

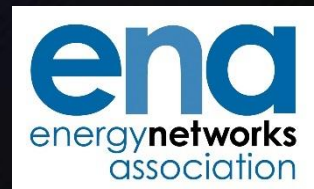
Consumer attitudes to DNO access to half hourly electricity consumption data

Ipsos MORI research study report

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Aims and objectives

Overall this study aimed to understand consumer attitudes to Distribution Network Operators accessing household half hourly electricity consumption data contained in smart meters, within the scope of the current data access and privacy framework.

In particular this project has explored:

- Participant reactions to half hourly data access **in the context of other data privacy issues**
- How participant reactions are affected by their **level of understanding of the role and remit of DNOs** and the **longer-term benefits** of access to this data
- Participant attitudes to DNOs' **accessing half hourly data under the SLC10A requirements**– exploring participant reactions to these safeguards, any perceived risks and what reassurances are needed
- Whether participants' attitudes differ depending on the **granularity of the data** and the **time period that the data relates to**

To achieve these objectives, the research consisted of 12 extended focus groups across Great Britain. More information on the approach taken to this research is presented in the Annex.



Executive summary

Overall this research found a high level of support for Distribution Network Operators to access half-hourly electricity consumption data held by smart meters. Support was expressed by most participants engaged in this study on the following basis:

- Electricity consumption data was not considered sensitive information by most, and many were comfortable with this being accessed (on the understanding this was not linked to any personal contact information);
- Once participants understood the role and remit of DNOs (as initial awareness was low), they felt further reassured that access to their consumption data would not result in negative outcomes for them (no selling or marketing, for example, or increases in bills);
- The use of consumption data to assist more efficient strategic planning was a benefit that resonated with many participants. Despite there being high levels of scepticism around DNO investment savings being passed to consumers via electricity bills, these benefits for the network as well as a general sense of reducing wastage and preserving resources, were sufficient motivation for most participants to be supportive (though some would like to see further evidence of a more direct benefit for themselves);
- While most participants were comfortable with DNOs using consumption data on a half hourly basis, and even at the level of individual properties, there is appetite for further information on the additional value this level of data provides to DNOs. There was, however, a small group of participants who were less supportive of the DNO proposal; this did not reflect concerns about DNO safeguarding of data or DNO use of data, but instead reflected a more general pervasive attitude about the importance of data privacy.

Study context:

Previous Ipsos MORI research¹ has found less than 2% of smart meter customers to express concerns about issues relating to data privacy. However, the specific context of the *user* and *uses* of data shared by consumers are also known to be strong influences on the acceptability of data access and application.

Through this research, DNOs sought to understand how current and future smart meter customers react to the specific proposition of half-hourly consumption data use, within the scope of the current data access and privacy framework.



Summary of implications:

The findings of this research can help inform DNOs of the key consumer issues to bear in mind as they develop their company smart meter data privacy frameworks. The key points which DNOs should consider are:

- **Reflect on the specific role and remit of DNOs as the context in which data will be used:** when stating the case for DNO access to half-hourly consumption data, this needs to be done in the context of low levels of consumer familiarity with the role of DNOs and an appreciation of the heightened support that is associated with an improved understanding of the remit which DNOs have, and the limits to the circumstances and purposes in which they can use and apply consumption data.
- **Ensure a clear articulation of benefits:** from a consumer perspective, the privacy frameworks would benefit from a clear articulation of the specific ways in which the data (at a specified level of granularity and geography) can be used by DNOs to support their day-to-day operations, as well as the wider benefits of accessing this data for the broader electricity network, local areas and even individuals.
- **Demonstrating the data being put to effective use:** while most participants did not feel they needed direct communication from DNOs on this issue, a transparent statement on how smart meter data will, and indeed when appropriate how it has been used (for example, case-studies of its application), would be welcomed as an online resource for those keen to consult it.
- **Address key concerns, but be aware of not over-claiming:** entirely overcoming fears held by some consumers around the risk of data hacking will be challenging for DNOs to overcome (given they are not related to the specific context of the DNO but rather the wider world). DNOs should be clear on their data protection processes as these are important but should avoid denying there is any potential risk - participants are suspicious of claims that any data can be kept completely safe and secure.

Key messages from consumers

The generic and company-specific privacy frameworks should reflect on four key messages resonating from this study from consumers

Planning and efficiency benefits resonate with consumers ...

Participants are supportive of consumption data being used to deliver a more reliable and flexible electricity network, which is built and maintained cost-effectively with less wastage through smart investment.

...but they are more wary of messaging around bill savings

Although participants would welcome (and some, would expect) to see a tangible personal benefit from DNOs accessing consumption data, there was scepticism around this being realised.

DNOs are generally trusted, particularly when their role & remit is understood

Transparency around the context in which an organisation is seeking data access (its role and purpose) aids confidence. Participants are wary of companies overclaiming that data can be kept entirely safe and secure however, as risks of data loss and/or data hacking, are real (and increasing).

A clear statement on the value that data use brings, and the specifics of how it will be applied to benefit is welcomed

Participants are keen to understand the "risk reward" of sharing their data, and need evidence of how data shared – at a specific level of geography and temporality – will be used.



A note on interpreting qualitative research findings

This research was based on qualitative research; a method which aims to explore views and attitudes, and the underlying principles and reasons on which views are held. Qualitative focus groups are valuable for collecting data on unexplored and complex issues such as the topics explored in this project.

While qualitative research helps to uncover the range of views held across a population, and the factors driving these views, it does not provide a precise indicator of the extent to which a certain view is held across a population. In this report, as far as possible, the extent to which a view or opinion was expressed across the 12 focus groups is provided to give a sense of the extent to which that view was commonly shared or represented a minority viewpoint. This is illustrated by writing, for example, “a few”, “many”, “some”, and “a couple”.

Verbatim quotes are used to demonstrate a viewpoint expressed during the focus groups in the participant’s own words. In order to protect the anonymity of the participant, only general information (such as their location and key demographics) is disclosed.



Study context

Where do participants start from in their understanding of the current electricity system and the role of DNOs?

What attitudes, and prior experiences, do they bring to a debate around data privacy in the context of the smart meter roll out?

Context 1: understanding of the current electricity system

In general, participants understand there are many components to the system but tend to think most about the role of suppliers and know less about DNOs

Participants understanding of the electricity system tended to be fragmented; while there was awareness of different parts of the system, there tended to be a fairly low understanding of how these interact and particularly of the distribution networks.

It was hypothesised at the outset of the study that most participants may consider the 'electricity system' to be mainly the relationship between electricity supplier and customer. However – whilst this was the most familiar element of the system - it was evident from the discussions that most participants recognise the range of elements and players that make up the wider system, including generation activity, as well as some means of transferring electricity around the country and to homes and businesses.

Across the groups, awareness was highest around the role of electricity suppliers and there was a lower level of understanding among participants about how electricity is transferred and distributed. While 'pylons' and 'cables' were mentioned by some to describe how electricity is transferred, there was uncertainty over who owns these assets, or how they are operated.

Although unprompted awareness of DNOs was very low, once these organisations were described and named, a few participants

realised they had been in contact with their DNO in relation to power outages or the Priority Services Register.

As discussions advanced, some participants still had difficulties separating the DNOs from suppliers, and often diverted into thinking about the implications of suppliers accessing half-hourly data.

Awareness of the role played by BEIS and Ofgem was mixed. Although they were not mentioned spontaneously as a part of the electricity system, most participants had at least heard of these organisations previous to this discussion. A few participants expressed concerns around the effectiveness of Ofgem's role regulating electricity suppliers, which tended to be linked to media coverage they had seen around profit levels for these organisations and concerns around competitiveness in the market.

Implications of this context: Participants naturally default to discussing data privacy issues in relation to electricity suppliers and a clear (and repeated) articulation of the differences between these organisations and DNOs was required. Perceptions of Ofgem's role regulating suppliers also affected participant reactions to, and reassurance provided by, some elements of safeguarding.



Context 2: awareness and perceptions of smart meters

Awareness of smart meters is high, with many participants predicting benefits

There was a high level of awareness of smart meters across the participants; often due to having seen adverts or being aware that family or friends had a smart meter installed.

Participants were generally very positive about smart meters, and many spontaneously mentioned the potential benefits of having one installed - such as, not having to send meter readings, receiving more accurate bills, and potential electricity savings from being more aware of electricity usage.

While many participants mentioned personal benefits that might be experienced through direct use of a smart meter, there was a lower level of awareness of the national roll-out and participants needed prompting to consider the system-wide benefits that might be achieved through this.

However, once a picture of the future electricity system had been described for participants (including multi-directional flows of electricity, and new or developing uses of electricity such as electric vehicles etc.) some came to appreciate the value offered by smart meters in providing the network with more accurate information on electricity demand. This application of smart metering was particularly welcomed by participants who had initially been surprised to learn that electricity demand planning is currently often based on modelling.

Although participants were overall positive towards smart metering, with many stating they would like to have one installed, a relatively common concern raised (by at least a few participants in each group) was whether electricity suppliers would increase electricity bills by charging customers a higher rate at times of their peak usage.

Smart meter customer experiences:

- Most were positive about their smart meter experience
- Had actively engaged with their IHD to track their consumption patterns
- Some felt more in control of their electricity usage but there was some uncertainty about whether they would be able to realise any electricity savings
- A few had turned off their IHD to avoid becoming 'obsessive'

Implications of context: Participants do not naturally connect smart meters to benefits beyond their individual households and need further explanation and prompting to understand how and why the data stored by smart meters may be of wider benefit.



Context 3: attitudes to data sharing and data privacy

Risks of hacking felt to be real, but for most do not affect comfort with DNO access

Although participants did not have direct experiences of data loss or data hacking, these risks were a concern to some based on coverage in the media – for the majority this did not, however, affect their reaction to the DNO proposition to access consumption data.

A few participants in each discussion group mentioned media coverage of data hacking incidents (such as the US elections, TalkTalk). This influenced many to believe these risks exist no matter what effort organisations put into creating and managing secure data systems. For the majority, this did not, however, affect their level of comfort with DNOs accessing electricity consumption data.

