



FROM INSIGHT TO INFLUENCE

Project Avatar:

The Future of Customer Service

Engaged Customer Panel

– Key Findings Report

Prepared for Electricity North West Ltd

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MAY 2018

Project No. 606

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VERSION HISTORY

Version	Date	Author	Status	Comments
1	30 April 2018	Impact Research	Draft	

APPROVAL

Name	Role	Date
T Kennelly	Innovation Customer Delivery Lead Electricity North West	8 May 2018

Glossary

Abbreviation	Term
DNO	Distribution network operator
DSO	Distribution system operator
ECP	Engaged customer panel
EV	Electric vehicle
FAQs	Frequently asked questions
IVR	Interactive voice response
LCT	Low carbon technology
RIIO-ED1	Electricity distribution price control 2015 to 2023
RIIO-ED2	Electricity distribution price control 2023 to 2031
SME	Small and medium enterprise

Foreword

The customer service landscape is changing. A wide range of political, economic, social, demographic and technological factors are accelerating a shift in customer needs and expectations. Some sectors are adopting radical customer service solutions to match their customer bases. Customers are better informed and more empowered than in the past.

Distribution network operators (DNOs) need to understand and predict customers' current and future needs to ensure that they improve upon or at least maintain the level of customer service they provide. Continuous investment is required to identify and implement the right technologies and approaches to best meet the needs of different customers.

Project Avatar builds on previous studies in this area to provide a more granular level of understanding that will facilitate greater efficiency in future investment decisions prompted by customer need. An understanding of functional and emotional service needs, by specific customer group, will be fundamental to informing DNO policies and investment plans for the second electricity distribution price control (RIIO-ED2) review and beyond. The project will provide guidance to DNOs on how to future-proof their overall customer service strategy, by mitigating customers concerns and ensuring future needs are accommodated.

Project Avatar is funded by Ofgem's Network Innovation Allowance, introduced as part of the RIIO-ED1 price control, which provides an allowance for RIIO network licensees to fund projects that have the potential to improve network operation and maintenance, and to offer financial benefits to the licensee and its customers. The project commenced in October 2016.

This document specifically references the learning from Phase 2 of the project, a strategic phase of qualitative market research, enabled through a series of meetings with an engaged customer panel (ECP) and in-depth interviews conducted by project partner Impact Research. The focus group meetings and interviews culminated in an assessment of three innovative customer service prototypes. These were developed by Electricity North West's project partner Schneider Electric and its project supporter DXC Technology to interactively demonstrate the potential of new and emerging technologies to improve the customer experience when interacting with a DNO and meet future needs and expectations. The method and findings from this phase of research are comprehensively documented in this report. The overall project research approach was derived from the Project Avatar Methodology Statement, which was designed by Electricity North West and its market research provider, Impact Research. The Methodology Statement and all associated documents are published on the [Project Avatar](#) webpage.

1 Executive summary

1.1 Introduction

This report presents the learning associated with a three-stage programme of qualitative customer engagement.

An ECP was convened to establish future customer service needs when interacting with a DNO, particularly given the increased adoption of low carbon technologies (LCTs). The ECP met as four separate groups, each representing a different customer segment:

- urban domestic
- rural domestic
- millennial domestic
- small and medium enterprises (SMEs).

During the first stage of engagement, panellists were educated about DNOs and existing channels of customer communication, to enable them to contribute, in an informed way, in two further sessions. At the second meeting they were invited to discuss customer service needs and expectations, and encouraged to express views about communication innovations and data sharing. The final session was used to elicit the panels' responses to prototypes demonstrating an enhanced model of customer service and to gather suggestions on how these could be improved.

The ECP meetings were supplemented by:

- a number of one hour, in-depth, one-to-one interviews with four vulnerable customers and two customers who had adopted a number of "smart home" devices (eg electric vehicles [EVs], Hive, Google Home)
- a "mini group" of four customers (two domestic and two SMEs) with recent experience of interaction with Electricity North West, specifically concerning a new connection to the distribution network.

The qualitative research findings and lessons learned are documented in the following sections of this report.

The discussion guides used in group meetings/interviews and the suite of accompanying materials, are referenced in Appendix 7.3, project replication. These are available to view and download on the [Project Avatar webpage](#).

1.2 Summary of key findings

The research found that customers currently expect access to multiple communication channels to contact DNOs. These include pull channels – such as the Internet, social media and radio – and direct contact methods – such as telephone, text/SMS, direct messaging and email. There are some notable differences in preference for communication channels from different customer types. This was linked to age, socio demographic and geographic factors; however, the availability of a range of methods was considered to be particularly significant for interactions during supply interruptions when it might not be possible to use mobile phones, landlines or computers.

Direct face to face communication was generally not expected; with the exception of a visible site presence during prolonged outages or when technical advice, concerning for example complex network connections, would be advantageous.

When interacting with a DNO, customers expected to receive a consistent level of service on all channels, and for customer services records to be integrated across these channels. This ensures any information a customer has provided or received is available to contact centre agents, irrespective of which channels have previously been used.

In terms of content, its presentation and delivery, customers stated that they wanted concise, clear, relevant information about the issue or process in which they were interested, such as a supply interruption or a new connection. When exploring perceived acceptance of new innovative platforms, there was no appetite for information to be presented by augmented reality ie a hologram. Participants also did not want to be offered surplus material such as live video footage of activities related to the enquiry or process. If DNOs invest in technologies that can deliver enhanced, real time information that could be pushed to individuals through smart home hubs or other devices, the overarching view of customers is that they should be able to control the type and frequency of such notifications.

The panel considered scheduling to be very important in situations where a DNO needed to visit them. Expectations were compared with those now routinely provided in other sectors. The minimum expectation was that, with the exception of emergencies, visits should be planned in advance and any changes or delay should be clearly communicated, in a timely manner via the customer's preferred platform.

When data about a customer's consumption is collected by smart meters or other devices, they expect to control whether it is shared with their DNO and understand the extent to which it should be aggregated, for example at local

level, to enable the network operator to effectively manage the network as opposed to property level consumption data. DNOs should be explicit and transparent about the data they collect and how they intend to use it.

Customers were also clear that they wanted to control how such data is used (eg turn off appliances automatically, to optimise energy usage).

1.3 Next steps

There will be ongoing knowledge sharing and dissemination of the key findings of the project to date.

2 Analysis and results

The next three sections of this report present the learnings associated with a three-stage programme of qualitative customer engagement.

An ECP was convened to establish future customer service needs when interacting with a DNO, particularly given the increased adoption of LCTs. The ECP met as four separate groups, each representing a significant customer segment:

- urban domestic
- rural domestic
- millennial domestic
- SME.

Customers aged under 25, commonly referred to as millennials or Generation Y, were specifically included because their preferred methods of communicating do not fit easily with traditional customer service models. This has already led many organisations to develop ways of interacting with this group and to address customer enquiries.

The content of the three ECP sessions is outlined below in figure 2.1. Section two of this report provides customers feedback on customer service and interactions with a DNO as discussed in the first two ECP session, section three outlines customers’ expectations for future communications with a DNO and feedback to enhancements to existing technology (introduced in ECP2 and continued in ECP 3) and section four provides an overview of customers reactions to the prototypes, tested in ECP3.

Figure 2.1 Overview of ECP sessions

	ECP1	ECP2	ECP3
Objectives	<p>The initial focus group meetings were designed to educate the panellists through a number of tasks and discussions relating to electricity supply and customer service.</p> <p>Electricity North West was introduced, its role as a DNO in the electricity industry and its relationship to National Grid and suppliers. Information was also provided how changes to the energy market will change</p>	<p>The second round of group discussions focused on customer service needs, current expectations and how expectations were likely to evolve in the future. Concerns around data sharing were explored.</p>	<p>During the final meeting, feedback was obtained on future enhancements to customer service interactions. Three prototypes for bespoke customer service were evaluated.</p>

	DNO interactions. This ensured that panellists had the level of knowledge required to participate in the following two sessions		
Content	Each group was educated about the role of a DNO, how Electricity North West communicates with customers, good communication practices adopted in other industries and future scenarios for monitoring and managing electricity consumption in homes or small business premises.	Initial discussions focussed on general customer service needs and expectations. Discussions then turned to expectations around direct contact with a DNO via recognised platforms and conceptually, via a smart hub, to demonstrate how new communications platforms and methods of interaction are evolving. These discussions explored how innovations in technology are changing the way that customers interact with organisations. The group debated concerns over data sharing issues (for example concerning usage of data collected by smart devices). Finally, panellists were introduced to customer contact scenarios to contextualise the customer service prototypes to be discussed in the third meeting.	An evaluation of enhancements to existing communication technologies. Introduction to three bespoke customer service solutions, designed according to feedback from the first two meetings and from the previous project phase (primarily the literature review and engagement with Electricity North West employees). Customers were asked to indicate the acceptability and appeal of the three prototypes outlined. Feedback was also sought on which customer segments would benefit most from each solution.
Reporting	Section 2	Section 2 and 3	Section 4

Six supplementary, in-depth, one-to-one interviews were conducted with representatives of the following customer segments:

- Vulnerable customers – four interviews
- Customers who have adopted “smart home” devices (eg Hive, Google Homes etc) – two interviews.

A “mini ECP group”, comprising four customers who had recently experienced a new connection (two domestic and two SMEs), was also convened for a single session.

A condensed discussion guide was produced for the in-depth interviews and mini ECP group, covering the key topics outlined in Figure 2.1 in a shorter format and more bespoke to the specific need of the customers taking part in these sessions.

2.1 What does great customer service look like?

Some common themes emerged when customers were asked what qualifies as “good” customer service, with examples provided from a range of industry sectors.

The primary expectation for many customers was that organisations must make it **easy** to interact with them. Amazon was regularly cited as a company that does this well. Customers valued being able to access the information they need quickly and easily. Manchester’s tram system was also given as a good example and commended for the ease of purchasing a ticket, the ability to plan a journey and being able to identify when the next tram is due. Online banking was also considered to be a good example of easy customer interaction – panellists appreciated, and now expected that by entering a secure password, they could obtain full access to their account and banking services 24-7.

Panellists placed a high value on the end to end customer journey and expected the **quick** and efficient resolution of any query or problem. Customers generally wanted personal contact with someone who can help. Vulnerable customers especially highlighted the distress that could be caused if they were kept waiting on the end of the phone or had to negotiate IVR options.

“Especially for me, because I’ve got a few different mental health problems, and after a while I’ll start to get a bit – we get to shouty mode. Then from shouty mode we get to upset mode, and from upset mode we get to crying mode. Then from crying mode it’s switching the phone off. So I find it quite difficult.” Vulnerable customer

There was also an expectation that organisations should invest sufficiently in their staff to ensure that issues are resolved ideally at the **first contact**. This was considered a prerequisite in situations such as retail, where a consistently positive experience is essential for customer loyalty and retention.

“Monster Earphones. Basically, they broke and just stopped working in one ear. So, I emailed the company and within an hour or so, they responded saying, ‘Send it to this address. We’ll cover the postage fees.’ And they sent it back within a week, which I thought was very quick considering it needed to be posted to Europe as well. So, I was very pleased at how fast and efficient it was.” Millennial

The panel recognised that on occasion, a complex situation means that a quick resolution is not possible; however in these circumstances, **good** communication and realistic expectations were identified as crucial. Customers expected accurate and regular updates throughout the process.

The panel also stated that they ideally wanted one **consistent point of contact**, who is familiar with their issue and their relationship with the company. When this is not possible, they expected that any agent with whom they needed to interact would have full access to their history or account details. They found having to speak to multiple contacts and repeating the same details frustrating.

“Because a lot of the time I think with customer service you quite often get passed to different departments or to different people, and if it’s a long story you end up having to repeat yourself over and over again. In the end you just think, I can’t be bothered anymore.” Rural domestic

There was a general expectation that companies should be able to access relevant details about the customer once they have initially provided identifying information. This expectation applied to a range of sectors, from the retail sector to mobile services providers; however it was recognised that this should include security questions and passwords where personal or sensitive data might be compromised.

“I got a washing machine the other week from AO ... I had to ring him and he had all my details. I didn’t have to give an order number; he just must’ve known from my phone number that it was me doing it.” Urban domestic

Such **personalisation** was positively received. Customers are impressed when companies recognise them from previous interactions and use this information to provide a superior and tailored service.

The panel's perception of good service was underpinned by the quality of their interactions with 'front line' staff and they firmly believed that the attitude and demeanour of customer service agents influences customers' perceptions of the company. They stated that agents should be knowledgeable, friendly, helpful, sympathetic and empathetic for the customer to have confidence in their dealing with the organisation. They also believed that it was important that any promised actions were followed up and delivered. A number of examples were given of staff going out of their way to help customers that set the company apart from others.

A range of different contact channels should be made available so customers can select their preferred method or the most convenient channel for them at the time.

"Phone is probably my last resort. I think mainly because having a young baby and stuff, it's hard when they're asleep and you then need to make a phone call. Whereas if I can sit and go on a live chat or something, I find that's a really easy way to communicate with a company." Tech adopter, domestic

Customers valued receiving the same service, regardless of channel. There was general acceptance, across all age groups, of new technology such as 'online chat' to provide customer service, provided it was well executed. For example, a retailer offered customers video footage of the customer service agent responding to their online chat query.

Finally, if companies have made an error, there was a minimum expectation that this should be acknowledged, an **apology** made and compensation and/or reimbursement processes should be seamless.

