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Smart for All

Understanding consumer vulnerability during the experience of smart meter installation

DEPARTMENT OF ENERGY & CLIMATE CHANGE

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Executive summary

Background

The roll-out of smart meters is a key Government priority. More than 53 million gas and electricity meters[1] are expected to be replaced by smart meters by 2019. The roll-out of smart meters along with the associated in-home display unit (IHD) is intended to provide benefits for consumers, energy suppliers and energy networks, and ultimately to improve the management of energy across the network. In April 2012 the Government published a consultation on its Consumer Engagement Strategy[2]. The Strategy's proposed high-level objectives include ensuring that consumers in vulnerable positions and/or on low incomes benefit from the roll-out[3].

Smart meters allow two-way communication between the meter itself and the energy supplier's systems, typically providing domestic consumers with close to real-time information about energy use via an IHD. The IHD is capable of showing near real-time data on current usage, and usage over the previous 24 hours, week, or month, in either pounds and pence or kilowatt-hours (Kwh) – or both. The information for electricity usage is updated approximately every six seconds and the information for gas usage is updated every half hour. This kind of data allows customers to track how much electricity and/or gas they are using and how far this fluctuates when different devices are in use.

The installation of the smart meter and its IHD is an important touch-point in the roll-out process. This is the point at which customers have a face-to-face opportunity to find out how to use the new technology, and the benefits it can bring them.

Research objectives

National Energy Action (NEA) and Consumer Focus are concerned that some consumers in vulnerable positions may not be able to access all of the advantages that smart metering offers. In conjunction with the DECC, Consumer Focus and NEA wish to identify issues experienced by consumers on a low-income or in a vulnerable position in relation to the installation of smart meters. The overall aim of the research is to inform all stakeholders of good practice for the roll-out of smart meters. This includes recommendations on how to overcome any negative experiences as well as sharing and building upon positive experiences in order to promote customer engagement and benefit.

[1] http://bit.ly/QknAG7 (PDF)
[2] SMIP Consumer Engagement Strategy, April 2012, page 9, http://bit.ly/RG30Nc
[3] Ibid. The other two high level objectives are: Building consumer support for the roll-out by building confidence in benefits and providing reassurance on areas of consumer concern; Delivering cost-

Methodology

NEA and Consumer Focus secured the participation of E.ON and British Gas who have both begun rolling-out smart meters to their customers. Customers who had a smart meter installed in January or February 2012 were invited to participate in either an in-depth interview in their home or a focus group discussion to share their experiences of the installation process and subsequent meter use. In total, 36 in-home depth interviews were conducted, with 15 consumers in a vulnerable situation and three non-vulnerable customers from each of E.ON and British Gas.

Eight focus groups were also conducted: four groups were conducted with British Gas customers in a vulnerable situations, two groups with British Gas non-vulnerable customers and two groups with E.ON customers in vulnerable situations. A total of 50 British Gas and E.ON customers participated in a focus group. The depth interviews and focus groups broadly covered the same aspects of the smart meter installation and subsequent use.

All customers were screened to determine the nature of their vulnerability and many customers were classed as vulnerable on multiple criteria. Criteria for vulnerability include:

- the presence of people aged over 65 in the household;
- the presence of children aged under 16 in the household;
- chronic physical health conditions;
- mental health conditions;
- a household income of less than £10,000 per annum;
- receipt of means tested benefits;
- an education level of fewer than five O-levels/GCSEs (as a proxy indicator for potential literacy or numeracy problems).

The fieldwork phase of the research was conducted between 14th February and 21st March 2012. The location of interviews and focus groups was largely dictated by the areas in which suppliers had been carrying out installations during the relevant period and included London and the South East, West and East Midlands, Yorkshire and Humberside, and the North East.

Differences between British Gas and E.ON installations

It is important to note that there are significant differences in the way in which the two suppliers conducted their smart meter installations, which may affect the profile of consumers included in this research.

E.ON customers had responded to a piece of direct mail offering a smart meter, which briefly explained that smart meters will be rolled-out throughout Great Britain by 2019, and offered them the possibility of having a smart meter installed early, free of charge. This leaflet highlighted in particular the advantage of no longer having estimated bills. All these customers had therefore 'opted-in' to receive a meter. The majority of customers in vulnerable situations had also been handled through a dedicated call centre with a view to ensuring the installation took into account any particular needs.

British Gas customers, by contrast, had received their meter as an 'end of life meter exchange'. Customers received a letter and/or a call informing them of the meter replacement and to set the appointment. Customers in vulnerable situations were handled through the same team and process as non-vulnerable customers.

Key findings

Pre-installation: supplier communications

The majority of customers who opted in to receive a smart meter were happy with the communication they received prior to the installation of the smart meter. They all had an understanding of at least one of the benefits which a smart meter could offer them and felt that their initial call covered any queries that they had. What was discussed in the call varied but two thirds recalled being asked whether anyone in the home had any medical conditions and the majority were informed how long the visit would take.

Customers who received the smart meter as part of an end of life meter exchange typically did not receive a letter prior to the phone call. They had less understanding of what a smart meter was prior to installation and over a third did not recall hearing the term smart meter used. However, this lack of information did not significantly concern them. The support needs of customers were typically not assessed.

On the day: the installation

Most customers were happy with the installation, considering the installer to be pleasant and polite, and their houses were left clean and tidy. The majority of customers received a courtesy call prior to the installer arriving and were satisfied with the identity of the installer; the branded van and uniform both provided reassurance.

Installations generally took under two hours, except for a minority of cases where, due to unforeseen problems, such as poorly located pipework, the installation took slightly longer than anticipated.

The majority of customers believed that the installer checked that some appliances were working again and consumers were happy with the level of service provided. A minority of elderly customers felt some discomfort when the heating was turned off but they were all satisfied that the length of time that this was switched off was kept to a minimum. Other than this, there are no differences between those in vulnerable situations and non-vulnerable customers in the satisfaction of what the installer did and the number of checks carried out.

On the day: the demonstration of the IHD

The vast majority of customers were given a demonstration of how the IHD worked. The installer talked to the customer about the traffic light display and in the majority of these cases informed the customer that the red light was not a cause for concern but an indication that they have switched on a device which uses a lot of energy, such as the kettle. It is worth noting however that only a small minority of customers demonstrated an awareness that the traffic lights change exclusively in response to electricity consumption, with some customers explicitly mentioning an expectation of the traffic lights altering in response to their gas consumption.

Immediately following the demonstration the majority of customers were happy with the information they had been given. However, some customers felt that they had not fully grasped how the IHD functioned. The reasons for this ranged from feeling that the demonstration was too quick to, more commonly, blaming themselves for not understanding the information the installer had given. Many customers also felt that although the demonstration was clear at the time, it was too much information to take in and retain.

Post installation support

Although nearly all customers felt that the installer provided them with sufficient information on how to operate the IHD, questions arose subsequently for many customers. Around half had unanswered questions, ranging from concern over how the financial information displayed on the IHD corresponds to their actual bill (especially in terms of the phrase 'indicative only') to questions around the use of the IHD to measure gas consumption. Some customers were also concerned about how much energy the IHD itself uses.

Both suppliers provided customers with booklets and only a very small number had not received one. Roughly half of customers had either only flicked through the booklet or not looked at it at all. Some of these customers just had not yet found the time to read the booklet, others preferred to learn by doing and a small number felt they would not be able to understand the booklet due to a literacy or language barrier. Some, particularly elderly customers, felt that the language used in the booklet was too technical and that there was not always a logical progression of information. Some customers felt that a DVD alternative to the booklet would help them to learn more about how the IHD works, as the physical experience of manipulating the different buttons would be played out visually.

Although the vast majority of customers said that they would phone their supplier if they had any questions about the smart meter, only a very small number had actually contacted their supplier.

Understanding and using the smart meter and IHD

Nearly all customers considered their IHD to be the 'smart meter' and when asked to define what a smart meter is, described the IHD and its functionality. The vast majority understood that the IHD monitors real-time usage and that it communicates with their supplier but very few understood the technical detail of exactly how the communication works. Frail elderly customers and customers with low literacy tended to find it harder to define what the smart meter is. End of life meter exchange customers typically had a narrower understanding of smart meters and their functionality.

The majority of customers could identify at least one benefit of having the smart meter and IHD. Customers who opted in were more likely to mention multiple benefits compared to end of life meter exchange customers. The benefits mentioned most frequently were being able to monitor electricity consumption and not having any more estimated bills. The lack of estimated bills has two benefits: the fact that customers will no longer need to be at home for meter readings; and for some, particularly customers in vulnerable situations, it brings peace of mind. A small number of customers could not think of any benefits of the smart meter for them.

The majority of customers had their IHD plugged in and glanced at the traffic lights on at least a daily basis, and often more frequently. Most customers also looked at the more detailed information on the IHD on a less regular basis (once or twice a week), usually citing the indicative pricing as most useful to them, followed by usage over time. Few customers used the Kwh or carbon emissions data.

Customers found the traffic light display the easiest thing to engage with on the IHD as it is highly visual and this was most frequently used to monitor how much energy they were using. Although some customers expressed a concern when they first saw the red light, they realised that it is usually triggered by appliances which require brief and/or occasional usage such as the kettle or washing machine. A few consumers, however, did remain concerned by the red light.

A minority of customers had not used the IHD and said that they did not intend to do so. These were typically the frailest elderly customers and some with literacy and mental health problems. A small number of customers had the IHD switched on but did not like the high visibility of the traffic lights, which they felt dominated the room.

Behaviour change and energy use

The majority of customers experienced a learning curve in the initial days and weeks following the installation and had made at least minor changes to their energy consumption. Given the prominence of the traffic lights on the IHD, behaviour changes typically focused on reducing electricity consumption. Many changes centred on appliances in the kitchen as this was where customers typically had the IHD.

Changes in behaviour ranged from only filling the kettle with the amount of water required, to switching off appliances at the socket, to reducing multiple device usage (typically households with children and teenagers). A minority of customers had reduced the use of their gas central heating, although some of these reported that this was not as a consequence of having the smart meter but a reaction to increasing energy prices.

Those who did not have the IHD on, did not display any behaviour change, whilst those who made minimal use of the IHD, displayed small changes in behaviour. Those who kept the IHD on all the time and used it regularly displayed the most behaviour changes. The vast majority of customers recognised that the IHD could help them control their energy consumption but that this should not lead to under-consumption.

End of life meter exchange customers were typically slightly less engaged with their IHD and had less understanding of the benefits than customers who opted in. This suggests that when smart meter installation is imposed on customers as something that is both compulsory and routine there is less engagement than where customers have actively reviewed information and opted-in to obtain the benefits of it.

Behaviour change is influenced by four key factors: perceptions of energy use prior to installation; household structure; financial situation; and interest in/capacity to use the IHD. These factors can work with or against each other to influence how someone responds to the IHD.

- Customers who already feel they are very cautious with energy use (typically elderly and low-income customers) are less likely to believe there are efficiencies which they can make;
- Customers with younger children and teenagers often see the IHD as a device which will help them educate their children and support their efforts to reduce waste. A similar dynamic is also observed between some couples where one is using the IHD to encourage the other to change their behaviour;
- Low-income alone does not necessarily drive behaviour change, as it operates in conjunction with the other factors. Similarly, whilst some higher income households are less motivated to change behaviours, others are altering their habits as they simply do not like waste;
- It is evident that those customers who have not engaged with the IHD at all are not adjusting their behaviour or energy use simply because they do not have the means or impetus to do so. Customers with multiple vulnerabilities, including specifically customers who have mental health conditions, the frail elderly and customers with low literacy are those who find it most challenging.

There is also a generational gap in beliefs around how people will react to the information displayed on the IHD, with some younger customers believing that older people would adjust their behaviour to a detrimental extent. However, this did not appear to be the case and older people typically felt that they did not need to change their behaviour as they are already energy efficient. Conversely, older customers sometimes suggested that it is the younger generation who could really benefit from having a smart meter, due to their wasteful attitude to energy consumption.

Overall, the picture suggests that IHDs are promoting more careful and considered use of energy, or no change at all, rather than excessive reductions in energy consumption arising from worry or anxiety. The longer-term impacts of the IHD on behaviour and energy consumption are less clear. There are some indications that even within the first month or so of usage, a small number of customers were starting to reduce their usage of the IHD and consult it less frequently. Whilst this has not yet reversed any behaviour changes, it is not known whether reduced engagement with the IHD will ultimately lead to a return to former habits and behaviours.

Using the IHD for messaging and communications

None of the customers who opted in had received any messages via the IHD. The IHDs of end of life meter exchange customers were set up with a welcome message that could be accessed when first switching it on, and the majority of these customers recalled receiving this message. Many customers were therefore unclear as to whether their device could communicate messages to them, and how it might do this. However, most customers are open to receiving messages via the IHD provided they have some control over displaying the messages at a convenient time. Generally messages should be infrequent and targeted so that they do not become intrusive or time-consuming for the customer.

Most customers were open to receiving information on billing and service interruption; in particular, many would like the IHD to display their account balance and information about new tariffs that could result in them saving money. Marketing messages, for example around other services offered by the supplier, were not viewed as favourably but provided that the quantity and quality is controlled, customers suggested that they would usually prefer to receive messages this way rather than through the post or by telephone. Messages from other organisations divided opinion between those who thought that it could be a useful way of providing information on energy efficiency and those who were indifferent or actively did not wish to receive such messages as they already felt that they had enough information on energy efficiency.

Supplier relations

A large number of customers are loyal to their supplier, particularly many elderly customers who had not switched for many years. For many customers who opted in the process resulted in them feeling slightly more positive about their supplier. This was also the case, albeit to a lesser extent, for end of life meter exchange customers.

No customers were informed what would happen if they were to move home, but the majority expected that they would have to leave the smart meter and IHD behind. Information about what would happen if they were to switch energy supplier was also not typically provided by the supplier. A small number of customers proactively asked what would happen if they switched suppliers and received a variety of responses, which were generally ambiguous about what the consequences would be for their smart meter.

Summary of key recommendations

1. All consumers should receive as a minimum an explanation in advance of what a smart meter is, why they are receiving one, its potential benefits, and a contact number to ring to find out more. When making the installation appointment, the supplier should carry out a thorough check of the customer's support needs, and provide an explanation of what will happen on the day of installation. The supplier should explicitly clarify that the customer will receive an IHD, and a demonstration of how to use it. Where appropriate, suppliers should suggest that the primary user of the IHD should be present for the installation and demonstration. This information should be provided by letter and ideally followed up by telephone.
2. The demonstration of the IHD and subsequent information materials left by the installer must cater to the full range of learning abilities and styles. The demonstration of how to use the IHD should involve asking consumers to complete an action they have been shown. A DVD with a visual demonstration should also be available. Customers should be encouraged to ask questions.
3. The demonstration of the IHD provided by the installer should include a clear explanation of the traffic light system. In particular, the installer should explain that the red light will probably appear briefly as a result of temporary high-level use (such as using the kettle) and thus is usually not a cause for concern. However, if the customer cannot readily identify the cause of the red light, it may be worth checking if there are devices that have been accidentally left switched on. The installer should also explain clearly that the traffic lights only indicate electricity consumption, but that gas consumption is also updated on the IHD screen at half hour intervals. Special attention should be paid to showing the customer how to switch between gas and electricity readings.
4. The IHD mandated for roll-out should include accurate account balance information, updated in response to usage to give consumers a running total of how much they are spending and how much they are on course to pay at the end of the next billing period. This should include all standing charges and other costs.
5. Consumers identified as being in vulnerable situations should receive a follow-up telephone call to answer any queries. A free phone number should also be printed on smart meters and IHDs encouraging consumers to call for any further information (not just 'problems'). Support groups such as local charities, consumer groups, councils and housing associations should also be educated and engaged in offering information and support on using the devices.
6. All demonstrations and booklets/DVDs should offer a small number of energy efficiency tips, expressed in clear, plain English. These should include information on the comparative cost of devices (for example, heating on the hob vs. microwave) and go beyond the standard advice to 'switch off lights' or 'switch off devices at the plug' which most customers already know.
7. The installer should also state explicitly that the IHD itself is not costly to run. Since customers may use their IHDs less as the novelty wears off, they may benefit from further contact at a later date. Further research with consumers who have had a smart meter installed will greatly help to understand how consumers are adapting (or not) to their smart meter on a long-term basis.
8. Messaging via IHDs should not be used as a sole means of communication for important information relating to billing or service interruptions, for example.
9. All consumers should be made aware at the time of installation of the implications for their meter should they choose to switch supplier.

10. Suppliers should have in place a special pathway for customers in vulnerable situations, tailored to their needs in terms of accessibility and clarity. Where appropriate, this should include allowing extra time for installations and IHD demonstrations, clear energy use advice, and referral to other sources of assistance. All consumers in vulnerable situations should receive follow-up.

A full list of recommendations is included towards the end of the report.

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1. Background and objectives

1.1 Background to the research

The roll-out of smart meters is a key Government priority. More than 53 million gas and electricity meters[4] are expected to be replaced by smart meters by 2019. Large-scale piloting such as Ofgem's Energy Demand Research Project[5] (EDRP) has been carried out, and some energy providers have already begun to install advanced[6] and smart meters[7]. The roll-out of smart meters along with the associated in-home display unit (IHD) is intended to provide benefits for consumers, energy suppliers and energy networks, and ultimately to improve the management of energy across the network.

In April 2012 the Government published a consultation on its Consumer Engagement Strategy[8]. The Strategy's proposed high-level objectives included ensuring that vulnerable and low income consumers benefit from the roll-out[9].

Smart meters allow two-way communication between the meter itself and the energy supplier's systems, typically providing domestic consumers with close to real-time information about energy use via an IHD. The IHD is capable of showing near real-time data on current usage, and usage over the previous 24 hours, week, or month, in either pounds and pence or kilowatt-hours (Kwh) (or both). The information for electricity usage is updated approximately every six seconds and the information for gas usage is updated every half hour. This kind of data allows customers to track how much electricity and/or gas they are using and how far this fluctuates when different devices are in use.

New communications technologies will also enable energy suppliers to produce accurate bills which could reduce the inconvenience to both customers and suppliers of estimated bills and arranging meter readings. The cost savings from this should be passed on to consumers. In time, greater availability of data on energy use and generation should also facilitate distributing energy more efficiently throughout the network.

Whilst the Government expects that consumers will save on average 2.8% on their electricity usage and 2% on their gas usage once they receive a smart meter[10], more research is necessary to establish the level of savings that those on low incomes and consumers in vulnerable situations could make, and what kind of support they would need to achieve this.

Accurate bills should help prevent the current situation where customers can be hit with a large back bill that they might not be able afford to pay, which can result in some consumers being forced into debt or onto more expensive payment methods.