For a minority of participants however, the potential for such incidents to occur “anywhere and everywhere” led them to be strongly adverse to the sharing of any individual or household information, and throughout the discussions wanted this restricted

Well, I think if schoolboys can hack into the Pentagon or to the CIA then nothing will stop people hacking

– Diss

I was with TalkTalk and then their system was hacked into. And all the information was leaked out, so it makes me a little bit nervous to think who would be able to access my data, basically.

- Leicester

as far as possible – this reflected their desire for strong data privacy in all areas rather than specifically in relation to electricity data or DNOs.

While only one participant had experienced any serious data breach (via TalkTalk), some believed they had been targeted for cold-calling and the marketing of goods and services as a result of either data mis-use or the passing of data onto third parties (which may or may not have been authorised as participants often recognised it was difficult to know what permissions had been obtained).

Implications of context: Participants want companies to be honest about the risks of data loss and/or data hacking and are suspicious of claims that any data can be kept entirely safe and secure. For most, this is a risk that is recognised to be a reality but does not overly affect their attitudes towards data being accessed or shared in some circumstances. Among the small number of participants with more deep-seated concerns about sharing of any type of data, these views were not expressed directly in relation to DNO access to consumption data.



Context 4: participant views of electricity consumption data

Electricity consumption data not considered sensitive information by most –

access and use of it is acceptable as long as this is fair and controlled to reduce any risk

Electricity consumption data collected by smart meters was not perceived as sensitive information by most participants, and this was a key reason underlying high levels of support overall for DNOs accessing this information.

Comparisons were made by many participants themselves to financial or health information which they gave as examples of data considered to be far more sensitive than their electricity consumption data.

It is important to note that this attitude was expressed based on the assumption (made spontaneously by many participants) that consumption data is not linked to information about them as an individual – participants assumed, for example, that their consumption data would not be linked to their name, telephone number, bank account details or health data.

As with general concerns expressed around data privacy, a few participants considered the dangers of smart meter data being used in unintended ways – for example, unauthorised linking of smart meter data to bank account details or other sensitive information. Overall these concerns were outweighed, however, by perceptions of the benefits offered by smart metering, and offset by consumption data being considered non-sensitive information.

There were however a couple of participants who remained concerned about the potential sensitivity of their electricity consumption data – these participants fell into the ‘Big Brother’ typology described below and held strong preferences for high levels of data privacy across all types of information related to themselves or their households.

I can't see the issue, they're only seeing what you're using, not your credit card details

- London (1)



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I think the government overestimates what people think is a big deal. It's knowing how much household A, B, C, D, E is using electricity is not an issue.

- Sheffield

Because if they know, if you've gone away, there's no electricity being used [...] they could pass it on, people would know that it's an easy target to break in because you're not there.

- Leicester

Summary of participant views on data privacy

A range of differing viewpoints on data privacy exist

Four main groups of participants emerged from this study when considering the range of viewpoints expressed about data privacy issues. These groups are not homogeneous or mutually exclusive, but participants who can be considered to belong in each typology, tended to share similar attitudes in general to data privacy issues, and went on similar 'journeys' in their discussions around smart metering, electricity data sharing and DNO use of half hourly data.

"Happy to share" - relaxed about public sharing of own information in most cases

"Depends who's asking" - comfortable sharing their data where the value of doing so is clear (whether this is of benefit to them or others)

"Quid pro quo" - comfortable sharing their data where the personal value to them of doing so is clear

"Big brother" – reticent towards any sharing of their data (this group was the smallest, but loudest, of all groups)

A small but constant group of participants fitted this typology

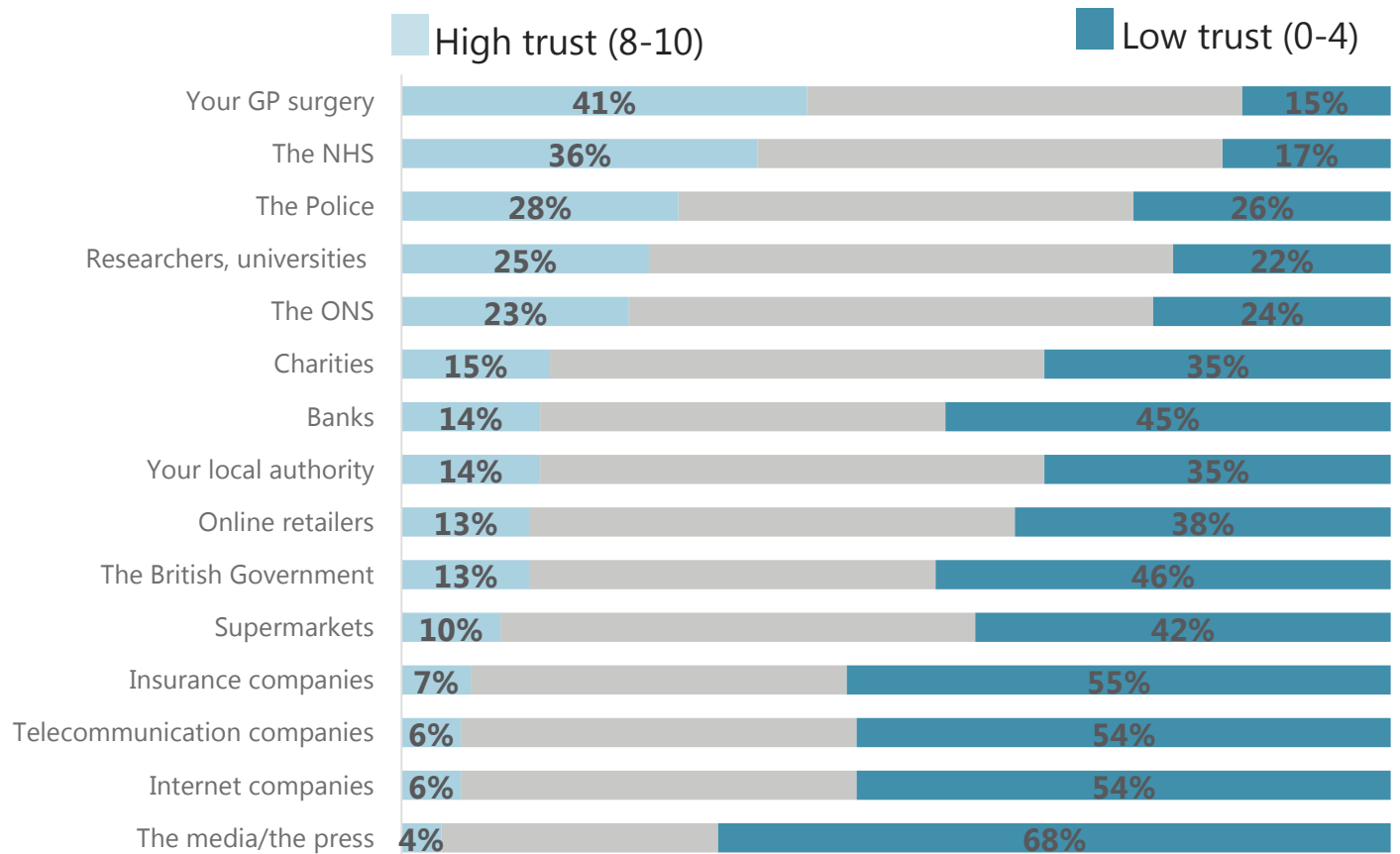
Most participants fitted into these typologies, with some moving back and forth between them as the discussions progressed

Understanding drivers of attitudes to data privacy

Trust in data sharing is highly dependent on the organisation seeking access to data

Previous Ipsos MORI research shows that levels of consumer trust in use of their data is highly dependent on the type of organisation in question – with higher levels of trust in institutions such as the NHS or Police, compared with either the 'Government' or varying types of private company.

It was similarly found in this study that participants attitudes towards use of their consumption data differed depending on the organisation they had in mind as they considered this. For example, after information was given about the role and remit of DNOs and the purpose for which they would like to access this data, participants on the whole were far more supportive of this data being shared than when they were considered this from the perspective of energy suppliers (where associations were made by participants to data being used for marketing products, services or for increasing bill charges).



Summary: key context for privacy frameworks

Stating a clear case for DNO access to consumption data needs to be in the context of low levels of familiarity with the role of DNOs and the value of smart meters data for them

As the ENA update the generic privacy framework, and DNOs develop their own specific smart meter privacy frameworks, it will be important to bear in mind the following key pieces of context based on the knowledge and attitudes brought to these discussions by participants in this study:

1. Low levels of consumer familiarity with DNOs and how they operate
2. Uncertainty about the difference in roles between suppliers and DNOs
3. Some scepticism over how effectively the electricity system can be regulated and the transparency of the sector
4. Consumers are alert to risks of data hacking (for any type of organisation holding individual data) and are keen to understand how they stand to benefit (the 'risk-reward')
5. While consumers are generally aware and positive about smart meters, this is most commonly related to an appreciation of the personal benefits offered, with lower awareness of how the wider electricity network may benefit and no prior understanding of the potential value to DNOs.

Concerns expressed about potential (mis)-use of smart meter consumption data – these general concerns were mentioned by a few participants across the research, and are not related specifically to DNOs or their use of the data, but demonstrate concerns that may be top-of-mind for some consumers:

- Fear of differential pricing
- Cold-calling to sell products or services
- Concern that this data may be misused or sold to other private companies
- Hacking into the smart meter
- Linking of smart meter data to other personal sensitive information



Participant attitudes to DNOs

using half-hourly consumption data

This section of the report goes on to discuss participants' understanding of, and attitudes towards, the potential benefits of DNO use of smart meter electricity consumption data.



Participant understanding of the DNO case for data use

Most participants understood planning benefits of DNOs using smart meter data

Most participants were favourable to DNOs using their electricity consumption data when they were told about the benefit this would offer for planning investment in the network.

After receiving information about the potential value of consumption data for DNOs, most participants understood the benefit of this data to DNOs for informing planning and decision-making. Many were surprised this type of information was not already available to DNOs, and understood the benefits it could bring.