2.2 Energy Use

Prior to the first meeting customers were asked to consciously consider their electricity use and keep a diary, documenting how they would feel if electricity was not available for the activities they recorded had.

This task was intended to demonstrate our reliance on the electricity supply and simulate how customers might react during a supply interruption, especially for those who had no recent experience of a power cut. In each group approximately half the participants had experienced a supply interruption, either planned or unplanned, in the previous three years.

Having given mindful attention to their electricity usage, panellists were all surprised by how frequently they relied on power and the implications of a loss of supply.

"I get up with a digital alarm clock, and sometimes actually it does happen when there's a power outage or whatever, and then you see the clock obviously has gone off and it's flashing, which means your alarm doesn't go off. You don't know what time it is, and you don't get up and you're late for work." SME

"I was quite surprised how many times I put the kettle on." Urban domestic

The need for Wi-Fi connectivity and the ability to charge mobile phones was consistently referenced. Although customers did not always initially consider the implications of a loss of supply on smart devices, when prompted they were very concerned about the loss of supply if they could not charge their phones or access the internet.

"It's like if my Wi-Fi went off, I'd just be sat there." Urban domestic

"Mine was plugging my phone in. You don't realise until you start writing it then, do you, how much you use it." SME

Appliances such as the fridge-freezer were often overlooked as panellists generally took such familiar appliances for granted; however, when prompted, there was consensus that the loss of refrigerator and freezer contents would be one of the largest financial impacts arising from a lengthy supply interruption.

“In the past we’ve had a power cut and you just lose your whole freezer. You lose everything, it smells, it’s disgusting ... It costs a fortune as well to replace.” Urban domestic

The rural domestic group tended to be far more resilient than the urban and millennial groups, largely because of exposure to power cuts and experience; this was particularly the case in terms of cooking and heating. Those not connected to the gas network, in particular, typically kept a camping stove and other equipment as a contingency for power cuts. However, some mentioned that the loss of electricity could have more far reaching effects. In some instances, rural customers with no mains water supply reported being unable to access water during a supply interruption because electric water pumps are affected. A further concern for this group was that in some rural areas mobile phones rely on a Wi-Fi connection and the loss of supply makes it impossible to use even fully charged phones.

“I was on a little camping... because I’m all electric as well and I had a little camp stove.” Rural domestic

“Because we’re rural and we don’t have mains water even, if the electricity goes off we don’t have any water even.” Rural domestic

The SME group was concerned about the potential loss of revenue arising from Wi-Fi being unavailable. This would result in being unable to access email or the large amount of data that is now stored in the Cloud rather than on a local server.

“It’s when you get to work you’ve got the problem. Because like everything that we do is based on the Cloud. Pretty much all our orders, everything that’s going out.” SME

“Your email goes as well. So, anything like that, especially in the work environment.” SME

2.3 Contact with Electricity North West

In general terms, the two most common situations in which customers contact a DNO are directly or indirectly associated with supply interruptions or when they require a new electricity connection or alterations to an existing connection.

Not all panellists had been in contact with Electricity North West. Among the urban domestic group especially there had been minimal previous contact, largely because the majority had little experience of outages.

Panellists who had previously contacted Electricity North West described their experience. Those panellists who had not previously contacted Electricity North West were educated about the most common contact scenarios. They were then asked to think about how they would prefer or expect to contact the DNO and what information they would need to receive.

2.3.1 Supply interruptions

The rural domestic and millennial groups met in Lancaster where, in recent years, extreme weather conditions and flooding resulted in long supply interruptions. Many of these customers had interacted with Electricity North West as result.

Panellists who had not experienced a supply interruption (most prevalent in the urban domestic group and SME group) were educated on the difference between unplanned supply interruptions that occur, without warning, often from faults, which are beyond the control of the DNO; and planned outages for essential works.

Panellists agreed that Electricity North West had a responsibility to communicate accurate information about an interruption quickly to the affected audience.

Online channels were the preferred platform for most panellists; however, this response was in a hypothetically context, where panel members had no actual experience of an outage. Many said that their first reaction in a power cut would probably be to look on the Internet or on social media channels such as Twitter.

“Look on my mobile and say ‘power cut North West what do I do?’ When it comes up you’d press a button.” Urban domestic

Most of the millennials in the group reported that they would use social media to provide reassurance that Electricity North West was aware of the problem and to establish when power was expected to be restored.

“I’d probably contact them on social media. My first thought would probably be call them, but if suddenly everyone’s power has gone out then I imagine a lot of people would be calling them. They might be rammed on the phones.” Millennial

“If they’re aware of it they post it on there. So it saves you time because if they’ve already said that they’re aware of it, you don’t need to really do anything.” Millennial

Some customers said that they would find it useful to be directed to a service or webpage where they could find out more information and advice on what to do during the supply interruption.

Social media was indeed the primary contact channel used by millennials in Lancaster who had experienced long supply interruptions, with customers surprised but pleased with the speed of response. This group appreciated receiving updates on social media from Electricity North West, for example, about where hot food trucks were and when generators were to be expected. This kept customers informed and reduced the volume of direct contact. Push notifications were further disseminated by Lancaster University, which retweeted the updates.

“They brought generators to the most important places. The university and the hospital. So I think it was okay on campus.” Millennial

“I messaged them on Twitter when the floods were happening, because I live outside of the city centre, so it’s a bit more rural. So we had no phone signal or anything, so it was the only way I could get hold of them to find out what was happening.” Millennial

Many customers (including some millennials) would ideally like to speak directly to an agent via telephone. There was an appreciation that there could be long waiting times if a large area was affected and customers acknowledged that being able to listen to a recorded telephone message, acknowledging the areas affected, was adequate, providing the message explained the reason for the interruption, how it was expected to last and it was regularly updated. Customers would Google the number to call and expected it to be easy to find. Some older customers said they would look in the phone book.

Customers in vulnerable circumstances said they would appreciate a proactive telephone call in the event of an unplanned interruption as other channels may be complex for them to access. One participant was visually impaired and therefore found social media of limited use. One vulnerable customer suggested that a van with a tannoy travelling around the affected area would be a good way to proactively communicate information, especially given that Electricity North West would be unlikely to have access to all customers’ contact details.

“I wouldn’t mind hearing that through an automated response because then if I know that they’re aware of it and they say it’s going to take an hour or two to sort out or a day or however long it is then there’s not much more I as a customer, can do about it. So you have confidence they’re doing something about it.” Millennial

“I’d be happy once you know that there’s somebody on the case and they’re doing it, you just let them do their job.” Urban domestic

During a supply interruption, all groups considered that the most useful piece of information would be when the power would be restored, with prompt updates if this changed. This would allow them to plan effectively and would reassure them that Electricity North West was working on restoring the power. There should be multiple ways for customers to find this information, including social media, the website, an automated telephone message, local radio and speaking to a call agent.

“How long it's going to be, then if it's going to be more than a couple of hours, if there's anything that you need to particularly do.” Millennial

The majority of the rural group reported difficulties in making telephone contact with Electricity North West during a supply interruption. There was an appreciation that, during major incidents, the DNO would be challenged by large volumes of telephone traffic; however, it was also recognised that multiple and wider reaching reasons compound communication difficulties. Some panellists do not have a reliable phone signal; and a number recognised that cordless phones, connected to their landline, would not operate during a power cut. The rural panel reported that an increasing number of the rural community have switched Internet and telephone services to specialist rural providers, such as B4RN but reported that these services do not work during supply interruptions, meaning these customers also lose access to online communication channels. For these reasons, the rural group tended to rely on local radio for updates, particularly during large scale outages, although others reported going to considerable lengths to contact Electricity North West for information.

“When the power went off that was it and the only way I could speak to anybody was by getting in the car, driving towards the signal area and then actually trying to [call].” Rural domestic

In the rural group it was noted that communication is difficult during a supply interruption due to their location, so they could not use the Internet to contact Electricity North West and that some would find it difficult to ring the company. Those who had a signal would be happy with an automated message as discussed above, but radio remained the most reliable method of contact for the most isolated.

“I found The Bay radio extremely useful. They were keeping me updated on what was happening and they were passing messages that were actually coming from Electricity North West.” Rural domestic

Some SME panellists had experienced supply interruptions at their place of work, both planned and unplanned. While generally, these were reported as disruptive for the respective organisations, the panel reported that they had found it easy to contact Electricity North West and there was a recognition that these events did not occur frequently. They were also impressed by how quickly they were updated about the situation and considered that this helped them to minimise disruption.

“They generally get in touch quite quickly, but it's obviously from our point of view they just need to narrow it down in terms of what the fault is, and they give you an update pretty quickly.” SME

SME customers mentioned that they were frequently advised to go to the website for updates during the supply interruption but could not do so because their Wi-Fi was down.

In the instance of a planned supply interruption, customers' preferred notification method was to receive a text message alert beforehand. Some of the panellists who had experienced a planned supply interruption recalled receiving advanced notification of when and why their supply was being switched off. One SME customer reported being sent a text message about an upcoming supply interruption; however he felt that this was inadequate as his business was operated across multiple sites and he needed additional location information, to identify which site was affected.

“They very kindly sent me a text; ‘Oh, your power's going to be down.’ What they don't do is say which site it is. We might have thirty, forty sites.” SME

2.3.2 New connections

The majority of customers requiring a new connection would not have gone through the process before and, therefore, would want a lot more information from Electricity North West than they would during a supply interruption.

A phone call was seen as the ideal point of initial contact for many, as they felt that they were likely to have a lot of questions they would like to ask an agent. By speaking to someone they could also be reassured that they had contacted the correct department for their situation. Customers expected to be told on initial contact what information they needed to give Electricity North West for the connection process.

"It's beneficial to actually speak to somebody on the line because I think a lot of the time it can be quite confusing on the website with the information that they're giving. And a human being will say to you, right, if you go to here, fill out this form, this will happen." Rural domestic

"I'd expect someone to be saying to me or guiding me through, 'Right, you need to provide us with this, this and this.'" SME

"I'd have too many questions like what's it going to cost, where are they going to put it, when are they going to put it there?" Urban domestic

Following this call, customers would expect an email confirming all of the relevant information. This would enable them to take their time to digest it, to understand what they need to do and what to expect at each stage of the process. This would also demonstrate that the details had been recorded to ensure that they were not forgotten, indicating the commitment made by Electricity North West.

"And once they've told you what they're going to be doing and the timescale, I'd like them to then get that confirmed in an email." SME

While a phone call is the preferred option for most, it is less convenient if it can only be made during business hours as many cannot make or receive long calls during the day. In this instance, customers suggested a live chat with an agent would be acceptable. This was also considered to be potentially quicker than going through many options on an interactive voice response (IVR) system and being kept on hold.

"You can do that at night time outside of business hours as well, can't you?" Rural domestic

Some customers would prefer to make their initial connection enquiry by email, though.

"I'm probably more on the email initially side. Over email go I'm thinking of doing this. What are the details? Can you tell me a bit about it so that I've got it all written down?" Millennial

There was a mix of views on how much detail customers might want about new connections. SME and domestic customers may want different levels. It was widely accepted that there should be pages on the website that have Frequently asked questions (FAQs), information on each step of the process and, if possible, an introductory video. This would allow customers to access the granularity of detail they needed, at their own convenience.

"Make people's lives and experiences easier. Some people are not technical, so they just want to know the basics." Rural domestic

"I quite like it when websites have little how-to guides and have the initial information." Millennial

"I'd want regular updates and to know who was dealing with it, what the expected timeframes was going to be. I'd want to be as involved in it as possible." SME

From the start of the process customers wanted to know what information they needed to provide, how much it would cost, what they needed to do in preparation, whether the power would be off and, if so, for how long.

“When we were having our meter moved, basically we wanted to know what the process was, what form do we need to complete, who do we send it to, how much is it going to cost, how long is it going to take and when can we expect somebody.” Rural domestic

During a connection, customers wanted to be kept up to date with the status of their connection and any appointments. A live tracker, similar to those used for parcel deliveries, would be appreciated so that customers did not have to wait in all day for short appointments. Some customers would also like text updates, as they felt they were less likely to miss these than they might a phone call. If all the information was sent to them, or was available on an online portal, then they anticipated that they would probably not call after the initial contact.

“All you would need is a quick link on an order confirmation; ‘This is a link to your order.’ It takes you wherever you need to go.” SME

“Sometimes I check my texts more often than I do with phone calls. I sometimes miss them. So the NHS have got them or local other organisations remind you of things.” Millennial

“I think the text would be especially good if it got to people coming round to do works that you knew that you were expecting to have somebody coming round doing it.” Millennial

SME customers who had gone through the connection process felt that obtaining a quote was very easy, but that there was a long wait between their acceptance of the quote and installation. They also stated appointments were frequently missed. Some connection customers mentioned they were aware that site works were conducted by contractors, rather than Electricity North West’s own staff. These panellists stated that any ‘contractor related’ issues arising during the connection process could reflect on, and lead to disappointment with the DNO.

In one case a construction customer appreciated having a named account manager at Electricity North West whom they could contact directly when necessary.

“We’ve got a guy that we ring direct and he comes out and sorts it out straight away for us usually.” SME

Customers in the new connections mini group had more and repeated contact with Electricity North West due to the nature of the work. Some of the SME customers in the group had navigated the connections process multiple times.

“I have a few sites where we’re making applications constantly because they’re always changing.” Connections customer

This repeated contact led to a more personal and tailored communication, which the customers appreciated.

