gas customers living in smart-eligible properties in Bristol or York (mainly living in social rented housing) who were either:

- Registered with British Gas' priority services register (PSR)⁸, with the reason for eligibility due to arthritis; or
- Recorded as a recipient of Warm Home Discount⁹ payment, with their eligibility on the basis of broad eligibility criteria. This includes low income households, including low income households with a child aged 5 or under.

Twenty-five participants were recruited in total. Thirteen were assigned to receive an enhanced installation visit and a follow-up phone advice call. Twelve were assigned to receive an enhanced installation visit and a follow-up advice home visit. Smart meter installations were not able to proceed in the homes of two participants in the phone advice group.

Other research activities conducted in preparation for the trial included an evidence review, observation visits and interviews with British Gas staff, development and pilot-testing of trial materials and participant recruitment. The analysis of evidence considered data from temperature loggers placed in the main living room for the period of the trial, participants' smart meter consumption data and self-reported information from participants, as recorded in household interviews at the start and the end of the trial.

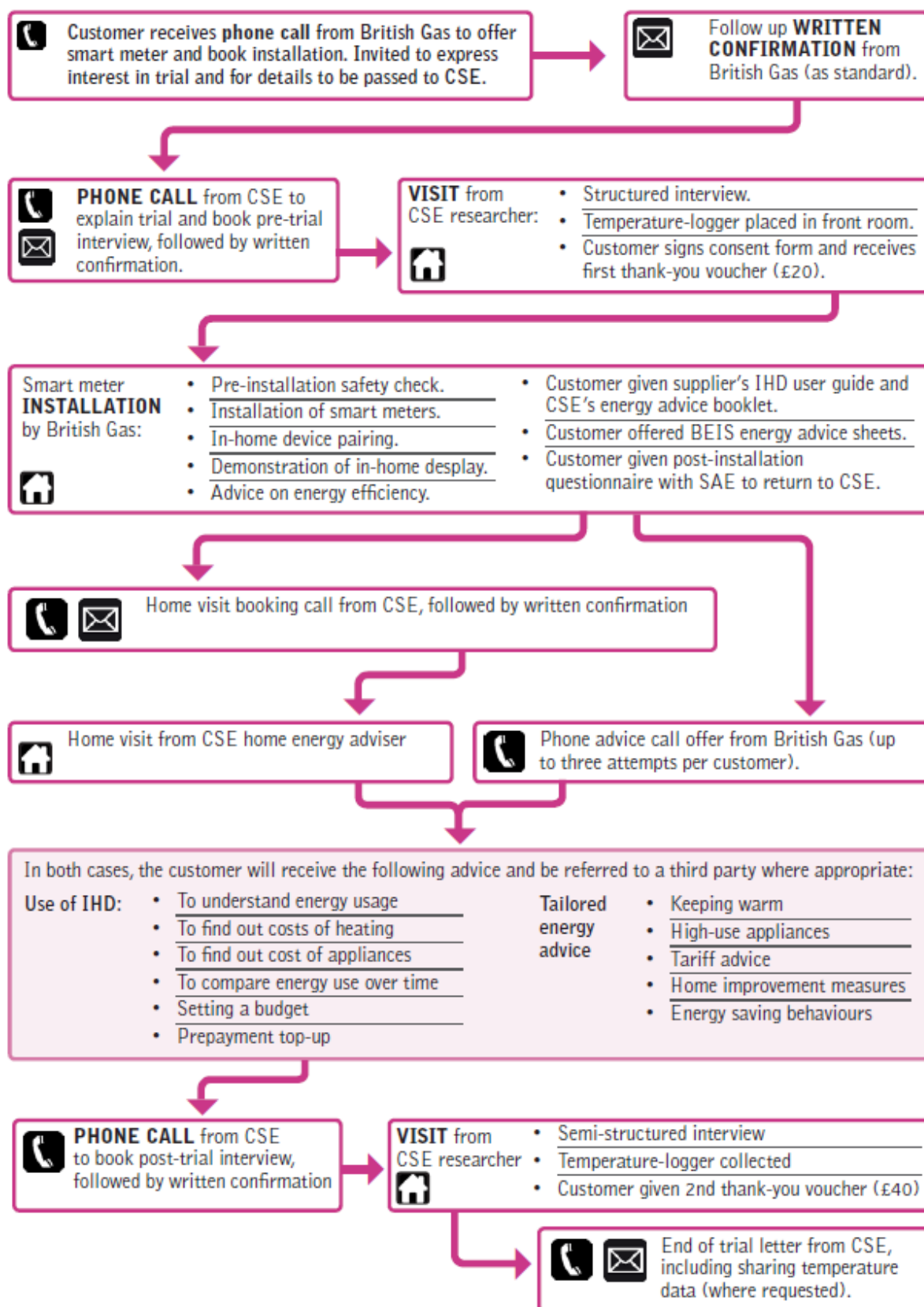
⁸ The Priority Services Register is a register of customers who need extra support or additional services, such as advanced warning of planned interruption of supply. It is open to people of pensionable age, disabled people and people with long term health conditions.

⁹ The Warm Home Discount is a one-off discount of £140 off a customer's electricity bill to help with heating costs. The 'core group' eligibility comprises people who receive the Guarantee Credit element of Pension Credit. The 'broader group' is for low income households and other criteria set by a customer's energy supplier.

Recruitment of trial participants commenced in September 2017. From 2,743 outbound calls, 25 customers agreed to participate, split between York and Bristol locations, with similar numbers assigned to receive a follow-up home visit or phone call. The very low response rate is largely explained by the fact that many customers simply did not answer the phone, even after three attempted calls, including evening and weekend calls. Customer reluctance to take-up the offer of a smart meter also affected the response rate. Repeated delays to the smart meter rollout and privacy concerns about smart meters have affected take-up of smart meters. This very low rate of recruitment is comparable to that of a similar 'Smart-Up' pilot project, which engaged 105 vulnerable households, from promotional activities estimated to have reached over 40,000 households. It is likely that vulnerable customers are more wary of participating in trials of new technology where there may be concerns about their ability to cope with any financial costs that might result if things go wrong.

The trial delivery process, as experienced by participating British Gas customers, is set out in Figure 2. All staff involved participated in training prior to delivery of the customer-facing activities.

Figure 2: How the trial was delivered to participating British Gas customers



Who participated in the trial?

The composition of the two trial groups was comparable in terms of trial location, tenure, property type and energy efficiency rating, income level, employment status, health condition, age of participant, energy payment type and history of tariff switching.

Demographic and income characteristics of trial participants

- Nearly all participants are women.
- All but one household include at least one person with a limiting long-term health condition: many have multiple long term health conditions.
- Across both trial groups, just under half of participants have arthritis.
- Across both trial groups, all participants report household incomes below £18,000 per annum. Over half report household incomes below £12,000 per annum.
- Most participating households receive means tested benefits.

The homes of trial participants

- Most participants live in socially rented homes.
- Most participants live in either a semi-detached house or a flat.
- All participants have gas central heating with radiators.
- Two thirds of participants across both groups live in EPC C or D rated homes, with the home visit group overall having more C-rated homes. The EPC ratings of a third of properties are not known.

Paying for energy

- Across both trial groups, there is an even split of participants paying for energy by direct debit or by pre-payment.
- Half of the participants in both groups report having never switched energy tariff
- More than half of participants in both groups are on standard variable tariffs, with the remainder on fixed or capped tariffs.

Analysis of data

Analysis comprised qualitative thematic analysis and descriptive statistics of participant self-reported data, descriptive and statistical analysis of energy consumption and indoor temperature data to test hypotheses about changes in heating-related energy consumption in line with participants optimising their energy use in line with their needs and circumstances.

On completion of the trial, the energy consumption data of trial participants and for an anonymised matched external sample of 496 British Gas customers was supplied for analysis. For each case, this included pre-smart meter reads, read dates (and if estimated or actual readings), and smart meter half hourly kWh reads. It included contextual data on age, geography and on the Priority Services Resister and Warm Home Discount recipient status of customers. The data provided covered the period of the trial and a year's prior (pre-smart) energy consumption data.

Further methodological detail is provided in a separate set of annexes.

Limitations of research

The project encountered important challenges to recruitment which significantly affected the achieved sample size, the trial design and the timing and duration of the trial. The scale of the trial was much smaller than planned and the design was adjusted in light of the smaller than hoped for numbers of participants. The intended trial design was for 90 participants in total, with 30 assigned to receive an enhanced installation visit and a follow-up phone advice call, 30 assigned to receive an enhanced installation visit and a follow-up advice home visit and a control group of 30 assigned to receive a standard installation visit and no additional follow-up advice.

As stated above, in practice, 25 participants were recruited and assigned to either receive an enhanced installation visit and a follow-up phone advice call (n=13) or to receive an enhanced installation visit and a follow-up advice home visit (n=12). The intended inclusion of an in-trial control group was abandoned. Of the 25 participants across the two groups, two were unable to have either a gas or electricity smart meter installed successfully. Two further participants did not have a gas smart meter fitted as part of the trial. In one case, this was due to technical problems. In the other case, the customer receives gas from a different supplier.

The very small achieved sample size meant the approach to analysis had to be modified, precluding planned statistical analysis of differing effects between groups. There has been a greater than planned reliance on case by case qualitative analysis to respond to the research questions. The lack of an in-trial control group also limits the ability to make strong claims about the effect of the trial interventions.

The customer smart meter data and pre-smart meter data supplied required significant preparatory cleaning to make it suitable for analysis. The small size of the sample limited what quantitative analysis of temperature and energy usage data was worthwhile to undertake.

In feedback on a draft of this report, a member of the steering group challenged an underlying hypothesis of the project design, namely that the in-home display has a useful part to play in informing consumer choices about their heating patterns. This challenge included reference to the fact that the IHD does not record room temperature accurately and so feedback from a room thermostat is more likely to be useful to a householder's heating decisions. The critique also questioned the extent to which low income households can further reduce their energy use. Related criticism was also made in reference to the encouragement of 'wise' energy choices. It was noted this could imply negative judgments about low income householders, with the observation that a decision to limit heating may well be a 'wise' energy choice in such a situation. Some revisions to the reporting have been made in response.

There has been care to maintain the independence of the analysis. CSE alone is responsible for analysis and reporting of all findings. British Gas supplied data, including the smart meter data for an external control group, using criteria defined by CSE. The techniques for analyses of smart meter data were selected based on their appropriateness for testing the research hypotheses and have not sought to follow the procedures required of suppliers by BEIS or Ofgem.