While some participants found it more difficult to understand what access to this data may mean for DNOs, they were comfortable with the idea that it was part of an upgraded and more efficient electricity network.

The following benefits to DNOs accessing consumption data were presented to participants:

- Better investment decisions as DNOs will be able to identify which streets need new cables and where new substations are needed.
- Financial savings for participants by passing on network investment savings to households via reduced electricity bills.
- More reliable future electricity system based on better prediction and treatment of issues in the network.
- More flexible future electricity system ready to respond to changing demands, for example from electric vehicles.

How can a business run just on estimates?

- Inverurie

I think it's absolutely critical. It's quite impressive that they've gone so long without this info

- London

I feel that if people know about what I'm doing, it will be useful and in the long-term the more info that those kind of people have, the more efficient they can become

- London

It's important because energy consumption changes depending on whether 1 person or 4 people live in 3 bedroom...it will be more efficient

- Southampton



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Participant understanding of DNO case for half-hourly data

Overall participants supported DNOs using half-hourly data, despite some queries

While most participants were comfortable with DNOs using their electricity consumption data in half-hourly intervals, some expressed reservations based on queries they had about the level of granularity required by DNOs and how they would practically make use of the information – for a few, this weakened their level of support for DNOs accessing this level of information as the benefits of doing so were not felt to be clear.

Most participants were comfortable with DNOs using half-hourly consumption data as they did not consider this to be sensitive information, and a few linked access to information at this level as potentially beneficial for being able to more accurately manage the network and restore supplies in the case of power cuts.

However, some participants struggled to understand how half hourly data would lead to better planning decisions, and queried what additional value DNOs would gain from having data at this level as opposed to, for instance, half-daily consumption information.

A small number of participants (with a range of starting points in this discussion), expressed a concern about 'invasion of privacy' on the grounds that the benefit of DNOs accessing this data was not clear to them. For the most part, these participants would be keen to have further explanation of the potential benefit offered by half-hourly data, and with a clear case given they felt likely to be accepting of this – they did not have a cast-iron view against it but instead sought further information to understand why it would be beneficial to DNOs.

I'm happy with it – no problem. What are they gonna sell me?

- Edinburgh

No worries about it and the data sharing. If it helps make it more reliable why not?

- Inverurie

I'm just not sure about it, I want to find out a bit more about why they need to access every half hour. It seems like too much information

- Inverurie

It's not going to change outcome, if 24hrs or half hour...it's not going to make a difference

– Southampton



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Participant benefits from DNO use of consumption data

Although most participants could understand the benefit to DNOs, there was uncertainty over the participant benefit, although this did not dampen overall support

While participants recognised the benefits to DNOs of using consumption data, most were uncertain that there would be any personal benefit to them, particularly where information provided to them during the discussions suggested this may come in the form of financial savings on their electricity bills.

Many participants were sceptical that DNO use of consumption data would result in participants benefitting financially. Many felt it was either unlikely that DNOs would pass any savings generated on to participants, or that this would not get transferred through via electricity suppliers who were issuing bills. The role of Ofgem in monitoring the transfer of any investment reduction to participants was explained during the discussion but there was a low level of trust among participants that this would be effectively managed.

A few participants were motivated to support the case for DNO use of consumption data on the basis of other ways in which they felt they would benefit from this on an individual level. For example, some older participants living in a rural area (who had previous experience of fairly regular power cuts) hoped that DNOs using this information would contribute to a more reliable supply of electricity.

For most participants, despite not recognising any personal direct benefits, they did support DNOs use of consumption data on the basis of, what were considered, significant advantages for DNOs in planning and decision-making. In a few cases, however, (those in the 'Quid pro quo' group), participants' level of comfort with DNOs accessing this data would increase if a direct financial incentive was realised in return.

We cannot stand still. We need to make provisions for the future, and it's only going to get bigger... if it's more efficient, in theory it should be cheaper

- Newcastle

So if it's a quarter of the costs to DNO company, if they're saving money by having more accurate data then the costs that we receive off them should go down. I don't think they will.

- Sheffield

That's when we had the power cut. There wasn't enough power coming out of the generators...well, today, with a smart meter, they would know within reason how much electricity they wanted to, say, fire up Ipswich. You know what I mean?

- Diss



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Participant attitudes to wider range of benefits

Some participants were motivated to support the case for DNOs using consumption data due to perceived benefits for the wider electricity system or the environment

Messages around potential “efficiency” gains from DNOs using consumption data resonated with participants, both in terms of financial resources being used more efficiently as well as potential environmental benefits from using electricity more wisely.

Many participants considered the needs of Britain’s future electricity network more generally when expressing support for DNOs using consumption data. The idea of a more *efficient* system for the future, which met the increasing and changing electricity needs whilst wasting less (either wasting less money, electricity or other resources) resonated with many participants.

Access to more accurate consumption information in order to cater for future consumption changes was seen as crucial by some

participants, often referring to potential electricity scarcities in the coming years. A few participants, particularly those in older age groups, explicitly spoke of their desire to support a modernising drive and to *“not stand in the way of progress for the future generations”*.


A few participants spontaneously mentioned their hope that DNO access to consumption data may bring environmental benefits, although they were not always able to articulate or understand in what ways this might be achieved. Although, *environment* itself was not mentioned across all groups, references to contributing to reducing climate change, or a general desire to see less wastage of natural resources was commonly raised.

If you can balance the load, the whole system becomes more efficient so it costs less
- Newcastle

I think it's going to be good for the future, yeah, definitely. Got to move with the times, if it's more efficient.
- Wrexham

That's how they should be portraying it to us, saying... to meet the needs of the next few decades
- Sheffield





We're not going to have as much energy in the future, we've got an expanding population [...] so they've got to do something about it, and if it means getting every single wattage we can out of the current usage by making things smarter, why don't we do that?
- Sheffield



I'd feel more confident with data sharing if could be told it was going to have a considerable environmental impact. I don't think it'll save us money in the long run but happy if it helps the environment
- Edinburgh



Participant attitudes to DNOs

appropriately using and safeguarding

electricity consumption data

This section of the report explores participant confidence in DNOs' approach to safeguarding consumption data, and preferences around the level of geography at which this is used



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Participant attitudes to DNOs fair use of data

Most participants trusted DNOs to use the data for valid purposes

Most participants trusted DNOs to use the data properly to better manage their network.

Following an explanation of the role and responsibilities of DNOs – and importantly how these differ from those of electricity suppliers, including in relation to levels of direct participant contact and commercial offerings – nearly all participants were reassured that smart meter consumption data would be used for appropriate, and valid, purposes by DNOs (i.e. it would not be used to market new products or charge higher costs for services). While some participants initially brought up the possibility for DNOs to attempt to link consumption data to other data sources that were deemed more sensitive (such as household financial information), as discussions went on they felt this was unlikely as they could not identify any DNO interest in doing so.

For me that's the reassuring point. DNOs aren't selling to you directly. One DNO isn't going to sell that [consumption information]. They're not going to do anything that will sell that. I'd feel more comfortable with them than energy providers

- London



Participant attitudes to DNOs safeguarding data

Most participants trusted DNOs to have suitable data protection systems in place, although risk of misuse or hacking can never be totally averted

While DNOs were trusted to have appropriate data security measures in place, it was widely believed that despite any organisation's best efforts, the risk of hacking was a reality.

This was not influenced by the type of organisation that a DNO is, nor any scepticism around the way in which the DNOs would use the data. Rather it reflects participants' general concern around data security in the wake of media coverage of previous incidents.

For most participants (i.e. the 'Happy to Share' group), a recognition of this as a risk did not, however, affect their level of comfort with DNOs accessing consumption data. Many participants explained that even a "worst case" scenario of their consumption data being hacked or misused was acceptable to them on the basis of this data not being considered overly sensitive.

For some participants, in particular those in older age groups, the data protection safeguards (such as high penalties for breaking licence conditions) in place did increase their level of trust in DNOs accessing consumption data. However, many participants were not influenced by knowing these systems were in place (and indeed for some who felt very comfortable with the safeguarding

practices, the information provided about data security systems and rules increased their uncertainty as they felt there must be something more sensitive about the data or the ways in which it could be used that they had not appreciated).

In some instances, participants expressed an attitude of "risk for reward" with their levels of confidence in the safeguarding of personal data influenced by the extent to which they recognised benefits to the data being accessed. These 'Quid pro-quo' participants would be more comfortable sharing their data if they had evidence of receiving a personal (often financial) benefit in return.

For a small number of participants, concerns around hacking and the potential for links to be made to more personal information such as household composition or financial details, as well as a general principle of desiring a high degree of privacy, negatively affected their attitudes towards DNOs accessing consumption information. This group of 'Big-Brother' participants, who would prefer not to share data in any situation to any organisation, were not convinced, or did not feel more comfortable with any type of safeguarding measure, no matter what security assurances were given.





***I would now give a 10 (out of 10).
Saying that they have to follow
procedures, the penalties are so drastic
that they'd be stupid not to be
following them.***

- Southampton

***That's an awful lot of protection that
they're giving us for just energy
consumption data, why, why? It's like
a hospital I can understand because
there's a lot of data there but if it's just
your energy consumption why are they
going to do all of this?***

- Newcastle

***Now you've read that
information out, obviously if
it's all governed by data
protection laws etc, so now I
feel a bit happier about it***

- Bath



Exploring participant preferences around approaches to anonymising consumption data

During the discussions, it was explained to participants that DNO's are likely to be required to aggregate property-level consumption data so that no individual property is identifiable.

The study explored participants' preferences around approaches to aggregation, including whether use of identifiable property data would be appropriate in any scenario and the trade-offs incurred through aggregation. These issues were explored to help ascertain participants' levels of comfort with DNO using property level consumption data and understand the most appropriate ways in which the license conditions may be met.

To avoid overloading participants, discussions focused on aggregation at the point of use of this data, and views were not explicitly invited on aggregation at the point of storage.