“They tend to actually ring me on my mobile rather than the correspondence route they may do with somebody else.” Connections customer

2.4 Attitudes to technology

Panellists were educated about the rapid changes that have occurred in the technology sector in recent years and how these changes are being embedded in the energy sector. Panellists were encouraged to articulate their views of the positives and negatives aspects of different types of technology and consider the future impact of these technologies on their lives and society as a whole.

2.4.1 Confidence in technology

Panellists were asked disclose how “tech savvy” they considered themselves to be on a 10-point scale (where 1 was essentially a technophobe and 10 was extremely tech savvy). In the case of SME customers, they assessed themselves both as individuals and from the perspective of their respective organisations.

The majority of customers rated themselves as relatively attune to technology, in the top half of the scale; although there was some variation both between the groups and within each group. Contrary to expectations, millennials rated themselves most harshly, with the majority being a 6 or 7. The reason was not explored in detail but may be due to this group generally undervaluing their appreciation of technology, which is ubiquitous, and a greater awareness of the capabilities of technology.

"I'd probably give myself about a five out of ten, middle of the road, average. I don't really like adopting new things, but I will do if it's going to make my life easier." Urban domestic

"I live with four other students in town and I'm probably about a four on the tech savvy. There's a lot of stuff I just never needed to use, so I've never thought about trying." Millennial domestic

In the SME group, customers rated themselves as less tech savvy than their companies; however, this was dependent on the organisation type.

"I'm an operations manager for an IT company. I'd score them at nine, and myself at seven." SME

2.4.2 Low carbon technologies

The groups were asked to think about what they deemed LCTs to be, whether they had any or saw themselves adopting any. Those who did not see themselves adopting any of these technologies were asked what would persuade them to do so. It was emphasised that they should answer in terms of LCTs as a whole and not about individual technologies.

Customers in all groups identified examples of LCTs: solar panels, wind farms, heat pumps, electric and hybrid cars, and tidal power.

Adoption of LCTs was low across the groups: a few customers had solar panels; one SME was installing a wind farm; and one rural customer had a heat pump. On the whole, Government initiatives were used to subsidise or pay for the LCT used by the panellists. There was some debate about the degree of money saving resulting from the technologies, with some arguing that they saved a lot in the long run, while others had not noticed a change in their bills.

"People won't do it purely for the environmental, it's got to be money in their pocket." Urban domestic

"I have solar panels. I didn't get the grant, but I got the high return tariff feed just before that was capped. So it made sense during the day." Rural domestic

"I've got an electricity heat pump and it's an amazing bit of tech and I'm told it's less electricity for more heat and it works out a bit cheaper than oil or gas and all that kind of stuff." Urban domestic

Some customers stated that they would like to have solar panels but were unable to due to the orientation of their properties or being in a conservation area, which was a source of frustration.

"We wanted to have solar panels and we rang up..., but we were told that the house has to be positioned in a certain way. We were facing the wrong way and we couldn't have it and we were quite frustrated at that." Urban domestic

The most common positives of LCT were:

- ✓ Environmentally friendly (ozone layer/cleaner air)
- ✓ Cost saving (in the long run)
- ✓ Tax benefits.

The negatives were:

- X Environmental issues with disposing of batteries
- X Being an eyesore
- X The potential short lifespan of these technologies
- X High upfront costs
- X Infrastructure for charging EVs is currently sparse
- X Noise from wind turbines.

2.4.3 Battery storage

Customers were introduced to information on battery storage and its anticipated future role in green energy.

The most common positives of battery storage were:

- ✓ Necessary for making green energy production more efficient
- ✓ Less wasted energy
- ✓ Convenience for charging EVs at home
- ✓ Back-up during a supply interruption, leading to less disruption
- ✓ Cost savings.

The negatives were:

- X Possible health and safety issues with fire risks
- X Concerns over battery life reducing over time and longevity
- X Maintenance costs and inconvenience
- X Disposal of batteries
- X Sourcing sufficient quantities of lithium and other resources
- X Cost of production and buying
- X Concerns over cooling the battery.

2.4.4 Smart meters

There were mixed sentiments among those who had a smart meter installed. Of the participants who had a smart meter, the majority reported that when it was initially installed, they tended to monitor their consumption patterns and, in many cases made some short term changes in their behaviour to improve their energy efficiency and reduce usage, with the aim of lowering electricity bills. The majority reported that these adjustments were short-lived and when individual became accustomed to the smart meter, they checked less frequently and consequently it no longer influenced their electricity usage habits.

“Sometimes it can make you conscious, you go and turn off lights. Generally, I don’t look at it too much, but there’s that odd occasion when you do look at it and notice it.” Urban domestic

“When I first got it, I was obsessed with the thing, and it was doing my head in, and I had to keep moving it just to stop looking at it.” SME

Panellists felt that energy consumption displayed in terms of cost was much more effective than using kWh to indicate energy use as cost made them more conscious of the energy they were using and increased their awareness of what their bill was likely to be.

“It’s obviously a positive to know where you can save money. You have the choice whether you want to do it or not because you’re aware of how much you are spending.” Millennial

“Think it’s a good idea because it’s basically just a condensed overview that’s easy for you to understand.” Millennial

Some customers reported issues with their smart meters, for example meters not showing any data, while other customers had swapped suppliers and therefore needed a new one. Rural customers also had experienced difficulties with inaccurate readings due to a poor Wi-Fi signal.

“They’re changing. Every twelve months they bring a new one out. Is this the same thing with the smart meters? Are they going to have to replace them all the time?” Urban domestic

Customers who did not have a smart meter were all aware of them. They did not have one either because they were not eligible for one or because they were sceptical of their benefits.

Some customers were concerned about their data being available to the Government and the information about their lives that could be gleaned. There were misconceptions about the granularity of the data available to suppliers, for example, whether consumption at a total household level was collected, or whether suppliers could identify the exact appliance turned on at a particular time.

“So, if it's a meter that connects to your overall usage and can monitor how much is being used, that's quite different in a household rather than usage of each individual appliance and plug being monitored.” Millennial

“There is a Big Brother element to it. Large corporations finding out about your business and requesting your data.” Urban domestic

Other customers were less concerned about how their consumption data was used as they recognised that a large amount of data is collected about them every day from various sources. They also trust their supplier to use the data in a responsible and ethical way. All that mattered for some customers was that they knew exactly what data was being collected and that they could access it.

“I’m sure everyone in this room uses Facebook and Twitter. This happens to us on a daily basis and we’re not really aware of it. They have massive databases of our trends online and shopping habits, consumption habits and all sorts. So to me it’s just an extension of what’s already happening to us.” Millennial

There was some concern about the costs of smart meters ultimately being recouped from customers.

“Smart meters cost a lot of money and someone’s paying for them and we are paying for them through our bills. They might be installed free, but your bill goes up before because you’re paying for them.” Urban domestic

The most common positives of smart meters were:

- ✓ Increased awareness of household energy consumption
- ✓ Potential monetary savings
- ✓ Environmental benefits from wasting less energy
- ✓ Aid Electricity North West in providing a better service by understanding demand in a specific area
- ✓ Convenience from suppliers not collecting meter reading manually
- ✓ Step towards integrated technology
- ✓ More effective operation of the electricity network.

The negatives were:

- ✗ Needing a separate device for this information
- ✗ Anxiety over high energy consumption
- ✗ Concerns around data sharing with suppliers
- ✗ Being tied to one supplier
- ✗ New iterations making current smart meters “dumb”
- ✗ Higher bills to pay for the rollout
- ✗ Reliance on strong Wi-Fi signal.

2.4.5 Distribution system operators

Participants were educated on the change of DNOs to distribution system operators (DSOs) and what this would entail. They were asked to evaluate the potential advantages and disadvantages of this model.

The most common positives of DSOs were:

- ✓ Receiving incentives for giving energy back to the grid
- ✓ Producing and using energy more efficiently
- ✓ Benefits to the environment
- ✓ More integrated data
- ✓ Lower bills
- ✓ More control over energy consumption.

The negatives were:

- ✗ More elements that could go wrong
- ✗ A concern around control over their energy demand, for instance, energy being rationed if demand outstrips supply or if a particular household is using “more than their fair share”.

2.4.6 The connected house

An ‘Amazon Echo Show’ smart home hub/assistant was introduced to the group as an example of how smart technology is already being used in many homes and businesses. The majority of the panel had not yet adopted an ‘Alexa-enabled’ device or one of its competitors and this session allowed participants to interact with it to contextualise potential capabilities, and how this technology might be harnessed to provide enhanced levels of customer service.

There was good awareness of the existence of technologies such as Alexa, Hive and Google Home. Most the panel, who did not already own one of these devices, were open to purchasing one and could see the appeal in terms of making life easy. Those who already owned them used them daily to, for instance, answer questions or play music.

Other panel members reported that they would be reluctant to introduce these technologies to their home, the primary concern among these customers, irrespective of age, was lack of privacy and the implications of being “spied” on.

“I just feel like there’s someone always listening to whatever I’m saying. You couldn’t have a personal conversation just in case you say something that triggers it ... I just don’t like the idea that somebody else could be listening in.”
Urban domestic

“It weirs me out that they’re essentially sitting there listening all the time. I’m not technophobic but generally averse to that kind of technology. There’s some data I don’t mind sharing and then, I don’t know, the feeling of having a little computer listening to you all the time is a bit too far for me.” Millennial

Others felt smart technology could encourage “laziness”, with devices and technology doing tasks that could, and should, be done by people.

Some participants reacted positively to interacting with the device. Others became frustrated if it did not “understand” exactly what was being asked of it. They felt it was “gimmicky” or were concerned that it was “listening in”.

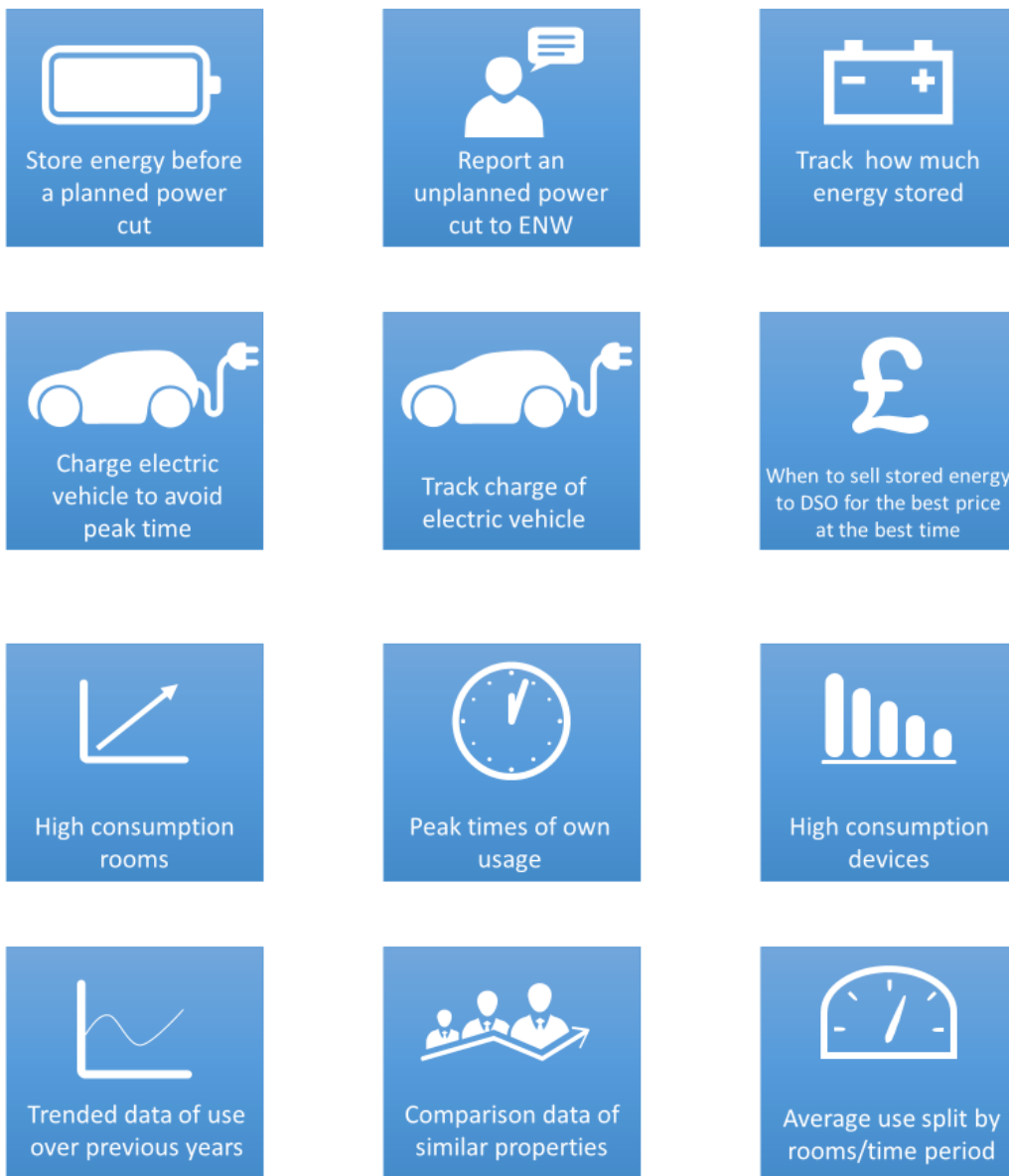
“Why do you want something prying on you all the time, listening to everything, watching you? I feel like that’s watching me right now.” Urban domestic

2.5 How could Electricity North West use smart technology?

As most customers do not currently interact regularly with their DNO, the panel was dubious about how frequently they would use smart technology such as the Amazon Echo for the specific purpose of interacting with Electricity North West.