3 The smart meter journey

This chapter describes the British Gas approach to smart meter installation and the smart meter journey for existing customers. It draws on information-gathering observational activities and interviews with British Gas staff. It reports insights identified from this initial research of how, industry-wide, the smart meter journey for vulnerable customers could be potentially enhanced to help them realise the benefits of smart meters, particularly considering the needs of people with arthritis and low income households with children. Whilst the insights emerge from observation of British Gas activities, insights are intended to be relevant more generally to suppliers¹⁰.

Suppliers are responsible for installing smart meters in their customers' homes. Each supplier has developed their own plan which must meet the government's overall timescale and targets. British Gas was the delivery partner for all smart meter installations as part of the trial. Due to ongoing delays in the Data Communications Company (DCC) data and communications infrastructure being ready for SMETS 2 meters to connect to it, all installations as part of the trial were of SMETS 1 meters.

British Gas approach to smart meter rollout and vulnerable customers

As of November 2017, British Gas had installed 3.3m smart meters in homes, accounting for more than half the smart meters installed to date.

British Gas shared with CSE details of their smart customer journey and the associated existing and planned customer supporting processes corresponding to key steps of planning and installation, starting to use smart (credit or prepayment), engagement, help, changes and leaving British Gas as a customer. British Gas has engaged with a range of specialist partners to help them tailor the smart journey and support offer for different sets of customers, towards achieving positive customer outcomes at to each key stage in the journey. It is developing additional processes to strengthen its smart customer support process.

Booking the smart meter installation

Ahead of the installation visit, smart meter installation contact centre agents book smart meter installations. Staff members are trained in recognising and offering appropriate assistance to customers considered vulnerable or in fuel poverty. British Gas offers its customers flexibility to book an appointment slot which suits them. After booking a smart meter installation, customers receive a series of warm-up communications to confirm the appointment and to inform them of what will happen on the day.

¹⁰ Please note that whereas in the overall report, generic industry terminology (as used by Smart Energy GB) is used, this chapter includes a mix of British Gas-specific and generic industry terms.

Smart meter installer training

British Gas uses its own dedicated team of installers (referred to as 'Smart Energy Experts' (SEEs) to undertake smart meter installations. All SEEs undertake an in-house apprenticeship training to equip them to deliver high quality installations. The apprenticeship includes training on the requirements of SMICoP and on connecting with customers.

Smart meter installation

Installers follow an established set of steps for each installation, which includes an early phase of settling the customer and establishing a safe working environment. Following the smart meter installation, the IHD is paired with the smart meters so that information from the smart meters is communicated to and displayed on the IHD. The IHD is then demonstrated to the customer. SEEs are expected to offer energy efficiency advice, in line with SMICoP requirements but do not routinely leave energy advice materials behind. British Gas offers smart meters that can operate either in credit or in prepayment mode. Every customer is left with a 'Welcome to Smart' booklet (IHD user guide). A prepayment-specific version of the booklet includes additional information on topping up, emergency credit and friendly credit.

Post-installation

A week after the smart meter installation, customers are sent a communication to welcome them to their smart meter and use of their IHD, normally by letter or email. British Gas does not routinely offer follow-up home visits or advice calls, although customers can call British Gas for over the phone advice. British Gas offers an online interactive service for credit customers. The help and advice section of its website includes videos about smart metering and the IHD.

Ongoing support to vulnerable customers

British Gas Home Energy Care team have the lead responsibility for customer facing support to vulnerable customers, including responsibility for their Priority Services Register and Warm Home Discount scheme and onward referrals to third party services. A specialist energy efficiency team provide in-depth advice by telephone. The Home Energy Care team make onward referrals to other British Gas and third party support providers.

The understanding gained of the British Gas smart meter customer journey informed the design of the trial. The trial focused on delivering an enhanced installation process and follow up support, making use of the in-home display as an aid available to all smart customers to understand their energy usage. Specific materials produced or selected to support the approach included:

- Arthritis and fuel poverty awareness training for installers.
- Installer checklist and prompt sheet to identify vulnerability risks and support delivery of tailored energy advice to vulnerable customers.
- Supply of BEIS pre-tested energy efficiency factsheets.
- CSE energy advice booklet including suggested experiments for the householder to try out, with using their IHD.

4 Experiences of the trial customer journey

This chapter draws on information from start of trial and end of trial interviews, notes and feedback from installers and advisors to identify participant's experience of different stages of their smart meter customer journey. It also reports limited feedback from installers on the installation.

Pre-installation

All but one of the participants had heard of smart meters prior to the trial, mainly through friends and family but also from TV and online advertising. A quarter of participants recalled having watched a British Gas video in preparation for their smart meter installation. Two people had smart meters at a previous address with a different supplier, whilst one person had previously had a smart meter at their current address which had subsequently been removed due to technical problems.

The installation visit

The design of the enhanced installation visit required the installer to gather some basic information to help them to provide tailored energy efficiency advice, to demonstrate different functions offered by the IHD, to deliver tailored energy efficiency advice, supported by a prompt sheet and to offer relevant factsheets during the delivery of the energy efficiency advice.

The majority of the 15 participants who completed a post-installation survey reported being satisfied with different aspects of the installation visit. The two participants whose smart meter installations could not proceed were, understandably, not satisfied. Ten participants did not complete the survey, but did provide some feedback in the end of trial interview regarding their experience of the installation.

In-Home Display Demonstration

Participants who expressed satisfaction with their experience of the install visit recalled that the installer provided a demonstration of the basic functions of the IHD, including how to view their basic energy usage but few recalled demonstrations of how to compare their fuel spend over time, how to set a budget, experiments to work out the cost of appliances. A handful of participants did not recall having been given a demonstration at all and were less satisfied with the installation visit. All the prepayment users recalled a demonstration of PPM-specific screens, including how to top up and how to view their credit balance.

"Yeah, he showed me how to get to my emergency, he showed me how to look at messages and alerts, and showed me what different things mean, you know, when you go on to, there's the pound and the pence, and then you can go to the other ones that's different types, which I don't go on, so the only one I know is the pound and pence, but... He showed me what the triangle with the exclamation mark means and how to get back to the beginning if we get lost, just press the button. He showed me everything really."

Mum with two young children – prepayment user

Participants satisfied with the demonstration of their IHD commented favourably on the unrushed pacing and care taken by the installer to explain the different uses in order and to check understanding:

"I do remember that he did say to me what everything was. He didn't go, [speaking more quickly] this is that, that's that, that's that, that's that... [Speaking at usual speed again] He was careful and slow....He didn't bombard me...And he did check that I understood before he moved on to the next thing"

Couple with five children and high electricity usage

Participants who were less satisfied with the IHD demonstration recalled a brief, rushed explanation:

"To be honest with you, I don't think she had much time, because she was there an hour doing the fiddling with the box, then she came, and she plugged that in, she just said a few things, this, this, this and that, she said, 'there's a booklet, if any problem, just ring' and that was it really"

Single mum with multiple health conditions – prepayment user

Energy efficiency advice delivered by installer

Participant recall of energy advice delivered by the installer is mixed. Some participants recalled the installer looking around their home and engaging them in conversation about energy efficiency, with recall of advice concerning: boiler efficiency, insulation, draught proofing, energy use of different appliances, efficiency of existing appliances and opportunities to replace them with more efficient models, efficiency and replacement of light bulbs, turning off lights and avoiding using standby. Others could not recall the installer providing advice. This suggests either that installers did not consistently provide energy efficiency advice in line with SMICOP requirements and did not consistently follow the trial-specific guidelines or that the guidelines and prompt sheet did not adequately support installers consistently to deliver advice in a way that is memorable for the customer.

Materials left by installers

In addition to the 'Welcome to Smart' IHD user guide, installers additionally gave customers a CSE energy advice booklet. This included suggested activities to try using the IHD to understand the cost of different energy-using activities in the home. The booklet encouraged people to optimise their use of energy and their heating controls to stay warm and well.

Figure 3: Suggested experiment to understand heating costs - from CSE energy advice booklet

Understand your heating costs

Knowing your heating costs can help you think about choices to keep warm affordably and give you peace of mind that you can afford to heat the home to a healthy and comfortable temperature.

Your heating costs are influenced by various factors including how cold it is outside, how well your home keeps the heat in and how you use your heating system. Your boiler has to work harder on a cold day to warm your home, so it costs more.

The experiments suggested below are best suited to people living in a home with gas central heating. Refer to the instructions in your 'Welcome to Smart' guide 'Compare your energy costs'.

Experiment 3: Check your usage at different times of day

1. Start at the Home screen and select Usage.
2. Select Next to view your hourly gas usage costs.
3. Look at the times of day when your gas usage is higher. Do these times fit with when you are at home and need to feel warm? Are there times when the usage was high but you weren't at home?
4. Look at the times of day when your gas usage is lower. Is this when you are out, or you don't need the heating on, for example, if you have gone to bed?
5. Consider whether you could adjust your heating settings so that the heating is only on at times when you need it.



Remember! A home's healthy temperature range is 18-21°C.

But if you have a health condition that is affected by the cold like asthma or arthritis you should keep it slightly warmer.



Installers additionally left behind selected energy efficiency factsheets as part of the installation visit.¹¹ These factsheets were produced as part of a toolkit developed by Energy Saving Trust and Ipsos Mori for BEIS (2016). The most commonly left-behind factsheets were *Zero-cost ways of saving energy around your home*, *Keeping cosy and warm for less*, *Draught proofing*, *Buyers guide: Choosing*

¹¹ Dept. of Business, Energy and Industrial Strategy toolkit guide: Supporting the delivery of energy efficiency advice to consumers during smart meter installations.

energy saving appliances and Buyers guide: choosing lighting for your home. The installer typically left 3 factsheets at the end of each visit.

Responses to the self-completion questionnaire following the installation visit indicated a high level of satisfaction with all the materials left by the installers. However, the end-of-trial interview indicated more mixed recall concerning the memorability and value of the materials left behind. Most participants required some prompting by the interviewer or another member of the household to recall being left advice materials.

More people recalled the British Gas IHD user guide than the trial-specific materials left behind. Where the installer provided the user guide early in the visit, this led some people to read through it whilst the installation work was ongoing, which helped their understanding of the IHD.

“As I say that booklet was really helpful because while he was working I could read that and I knew then what it was all about and how it worked so yeah, I think the information point of view was all very clearly set out.”

Mum with two young children – prepayment user

Those who hadn't yet looked at the IHD user guide either hadn't found time or didn't feel they needed to, particularly where they were satisfied the explanation from the installer was sufficient. Some participants identified the user guide as a manual that they would only refer to if they needed to do so, for example, to check something they weren't sure about or if something went wrong.