[4] http://bit.ly/QknAG7 (PDF)
[5] http://bit.ly/qwp5H4
[6] Throughout the report we will refer to these meters as smart meters
[7] http://bit.ly/UvfpSW (PDF) p.20.
[8] SMIP Consumer Engagement Strategy, April 2012, http://bit.ly/RG30Nc page 9
[9] Ibid. The other two high level objectives are: Building consumer support for the roll-out by building confidence in benefits and providing reassurance on areas of consumer concern; Delivering cost-effective energy savings, by helping all consumers to use smart metering to better manage their energy consumption and expenditure
[10] Department of Energy and Climate Change (DECC)'s Impact Assessment – 'Smart Meter Rollout for the Domestic Sector', April 2012, http://bit.ly/LapOEK

As well as benefits, there are likely to be potential new risks. For example, an increased understanding of the financial cost of using different appliances in the home may cause some consumers in vulnerable situations to become anxious as they track their energy spend and seek to ration energy use to an extent that is detrimental to their overall wellbeing and quality of life. There is also some concern that the costs of roll-out may be disproportionately borne by consumers in vulnerable positions – as they may have less potential to reduce their energy use with a smart meter, but will still be paying for the smart metering programme via their energy bills. They may also be less able to engage in the market to take advantage of new lower cost smart energy deals.

The installation of the smart meter and its IHD is an important touch-point in the roll-out process. This is the point at which customers have a face to face opportunity to find out how to use the new technology, and the benefits it can bring them. Energy suppliers will be required by new licence conditions[11] to adhere to a Smart Metering Installation Code of Practice[12] (SMICOP) for smart metering installations; this is currently under development. It will outline minimum standards that all energy suppliers have to meet before, during and after the smart metering system is installed. This will include the need to provide adequate information and advice to customers when smart meters and IHDs are installed, so that customers understand how to use the devices and can monitor and more easily manage their energy consumption, ultimately reducing both the fuel used and their fuel spend where appropriate.

The SMICOP includes some clauses on vulnerable customers[13], although the exact content is still to be finalised[14].

[11] http://bit.ly/WuBWWX, p.9

[12] Ibid, p.9: More information about how this process will work: Suppliers would be required, through new licence conditions, to develop the Code to cover the customer experience before, during and after a smart meter installation visit. In developing the Code, suppliers would have to take into account the views of consumer groups and other interested parties:

- Suppliers would be required to submit the Code to Ofgem for approval, and adhere to it once it had been approved
- Suppliers would be required to have in place monitoring arrangements under the Code
- Ofgem would monitor compliance and could take enforcement action if a supplier was not complying with its licence obligations
- Suppliers would be required to put in place procedures for reviewing and updating the Code, consulting consumer groups and other interested parties in the process. Ofgem would also have the right to instigate Code changes.

These requirements would be incorporated in the standard conditions of Supply Licences, which are enforceable by Ofgem. The necessary licence modifications would be made by the Secretary of State, using his powers under the Energy Act 2008. These modifications were expected to be in place in the first half of 2012; until then, the Government and Ofgem would work with suppliers to seek voluntary compliance with an appropriate Code.

[13] The SMICOP uses the following definition of vulnerability: “A Customer is vulnerable if, for reasons of age, health, disability or severe financial insecurity, they are unable to safeguard their personal welfare or the personal welfare of other members of the household.” This is the same definition as used in the Energy Retail Association (ERA) Safety Net – an industry Code of Practice: http://bit.ly/U6whyR

[14] For more information, see http://bit.ly/XgjeS0

Current discussion around increased data matching[15] with the Department for Work and Pensions (DWP) could further enhance energy suppliers' abilities to identify consumers in vulnerable situations and tailor the support and services they offer.

1.2 Objectives

National Energy Action (NEA) and Consumer Focus are concerned that some consumers in vulnerable situations may struggle to access all of the advantages that smart metering offers. People with physical or mental health conditions, and those with low levels of literacy or numeracy, for example, may find it harder to understand the IHD and how it works, and hence successfully take advantage of its potential benefits.

In conjunction with the Department of Energy and Climate Change (DECC), NEA and Consumer Focus decided to carry out this research to ensure that those consumers in vulnerable situations are able to easily use and engage with smart metering technology to better manage their energy use. A further objective is to help make sure that all customers have a positive installation experience and as far as possible engage with new technology to their benefit.

It is hoped that this learning will inform the development of the SMICOP, suppliers' approach to those consumers at risk of vulnerability during roll-out and DECC's wider policy work. The research seeks to identify issues experienced by consumers at risk of vulnerability in relation to the installation of smart meters, and will consequently make recommendations on how any negative experiences can be overcome and positive experiences built upon and shared to promote customer engagement and consumer benefit.

[15] Data matching is a process, in which social security and tax credit information is provided to a trusted party who then matches it to energy suppliers' records. This enables consumers who are most in need of assistance or eligible for energy efficiency and fuel poverty schemes to be flagged up to companies.

2. Methodology

2.1 Approach

NEA and Consumer Focus secured the participation of E.ON and British Gas who had both begun rolling-out smart meters among their customers.

A sample of customers who had had a smart meter installed by one of these two companies during January and February 2012 were invited to participate in either an in-depth interview in their home or a focus group discussion to share their experiences of the installation process and subsequent meter use.

A total of 36 in-home depth interviews were conducted, with 15 customers in vulnerable situations and three non-vulnerable customers from each of E.ON and British Gas. In-home depth interviews were conducted by RS Consulting.

Eight focus group discussions were conducted. Four groups were conducted with British Gas customers in vulnerable situations, two groups with British Gas non-vulnerable customers and two groups with E.ON customers in vulnerable situations. A total of 50 British Gas and E.ON customers participated in a focus group. The group discussions were moderated by NEA and Consumer Focus[16].

It should be noted that there were slight differences in the focus of discussions between the depth interviews and the focus groups. For example, the depth interviews explored in more detail the customer journey whilst the focus groups covered more extensively the use of IHDs for messaging and communications. The respective topic guides are shown in the Appendix to this report.

The SMICOP will set out what service consumers should receive pre, during and post the installation of their smart meter. The interview questions followed a similar structure, and included issues that the SMICOP covers, as well as issues that consumer groups consider that it *should* cover – they include:

- What information customers receive at each step of the process;
- Any steps to identify customers' vulnerability;
- Security measures for consumers in vulnerable situations including a security password, the option to have a carer or third party present;
- Choice around appointment times;
- Demonstration of how the IHD works;
- Energy efficiency advice given;
- Opportunity for customers to ask any question, at all stage of the process.

All these aspects are important, as they should ensure that consumers have a positive installation experience. For example, having a password enables the customer to check the identity of the installer. This provides reassurance, and also helps to prevent bogus callers and distraction burglaries.

The fieldwork phase of the research was conducted between 14th February and 21st March 2012. Both the interviews and the focus groups were carried out with people who had had a smart meter installed within the previous two months; the vast majority had been installed within the previous four weeks.

[16] NEA moderated seven of the focus groups and Consumer Focus moderated one

2.2 The nature of vulnerabilities

Both suppliers provided a file of customers already identified as being in vulnerable situations, but due to the limited amount of sample available, the remainder were identified by screening suppliers' main customer databases. In both cases, it became evident that a significant proportion of customers had one or more previously unidentified vulnerability.

In order to ensure a diverse range of consumers participated in the research, all consumers were screened to determine if they were in vulnerable situations, and if so, the exact nature of that vulnerability. Inevitably, as with the wider population, many consumers are classified as being in vulnerable situations on the basis of more than one criterion. In particular, most of the elderly consumers who participated also have health conditions. Data on vulnerabilities was captured for not only for the principal respondent but also for any other residents, with the exception of educational level.

A summary of the vulnerabilities included in the research is given below:

- 20 households had at least one resident aged over 65
- 21 households had at least one resident with a chronic physical health condition
- Six households had at least one resident with a chronic mental health condition
- Seven households had at least one child aged under 16
- Nine households had a (combined) income of under £10,000 per annum (nine more refused to say)
- 21 households were in receipt of means-tested benefits
- 17 consumers had fewer than five O-levels/GCSEs. This educational level was used as an initial benchmark for identifying individuals with potential numeracy and/or literacy problems during the screening phase to minimise the number of sensitive questions at that point. Literacy was then evaluated more closely during the interview.

2.3 Geographical distribution

A geographical distribution of interviews was originally sought to ensure that both regional discrepancies and local issues could be taken into consideration. However, as suppliers were not rolling-out nation-wide at the time of this research, the ability to achieve this was limited. In practice:

- 10 interviews and two focus groups were conducted in London and the South East;
- Seven interviews and two focus groups were conducted in the West Midlands;
- 16 interviews and two focus groups were conducted in the East Midlands;
- Two focus groups were conducted in North East;
- Three interviews were conducted in Yorkshire and Humberside.

2.4 Differences between E.ON and British Gas smart meter installations and customer journeys

It is important to note that there are significant differences in the way in which the two suppliers conducted their smart meter installations, which may affect the profile of consumers included in this research.

E.ON

E.ON customers were sent a direct mail leaflet briefly explaining that smart meters will be rolled-out throughout Great Britain by 2019, and offering them the possibility of having a smart meter installed early, free of charge and on a voluntary basis, by calling a phone number. This leaflet highlighted in particular the advantage of no longer having estimated bills.

The E.ON customers in vulnerable situations included in this research had therefore actively 'opted in' to receiving a smart meter.

E.ON had already identified a number of its customers as being in vulnerable situations and lists these on its Priority Services Register. E.ON has in place a special process for these customers, including a dedicated call-centre and helpline, to ensure that the installation runs smoothly and is sensitive to their needs. The majority of E.ON customers in vulnerable situations interviewed had been handled through the specialist team (11 customers).

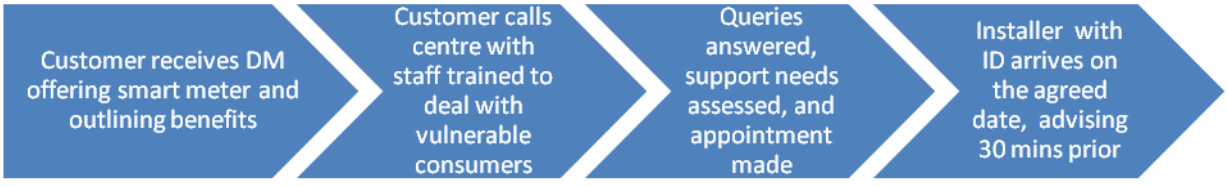
However, E.ON also had customers who had not previously been identified as being in vulnerable situations. These customers came through to the main call centre, and were subsequently identified as being at risk of vulnerability, either during the initial call to set an appointment or at the point of installation. Two of the customers interviewed had gone through this route.

A further two interviews were carried out with customers in vulnerable situations whose details were still on the main customer database following the installation process but who were identified as being in vulnerable situations through the research screening process. The table below shows the distribution of the interviews, by customer database source.

Customer source	No. of vulnerable interviews	No. of non-vulnerable interviews
Priority Services Register - Already flagged as vulnerable	11	-
Priority Services Register - Identified as vulnerable through the installation process	2	-
Main customer database	2	3

The intended customer journey for customers opting in to receive a smart meter in response to direct mail is summarised in Figure 3.1.

Figure 3.1: Customer journey for customers in vulnerable positions opting in to receive a smart meter



The vulnerable customer journey highlighted in Figure 3.1 above can be compared to a slightly different process for non-vulnerable opt-in customers, who received a slightly different form of the direct mail campaign and were put through to a general call centre, rather than the specialist call centre.

British Gas

The British Gas customers had a smart meter installed because their old meters were due for replacement. This process is known as 'end of life meter exchange'; these customers are referred to as such throughout this report. Customers received either a letter, phone call or both informing them that they were due to receive a smart meter. Most customers only recalled receiving a phone call informing them their meter was due to be replaced. Some customers did not recall being informed prior to the installation that they would be receiving a smart meter prior to the installers visit. They were not explicitly given the option to opt in or out of receiving a smart meter.

British Gas does not have a dedicated pathway in place to assist consumers in vulnerable situations or on low incomes but during the phone call to book the appointment, customers are asked if they have any special circumstances which need to be taken into consideration. Many customers did not recall being asked this question, however.

Some customers were identified as being in vulnerable situations because they are in the British Gas Warm Homes discount group[17], with the exact nature of the vulnerability confirmed through screening during the research process.

The intended customer journey for customers receiving a smart meter as an end of life meter exchange is summarised in Figure 3.2.

Figure 3.2: Customer journey for receiving a smart meter as an end of life meter exchange

[17] The Warm Homes discount is offered to a 'Core Group' which is notified to British Gas by DWP. The Core Group criteria for this 2012 is: Pension Credit Guarantee recipients and Pension Credit Savings aged 80 years or over. It is also offered to a 'wider group', which is defined as follows:

- In receipt of the Savings or Guarantee & Savings element of the State Pension Credit (unless already qualifying as part of Core Group – see above).
- In receipt of one of the following means tested eligible benefits: Income related employment and support allowance (including Support element); Income based Jobseekers' Allowance; Income Support; or
- Customer household has an annual income of less than £16,190 and the account holder is living with a mental or physical disability or illness, or there is an element of vulnerability in the home, e.g. Households with children aged 5 years or under; Account holder (or partner) aged 60 or over; or
- Customer household has an annual income of less than £16,190 and spends 10% or more of their household annual income on fuel for adequate heating (usually 21 degrees for the main living room, and 18 degrees for other occupied rooms).

3. Pre-installation: supplier communications

3.1 Customers who opted in

The majority of those who responded to the direct mail cited the end to estimated bills and manual meter readings as an important motivation for opting to receive a smart meter. Over half of customers also identified the ability to monitor their usage as a driver for requesting an installation.

> *"It just tells you the up and coming thing, that everybody will eventually have one. And they're offering me an opportunity to have it, I thought, why not… You can sort of see how much you're using, you can give a guide of how much you've used from day to day."*
> (Customer who opted in, West Midlands, aged 65-74, physical and mental health conditions, receiving benefits)

> *"[The information letter] gave me roughly what it is, and said it would save on estimated bills. I know it's probably for their convenience, 'cos they don't have to send a meter reader round, but also it's better for us 'cos we're not having to wait in for anybody."*
> (Customer who opted in, East Midlands, over 75)

In addition, a minority were under the (false) impression that it will eventually be compulsory to have a smart meter and they therefore felt that they might as well get one now.

> *"All my bills were being estimated and I didn't like that. I don't like owing money."*
> (Customer who opted in, East Midlands, aged 50-59, physical and mental health conditions, receiving benefits, low income, low literacy)
>
> *"I wanted to know exactly that. Was it going to show what I was using? Would I be able to calculate, you know, if I switch the computer off, how much difference it makes if you leave it on standby all overnight or if you turn it off completely, would I be able to do all that?"*
> (Customer who opted in, South East, aged 46, physical health conditions, receiving benefits)

Customers were generally very happy with the way in which their initial call to the supplier was handled. They felt any queries they had were fully answered and that the outcome of the call was as hoped.

When asked, around half of customers recalled being offered the name of the installer. Those who did not recall this were content with seeing the installer arrive in a branded van at the time of the installation and then show ID at the door. Just over a third also remembered being offered a password system, and a minority of customers took the supplier up on the offer.

Nearly two thirds of customers in vulnerable situations remember being asked during the call if anyone in their household has any medical conditions or additional support needs. Fewer recall being asked if they had medical equipment that relied on electricity but imagine that this was because they indicated that there were no residents in the household with significant medical conditions or support needs.

Only a minority of customers received a spontaneous explanation during the call about what a smart meter is, how it works or how it could benefit them. A few asked questions in order to develop their own understanding, but most were content with the description that had been given to them in the leaflet. A small number thought that they had been "selected" but did not know on what basis, and one customer thought he was only receiving an IHD, not realising that a new meter would also be put in.

The vast majority of customers reported that the appointment offered to them was at a time convenient to them, and the small number for whom it was not were easily able to rearrange the appointment for another time. The majority were also given a rough estimate of how long the installation would take.

3.2 End of life meter exchanges

For those customers who received a smart meter as an end of life meter exchange, this replacement was presented as something that was both routine and compulsory.

The initial contact was a phone call for most customers, with a small number receiving a letter either instead of, or as well as, the phone calls. Phone calls were sometimes reported to have originated from an anonymous number and sometimes took place in the evening. This undermined the confidence of those customers in the caller's identity and their reason for calling them.

> *"They just phoned to make an appointment, that was all, and said it was a routine thing they were doing, changing the meters… To be honest, when I got the phone call, I made the appointment, and after a while I thought, was it [the supplier] or was it somebody else. So I actually phoned [the supplier] back, and made the excuse that I was just confirming the date they were coming, just to make sure it was them."*
> (End of life meter exchange customer, Yorkshire, aged 56, physical health conditions, receiving benefits.)
>
> *"I'm not sure if it was just a meter reading but somewhere along the line it was suggested I had some new meters … They came back and said I could have the new meters. So I thought OK and didn't question it. I thought 'fine - anything more modern and up-to-date is great'."*
> (End of life meter exchange customer, South East, aged 59, physical and mental health conditions, receiving benefits, low income.)

Many customers would have preferred to receive a formal letter informing them about the smart meter installation. This would have served two purposes: preparing customers to expect a phone call and also providing background information about the specific functioning and potential benefits of smart meters.

These customers also received much less information and passed through fewer checks in regards to their support needs, compounding the lower level of early engagement arising from a meter exchange rather than opt-in process.

Over a third of customers did not recall the term 'smart meter' being used during the initial phone call, and at this stage knew only that their meter needed to be replaced. Many were also not clear about whether the replacement meter would be for gas or electricity or both. A minority later received a second call from their supplier in which both these pieces of information were given.

> *"Well, as I say, I didn't know I was going to get two new meters, nobody, there was no letter of confirmation, nothing. They just turned up."*
> (End of life meter exchange customer, South East, aged 83, physical health conditions, receiving benefits, low literacy)

Nonetheless, the vast majority of customers were not concerned by this lack of information, accepting it as a routine procedure in which they would have minimal involvement.

In comparison with customers who opted in, a slightly smaller proportion recalled being offered the name of the installer. However, as with customers who opted in, those who did not recall this were reassured by the combination of a branded van and personal ID upon the arrival of the installer. A small minority recalled being offered a password system. Only a very small number reported installers arriving without ID or a recognisable uniform.

Unlike customers in vulnerable situations who opted in to receive a smart meter, no customer was asked if anyone in their household had any medical conditions or additional support needs, or if they had medical equipment that relied on electricity.

The appointments offered were generally at a time convenient to customers, but the small number for whom it was not were easily able to rearrange the appointment for another time. The majority were also given a rough estimate of how long the installation would take.

Chapter summary

The majority of customers who opted in to receive a smart meter were happy with the communication they received prior to the installation of the smart meter. They all had an understanding of at least one of the benefits which a smart meter can offer them and feel that their initial call to their supplier in response to the letter they received covered any additional queries that they had. What was discussed in the call varies but two thirds recall being asked whether anyone in the home had any medical conditions and the majority were informed how long the visit would take.

Customers who received the smart meter as part of an end of life meter exchange typically did not receive a letter prior to the cold phone call. They consequently had less understanding of what a smart meter was prior to installation and over a third did not recall hearing the term smart meter used during that initial phone conversation. However, this lack of information did not significantly concern them. Support needs of customers were typically not assessed.

4. On the day: the installation

4.1 Punctuality and installation time

On the day of the installation, most customers received a courtesy call to let them know that the installer was on their way, and some also received an SMS two days before as a reminder of the appointment.

The installer arrived on time for almost all customers and generally took the expected time to complete the installation. Where the installer was not able to arrive at the appointed time, the majority of customers received a phone call to inform them of this. There are indications of greater variation in the punctuality and duration of appointments in London: for one end of life meter exchange customer for example, the installer failed to turn up on three occasions.