In the hypothetical context in which this issue was explored, the panel reported that they would be unlikely to acquire a device specifically associated with their DNO, they did however perceive some potential benefits in smart technology being integrated with “interconnected” systems within the home or workplace when asked to indicate the acceptability of the various options in Figure 2.1.

Figure 2.1: Integrated smart technology options



Understanding that many of the scenario presented fall outside the DNOs current licence conditions, the panel responded positively to potential future benefits, such as real-time information; savings from energy optimisation, facilitated by flexible ‘time of use’ tariffs; advice to turn off equipment on standby. Some customers took this one

stage further and could foresee complete autonomy, where devices switching themselves off when not in use. However, they considered that relinquishing control in this way would require an “opt in” process, with customers able to set parameters for what could and could not be controlled.

In the context of a hypothetical scenario, the panel could foresee significant commercial benefits for customers from integrated smart home technologies from real-time information relating to the amount of generated or stored energy available, the household’s immediate requirements and the payment for exporting surplus energy to the grid.

Concerns were expressed about moving to a “smart home”, for example, what would happen if the single, interconnected system failed? Some considered the possibility of such systems too complex to be credible, others queried whether the ‘energy management’ elements of a ‘home hub’ would be compatible with existing systems and what this might mean for equipment that was not smart enabled:

“And if your things aren’t smart things, it could make life really difficult because you then either can’t replace your meter if you needed it to be replaced, or you have to buy a new washer, dishwasher, TV, lightbulbs ...” Millennial

2.6 Data sharing

To demonstrate how a smart grid could change customers’ energy interactions and to stimulate conversation around data sharing, in the context of smart grid development, panellists were shown the ["what is the smart grid" video](#) produced by BGE.com.

Some participants expressed the view that as the use of smart technology becomes more prevalent, increased regulation to protect customers will be introduced and had confidence that their data would be used appropriately; however, they expected clear and transparent information about what the data would be used for.

Others speculated that people may start to reject some technologies. For example, millennials mentioned that some of their peers had stopped using Facebook because of recent concerns about its data sharing practices.

In terms of sharing data with a DNO, participants could see some benefits. Exploration of hypothetical concepts such as notifications that could alert customers to potential savings by delaying usage to off-peak times were positively received. Customers deemed the ability to see granular energy usage information by individual devices or on a room by room level, at particular times useful (though most would not want this to be shared with a DNO at this level of detail), particularly if this could be viewed and controlled remotely via an app.

2.6.1 Concerns about data sharing

A range of education material were shared with the panel to ensure they had a general understanding of restrictions around the use of smart meter data, data privacy and security principles, and regulatory considerations. These materials explained that a limited amount of aggregated smart meter data is available to DNOs and the rules about how this information is used and shared is likely to evolve in the future, to help DNOs better manage their networks, balance supply with demand and more efficiently respond to faults.

Smart meter data was distinguished from the detailed information about smart appliances that can be monitored, managed and stored by other ‘cloud based’ technologies and which could, theoretically be harnessed by energy companies to provide home energy optimisation and customer serving solutions for in the future.

The distinction about smart meter data and detailed cloud based data (which, in theory could be voluntarily shared by customers in the future) was explained in some detail; generally panellists struggled in separating these potential data sources.

Exploration about the acceptability of data sharing was framed in a hypothetical context and it was explained that there are stringent rules and restrictions relating to the DNO’s remit and licence conditions. However, questioning focussed on evolution of the ‘smart grid’ and the transition from DNO to DSO, with the idea that this could

theoretically introduce new commercial opportunities for customers in the future, but would require significant regulatory changes. Working in small groups, participants listed their concerns about sharing data with DNOs and other energy organisations.

Security was a significant issue for both domestic and SME customers of all ages. Panellists were concerned about the potential for others to gain access to their data and, for example, use it to identify when they were out or on holiday. The panel also worried that sensitive information (such as bank details) could be at risk. Panellists' believed that any reassurances that their data is stored securely would be of limited value as they perceived that hackers are always one step ahead so could find a way to access the data.

"Who can get hold of that information and where will they store it? Obviously, there's going to be a lot of information because it's from every single person. How long do they store it for? How much information is taken? Is it every single appliance that you use or is it just a daily average of how much you use?" Millennial

Customers were also concerned about potential lack of privacy if the level of data shared is very **granular**. In particular, they questioned whether DNOs really need access to overall consumption data or patterns, at the individual house, Most failed to see any need for DNOs to have sight of cloud base data at 'smart appliance' level.

"Do they need to know your name and your house? Can they not just look at the street and say, across that, this is the net demand that we need?" Urban domestic

In general, customers lacked **trust** in companies and had concerns their data could be used for profiling or would be passed on to other organisations for marketing purposes.

"We talked about advertisements; obviously like just bombarding you with stuff because they know what you're doing." SME

Customers also worried that they could be **penalised** if they were using energy inefficiently, or that "limits" and quotas could be imposed on individual energy use. Likewise, concerns were raised about mandatory introduction of **time-of-use tariffs** to deter/restrict usage at peak times or the introduction of thresholds, with higher charges levied on higher usage customers.

"Will it be used to control how much I use and what I use it for? This is a personal thing ... I just don't like the Government having too much control over me." Rural domestic

"The electric police; visions of somebody knocking on your door saying you're using too much electricity. Whether electricity will one day end up being rationed through this sort of thing." Rural domestic

Some participants queried the fairness of time-of-use tariffs and the concept of higher charges for using energy at peak times. Some considered that this could have negative consequences on day-to-day life and penalise those who were unable to flexibly consume energy when network conditions are more favourable, for example, for customer who may have no option than to charge an EV, within a short window, during times of peak demand.

"If that's going to mean we're always going to pay more for electricity when we need it, then that's not good." Millennial

Other customers effectively embraced the concept of flexible, off-peak/time-of-day tariffs stating that they would expect to be rewarded for changing their behaviour, for example, benefiting from cost savings for charging an EV in the middle of the night.

2.6.2 How to alleviate data sharing concerns

Some panellists suggested that **increased regulation** could help alleviate their concerns and would enable more trust in energy companies. Participants mentioned that they are happy to pass details to their bank due to higher levels of trust in that type of organisation and the presence of financial regulations.

The panel also considered that they should have **control** over how their data is used and have the ability to opt in to sharing data. They believed that they should be informed about how their data would be used and who it would be shared with, the panel also felt strongly that data should only be shared with explicit consent. They also thought that it should also be easy to identify where companies have received customer details from, with a clear “map” that is disclosed to customers on request.

“Is there an option for how much they can get from you? And then can you opt out of sharing your data once you’ve had it installed? And what companies is the data going to be shared with? That needs to be clear.” Millennial

The panel had a reasonable awareness of Data Protection legislation and had an expectation that they should easily be able to access the data companies hold about them.

The general consensus was that collecting **aggregated data**, rather than individual property level data, would also provide reassurance about data security. On the whole, the panel expressed reluctance for DNOs to have detailed granular level data relating to the use of specific appliances, they were more open to sharing high-level total household consumption data, but the preference was that data transfer should be restricted and aggregated at street or feeder level.

However the panel did recognise the value of data to the DNO and how access to this information could be harnessed to improve service and the overall customer experience. As such they considered that companies in the electricity industry should promote the benefits of using data captured from smart meters, for example, the ability to respond more quickly to a supply interruption.

However, there were different views about being offered cost savings in return for allowing DNOs to access their data, with some considering this was akin to bribery.

Offering cost savings was generally more acceptable if phrased in terms of general savings that could occur if DNOs were able to manage the network more efficiently by using shared consumption.

3 Future communication with DNO’s

Towards the end of the second meeting, panellists were asked to consider how they felt interactions with a DNO would change in the future, contextualised to the next 10 years or so. Several scenarios illustrating typical households or businesses in 2028 were introduced to the ECP to provide a context for the customer service prototypes to be discussed at the next meeting. These scenarios involved buildings fitted with an interconnected energy device system, including battery storage and a hub to provide enhanced information about energy consumption. During the third meeting, information was provided on potential enhancements to current methods of communicating with a DNO, and the merits of these were debated.

3.1 Changes in interaction with DNOs

It was widely anticipated that automation will increase, although what this would “look like” was not always fully understood. Automation was expected to result in fewer occasions when customers needed to contact their DNO, for example, the panellist had an expectation that smart meters were likely to automatically report supply interruptions, removing the need for customers to contact Electricity North West directly. However, panellists considered that greater automation would result in less staff and as a consequence, it would be more difficult to get through to a contact centre agent to discuss concerns directly. They expected DNOs would use automation to push useful information to customers.

“You would want them to tell you rather than you sort of contacting them, you know suppliers, how you can reduce your bills. You would want it automatically to tell you how to reduce your usage.” SME

“I think we’re looking a long way into the future where this level of automation is actually going to happen. What are you going to have that’s automated, because your washing machine you still need to put your clothes and washing powder in it, because it isn’t going to do that for you.” Urban domestic

When customers did contact a DNO, there was an expectation that communication might involve video conferencing elements such as Skype or facetime rather than just a phone call. The expectation was that contact in the future might increasingly be made via an automated virtual assistant such as an Amazon Alexa or similar technology.

“I think you’re going to find that everything is going to talk to everything, innit?” Rural domestic

Customers also expect that advancements in smart meter technologies could eventually allow DNOs to provide messages and updates via the meter ie, warnings about planned supply interruptions.

3.2 Potential enhancements to current methods of communicating with a DNO

Participants were asked to debate potential enhancements to current methods of communicating with a DNO, with reference to specific examples from other industry sectors.

3.2.1 Appointment tracking and selecting

Most participants were familiar with and had used apps to monitor parcel deliveries from companies such as DPD or Amazon Prime, or to track taxis through firms such as Uber. Both domestic and SME customers appreciated the reassurance such tracking information provided and the way it helped them use their time more efficiently.

Participants were positive on the whole about the idea of being able to track an Electricity North West engineer for an unplanned supply interruption, a connection or for non-emergency work. Generally, only top-level information was needed, such as when the engineer had been despatched, had arrived and had completed the job, with an option to access more information if required.

“(Good) for time management. Especially if we’re on site and we’ve got quite a lot going on and I need to be at one particular area or another, if you know exactly how long it’s going to be and you can see them coming, you can make arrangements.” SME

However, a minority felt engineer tracking was intrusive and a little “Big Brother”. Others felt sympathy towards the person being tracked (for example, the driver or engineer), as it might add extra pressure to their working day.

“And also, from the work person’s point of view, knowing that they’re being tracked night and day by all their clients could make work quite a difficult, paranoid situation as well.” Rural domestic

The ability to schedule an appointment online was appealing, however, customers considered that it was then important to communicate easily with Electricity North West on the day of the planned engineer visit, for example, to inform them if they had to leave their home for a short period. Some participants were open to the idea of paying more for a narrower appointment slot, as currently occurs in the grocery sector.

SME customers were aware that a planned engineer visit may need to be postponed in the event of an emergency but emphasised that in this situation it was crucial that the change was quickly communicated to customers.

3.2.2 Automated guaranteed standards payments

Panellists were reminded of the guaranteed standards scheme, which requires energy companies to meet minimum service levels and to compensate customers if they fail to do so. Customers were asked to give feedback on a future scenario where automatic payment would be made if there was a failure to meet the guaranteed standards:

Electricity North West has to meet certain standards of service. For example, customers are entitled to a payment if they have had a power cut that lasts longer than 12 hours in certain circumstances.

If you think that Electricity North West has failed to meet a guaranteed standard of service, you can contact them using traditional methods or complete and submit an online form. A team will investigate and if you qualify they will send you a payment.

In the future, fully integrated autonomous (robotic) systems will be able to identify failures in standard and instantaneously make an automatic payment without any need for a claim, where they have the customers' details.

Participants were positive about the principle of receiving automated payments without the need to make a claim. Virgin Trains was cited as an organisation who already adopts this approach. An automated process was perceived by some as likely to make Electricity North West even more accountable.

Most were open to the fact that Electricity North West would need to have access to their bank accounts to facilitate this, provided stringent security processes were adopted.

“But regarding holding the information, it all goes back to security again. It’s a case of ensuring that they have a good firewall, best security systems in place, so it’s not going to get broken. It’s just like your supplier has your information.” Rural domestic

It was suggested PayPal could be a good intermediary for making safe transfers, as a trusted mechanism of facilitating payments with a good reputation. This was reassuring to some of those reluctant to allow Electricity North West access to their bank details, but others had a general lack of trust in providing financial information and would need a different approach, for example, a voucher or a credit applied to an energy bill.

The general consensus was that customers should be able to choose how they were compensated and how they should receive information to confirm when a payment had been made, for example, by email or text message.

3.2.3 Mobile applications

Mobile applications (apps) is a technology which is currently being harnessed by millions of companies across the globe, however there is not currently a specific app relating to Electricity North West for their customer base. Feedback was gathered from participants around when, if ever, an app for Electricity North West would be useful to them and what services they would expect from an app.