There was more limited recall of the CSE energy advice booklet – few who were assigned to receive follow up phone calls remembered it. Amongst those who had received a home visit, participant feedback indicated that the advisor's support was needed to get the most out of the booklet:

“One or two, I wasn't sure about the answers, but the [home visit advisor] helped me with them, so we got there in the end....I can tell by that, like, when I've used the dryer, it goes right up to where the red mark is. The red mark isn't on there at the moment. But, yes, I can tell when I've got something on; when the wash is on, when the dryer's on, when my granddaughter's here and she's using the hair dryer. You know, you can sort of tell all things like that, so yeah I can tell when I'm using more.”

Retired woman in her seventies

There was also generally poor recall of the factsheets: the more motivated participants had taken time to look at them, whilst most had put them aside and several had since mislaid them.

Installer experience of the installation

Installer feedback was captured on the trial installation process from two installers, who were responsible for over half of the installations conducted. Both these installers reflected that compared to a standard installation visit, the enhanced installation approach being trialled encouraged them to tailor the information more to the customer and that this led to their conversations with customers about the IHD and energy efficiency took longer than usual. One installer requested authorisation to allow an additional half hour for each job as part of the trial as

they found they were routinely taking longer than standard visits due to tailoring the conversations to the customer circumstances. The installer noted that:

“the customers seem to have a lot more questions about the meters and energy efficiency”.

In a telephone interview conducted after completion of the trial, another installer identified that the visits were on average about fifteen minutes longer than a standard visit. The installer noted that the trial specific prompt sheets and guidance encouraged him to spend more time looking around the house and to select advice messages tailored to a consumer's circumstances. He admitted that in previous installation visits he has struggled to identify what advice might be most helpful to a customer. He also felt positively about being able to leave behind factsheets, which he felt customers appreciated as something that can help them save money. He said that he had held onto the surplus materials to use in subsequent routine installation visits.

Rescheduled and unsuccessful installs

The installation dates of seven participants were rescheduled for a range of reasons: at the customer's request; due to extreme weather; where a customer was not at home at the time of appointment; or due to technical problems on the originally scheduled date of the appointment.

The smart meter installations in the properties of a further two customers who had agreed to participate in the trial were unsuccessful within the period of the trial, despite two appointments going ahead in each case. These two customers are included in the sample of 25 participants. In both cases, the installation could not go ahead due to insufficient space for the meters – a problem identified at the first visit and still unresolved at the second visit. In one of these cases, there was a further complicating factor concerning permission to switch off the power supply to another property which shared the same fuse box. In both cases, the participants expressed frustration at the associated hassle and decided not to proceed further, having originally been motivated to have smart meters installed to enable them to monitor their energy usage better.

Follow-up advice provision

This section reports on consumer experiences of the follow-up advice provision as part of the trial. It reports first on experiences of the follow-up phone advice, then on experiences of the home visits. The scripts for home and phone advice were as far as possible similar, encouraging the advisor to check on the consumer's understanding and use of different IHD functions and to offer tailored energy advice.

Phone advice

British Gas records showed that up to five attempts were made to call and offer follow-up advice to each of the eleven participants assigned to the phone trial group who had smart meters successfully installed. In some cases, attempts to make follow up calls continued up to three months after the installation date, rather than taking place within the 10-14 days planned, due to initial calls going unanswered. Whilst the installers advised participating customers to expect a follow-up call in the next 10-14 days, they were not pre-advised of a specific time. This highlights that it can be difficult to

get through to people. However, it is notable that all the phone calls made to arrange all the home visits were successful within the planned timeframe.

Five participants received phone advice, of whom one requested that information was sent in the post rather than over the phone and one contacted British Gas about a technical problem with their smart meter and was offered energy advice during the call. A further three participants contacted declined the offer of over the phone advice. In the follow-up interview, these participants explained that they felt they did not need any further advice. Three participants were uncontactable by phone to offer follow up advice despite multiple attempts.

Those who received phone advice reported finding the follow up advice helpful. One participant who had received the call approximately a week after the installation commented that the advice was well timed as it had allowed her time to play with the IHD beforehand. However, the fact that six of the 11 participants either declined telephone advice or were not contactable after multiple attempts would suggest that follow-up phone advice has its shortcomings as a way of delivering additional support to vulnerable customers.

Home visit

All the planned follow-up home visits took place, with one visit rescheduled when the participant was not at home at the initial agreed appointment time. This greater rate of uptake compared to the phone visits may be because participants valued a home visit more highly or it may be because they felt an obligation as part of the project. Most of the participants who received a home visit specifically recalled the advisor showing them how to use their IHD to test the costs of using particular appliances, such as boiling a kettle, using their washing machine at different temperature settings or to understand the costs associated with habitual wasteful practices, such as keeping lights on when not needed, leaving devices on standby or leaving the heating on when no-one is at home. Many recalled the advisor helping them use the IHD to compare the costs of different types of light bulbs. Participants also recalled the advisor helping them with their heating controls and thermostat settings.

Positive feedback on the home visit referenced preferred learning styles, help in overcoming lack of confidence or even fear regarding new devices and help with remembering information:

"I'm not very good at things like that and I don't really like referring to manuals, so it was nice actually she could show me a little bit more. I pick things up more if someone shows it to me."

Single mum on PPM

"I think it's sometimes easier to talk to people face-to-face. Sometimes, a phone call can be a bit cold and, nine times out of ten, you can guarantee you'll think of something when you've hung up."

Retired woman in her seventies

One busy single mother with young children found the visit an inconvenience as she was feeling tired and her baby was crying. She felt the advice took too long and was largely unnecessary, as it covered information that the installer had already been over.

What she was saying, I understood, but I kind of knew a lot of it because I'd already been told by the British Gas guy, so some of it I didn't really need. But she would have been helpful for somebody that didn't know, because she explained it thoroughly

Mum in her twenties with two young children on PPM

Accessing further support from third parties

The guidance for installers and advisors included prompts to make referrals to third parties, including social landlords and energy advice providers. In the follow up interviews, several participants mentioned ongoing engagement with their social landlord to get improvements made to their home, including replacement of doors and windows, replacement of boiler and heating system. In one case a single parent living with one young child had a new boiler and heating system installed in her home after her follow-up advice visit, but reported that this was not as a result of the trial. . One participant asked to be given a copy of the data from the temperature logger used in the trial to show to her landlord in support of her efforts to convince the landlord to prioritise repairs and energy efficiency improvements to the fabric of her home.

There is limited evidence that the project resulted in participants accessing further support from third parties. All the participants were already either registered with British Gas Priority Service Register or had previously received the Warm Home Discount. So whilst many made fresh applications for the Warm Home Discount during the period of the project, it is likely that this would have happened anyway.

5 Knowledge, understanding and control of energy usage

This chapter reports on the changes in knowledge and understanding of their energy usage achieved by participants, based on their self-reported accounts, from the end of trial interview, which took place at least seven weeks and up to 18 weeks after the installation date. In particular it considers how far the support provided on use of the IHD and tailored energy advice has helped increase participants' knowledge, understanding and ability to control their energy usage.

Frequency of using IHD

All participants were given a demonstration of the IHD by the installer. Most participants in both groups said they looked at the IHD once a day or more (83% home visit; 82% phone call) with many looking at it several times a day (67% home visit; 64% phone call), mostly to glance at their current energy usage. Most felt they were likely to continue to look at it with the same level of frequency though some mentioned that they expected to use it less once the novelty had worn off. A few reported checking their IHD frequently throughout the day, referring to themselves – or to their partner as “obsessed” or “paranoid”. One man, who had declined the offer of follow-up phone advice, discouraged his wife from looking at the IHD so frequently out of concern it was making her overly worried and that, in his view, they were already doing all they could to optimise their energy usage.

Confidence in using the IHD

Most participants reported feeling confident in their routine use of the IHD to check their current, to daily or past usage and, for prepayment customers, to check their current balance. Some people reported having been able to pick up how to use the IHD from the installer demonstration or by playing with it themselves, with some also referring to the IHD user guide.

“Well, I went through it, you know, and I could pick up , it was common sense really”

Retired man in his seventies

However, the installer demonstration of the IHD alone did not leave participants confident in how to set a budget, how to use the IHD to understand the costs of specific energy using activities or how to check their tariff. Some participants in their fifties and sixties mentioned they'd got help from children or other younger members of their family or household who were more familiar with technology and 'gadgets'. Where people reported feeling less confident in their use of the IHD following the installation, this was associated with a feeling that the demonstration was rushed. Some people also mentioned feeling confused where an alert had appeared unexpectedly. In these instances, individuals had either called British Gas or checked their IHD user guide, finding it 'simple to understand' and 'clearly set out':

Yeah, it's like a quick guide, it's a problem-solving thing. When there was a problem I just went straight to that, flicked through, found the solution, it was done.

Parent with multiple health conditions

After follow up advice, nearly all participants reported being very or fairly confident in using the IHD. The responses of some participants indicated some fear about trying out unfamiliar things on the IHD in case they broke it after their installation. Those who received follow-up home visits reported that it helped them overcome such fears and build confidence in using the IHD. One woman who felt that the demonstration provided by the installer left her with only a basic understanding of how to use IHD particularly appreciated the chance to play with the IHD after the installation and then receive a more thorough explanation of the different functions in a follow-up home visit:

"She went through things a little bit more thoroughly with me, 'cause I think with something like that you're a bit frightened that you're gonna press the wrong button and erase everything somehow... And Mister Gas'll be coming knocking on the door, 'what've you done with my thing?'"

Full-time worker in her early sixties

She had been able to move past her initial fear of doing something wrong to recognise the potential to use the IHD to look back at her recent usage:

Not surprised me, but things that I'd never thought of doing, like being able to see what I used, like, last week and being able to look like that, because obviously with a normal meter you don't have that option, and you have no idea what the numbers on the normal meter mean anyway.

Full-time worker in her early sixties

Similarly, a recipient of phone advice commented enthusiastically about the explanation given over the phone of how to use IHD, which had led her to use it more since the advice call. She found the phone advice about how to use the IHD particularly useful because she'd felt the demonstration by the installer had been overly rushed.

IHD functions used

The majority of participants across both trial groups reported using the IHD to see costs of energy over a day or week and check real time energy use (see Table 2). More participants in the home visit group than in the phone call group reported using the IHD for other functions such as finding out the costs of specific activities, and monitoring use over time. The least used functions were the budget setting function and use of the IHD to work out their baseline usage. The baseline usage function was described in the CSE advice booklet but is not in the British Gas 'Welcome to Smart' IHD guide.