Estimates of the time taken to complete the installation vary considerably: customers recall their appointment lasting from as little as 20 minutes (where only one meter was installed) to over two hours. It should be noted that some customers paid relatively little attention to the installer and so recollections of the time taken are estimates. The longest visit took around seven hours. The vast majority of longer installations were due to an unforeseen problem such as the existing meter and pipes being particularly old or in bad repair, problems relating to accessibility or positioning of the meter, or in one case, a gas leak.

When installations took longer than anticipated, customers were kept up-to-date and informed about the nature of the problem and the likely time needed to resolve it. Vulnerable customers with longer appointments were typically not inconvenienced by this, and often only had a vague sense of how long the installer was there. It is worth noting, however, that these customers were not working and often pointed out spontaneously that they had no other commitments with which the appointment could interfere. Over-running appointments could prove more problematic for working customers, especially customers on low incomes who are taking time off and are paid by the hour.

With a small number of exceptions, all installations were completed in one visit by the installer. Where a second visit was required this was again due to unforeseen circumstances relating to the position of the meter or condition of the boiler and pipes, or delayed arrival of the IHD. In the latter situation, one customer was not expecting this second visit and had not been aware that she would be receiving an IHD prior to the second visit. Two consumers had the IHD delivered in person by someone from the company at a later date.

4.2 During the visit – engagement with the installer and time off supply

All customers were comfortable with the presence of the installer in their home, and felt able to talk to them and communicate any questions or doubts they might have had. Opinions on politeness and approachability of the installer ranged from those who simply left them to get on with their job to those who were effusive on the subject of how much they enjoyed talking to the installer.

"He was good at his job, he was clean, no mess, nothing… I just left him to get on with it. I didn't look over his back, because I don't like anybody doing that."
(Customer who opted in, East Midlands, aged 50-59, physical and mental health conditions, receiving benefits, low income, low literacy)

"Brilliant, really very, very good. The gentleman was very polite, very careful, explained, when he finished, he tested it all and explained, you know."
(End of life meter exchange customer, South East, aged 66, receiving benefits, low income)

"He was just very friendly, you know it's nice to have somebody come round that actually engages in a bit of conversation and gets on with it. He was in and out really quickly as well, so he was very efficient at what he was doing. Very happy with it."
(End of life meter exchange customer, East Midlands, non-vulnerable)

A minority of customers did not recall being warned that the energy supply would be switched off in advance, but nearly all of these realised that this would be the case, describing it as 'common sense'. A small number thought it was odd that the meters were installed during winter when it was cold, especially as the power had to be turned off. A small number of elderly customers felt some discomfort due to physical conditions such as arthritis being aggravated by the cold, but all of these were satisfied that the heating was put back on again as quickly as possible.

4.3 Tidiness and post-installation checks

Customers of both suppliers were very impressed with the tidiness of installers, and many registered surprise at how little disruption was caused to their homes. Where furniture had to be moved, the vast majority of installers moved this back. In some cases, the customer returned furniture to its original position before the installer left and in the remaining cases, the customer was happy to return things to their places once the installer had left.

"Everything went really well. If I could have given him a score out of 10, it probably would have been 20. I didn't even know he'd been when he'd been and gone, he took all his rubbish away."
(Customer who opted in, East Midlands, aged 65-74, physical health conditions, receiving benefits, low literacy)

Most customers think that their installer checked at least some appliances were working again once the power supply was turned back on, usually mentioning the boiler or gas fire as an example. In some cases, the installer went around checking lots of different appliances, but many were not closely monitoring the installer and so were unsure what had or had not been checked.

The majority of installers did not reset clocks on appliances for their customers. In most cases, they did not offer to do so, and in some cases, they offered but the customer preferred to do this themselves. All customers were happy to do this themselves and did not consider it part of the installer's job.

"He didn't really have to because I did it… I've done it a thousand times so it was no sweat to me."
(Customer who opted in, East Midlands, aged over 80, physical health conditions)

There were no discernible differences between those consumers in vulnerable situations and those that weren't in the number of checks the installer made before or after installation or the customers' satisfaction with what the installer said and did.

Chapter summary

Most customers were happy with the installation. The majority of customers received a courtesy call prior to the installer arriving at their house. Installations generally took under two hours, except for a minority of cases where due to unforeseen problems the installation took slightly longer than anticipated. All customers were comfortable with having the installer in their home and happy with the way their home was left following the installation. The majority of customers believed that the installer checked that some appliances were working again and although the majority of installers did not reset the clocks, consumers are happy with this level of service. There were no differences between those consumers in vulnerable situations and those that weren't in terms of the satisfaction with what the installer did and the number of checks which were carried out.

5. On the day: the demonstration of the IHD

5.1 What was the demonstration?

On the day of the installation, almost all customers were given a demonstration of how the IHD worked, although the length of time spent on this and level of depth the installer went into varied across households. For the majority of participants the demonstration involved them being shown the functionality of the IHD, with the installer taking them through all the different buttons and explaining which combination of buttons to press to display different pieces of information.

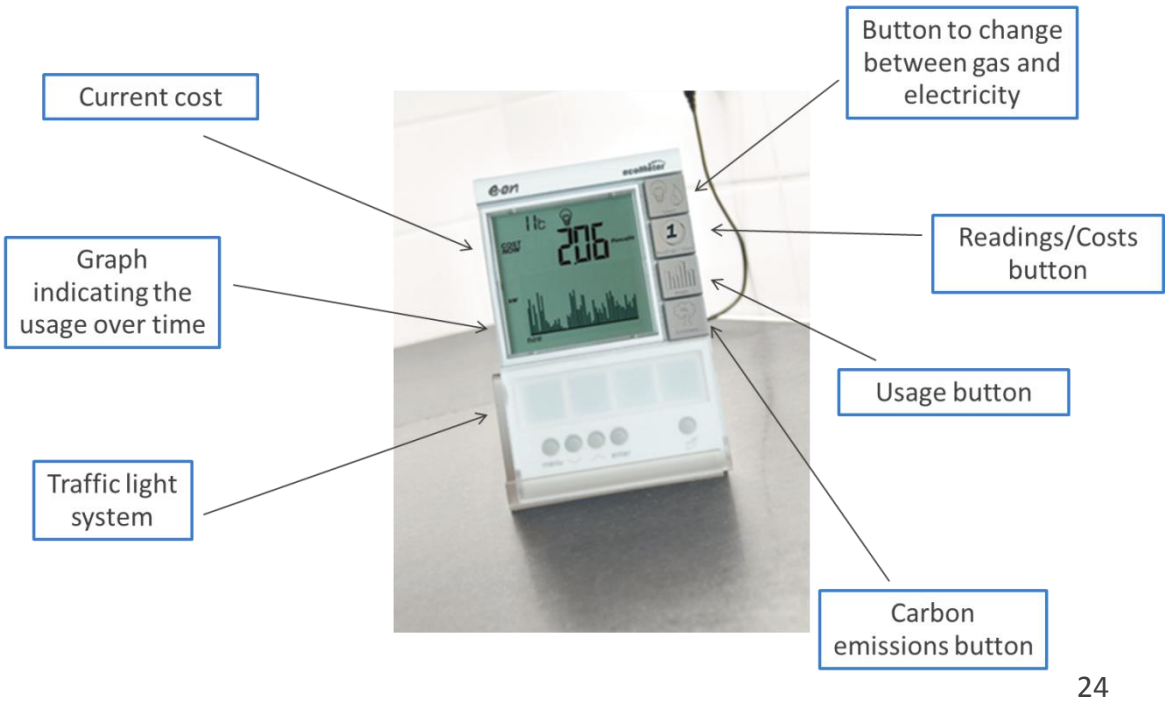
In most instances the installer also talked to the customer about the traffic light system on the IHD, stating that if they are not using very much energy then the display will show a green light, if they are using a moderate amount of energy it will show an amber light, and if they are using a lot of energy it will show a red light. The majority of customers were told that the red light is not a cause for concern but just an indicator that they have switched on a device that uses a lot of electricity. Often the installer used the example of the kettle when discussing this with them. It is worth noting however that only a small minority of customers demonstrated an awareness that the traffic lights change exclusively in response to electricity consumption, with some customers explicitly mentioning an expectation of the traffic lights altering in response to their gas consumption.

Some customers were also told that when the red light shows they could use it as an opportunity to work out which devices were using the most electricity and look for places where they could cut down this usage. For some customers, particularly end of life meter exchange households, this was combined with more general energy saving tips and advice from installers, which was generally received positively as a helpful aspect of the installation process.

A minority of customers were also given energy efficiency advice regarding things such as cavity wall insulation or loft insulation.

Figure 5.1 shows an example IHD and the different buttons that the installer talked to the customer about.

Figure 5.1: The in home display (IHD)



"He put the monitor on and went through what each button represented and the information he left me with has that in it if I need to refer to it at any point."

(Customer who opted in, East Midlands, aged 39, physical and mental health conditions, receiving benefits, children under 12 in the household)

Immediately following the demonstration, the majority of customers felt that the demonstration was adequate and felt that the installer had shown them enough information in terms of how the IHD works and how they can use it to monitor the amount of energy they are using and the cost of this.

"He was better than the book because he explained it in great detail."

(End of life meter exchange customer, Yorkshire, aged 59, physical health conditions, reliant on electricity for medical equipment, receiving benefits, low income)

"Yes, explained a little bit about them. How to check what electricity I'm using on a daily basis, cost per hour, emissions that we're sending off and the same with the gas. Noticed the oven sent it to red – I was chuffed that most of the time it stayed on green."

(Customer who opted in, East Midlands, aged 39, physical and mental health conditions, receiving benefits, children under 12 in the household)

A small minority of customers said that they were not shown the IHD or felt that the installer had shown them the IHD rather quickly, but in the majority of these cases the customer specified a reason for this. These customers reported that this was because they did not have time to listen to what the installer had to say or because they had told him they did not want a demonstration. For example, one customer requested a quick demonstration as she had to visit her husband in hospital.

Only a handful of customers were also shown the actual smart meter on the day of the installation. The explanation was typically very short and the majority of customers did not expect to be shown how to use the meter.

"I wouldn't have had a clue regardless of which meter was in there, I just thought they were there and left for someone else to read the meter for bill purposes."

(Customer who opted in, East Midlands, aged 39, physical and mental health conditions, receiving benefits, children under 12 in the household)

5.2 The outcome

Immediately after the installer had left, the majority of customers were happy with what the installer had showed them on the IHD and the time taken with the explanation. However, some customers felt that they had not fully grasped how the IHD functioned and how they could use it.

There are a number of reasons for this with some customers, including the frail elderly, customers with mental health conditions and customers with low literacy or English as a second language feeling that the installer had taken them through how to use the IHD too quickly. Other customers who were typically younger and had busier lives believed that they would learn how to use the IHD by playing with it, rather than by being told by the installer.

> *"He showed me the basics and said 'I can spend ages going through it if you want me to, it's entirely up to you'. And I said 'No, I like to play'. And they give you a guide anyway so there is a back-up with a number you can call so I figured I didn't need him to stay for another hour."*
>
> (Customer who opted in, South East, aged 46, physical health conditions, receiving benefits)

Those customers who felt the installer showed them how to use the IHD too quickly would have liked to be provided with a longer explanation of how the IHD works. The majority of these customers were reluctant to blame the installer for their lack of understanding, for a variety of reasons. Even those customers who blamed the installer did not ask questions or pursue clarification on the day.

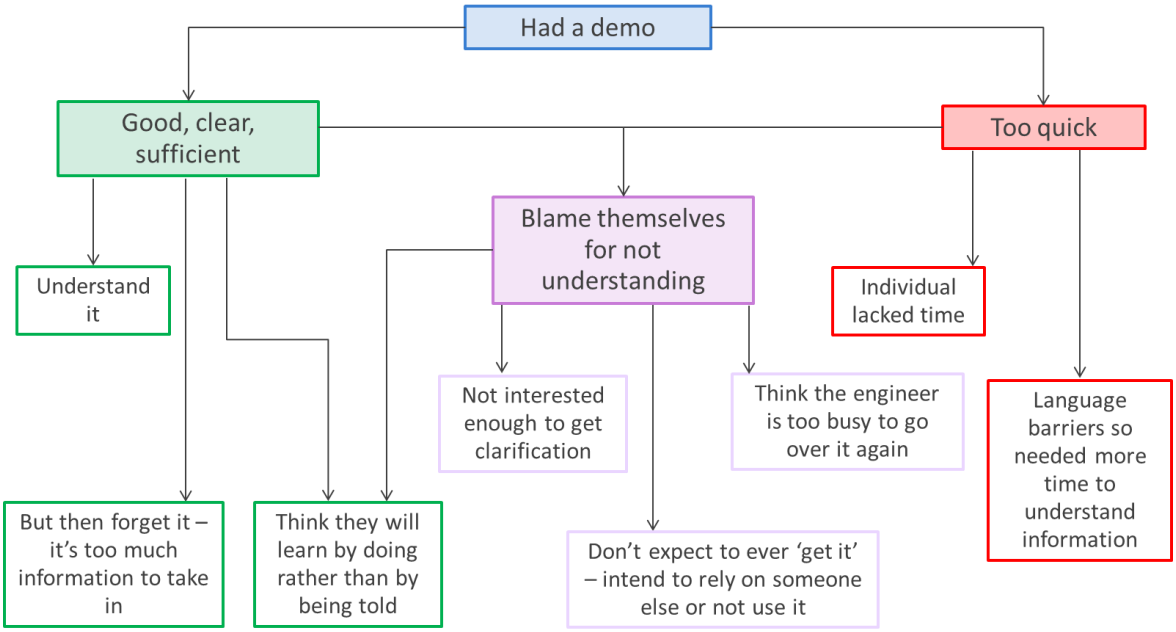
Very few customers felt that the supplier or installer was responsible for any shortcomings in their understanding of their IHD. Typically they attributed their lack of understanding to one of several factors:

- That they personally lacked time at the moment of installation to ask for further clarification;
- Believing that it would take them a long time to fully understand how to use the IHD and that the installer was too busy to stay around and help them;
- A lack of interest in the smart meter and IHD, meaning that although they had questions outstanding, they are indifferent about whether or not those questions were answered;
- Believing that it was too complex for them to understand, and although they would like to be able to use the IHD, they intended to rely on other people to use it for them, or would simply not use it all;
- Expecting to 'learn by doing' and so paid relatively little attention to the demonstration but later experienced difficulties in operating the IHD.

Many customers had questions immediately after the installation, regardless of whether they considered the explanation and demonstration of the IHD to have been delivered with sufficient time and clarity. Others also found that questions arose in the days and weeks following the installation visit as they began to use the IHD and tried to access the information of interest.

The different outcomes following the demonstration are illustrated in Figure 5.2.

Figure 5.2: Outcomes following the IHD demonstration



"He said you could find out what you're using right now, what you're using per day. Don't know that he said week, I know he said month... Well it's hard showing me. He's got a lot to do and whatnot."
(Customer who opted in, Yorkshire, aged 50-59, physical and mental health conditions, reliant on electricity for medical equipment, receiving benefits, low literacy, low income)

"If I'd tried there and then to understand what was involved, I probably would have forgotten some of it anyway. I felt that I needed to try it before asking any more questions."
(Customer who opted in, East Midlands, aged 80+, physical health conditions, receiving benefits)

"If they could talk me through maybe more how to use those. It's probably very, very simple. Just a little follow-up call would have been nice I suppose. It's more a man's thing normally isn't it, you know to check the meters and... But I do everything here, I'm on my own now."
(End of life meter exchange customer, South East, aged 59, physical and mental health conditions, receiving benefits, low income)

"I like to play with things and see how they work so I did. I pressed all the buttons… and figured out what was what."
(Customer who opted in, South East, aged 46, physical health conditions, receiving benefits)

Chapter summary

The vast majority of customers were given a demonstration of how the IHD worked. This tended to involve the installer showing the customer the majority of the functionality of the IHD by going through the different buttons and explaining which combination to press to display different pieces of information. The installer also talked to the customer about the traffic light display and, in the majority of these cases informed the customer that the red light was not a cause for concern but an indication that they have switched on a device which uses a lot of energy, such as the kettle. Immediately following the demonstration the majority of customers were happy with the information they were provided with. However, some customers did not understand that the lights only applied to electricity consumption. Some customers felt that they had not fully grasped how the IHD functioned and would have liked a longer explanation of how the IHD works. The reasons for this range from feeling that the demonstration was too quick (a minority) to blaming themselves for not understanding the information the installer has given to feeling there is too much information to take in. A significant number also expect that they will learn how the IHD functions by 'playing with it' and testing out how the different buttons work.

6. Post-installation support

The vast majority of customers were satisfied that they absorbed as much information as they could from the installer's demonstration. However, the explanation as to how to operate and benefit from their smart meter often faded very quickly from the customer's mind once the installer had left.

In order to try and address queries about IHD functionality, installers from both suppliers provided customers with a short instruction booklet at the time of the installation. One supplier had more than one booklet, and gave usually one, or occasionally two, to each customer. Both booklets also contain an 0800 phone number (free from landlines but not from mobiles), which customers are encouraged to call with any questions that arise.

6.1 Unanswered questions

Around half of customers across both suppliers had unanswered questions following the installation. These ranged from minor concerns through to fundamental issues with understanding and operating the smart meter. As an example of the former, one couple were having problems with their mobile phone signal following the installation and contacted their supplier to ask if the smart meter could affect this.

One particular area of confusion was related to using the IHD to measure gas consumption: some customers were not aware that the IHD could also measure gas consumption, and others were aware that it could, but did not know how to bring up this information on the display. Around half of customers were confused or discouraged by the term 'indicative only' displayed on the IHD from engaging with the information on costs, and would like to see a running total of how much their actual bill will be. Conversely, those customers who thought the IHD was displaying their actual expenditure may be discouraged from engaging with the IHD further if their bill was noticeably different to what it has displayed. One customer who had opted in interpreted the 'indicative only' wording on his IHD to mean that he had been given an IHD that could not read his smart meter properly, rather than understanding that it means the price displayed only shows the cost of the units of energy that he is using, and does not include any standing charges. Therefore the amount shown is likely to be different from the final amount that he will be billed.

> *"One of the problems is it doesn't seem to relate directly to the unit that I've got installed… [Would you like some contact from the supplier to help you use it?] "Not yet, because I got the feeling this is still a work in progress. My daughter says that there is yet another model being produced so I didn't want to stir things too much."*
>
> (Customer who opted in, East Midlands, aged over 80, physical health conditions, receiving benefits)

Other areas where some customers would benefit from clarification are around how much energy the IHD itself uses, and about how frequently they should be checking the information. Concerns around the cost of running the IHD are leading a small number of customers to switch it on only when they want to check their level of energy use and, in the case of one end of life meter exchange customer, to believe that it may be better to switch back to having a dumb meter.

Another customer, who opted in because she wanted to get rid of estimated bills, does not understand how billing will now work with the smart meter.

"Since that's been in, it's obviously using electric. So really, you're no better off, I don't think, are you... with it being on permanently?"
(End of life meter exchange customer, East Midlands, aged 75, receiving benefits, low income)

"The only thing I meant to ask was, does it still stop you, like £77 every three months, do they still do that or do they stop you the correct amount?"
(Customer who opted in, East Midlands, aged 77, physical health conditions, low literacy)

However, even where customers themselves were aware that they were missing a piece of basic information, they were almost always insufficiently concerned to actively seek out an answer. Hardly any customers had contacted their supplier, for example.