To provide contextual information on how Electricity North West could use this technology to enhance customer service in the future, an aircraft flight app was demonstrated (Flightradar 24). This demonstrated live flight details of aircraft in the sky at the user’s location, including plane type, flight number, route, flying speed, height and landing times. The app also allowed users to see a view from the cockpit. After interacting with the app participants were asked how useful they would find similar technology for information on road works. Most felt they would be unlikely to use such an app or program specifically for roadworks unless they were very local to them.

“Unless it’s roadworks right outside the building or right outside the house and it’s affecting parking, or there are actual issues as to why we’d want to know ... it wouldn’t be interesting.” SME

“I think unless it actually affects your property, we don’t bother. We just know that the road is shut, or we may be diverted somewhere else.” Rural domestic

However, for local roadworks that caused personal disruption, participants would be more likely to use an app than ring up Electricity North West.

“I would never bother ringing about roadworks at the bottom of a road, but I would like to know when they’ll be done, so it would be really useful.” Urban domestic

“You don’t have to be on the phone, on hold, asking someone what’s going on for half an hour.” Connection group

However, while a standalone app did not hold wide appeal, there was much greater appetite for an app with this feature integrated into it. This would increase the likelihood of downloading such an app, and also using it.

“Personally, find it a bit strange having an app on my phone just for spotting when they’re doing excavations and these kinds of things. Obviously, it’s integrated into maybe the smart meter and all that kind of stuff and it’s all centralised in one app, and I can see it making sense.” Millennial

While participants appreciated that a power cut is rare, they would expect any Electricity North West app to have a simple feature to report a power cut and also signpost any vulnerable customers to additional support and advice. Any notifications about the duration of a power cut should be kept up to date otherwise confidence in the information decreases.

There were caveats on an app from Electricity North West which need to be considered for an easy customer experience, notifications about power cuts should be relevant to them and not generic, utilising information on their current location and their home address. For commercial customers they would need to also be able to receive information about multiple sites, if applicable, to ensure that they are aware of any power cuts at a site they are not at.

“If you’re away from home and you don’t get a notification, if it’s just sending to the geographical location – say, for example, it’s ten miles and you’re fifty miles away, then you don’t know.” Commercial

The panel stated that they were unlikely to download a generic Electricity North West app; however, there was appeal for this technology in situations where customers are likely to have repeated interactions with a DNO. An app was considered to be both logical and useful by those who had experience of navigating the connections process, either for a new load or generation connection, application for additional capacity, diversions or to move the position of an electricity service/meter. In these circumstances, the panel were recognised the potential benefits for both Electricity North West and their customers.

“If you were going out to a development site and that technology was available, you’d be able to find out all the information around that site without having to actually go and ask ENW for it, wouldn’t you?” Connections group

For the connections process, participants stated that they would appreciate being able to get feedback on the site and capacity constraints etc; make payments; find out information on the next step of the process; obtain network records to safely excavate etc and to generally track the status of the connection without having to proactively contact Electricity North West.

“In most of our projects we have to go to ENW for mapping all around the site, but if that kind of information was available, similar to what you showed there or suggesting there.” Connections group

The panel indicated that there would also be an appreciation of a feature which confirmed appointments and issued reminders, and potentially enhanced features which allowed customers to track an appointed engineer, immediacy prior to a visit, to help time management during the connection process.

“If we’re on site and we’ve got quite a lot going on and I need to be at one particular area or another, if you know exactly how long it’s going to be and you can see them coming, you can make arrangements.” Commercial

Panellists reacted positively to a service that would provide EV owners with updates about local charging stations, linked to a site or a vehicle’s current GPS information such as: queues, capacity problems, service station and network faults along with recommendations for alternative charging locations.

In conclusion an app, as demonstrated (which related to roadworks), held minimal appeal but the panel suggested that they would appreciate an app from Electricity North West if it had a broader functionality, such as tracking the status of faults. However, the empirical research concluded that an app, specifically linked to the connections

process, was appealing with participants recognising opportunities this affords to ease navigation of the end-to-end connection process and deliver efficiencies in communication, information exchange and status tracking.

3.3 Smart hub/digital energy hub

Customers' views were elicited on what they thought a 'smart hub' or 'digital energy hub' of the future should do under normal conditions and during a supply interruption.

There was general consensus on the **principal information** that should be provided in such a smart hub or digital energy hub:

- Amount of energy generated.
- Amount of energy stored.
- Cost-related information, including the price for energy sold back to the grid and how much money had been saved by a customer generating their own energy.
- Whether sufficient energy was available on the grid to maintain power for all devices in the home, especially if this included an EV.
- Amount of energy used on a device level (accessible by room). Some millennials had concerns about this and may not want their parents to see how long they were spending on electronic devices.
- Push notifications when a certain threshold or barrier for energy use or expenditure was crossed. Too many notifications were considered to be counterproductive and customers considered that they would start to ignore them. However the ability to set personalised limits after which customers would receive a notification was appealing.

Other proposed features were considered "nice to have" or as optional extras, such as the ability to view consumption history over time and highlighting devices using the most energy.

Most customers also wanted the hub or device to have some control over switching on and off appliances it detected as not in use. Many could see the appeal of this being extended by the hub "learning" when to charge devices, for example, an EV. However, customers would need to be able to set the parameters for activation.

A comparison of consumption information with other households in the area had only a limited appeal. Some liked the ability to see how their use ranked in comparison to others, which could inspire a behaviour change that would have both financial (cost savings) and environmental (a desire to improve your carbon footprint) benefits. Others considered that this was invasive and would not affect their activity.

Domestic customers were sceptical that this technology would be accessible to all. They felt it would only be adopted by more affluent customer segments.

"I can't imagine a street in Oldham of terraced houses having anything like that in the slightest." Urban domestic

Some customers could see advantages to enhanced services being available to vulnerable customers, such as those who are medically dependent on an electrical device. This included, for example, an alert being sent to a designated contact of a vulnerable customer if their energy consumption changed dramatically. However, to make this acceptable, informed consent (from the vulnerable customer) and complete transparency over what information was shared (and under which circumstances) would be essential.

Vulnerable customers themselves also liked this idea, as long as appropriate data safeguarding was in place. The "correct" person may be a friend or family member, or a social worker or other professional, such as a community psychiatric nurse. For those in social or community housing, a housing officer was an alternative contact, again only with informed customer consent.

During **unplanned supply interruptions**, the most important information customers would want the device to tell them is:

- That Electricity North West is aware that there is a problem and where to go online or who to contact for more information, for example a helpline for vulnerable customers.
- When power will be restored: proactive communication and updates through “push” notifications were deemed useful; and an update confirming when power was actually restored.
- How much energy the home has in storage and any gap envisaged before mains supply is resumed.
- Advice on what can be done to conserve energy, for example, switch off the TV and listen to the radio.
- Some customers were happy for the smart hub to switch devices off in the event of a supply interruption, as long as they could specify in advance which devices to prioritise. Others wanted to switch devices off themselves – control and personalisation being very important.

For commercial customers, this could vary according to the level of reliance on electricity and amount of resilience in place, such as generators.

“Basically, you want to know there’s a fault, what is the fault, how long is the fault going to be there, is it being repaired and how long is it going to take to repair it?” Rural domestic

Generally, it was acceptable that the hub or smart device could communicate directly with the DNO to inform them of a supply interruption. Customers would like a record or audit trail as evidence that this communication had occurred. This could take the form of a notification through an app or in the hub itself, but a proposal that it could be communicated by a hologram was dismissed.

“I think that would be quite unnecessary. That would be a bit weird, a random person standing in your living room. No, I think that would be a bit weird.” Millennial

Most customers, domestic and commercial alike, did not see the need to view a live video stream of engineers working to resolve the issue.

“Wasting time. They could be fixing it while they’re trying to fly the drone.” Millennial

Being able to view a map of the area affected by a supply interruption could be beneficial, for example, to check if elderly relatives were off supply.

4 Evaluation of future customer service prototypes

Learnings from the previous groups culminated in the presentation of possible services which could be provided to customers. These services were based upon emerging technologies to demonstrate how customer service could be enhanced if these technologies are harnessed. Panellists were able to interact with three different prototypes on iPads, which had been developed to demonstrate some of the services they could theoretically provide. The prototypes’ functionality was limited but each was presented to the panel in the context of a particular narrative, which explained the services and benefits that it could potentially offer both the DNO and its customers.

Participants were asked to give feedback on these solutions in the context of future household or business scenarios, identifying the most appealing features, any concerns and any barriers to up take.

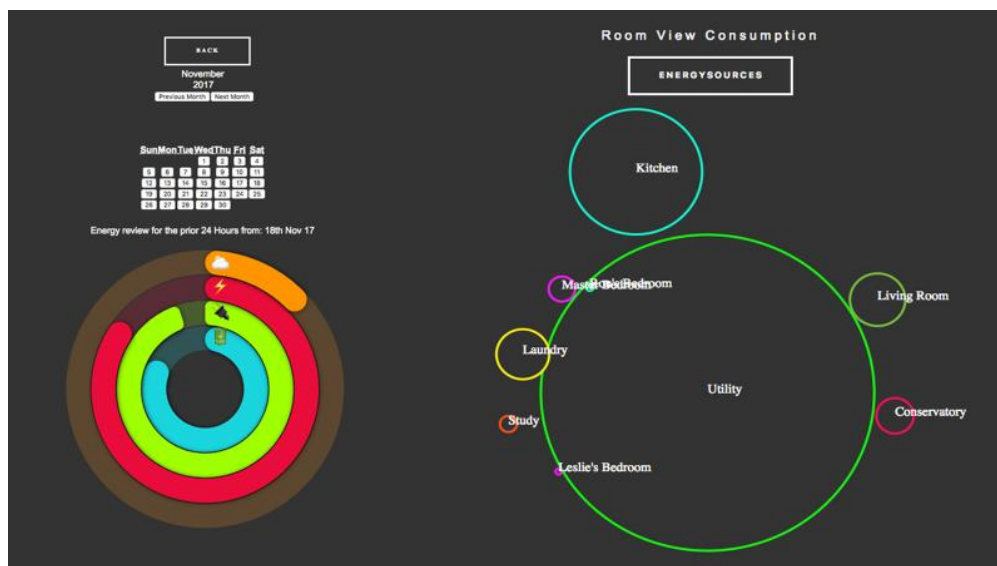
4.1 Prototype 1: smart home hub

The first prototype was introduced as the next generation of Hive or Nest technologies. It showed real time overall electricity consumption and this information could be viewed on a room by room basis, down to the individual device level. It could also distinguish the source of energy being used (ie own generation source, battery storage or from the network). The prototype enabled the panel to access historical consumption information and view usage trends.

Although this is not the type of technology that DNOs will develop themselves, the functionality of these devices is expected to evolve with advances in smart interconnected technologies. Whilst there would need to be significant changes to DNOs licence conditions to harness real-time and stored cloud based data from smart homes, the prototype was successfully able to demonstrate how access to both aggregated and granular consumption data could benefit both the network operator and its customers. Participants were reminded of the hypothetical nature of the demonstration and that they were to evaluate the prototypes on the basis that they would have control over who saw their data and how it was used.

Participants were able to interact with the smart home hub through the iPads. They could see energy consumption on a room by room basis, down to device level (see screenshots in Figure 4.1).

Figure 4.1: Smart home hub displays



4.1.1 General perceptions

The idea was generally considered appealing. Most participants liked being able to easily access how much energy they were using, the source and the associated cost.

The ability to view this information at device level was also a positive. Some panellists compared it to technology in their cars.

“I think it’s amazing and I think it’s really useful. I would say, just going back to something I was thinking about last week, it’s great knowing how much you’ve used, but sometimes psychologically, if I knew how much money I was saving against an arbitrary judgement ...” Rural domestic

“It’s similar to what you get on cars now, you know, with energy consumption, that type of thing. There’s lots of little things on, when you’re driving along in fairly modern cars, what tell you instantaneous miles per gallon and average miles per gallon.” Connections customer

Participants liked the circular depiction of consumption and felt this visual representation was easy to comprehend. They considered that they would like to access this information on their mobile phones, with push notifications about any abnormal activity to enable them to monitor their consumption behaviour.

“What I think is useful, what you can do is programme them to give you any abnormal. So, you can say, ‘Do you realise this Monday you’ve done this?’” Connections customer

Participants also liked the fact that they could see consumption information as money spent which was easier to relate to than kWh.

“I like the fact that it shows you in money, because you can talk about kilowatts and blah, blah, blah, but like with an electric car, I didn’t understand. They were like, ‘It charges at so many kilowatts per hour,’ and I was like, ‘I don’t understand.’ And then they told it to me in miles, something you can relate to, and I was like, OK, I get it.’ So, the fact that it converts to money, I think that’s a big positive.” Domestic EV owner

The ability to look at historical information and view usage trends was considered useful.

“I think it would be interesting. I’m always interested in what I use in the winter in comparison to what I use in the summer, because the bills every month are the same.” SME

However, some panellists felt the smart home hub provided too much information that would not necessarily be useful day to day. While they may use it initially, the novelty would wear off and they would stop referring to it.

“There’s too much information. It’s nice to know, but actually how often would I use it? I’d probably look at it once or twice.” Urban domestic

Others felt that knowing consumption information by device would not necessarily change their behaviour and that they would continue to use their major devices in the same way.