Participant preferences around aggregation of data

There was a broad range of views expressed on the extent to which participants would expect and want DNOs to aggregate property-level consumption data

Different participants expressed different levels of comfort with DNOs accessing consumption data on an individual and identifiable property basis as illustrated below:

Most participants expressed one of these two points of view

Comfortable with data being used at individual property level - *enables most precise and accurate decision-making & is not sensitive information*

Cautiously supportive – *comfortable in principle but uncertain of value provided to DNOs of accessing data at this level*

Uncomfortable with individual property data – *preference for aggregation as considered to provide balance of offering value to DNOs and offering data privacy to households*

Consumer views on value of using property-level data

Comfortable with individual property level

Most participants were either very or fairly comfortable with DNOs using half-hourly electricity consumption data at an individual property level. Participants understood this to mean that a property was identifiable through some kind of geographical marker on the network (including the precise address), but that this would not be linked to any information about the property's inhabitants (names, ages, household activities, financial information).

These participants supported DNO use of individual property data for two key reasons:

- 1) They believed DNOs could make the best decisions with this level of data, such as being able to more quickly identify and fix faults, and better plan for the future.
- 2) They did not feel the data being used was sensitive information, in the absence of it being linked to other forms of more identifiable, and in participants' minds, more personal information.

Cautiously supportive if value to DNO is clear

Other participants who were comfortable with the principle of individual property data on the basis of point 2, were not entirely comfortable as they did not feel that the additional value provided to DNOs of using this level of granular information was clear enough for them (they did not have 'buy-in' to point 1). For a few in this group, their uncertainty over the need for DNOs to use this level of data was made greater as they did not believe it would be practically possible for DNOs to look at, and make use of, consumption data for every building within their region. The support of these participants was dependent on a clear articulation of the added value of this granularity to DNOs decision-making and examples of how it would be used.

A few participants also raised uncertainty about the value of this data in the context of moving householders and changing properties (most commonly those in high-transient areas such as London). Some linked use of individual property data to very specific potential applications of it, with a few querying whether such information would be used to replace cables more frequently in response to detailed analysis of changing consumption patterns at a property or street level (with associated concerns around increased disruption and congestion from digging up roads).



Consumer views on value of using property-level data

Uncomfortable with individual property data

A small group of participants (those who tended to express views in line with the 'Big Brother' group, but also some additional participants for whom this element of the discussion was the most contentious) did not feel comfortable with DNOs using half hourly electricity consumption data at an individual property basis, and were in favour of aggregation.

For those in the 'Big Brother' group, this reflected their consistent concerns around intrusion and their right to privacy. For the small number of others putting forward this viewpoint, it was based on believing this level of data offered no additional value to DNOs (and unlike the Cautious Supporters were not likely to be persuaded through any further explanatory information). There was also a sense for this group that it was simply lower risk to use aggregated data; both to reduce any risk associated with data loss or data hacking, and to reduce any consumer concerns about being identified.

Participants did not have strong views on the most appropriate level of aggregation to apply to household consumption data – this was felt to depend on the area type and how the data needed to be used, but for this 'uncomfortable' group no single property should be identifiable.

It makes me feel more comfortable ... You're not just pinpointed then, are you?

– Wrexham

The issue with house level is what they're talking about is data that while there are trends and patterns, it can fluctuate a lot. They're using this stuff for long-term strategic planning. If you put cables in they're putting in for 20, 30 years. I think street-level is enough for me

- London



Summary & implications

Learning from participant reactions for developing privacy frameworks

While consumers are unlikely to be a key audience for the privacy frameworks, these documents may be strengthened in the clarity of the case put forward, and the safeguarding measures recommended, if DNOs reflect on the common questions and feedback received across participants in this research. DNOs may also like to consider communication with consumers on these issues.



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Summary of findings

Overall there is a high level of support across most participants for Distribution Network Operators to access half-hourly electricity consumption data held by smart meters.

Electricity consumption data is not seen as sensitive information by most participants. Use of it by DNOs is therefore acceptable as long as it cannot be linked to personal information such as names or other information such as bank details.

Informing participants about the role and remit of DNOs, reassured them further that this data would be used for beneficial purposes (for DNO planning but also to the advantage of the wider electricity system), and importantly, understanding the ways in which the information would not be used (e.g. for marketing or selling or increasing consumer bills), increased general support for DNOs accessing consumption information. DNOs were generally trusted to keep this data safe (within the bounds that participants felt can be expected of any organisation).

While most were comfortable with DNOs using consumption data on a half-hourly basis, where participants struggled to understand the way in which this granularity of data would be used to valuable effect, it led to some increase in concern around the intentions of DNOs in seeking access to this information; this can be overcome through a clear articulation of the benefits of half-hourly data.



There is also evidence of conditional participant support for DNOs implementing *less restrictive* practices than are currently required by the license condition in relation to the anonymization of property-level consumption data.

Participants tended to be comfortable with DNOs using half-hourly *non*-aggregated data if there was a clear articulation of how this granularity of data would offer additional value to DNOs, how learning from it would be practically applied, as well as how this data would be kept safe.

Summary of common participant queries

DNOs should reflect on these commonly raised questions from consumers to help ensure privacy frameworks include measures to clearly address these issues

Current information which DNOs hold:

1. What information do DNOs currently base their plans on?
2. Some of this information must be known by my supplier to charge customers for Economy 7 tariffs? Do they share this with the DNO?
3. What happens when new developments and buildings are being built? How do DNOs plan for this currently?

Value of granular data access:

4. Why is half hourly data better than daily or half daily? How would my DNO benefit from knowing my property data, as opposed to my whole street?

Practicalities of managing & using data:

5. How can my DNO have the capacity to look at all this data? Will it really be able to be valuable to them?
6. In some areas, people move a lot or properties change, so how can this information be used for long-term planning? Will all this new detailed information mean they are constantly digging up my road to change the cables based on the latest information?



Appetite for further information from DNOs to consumers

Information about the role of DNOs & transparency around data use should be online

Most participants agreed that having an increased awareness of the role of DNOs, and transparency about the way in which access to consumption data would benefit their operations in their local area, was likely to increase their level of trust and comfort in their smart meter data being shared. However, there were mixed opinions on the extent to which participants would welcome direct communications from DNOs on these issues – this would mostly be preferred as online information for those wanting to access it.

Given the low levels of awareness of DNOs at the outset of the discussions, many participants recognised the value of understanding the context for DNO's operations when considering the proposition of DNOs accessing household consumption data. During the discussions it was challenging to ensure participants were considering these issues from the perspective of the DNO use of this data. In the absence of information about the DNO it is very likely that consumers would tend to think about the implications of an organisation similar to an energy supplier having access to their data.

The following information was considered by participants as important for consumers to understand:

- For what purpose the DNOs are accessing consumption data, including how access to this information will benefit the local area
- The amount of investment saving made by DNOs through use of this data and how it is being passed back via consumer bills
- What DNOs would not be able to do with the data (including the limits of what information is attached to consumption data)
- How the data will be effectively managed and controlled

While a few participants would welcome information such as this being delivered to them (via direct mail, for instance), most felt it was sufficient for this information to be available online for those who would like to access it.

The transparency will have to go both ways, we will need to know what they save and what we save

– London



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I think it would be good to know, if they use the data they will use it for the right reasons, and that money is being saved and being passed down to consumers.

- London (1)

Reassurances about data security and why smart meters are being introduced. Need more detail about what it's about

– Inverurie



If they told you clearly what they hold on you and how it's used. So if it was leaked you'd know what was given away. More useful than which rules they comply to. They should be upfront and honest at the start

- Edinburgh



Differing viewpoints

Exploring the range of views

The following slides provide a summary of different consumer perspectives uncovered through this research.



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Differing data privacy viewpoints

Summary of participant personas uncovered through research in relation to data privacy

Four main groups of participants emerged from this study when considering the range of viewpoints expressed about data privacy issues. These groups are not homogeneous or mutually exclusive, but participants who can be considered to belong in each typology, tended to share similar attitudes in general to data privacy issues, and went on similar 'journeys' in their discussions around smart metering, electricity data sharing and DNO access to half hourly data.

“Happy to share” - relaxed about public sharing of own information in most cases

“Depends who’s asking” - comfortable sharing their data where the value of doing so is clear (whether this is of benefit to them or others)

“Quid pro quo” - comfortable sharing their data where the personal value to them of doing so is clear

“Big brother” – reticent towards any sharing of their data (this group was the smallest, but loudest, of all groups)

Most participants fitted into these typologies, with some moving back and forth between them as the discussions progressed

A small but constant group of participants fitted this typology



“Happy to share” - relaxed about public sharing of own information in most cases

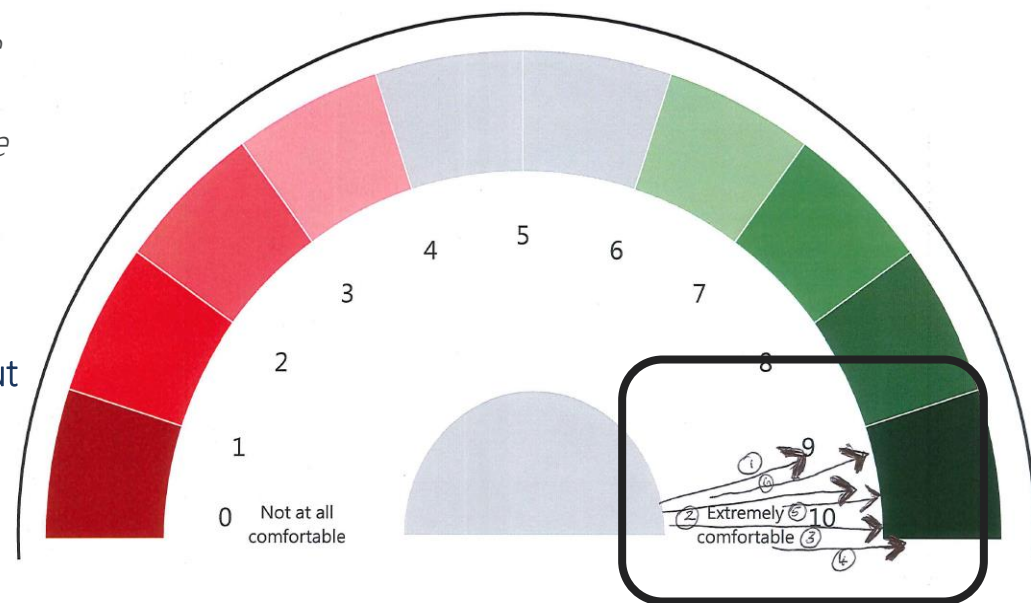
This group of participants are generally relaxed towards sharing their half-hourly consumption data with DNOs and for this to be used at an individual property level, due to having:

- **Relatively low concern around data privacy** generally, and electricity consumption data not considered sensitive
- **Belief in the potential benefits** of DNOs accessing this data – as well as understanding the benefit for DNOs, many also base their support on the basis of benefits for the wider electricity system, the environment or themselves (even those sceptical of individual benefit can be in this group where the other benefits are felt sufficient).