"It would be nice to know how to use it but I'm not worried about it."
(Customer who opted in, East Midlands, aged 50-59, physical and mental health conditions, receiving benefits, low income, low literacy)

6.2 The booklet

A very small number of customers were not given a booklet: two of these were not aware that there is a booklet as it was not mentioned by the installer, while the others had been told during installation that their booklet would be sent to them but had not yet received it.

Opinions and use of the booklets varied widely. Around half of customers of both suppliers had given it either a very cursory look-through or have not looked at it at all.

There are a number of reasons for this:

- A lack of interest in using the IHD;
- Busy lifestyles in which reading the booklet is not considered a priority;
- Already having sufficient understanding of the IHD or expect to pick it up through experimenting with the IHD, preferring to 'learn by doing';
- A literacy or language barrier.

"Yes, I look at it but I am not very good at understanding… For me, I think I don't need to know anything about gas or electricity."
(End of life meter exchange customer, South East, aged 26, two children aged 4 and 1, receiving benefits)

Others had put more effort into reading the booklet. Some of these (particularly elderly customers) had criticisms that the language was sometimes too technical, or that the information did not follow a logical progression. Several participants found that the relationship between the diagrams and the text underneath was not always clear to them. However, just as many praised the clarity of the information that the supplier presented in their booklets, and some customers had actively used of the booklet, including energy saving tips included within it.

Some of these customers felt that a DVD including a demonstration of the different functions of the IHD would be helpful as they prefer to learn visually.

"Having had it in for a bit, I wouldn't mind having somebody come back and going over it again with me, because I don't find the instruction book entirely helpful."

(End of life meter exchange customer, South East, aged over 90, physical health conditions, receiving benefits)

"They tell you everything, you know what it does. It's very good for information. It's very good for explaining things, and if I can understand some of it, everybody can!"

(Customer who had opted in, East Midlands, aged over 70, physical health conditions, receiving benefits)

6.3 Phone lines

An 0800 phone number (free from landlines but not from mobiles) for the supplier is displayed prominently in the booklet for both suppliers. However, the memory of seeing this number, and precisely where they have seen it, varied between customers. Those who did not remember if (or where) they had seen it were still confident of locating a contact number of some kind, either on other paper communications from their supplier or via the internet.

When asked who they would turn to for general advice about energy efficiency in the home, the vast majority of participants said they would ask their supplier, although many were hesitant. When subsequently asked who they would turn to for advice about their smart meter, all customers said they would ask their supplier. Nonetheless, although nearly half have some kind of question relating to their smart meter, only one or two customers had called their supplier since the installation.

"[I would call my supplier] because they put it in, then yes. And if I couldn't get through on the phone, then I'd probably say to my son, just look online, they're bound to have a query section."

(Customer who opted in, East Midlands, aged 60-69, physical health conditions, receiving benefits, low literacy)

"If I had problems with the display, I'd just unplug it and forget it. If there was an issue with the meter I wouldn't know, I'm not an expert but I'd call British Gas."

(End of life meter exchange customer, East Midlands, aged 89, physical health conditions, reliant on electricity for medical equipment, low income)

Chapter summary

Although nearly all customers felt that the installer provided them with sufficient information on how to operate the IHD during the installation visit, questions arose subsequently for many customers. Around half had unanswered questions ranging from concern over how the financial information displayed on the IHD corresponds to their actual bill to questions around the use of the IHD to measure gas consumption. For some customers there was also a lack of clarity around how much energy the IHD uses itself. Both suppliers provided booklets to customers and only a very small number had not received one. Roughly half of customers had either only flicked through the booklet or not looked at it at all. Some of these customers just hadn't yet found the time to read the booklet, others prefer to learn by doing and some felt they will not be able to understand the booklet due to a literacy or language barrier. Some customers felt that a DVD alternative to the booklet would help them to learn more about how the IHD works. Although the vast majority of customers said that they would phone their supplier if they had any questions about the smart meter, only a very small number had actually contacted their supplier. This indicates the potential value of a follow-up call in fostering customer engagement with the IHD.

7. Understanding and using the smart meter and IHD

7.1 What is a smart meter?

The vast majority of customers considered their IHD to be the smart meter and when asked to define what a smart meter is, described the IHD and its functionality. All did understand that they still had a meter unit but the technical difference in terminology is not evident. It is therefore possible that some customers may attribute issues with their billing to a problem with their IHD (such as having switched it off, or the IHD having malfunctioned).

When asked to give a definition of a smart meter, only a small number of customers had fully grasped both the functionality of the IHD and that the meter was communicating usage directly to suppliers via the mobile phone network. At the opposite extreme, a small number of customers only focused on one aspect of the IHD when defining smart meters. Most customers understood that the meter communicated directly with their supplier without fully understanding the technical details of how it does this.

> *"It's a way for them to tell what power you're using without having to have somebody to call to check the meter. It tells them straight away what power we're using. And it's also a way for us to see what power we're using instantaneously. So it's an advance on what the old system was, because they could only tell what power you were using once every three months when they called and knocked on the door to check the meter. Whereas now this thing tells them straight away."*
> (End of life meter exchange customer, London, aged 52, low literacy)
>
> *"It can show you what you're using, for monitoring what you're using, for monitoring the amount you're paying, for getting accurate meter readings for your supplier."*
> (Customer who opted in, South East, aged 46, physical health conditions, receiving benefits)

A small number of frail elderly customers and customers with low literacy found it harder to understand what the smart meter was – both in terms of its communication with their supplier and how it could communicate with them via the IHD. In addition, end of life meter exchange customers had a more limited understanding of how the IHD works and were more likely to mention only one aspect of the smart meter's functioning when asked what a smart meter is.

> *"Well all I know is, it's a smart meter and that they don't have to come round and read it and to me – it's just a meter that's in the cupboard."*
> (End of life meter exchange customer, London, aged 83, physical health conditions, receiving benefits)

7.2 Benefits of having the smart meter and IHD

The majority of customers were able to identify at least one benefit of having the smart meter and IHD. Customers who opted in were more likely to mention multiple benefits in relation to having the smart meter and the IHD compared to end of life meter exchange customers. Fewer end of life meter exchange customers mentioned any benefits in relation to having the smart meter and IHD, and prior to the installation had less understanding of how the smart meter could benefit them compared to customers who opted in.

> *"Primarily that it would eliminate estimated readings; it would give more accurate readings. I thought it would be of some value in keeping an eye on the consumption of individual appliances, but I have got two separate devices anyway which I can plug in at any one time if I want to, and check the actual consumption."*
> (Customer who opted in, East Midlands, aged 80, physical health conditions, receiving benefits)
>
> *"I didn't even know there was a thing called a smart meter until he installed it."*
> (End of life meter exchange customer, East Midlands, aged 66, physical health conditions, receiving benefits, low literacy)

Some customers saw the benefits in terms of having both the smart meter and the IHD whereas some customers only associated benefits with one of the devices (either the IHD or the smart meter).

A range of different benefits were mentioned, summarised below in order of frequency:

- Not receiving any more estimated bills;
- Being able to monitor the cost of the energy you are using at that moment and monitoring the change in this both over the course of a week and the course of a month;
- No need for an installer to visit their house to read the meter;
- Knowing which devices use the most electricity and where possible reducing use of these devices accordingly;
- Knowing the difference that small changes make such as not leaving the TV on standby or turning the heating down by a degree or two;
- Being able to see how much energy they are using and monitor this;
- Receiving any changes which their supplier makes to prices straight away.

> *"I didn't know really what benefit until I saw them colours, but that's the benefit I find from it. It does kick in your mind to look at that and see where it's on and see where you can make savings."*
> (Customer who had opted in, East Midlands, over 70, physical health conditions, receiving benefits)
>
> *"Just so I could keep my eye on where the money was going."*
> (Customer who opted in, East Midlands, aged 77, physical health conditions, low literacy)

A small number of end of life meter exchange customers expressed that they could not think of any benefits that the smart meter and IHD could offer them. Instead they understood the smart meter to be an essential replacement of their meter and that they would become compulsory in the future.

7.3 Usage of the IHD

Although many customers struggled to define and articulate all the functionality of the IHD in detail, it is clear that most had a good understanding of the information it should be able to provide.

The majority of customers did use their IHD at least some of the time, either keeping it constantly plugged in and on, or switching it on once a day or a couple of times a week to check what electricity they were using and the cost.

> *"The guy said I don't need to use it every day. He said, you can put it in the cupboard, you can take and look."*
>
> (End of life meter exchange customer, London, aged 26, receiving benefits, children under 12 in the household)

A small number of customers had the IHD switched on but did not like the high visibility of the traffic lights, which they felt dominated the room. One customer, who suffered from epilepsy, hid the IHD behind a curtain so that it did not aggravate his condition. Another customer had failing eyesight and so did not attempt to read the more detailed information on the IHD. She too hid the IHD as she disliked the brightness of the traffic lights.

A minority of customers had never switched on the IHD or used it, nor did they intend to. These customers typically already felt that they used the minimum amount of energy and did not see any potential benefits from monitoring their consumption. These tended to be frail elderly customers.

> *"My son knows more about it than I do. There's nothing to it really, when you're gone I'll switch it off. I switched it on because you were coming!"*
> (End of life meter exchange customer, East Midlands, aged 89, physical health conditions, reliant on electricity for medical equipment, low income)

Understanding of IHD functionality is mixed:

- A small minority of customers had tried out the IHD, but later decided to keep it either temporarily or permanently switched off. A very small number of customers had never switched the IHD on at all. Reasons for this included a lack of understanding about how the IHD works, being concerned about the cost of keeping the IHD plugged in, and being disinterested in the information provided by the IHD and unconvinced that this information could benefit them;
- All customers (except those who have never switched it on) were aware of the traffic light display on the IHD;
- Almost all customers were aware that it displays information on usage in terms of cost and Kwh, but price information is considered to be far more useful.

Understanding of the time period to which that information related and is available varies considerably;

- Most appeared to believe that the default display is the energy consumed that day or hour;
- Many were aware that historic usage information (previous week/month) should be available but not all of those knew how to access it on their device;

- Awareness of the carbon emissions information was far lower than for usage data and almost no customers had attempted to access this.

The information that is accessed most often via the IHD is the traffic light display. Customers found this the easiest aspect of the display to engage with as it is highly visual and hard to avoid noticing if you are near to it. They understood that the traffic lights indicated the amount of energy they were using and that there were some appliances which were high consumption and therefore would send the IHD on to red. They most often spontaneously mentioned the kettle, cooker, tumble dryer and washing machine as appliances that turn the IHD red.

"I look at it as traffic lights. Green for go, orange and then red you are in the hot zone. That's how my idea of it works. So that if you're in green you know you're not using a lot, orange you're using a bit more. If you go into red you know you're on the heavy… because you've got washing machines or tumble dryers or kettles. You know you've got your heavy stuff going."
(Customer who opted in, South East, aged 61, physical health conditions)

"I like to see the colours; what I'm using. I'm no good at mechanical things but that is ok. I sit here and think "Go down to green, go down!"
(Customer who opted in, East Midlands, aged 73, physical health conditions, receiving benefits)

Although the majority of customers were a little worried the first time they saw the IHD light turn red, they quickly worked out which appliances caused this to happen. One customer did, however, not realise that it is possible for the lights to turn green, believing that amber is the best he could achieve.

"You look at it, and you think, you ask yourself 'How can I stop it?' Maybe I don't need to use that so often… Which I've done with the washing machine… I'm not frightened of it, I'm just glad. I'm rather pleased that I have it now."
(End of life meter exchange customer, South East, aged 66, receiving benefits, low income)

"It's not really relevant. I mean if I want the heating on, it's going on isn't it? Whether the meter is telling me or not, it's still going on... it's normally on green anyway, so I can't go any lower than that can I?"
(End of life meter exchange customer, East Midlands, aged 74, physical health conditions)

"Bit like the washer, we don't use it that often... If you've got the red light on, you know you're using something that you've got to, like when you've got the toaster and the microwave on at the same time. You can't cut corners."
(Customer who opted in, East Midlands, aged 75, physical health conditions, low literacy)

Most customers however understood that the devices which turn the IHD red were not appliances that they typically used for prolonged periods and are often essential devices. Whilst a minority of customers did say that seeing the IHD turn red was a 'worry', this was almost always clarified with the explanation that it was not a cause of stress or concern, but a positive outcome as it made them more aware of how much energy they were using and identify where they could reduce consumption.

A few consumers, however, did remain concerned by the red light.

> "It gives me palpitations, you just think about the money."
> (End of life meter exchange customer, South East, aged 66, receiving benefits, low income)

Some customers also used the IHD to look at their energy use in more detail, and many looked at the cost per hour to get an indication of how much they are spending on their electricity at a given moment. When asked, about half of customers also looked at the graphs to see when they are using the most energy. Some people spontaneously gave the example of being able to notice when their children were home from school because the graph then peaked.

A number of customers could not remember how to access the information on gas usage and cost, or were unaware that this function existed.

A very small minority of customers had used the carbon emissions button more than as an occasional experiment, with most indicating that they did not intend to use it in the future either. The small number of customers who were interested in this information planned to look at it in the future (although not as frequently as the other information on the IHD).

Chapter summary

Nearly all customers considered their IHD to be the 'smart meter'. The vast majority understood that the IHD monitors real-time usage and that it communicated with their supplier but very few understood the technical detail of exactly how the communication works. A small number of frail elderly customers and customers with low literacy found it harder to define what the smart meter is.

The majority of customers could identify at least one benefit of having the smart meter and IHD. Customers who opted in were more likely to mention multiple benefits compared to end of life meter exchange customers. The main benefits were being able to monitor electricity consumption and not having any more estimated bills. A small number of customers could not think of any benefits that the smart meter could offer them.

The majority of customers used their IHD at least some of the time, primarily relying on the traffic light information and/or the indicative pricing, followed by the graphs showing usage over time for a smaller proportion. Few customers used the Kwh or carbon emissions data. This was most often used to monitor how much energy they were using and although customers said that they were concerned when they first saw the red light they realised that certain appliances cause the red light to show. A minority of customers had not used the IHD yet and said that they did not intend to do so in the future. These are typically the most frail and elderly and some with literacy and mental health problems.

8. Behaviour change and energy use

8.1 Extent of behaviour change

There was considerable variation in the extent to which customers believed the installation of the smart meter and the presence of the IHD in the home had affected their behaviour and energy use, as shown in Figure 8.1.

Figure 8.1 Extent of behaviour change

The majority of customers reported that in the first few days or weeks following installation, they experienced a useful learning curve as they gained awareness of which appliances used most energy. Many customers had the IHD in their kitchen and so awareness had increased particularly around appliances such as kettles, toasters, ovens and microwaves, washing machines and tumble dryers, all of which tend to be located in that area.

A minority of customers focused on the effect of passive energy use, such as leaving items on stand-by or leaving lights on in unoccupied rooms, in an effort to reduce wasteful consumption. However, many relied on a change in the traffic lights, typically up to red, as an indicator that an appliance was consuming a high amount of electricity, rather than experimenting with different appliances that did not produce an obvious spike in consumption, to see how much could be saved by switching items off.

Customers identified a wide range of small changes to behaviour which were resulting in reduced energy use. These are summarised below, approximately in order of the number of mentions:

- Turning off lights when leaving a room;
- Only filling the kettle with the amount of water required;
- More efficient approaches to cooking, such as baking a cake and cooking a meal at the same time to benefit from the heat, or cooking two days' worth of meals at a time and then re-heating one the following day;
- Reducing the time clothes are in a tumble dryer, or not using it at all on sunny days and hanging washing out to dry;
- Switching off appliances at the socket;
- Taking shorter (electric) showers;
- Reducing multiple device usage.

As is evident from the nature of the changes being made, customers are typically reducing their electricity consumption rather than their gas consumption. This is almost certainly linked to the fact that the traffic lights reflect only electricity usage and are providing the visual stimulus for customers to review and amend their behaviour.

Few customers seemed aware of their gas consumption or identified any changes to behaviour in this area, with the exception of a few customers who were reducing their use of central heating. It is important to note, however, that some customers who had reduced their use of gas central heating had done so due to tariff increases, rather than as a result of a fundamental change in attitude towards, or understanding of, energy consumption following the installation of the smart meter. However, the IHD may of course contribute to a stronger consciousness of the cost of energy more broadly.

Some of these changes in behaviour were more common amongst certain consumer groups than others. For example, multiple device usage was more common in households with children and teenagers whilst older people were more likely to have the time and inclination to make changes to the way in which they cook.

> *"It's made me more aware of what I'm using. And I suppose I'm being a little bit more careful, certainly, about how long I have things on for. With central heating, you don't realise how much money you're using just by having it on… I'm putting a thicker cardigan on, and a hot water bottle up my back, to save putting the central heating on... It's just sensible."*
> (End of life meter exchange customer, South East, aged 66, receiving benefits, low income)
>
> *"I've got to admit, it does make me sort of think with the dryer, maybe I'll not put it on for so long, which I have started doing. Same as the heater, I have turned it down, just slightly. And I haven't really noticed, except at night and then I crank it back up, because it is cold at night."* (Customer who opted in, East Midlands, aged 65-74, physical health conditions, receiving benefits, low literacy)
>
> *"You know, if I know I'm making a cup of tea for two, I used to always fill the kettle right up. But now I'm more conscious, because I know it's a red light jobby. I'm thinking, it takes longer for a full kettle to boil than it does a little bit."*
> (End of life meter exchange customer, South East, low literacy, children aged 14 and 12)

Nonetheless, although the majority of customers had made at least minor changes to their energy consumption habits, around one-third of customers had not made any changes. It is worth noting here that, for most, this is based on consumers' own subjective description of their day-to-day behaviour, rather than an objective measurement of the energy they had consumed in kilowatts.

> *"To me it's just a curiosity. It hasn't changed our lifestyle at all."*
> (Customer who opted in, East Midlands, aged 65-74, physical health conditions, receiving benefits)

8.2 Factors that influence IHD usage and associated behaviour change

There is a relationship between understanding how to use the IHD and the extent to which a customer engages with using the IHD and perceives its potential benefits.

End of life meter exchange customers were typically slightly less engaged with their IHD than customers who opted in. This was demonstrated in both the benefits that they perceived the IHD to offer and the way their behaviour had changed since receiving the IHD. The lack of information provided to these customers in their first conversations with the supplier created the potential for a vicious circle where their lack of understanding of the potential benefits of their IHD leads to a lack of motivation to try to learn more about it.

In contrast, the majority of customers in vulnerable situations who opted in tended to understand better how the IHD works and cared about how they could use it to monitor the amount of energy they used in their daily activities. These customers recognised the benefits of the IHD and were more likely to have made changes to their behaviour.

It is important to note, however, that it is not clear whether a lack of understanding of the IHD leads customers to disengage, or whether a lack of engagement with the potential use and benefits of the IHD results in customers paying less attention to the demonstration and explanations of how to work it.

A number of factors that influence and drive behaviour change were evident. These are:

- The extent to which customers believed they were already careful with energy and not wasteful;
- The household composition and extent to which individuals were prepared and able to adjust their day-to-day habits;
- The financial situation of the household;
- The interest in and capacity of the individual to use the IHD and to interpret the information it shows.