“You’re always going to use more on your washer, dryer and fridge, than you’re going to use charging mobile phones. But you’re not going to do less laundry and you’re not going to use your kitchen appliances less.” Urban domestic

4.1.2 Enhancements

Participants spontaneously made suggestions on how to enhance the prototype. These included changes to the visual display:

- An overall dashboard function, providing an overview of information for all devices across the whole house without the need to scroll room by room, would improve ease of use. Some felt there was too much information in the prototype, so a dashboard would be a useful summary of salient information.
- While the circular representation of consumption at a device level was positively received, adding a number (for example, 30% is being used in the utility room) would provide further context.
- Organising the display of device-level information either alphabetically or by usage, rather than the current (apparently) random order.
- Psychologically, it could be more appealing to display consumption information in relation to the amount of money saved, as opposed to money spent.

Panellists proposed that a more user-friendly interface, with a tutorial on how to use the various functions, would be helpful. The ability to seek support if needed was also requested, especially for vulnerable customers who suggested an information button or “i” symbol where they could easily access information or an online chat function to ask questions.

Members of the ECP frequently queried whether the smart home hub could switch devices off. This would be an advantage for some, while others did not like the lack of control. Those in favour suggested a “go to bed mode”, which allowed you to switch off all selected devices at the touch of a button.

The ability to view information for multiple houses on the smart hub could offer advantages. For example, millennials suggested if they could view their parents’ house it would have security benefits if their parents were away.

Participants were also asked for feedback on a number of potential enhancements. These are listed below in rank order, from most appealing to least appealing:

- ✓ The ability to set different **operating modes** on the hubs was appealing, for instance a “holiday mode”, which would activate security processes such as switching lights on when residents were away, or a “low-cost mode”, which would delay charging of specified devices until a cheaper tariff period. The ability to override these modes was desirable. There should also be a limit to the number of modes available to avoid over complicating the hub.
- ✓ **Push notifications** when you were approaching certain thresholds (financial or consumption) would, on the whole, be an advantage. It would be useful if these could provide advice on using energy, especially on how to balance usage, generation and storage more efficiently, but this could prove complex.

“Yeah, because I think it’s quite complicated how to work that in the best way. I wouldn’t know how to average and balance it out.” Millennial

Some participants had concerns about being overloaded with this type of information, so the ability to set controls over how frequently or under what conditions this was communicated would be beneficial.

As an extension of this idea, vulnerable customers suggested it would be useful to receive notifications through the smart home hub if they had forgotten to charge a piece of vital equipment.

“It could warn you you’re going have a cut out, so maybe your scooter’s not been charged up, it would warn you.” Vulnerable customer

There were mixed opinions about whether the smart home hub should actually take the action needed to make energy efficiencies, or whether customers should just be given recommendations. Some panellists did not want to receive multiple notifications and would prefer the smart home hub to take care of their energy usage for them, while others would not want to relinquish control. The ability for customers to choose how much control was awarded to the smart home hub was considered very important.

It was important that the smart home hub provided independent advice and did not recommend purchasing particular products or devices from selected companies in the guise of offering advice.

- ✓ The provision of information about **potential problems with energy supply** (for example warning of unusually low/ high usage or unusually low/high voltage) had only moderate appeal. Participants assumed that Electricity North West would already be aware of any issues with supply and would be taking steps to rectify this without the need to inform customers.

“I think they’ve got to be really careful about flooding us with stuff that we’re just not interested in, instead of when we do get one, we think, ‘Right, OK, that’s something I’ll have to respond to’” Rural domestic

- ✓ Provision of personalised information on **carbon emissions** associated with household devices was deemed as a “nice to have”, rather than as essential. While this may be noted initially, it was felt that over time customers would be less inclined to make use of this information. Indeed, some panellists were not interested in having access to this information at all.

“I’m bothered about carbon footprint, but I’m not interested in being shown numbers about it” Urban domestic

However, SME panellists considered that this could be a useful addition due to the need to provide information on their carbon footprint, for example during tender processes or to qualify for tax incentives.

In summary, customers should have the ability to view this information if they were interested in it.

- ✓ **Integration with local weather information** to predict the need for appliances such as lights and heating and to estimate the amount of energy likely to be available from solar was moderately appealing. As with most of these functions, participants would like the ability to override decisions made by the smart home energy hub.

“Perhaps a general yes, but with an option that you could override it for an hour or two. If it said it was going to be cloudy all day and actually you had a bit of sun, so for an hour or two we can use solar from the battery.” Millennial

4.1.3 Data sharing

Most participants stated that they would be happy for their DNO to have access to the data generated by the smart home hub, with some caveats, in particular that data should be aggregated. Participants did not want to share individual, device-level data (ie from a smart appliance), or the data generated from their household’s overall electricity consumption. They were more open to providing data on the understanding that it would be anonymised and aggregated, for example, at street or feeder level. Participants suggested that they would need to opt in to sharing their data, while DNOs would need to be open and transparent as to how it would be used. Using this data for marketing purposes was a definite “No” for all panellists.

“If it stays within that circle, yes. But not just to be passed on to third parties where you can get harassed ... So I’d be very conscious of the way the data is preserved and who sees it.” Vulnerable customer

Vulnerable customers are more sensitive to sharing data. As they frequently interact with multiple Government departments anyway, they already feel “watched” or “Big Brothered” to some extent. They also have concerns about anything that could affect their benefits.

4.2 Prototype 2: Chatbot

The second prototype introduced to participants was a simulation of artificial intelligence (AI) technology, chatbot. This built on the first prototype by offering a different interface. The chatbot could be accessed through a central hub, such as Amazon Echo or Google Home, or even through a hologram or an immersive technology.

Chatbots give the perception of personal interaction with a human, without anyone else being involved; callers speak to an automated system that recognises keywords and responds to queries. Customers would be able choose voice recognition or typing to interact with the chatbot.

Participants were informed that, although currently in its infancy, this technology does already exist and is established in other sectors, such as banking and finance, to help resolve customer queries. Examples of chatbots already in existence were given to participants and included:

- Power bot: understand why your power has been turned off and when it will be coming back on
- Weather bot: get the weather whenever you ask
- Grocery bot: help me select and order groceries for the week
- News bot: ask it to tell you whenever something interesting occurs
- Life advice bot: tell it your problems and get help to think of solutions

- Personal finance bot: get help to manage your money better
- Scheduling bot: get the next possible doctor's appointment at my local surgery.

Panellists reported that finding the phone number of a company and then subsequently being routed to its IVR system could be frustrating. With this in mind, they were asked for feedback on how appealing chatbot technology would be to overcome this.

Initial reactions suggested that participants would rather talk to a human because they did not believe robots would give the correct information or have the cognitive ability to understand their concerns. For some participants the thought of speaking to a robot was unfamiliar and unnerving.

"I wouldn't want to speak to a robot. I like a human interaction. All that robotic stuff is very creepy." Millennial

Other panellists considered that they would miss the personal touch in human interaction. Reactions were driven by an individual participant's preferences.

"I think it's a bit like text, for me I don't really like texting, simply because when you're speaking to somebody face-to-face you pick up intonation, and you've got that visual thing that you can pick up on people's emotions. Whereas if you're speaking to one of those things or you're just typing, you've got no sense of that. It's like with text messages it's just flat." Vulnerable customer

Commercial panel members in particular felt that their requests are normally unique and therefore would be out of the scope of a chatbot's programming, meaning that they would not be provided with an adequate answer.

"If I was a general person asking a general question, fine. But I'm specific." SME

Vulnerable customers especially, queried whether the interactivity of such smart devices could be tailored to their specific needs or enable them to feel properly "listened to".

"Yeah, that would bug me a bit thinking how can I explain to them and what will they come back with. Will they be sympathetic, like if I owed this big bill and I couldn't afford to pay it? I'd think, I'm only talking to a computer and I think that would stress me out. That's being honest with you." Vulnerable customer

Some panellists were concerned that not all customers have access to the technology needed to interact with an app, for example, older customers or fuel-poor customers. There were also concerns that this could isolate customers who did not read or write fluent English, or did not feel comfortable interacting with a computer.

"No, I couldn't. I couldn't speak to a computer. It's ideal for younger people in their twenties or thirties with a busy lifestyle, and they don't have the same sort of problems as when you get older." Vulnerable customer

Vulnerable customers also wanted reassurance that the device would be easy to use, with the option to speak to a person if they were struggling to get the chatbot to comprehend their needs.

"If you were not very tech savvy and not getting on very well with it, if there was some way of speaking to somebody if you couldn't explain what you were trying to say or to type out." Vulnerable customer

Some members of the ECP also had practical concerns, including how they could access historical data and whether the chatbot would understand regional dialects. In Lancaster there were also concerns about the strength of the signal; many customers reported poor Internet connections without Wi-Fi and would therefore be concerned about whether the technology would work for them during a supply interruption.

“Are they going to make it understand all the different local accents that there are?” Rural domestic

“As soon as the Wi-Fi goes it would be useless to me, I still won’t be able to use it because I won’t be able to connect to it. So, to me I think it’s a bit pointless, because the only time I ever contact them is during a power cut.” Rural domestic

Previous discussions had focused on data security, a concern that was raised again based on the fact that everything would be online and could be controlled remotely.

“I’m worried about if it’s all electronic like that, and there is, at the end of the scale, no one to come back to, hackers and governments and intelligence agencies can shut the world down, if they want to.” Rural domestic

“I know that a lot of the time when you’re speaking to a person with a company like that it will say this conversation is being recorded, but the idea that it could be hacked in a way?” Millennial

After some discussion participants could see benefits in this system and could envisage instances where they would be happy to use it. Participants considered it a factual database, which would work as long as their question was simple. There was also a perception that the information would be more reliable and consistent as human error would be eliminated. Knowing that they were receiving the most up to date information, and that all customers were receiving the same information was positive and reassuring for participants.

“I don’t have any problem with chatbots or whatever. It’s just an interface to get the answer.” Rural domestic

“The advantage of bots is that they’re factual. They tend to be factual information or information drawn from somewhere, so there’s no human error in what you’re getting back from them.” Urban domestic

Other participants appreciated that the chatbot could lead to a quicker, more instant response. Participants acknowledged that the chatbot could significantly reduce call volumes, especially during a large incident, and therefore hold time would be minimal if they existed at all. This was a significant pro to participants as being on hold is a great source of discontent during the customer service journey.

“My pet hate is being kept on hold. It ultimately solves that problem so, I’m quite happy.” Domestic EV owner

Those participants who were happy to use chatbots would still want the option to speak to a human, for example, if their query was obscure. They also felt that it was important that companies are transparent about when the customer is speaking to a chatbot.

“Maybe when you call them, it tells you that when you first hear the phone you could then have the option to talk to a person if you wanted to. So, this is a bot, we’re 99% sure it will solve any problems you have, but if you’d rather talk to a person then we can put you through.” Urban domestic

Participants were then given a demonstration of the chatbot in a supply interruption scenario to enable them to experience the information they would be given and to understand what questions could be answered. The scenario involved the chatbot confirming the customer’s identity, asking to access their smart hub so that it could make their energy system more energy efficient and confirming that their neighbours were also without power.

Participants were impressed by the demonstration on the whole and some stated that they were unable to tell that they were not interacting with a human.

“You wouldn’t know that it isn’t a real person. Because there is so much now, of this online chat.” SME

There was also a positive response to how this could benefit them individually as customers and as a wider population if it led to data sharing. A chatbot with access to a large amount of information from both customers and Electricity North West should lead to more accurate answers about duration and area affected, while also helping

Electricity North West identifying issues quicker through customers smart hubs and queries through their chatbot. This was especially the case with millennials, who could be more comfortable speaking to a bot than a human.

"I think if it can access a lot of people's smart hubs, identifying problems faster and then getting engineers on route faster, then the more vulnerable people are going to get their power back on faster. I think that's quite a good thing." Millennial

"I'm almost more comfortable with a bot. I don't know why, I just feel like I think you can ask questions and they won't judge you." Millennial

Participants were comfortable with a chatbot accessing their smart hub, giving them advice and changing their energy consumption, for example, by delaying when an EV charges to minimise the effects of a supply interruption by conserving battery power for essential devices. They were also happy to interact with the chatbot during a supply interruption. However there were participants who wanted the reassurance that they would still have the option to speak to a contact agent, as this was considered to be an emergency situation and some participants want the reassurance and sympathy from a human voice.

Although customers were happy for Electricity North West to access their smart hub to assist them, they wanted details about the specific information that would be accessed, especially the level of details and what personal information was being shared.

"I think it would be good for it to be slightly clearer about which information it would be accessing. Saying access the information is very vague, and could encompass all the information ever, or it might be like your recent information." Millennial

Some panel members were open to allowing the chatbot more complete access, for example, so that it could add a planned supply interruption to their calendar. The main factor here is, once again, that participants need to be able to personalise or control the level of access. In reality participants accepted that they would likely give permission to everything rather than personalise it, but would be reassured to know that this was an option.

In terms of access, participants required an option of multiple logins so that partners and children can also use the chatbot depending on who is home during a supply interruption. They would want to personalise the level of security they have, with some participants wanting a much higher level of validation than others.

"I'd rather you've got my details [and] crack on. Confirm my identity the first time, and if I'm on the same device." Urban domestic

"I think it would be good to have some kind of number or something that was linked to your smart hub that you could put in so people couldn't pretend to be you." Millennial

"You'd have to have multiple users as well, because you can't rely on one person in that premises to be responsible for that conversation. I could be working away; my wife could be working away." SME

In addition to being able to control their hub, participants could also see the benefit of hubs pushing information to them during supply interruptions about charging points, the area effected and where hot food was available. Information was considered to be up to date and accurate, and is information that participants appreciate but would not necessarily call Electricity North West to find out.