Moreover, data access and use must still have an **appropriate end-use** for participants in this group - which is clearly communicated in a transparent way

Participants were asked at multiple points in the discussion to indicate their level of comfort with the data sharing proposal being explored (on a scale of 1 to 10) as further information was provided around the role of DNOs, the potential benefits from data access and the approaches to safeguarding.

This dial was completed by a participant falling into this typology – showing a **high level of comfort with the proposal from the start (9 out of 10), but increasing further (10 out of 10) as the discussion progressed.**



It just comes down to it's not that much sensitive information. Why don't they just use everybody's house?
- Sheffield

“Depends who’s asking” - comfortable sharing their data where the value of doing so is clear (whether this is of benefit to them or others)

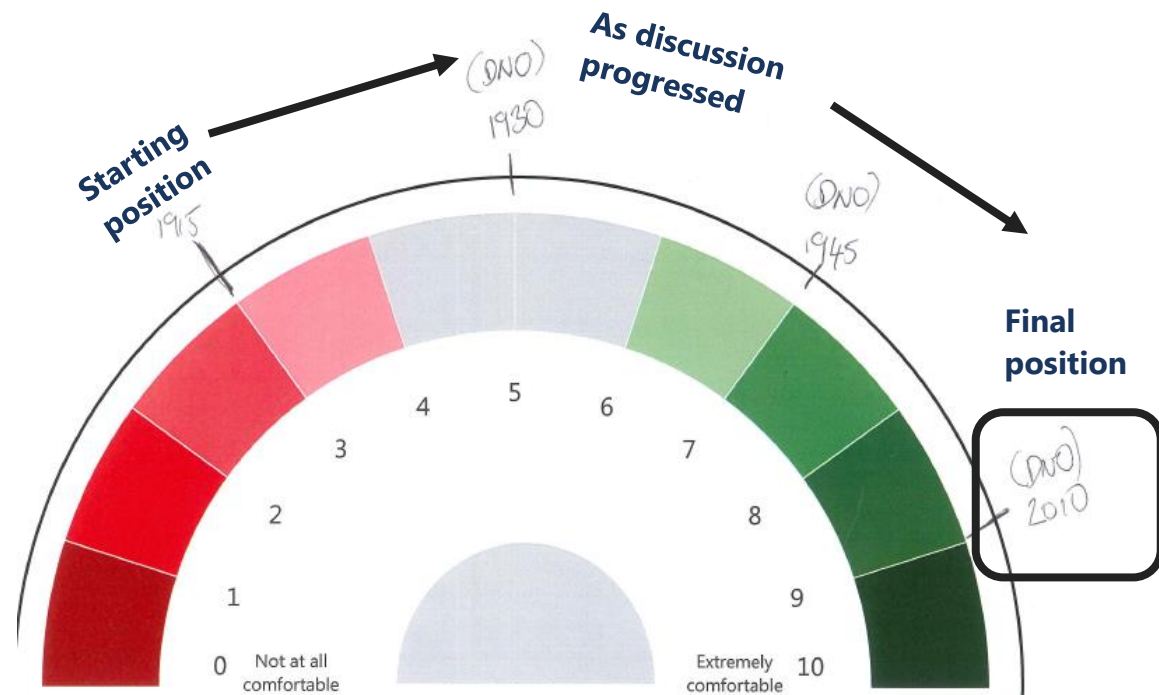
This group of participants are comfortable sharing their consumption data where they understand the role and remit of the organisation accessing the data and are clear on the way in which the data will be used and to what effect (i.e. the value).

As evident by this example dial, participants in this group felt more comfortable as the discussions progressed and as general explorations of attitudes to smart meters and data privacy developed into a discussion of DNOs specifically accessing and using this data – as opposed to any other type of organisation, such as energy suppliers.

This is shown through the increasingly positive score marked as the discussion progresses (from 3 out of 10 at a time of 19:15 near the start, to 10 out of 10 at a time of 20:10 near the end).

The more I know about it the more sense it makes, the more comfortable I feel. When you don't know about it, all you're hearing is your data being sold or whatever[...] it's literally just the reading and how it will then benefit everyone not just your household. It will benefit your street, it will benefit your community because they're getting more accurate amounts of, as we've said it's dispersing the right amount of energy, nothing's being wasted. I hate wastage.

– Manchester



“Quid pro quo” - comfortable sharing their data where the personal value to them of doing so is clear

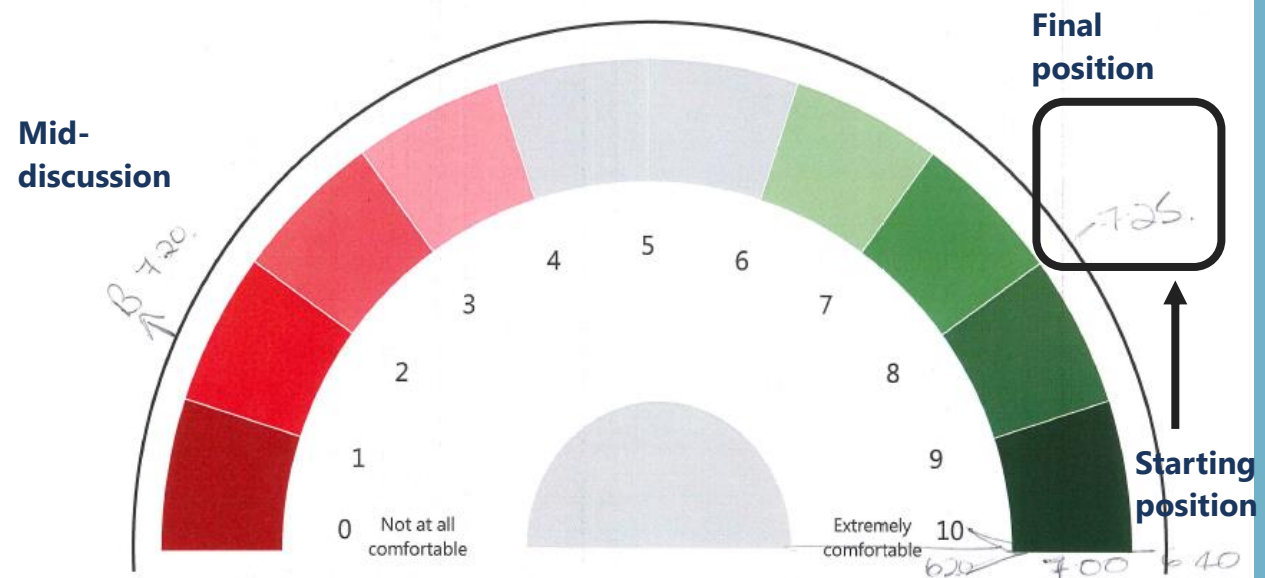
These participants are fairly comfortable with DNOs having access to their half hourly consumption data, and many with this being used at individual property level. However, their support is **conditional on seeing a personal benefit from sharing their data**.

Some of these participants place high value on financial gain from sharing their data and would be most supportive of the DNO proposal if they were able to be convinced that investment savings would be passed on to consumers through their electricity bills.

Over the course of the discussion, a few of these participants moved from being extremely comfortable with the proposal to moving down the scale as they came to a view that they should get something tangible in return for sharing their data, as this dial shows.

This participant gave a **score of 10 at the discussion start** (indicated as between 6-7pm), before moving to a score of 1 as the discussion progressed and they came to a view that they were not convinced by the personal benefit. This individual did **complete the discussion at a score of 8**, as they became more comfortable again after valuing wider system benefits.

I feel that we should benefit for it though, as long as we benefit from it I am comfortable
- London (1)



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“Big brother” – reticent towards any sharing of their data (this group was the smallest, but loudest, of all groups)

For a few participants there was no ‘tipping-point’ – no matter the information presented to them about DNOs or the potential benefits, they would prefer their data not to be shared. Some participants in this group discredited information provided – for example, they rejected a potential future where more electric vehicles are used.

This group (while likely to be small in size) pose a challenge as it is unlikely that DNOs will be able to address their concerns – which are pervasive about any type of data sharing and across a wide range of scenarios, not related to the DNO proposition. The priority here may instead be to ensure absolute transparency and clear evidence-based arguments – which may still not be believed by this group but will help reassure other consumers and citizens.

As shown on this dial, the small number of participants in this group **remained at the ‘uncomfortable’ end of the scale, no matter the information presented.**



Although there were few demographic or geographic differences which came across noticeably throughout the groups, older participants and those living in rural areas were *less* likely to fall into this group. This was often due to having experienced times when electricity was more scarce, and in rural areas also currently being more prone to power cuts.



I don't believe it. I don't trust it. I don't believe it. [They] want more money out of us as a consumer.