These factors can operate alongside each other and together influence each individual's response to the IHD and the information now available to them. Further work is needed in this area to understand variation between different vulnerabilities and fuel-poor customers segments.

Perceptions of energy use prior to installation

The extent to which customers believed they are already careful with energy is a significant factor influencing the extent of behaviour change. In particular, those who had not made any changes to their behaviour believe that it is simply not possible for them to do so as they are already as careful as they can be.

> *"If you're conscious people, it doesn't matter, 'cos it's the same amount we've always used."*
> (End of life meter exchange customer, Yorkshire, aged 66, physical and mental health conditions, receiving benefits, low literacy, low income)

Many customers perceived a generational difference in this respect, with older customers particularly likely to consider that they did not waste energy because they were raised in an era when wastage was frowned upon, and that these values and attitudes have remained with them. They considered this to be an important difference in attitudes between older and younger generations.

> *"The impact I think would be greater for younger households. They might become more careful… Our generation was more careful and less wasteful."*
>
> (End of life meter exchange customer, North East, aged 76, physical health conditions, receiving benefits, low literacy, low income)
>
> *"Living on my own, as I am, I tend to have a pattern of behaviour which won't change a great deal, unless the cost of electricity and gas goes up a colossal amount."*
>
> (Customer who opted in, East Midlands, aged over 80, physical health conditions, receiving benefits)

Household composition

Household composition can also have a significant impact on behaviour change. Customers with young children and teenagers in the home were typically keen to make energy savings but often found that it could be an uphill struggle to achieve cooperation, pointing out that the traffic lights only turned to green when the children are not at home. Several parents were now using the red light on the IHD as a justification for their requests to switch lights and appliances off and as an educational tool to teach their children about energy consumption and efficiency.

Snapshot: Customers with children

Kelly lives with her husband and three children. Before the installation of the smart meter Kelly had a fair understanding of what a smart meter was.

Kelly felt that the demonstration was efficient but has since forgotten how to access some of the information. She keeps the IHD plugged in and looks at the traffic lights and current electricity cost often. Kelly has been making her children more aware of how much electricity they are using.

Customers with children understood that they could use the IHD to monitor their energy consumption and customers found it useful because they could use it to see how much energy their whole family was using.

In many cases, the IHD had made them aware of how much energy different devices use and they were using it to tell their children to switch things off and not have multiple electrical devices on at the same time.

The potential benefit of the IHD to young families was also highlighted by some older customers, several of whom had recommended smart meters to their adult children in the belief that it would help parents influence their children and hence save energy and money.

"If the kids are in the shower I've got quite mean now, 'Get out of the shower, quick, quick!'… It's a good thing, and it's a bad thing because you feel like you're quite mean. 'Turn the lights off, and do this, do that, don't be in there long, don't be in the shower long.' And they're like, 'God Mum, since you've had this meter you've been a nightmare.' But it just makes you conscious, that's all."

(Customer who opted in, West Midlands, aged 36, receiving benefits, low literacy, children under 12 in the household)

"I tend to be in the habit now of following them round almost, switching the lights off… live pause on Sky means the kids leave the TV on for ages… It's making me unpopular!"

(Customer who opted in, West Midlands, non-vulnerable)

"She says 'Well I'm not going to stop ironing!'"

(End of life meter exchange customer, North East, aged 64, physical and mental health conditions, receiving benefits, low literacy)

A similar dynamic was also observed between some couples without children living at home, where one person was particularly conscious of energy consumption and was trying to change the behaviour of their more resistant partner.

Financial situation

Income or the financial situation of a household was rarely, if ever, the sole factor influencing whether or not the IHD installation had led to behaviour change. For example, low-income households often responded differently to each other, with those who considered themselves already extremely careful in their energy usage less likely to make changes to their behaviour than those who felt that they were learning and understanding new ways to save energy and money.

Similarly, some customers who had no concerns about being able to pay their energy bills felt that whilst the information displayed on the IHD may be interesting, it was not sufficient to adjust their behaviour as they did not feel the need to make financial savings. However, other customers in the same income bracket were still driven to make changes simply because they did not like waste.

"It's more for the young; they leave the computers running and television on standby. If I'm cold, I put the fire on. I'm in that position where we can afford to put the fire on. I don't think twice."

(End of life meter exchange customer, vulnerable, East Midlands, aged 65-74, physical health conditions, receiving benefits)

The interest in and capacity of customers to use the IHD

There was no evidence to suggest that those who fully understand the functionality of their IHD were making more significant changes to their behaviour than those who rely on just the traffic lights or other key metrics such as price.

It is self-evident, however, that those customers who had not engaged with the IHD at all were not adjusting their behaviour or energy use because they have less means or impetus to do so.

"You could switch it off now and throw it in the bin. To me it's just a glorified gimmick." (End of life meter exchange customer, East Midlands, aged 65-74, physical health conditions, receiving benefits)

Customers with multiple vulnerabilities, including specifically customers who have mental health conditions, the frail elderly and customers with low literacy were those who found it most challenging to engage with the IHD. While they understood the basic functionality of interest to them, they were less likely to know how to access other information, or feel motivated to read the information booklet to gain more information on how the IHD works.

Customers with language and literacy conditions were more likely to struggle to fully grasp how they could use all of the IHD functions, and how they could use it to monitor the amount of energy they are using in their daily activities.

Snapshot: Customers with language and literacy conditions

Mary left school aged 14 and since her husband died lives alone. Before the installation of the smart meter Mary had only a basic understanding of what would be happening. She received a demonstration of how the IHD worked and now has a basic understanding of this. She uses the IHD infrequently and sees the main benefit as being the removal of estimated billing.

Frail elderly customers were amongst those who found it the hardest to understand how the IHD works. They also tended to consider the main benefits of the smart meter to be the elimination of estimated bills and meter readings. Generally they were not motivated to engage with the IHD and how they could use it to monitor their energy use. They saw themselves as already using the minimum amount of energy that they could and felt that cutting down what they use would be unnecessary.

Snapshot: Frail elderly customers

Vera lives alone and has a number of physical health conditions. She has a stair lift in her home and her eldest son visits her regularly. Prior to the installation she did not understand what a smart meter was and thought that her meter was just being replaced. She did not understand how the IHD works and chose to keep it switched off. Vera understood that her meter will no longer be read, but does not see how this helps anyone other than her energy supplier.

By contrast, non-vulnerable customers generally found it easier to understand how the IHD worked and the range of functionalities, compared to customers in vulnerable situations. However, they seemed on the whole less engaged with the IHD and did not care as much about how they could change their behaviour as a consequence of having the IHD. Many of the non-vulnerable customers had a higher income and therefore they did not feel the need to consider the cost of energy in relation to their consumption.

Snapshot: Non-vulnerable customers

Philip lives with his wife in a semi-detached home. Before the installation Philip understood that a smart meter would remove the need for estimated billing. This was something that he thought was a great benefit and this continues to be the biggest benefit to him. Although he keeps his IHD switched on he does not see how it can help him to save energy and hence pays little attention to the information shown.

8.3 Impacts of behaviour change

Almost all customers, including many of the most vulnerable, were pragmatic about the extent to which they could control and reduce their energy consumption. They recognised that their health and wellbeing came first, with many explicitly mentioning that they were not prepared to lower the heating to the point where it exacerbated a condition such as arthritis or left them feeling cold. Similarly, most customers highlighted that many appliances which consume a large amount of energy were essential. For example, whilst they may now boil less water in the kettle, they are not going to stop having a cup of tea when they want one.

> *"When the kettle has finished it comes back to amber. If it's amber, you're ok but you do notice if the washing machine is on, it goes onto red, if my wife's ironing it goes onto red, so you find out the things that are using the most electricity. You just have to sort of change the way of thinking and using electrical, especially electrical appliances. The gas is not so bad."*
>
> (Customer who opted in, West Midlands, aged 57, physical health conditions, receiving benefits)
>
> *"I've already used it to figure out which one's cheaper to use; the gas or electric… It goes on your daily usage and one day I used the gas kettle all day and the following day I used the electric kettle all day and then worked out which one was cheapest."*
>
> (Customer who opted in, South East, aged 46, physical health conditions, receiving benefits)

There was, however, a small number of customers in vulnerable situations that might start under-consuming energy to the detriment of their wellbeing, if appropriate guidance is not provided at the time of installation and beyond. Some of these customers had turned their heating down (one as low as 12^{o}C) and one was limiting his television viewing to only the programmes he most enjoys. It is worth underscoring that the perception of different kinds of energy consumption as 'essential' or otherwise is very much a subjective one. For some individuals in vulnerable situations, for example those who live alone and are rarely able to leave their home, activities such as watching the television may constitute one of their main windows on the world.

As discussed in Section 7. 3, there was also a small amount of evidence that the IHD can be a source of concern for some customers in vulnerable situations, particularly if the red light is often on.

Interestingly, there was also a generational gap in perceptions and beliefs around the extent to which frail elderly people would be concerned by the information displayed on the IHD and would adjust their behaviour to a detrimental extent. Some younger customers were concerned that older people, such as their parents, would lower their heating levels too far and some older customers reported having been warned not to do this by their children. Older people, however, demonstrated considerable resilience and tended to be amongst the most adamant that they would not change their behaviour if they believed their habits are already energy efficient (see section 8.2).

"It's more for the young, they leave the computers running and television on standby."
(End of life meter exchange customer, vulnerable, East Midlands, aged 65-74, physical health conditions, receiving benefits)

"I can't do much more than I've done to conserve energy, both gas and electricity."
(Customer who opted in, East Midlands, aged 80+, physical health conditions)

Overall, the picture suggests that IHDs are promoting more careful and considered use of energy, or no change at all, rather than excessive reductions in energy consumption arising from worry or anxiety.

"It's one of them things, you've got to have your heating on. You know, you can't do without heating, not when you're old people, you've got to have your heating on."
(End of life meter exchange customer, vulnerable, Yorkshire, aged 73, physical health conditions, receiving benefits, low income)

"Whether you could actually change your behaviour because you can see what power you're using, is perhaps debatable. You know, the fact you want a cup of coffee, still means you want a cup of coffee and you're going to put it on. If you need to do the washing, you put the washing machine on. It doesn't necessarily affect... But, you see, we're perhaps in a fortunate position because we don't have to worry about money that much. I mean I'm not saying I'm rich, but I don't have to watch the money that much that I wouldn't use it because I can see how much it's costing us."
(End of life meter exchange customer, South East, aged 52, children under 12 in household)

The longer-term impacts of the IHD on behaviour and energy consumption are less clear. There are some indications that even within the first month or so of usage, a small number of customers were starting to reduce their usage of the IHD and consulted it less frequently. A few also mentioned that they no longer left it switched on all the time. Whilst this had not yet reversed any behaviour changes arising as a result of the installation, it is not yet known whether reduced engagement with the IHD will ultimately lead to a return to former habits and behaviours. This is a reminder of the importance of customers being provided with follow-up support and incentives post-installation such as tailored tips on energy efficiency to help support and maintain engagement.

Chapter summary

The majority of customers experienced a learning curve in the initial days and weeks following the installation and had made at least minor changes to their energy consumption. Given the prominence of the traffic lights on the IHD, behaviour changes typically focused on reducing electricity consumption. Changes ranged from only filling the kettle with the amount of water required to switching off appliances at the socket, to reducing multiple device usage (typically households with children and teenagers). Those who did not have the IHD on did not display any behaviour change, those who had minimal use of the IHD displayed small changes in behaviour and those who kept the IHD on all the time and used it regularly displayed the most behaviour changes. Behaviour change is influenced by four key factors: perceptions of energy use prior to installation, household structure, financial situation and interest in/capacity to use the IHD. These factors can work with each other to influence how someone responds to the IHD. The vast majority of customers recognised that the IHD could help them control their energy consumption but that this should not lead to under-consumption. More research is needed on the long-term impact of smart metering on behaviour change and follow up engagement strategies post installation.

9. Using the IHD for messaging and communications

Some customers mentioned that a welcome message had appeared on screen when the IHD was first plugged in. These customers therefore realised that the IHD could be used to communicate messages from their supplier. The majority of customers, however, had either not received or not noticed a welcome message and were hence unclear about whether or not their device would be able to communicate messages to them. One customer commented, for example, that he had not been able to work out how to read the message and so had switched the IHD off.

In principle, most customers were open to the idea of receiving some communications via their IHD, although the extent to which it was acceptable varied considerably, both in terms of the frequency and content of the messages. A large minority of customers thought that for a variety of different kinds of message, they could potentially be more receptive to IHD messaging than to 'junk mail' sent through the post or cold calling.

Most customers also wished to retain some control over their receipt of messages by being able to press a button to view the message at a convenient time.

9.1 Billing and service delivery information

There was widespread support for the idea of using the IHD to send warnings of planned interruptions to supply. Customers did not feel this should be the only means of communicating this information, but it could be a useful addition to traditional channels.

Only a minority of customers had received a bill since the installation but a small number of these (for both suppliers) reported a large discrepancy between the cost displayed by their IHD and their Direct Debit, with the Direct Debit for a small minority having doubled from their previous level even though the IHD indicated that their consumption had remained the same.

There was also strong support among customers for IHDs to display an account balance. Customers who pay quarterly would also like to receive a message warning them when a new bill or Direct Debit was due. A week's notice was felt to be the appropriate time to send this.

9.2 Tariff information

There was strong support for information about available tariffs that might result in cost savings. Customers felt that it was currently up to them to chase information about lower tariffs, which suppliers were reluctant to give them unless there was a risk of the customer switching away from them. Some respondents felt that greater transparency would improve their sense of loyalty to their existing supplier.

Information on the eligibility criteria for lower tariffs was seen as particularly helpful. Ideally customers would like to receive a tailored message, flagging them as eligible for specific tariffs or rewards. A small number of customers mentioned that they felt suppliers should be required by law to inform consumers if they would be eligible for a cheaper tariff. This may reflect a more general lack of consumer confidence around accessing tariff information and choices.

"New tariffs and discounts would be handy, could be quite helpful actually to have it there. Tips, I wouldn't mind that at all – better than getting the phone calls – I'd probably take more notice of the messages on the display. I would feel less intruded by messages on the display than by having people call."

(Customer who opted in, East Midlands, aged 39, 11 year old child, physical and mental health condition, receiving benefits)

9.3 Marketing messages

While customers were very positive about receiving information about their actual consumption, there was a more muted response to the idea of receiving information about other products and services. The reactions from customers to this possibility varied widely, according to whether the information in question was perceived as something that could benefit them, or whether that potential benefit was likely to be outweighed by the unsolicited and intrusive nature of the information.

As long as the quantity and quality of messages are controlled so that their relevance is easily perceived by customers, some customers suggested that communication via the IHD may in fact be preferable, as posted leaflets tend to go in the bin and cold callers are usually perceived to be intrusive. That said, it seems that the more messages that are sent, and the less personalised they are, the greater the potential for customers feeling bombarded by more 'junk mail' and hence disregard or come to ignore all IHD messages.

"It wouldn't worry me a great deal, provided that it didn't materially interfere with accessing the information that I was concerned with… What you're doing here is offering a marketing facility which could be a nuisance… It's a question of whether someone's trying to sell me something rather than give me advice."

(Customer who opted in, East Midlands, aged 85, physical health conditions, receiving benefits)

9.4 Messages from other organisations

It was also suggested to participants that carefully selected independent partners and charities could communicate messages around energy efficiency, switching and money saving tips via the IHD. Sources of general support and impartial advice such as Citizens Advice Bureau or Age Concern were mentioned, as well organisations such as Consumer Focus and NEA.

Consumer reaction to this idea ranged from indifference to positive support for these types of messages. At the one end of the scale, a significant minority of customers felt that either their energy use was already as low as they were willing for it to be, or that they knew enough already about energy efficiency. At the other end of the scale, many customers welcomed the possibility of finding further ways to lower their usage or expenditure, and declared themselves happy to ignore such messages if they are felt to be irrelevant or something that the customer knew already. Some customers also felt that they did not wish to receive unsolicited advice and that it is inappropriately intrusive, albeit preferable to cold calling or doorstep selling.

"You don't have to read it if you don't want to, do you? Just delete it."

(End of life meter exchange customer (his carer), Yorkshire, aged 66, physical and mental health conditions, receiving benefits, low income, low literacy)

"I don't like to be bogged down with data. I like to be in control of what I'm doing myself, more than anything, but it's just a guide for me. I wouldn't want to be troubled with all sorts of new things that were coming in… I think I would look on it as a bit of an intrusion."

(Customer who opted in, East Midlands, aged 65-74, physical and mental health conditions, receiving benefits)

Chapter summary

All customers who opted in had not received any messages via the IHD and a minority of end of life meter exchange customers had not accessed any messages via the IHD and therefore were not clear as to whether their device can communicate messages to them. However, most customers were open to receiving messages via the IHD providing they had some control over displaying the messages at a convenient time and the choice to say no to them. Generally messages should be infrequent and targeted so that the customer feels the messages were helping them. Most customers were open to receiving information on billing and service information; marketing messages were not viewed as favourably but provided that the quantity and quality is controlled customers felt that this was a useful way of communicating with them. Messages from other organisations divided opinion between those who thought that it could be a useful way of providing information on energy efficiency and those who were indifferent or actively did not wish to receive such messages as they already felt that they had enough information on energy efficiency.

10. Supplier relations

A large proportion of the participating customers were loyal to their supplier, whilst others were apathetic or unconvinced about the benefits of switching, and hence had been with their supplier continuously for many years. It should be noted that a majority of participants were retired customers who had been with one supplier for many years.

When asked, around half of customers who opted in to having a smart meter installed generally felt slightly more positive towards their supplier at the end of the process, but had already started from a position of relative satisfaction and loyalty. For the vast majority of end of life meter exchange customers, their relationship with their supplier had not been harmed by the smart meter installation, and in some cases, there had again been a slight improvement. Customers who were more apathetic or were unconvinced about the benefits of switching often felt that the only way they could get a better offer would be if the IHD gave them clearer information on better tariffs.

> *"I wouldn't change to a different supplier… I've been 65 years with the company and I'm not looking for any cheap company."*
> (Policy exchange customer, East Midlands, aged 89, physical health conditions, reliant on electricity for medical equipment, low income)
>
> *"They're all the same so what's the point in changing?"*
> (End of life meter exchange customer, South East, aged 65-74, language barriers)
>
> *"If one offers you a cheaper deal a couple of months later they'll put their prices up so there's no difference."*
> (End of life meter exchange customer, South East, aged 65-74, physical health conditions)

A very small number of customers were worried that energy consumption data could potentially be used by suppliers to develop unfavourable tariffs that charge more at times when usage is price-inelastic. However, others are more optimistic that this data could be used by suppliers to come up with more intelligent tariffs that would allow customers to manage their expenditure according to their patterns of use, or their patterns of use according to their budget.

A minority of participants had concerns that the smart meter roll-out was causing meter readers to lose their jobs. However, this did not have a significant impact upon perceptions of suppliers.

10.1 Moving home

No customer of either supplier had been informed about what would happen if they moved home. It was evident that the majority of customers had not thought about what the implications would be for their smart meter, but most considered it obvious that the smart meter and the IHD would stay behind, whatever this might mean for the next resident of the property.

"I obviously couldn't take it with me unless there was a smart meter where I was going. So I suppose I'd ring them up and they'd either fetch it back or they'd get the new people to take it on, I don't know."