Table 2: IHD functions used by participants in each trial group

Functions used	Home visit (n=12)	Phone call (n=11)
Seeing costs over day / week	10	10
Checking real time use	9	9
Finding costs of activities	6	3
Monitoring use over time	5	2
Top-up balance / alerts	4	1
Personal budget	3	2

Working out a baseline	2	2
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Most of the participants who received a home visit specifically recalled the advisor showing them how they can use their IHD to test the costs of different activities, such as boiling a kettle, using a tumble dryer or cooking using a microwave or oven. Two participants mentioned having used the CSE energy advice booklet themselves to work out the costs of more activities after the home visit.

Prepayment customers topping up online

More than half of the prepayment customers in both trial groups had started to top-up online since getting their smart meters installed (see Table 3).

Table 3: Top-up online function used by participants in each trial group

	Home visit PPM	Phone call PPM
	Count	Count
Top up online	4	3
Doesn't top up online	2	2

This function was appreciated as a convenience by low income families with children and by people with health conditions, removing the need to go to the shop to top-up:

"It's brilliant, absolutely brilliant... I've got it on my phone, so it's just top it all up, once you've registered your card, your debit card or your credit card, whatever, it's ten seconds, which suits me because I don't like to go out very much, it's brilliant."

Grandparent with multiple health conditions

Several prepayment customers noted that remote top-up had been a motivating factor for them wanting to change to smart metering. Two participants recalled individual instances of problems with automated top-up functions – either where the top-up had not transferred to the meter, or where the warm home discount credit had not automatically appeared as expected. In both cases the issue had been resolved satisfactorily after a call to British Gas.

Amongst those who did not top-up online, reasons for this included not liking to use computers, concerns about the security of entering payment details on the British Gas website and a preference for visiting the shop to top-up.

Automated meter reading benefits

No longer needing to manually read the meter and the avoidance of billing problems associated with incorrect meter readings were identified by participants as benefits of their smart meters.

Energy literacy and awareness

Participants were asked to rate their knowledge of their own total daily energy spend at the start of the trial and at the end of trial interview. At the start of the trial, most participants had no or almost no idea of their total energy spend (60% home visit, 69% phone call) (see Table 4). Prepayment customers generally had a better knowledge of their spend, associated with the ability to check their

balance and the need to top up regularly. At the end of the trial, participants across both groups reported an increased awareness of their daily energy spend since their installation (see Table 5).

Table 4: Self-reported knowledge of daily energy spend at baseline in trial groups

Self-reported understanding of total daily spend at baseline	Home visit (n=12)	Phone call (n=11)
Some idea	5	3
No / almost no idea	7	8

Table 5: Change in self-reported knowledge of daily energy spend in trial groups

Change in self-reported knowledge of daily spend	Home visit (n=12)	Phone call (n=11)
Improved knowledge	10	7
No change / reduced knowledge	2	4

Participants were asked to rate their knowledge of the costs of energy used by specific activities including lighting, making a cup of tea and running the washing machine. At baseline, most participants felt they had little or no idea of the costs of specific activities – as shown in Table 6. At the end of the trial, some participants reported an improved knowledge of the costs of selected domestic energy-using activities but others reported worsened knowledge (see Table 7). This raises doubts about the efficacy of the enhanced smart meter journey in building consumer's understanding of the costs of specific activities.

Table 6: Self-reported knowledge of selected energy-using activities

No or almost no idea how much activity costs at the start of the trial	Home visit group (n=12)	Phone call group (n=11)
Cost of energy used for lighting	8	6
Cost of running washing machine	7	9
Cost of making cup of tea	7	10

Table 7: Change in self-reported knowledge of the costs of energy for specific energy using activities in trial groups

Activity participants rated their understanding of the energy costs	Home visit group		Phone call group	
	Worsened understanding	Improved understanding	Worsened understanding	Improved understanding
Costs of lighting	5	2	3	2
Cost of running washing machine	2	3	1	4
Cost of making cup of tea	4	2	3	1

However, amongst those who received a follow-up home visit, several directly attributed their improved understanding of the costs of energy to the advisor-led experiments which compared the costs of different light bulbs or different washing machine settings. People's motivations and reactions to the ability to work out these costs varied from finding it helpful to seeing it as not

worthwhile, as the savings were not as big as they had hoped. The reasons why many people rated their own understanding of energy costs worse following the enhanced installation visit and follow up advice than before are unclear. It may be that they recognised that the IHD should allow them to work out the cost of activities more accurately but that because they hadn't done so, they scored their own understanding more harshly. Or it may be that they felt more confused about the actual energy costs of activities than previously, when they hadn't really thought about it before.

Parents' understanding of the costs of entertainment devices

In low income households with children or visiting grandchildren, interviews revealed how the IHD had led to increased visibility of the costs of entertainment devices by children, particularly teenagers. There was mention of having used the IHD to show or tell teenagers the cost of using their games consoles and one grandparent had showed their visiting grandchildren the costs of leaving the lights on and joked about charging them to remind them to switch them off.

One couple with five children ranging in age from pre-school to teenagers were keen to track their energy usage. Whilst their gas usage was relatively low, their electricity usage was very high. At the end of trial interview they said they felt they had a good understanding of what they could do to reduce their electricity usage. One area where they recognised that the family uses a lot of electricity was their use of electronic entertainment devices, including TVs and gaming devices. The parents described how the IHD had enabled them to get a much clearer understanding of the cost of their son's use of devices, with the mother explaining that she had worked out he spends £1/day using his Playstation:

Dad: Yes, he's got a telly almost that size and then his Playstation, then his laptop is going, his phone is going because he's listening to music, but then he's also got his Bluetooth speaker plugged in at the same time because he's playing music through that and it just eats our electric and that's from nine in the morning 'til one in the morning.

Interviewer: Did you know that it was that much before?

Dad: Kind of.

Mum: Well we thought but I never knew it was.

Dad: I knew it was, she didn't believe me how much it was.

Mum: Because I gave him his Playstation back because I took it off him because he was grounded for two weeks and then I realised how much it went up when he had it back.

Couple with five children and high electricity usage

The parents mention that they have TVs in nearly every room and often have multiple entertainment devices switched on at the same time. However, neither this couple nor any other parents expressed an intention to try to achieve savings in either their own or their children's use of entertainment devices, seeing this as part of their daily activities:

No, we don't bother because it varies day to day so we don't. I mean even if it clicks in an alarm to say that we've gone over a fiver for that day there's not a lot we can do, we can't really go and switch things off and start trying to save money because we've only got the things on that we use daily really.

Couple with five children and high electricity usage

Self-reported understanding of how to save energy at home

Participants were asked at baseline (see Table 8) and at follow-up about their own level of understanding of how to save energy at home (changes shown in Table 9). At the start of the trial, nearly all participants in the home visit group reported feeling that they already have a reasonable idea: this either remained unchanged or increased at follow up. Several participants who felt their understanding had improved directly attributed this to advice given during the home visit. Amongst the phone call group, participants started from a generally lower level of self-reported understanding and whilst there was a comparable increase in the number of people who reported improved understanding, some participants reported less understanding at follow-up than at the start of the trial. However, the small numbers make it hard to draw firm conclusions about these changes. This is however, consistent with findings reported elsewhere.¹²

Table 8: Self-reported understanding of how to save energy at home at baseline in trial groups

Self-reported understanding of how to save energy at baseline	Home visit (n=11)*	Phone call (n=11)
No / almost no idea	4	3
General / reasonable idea	6	4
Know exactly	1	4

*one respondent in the home visit group did not answer this question

Table 9: Change in self-reported understanding of how to save energy at home in trial groups

Change self-reported understanding of how to save energy at home	Home visit (n=11)*	Phone call (n=11)
Improved understanding	5	5
No change	5	2
Reduced understanding	1	4

*one respondent in the home visit group did not answer this question

It is notable that even participants who reported increased understanding of how to save energy felt there was little opportunity for them to use this knowledge to make changes as they felt they already only used energy for things they need to do as part of their everyday routines.

¹² Sovacool, Benjamin K, Kivimaa, Paula, Hielscher, Sabine and Jenkins, Kirsten (2017) *Vulnerability and resistance in the United Kingdom's smart meter transition*. Energy Policy, 109. pp. 767-781. ISSN 0301-4215

Self-reported wasteful energy practices

Participants were asked about practices that may be considered wasteful, including leaving unnecessary lights on, leaving hot water running, boiling more water than needed in the kettle, and using the washing machine with less than a full load. The same questions were asked at the start and end of the trial. The most frequently reported wasteful practices at baseline were leaving on unnecessary lights and overfilling the kettle. Table 10 and

Table 11 show how many participants said they did this at baseline and how many self-reported doing so less frequently post trial.

The small numbers and lack of strong patterns make it difficult to firmly claim that the advice has led to a reduction in wasteful behaviours. In their recall, some participants connected conscious efforts on their part to avoid wasteful behaviours with their seeing on the IHD how much specific activities cost. The case study below is an example of a particular use of the IHD to support understanding of the energy costs of activities and using this to make changes:

Case study 1: Using IHD to identify electricity saving opportunities following home visit

A retired woman with multiple health conditions was already in the habit of using her prepayment meter to monitor her energy use. Since working out the costs of activities using the IHD with the help of the advisor during the follow-up home visit, she has changed the light bulbs and become more aware of their washing habits. She recalled finding the advice easy to understand because she could see the figures in front of her when using the IHD. She explained that since the home visit, she had worked out the cost of running the washing machine and the tumble drier herself. She claimed that since the home advice visit, she is now more likely to make sure she has a full load before doing washing rather than wash a half-load. Her self-reported use of the IHD seems notably different from other participants. She claims to have only used it for experiments to understand the cost of different activities but not to check her actual daily usage regularly.

Those participants who admitted to continuing wasteful energy recognised these as habitual practices which they find hard to change.

Table 10: Participants reporting ever leaving unnecessary lights on at baseline and doing so less frequently post install and advice

Group	Reported ever leaving unnecessary lights on at baseline	Reported leaving lights on less frequently post install/advice
	count	count
Home visit	5	3
Phone call	6	4
Participants with under-16s in household	6	5

Table 11: Participants reporting ever overfilling kettle on at baseline and doing so less frequently post install and advice

Group	Reported ever overfilling kettle at baseline	Reported overfilling kettle less frequently post install/advice
Home visit	6	3
Phone call	6	2
Arthritis	2	0
Participants with under-16s	7	1

Some retired participants linked their self-perception as avoiding wasteful energy usage with their generational values of being careful not to squander.