- Leicester

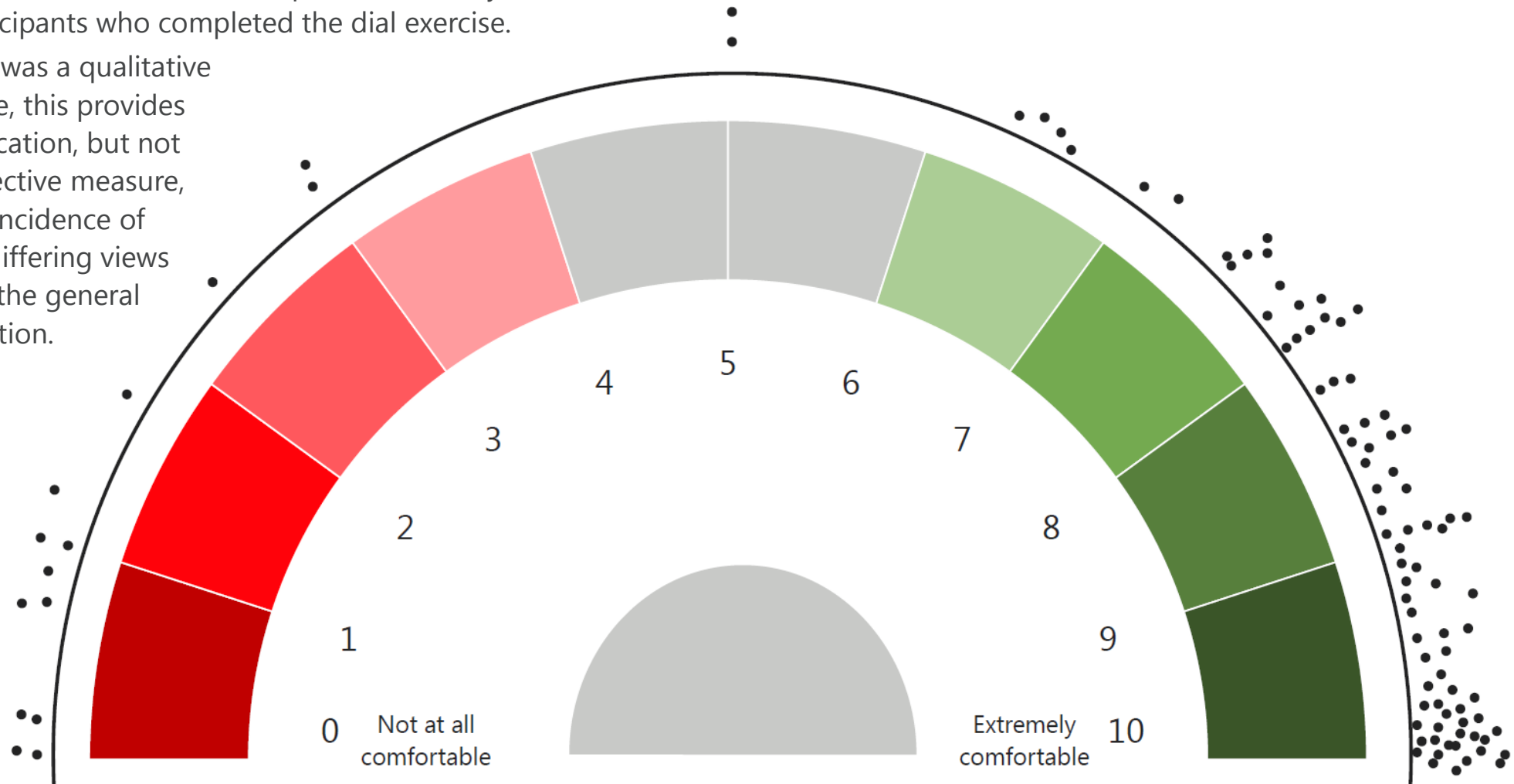


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All participant end-points

The dial below shows the end-point marked by all participants who completed the dial exercise.

As this was a qualitative exercise, this provides an indication, but not an objective measure, of the incidence of these differing views across the general population.

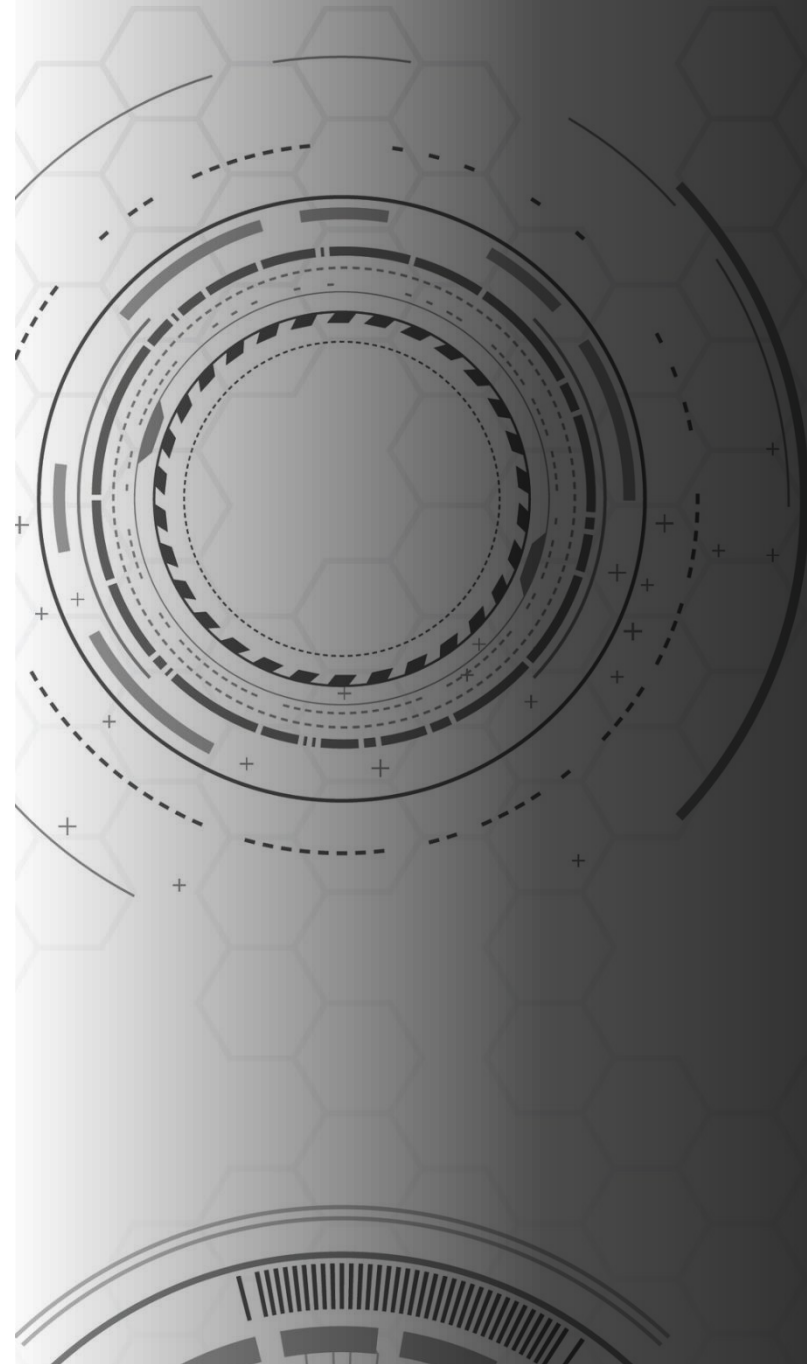


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Broader learnings

for smart meter rollout

The following slides provide additional insights from this study around the smart meter roll-out, although not specifically linked to the key issue under discussion related to DNO access to consumption data.



Further insights into participant views of smart metering

Despite a generally positive view, participants do have some concerns about the roll-out

Although participants were overall positive towards smart metering, with many stating they would like to have one installed, a few concerns about how the data would be used (by electricity suppliers) as well as other issues were repeated across the discussions by a small number of participants:

- A few participants believed smart meter data would be used by electricity suppliers to increase electricity bills by charging their customers a higher rate at times of their peak usage. This led a couple of participants to say they would resist having a smart meter installed.
- A few participants were concerned about job losses among meter readers (and they did not tend to consider the creation of smart meter installation jobs).
- Both owners and non-owners of smart meters expressed concerns that smart meters may cause some people to become overly concerned about their usage, and in the worst case scenarios could encourage older or vulnerable people to under-heat their homes. Some also mentioned potential technical obstacles for older people less able to interact with the IHD.

- Another spontaneous concern raised by one participant was the potential for radiation from the smart meter to affect people's health.

Some participants expressed a belief that smart meters will instantly save a household money through the simple act of having it installed. There is a danger that this belief leads to participants believing they will automatically save money, and if this is not achieved, leading to expectations not being met.



Perceived benefits and concerns around smart metering – participant reactions

I think from it you can also establish what things don't actually need to be on and stuff like that

- Wrexham

It's great for knowing whether you should 'fire it up' at certain time only or keep heating on continuously at moderate temperatures, you can work out which is best most economically

- Southampton

It sends your data back to the supplier as well, so you don't have to get the card to go with, you don't have to write the meter readings, it's all done automatic.

- Manchester

I feel like it's a trap for the future, they'll charge different amounts for different times of day.

- London

You have an idea of what appliance costs you more

- Edinburgh

"what if it's wrong, because we don't do meter readings ourselves, what if they charge £5 more and we are not aware?"

- Southampton

I have heard about the level of radiation not being good for you and your children, and I was a bit concerned about privacy.

- London (pilot)

I can imagine my nan ringing me up now and saying, I press something on it, I don't know what I've done, and now I've got no electricity or something like that.