(Customer who opted in, East Midlands, aged 65-74, physical health conditions, receiving benefits, low literacy)

"I'd tell them I was moving, I presume it's their equipment and it belongs to them, not to me. I wouldn't take the meter with me and I don't think I'd take this thing, it might not work anywhere else."

(End of life meter exchange customer, South East, non-vulnerable)

10.2 Switching tariff or supplier

Currently technical issues may mean that in the early stages of the smart meter roll-out (before the mass smart roll-out starts in 2014), consumers might not have all the smart functionalities if they switch from one supplier to another. Ofgem (the regulator) is planning to bring in new rules[18] to make it easier for consumers that get a smart meter installed early to switch, and still keep their smart functionality. These rules are expected to come into force from autumn 2012.

Around half of elderly customers did not have internet access, but all of these were comfortable researching other energy suppliers through other means, in the unlikely event that they decided to switch. Some customers said that they were discouraged from switching supplier after having previously experienced pushy behaviour by other suppliers' salespeople.

Only a very small minority of customers of either supplier had been given any information about what would happen to their smart meter if they wanted to switch their tariff or supplier. In some of these cases the customer had been given partial or potentially misleading information.

One end of life meter exchange customer was told their supplier would 'lose out' if they switched as the supplier had paid for the installation. There were two further instances of customers who opted in, and having proactively asked about the issue of switching, being given partial information.

"She said, no, there's nothing to stop you going anywhere else… she said no, it makes no difference, I'm sure that's what she said."

(Customer who opted in, East Midlands, aged 70-79, physical health conditions, receiving benefits)

Another customer arranged the appointment for his installation and later read a newspaper article saying that smart meters weren't 'compatible' with other suppliers:

[18] Ofgem consultation on 'Supporting effective switching for domestic customers with smart meters', December 2011

"So I rang E.ON and said 'I don't think I particularly want this smart meter after all, because they're not compatible with other firms'. And she said, 'Well I can assure you that they are and they will be and they'll have to comply anyway in the near future'. So I've taken her at her word."

(Customer who opted in, East Midlands, aged over 80, physical health conditions)

However, most customers had no plans either to move home or to switch supplier and so none had thought to ask questions on either of these subjects. The vast majority did not seem concerned about the consequences that either of these scenarios might entail. A small minority were concerned about the prospect of being tied in by the smart meter to their existing supplier.

"Why should it worry me? It's standard procedure with these companies. They work on the way they've always worked… They have to have their own facilities for working smart meters."

(Customer who opted in, East Midlands, aged over 80, physical health conditions; pacemaker)

It is worth noting that a large minority of participants did not fully understand that they have received their smart meter in the context of a Government-led roll-out involving all suppliers. A much smaller minority had also read alarmist stories in the media about smart meters, raising concerns over safety or over how either suppliers or the Government could use sensitive usage data. In these instances, the installer was often unable to give a satisfactory response, which may fuel anxiety and discourage engagement with the smart meter.

Chapter summary

A large number of customers were loyal to their supplier, particularly many elderly customers who had not switched for many years. For many customers who opted in to having a smart meter, the process resulted in them feeling slightly more positive about their energy company. This was also the case, albeit to a lesser extent, for end of life meter exchange customers. No customers were informed what would happen if they were to move home, but the majority expected that they would have to leave the smart meter and IHD behind. Information about what would happen if they were to switch energy supplier was also not typically provided by the supplier and in the rare instances where customers raised concerns it was not generally felt that the installer was able to give a satisfactory response.

11. Conclusions and recommendations

The research highlights a number of important points in relation to the experience of consumers in vulnerable situations with the installation and subsequent use of a smart meter. This has implications for all consumers more generally. These findings are summarised below, along with associated recommendations as to how these issues can potentially be addressed for the future roll-out of smart meters.

Suppliers need better processes in place to proactively identify vulnerability, both pre and during installation

In the process of recruiting customers for this research, we found a number of customers in vulnerable situations in the general customer database for both suppliers. Suppliers' Priority Services Registers (PSR) can be a useful means of identifying and 'flagging' a vulnerable household, but the definition is narrow, and customers are expected to self-refer. Most suppliers also apply a wider definition of a vulnerable household than the PSR (e.g. the definition set out in the ERA Safety Net[19]) and have other ways of capturing this information: it is essential that any information about vulnerability is clearly visible to any member of staff who looks at a customer account.

The main six suppliers in particular have been proactive in improving the policies and processes used to identify consumers in vulnerable situations who are in debt, and it is essential that this approach is shared internally across the company as well as across the industry. This will ensure best practice is followed and every interaction with a consumer is properly used as an opportunity to identify those individuals and households in vulnerable situations.

The smart meter installation provides a valuable opportunity to access and interact with the entire customer base and update records. There will inevitably be consumers in vulnerable situations who are not known to suppliers: all staff involved in the smart meter installation visit must be enabled to not only identify a customer's circumstances but to also properly record and offer appropriate assistance, in the form of signposting, referrals or specific support. This should be done through appropriate training and processes in place for the staff involved in every stage of the installation process from arranging the installation visit, through to the installation visit itself and demonstrating how the smart meter and IHD work.

Pre-installation

Processes should be in place to check for vulnerability prior to installation. All contact with the customer pre-installation should seek to identify whether the customer is in a vulnerable situation, needs additional assistance or is eligible for any existing social assistance or energy efficiency programmes. Suppliers should update their records if the customer is eligible for extra help or support.

During installation

Installers should be trained to identify customer vulnerability. If they do identify that a customer is in a vulnerable situation when they arrive to install a smart metering system, installers should satisfy themselves that it is still appropriate to proceed with installation. The decision should be proportionate to the customer's individual circumstances. All suppliers should ensure that, where there are any concerns about vulnerability, installers should obtain senior-level sign-off before proceeding with installation. Installers should log any vulnerability, which should then be followed up by an appropriately trained member of staff.

[19] http://bit.ly/U6whyR

Clear communication in advance of the installation is essential

Consumers who understand, at least in broad terms, what a smart meter is, why they are receiving one, and the potential benefits are more likely to be interested in the installation and more likely to view it as a positive change from the outset. They are also slightly more likely to engage with the IHD after installation. In particular a minority of consumers in vulnerable situations who receive notification by phone 'out of the blue' can be concerned by the process.

Early communication about the nature and potential benefits of a smart meter also enables consumers in vulnerable situations to digest this information in advance of the installation visit and hence engage with the installer's explanation and demonstration from a more informed viewpoint. Those who are unaware that they will be receiving a smart meter or what this means need to absorb that knowledge during the visit, in addition to the detail of how to operate the IHD.

Consumers value having their needs taken into consideration, for example with regard to timings and any special needs they may have which would affect the installation.

All suppliers should ensure that consumers who are due to have a smart meter installed receive the following minimum information and service in advance of the installation visit. This information should be provided by a formal letter, contain visual images and ideally be followed up by phone after the customer has had a suitable length of time (1-2 weeks) to digest the information provided:

- A short but clear explanation of what a smart meter is, how it operates, why they have been selected to have one at this point, and the potential benefits that it offers consumers;
- A free phone contact number to ring if they have any queries related specifically to smart metering – ideally this should be free from mobiles or suppliers should offer call backs;
- An explanation of how long the visit will take and the work involved in the installation;
- An explanation of the fact that they will receive an IHD and be given a demonstration during the installation visit. It should be recommended that where possible, the person most likely to use this device, or anyone who will support with use of the IHD, is at home for the visit.

Providing this information by letter prior to a phone call will allow customers to have something to refer to during the phone call and will also have the benefit of avoiding cold calling as customers will be expecting the phone call. The phone call should cover the number of installers (and names), offer a security password, mention that the installer(s) will show ID and any other elements covered in the SMICOP.

These points are particularly important for consumers who are receiving a smart meter under an end of life meter exchange because it offers them an opportunity to engage with the installation process and starts to educate them about how it might help them to understand and control their own energy use.

In addition, consumers should be asked questions to ascertain:

- Whether they have any support needs related to a physical or mental health condition, including the presence of a carer or other user for the demonstration.

The Consumer Focus/Ofgem vulnerability check list would make a good starting point for this;

- Whether there are likely to be issues related to the property type or meter location which may necessitate a longer visit and/or special materials or equipment.

There is also a role for Government and suppliers to play in wider, public communications around the benefits of the smart meter roll-out. Some consumers are more likely to trust a Government-backed initiative and distrust a commercial supplier, whilst for others the opposite is true. This has implications for who promotes smart metering.

The IHD demonstration during the visit is a valuable and welcome opportunity to engage consumers but is insufficient alone to ensure a real understanding by many

Consumers who understand how to operate their IHD and access the information of interest and relevance to them are most likely to be satisfied, engaged and change their behaviour.

Many customers felt that the information they were provided with during the installation visit was sufficient but subsequently found that questions arose regarding how to operate the IHD. In particular, many struggled to switch between electricity and gas information. In the most extreme cases, a lack of understanding resulted in the IHD never having been used at all. Many customers with outstanding questions felt that they could get more out of the device if they understood properly how to use it.

A small number of customers with eye conditions or epilepsy had hidden the IHD as the bright lights cause them discomfort, and a few others had also hidden it as they find the lights annoying or distracting.

The amount of information that consumers are required to take in during the installation visit is overwhelming for some, so simply providing more information at that time is unlikely to be the solution. Many lack the necessary confidence and/or skills to experiment with their IHD and learn through a process of trial and error. Literacy and confidence barriers also limit the use and value that some consumers can obtain from the information booklet which is left behind.

On a related note, some consumers are worried by the electricity consumption of the IHD itself, and how much this might be costing them. Some consumers are also worried about how often they are supposed to be consulting the IHD

The IHD itself, the demonstration and subsequent information materials left by the installer must cater to the full range of learning abilities and styles:

- Demonstrations of how to use the IHD should involve firstly showing consumers how to do something and then later asking them to complete the action themselves – 'learning by doing';
- Information booklets are important and should be clear, with step-by-step instructions on how to perform each action or access each type of information;
- A DVD with a visual demonstration would be of huge benefit to those who have lower levels of literacy or are daunted by seemingly technical booklets, and those who prefer to learn visually, where they have the appropriate technology to use this. This could be translated into different languages, sign language etc., in order to ensure that all consumer groups are able to access the relevant information;
- A portable device would also be of benefit to the most engaged consumers and facilitate easy understanding of the energy consumption of different devices located around the home. Whilst the current devices can be plugged-in in any room (although this has to be in a location where they can get a signal from the meter), consumers are not able to wander from room to room with the IHD, testing different appliances.

All communication materials should be tested before deciding the best format to provide information in to customers, with a focus on identifying whether different types of consumers find the information easier to understand in other formats.

Consumers need to understand not only how to read the information provided, but how to interpret it and act upon it

Most consumers were interested in and willing to change their energy behaviour if they could see it was wasteful. This is driven mainly by financial concerns but also by a dislike of waste in general or concern for the environment in particular.

Most customers found the traffic lights useful despite a misunderstanding that the traffic lights alter in response to both gas and electricity consumption.

Many felt that the IHD had educated them to some extent about which devices use most electricity and that this had been helpful, frequently adapting their behaviour slightly as a result. However, they often felt that there was more to know and had questions relating to the relative consumption of different devices. Some also found it difficult to identify or had not considered the consumption of devices such as their electric shower, which was located far from the IHD.

Many consumers also struggled to access the gas information through their IHD and reliance on the traffic light system meant that they were often paying relatively little attention to their gas consumption. This is significant as gas is used by the majority of consumers to heat the home, and can be a significant cost.

Some consumers struggled to see how the device could benefit them at all, believing they were already using the minimum of energy. Low income consumers in particular may already be under-heating their homes and have less potential to benefit from the smart meter. The possibility of under-heating should be monitored carefully as the roll-out continues.

It is essential that the installer explains to the consumer the benefits of using and engaging with the information communicated via the IHD, and how they can do this, focusing on the information which gives greatest benefit to consumers.

This should include:

- A clear explanation of the traffic light system, where there is a traffic light system to provide ambient feedback on electricity consumption;
  - in particular it is important to explain that whilst the red light is not a cause for concern if they have the kettle or oven on, for example, if they are unable to quickly identify the cause of the red light, they should check for devices which have been accidentally left switched on, such as an iron;
  - The baseline for the traffic light system should also be explained to consumers as currently there is ambiguity about whether it is adjusted for household size and occupancy, or whether it is a universal average and hence very difficult for a large household to reduce the indicator to green, regardless of the energy efficiency measures they adopt;
  - Clarification that it only covers electricity usage and not gas usage;
- A clear explanation of how to access both gas and electricity consumption data.

Information about which devices consume most energy and the relative merits of using different devices should be included in the booklet and DVD left behind. For example, is it cheaper to cook peas in the microwave or on the hob? Is it cheaper to wash dishes by hand or in dishwasher?

Other information which customers would find helpful to know at pre-installation and installation include:

- Reassurance should be provided that the IHD consumes only a small amount of electricity and even if left plugged in all the time, would only cost £X a year to run. The information provided to households needs to be consistent across all installers;
- Explanation of the wider context and policy around smart meter introduction; particularly that it is national rather than supplier-specific, why the Government is doing it and what the expected benefits are;
- Clarification on who pays for, and who subsequently owns smart meters and what this would mean should somebody want to change supplier.

This information could also usefully be provided in an FAQ booklet and DVD format for both installers and consumers.

Given the dependence on the traffic light system further research is needed to understand if having two parallel traffic light systems on the IHD (one showing electricity consumption, one gas consumption) would be valuable for consumers. Further research is also needed to explore the value of tailoring the settings for the traffic light system to reflect the size of the household. Currently the majority of IHDs have one threshold for low, medium and high usage, regardless of the household that is using them. This could lead to a one person household thinking that they were using a low level of electricity, because the light rarely goes to red. Conversely, a large household could find that the light was often red, even when they were using a low level of electricity relative to the number of people living there.

There is also clear potential to provide consumers with additional information relating to energy consumption and efficiency at the time of installation but caution should be exercised to ensure customers in vulnerable situations are not overloaded with information. More research needs to be done in relation to the provision of other information to ascertain whether, for example, it is more effective to provide basic tips at the time of installation and then leave some information with the consumer and follow this up in more detail at a later stage, or whether all the information should be covered at one time. Any additional information should be provided in the most appropriate format for the customer.

Many consumers have questions subsequent to the visit and would benefit from follow-up

The majority of consumers in vulnerable situations had questions about how to operate their IHD and/or interpret the information several weeks after installation. None of them, however, had proactively contacted their supplier for information or support.

We recognise that one supplier is already following-up with customers in the form of reminders in the first bill after installation, a letter or email after six months and again after one year. Customers in vulnerable situations will also receive a phone call to check the installation went according to plan.

The other supplier is also following up with customers although for a shorter period of time. Customers with this supplier receive a 'courtesy phone call' around two weeks after installation to check they understand what they have been supplied with and how to use the IHD.

The demonstration and subsequent information materials left by the installer must cater to the full range of learning abilities and styles:

- Consumers identified as being in a vulnerable situation (either specifically or via other proxies) should be receive a follow-up call by telephone around two weeks after the installation to identify and help address any queries or concerns and to further seek to identify those with further support needs. This should not only address the quality of the installation but also any outstanding questions, however trivial they are perceived to be by the household. After two weeks, the customer has had enough time to start engaging with the IHD and identify where they have unresolved questions and will still be relatively fresh in the memory of those who have not yet managed to engage with it at all;
- A free phone number should be printed on the front of all smart meters and IHDs encouraging consumers to call with any questions (not just 'problems') about their meter or IHD. Ideally this should be free from mobiles or suppliers should offer call backs. A local rate option would be helpful, since 0800 numbers are not free from mobiles. The free phone number should be to call the supplier as problems and questions may be specific to the supplier although it would also be useful to have a free phone advice line in case customers switch suppliers and then have a query;
- Local charities, consumer groups, councils and housing associations should be educated and engaged as to how offer information and support on using the devices.

Indicative pricing information devalues the IHD for many and is perceived to limit its use

Some consumers were either told or have noticed that the price displayed is 'indicative only' and feel that whilst it is still of some use, the information does not help them as much as it could. This confuses customers, particularly during the first weeks of operation, many of whom are waiting for a bill to confirm the readings they are seeing and savings they perceive to be making. This may prove to be particularly important for consumers who wish to use the IHD to closely monitor expenditure and plan their budgets.

The IHD mandated for roll-out should include accurate account balance information, updated, as consumers use energy, to give a running total of how much they are spending and how much they are on course to pay in at the end of the next billing period (i.e. including standing charges). This would limit the potential for consumer confusion and backlash when final bills are higher than expected based on the information displayed. The Government has ensured that this remains an option by mandating that all smart meters should be capable of providing the account balance, and that all IHDs should be capable of displaying it.

Information relating to the ability to switch suppliers is not currently being communicated and whilst many customers in vulnerable situations have no intention of switching, this is clearly not the case for all

Only a handful of consumers were aware that if they now choose to switch supplier, their meter could return to 'dumb' or lose functionality. Furthermore, this was a question that the vast majority of consumers had not thought to ask, even after having time to digest the information. While it is intended that these issues will be resolved by the time full roll-out takes place this could remain an issue for the foreseeable future as suppliers continue with early roll-out and targeted trials.

All consumers should be made aware at the time of installation about the implications for their meter should they choose to switch supplier[20].

[20] Ofgem recently consulted on this issue (Ofgem consultation on supporting effective switching for domestic customers with a smart meter) and is expected to come to a decision in autumn 2012.

Question marks exist over the long-term impact on behaviour change and further research is needed to understand this

Whilst the majority of consumers had made at least minor changes to their energy consumption and usage behaviour, there are also indications that once the novelty of the IHD starts to wear off, it may be disconnected or moved to a less visible position in the home.

As the consumers in this research had only been using their IHDs for less than a month, any behavioural changes which had been implemented were still in evidence and happening. What is not known is how long these changes will last and to what extent they are dependent on longer-term interaction and engagement with the IHD and parties such as supplier, local community groups etc.

Further research is required to follow-up on consumers that have had a smart meter installed, to understand how this has impacted on their behaviour and how the level of behaviour change may alter over time. This should be done at a number of stages; from the initial period following installation through to six months or a year later, tracking changes in behaviour and attitudes. Such a project could examine the potential need for on-going support or additional prompts in order to maximise and prolong the extent of positive behaviour changes. It should also consider the impact of a receiving a smart meter on different types of customers in vulnerable situations and explore how factors such as household composition, financial situation, and energy consumption patterns (including electricity only households) and payment method interplay to affect behaviour change.

It would also be of interest to evaluate the impact of potential interventions designed to maintain engagement, such as follow-up calls, annual reminders or how use of the IHD for messaging affects consumers.

A further potential area for research would be to explore how smart meter installation impacts on wider energy and environmental attitudes and behaviours over time; e.g. whether it prompted customers to install energy efficiency measures.

The use of the IHD for communicating with customers and for marketing messages should be treated with caution

Most consumers were open to receiving information relating to billing, service interruptions or other important messages from their suppliers via the IHD. Some were also willing to accept offers from their supplier, such as on tariffs or boiler care, or energy saving advice.

There were, however, concerns about receiving information from a wide range of sources or being 'bombarded' with information. Some also felt it is a form of direct mail that they had no control over.