Parents of teenage children tended to recognise wasteful energy usage both in their children's behaviour and in their own usage, with a sense both that they are too busy to deal with their children's wasteful practices, even though they are aware of it and that likewise that they find it hard themselves to change wasteful practices. The case study below of a single parent on a low income who took part in the trial illustrates the challenges faced by participants who recognise that certain practices are wasteful but are part of their habitual practices whereas other changes, which make her daily routine easier and don't require habits to be altered, are easier to act on.

Case study 2: Increased awareness from IHD but challenges in changing habits (declined phone advice)

A single parent woman previously had a pre-payment meter and topped up at the shops. Since getting the smart meter, she has downloaded an app on her phone to top-up online and has surprised herself with how easy she found the process. She expressed satisfaction at no longer having to go to the shop to top-up. She claimed to look at the IHD several times a day and explained that it had made her much more conscious than before of her spending on energy. She felt the installer provided a clear demonstration of how to use the IHD demonstration and useful energy advice. In particular, she reported that on the advice of the installer, she had replaced all her lightbulbs with the more efficient model suggested. She felt satisfied with the demonstration and advice at the installation visit and so had turned down the offer of follow up phone advice.

However, the post-trial interview revealed that she has found it harder to make changes to her laundry to save energy, despite her recognition that she frequently washes just one or two items on a 60°C setting. The IHD has helped her recognise that her frequent use of the machine is costly. However, she hasn't changed her behaviour because she worries if she lets the dirty washing build up she'll have too much. Her old washing machine broke so she bought a new washing machine just prior to the end of trial. She had chosen one with a time-saver setting and mentioned that time was her priority. She hadn't considered the energy rating of the new machine.

This illustrates how, even for economy-conscious individuals, the visibility offered by the IHD does not necessarily lead people to change behaviours where they have other reasons for not wanting to change.

Switching to low energy light bulbs

Whereas participants admitted to finding it hard to make behavioural changes, several reported having replaced older light bulbs with newer, more efficient bulbs. This energy saving measure does require action to make a purchase but does not require a change in habitual practices within the home. The home visit advisor's demonstration of a newer brighter low energy bulb appears to have been particularly effective in persuading some to overcome their reservations about previous models that they had found too dim:

Because, you know, that one, she showed me how...because I always thought, I can't read with them, you know, because they're so dim. But she said, "They're not like that now." And she sent me that one and that's helped my eyes, you know."

Man in early seventies, lives alone

Several participants mentioned having considered replacing larger appliances with more energy efficient models in the future. However, in all cases, the replacement cost was mentioned as a reason for not doing so.

Benefits for vulnerable customers

This section discusses how far the enhanced support approach used in the trial enabled participating vulnerable customers to realise benefits beyond what could reasonably be expected from the customer journey they would experience as part of a standard installation. It considers the evidence that the enhanced support successfully responded to and addressed the specific needs of people with arthritis or other health conditions, and for low income households, particularly those with children.

People with arthritis

The findings indicate that some participants with arthritis feel they already avoid wasting energy. This can be partly explained by the cross-over of older age and arthritis amongst participants and generational values of avoiding waste. This sense that they already avoid waste was reflected in the low self-reported changes in energy efficiency behaviours and limited receptiveness to energy efficiency advice amongst people with arthritis and older people. None of the participants with arthritis reported having problems using their IHD in relation to issues of dexterity. The removal of the need to access a meter to submit meter readings was a benefit identified by people with health conditions, including people with arthritis.

Households with children

Nearly all participants in households with children self-reported habitual wasteful energy practices of leaving appliances switched on or overfilling kettles. Whilst several reported having reduced wasteful energy practices at the end of the trial, parents felt they are too busy and have too many other concerns to change either their own habits or those of other members of the family.

The ability to make visible the energy consumption of particular appliances and activities equipped parents with a more accurate understanding of the costs associated with their children's use of

games consoles and other electronic devices. However, none of the parents suggested that they would use this knowledge to set limits on how many or for how long their children use such devices.

The research exposed how the timing and duration of installation visits and follow-up advice sessions can be disruptive for low income families with young children, making consumers less receptive to advice offered.

Low income households

All participating households were low income households. There was an overall reduction in levels of worry about energy bills reported amongst participants. Some participants reporting feeling reassured by seeing how much energy they were using, and not worrying about accidentally going into emergency credit or receiving a large bill. However others attributed increases in worry due to constantly being reminded of the costs of their use by the IHD. Some participants found this very stressful, and without feeling confident as to how they could use the IHD to help manage their energy use, felt a sense of hopelessness. Issues of replacement cost deterred participants from taking action to invest in new energy-saving higher ticket appliances, such as dishwashers, cookers or washing machines. Anxiety about the ability to afford bills is a key concern and can particularly be an issue for people with existing mental health conditions.

Prepayment customers

As with other studies, prepayment customers particularly value the benefits of online top up, both for convenience and for reducing the risk of going into emergency credit or self-disconnecting. Participating prepayment users were generally very positive about their experiences of topping up online and any problems had been resolved satisfactorily. The advice from the installer on prepayment functions was in line with standard installations and feedback suggested that this was adequate to meet participants' needs. Prepayment users who don't have access to the internet and who are generally adverse to technology or computers had not switched to topping up online and continued to prefer to top up at the shops.

Prepayment users generally had a better awareness of their spending on energy and demonstrated generally higher energy literacy than others at the start of the trial. Nevertheless they still valued the increased visibility of their energy use offered by the IHD. However, for some, this increased visibility was also a cause of worry at being able to see how much they are spending, with a sense that they have a limited ability to reduce it further. Some prepayment customers had expressed interest in the budget setting facility on the IHD but had found it tricky to set up, even where they had asked for help from the installer or from an advisor.

Without an in-trial control group to compare against, it is not possible to make strong claims about whether the IHD demonstration provided as part of the trial was more or less effective than that normally delivered by installers in line with SMICOP obligations and British Gas quality standards. It is also not clear from the accounts of participants how far installers carried out all elements of the enhanced installation guidance which differed from their standard IHD demonstration.

Contribution of elements of the enhanced customer journey

This section reviews the contribution of specific elements of the enhanced customer journey to participants' understanding of IHD functions, their energy literacy and control of their energy usage.

Enhanced installation visit

Installer feedback indicates that they were typically taking longer than usual to look around participants' homes and providing more tailored energy advice. Both of the installers who gave feedback reported that participants tended to ask more questions than at typical installs. It is likely that greater than usual interest on the part of participants is partly due to being part of a trial. The IHD demonstrations by installers left most consumers feeling confident in how to use a limited range of IHD functions. Participants who recalled advice from their installer indicated trust in the energy advice provided, supported by accounts of participants acting on advice, including to buy lightbulbs recommended by the installer. One participant directly attributed the quality and relevance of the advice to having the installer in her house looking around. This supports the finding that the installation visit is an important opportunity to reach vulnerable householders and provide relevant tailored energy advice. However, where participants perceived that the advice was hurriedly fitted in after a lengthy technical install, they felt that the advice was of limited value to them. Without an in-trial control it is not possible to make strong claims about whether the IHD demonstration and advice was more or less effective than that normally provided by installers in line with the SMICOP obligations and British Gas quality standards.

Leave-behind materials

The findings provide little support to suggest that leave-behind materials are widely used by participants after their installation, though it is possible that installers use the offer of leave-behind materials as a trigger to engage participants in a conversation about energy behaviours and to offer verbal advice. There is some evidence that a preference for learning through demonstrations meant many participants were unlikely to refer to leave-behind materials. The supplier IHD guide, which is given to all customers at their smart meter installation, was the most frequently referenced leave-behind material mentioned by participants. The CSE energy advice booklet appears to have been somewhat more useful for participants who were helped to try out the suggested activities by an advisor during a home visit. However, it appears only a handful of highly motivated participants subsequently referred back to the booklet.

Follow-up phone advice

The very poor rate of take-up of follow-up phone advice by participants suggests that this has limited effectiveness as a means of providing follow-up support to customers. A possible barrier identified is that preconceptions of what 'energy efficiency advice' will cover in relation to their own behaviours may lead people to feel that advice is not relevant or useful to them, leading people to decline the offer of advice. Where people feel they are already doing everything they can to avoid waste, there is a sense that any further reductions in energy consumption will be detrimental to comfort levels or the ability to make use of household equipment for routine purposes, including for entertainment, laundry, cooking and cleaning. The fact that these calls were not pre-scheduled is

likely to have contributed to the poor response rate, as people increasingly use call screening to avoid unsolicited phone calls. Amongst those who had received follow-up phone advice, poor recall of the call suggests advice was unlikely to be acted on.

The strongest case of where phone advice appears to have made a difference to a participant's ability to make wise energy choices was where a participant contacted British Gas for help herself in relation to a specific problem. She was then offered additional help that she perceived to be useful and relevant to her and took some follow up steps. British Gas customers are able to request such support as part of a 'standard' customer journey, hence this cannot be considered as a benefit of an enhanced journey.

Consumer perceptions of whether they feel they are likely to learn anything new and of relevance to them appear to be important factors influencing uptake and receptiveness to follow-up phone advice. Unscheduled phone calls appear to be an ineffective way of delivering follow-up advice to vulnerable consumers.

Follow-up home visit

The home visits had a 100% success rate for uptake and delivery. Participants were ready for their pre-booked appointment and were for the most part ready to engage with the advisor. Feedback suggested that participants were pleased with the services and found it helpful.

Appreciation of home visits was particularly associated with people's preference to receive advice face to face and to learn through demonstration and trying things for themselves, rather than by reading information. There was also value of having an advisor provide reassurance that they won't break the IHD. Participants who received home advice were more likely to report using more advanced IHD functions that are likely to help them make wiser energy choices. Demonstrative experiments to test the costs of particular energy-using activities, high use appliances and lightbulbs using the IHD by or with the advisors appear to have been particularly impactful in improving the energy literacy and subsequent activity amongst more motivated participants. The ability to demonstrate newer style energy saving lightbulbs helped change preconceptions that energy saving bulbs are not bright enough. However, these findings are largely based on the self-reported evidence of participants. It is likely that participants will have over-reported what they perceive as the desired outcomes of the trial.

Summary

The combination of an enhanced installation and follow-up support helped most people understand their daily energy usage and feel confident in how to check their current, daily and past energy usage. There is some evidence that the home visit helped build people's understanding of how to use a greater range of IHD functions and particularly helped more motivated participants check the energy costs associated with certain appliances and energy practices. The findings provide a mixed picture regarding whether the advice led to changes in energy literacy and practices. Time constraints and habitual daily practices can be hard to influence whereas advice may more easily lead to low cost purchases to save energy, such as buying new energy efficient lightbulbs.