- Wrexham



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Technical notes and annexes



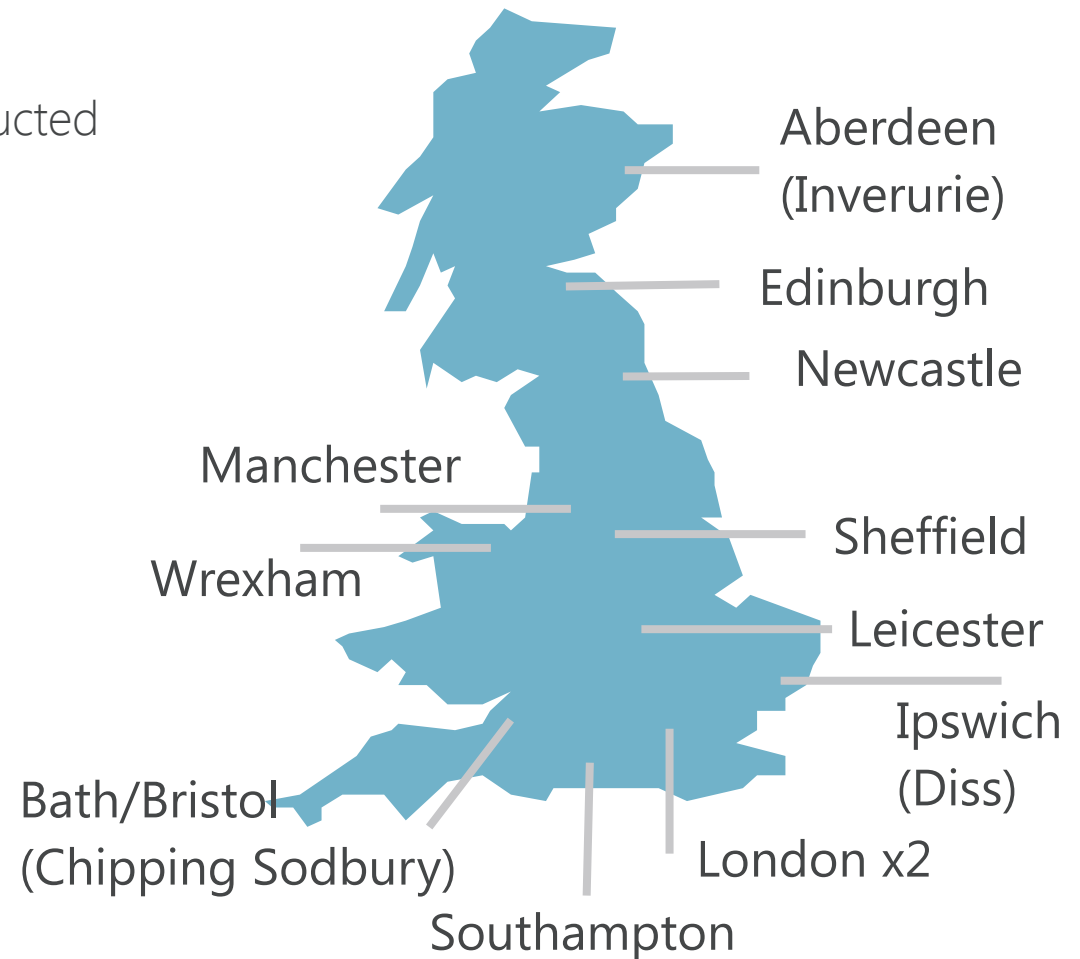
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Study approach

Research conducted across Great Britain

12 focus groups, each lasting 2 hours, were conducted across Great Britain.

The locations chosen ensured coverage across Great Britain and with at least one group in each DNO area. The locations included large cities such as London and Manchester, and rural areas such as Diss to ensure the research captured a wide range of views from people living in different types of property and areas.



Characteristics of participant participants

Participants were recruited to be reflective of the general population

A wide range of participants were recruited to participate in this research to ensure the views gathered were reflective of the general population. 10 participants were recruited for each group.

Quotas were set on the following characteristics:

- age, social grade, tenure, property type, mains gas grid connection
- use of social media, vulnerability in the household
- method and ease of paying electricity bills, supplier switching and smart meter ownership

Qualitative research is not intended to give statistical inferences about a population, hence sampling for qualitative projects are not based on probability methods. Rather, quotas are set on key demographics to achieve a reflective sample of mixed views and characteristics

Generating informed and in-depth discussions

At the beginning of each discussion group, the Ipsos MORI moderator delivered an educational presentation, alongside discussion of the key concepts covered with participants. This helped ensure each group was familiar with key background pieces of information in order to facilitate a more informed and in-depth debate around DNO data access. The initial materials developed by Ipsos MORI were finalised in close collaboration with the ENA and its DNO members and stakeholders. The materials were tested during a Pilot group in London and were slightly amended following this testing.

The educational material included information on:

- Britain's current electricity system and metering system
- The roll-out of smart meters, half-hourly data collection and the potential impact of smart metering for the future electricity system
- Introduction to DNOs – their responsibilities, how they operate and are governed

The full range of materials used during this research are provided later in this Annex.



Uncovering principles underpinning participant reactions

The discussion groups focused on exploring levels of acceptability for DNOs to access half-hourly electricity consumption data from smart meters. The ENA Generic Privacy Framework was not presented to participants but the discussion explored reactions to the principles on which DNOs may access this data under the terms of their license conditions – including detailed debate of the various levels of safeguard and the perceived benefits.

Key stages of discussion of Generic Privacy Framework principles with participants:

- Discussion of DNO case for use of half-hourly consumption data – exploration of potential benefits for DNOs, wider electricity system and consumer
- The safe-management, laws and practices DNOs (and other companies) abide by in the access, use and storage of data
- Aggregating of households and the use of consumption data at different levels of geography
- Unprompted ideas were also invited from participants on how DNOs can further ensure the protection of their data



Ipsos MORI's standards and accreditations

Ipsos MORI's standards and accreditations provide our clients with the peace of mind that they can always depend on us to deliver reliable, sustainable findings. Our focus on quality and continuous improvement means we have embedded a 'right first time' approach throughout our organisation.



ISO 20252:2012

The international market research specific standard that supersedes BS 7911 / MRQSA & incorporates IQCS (Interviewer Quality Control Scheme); it covers the 5 stages of a Market Research project. Ipsos MORI was the first company in the world to gain this accreditation.



ISO 27001:2005

International standard for information security designed to ensure the selection of adequate and proportionate security controls. Ipsos MORI was the first research company in the UK to be awarded this in August 2008.



MRS Company Partnership

By being an MRS Company Partner, Ipsos MORI endorse and support the core MRS brand values of professionalism, research excellence and business effectiveness, and commit to comply with the MRS Code of Conduct throughout the organisation.



ISO 9001:2008

International general company standard with a focus on continual improvement through quality management systems. In 1994 we became one of the early adopters of the ISO 9001 business standard.

Data Protection Act


Ipsos MORI is required to comply with the Data Protection Act; it covers the processing of personal data and the protection of privacy

This work was carried out in accordance with the requirements of the international quality standard for market research, ISO 20252:2012 and with the Ipsos MORI Terms and Conditions.

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Annexes

Educational materials used

The following slides were used in the first 45-50 minutes of the discussion as a part of the 'education' piece which sought to increase participants understanding of the electricity system, smart meters and DNOs to enable an informed discussion throughout the groups.



Current Electricity System – the electricity chain

Electricity is **delivered** to your home via a large network of cables and wires...



Generator

(coal, gas, nuclear,
renewable)

Transmission

The national grid transmits
high voltage electricity from
the generators

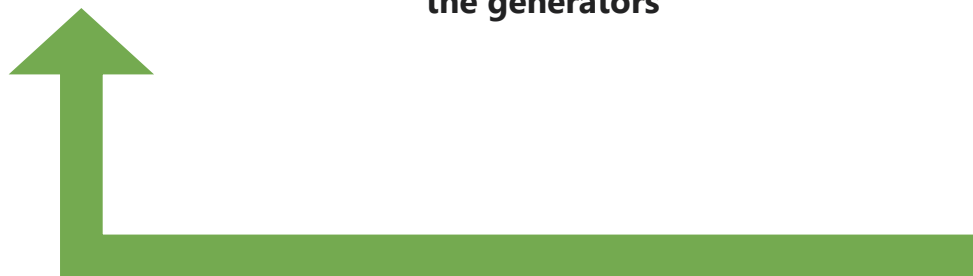
Distribution

Electricity is distributed from the
national grid into our homes on
lower voltage networks

Customer

Supplier

The supplier buys electricity from the
generator and sells it to you. The
supplier pays the distributor to deliver
the electricity to your home (N.B they do
not actually deliver the electricity to you
themselves)



Who else is involved?



Department for
Business, Energy
& Industrial Strategy

Part of Government responsible for energy policy
(previously DECC)

Key priority to:

- ensure UK homes & businesses have energy when they need it and at a price they can afford
- consider our future energy supply, including reducing our reliance on imported energy and using more sustainable sources such as renewables



Independent regulator of gas and electricity industries, working with, but independent from, Government

Key priority to:

- protect the interests of existing & future consumers
- make sure industry complies with its rules (i.e. license conditions)
- take action if companies break rules – such as imposing heavy fines or taking away their license to operate

How does the system currently know

how much electricity is used and needed?



You, or a meter reader, sends regular meter readings in kilowatt hours (kWh) to your supplier to let them know how much electricity you have used



Your supplier records the kilowatt hours (kWh) of electricity you have used which is linked to your account details (name, address, and any contact details you have given to them)

The rest of the electricity network does not get any information on individual household usage

Instead they estimate what will be needed by homes in a certain street or area from data on what was used by that street or area last year, or what has been used in similar types of streets and areas



Smart meters – the next generation electricity meters

By 2020, 30 million smart electricity meters will be installed across Great Britain. These smart meters are replacing current traditional meters.

How are they different from traditional meters?

- Meter readings are sent automatically to your supplier – meaning no meter reader visits & no estimated bills.
- All homes will be offered a display which shows you your household's electricity use in near real-time.
- Record electricity consumption for each home for each half hour of the day.



Collecting information on electricity usage every half hour

Half hour electricity use data will be collected by the smart meter. This will be visible to you via the in-home display – as kilowatt hours (kWh) and how much money (£) you have spent.



Why does the Government think the UK will benefit from a smart metering system?

For you:

- See electricity use in near-real time
- No estimated bills
- No meter readers
- In future, you will be able to switch supplier more easily – even within 24 hours
- If you pay your bill through pre-payment, you do not need a special meter for it

For electricity suppliers:

- Access to accurate data for billing
- Better able to forecast how much electricity needs to be purchased to supply customer demand – resulting in a reduction in the surplus electricity that is currently bought

For the electricity network:

- Part of a move towards an upgraded 'smart' electricity grid – to modernise the electricity network
- Electricity networks will have better information with which to manage their activities and network investment

We are not the only ones!