Some consumers also suggested that they would simply ignore messages, as they do with other unsolicited communications. This could have implications for how well IHD messages regarding energy saving tips or billing messages are received or taken notice of, as well as having a potential knock-on impact on levels of overall engagement with the primary IHD functions.

The use of IHDs for messaging, particularly marketing messages, should be treated with caution and tested to gauge consumer response and impact.

Messaging via IHDs should not be used as a sole means of communication for important information relating to billing or service interruptions, for example.

Nonetheless, consumers would welcome opportunities to hear about best available tariffs, information which suppliers are already obliged to communicate to vulnerable groups.

Suppliers should, as a minimum, have a special pathway for customers in vulnerable situations or on low incomes

A special pathway for consumers in vulnerable situations and on low incomes should include:

Pre installation

- Offering customers a password which the installer can use to confirm their identity;
- Asking customers if they would like to have a third party present, for example a carer or family member;
- Ensuring communications materials used at every step of the process are tailored to customers in vulnerable situations' needs, in terms of clarity and accessibility.

During installation

Installers should be appropriately trained to explain how the IHD works, and communicate with the customer in the most appropriate manner.

Extra time should be allowed for installations where the customer is known to be in a vulnerable situation, to cover additional time that may be needed for explanations about how the IHD and smart metering system work, and to provide reassurance where needed.

Installers working with these customers should never be incentivised on the number of meters installed in a day, or the time spent on installation, as consumers in vulnerable situations, in particular those with low levels of literacy or numeracy, learning difficulties or a communication disability such as aphasia[21], are all likely to need more time to understand how the IHD works.

Customers should be reminded about the importance of adequately heating their homes to stay healthy and well.

Where appropriate, customers should be told about and referred to additional sources of help for assistance with paying their energy bill such as social tariffs, and existing energy efficiency schemes. More research is needed to explore this further.

Suppliers should explore the value of working with a third party, for example a local charity or other trusted partner, to ensure that they are reaching the consumer in the most vulnerable situations. The Central Delivery Body which DECC has recently consulted[22] on could also have a key role to play in this type of coordination.

Post installation

Suppliers should explore the most effective way of following up with customers, to ensure that they are comfortable using their IHD, and check whether they have any follow-up questions.

[21] Aphasia is a communication disability which occurs when the communication centres of the brain are damaged. It is usually caused by stroke, but can also be caused by brain haemorrhage, head injury or tumours. Each person with aphasia experiences it differently. Some people cannot speak at all; some people have just a few words. Others can no longer read, write or use numbers. Everyday activities such as having a conversation, answering the phone, watching television, may suddenly become a source of profound frustration and anxiety both for the person with aphasia and for their families, friends and carers. http://bit.ly/Rd4vCK

[22] http://bit.ly/RG30Nc

Appendix I – Pen portraits

This section contains pen portraits of five vulnerable consumer groups, and one 'non-vulnerable' group. These portraits have been developed on the basis of the individual depth interviews conducted. The stories told reflect an amalgamation of the experiences of each specific type of consumer, rather than telling the story of a particular individual.

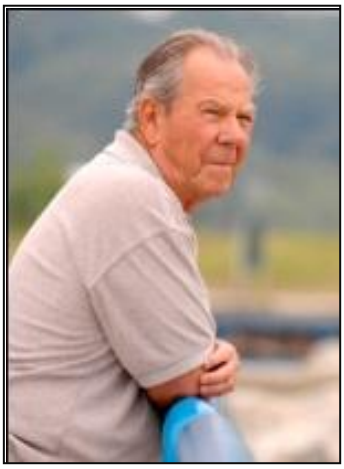
An overview of the pen portraits included is provided in the Table below.

Consumer group	Name	Description
Frail elderly	Vera	Multiple physical health conditions; mid 80s; low income; reliant on electricity for medical equipment
Mental health conditions	John	Chronic mental health conditions; early 60s; deteriorating physical health and mobility; low income; lives alone in a council-owned property
Language & literacy barriers	Mary	Low educational level; low income; mid 70s; lives alone in a housing association property
Families with young children	Kelly	Mid 30s; lives with her husband and three children; no physical or mental health conditions
Low income; on benefits	Andrew	Late 60s; dependent on the state pension and other benefits
Non-vulnerable consumers	Philip	Working full-time; early 60s; lives with his wife in a semi-detached property; no physical or mental health conditions

In addition, we have included two short case studies which illustrate the 'worst case scenarios' which emerged during this research.

NB: The images used are stock photography and not real consumers who participated in this research.

Mental health conditions: John



Has experienced chronic depression for the last 30 years and also suffers from anxiety

In his early 60s, he is unable to work full-time and receives a number of means-tested benefits including Working Tax Credit and Housing Benefit

His income rarely exceeds £10,000 per year

He lives alone in a council-owned property where he has been for the last 15 years

In addition to his mental health conditions, he suffers with arthritis and increasing mobility problems

The installation process

Prior to the installation, John was a little concerned about having the meter fitted as he did not understand why it was necessary. However, with explanation he came to believe that they are an inevitable part of the future and decided to go ahead with the installation.

John was very happy with the installation process on the day, finding the installer to be polite, helpful, clean and tidy at all times. He had no concerns about letting the installer into his home once he had checked the ID and seen that the van carried the supplier logo.

The IHD demonstration

Although John felt the installer tried hard to be clear with his explanation, he found the amount of information he needed to take in overwhelming.

"When they're telling me something, they tell us one thing, they tell us the next thing, I've forgotten the first thing. At the end, I can't remember anything."

He struggles to absorb the information and his mental health conditions mean that he didn't engage as much as he may have done on another day. At the time, he didn't ask too many questions about the functioning of the IHD, partly because he felt he wouldn't take it in and also because he was concerned about delaying a busy installer.

Using the IHD and benefits of smart metering

John now makes very limited use of the IHD. He knows how to look at the top-line price information it shows him and checks occasionally to keep an eye on his expenditure. However, he does not use any of the other functionality such as Kwh usage or trend data. He perceives the main benefit to him to be the avoidance of estimated bills – this reduces his anxiety and also helps him to manage on his limited income.

"I'm not very up on the kilowatts and therms or whatever… It's just purely to give me a guide of how much I'm using when I want to refer to it… Knowing that it's not going to be estimated, that's the big thing."

The information he accesses via the IHD has not prompted John to make any changes to his behaviour. He feels that he already uses only energy quite wisely and perceives heating, cooking and boiling the kettle to be essential usage that he does not intend to change, and hence he is unconcerned by the red light when it appears.

"I know I'm not wasting it and that's all I'm worried about."

Overall, he is satisfied with the smart meter and it does not cause him any concern. He is ambivalent about learning to use more features but recognises that a follow-up call might help.

Literacy barriers: Mary

Aged 74, left school aged 12 with no qualifications and struggles to read longer pieces of text

She is widowed and lives alone, although adult children live near

Her income is £10,000-£15,000 a year, based on her late husband's pension and state pension

She lives in a housing association bungalow where she has been for the last five years

She is generally in good health, other than mild arthritis and asthma and the usual "niggles of growing old"

The installation process

Prior to the installation, Mary had little understanding of what would be happening or why her meters were being replaced. Upon receiving a call from her supplier, she simply accepted the fact that it would be happening and asked no further questions. The supplier did not clarify what a smart meter is or its benefits.

"I was phoned up and told I was going to have it. I had no choice! I didn't even know if it was allowed, what with it being a rented property."

On the day of the installation, Mary was happy with the way the installer fitted the meter, finding him to be polite and courteous.

The IHD demonstration

Mary was happy with the demonstration provided about how to use her IHD.

"He showed me how the set worked... but it's all new isn't it, and you never remember everything the first time; well, I don't."

Following the installer's explanation Mary now understands that the meter monitors her energy usage in real-time and that the traffic lights are an indication of this. She did not wish to ask the installer any further questions and he suggested that she read up on the functionality in the booklet provided.

Using the IHD and benefits of smart metering

Mary now looks at the traffic lights occasionally but has also had the IHD unplugged for periods of time. She struggles to interpret the other information displayed.

"You get big numbers, you get small numbers, and they're changing all the time … And that's confusing."

Mary finds the IHD to be of relatively little value because the lights only turn red when she uses certain appliances, such as the kettle, and she feels she has no choice but to use them. The information shown has not prompted Mary to change her behaviour in terms of energy consumption. As such, she sees few benefits apart from the fact that meter readings will no longer be needed and her bills will not be estimated.

"It's one of them things. You've got to have your heating on. You know, you can't do without heating, not when you're old people, you've got to have your heating on."

Overall, Mary is ambivalent about her smart meter. She hasn't taken the time to look at the booklet because she knows she would struggle to read it. Mary's daughter often handles important correspondence for her, but she hasn't felt the need to ask for help with the smart meter or IHD as it is not a priority for her.

Families with young children: Kelly

Aged 34 and married to Andy, 37, for 9 years

They have a daughter aged 14 and two boys aged 7 and 4

Their income is £30,000-£40,000 a year. Andy works full-time but Kelly recently lost her part-time job so money is now tighter than it was

Everyone is healthy but the youngest boy is mildly autistic

They live in a detached home with a mortgage

The installation process

Prior to the installation, Kelly had a reasonable understanding of what a smart meter was. She liked the idea of being able to see what her family was using and looking for where she could save money.

"I just liked the thought of the whole smart meter. The thing that interested me was that I could see what I was using."

On the day of the installation, Kelly thought that the installer was very efficient and polite. She was particularly happy with the way the installer conducted himself and appreciated him communicating to her what he was doing.

The IHD demonstration

Kelly was happy with the demonstration provided about how to use her IHD.

"He showed me the buttons, how to see gas and electric, usage per minute, and the graphs. He told me to keep an eye on using the kettle and tumble dryer and try to minimise using these and to make the children more aware of how much they are using."

She would have liked a bit more information from the installer but she was aware that her children were becoming impatient as they were going to the park after the installer had finished installing the new meters.

Using the IHD and benefits of smart metering

Kelly keeps the IHD plugged in and on constantly. She keeps it in her kitchen because that is where she spends a lot of her time. She looks at the traffic lights and also keeps an eye on how much it is costing her per minute and the graph showing the day's usage. Kelly would use more information on the IHD but she can't remember everything the installer told her because the boys were running around at the time.

"He did take me through how it works but I think I was a bit distracted at the time because the boys were running around."

Kelly thinks the IHD is a fantastic gadget and uses it to tell her children to turn things off all the time. However, she doesn't feel that her children are much more aware of what they are using.

"Obviously there are some things that still need to be used...but things like turning the lights off can be changed...I'm shouting at my kids all the time about things like that. They're like 'Mum you're such a bore since you got that new meter'."

Overall, Kelly thinks the new smart meter is a good thing. She is planning on reading the booklet in the future when she has some time so that she can fully understand how the smart meter works and take advantage of all the information it can provide.

Frail elderly: Vera

Aged 85, has a number of physical health conditions including arthritis, emphysema, high blood pressure and mobility problems

She also has memory problems

Since her husband died she has lived on her own in a rented property but her eldest son lives close by and often visits her

She has a stair lift in her home to help her mobility

Her income comes from her pension and some government benefits which she receives, including housing and council tax benefits

The installation process

Prior to the installation, Vera didn't really understand what a smart meter was. She understood that the meter needed to be replaced but was not made aware of how her new meter would be different to the meter that she had previously had. She understood that changing the meters was a necessity and thought she might as well have it changed now.

"I was told it's going to be compulsory."

On the day of the installation, Vera was pleased with the way the installer conducted himself. He phoned before he arrived and also showed her ID so she did not have any concerns about letting him into her home. The installer didn't continuously update her with what he was doing but she didn't feel that this would have been necessary and was very happy that he tidied up before he left.

The IHD demonstration

Vera thought the demonstration from the installer was a bit quick and she struggled to grasp what all the different buttons would tell her. She asked him to repeat what he was saying a couple of times and although he did go over things she still was unable to understand how the IHD worked.

"Yeah but telling me how to use that is a waste of time. I couldn't understand what they were talking about."

She feels that the installer gave her enough information on how to use the IHD and instead blames herself for not understanding how this works.

Using the IHD and benefits of smart metering

Vera does not use the IHD. Although she originally kept it switched on after speaking to a friend who also had one she now keeps it switched off. She is not bothered about monitoring the amount of energy that she uses as she feels that she uses what she needs to. She does not see where she could save energy.

"I don't bother an awful lot about it, frankly. We're using the stuff and we're having to pay for it. And that's all there is to it. Being old, we need to have heat in the house. So if we need to have heat, we have heat."

Overall, Vera does not really see the point of having a smart meter. She understands that no-one will need to come round and read her meter but is concerned that this will mean that people will lose their jobs. She does not plan on switching the IHD on again in the near future.

Low income, on benefits: Andrew

Aged 68, Andrew lives with his wife, and their two adult children visit regularly

They live in their own terraced house, having purchased through a right-to-buy scheme some years ago

They are dependent on the state pension and also receive some other means-tested benefits

Both are in good health, although his wife suffers occasionally from arthritis

The installation process

Prior to the installation, Andrew was attracted by the idea of eliminating the need for estimated bills, since he and his wife are on a fixed income. He also liked the idea of being the first to get a piece of technology that eventually would be compulsory for everybody. The phone call with his supplier was focused solely on arranging the appointment.

"It gave me roughly what it is and said it would save on estimated bills. I know it's probably for their convenience, 'cos they don't have to send a meter reader round, but also it's better for us 'cos we're not having to wait in for anybody."

On the day of the installation, there was a small problem with needing a new valve for the gas, which meant the appointment took two hours. However, this did not inconvenience Andrew.

The IHD demonstration

When the installer explained how the IHD could monitor real-time usage, Andrew was excited by the possibility of controlling their energy consumption. He felt that he understood most of the demonstration and was happy to play with it in his own time. His wife found the explanation went over her head and left it to Andrew to figure out, considering energy use to be his responsibility.

"Once someone knows something – it's like our kids when you ask them how to do something on the computer. They'll do this, this and that and that's it."

Using the IHD and benefits of smart metering

Andrew has the IHD plugged in constantly. He looks at the IHD every time he goes in the kitchen and enjoys turning different appliances on and off to monitor their energy consumption. His wife has now also begun to look at the traffic lights, but more out of curiosity than out of concern to change her behaviour.

Andrew however is making small changes to both he and his wife's energy use, and since he is not working, he has had time to play around with the IHD and takes an interest in reading how their usage patterns develop over time. Although he and his wife are not struggling to get by, their income is low enough that he sees the value in cutting down his energy use, so long as this does not have an impact on their well-being.

"When a person is more aware of what's happening, they can take action on it, and I like to be in control in that way... I suppose I'm being a little bit more careful, certainly, about how long I have things on for, certainly with central heating, you don't realise how much money you're using just by having the central heating on."

Non-vulnerable: Philip

Aged 55, lives with his wife, Sally
They have grown-up children who they travel to visit every month
He works full time and his income is £30,000-£40,000 a year
They live in a semi-detached home
Neither Philip nor his wife have any long term health conditions

The installation process

Prior to the installation, Philip spoke to his supplier about the smart meter that was going to be installed. One of the things that most appealed to him about the smart meter was that it would remove the need for estimated billing. He thought it would be something that was good to have because it means that he will have accurate bills without needing to take time off work when the meters needed to be read. He had a good understanding of what would happen when his meter was replaced and asked some questions to clarify exactly what the installation would involve.

"Not needing to take time off work for when someone has to come round to read the meter was really the best thing about this."

On the day of the installation, Philip was happy with the installer. He thought that the installer was very polite and appreciated the way he got on with his job.

The IHD demonstration

Philip thought that the demonstration provided about how to use the IHD was rather brief. Even though many of the buttons are self-explanatory he felt that it would have been useful to be shown in a bit more depth about how the buttons worked.

"Well he told me what the various buttons were for, but I suppose if you look at them, the difference is when there's a bulb that's electricity, when there's a flame, that's gas, but that's self-explanatory anyway."

However, Philip understands that the IHD shows him how much energy he is using and that he can use it to monitor both the amount of gas and electricity he is using.

Using the IHD and benefits of smart metering

Philip understands how the smart meter works but he hasn't fully grasped the benefits that it offers as he has not yet had time to read the booklet provided and familiarise himself with all the functionality of the IHD. He keeps it constantly switched on and looks at it once a day. Although he thinks the IHD is useful, he does not see where he can save energy as he feels he is already uses the minimum amount of electricity he requires.

"When it was plugged in, I mean you do then think about actually how much you're using, when you keep seeing it on red and stuff. And it does go through your mind, you know, what you could do. But whether you're actually going to do it, I don't know."

Overall Philip thinks the best thing about the smart meter is that it has removed the need for estimated billing. He can see the benefits of monitoring what he is using but he is not planning on changing his behaviour as a consequence of having the smart meter.

Worst case scenario case studies

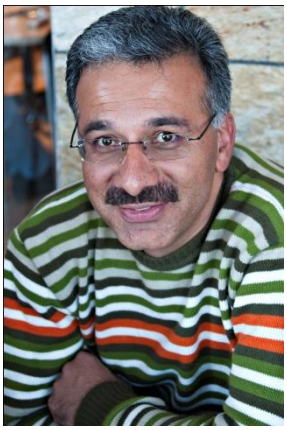
Whilst it is acknowledged that the following experiences were both extreme one-off cases and therefore to some extent represent anomalies in the research, it was felt important to include these two examples of 'worst case scenario' case studies for the following reasons:

They may be helpful in understanding situations that may arise and the subsequent barriers that some consumers may face across a larger sample.

Clearly, there are limitations to the extent to which those participants in our research reflect the nature of the vulnerable population at large. Many of the participants from the E.ON trials were opt-in and therefore already more likely to be engaged than other harder to reach vulnerable groups.

The only participants in the research with language barriers attended the London focus groups and so it was felt important to include the particular nature of their experiences.

Language barriers: Amir



Amir is a 75 year old pensioner of Turkish decent. English is his third language and he speaks with a heavy accent. On top of this, he has a mild speech impediment and is not the most effective communicator.

The installation process

Amir was happy with the installer when he came to the house. He recalls being called up by his supplier three years ago and told that he would be getting a smart meter. This may have been a clip-on but he had not received it or understood the difference. Amir commented that the installer called to notify him that he was running half an hour late and as he is retired and was planning to stay at home all day this did not bother him.

The IHD demonstration

Amir didn't really understand the demonstration but the installer had said that he would leave him a booklet. However, he believes that the installer must have forgotten because he never received it. He said that he subsequently tried to call his supplier a couple of times but he still has not received anything in the post.

Using the IHD and benefits of smart metering

When asked about the smart meter, Amir says he might be happy with it but doesn't know yet. Amir commented "let's see how much it saves me and what it does when the energy bill comes in." When asked further questions about how his attitude to the IHD and energy usage had changed it he indicated that he had not interacted with it or altered his behaviour at all.

As the conversation progressed it became apparent that Amir had understood the smart meter is in itself a piece of technology that would save you energy; an energy efficiency measure rather than something that involves active participation or behavioural change on the part of the consumer.

Not present at installation: Lindsay

Lindsay is a 44 year old single mum with two small children living with her elderly mother who also has dementia.

The installation process

Lindsay was told on the phone that she would be getting a new meter and that it was something she had to do. She didn't think anything more of it. She works full time so when the installer came her mother was at home.