6 Heating, warmth and health

This chapter reports on the heating-related changes in energy usage by participants in the trial, including any differences between the two trial groups. It outlines how the health conditions of participating householders influences their heating and other energy needs. It reports the findings regarding changes in gas fuel consumption and changes in living room temperature data over the course of the trial, followed by self-reported changes in heating behaviours. All the trial participants use gas central heating as their primary form of heating.

Heating and Health

Nearly all of the participating households included at least one person with a long term health condition, with many having multiple conditions which are affected by the cold. This is reflected in the fact that almost half of participants reported they were either retired or not working due to disability or a long term health condition, whilst several of the younger households included children with asthma or other health conditions. Ten households included people with arthritis. Other health conditions included chronic respiratory conditions (15), cardiovascular conditions (9), mental health conditions (9) and cancer.

Several participants described how the temperature of their home affects the health of themselves or other family members. Several identified that cold temperatures make their condition worse, increase pain and cause them extreme discomfort:

"If you feel warm, comfortable, you're alright. If I get cold, I'm irritable and really uncomfortable"

Single mum with multiple health conditions on PPM

For those with arthritis, asthma, COPD or cancer, keeping the house warm helped them feel comfortable and well. Participants also mentioned other strategies for keeping warm to manage their condition, ranging from annual extended trips to warmer climes to relieve chronic pain, visiting relatives in the daytime, use of hot baths, blankets and staying in bed for longer. Excessive warmth was reported to be problematic for a few participants with asthma or arthritis. Where members of a family had different health conditions, this raised some challenges in balancing somewhat different room temperature, humidity and air flow needs relating to their pain management and comfort levels. Reported problems of damp were relatively scarce, but in two households, this was identified as exacerbating asthma symptoms.

Some individuals described how they had adapted their electricity-using practices in relation to their health condition, including for warmth, therapeutic purposes, their laundry and cooking practices. Certain of these practices are likely to be associated with higher than average electricity usage, including daily usage of a hot tub or regular long baths for therapeutic reasons as well as more frequent washing of bedding and clothing. Others may be associated with lower usage: individuals with arthritis or related conditions favoured use of the microwave or slow cooker as ways to avoid the need to lift heavy pans from the hob. Several participants were reliant on family members for cooking, laundry and cleaning due to severe impairments associated with their condition.

These findings from the interviews illustrate how health conditions, including arthritis, strongly influence people's self-reported heating needs.

Heating behaviours of trial group participants

This section presents the self-reported heating behaviours of participants, concerning their use of heating controls and periods of heating and how this corresponds with their recorded indoor temperatures. More detailed reporting of the indoor temperature analysis is in Appendix C.

Table 12 and Table 13 show the self-reported use of heating thermostats and programmers by trial group participants. A quarter of participants do not use – and do not have – a thermostat fitted to their heating system, which limits their ability to control the temperature in their home. Nearly half of both groups use a secondary source of heating in addition to their gas central heating (low numbers so actual numbers not reported). These are generally used when it is particularly cold.

Table 12: Reported use of heating thermostat at baseline across trial groups

Thermostat use	Home visit (n=12)	Phone call (n=11)
Don't use thermostat	3	3
Use thermostat	9	8

Table 13: Reported use of heating programmer at baseline across trial groups

Programmer use	Home visit (n=12)	Phone call (n=11)
Don't use programmer	7	4
Use programmer	5	7

At the start of the trial, just three participants believed their home to be under-heated. However, the temperature logger data did not indicate that any of these homes were heated below 18°C for any significant periods of time before the installation visit. Just one of these reported having made changes based on phone advice but still felt their home was under-heated at the end of the trial. This participant had started using a heating programmer following phone advice. Overall, three participants in the home visit group (27%) and two participants in the phone call group (22%) self-reported making a change to the way they heat their home during the period of the trial (see Table 14). Most participants who had not made changes to the way they heat their homes did not believe they needed to make any changes.

Table 14: Self-reported changes in heating practices during trial

Change in heating	Home visit (n=11)*	Phone call (n=10)*
No change	8	7
Change in heating	3	2

*two participants did not answer this question

Data from the temperature loggers of two participants showed a slight increase in under-heating after the installation and advice. This may be explained by the participants being away from home during a stint of extreme weather which occurred after their smart meter installation date, so does not necessarily indicate that this may have given rise to an increased health risk from under-heating.

No participants reported their home was over heated. The data logger shows only one participant heating their home to above 24°C for more than 1% of time in any period (see Case study 2). In this case, the logger indicates that periods of overheating increase following the smart meter installation (to 9%) but later drops backs to the same frequency as pre-install (3%). The participant declined the offer of follow-up phone advice.

Follow-up advice and heating patterns of vulnerable households

The following case studies describe the heating behaviours of participants with cold-related health condition and what effect follow-up advice had on their heating behaviours.

Case study 3: No change to under-heating patterns

A man with multiple health conditions, including arthritis, lives with his wife on a very low income. He reported never using energy unnecessarily and rarely putting on the heating, unless it's very cold, but instead wrapping up in a quilt. He explained that when the heating is put on, they use the thermostat but not a programmer, leaving it on a low temperature. They are both at home in the day as he cannot work and his wife acts as his carer. The temperature logger shows their living room is often under-heated. The proportion of time when the living room is under-heated (below 18°C and below 16°C) increases over the duration of the trial. This is likely to be in part associated with extreme weather later in the trial period. In the last monitoring time period of the trial, the living room is under 16°C 18% of the time between 8am and 4pm. Despite this, the participant reported the temperature of his home to be 'about right'.

Before the trial, he already knew specific costs of the energy used for certain activities he needs to manage his health condition, from seeing on the prepayment meter how much they used. The couple had used this to calculate the cheapest way to manage his health condition. He explained that when the smart meter was first installed they watched the IHD every time they put anything on to see the energy use fluctuate. He felt this made no difference to their overall spending and so then discouraged his wife from looking at the IHD so frequently:

"She was obsessed with it because she sits there, and it was right in front of her and that's why I've laid it on its back now, just looking upwards. I said to her we're using the same amount of gas and electric as we were before, it's just that now you can actually see exactly what it was, you know?"

The evident close attention this couple pay to their spending on energy raises the concern that the greater visibility offered by the IHD is actually increasing their vulnerability to risky under-heating because it is a constant reminder of the cost of the heating they are necessarily using for the sake of their health. The husband expressed some interest in switching tariff to save money but considered that being on a prepayment meter would mean he couldn't access cheaper tariffs. He declined the offer of phone advice. His reason for declining advice was on the basis that their situation is ongoing and the advice is unlikely to identify anything to improve the situation:

"Don't think there's anything else we can do really because we're pretty spot on with it anyway because we've been living like it for years."

Their decline of follow-up phone advice prevented exploration of any further exploration of other means available to help them to afford to heat their home more affordably, such as through fabric

improvements by their landlord. This illustrates not only how people on a low income with health related conditions may respond to the increased visibility of the costs of heating on their IHD in ways that increase their risks of under-heating but also that where follow-up support is declined, this makes it difficult to make onward referrals or take other steps to address these risks.

Another case demonstrates the importance that where advice is given, it is appropriate to the circumstances of the individual. One woman in her seventies with arthritis accepted the offer of phone advice. However, she recalled that the advisor had told her to turn her heating down to 10°C at night. She had chosen to ignore the advice as inappropriate to her health condition. Her heating patterns remained largely unchanged during the period of the trial, with no significant periods of risky under-heating. She went on to explain that she found the advice received in person from the installer to be more helpful than the telephone advice, as the installer was able to look around her property and tailor the advice to her.

"Maybe the lad who's in the office doesn't go out and about and see what people are like and see what heat they need, you know what I mean? So maybe he's just reading from a script, whereas the lads who are out and about doing the installations have a better idea of the properties they're going into, don't they?"

Retired woman with arthritis

A further case study illustrates that phone advice on ways to save money on heating and on use of a programmer can result in self-reported beneficial changes, though the logger data indicates that this may not fully avoid periods of risky under-heating.

Case study 4: Changes to heating programmer settings following phone advice

A single parent with young children, including one child who suffers from an auto-immune cold-related condition, reported being constantly worried as she felt the house was very cold and draughty and was concerned to keep the children warm. Due to financial strain she used a variety of coping devices, including turning the heating down even though she'd prefer the home to be warmer, in order to save money on heating. She sometimes goes to her mum's house where it is warmer.

She found the installer led IHD demo rushed and didn't feel informed after the installation. She said she hadn't really looked at the advice materials but had called British Gas herself to ask for advice because her IHD was not working properly. She was pleased with the phone advice received, which lasted about 45 minutes and not only addressed the issues with the IHD but also covered advice on ways to heat her home affordably as well as to save energy in other ways. The advisor checked and confirmed that she was eligible to receive the Warm Homes Discount and arranged for it to be credited to her account. She recalled the warmth-related advice including tips on putting foil behind radiators and how to make effective use of her boiler, heating programmer, thermostat and TRV settings.

She was much more satisfied with the telephone advice than that offered by the installer:

"The woman on the phone, she couldn't have helped me more. She was amazing....The guy who came ... it was like he just wanted to get here and get out 'cause it was a Friday and he wanted to go out. Do you know what I mean? But yeah the woman on the phone was miles more helpful."

Based on the advice she was given, she reported using her programmer to heat the house to 18°C in the mornings and the evenings. The temperature logger shows daytime temperatures becoming more consistent when the programmer is used. She also reported having adjusted the radiators in the bedrooms. Temperature was not monitored in the bedrooms, but the temperature in the living room is recorded as dropping to 14°C overnight at times, though it largely remained within recommended temperatures of 18-21°C during the daytime.

A further case study illustrates that fundamental problems with the heating system need to be addressed in order for householders to be able to apply advice on using heating controls to heat their home to a safe temperature:

Case study 5: Trying to set heating using disconnected controls

A single parent living with one young child explained that before she received her home advice visit, she had tried to control her heating using a thermostat. The advisor identified that the thermostat was not connected to her heating system. It was thus unsurprising that she had found it hard to regulate the temperature of her home using the thermostat. At the home visit, the advisor located a different set of heating controls and explained how to use the controls as well as offering advice on other practical low cost measures to keep the home warm affordably. However, after the visit, the woman still found the temperature didn't seem to change in response to the control settings. This is reflected in her indoor temperature over the period of the trial, which showed large variation in temperatures, varying by as much as 10°C on some days. Shortly after the follow-up home visit, her boiler broke and the housing association installed a replacement. At the installation the heating engineer identified that the controls she had been using had also not been connected to the boiler. The heating engineer showed her how to use her new programmer, which she was now using. The daytime indoor heating temperatures in her home become noticeably more consistent after the date of the new boiler installation, largely remaining within the recommended temperature range of 18-21°C.