Panel members were asked whether they would like the chatbot to check up on them during a power cut, and the majority of participants would not appreciate this. They deemed it patronising and acknowledged that they would actively contact Electricity North West or the chatbot if they had any further queries. However participants could see the benefit of this service for vulnerable customers, and therefore should be an option available to customers.

"When you're feeling a bit vulnerable, it could talk to them and say, 'It's alright, this is happening.' It could just give that reassurance that they need." Rural domestic

“I think my grandma would absolutely love that checking on her. For me personally, I wouldn’t. But I know my grandma would be quite, ‘Oh! It’s checking on me’.” Millennial

There was further appreciation that the chatbot could be beneficial for vulnerable customers who were unable, or less confident in interacting with technology through traditional methods of typing. Being able to talk to a device removes the necessity to move from their position and customers with visual or physical impairments can access information and be given reassurance more quickly and without having to call Electricity North West.

Panellists were asked if they would be interested in seeing a video of engineers on site during a supply interruption. While it might provide reassurance that work was being completed it would be a drain on their electricity reserves.

“I think if you’re low on power, the last thing you want is a video.” Urban domestic

Connections customers agreed that chatbot technology would be useful during a supply interruption when they just needed simple information to confirm that the DNO knew about the issue and updates.

“I think it’s just an easy way and an instant way to get feedback on what’s happened, say, if there is a power cut down my road. It’s just an instant communication.” Connections customer

For communication regarding new connections, connections customers expressed concern about the knowledge a bot might possess regarding the complex queries typical of the process. Participants admitted that they struggled to explain their problems to call agents due to the specialist nature of their connections and, therefore, they would have very little faith in a bot being able to address them. There were situations where connections customers could see themselves using the chatbot for simple questions about timescales and confirming appointments.

I think from my point of view, on the straightforward connections, the only thing that concerns me is probably timescales and when the civil contracting go there, when the connection’s going to be made.” Connections customer

“Like if you told them your reference number or something, would they be able to feedback like an answer to you and stuff like that?” Connections customer

The overall consensus of the panel on chatbots was positive. They could see a benefit, both for themselves and for the network and recognised that technology deploying ‘virtual workers’ has significant potential to reach large numbers of customers simultaneously, which could significantly reduce the volume and wait times associated with traditional telephone interactions. They also recognised that information will be consistent, up to date and capable of being relayed in a customer’s preferred language. Vulnerable customers were seen to be a group who would particularly benefit from a chatbot, especially during power outages. There were concerns that vulnerable customers may be left behind by current web and keyboard based communication platforms, and chatbot technology would allow these customers to ‘speak’ to an agent, albeit a virtual one.

Chatbots were also seen as a logical step as participants already used them in other sectors. The panel were conscious that this technology is evolving at a significant pace and therefore considered it a viable future communication platform for DNOs. There was however the caveat that while chatbots would be suitable in the majority of instances the option to speak to a person needed to be maintained.

There were also concerns around security and how vulnerable such a system might be to hackers. Participants expected to be informed (or have the ability to establish) what type of data would be collected and stored by Electricity North West and have control to set their own privacy and security options. This personalisation would considerably reduce the concerns that participants have around this prototype.

4.3 Prototype 3: control centre

The final prototype was demonstrated to illustrate the type of changes that would be needed to integrate all Electricity North West's systems, and technologies similar to prototypes 1 and 2, with its overarching network management and communications systems. This prototype gave an indication of the type of information that Electricity North West staff would be able to see from their desks and on their mobile phones when on site. It was explained that, as is currently the case, control centre or operational information is not routinely shared with customers; however, the prototype illustrated the type of information that might be made available, as a result of more efficient systems, to enhance levels of customer service. Participants were asked to think of this as the central nervous system of Electricity North West that provides the chatbot (prototype 2) with its "knowledge".

Participants were shown a video demonstrating why it is important for Electricity North West to have greater visibility over its network and how this will be increasingly important in the future. They were then introduced to the prototype's functions via an iPad.

The prototype illustrated that in the future, customers might be able to access real time information about, for example: the volume of telephone/chatbot traffic from a particular region, more detailed information about faults, their repair status and other network activities including road closures and street works. For new connections, customers should be able to see network constraints and obtain information about specific work via password protected functions etc. Not all participants were initially sure whether they would ever want or need to access such a system, given the level of detail included in the prototype. Some participants were aware that a real-time 'supply interruption map' is already available to customers, via Electricity North West's website and considered this information adequate; others did not think that they would look at it at all. There was an acknowledgement that customers might be more interested in accessing more data as their energy use and relationship with the DNO changed.

"However, they manage it all in the future, I don't see my consumption of that sort of data changing, which is I've never looked at it." Urban domestic

"I think it's the kind of thing that would be nice to have, but I don't think I would probably use it myself personally. But when I have my own house maybe I'd be more concerned about the whole thing, so maybe I would." Millennial

Conversely, there were participants who would actively follow the resolution of a supply interruption to reassure themselves about the status of the repair and when the power might be restored.

"It'll take away a lot of the worry and stress in a sense so, if there is a power cut, you can actually follow and watch what's happening and be aware of what's happening, rather than second guessing or relying on somebody else to tell you" Rural domestic

Rural participants had concerns about a lack of signal and whether they would be able to access the system, or push notifications, from this system if they experienced a supply interruption.

"When we had storm Desmond, we didn't have a phone signal, an Internet signal. So, how are they getting that? So, what you're talking about is fantastic, but how are they going to get that information to us?" Rural domestic

Participants did understand the benefits for Electricity North West, especially in terms of speeding up the solving and fixing of a problem on the network. They appreciated that having sight of the information in real time allows for a quicker response to issues. For SME participants this was especially appealing since time without power directly correlates to losing money, so they wanted a resolution as soon as possible.

"It makes a lot of sense to have as much information that's readily available at your fingertips as possible, so they can resolve whatever problem it is a lot quicker." Millennial

“They might be able to work out what the problem is before they’ve even got to you. So, if you’ve got a power cut and they’re sending an engineer out, but probably by looking at this they’ll know what they need to do as soon as they arrive. So, it would save a lot of time wouldn’t it?” Urban domestic

“You’d like to think you’re getting better communication, a quicker response to an initial problem or initial fault.” SME

Participants were then asked for their feedback on various data that could be overlaid on the system for them to access. The most positive response was from connection participants who wanted to see how much a new connection would cost.

“I think it would be good for cost-benefit analysis when deciding whether or not you’re doing extension.” Millennial

They wanted to be warned of any upcoming storms or bad weather that would increase the likelihood of a supply interruption so that participants could stock up on candles and food.

4.4 Overall opinion of the prototypes

Overall, participants were positive about the prototypes and understood how they integrated to offer a better service for participants.

“I quite like the seamless integration of all three prototypes as well. So, like they’re all connected, they’re all sharing information with each other, so you know that if you’re using one service, like if you’re talking to a bot, that the main hub has got the same sort of information that they’re using for the road information.” Millennial

There was a consensus that participants could see themselves using these technologies. They did recognise that it would take time before they could form an integrated part of the electricity service.

“I can definitely see it starting to come in, in the not too distant future in maybe ten years’ time, but I think it will be maybe twenty or thirty even, before it becomes really every day, when most households have it.” Millennial

Participants could also see how sharing their data could be beneficial, although they had concerns around data sharing and security.

“I’d be prepared to trade my anonymity for the benefits, but they’ve got to be really explicit about the link between those two things. So, ‘To keep the lights on in the NHS, this is the way that we’re going to have to go’, I think most people probably are prepared to trade that bit of information.” Rural domestic

5 Lessons Learned For Future Innovation Projects

5.1 The relationship between DNO and supplier continues to be confusing for customers

When introducing research and development projects to participants, it is imperative that the relationship between the DNO and electricity suppliers is explained and understood. This should be reinforced with an explanation that the DNO is responsible for a regionally based infrastructure; does not have any involvement in the calculation or production of customers’ bills; and that customers are unable change their DNO, whereas they can change their supplier. For Project Avatar, it was necessary to explain why customers may have reason to contact their DNO due to limited previous contact and awareness of responsibilities.

5.2 Customer personas and scenarios are an effective tool to encourage customers to envisage the future

Based on learning from previous Low Carbon Networks (LCN) funded projects, the background and context of information introducing the low carbon agenda and DNOs' potential responses to the challenge should be concise, focused and specific to the project. Customers often find it extremely difficult to imagine, or are unwilling to accept, the extent of changes in electricity usage in a low carbon future and consequently, the increased dependence on a reliable supply.

However educational materials, specifically videos, can help customers understand the impacts of a future transition to a smart grid network, and provided valuable context on the likely resulting changes to interactions with a DNO/DSO.

In addition, providing hypothetical descriptions of future customers, tailored to both domestic and commercial audiences, gave customers a useful point of reference when providing feedback on future customer service tools

5.3 Do not have pre-conceived ideas about customer attitudes to technology

Individual customer reactions to technology and to data sharing vary according to their own personal attitudes and beliefs. It should not be assumed that all millennials are eager to adopt new technology and are unconcerned about allowing companies access to their personal data. The converse is also true; older customers can be keen to uptake new technology and are in some cases more open to sharing their data to realise benefits.

This finding emphasises that customer perspectives do not necessarily conform to what might be anticipated. It is therefore important to engage with customers who differ attitudinally, as well as representing a range of diverse customer segments.

5.4 Allowing customers to interact with prototypes and physical products such as Alexa enrich feedback

Participants engagement greatly increased when they were able to interact with physical devices, for example operating the prototypes via a tablet, or view apps such as Flightradar 24, to provide interest and context. The latter was especially useful in providing an engaging and interactive way to demonstrate a potentially complex scenario. The app illustrates how functions could be adopted by a DNO to improve interaction and simplify common enquiry scenarios (for example allowing customers to report a problem to a DNO, based on the user's GPS location and instantly find out why for example, excavations are taking place or provide/receive updates about a specific activity).

For future engagement, where there is a need to describe a complex topic and convey a potential solution, a relevant example, even from outside the energy sector, should be considered to simulate how it might work/be applied in a DNO context.

5.5 Repeated engagement with customers is useful to capture changes in attitudes

There was a gradual and consistent progression in attitudes during this iterative engagement process, with panellists becoming more open to emerging technologies potential to enhance their day to day life. This was also reflected in the increasing acceptance of data sharing, to realise customer benefits, as the sessions progressed. This demonstrates the importance of repeated engagement with customers, especially when the topic for discussion is complex and sensitive.

5.6 Outcome

Recruitment of the ECP across the four key segments was an effective approach for engaging a broad spectrum of customers with a balanced demographic profile, to examine existing, and future customer servicing needs and expectations. The deliberative ECP strategy was successful in obtaining constructive feedback about customer service prototypes.

6 Conclusions and next steps

6.1 Customer contact with Electricity North West today

Most participants in this research had only minimal previous contact with Electricity North West.

To maximise the numbers of ECP members who had previously contacted the DNO, some ECP groups were specifically recruited in Lancaster, where a number of customers had experience of large-scale supply interruptions in recent years. Communication with Electricity North West was rated positively by these groups and was described as quick, effective and useful. The ability to access information through a range of communication channels (such as Twitter or local radio) was appreciated, especially by rural customers who may be without telephone or Wi-Fi in these circumstances.

In the event of a supply interruption, customers primarily wanted reassurance that Electricity North West was aware of the problem and to be given an estimated time when power would be restored.

For connection queries, more detailed, personalised communication was required, as domestic customers are unlikely to be familiar with the process and commercial connections can be complex. For this reason, the panel believed that this should ideally commence with a telephone conversation or online messaging, with subsequent confirmation by email. It was also deemed useful to access more information online, such as FAQs. The panel also believed that an online App would add value in guiding customers through the connection process and provide an additional communication platform, but most suggested they were unlikely to download such an App unless they were actively seeking a connection to the distribution network.

6.2 Understanding “good” customer service

Customers’ perceptions of “good” service had a number of underlying themes that were consistent across the range of customers interviewed.

The priority was to make it easy for customers to interact. They also valued a quick resolution of their issue but when this was not possible, regular updates were appreciated. Companies should understand their customers and cater for their needs with a personalised service. Customers’ preferences for how this could be achieved was via: named account managers, or by ensuring that all agents or contact points have access to full customer details and history, regardless of contact channel. Customers valued receiving the same service regardless of the channel they use on a particular occasion.

6.3 Integrating with new technology

Participants were aware of smart meters and largely understood that there is a drive to roll them out across GB. There were members in each group who had a smart meter installed. Feedback from those who had a smart meter was mixed, with some considering that they had changed their behaviour as a result of increased knowledge about their consumption, but others reported technical difficulties and inaccurate readings. Irrespective of whether panellists had a smart meter or not, most indicated that they would be happy to share a limited amount of

information with their supplier, provided they knew what data was being collected and who would have access to it. There were no concerns about sharing aggregated data.

Customers felt that increased automation will minimise the need to contact their DNO because it was anticipated that DNOs would automatically have access to the information they need through interconnected smart technology.

Customers accepted that technology may provide future benefits regarding energy consumption, such as real-time information on the amount of energy being used, or the ability to save money by switching to a different tariff. However, customers' views varied about the amount of control they would be willing to hand over. Some were happy to relinquish control to automation (for example, allowing devices to be turned off, if not in use), but others were very reluctant. To accommodate different customer preferences, any future service technologies should provide the option to "opt in" or "opt out" at a detailed level.