The IHD demonstration

When Lindsay arrived home from work, she saw the IHD on the counter plugged in. Her mother had no recollection of the installation. She didn't know whether she was given a demonstration but doesn't think so. Lindsay unplugged the IHD straight away and put it in a drawer. She only took it out to look at it when she received the call asking if she would participate in the research and this was the first time she switched it on and looked at it briefly.

Using the IHD and benefits of smart metering

Lindsay commented after the focus group discussions that she was now curious to go home and play around with the IHD to experience first-hand what some of the other participants were talking about. She commented that she would have arranged to be there had she known that the installation was going to be complicated, as long as they didn't arrive when she was coming in through the door from work.

Appendix II – Discussion guides

Smart meter in-home interview topic guide

Introductory section

1. **Firstly I'd just like to ask you a couple of questions to get to know a bit more about you**

Please could you tell me a bit about the people who live in your household?

Who lives here? (Including ages of any children)

Marital status

Occupations – full or part time (including any seasonal work)

Financial situation – Income (check screener) and benefits (show card) and pensions etc.

Any health conditions or disabilities [these may have implications for the rest of the interview so bear the response here in mind throughout]

Reliance on electricity for medical equipment

Hobbies and leisure activities

Household tenure (owned/ rented etc)

Long-standing physical or mental health conditions or impairments

2. **Let's begin by talking briefly about your energy supply and who you get it from.**

Do you use both gas and electricity here?

If use both fuels ask if gas and electricity are from same energy supplier.

Which company do you get your gas and/or electricity from? [Be aware they may use previous incumbent name e.g. gas board. List a number of suppliers to prompt recognition or ask to see a bill]

What is the main source of heating?

Any supplementary heating sources? When used?

Installation process:

3. **Can you explain how you came to have a smart meter installed?**

(EON) What was it about the leaflet that persuaded you to get a smart meter?

When you made that phone call, what did you and the supplier talk about?

4. **Were you told by your energy supplier who would be visiting your home to install the meter?**

Were you informed of their name?

Were you offered a password?

Did you have any concerns or worries?

When you were informed about the installation of your smart meter was the date and time offered suitable for you?

If no, were you able to easily rearrange a date and time?

Were you given the option of refusing the installation of a Smart meter?

5. **What information (if any) were you given about smart meters when your energy supplier first contacted you about having your smart meter installed?**

Prompt: Were you told about what a smart meter was; what the installation would involve; any ways in which the smart meter could benefit you?

Meeting the needs of potentially vulnerable households

6. **And thinking about when your supplier contacted you about having a smart meter installed were you asked about any support and needs that your households might have in relation to having the smart meter installed?**

7. **You may have been asked about whether anyone in your home had any medical or health conditions, or needed any support during the installation or receiving advice about using your smart meter/in-home display after the installation – was any of this discussed with you?**

Prompt: Were you asked about whether anyone in your home has any specific health condition, disability or mobility issues, any communication / literacy/ language problems?

Were you asked any questions about whether anyone in the house uses a pacemaker?

The installation

8. **I would now like to ask you about what happened on the day you had your smart meter and in-home energy display installed. Overall, how would you say things went with the installation?**

Please tell me approximately how long the visit to install your meter lasted?

Did the installer have to return to your home for any reason to do with the Smart meter or display? **If yes**, please tell me more about this - Is the problem or reason they had to return resolved now?

So what did you actually have installed?

Prompt: Smart meter itself, in-home display unit?

Were you happy with where the meter and display are situated?

Prompt: can you get to them easily? Are there any mobility or disability issues that mean you cannot see or access them very well?

9. **Were there any aspects of the installation that you thought were particularly good or went well?**

Were there any aspects that did not go so well, or did you have any worries or concerns at the time of installation?

Did you communicate these to the installer and were they able to help, or did you contact someone else?

Prompt: energy supplier, other advice agency, friends/family.

Did you feel comfortable talking to the installer of your Smart meter and having them in your home?

Did you feel that you were able to successfully get your message across to them?

Prompt: Were there any language problems that were not overcome during the installation?

Would you have liked for another member of your household, or family or friend to be present during the installation?

Was there any disruption to your home or damage that required building or repair works?

If yes, what did this involve?

Prompt: What damage or disruption was there?

Prompt: Did your energy supplier arrange for the repairs to be done?

Prompt: Did the installers put back any furniture or fittings that required moving/ or re-set clocks?

Prompt: Were you informed beforehand that your energy supply would need to be turned off whilst the installation took place?

Did this cause you any problems?

Prompt: Did all appliances work properly again, was the supply restored properly, was there any disruption caused by this to your day, any health equipment that requires supply that could not be used?

Prompt: Was there any additional cost to you?

If yes, how were these problems resolved and did you receive any help putting things right?

Support & advice

10. **Thinking back again to when you had your smart meter installed, were you given a number for your energy supplier to call if you had any questions? Was it free-phone (from landlines and mobiles)?**

Did you call it? If yes, ask why and when (before or after install)

11. **What information, like booklets, did you receive about your smart meter and in-home display?** [Ask to see them if not too much trouble]

Have you looked at them or had to refer to them if you had a problem?

How useful do you find the booklet?

12. **Thinking about the advice or instructions you received about *just* your <u>display unit</u>, overall how satisfied are you with this advice?**

Was any of the advice or instructions about your smart meter provided to you *before* its installation, maybe from your energy supplier?

If yes, were you happy with this, was it clear and easy to understand?

Did you refer to the information provided about your smart meter before it was actually installed?

What about from your installer, did they provide you with any written or verbal advice or instructions about your smart meter when they were installing it?

If yes to written guidance, have you referred to it? Was it easy to understand?

If yes to verbal advice, can you recall what they told you?

Have there been any issues with your smart meter that were resolved by referring to the instructions or advice you were provided with?

13. **Again, thinking about the advice and any instruction you received, but this time *just* about the smart meter itself, such as how to use it and where to view your consumption data, overall how satisfied are you with what you received?**

Was any of the advice or instructions about your in-home display provided to you *before* its installation, maybe from your energy supplier?

If yes, were you happy with this, was it clear and easy to understand?

Did you refer to the information provided about your in-home display before it was actually installed?

What about from your installer, did they provide you with any written or verbal advice or instructions about your in-home display when they were installing it?

If yes to written guidance, have you referred to it? Was it easy to understand?

If yes to verbal advice, can you recall what they told you?

Have there been any issues with your in-home display that were resolved by referring to the instructions or advice you were provided with?

Do you have any remaining questions about how to operate it? Do you know how to get these resolved?

14. **Were you given any advice by the installer or your energy supplier about how you can use your smart meter to switch energy supplier or tariff?** [Interviewer check who the information was from if received]

Did the installer tell you about these or other tariffs and how you can switch tariffs or energy supplier?

Do you have access to the internet? Are you aware that you can switch energy supplier and energy tariff using the internet, for example, using price comparison websites?

Were you told about this by your installer or energy supplier, or how you could switch tariffs or suppliers using another method?

Did your supplier explain that the meter you received may not be able to work in 'smart mode' [may need to explain what is meant by 'smart mode] if you switch to another supplier? You will still be able to switch, but your meter might have to change back from being 'smart' to being a standard meter.

15. **Supposing you had a problem or a question about using energy at home or how you could save energy, where or to whom would you be most likely to seek out advice or help?**

And, what about any advice or problems you have about your smart meter or in-home display?

16. **Did your supplier tell you about any other independent advice or where you could get more information about smart meters or energy efficiency from?**

What about an advice line or any other numbers to call, different to the contact number for your energy supplier?

17. **Do you feel confident about where to go for help with any problems or faults, or advice on how to use your Smart meter and in-home display?**

18. **Were you informed by your supplier or the installer about the potential to change between a credit and prepayment 'meter' without needing to have your meter replaced?**

19. **Did the installer of your Smart meter or your energy supplier explain to you what happens to the Smart meter and in-home display if you were to move or leave the property, or if you switch supplier?**

What do you understand about what would happen if you were to move or if you were to switch energy supplier?

20. **Did your installer or supplier provide you with any advice about how you could save money on your bills or better keep warm at home?**

Prompt: using: your smart meter, in-home energy display, energy efficiency measures you could have installed, other tips and energy advice?

21. **Were you offered any extra help as part of the installation? For example, free energy efficiency measures? Benefit entitlement checks? Referrals to other agencies that could give you free energy efficiency measures?**

22. **Are you happy with the amount of advice and support you have received so far?**

Would you have liked any other advice or support?

Understanding and impact of smart meter and in-home display

23. **In just a couple of sentences can you explain to me what a smart meter is?**

Prompt: Think about what it does and what it's for?

Do you know that a Smart meter communicates directly with your energy supplier and sends them information about your energy consumption?

24. **Thinking back to when you were first told that you would be receiving a Smart meter, what did you think might be some of the benefits of having one?**

What is the biggest benefit for you now? Why is that important to you?

25. **Did you receive an in-home display?**

Are you comfortable using your in-home display?

If not, why not?

Were you given a choice about which in-home display to have; this may have involved a charge for a different type of display?

Prompt: Perhaps an enhanced version that does a little bit more or does things differently to the one that you would receive free of charge?

If yes, can you recall how much an enhanced version would have cost?

26. What do you know about your in-home display?

Prompt: Think about what it does and what it's for?

Prompt: Do you think it has something to do with telling you about the energy usage in your home?

27. Have you looked at or been using your home energy display to find out about the energy you use at home?

If yes, what do you think about the information it can provide you, have you used it in any way?

Do you think the information it can provide you is easy to see and understand?

How can you tell from your in-home display when you're using a lot of energy?

Prompt: do you look at the traffic lights? How do you feel when it turns red?

What do you normally do when it does this?

NOTE: If respondent indicates they turn down their heating or use less energy as a result follow up at Q29

28. Since receiving your Smart meter and in-home display has anything changed for you?

What about using energy at home – has the way you use energy changed at all?

Do you feel you know enough about what you can do to save energy and how your smart meter can help you?

Now thinking particularly about energy, since receiving your smart meter and in-home display do you think more about the amount of energy you are using at home, in your day-to-day activities?

Do you think you are more or less aware now of the *amount* of energy you are using since receiving your smart meter?

What about the cost of energy, since receiving the smart meter do you think about the *cost* of energy less, more or the same as before?

Do you worry any more or less about energy or affording the energy you need since receiving your smart meter?

29. Can you think of any ways in which your Smart meter could help you save money and/or energy on your energy bills?

30. Thinking about before you received your smart meter can you tell if you ever cut back or went without anything to help you make ends meet?

If yes: please tell me a little bit about this:

Prompt: Use heating less, buy less food, using savings, loans, cut back on socialising.

Ask in all instances: And what about since you received your Smart meter and display, has this changed at all?

Follow-up from Q26: Do you feel that you are prompted by your Smart meter and in-home display to cut down your energy use when you would prefer not to?In what ways?

31. Have you and/or your family or other members of your household changed any behaviour at home regarding how you use energy since receiving your Smart meter?

Prompt: Think about things in your home that use energy, are you using any of them differently to before? (*heating, lighting, hot water, appliances, cooking, using standby*?)

32. **Has the smart meter prompted you to think about the environment or being more sustainable in any other ways?**

Prompt: Perhaps using less or more water now, wasting less food, recycling more, using car less etc.

33. **Since having the smart meter installed do you think differently about your energy supplier?**

Has it affected how much you trust your energy supplier?

Do you think the smart meter might help with communication between you and your energy supplier?

Prompt: How would you feel if the display showed you messages from your supplier – special offers, new tariffs?

Prompt: How would you feel if it showed you energy tips from independent bodies like NEA or Consumer Focus?

34. **How confident would you say you are using your new in-home display and understanding and using the information it can provide you?**

Closing

35. **Thank you for taking the time to speak to me today. We are just about finished. Before we finish though, is there anything from the time of your installation, or about your Smart meter and in-home display that you are concerned about?**

I would just like to thank you again for your time today, it has been really valuable. Is there anything else you like to add?

Smart Meter Focus Group Topic Guide

12:30-12:50 – Arrival, lunch & welcome

12:50-13:00 – Introduction and background to the research:

Thank you for coming along to today's session. My name is X and I work for National Energy Action/Consumer Focus. We are a national energy efficiency charity whose main concern is ensuring that everyone can keep warm and healthy at home/the Government's consumer champion an organisation which aims to support and represent the voices of consumers.

The main aim of today's session is to find out from you your experience of living with a Smart meter and how you find using it on a day-to-day basis. We are also interested to hear your opinions about any support and assistance you have received along the way and what improvements could have made the experience better.

We have been able to do this research with joint funding from the Department of Energy and Climate Change [omit if required and Consumer Focus, an organisation which aims to support and represent the voices of consumers.] We will be writing a report based on what we have found out from these discussion groups, but information contained in it will be confidential and nobody's name will be included in the report.

We hope that the report will be used by DECC to help inform the design of support programmes for other people that are to receive Smart meters, and to make suggestions about any improvements or additional types of support that could be introduced.

13:00 – 13:40 Discussion Part 1: Experience of Installation (40 mins)

[Note this session is recorded only for the purposes of note taking. You will not be personally identified in any report.]

SWITCH ON RECORDER

Icebreaker:

Who we are - I am X and my favourite book/TV programme is…

Please say who you are and if you want to your favourite book or TV programme.

Discussion Part 1:

For the first part of the discussion, we would like to find out about your experience of having a Smart Meter installed.

1. **First of all, we'd like to hear about how you came to have a smart meter installed**.

Can you tell me a little bit about how you were first told that you would be receiving a Smart meter? [Be aware that BG are largely policy meter exchanges; E.on are self selectors]

Did you receive any information before the installer came to fit your smart meter? [What was it (telephone call, letter)? Opinions on level/type of info/any differences amongst the group]

Did you feel that you received all the information you needed before you had the meter installed? [Anything else you would have liked to know/ information liked to receive?]

2. **We'd also like to find out about what happened when you had the meter installed. Could you please describe briefly about what happened on the day?**

So, what was actually installed on the day? Did this include a Smart meter and in-home display? [Use pictures as prompts if needed]

Were they offered a password? How many people came to their home (might be one or two)

Was the installer helpful, did you have any questions? [If yes, were they answered?]

How did you feel having the installer in your home? [any difficulties e.g. language, mobility, etc.]

Did they leave you any information? [If yes, what was it, have you referred to it, was it helpful –opinions]

Did the installer show you how to use your Smart meter and in-home display? [Was this helpful, do you recall what they said? Explore whether the installer just touched a few buttons, or actually demonstrated how the IHD worked, for example by turning appliances on and off]

3. **Do you feel as though you have received all the information and support you need about your new Smart meter and in-home display?**

[Have you had to contact anyone since the installation about your Smart meter or in-home display? If yes, who, why, was it resolved?]

13:50 – 14:50 Discussion Part 2: Energy Use and On-going Support (1hr)

For the second part of the discussion, we would like to find out about what has happened since you had the Smart meter installed.

1. **Firstly, we would like to find out whether the Smart meter and in-home display has made any difference to what happens in your home and how you use energy.**

Can you explain to me how your Smart meter is different to the meter you had before?

What about your in-home display, can you tell me what this does? [Do you use it or refer to it at all; How often, what prompts you to look at it?]

Have you noticed any changes in the way you use energy since having them installed? [using energy differently, using less or more for different things] If yes, why do you think that is? If no, why do you think that is?

Has Smart meter and in-home display changed the way or the amount you think about using energy at home [e.g. as a resource to be careful with, thinking about it more, worrying less/more about fuel bills or energy use etc]

What about the in-home display. Is that easy to understand and use? What features do you look at? [Explore if just glance at the first screen or look in more detail, and at information on different screens. If don't use it much, why? Is there anything that would make you more likely to use it? E.g. temperature display]

What information do you receive from your display? [Is it easy to understand, do you use it? What information do you use or look at most often? Is the information about the energy you use in pounds and pence or kWh? Which do you prefer, why? Do you think it is a good idea to show an accurate account balance on the in-home display? NB Current debate around this –would show running total costs]

How much difference does the information make to how you use energy at home for heating, appliances, lighting or cooking?

What about the traffic light system, how does that make you feel? E.g. when the red light shows, what does this mean to you, how does it make you feel? [Do you ever feel prompted by your Smart meter and in-home display to turn down your heating when you would prefer not to?]

Do you receive any other information on your home display apart from the amount of energy you use, and an idea of how much it's costing? [What about energy efficiency

advice or tips? If received, do you find these useful and easy to understand, have you used them? NB the models that participants are receiving don't necessarily show accurate costings –may be indicative rather than accurate]

Has anyone received a bill since they got their smart meter fitted? [Was it accurate or estimated?]

2. **Finally, we would like to find out about any on-going support you have received, or any other support that you think would be helpful to households like you that have received a Smart meter.**

Have you received any support/heard from your supplier since your Smart Meter was installed? [If yes, what was it? If no, would you have liked some? Opinions, how valuable, anything missing]

Have you had any concerns/questions/queries about the Smart meter or in-home display since it was installed or have you used the handbook/phone number provided by your supplier? [If yes, why was this?, Have you contacted anyone else apart from your supplier about your Smart meter or in-home display – who and why? Did you get any help from friends or neighbours?]

Is there any extra support or information that you think would have been useful? [Before, during, after installation]

What would you think about other services being provided, either as part of the installation, or soon after the installation?

LIST for above sub-question:

Information during the installation as part of the handbook/written material

Guides on how to switch supplier/switch tariff.

Detailed advice on how to improve the energy efficiency of your home [also briefly explore interest in water efficiency information, especially if they have a water meter]

Extra Help

Someone to help you set your heating controls to make sure that they're working properly

Straight-forward/low cost energy efficiency measures being fitted, for example reflective radiator panels, energy efficient light-bulbs fitted, etc.

Schemes that that are available to improve the energy efficiency of your home – insulation measures, renewable technologies and efficient heating systems.

[Explain but keep simple that these may be a grant and free to qualifying households in receipt of certain benefits or a new scheme that would mean the measures were paid for through a charge on their electricity bill that would always be less than the money they had saved on their energy bill through having the measures installed. NB no need to dwell too much on details of the schemes unless asked specifically.]

Free carbon monoxide detectors

Benefit entitlement checks to make sure you're claiming everything you're entitled to.

Any other measures that would be helpful?

[Explore if they have had any help like this from their supplier before/ if they have applied for grants before or received measures they contributed to (part or whole). If not, why not – what would be a better way to reach them? Explore whether would be suspicious of extra help/'something for nothing' or would see as a good opportunity.]

Messages/Information via In-home display

What would you think about receiving information via your IHD? This might be similar to a text message

Notices from your supplier about any planned interruptions to your energy supply or changes to your energy bill, e.g. Direct Debit, when your bill payment was due/reminder

Advice and support relating to your Smart meter and in-home display or general energy advice from other sources [e.g. independent advice agencies?]

Advertising or marketing from your energy supplier or other services?

[Explore if think these would be helpful? If yes, what form would you like it to take? Verbal/information booklet/messages direct to your Smart meter's in-home display]

Closing question (14:45):

Have you any other thoughts about the support and advice provided to people receiving a Smart meter, what you were provided with before during and after installation, or any other advice or information you think could have been provided but was not? Any other improvements? Would you recommend getting a smart meter?

TURN OFF RECORDER