Worry and self-reported heating coping mechanisms to reduce bills

The research sought to understand participants' use of certain coping strategies to keep their heating bills down. Such coping mechanisms are known to be used by low income households but in health terms, may be unwise energy choices for people with cold-related health conditions. At the pre-trial interview participants were asked if they had used any of these coping strategies during the previous winter, and in the post-trial interview they were asked if they had used them since their smart meter install.

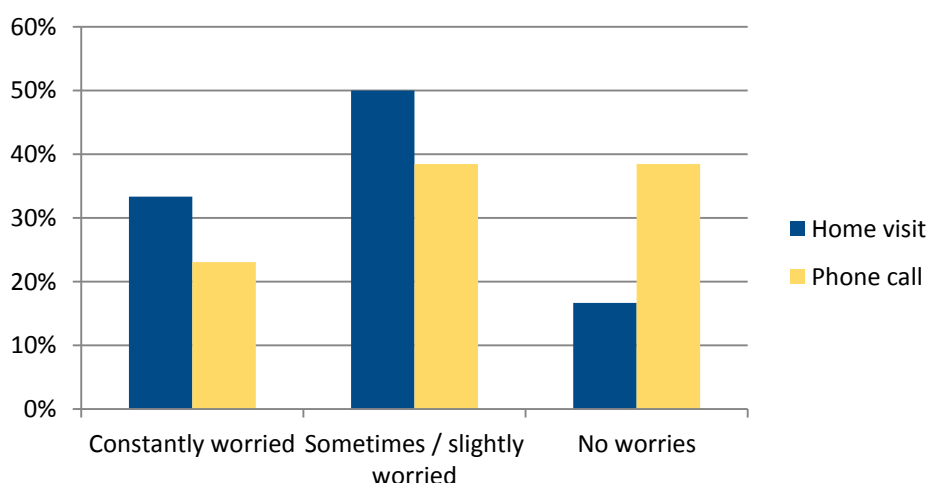
At the start of the trial, across both the home visit and advice groups, over half reported turning the heating off or down last winter because they were worried about the costs of heating (see Table 15). People with arthritis were somewhat less likely than others to report using this coping strategy.

A number of participants report that they cannot reduce any more energy as they believe they are using the minimum already. Some consider 'the minimum' to be using as little as possible whilst keeping their home warm enough, especially when considering people in their home with health conditions. Others consider they use a minimum and their homes, as a consequence, are too cold.

Table 15: Reported changes in the use of coping strategies by trial group participants

Coping behaviours	Group	Reported behaviour pre-trial	Stopped behaviour
Turned heating off or down	Home visit	7	2
	Phone call	4	2
Only heated and used one room	Home visit	1	0
	Phone call	1	1
Used less hot water	Home visit	1	1
	Phone call	3	2
Had fewer hot meals or drinks	Home visit	1	1
	Phone call	1	1

Over half of the participants reported at baseline that they worry about their energy bills to varying degrees (see Figure 4). Prepayment customers mentioned the PPM as a means to keep control of their energy use.

Figure 4: Levels of worry about paying energy bills among participants home visit (n=13) and phone call advice (n=12) groups**Table 16: Changes in levels of worry amongst participants in both trial groups**

Group	Worried about energy bills (any amount at baseline)	Worry reduced	Worry increased
Home visit	10	6	2
Phone call	6	3	2

At the end of the trial, some participants who pay by credit felt less worried about receiving a large bill because they can see how much they are using. Amongst participants who use a prepayment meter, some reported feeling less worried about forgetting to top-up and going into more costly emergency credit. Others reported watching the IHD obsessively and becoming worried as they watch how much they are spending, are unsure how to reduce it and are worried they cannot afford to pay for it. The case study below illustrates a particularly acute case of potential harmful outcomes

that may be associated with the increased visibility of heating costs for people with cold-related health conditions on low incomes.

Case study 6: Continued worry about heating bills

A woman with a mental health condition and self-reported high sensitivity to the cold lives in a C-rated social rented flat and has a low income. At the start of the trial, she reported having very little idea of her energy usage and being very worried about paying her energy bills. She explained that she tended to just heat one room with an electric heater in an effort to minimise her heating costs but also said she used the gas central heating in the morning and the evening, controlling it manually. She also used a variety of hot water bottles, an electric blanket and other low cost ways of keeping warm. The flat had some damp problems and she uses a dehumidifier when she is cooking or showering. She also mentioned that she sometimes leaves it on when she is out.

She received a home advice visit in follow up to her installation. This included advice on the costs of using the dehumidifier and the electric fire. The advisor encouraged her to contact her landlord about getting an extractor fan fitted in the bathroom and to use her gas central heating as a more cost-effective form of heating than the electric fire. At the end of the trial the woman explained that she had followed up on some of the advice, including to use the central heating rather than an electric fire, though she remained somewhat unconfident about how to use the settings on her programmer. She indicated that sometimes she turns it off entirely, sometimes uses default settings and sometimes uses an override function to turn the heating on and off as she wants it. She repeatedly emphasised her desire to be in control but felt confused by and mistrustful of the programmer controls. This account is reflected in considerable fluctuation in the indoor temperature of her home after the date of the advice visit, including to above 24°C and as low as 10°C. However, this may also reflect periods when the home is unoccupied coinciding with a period of extremely cold weather. She mentioned that she regularly stays over with her partner. At the end of the trial, she expressed ongoing anxiety about the smart meter and her bills, in particular about the cost of heating. She felt discouraged that she had gone over the budget she'd set on her IHD and expressed a sense of powerlessness:

"I am that type of person to worry anyway, and if something is constantly showing me something and I can't figure out a way to rectify it, it makes you go I don't know what to do."

This case suggests that follow-up home visit advice can help individuals to make some adjustments but may not be sufficient to build confidence in how to use heating programmers effectively as a key way to control heating. It again highlights the fact that the IHD may serve to exacerbate worry about the costs of heating if the participant feels unable to make meaningful changes.

Switching tariff or provider

Switching tariff or provider can be an effective way for households to cut their energy bills where they switch to a cheaper tariff, particularly where they switch from a standard variable tariff to a fixed tariff. A condition of the trial was that participants should not switch supplier during the period of the trial. All but five participants were on standard variable tariffs at the start of the trial, with two on capped tariffs and three on fixed tariffs. Despite this, most participants told interviewers that they believe they are either on the best tariff available to them through British Gas or are on a better than average tariff and could not save very much money by switching tariff. Some were cynical about the value of switching supplier to get a cheaper tariff:

"Well, they just keep telling you to change energy suppliers, you know what I mean? They keep telling you somewhere else is cheaper, the other one is cheaper, do you know what, I just, no, doesn't matter what you do, it's still the same price, it will go up."

Single mum with multiple health conditions on PPM

There was considerable loyalty to British Gas amongst participants, which is likely to be an effect of how the sample was selected. Reasons given by participants for preferring to remain with British Gas included trusting their customer service, always having been with them or having had a bad past experience of another supplier or the process of switching:

"Well, I have looked but I like British Gas, so I wouldn't change it on a whim, you know, to save a few pounds a year... but they look after me, British Gas."

Man in his sixties with arthritis on a standard variable tariff

All of the participants in the trial have characteristics (low income household, social rental, prepayment meter user) associated with below average rates of engagement with the energy market¹³. Many of the participating households receive the Warm Home Discount, qualifying under British Gas broader criteria (though many would also likely qualify under the core criteria). As suppliers have different Warm Home Discount criteria, a few of those who participated would potentially risk no longer receiving the Warm Home Discount if they moved suppliers. Only one participant reported intending to switch supplier following the trial: this was on the basis of a doorstep visit by another supplier. This suggests that even after the end of the trial, participants are unlikely to achieve the potential saving benefits from switching to a cheaper tariff.

Gas consumption and indoor heating patterns

This section reports on the findings about gas consumption and indoor temperature of households participating in the trial.

Analysis was conducted to compare the gas consumption in the homes of trial participants before and after delivery of the trial. It conducted equivalent analysis for an external control group of British Gas customers who had switched to a smart meter. The analysis controlled for changes in external temperature. It found that there was no significant change in gas consumption, either for the trial participants or for the external control group. However the sample size was very small to draw meaningful conclusions.

Analysis was also conducted of changes in indoor temperatures in the main living space over the period of the trial for all homes of participants. This also found no statistically significant change in heating level following the installation and advice delivery.

¹³ Citizens Advice, 2017. Frozen Out. Available at: www.citizensadvice.org.uk/Global/CitizensAdvice/Energy/Frozen%20out.pdf

These findings indicate at a group level, that the enhanced support offer had no discernible effect on gas consumption or on heating patterns. Full discussion of these findings is shown in Appendix C. The most likely explanations for this are presented here.

Previous studies of the effects of feedback provided by smart meters indicate that only a small energy reduction effect is likely. It is likely that sample achieved is simply too small in size to detect a small, but real, effect. Furthermore, detecting real changes in energy consumption requires monitoring over an extended period. It is likely that the duration of the trial study meant that there was insufficient elapsed time following the smart meter install for meaningful change to be realised.

For nearly all of the households, their heating was already within generally recommended safe temperature range. In terms of changes to internal temperature our research found that, with one exception, the indoor temperature did not reveal significant under-heating amongst participants, either before the installation, following installation or following further advice delivery. Further, all households with one exception, were heating their home within recommended temperature ranges of 18-21°C during the evenings prior to the trial. These households had no reason to reduce or increase their heating energy consumption. This is primarily because temperature levels were already at comfortable levels and further efficiencies to achieve the same temperatures using less energy were not found (within the short time frames of this project). Therefore advice could not leverage significant changes. The temperature data and interview data supports this idea. The majority of householders stated that they made no changes to their heating.

In the homes of three participants, there was evidence of a slight increase in under-heating after they had received advice but this coincided with a period of extreme cold weather and includes periods when they may have been away from home. The analysis of recorded indoor temperature during the daytime also found that homes were largely kept within the recommended temperature range of 18-21°C. Given that many of the householders are at home during the daytime, this is important. However, none of the participating households routinely heated above 21°C, either before the trial or following installation and follow-up advice. One participant's living space had occasional periods of heating above 21°C. This indicates that even with advice, participants with cold-related health conditions do not heat their living spaces to higher temperatures, even during particularly cold periods of weather.