There was a mixed reaction when technology was introduced to the groups. Many participants were positive after the Alexa Echo Show demonstration. This was designed to show the benefits that it and similar devices, such as Hive and Google Home, offer for improved communications and easing functions that can be automated. The purpose of the demonstration was to simulate how customers might interact with the DNO to receive/relay information via a chatbot. Others were less accepting and had particular concerns about a lack of privacy. These concerns were determined by customer attributes and beliefs rather than by demographic factors such as age.

6.4 Attitudes to data sharing

Participants could see some benefits in sharing their data with DNOs in the future. For example, the expansion of 'time of use' tariffs could, if combined with the technologies evaluated in this study, notify customers of potential cost savings by delaying charging to off-peak times or indeed intelligently shift non-essential load automatically.

However, to facilitate data sharing it will be necessary to address customers' security concerns and their apparent lack of trust in energy organisations. The ability to "opt in" to data sharing with informed consent was desirable. Customers were more open to sharing granular level information if there was complete transparency about exactly what data is collected and its use.

Those who were negative about sharing data were apprehensive about security and concerned that data might be used to impose limits or quotas on an individual's energy consumption; therefore, the benefits (to the customer) of sharing data should be clearly communicated.

6.5 Reactions to future innovations

The key learning outcome from this research is that customers are generally open to emerging technologies with the caveat that they add value, improve the customer experience, and they have control over the extent to which they engage with it. Critically they expect to have ultimate control of any personal data harvested and understand how this is used, to ensure that they feel comfortable with the platforms and technologies with which they interact.

The smart home hub prototype had general appeal and, whilst outside a DNOs current licence conditions, was seen as an extension of how smart meters might potential evolve to interact with interconnected smart technology platforms such as Hive. Most participants liked the idea of being able to easily access data about how much energy they were using, down to device level, and how this had changed over time.

Acceptability improved with the ability to personalise the smart hub. Customers wanted to set parameters for how much control the smart hub device had (for example, the ability to switch devices off), how regularly and in what format notifications were sent. As with smart meters, they considered that smart hub data should only be shared with their DNO with their consent, that data should only be on an aggregate level and with clear communication about what it would be used for.

The chatbot prototype was also favourably received. Whilst most initially expressed a preference to speak to a human, they also realised its potential in certain circumstances, for example, to obtain an estimated restoration time after a supply interruption and to instantaneously obtain/relay information during large scale events. The panel recognised the value of AI to both DNOs and their customers of simultaneously processing multiple customer interactions in a consistent manner, tailored to the personal needs of the individual. Many millennials, more accustomed to technologies such as web chat, actually felt more comfortable speaking to a bot than to a person.

SME customers doubted the ability of a chatbot to provide them with an adequate response to their specific queries but understood that AI is continuously evolving and recognised that organisations, across all sectors, are already investing heavily to harness ‘big data’, integrated with chatbot technology, to extend their capacity to handle complex issues. This group were also the most concerned about security when speaking to a machine.

The control centre hub prototype was generally recognised by participants as an aspirational extension of Electricity North West’s existing network management system, capably of fully integrating real-time technical and customer data. The panel understood this was introduced to demonstrate how increased visibility of data, combined with integrative systems and an enhanced level of automation could allow Electricity North West to respond to network conditions quickly to benefit its customers. The prototype allowed customers to access representations of ‘real time data’ that could be available from the system, for example to status of network faults or new connections. The ability to track the progress of work and seamlessly interact with the appropriate team, at different stages of delivery, was particularly appealing for SMEs. Customers understood how the control centre hub would integrate with the information provided by the smart home hub and the chatbot.

6.6 Next steps

There will be ongoing knowledge sharing and dissemination of the key project findings to enable DNOs to develop/ invest in customer servicing technology that meets the future needs and expectations of their customers.

7 APPENDICES

7.1 Key learning outcomes incorporated from previous LCN Fund projects

Figure 7.1 lists the learning from previous LCN Fund projects – C₂C, CLASS, Smart Street and Respond – that were subsequently applied to the Project Avatar customer engagement methodology:

Figure 7.1: Applied learning

Learning from C ₂ C, CLASS, Smart Street and Respond	Application to Project Avatar
<p>The ECPs for both projects demonstrated that customers had little or no understanding of Electricity North West’s identity and were unable to differentiate the role of DNOs from suppliers. They also lacked awareness of decarbonisation, the increasing demand for electricity and the subsequent need to expand the electricity network. Customers needed to be educated about these matters before new concepts could be introduced.</p>	<p>Draft communication materials were presented at the first ECP meeting to introduce participants to Electricity North West, the DNO’s role and responsibilities and how they differ from those of suppliers and National Grid Electricity Transmission. Once the position of the DNO was understood, ECP panellists were more able to engage in informed discussions about their needs when interacting with a DNO and how this may change in a decarbonised future.</p>

Learning from C ₂ C, CLASS, Smart Street and Respond	Application to Project Avatar
<p>ECPs had previously valued a simple “Who’s who in the electricity industry?” Q&A factsheet and showcards highlighting key information. Videos were found to be particularly effective in explaining the complex concepts and how customers might be affected.</p>	<p>The role of the DNO was explained in a simple manner through a mixture of audio and visual methods that had been effective in previous projects (FAQs, showcards and video). Panellists were also shown a video to highlight the advanced network management systems already in place at Electricity North West, which provide their staff with a real-time overview of power cuts and other events</p> <p>https://www.youtube.com/watch?v=jhkOJz2mYTQ.</p> <p>The transition to a smart grid model was also introduced in the second session via a publicly available video</p> <p>https://www.youtube.com/watch?v=JwRTpWZReJk</p>

7.2 Terms of reference

Overall objectives of phase two ECPs

The key research objectives of phase two ECPs were to:

- Explore customer perceptions about the role and importance of a DNO now and in the future
- Identify customer service needs, both current and future (with a focus on long-term expectations, more than ten years hence)
- Identify how needs and expectations differ by contact touchpoint (including but not limited to supply interruptions, general enquiries and new connections to the electricity network)
- Assess reactions to potential new services and techniques proposed to improve standards, efficiency and to make the customer journey easier or more enriched.

The customer engagement method designed to meet the research objectives for phase two of this project is set out in Section 4 of the [Project Avatar Methodology Statement](#).

Addressing the objectives with an ECP

The research objectives were exploratory by nature and required a methodology that elicited a deeper understanding of customer needs and expectations when interacting with a DNO and how these may differ among different customer segments. Focus groups are proven to be a suitable ECP platform to explore complex concepts and encourage informed discussions and were seen as an appropriate mechanism for this research activity.

An ECP comprised of four distinct customer groups, likely to have shared experiences, was convened and met on three separate occasions in January and February 2018. The ECP represented both domestic customers and SMEs from a range of commercial sectors.

During the ECP, a professional, independent moderator asked participants semi-structured questions relating to a predefined list of topics. During these meetings, information was shared and evaluated by the participants, who were encouraged to provide feedback and share their unique experience in relation to the discussion topics. This format allowed the moderator the flexibility to question participants further on issues arising through open discussion. It also furthered the natural evolution of the ECP’s understanding of the role and responsibility of Electricity North West, their needs when interacting with a DNO and how these may vary in future.

The iterative approach adopted allowed the project team to develop, test and evaluate prototypes to support future customer service strategy. This customer engagement approach follows the successful use of similar techniques by Electricity North West in its previous LCN Fund projects, C₂C, CLASS, Smart Street and Respond.

Re-convened ECP meetings

The focus areas of the three meetings are outlined in Figure 7.2.

Figure 7.2: ECP meetings

ECP meeting	Research objectives
ECP meeting 1	<ul style="list-style-type: none"> • Introduce Electricity North West, its role as a DNO in the electricity industry and its relationship to National Grid and suppliers • Discuss how changes to the energy market will change DNO interactions
ECP meeting 2	<ul style="list-style-type: none"> • Defining customer needs and expectations • Explore innovation in customer experience • Understand concerns on data sharing • Introduce customer contact scenarios (followed up to demonstrate the prototypes in ECP meeting 3). Explore what would be important to the customer in these scenarios, any concerns (and how to address them)
ECP meeting 3	<ul style="list-style-type: none"> • Establish reactions to the bespoke customer service solution(s) • Discover improvements that could be made to the bespoke customer service solution(s) to enhance its/their acceptability and appeal • Test hypotheses in relation to the customer segments most likely to benefit from the solution(s).

The initial round of ECP meetings for each of the customer groups included an introduction to Electricity North West to ensure the role of the DNO within the electricity sector was understood. Any previous contact with Electricity North West was explored and reasons for contact highlighted. It then introduced how new technology has evolved customer service in a number of sectors and how changes to the energy market will change DNO interactions.

At the second meeting panellists were invited to discuss customer service best practice. This encouraged debate about personal experiences and was designed to generate feedback on customer needs and expectations when interacting with a DNO, now and in the future. New innovations in communication and attitudes to data sharing were explored.

The final session was used to elicit their responses to prototypes for an enhanced model of customer service and to gather their suggestions for how these might be improved.

The learning outcomes from the re-convened ECP meetings are documented in Section 5.

Membership of the ECP

The ECP was comprised of four separate focus groups, each one representing a key customer segment. A maximum of ten individuals were recruited to participate in each ECP subgroup.

Recruitment was on the basis that participants would attend all scheduled meetings. Participants were geographically clustered to enable easy access to the venues.

A broad customer demographic was recruited to reflect age, gender, social grade, region and household composition, as demonstrated in Figure 7.3.

Figure 7.3: ECP subgroup definitions

Key customer segment	Region	Customer type	Gender	Age
Urban domestic	Manchester	Domestic	Equal proportion of males and females	5 <45 years old and 6 >45 years old
SME	Manchester	SME	Equal proportion of males and females	No quota on age Quota on business size
Millennial domestic	West Lancashire	Domestic	Equal proportion of males and females	Aged 18-24 years old
Rural domestic	West Lancashire	Mixed (predominantly domestic)	Equal proportion of males and females	5 <45 years old and 6 >45 years old

Frequency of meetings and attendance

Each ECP met on three separate occasions (see Figure 7.4). The meetings lasted approximately 90 minutes each and were facilitated by an accredited Interviewer Quality Control Scheme qualitative moderator.

Figure 7.4: ECP meeting dates

Meeting	Date
ECP meeting 1	January 2018
ECP meeting 2	February 2018
ECP meeting 3	February 2018

Participants were advised of the meeting dates prior to committing to take part in the ECP and were expected to attend all meetings.

A target attendance level of at least eight customers was set for each meeting. Based on previous customer engagement, it was anticipated that the attrition rate of customers who no longer wished to participate would be approximately 10%, or one person, between the two meetings. Recruiting ten customers allowed sufficient mitigation for non-attendance.

The minimum attendance of eight people per group was achieved on all occasions.

Administrative support and facilitation

The ECP research was conducted on behalf of Electricity North West by Impact Research, an independent market research agency. All research was carried out in accordance with the professional standards set out in the Market Research Society Code of Conduct.

Impact Research was responsible for the day-to-day management of the ECP, booking of venues, associated arrangements and moderating the group discussions. They were also responsible for the analysis and documentation of the findings.

Incentives

Domestic participants were offered a cash payment of £60 for attending each of three meetings. SME representatives were offered a higher cash payment of £80 for attending each of three meetings. This tiered payment was recommended by Impact Research based on previous experience of recruiting customers to take part in similar multi-session panels, where specific recruitment quotas are required, such as a range of business size. Customers were required to sign a claim form to document receipt of the payments and could elect to make an equivalent donation to a registered charity of their choice if they preferred.

Meeting the requirements of the customer engagement plan

The [customer engagement plan](#) placed a commitment on Electricity North West to engage appropriately with relevant customers taking part in this study. This was achieved by:

- Providing customers with appropriate communication materials from the outset. This included general information about the project objectives, information about the role of Electricity North West and why research is necessary to develop a customer service strategy.
- Effective communication strategies in focus group meetings and interviews, using tailored communication channels, including written, audio and visual mediums.
- Delivering these materials in such a way that customers are able to interact with the customer service prototypes developed.

7.3 Project replication

The following is a list of physical components required to replicate this activity:

- Database of customers in the geographical area of interest
- Recruitment screener
- Recruitment quotas
- Discussion guide
- Stimulus materials
 - FAQs document explaining the role of a DNO and industry structure; composition of charges in a typical electricity bill; the problem the project seeks to address and customer engagement being undertaken
 - Audio communication materials (eg a video including an introduction to the smart grid)
 - Smart home technology to demonstrate, such as Amazon Show or Google home; and apps to highlight developments in technology, such as Flightradar 24
 - Visual communication materials (eg reasons to contact a DNO, information regarding the technology involved in delivering a low carbon future)
- Focus group venue
- Web streaming technology
- Transcripts and audio recordings.

The following knowledge is required to replicate the outcome of this activity:

- The geographical area of interest
- Customer profile
- Various methods of recruiting customers for ECP
- Qualitative research methods required to produce the physical components listed above for: recruitment; design; moderation; analysis and reporting.
- The anticipated project replication costs are in the region of:
 - Conducting an ECP (40 customers taking part in three phases of focus groups across two different locations) at £62.5k, of which incentivisation at £8.5k. Plus in-depth interviews and “mini group” of connections customers at £11.5k.