The logger data did identify three households which were under-heated (below 16 °C for more than 10% of time) prior to the install. However, interview data suggests that these periods of under-heating coincide with periods when there was no-one at home during the daytime (i.e. wise energy behaviour). The data also indicates there was little, if any under-heating during the evening period between 6pm and 9pm. Further, no participants reported their home was over-heated. This is supported by logger data which shows only one participant heating their home to above 24 °C for more than 1% of time in any period.

The lack of evidence of a change in heating by households can be understood in terms of most participating households already heating their homes to recommended temperatures. All the participating households included at least one person with a health conditions which can be exacerbated by cold temperatures. Therefore advice to make changes to reduce the indoor temperatures via adjusting heating settings, would have been inappropriate.

Recognising the importance of people heating their home to recommended safe temperatures, advisors offered relevant advice on how to maintain comfortable temperatures whilst using less energy. A full discussion of options for this that would have been offered as part of the advice in the trial is given in Appendix 3. In sum, these are:

- a) Use of timers to reduce heating when no one is present
- b) Correct use of the thermostat (not used as an on-off switch)
- c) Keeping heat where it is required (closing doors and windows, drawing curtains)
- d) Investment in energy efficient equipment and fabric measures.

Options a, c and d are likely to deliver limited savings for households who spend most of their time at home and so cannot leverage savings from diligent use of timers or have limited finances or DIY skills to make changes to the efficiency of heating equipment or building fabric. Option b is generally suitable for all households but it would appear that some participants continued to prefer using the thermostat as an on-off switch, rather than using a programmer. Some participants did not have a thermostat fitted and so were not able to use this control.

A competing explanation is that the enhanced energy advice given at install and in follow up phone calls and a home visit was not effective because it was not sufficiently engaging or relevant (or did not take place). Our experience of shadowing of the installers and of observing the delivery of phone energy advice has highlighted the difficulties of giving effective advice in a short space of time, particularly on complex issues such as improving heating efficiencies via behavioural changes.

It therefore judged likely that the absence of significant or detectable changes in both indoor temperatures and heating energy levels is the result of trial participants already heating themselves to healthy temperatures, whilst simultaneously not having the opportunities, skills or capacities (within the trial period) to use behavioural or technical measures to measurably reduce their energy consumption. The small sample size prevented the relatively small increases or decreases in energy consumption achievable within the project timeframes being identifiable as a statistically significant change. This means we are unable to either prove or disprove whether the approach of linking use of the IHD to energy advice is effective to overcome challenges and facilitate the desired changes in confidence, knowledge and behaviours.

Summary

The findings indicate that the enhanced advice made little difference to heating patterns. This is likely to be because the majority of participants were already largely heating their homes within the recommended heating range of 18-21°C, with the exception of one case of risky under-heating. This did not change at a group level. Certain individuals' heating patterns showed some evidence of adjusting the timing of heating to better fit their presence in the home. There is some qualitative evidence that people who received home visits gained an improved understanding of how to use their heating controls, following advice given. Concerns about the costs of heating appear to be a major factor influencing people's reluctance to heat for longer, even though most participants claim to prioritise keeping warm over cost considerations.

7 Conclusions

The modest scale of the trial in terms of size and duration limits the ability to conclusively answer the research questions set out. The findings nevertheless add to the growing body of knowledge of how vulnerable customers can be supported to share in the promised benefits of the smart meter rollout.

The project findings point to the importance of an unrushed, step-by-step and face-to-face demonstration of IHD functions by the installer and for energy advice that takes into account the householder's circumstances and the condition of their home. It also provides some evidence to support the case that vulnerable households should be offered a follow-up home visit which combines a further demonstration of IHD functions with more energy advice. However, the limited scale of the trial meant that no hard evidence was generated to show what energy or financial savings would result for households.

The research exposes tensions between the promise of smart metering as an enabler of greater control and the limited energy-saving options low-income households feel are available to them once their heating needs and other routine energy-using practices that they value are taken into account. It also generated some evidence that, for vulnerable individuals with particularly acute anxieties about their energy use, the IHD display may act as a trigger for increased anxiety rather than as a useful aid for making energy choices, potentially raising the risks of harmful self-rationing. This could mean that the installation visit, rather than being an opportunity to access additional support, leads people to decline associated opportunities for help from third parties.

8 Implications for practice

Policy makers and industry bodies

BEIS should work with Smart Energy GB and energy suppliers to consider how to promote and frame the offer of smart metering related support to vulnerable households so that it feels relevant.

BEIS and Ofgem, in discussion with industry actors, should consider what can be done to guarantee that automated switching will bring financial benefits to low-income households. This is particularly important given the expectation that price caps on variable tariffs and prepayment tariffs will no longer be needed once widespread uptake of smart metering has been achieved. Amongst low-income households, risk aversion and a low trust in switching as a solution to high energy bills are likely to limit the appeal of ease of switching as a promised benefit of smart metering.

The Smart Metering Installation Code of Practice (SMICOP) remains a crucial reference for what the installer is required to do, and this includes demonstrating the IHD and providing energy efficiency advice tailored to the needs of the householder. This tailoring should be understood in terms of the actual circumstances of the householder, including the condition of their dwelling. It should *not* be solely based on the customer's initial level of interest.

Suppliers

The smart meter rollout provides a strong driver for greater integration of customer-focused services for vulnerable customers; vulnerable customer support teams should be able to view consumption data that the consumer has consented to share with their supplier so that they can offer more tailored energy advice and trigger appropriate referrals.

As part of an installer training programme, suppliers should enhance the awareness and skills of installers to identify signs of vulnerability among the people they visit and to help vulnerable customers to get the most out of their smart meter and IHD. This includes recognition of fuel poverty risks, cold-home related health conditions and support on selecting relevant advice according to the dwelling condition and household circumstances of the householder.

The framing of energy-saving advice should recognise the importance of energy use for activities, entertainment and comfort that people consider to be part of their everyday life – not luxuries that they can willingly do without. Similarly, for people with cold-related health conditions, particular care is needed to deliver advice that enables them to achieve affordable warmth. Advice that consists solely of energy saving tips is likely to be inappropriate.

Support for vulnerable households should use messaging that balances the encouragement of active engagement with the IHD with an understanding that this can lead to heightened anxiety among some vulnerable individuals who may respond by harmful self-rationing of energy, particularly heating.

Advice delivery at the installation

Suppliers should consider including a checklist of vulnerability risk factors and circumstances for installers to look out for, with links to appropriate advice messages. Such a checklist could be integrated into the tablet device typically used by installers when offering tailored energy advice to vulnerable consumers. This can help set the tone of the visit and provide an opportunity for customers to ask energy-related questions. It can also prompt the installer to flag up customers may be eligible for the supplier's priority services register or the Warm Home Discount.

The installation visit is the primary opportunity to deliver face-to-face advice and support to vulnerable customers. In the delivery of energy advice, installers should consider the circumstances of the household and select appropriate advice messages in addition to addressing specific issues that the householders themselves raise. It may require an additional 15-30 minutes to deliver an enhanced install visit to vulnerable consumers to allow for a thorough demonstration of the IHD functions and for more time to discuss energy efficiency issues.

An unrushed IHD demonstration and a check that the customer understands each function of it are important quality-control aspects of the installation visit and can help consumers feel more confident about their smart meters and how to use their IHD. Customers who felt the installer took time to demonstrate and explain how to use the in-home display were more likely to recall the demonstration, feel satisfied with the overall installation and be confident in their ongoing use of the IHD.

Installers should encourage regular but not excessive usage of the IHD as a monitoring tool. The demonstration of the IHD should lead into tailored energy advice that consumers can act on; this is to safeguard against increased worry triggered by the new visibility of energy use shown on the IHD.

Advice offered to consumers with an existing cold-related health condition and identified as at risk of under-heating should include effective use of their heating controls and other measures to keep warm affordably. Installers should be wary of advising vulnerable customers to turn down their thermostat or heat their homes for shorter periods as a way to save money. Advice offered should be to heat the home to at least 18°C in the daytime when at home, preferably higher - current recommendations typically suggest 21°C - in the main living space. Older people, or those with cold-related health conditions or who are inactive, may require it even warmer. All advice needs to be balanced with recognition of personal preferences for what is a comfortable level of warmth.

Suppliers should equip installers with well-presented energy advice materials, such as the BEIS energy factsheets, to leave with vulnerable consumers. The offer of such materials, particularly regarding no-cost measures, can help trigger conversation about energy efficiency.

Vulnerable and low-income households who are already low energy users (based on their historic annual usage) may feel they are already limiting their energy usage as much as possible and be unreceptive to generic tips on cutting back their energy usage further.

The demonstration of budget setting by the installer may be of particular benefit to cost-conscious prepayment customers who are keen to actively manage their spending on energy but who are uncomfortable with reading a user guide.

Follow-up advice

Suppliers should develop a systematic plan for offering follow-up advice of different types. This should recognise the fact that some vulnerable consumers may feel the need for more than one IHD demonstration and prefer face-to-face demonstrations over reading materials left behind. This is particularly important for consumers who experience installer advice as too rushed or containing too much information to recall.

For consumers in vulnerable situations, suppliers should develop efficient onward referral routes to third-party advice providers and to schemes for funded energy efficiency and heating measures. Vulnerable consumers in fuel poverty will require help to address underlying issues such as bad housing, outdated appliances and wider financial problems so they can realise the benefits of their smart meters.

Home visits should be offered to low-income families and to low-income households containing people with arthritis or other cold-related health conditions, so that advice can be tailored to their complex circumstances and needs. Visit length, structure and behavioural messaging require further tailoring to the different circumstances of vulnerable consumers.

Amongst low income households, people with arthritis or other cold-related health conditions and families should be offered a home visit so that advice can be tailored to their complex circumstances and needs. Visit length, structure and behavioural messaging require further tailoring to the different circumstances of vulnerable consumers.

Timing of early follow-up support 10-14 days after the installation appears to be appropriate for most participants who received a home visit. Suppliers should also consider how they can best deliver smart metering related support to vulnerable consumers over the longer term.

Pre-booking follow-up phone advice calls and setting clear expectations of what this will cover may support uptake of advice by vulnerable consumers. Enabling call centre advisors to view a customer's smart meter data can support the delivery of relevant advice.

Social landlords

Maintenance and upgrades to improve the energy efficiency performance and heating systems of their housing stock is the most important way social housing providers can support tenants to manage their energy costs.

Housing providers' energy advice services to leaseholders and tenants with smart meters should seek to link advice on how to use the IHD with more general energy advice.

9 Notes and References

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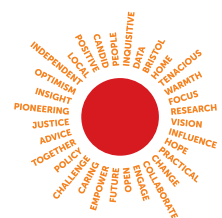
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