Smart meters have already been rolled out in other countries, such as:

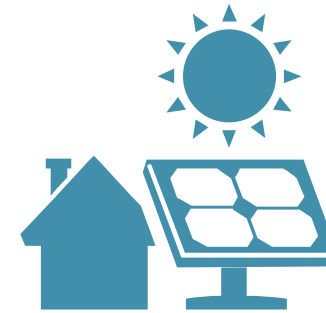
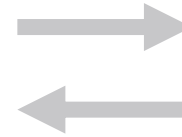
- **Sweden:** first country to install smart meters to residents in 2009
- **Australia:** installed in homes and small businesses between 2009 and 2013
- **Germany:** roll-out will begin in 2017

Looking to the future

Traditionally electricity has been supplied in one direction, from the grid to our homes.



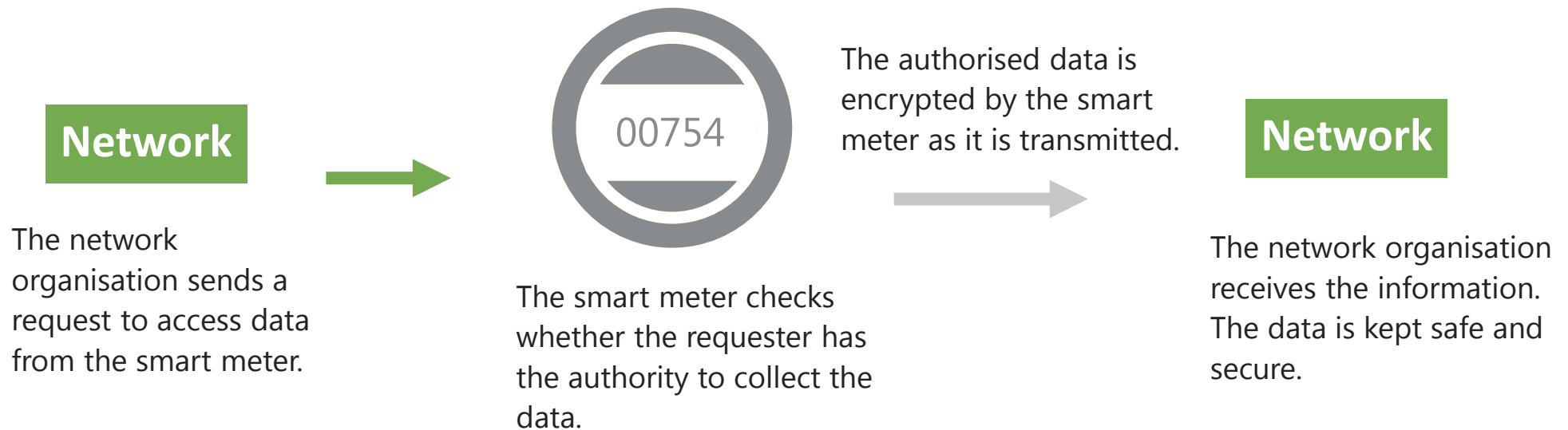
Increasingly, electricity is being produced in lots of different places – including in our homes or local communities – and we are also using it for more different things.



With more electricity flowing in different directions more detailed and real-time data on what electricity is being produced and consumed is becoming increasingly important

What happens to my smart meter data?

Customers own their smart meter data. Authorised parties can ask permission to receive some of it. Different parts of the electricity industry are authorised to see data that is of use to them – this is determined by the Government.

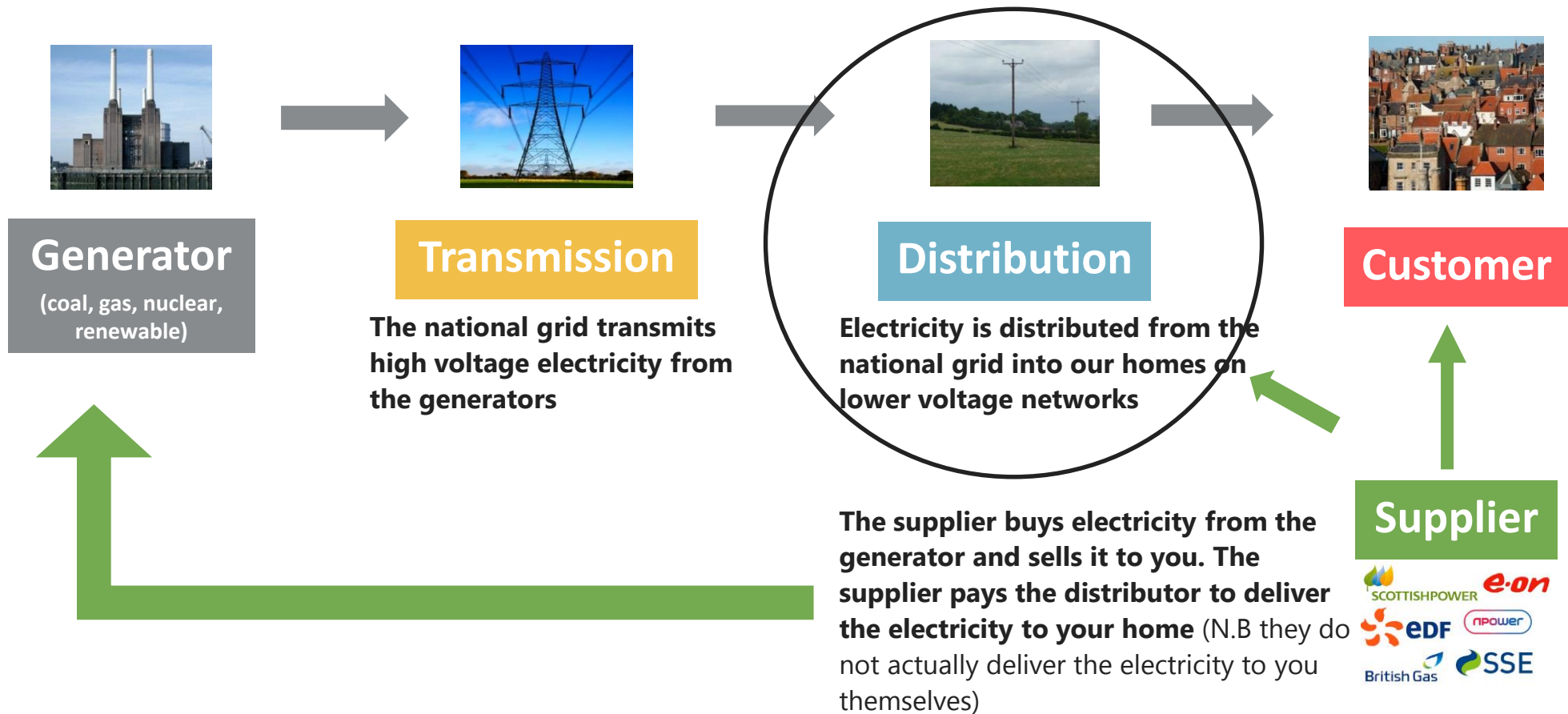


How is smart meter data kept safe and secure?

- **Data protection laws** – all organisations in the electricity chain have to comply with the 1998 Data Protection Act in their current practice.
- All users of smart meter data have to be a member of the **smart energy code** (SEC) which means they need to follow international security standards.
- **Ofgem** makes sure these rules are being followed.

Current Electricity System – the electricity chain

Electricity is **delivered** to your home via a large network of cables and wires...



The role of DNOs

Electricity is **delivered** to your home via a large network of cables and wires...



DNOs own and operate the system of cables and substations that bring electricity from the national transmission network to our homes and businesses.



DNOs are also the organisations that:

- Fix the network after a power cut
- Provide new connections to homes, businesses and generators
- Monitor the network to make sure its working properly

DNO coverage



1, 8  **Scottish & Southern**
Electricity Networks

2, 5  **SP ENERGY**
NETWORKS

4  **NORTHERN**
POWERGRID

3  **electricity**
north west
Bringing energy to your door

6  **WESTERN POWER**
DISTRIBUTION
Serving the Midlands, South West and Wales

7  **UK**
Power
Networks
Delivering your electricity

There are six DNOs across Great Britain

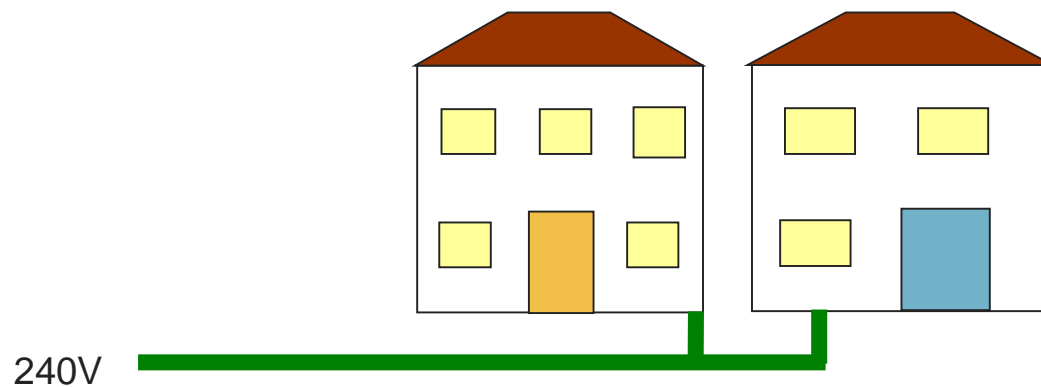
- Unlike an electricity supplier, you do not choose your DNO
- You might not have heard of them, as they do not generally communicate directly with customers
- e.g. they do not bill you directly and have no products or offers to sell to you

Ofgem protects customers' interests by deciding how much money the DNOs should receive, through setting an amount of money a DNO can charge for their services.

About a quarter of your electricity bill consists of charges from the companies who distribute electricity

Based on annual substation data, imagine a street with two households that uses an average total of 90kWh per day.

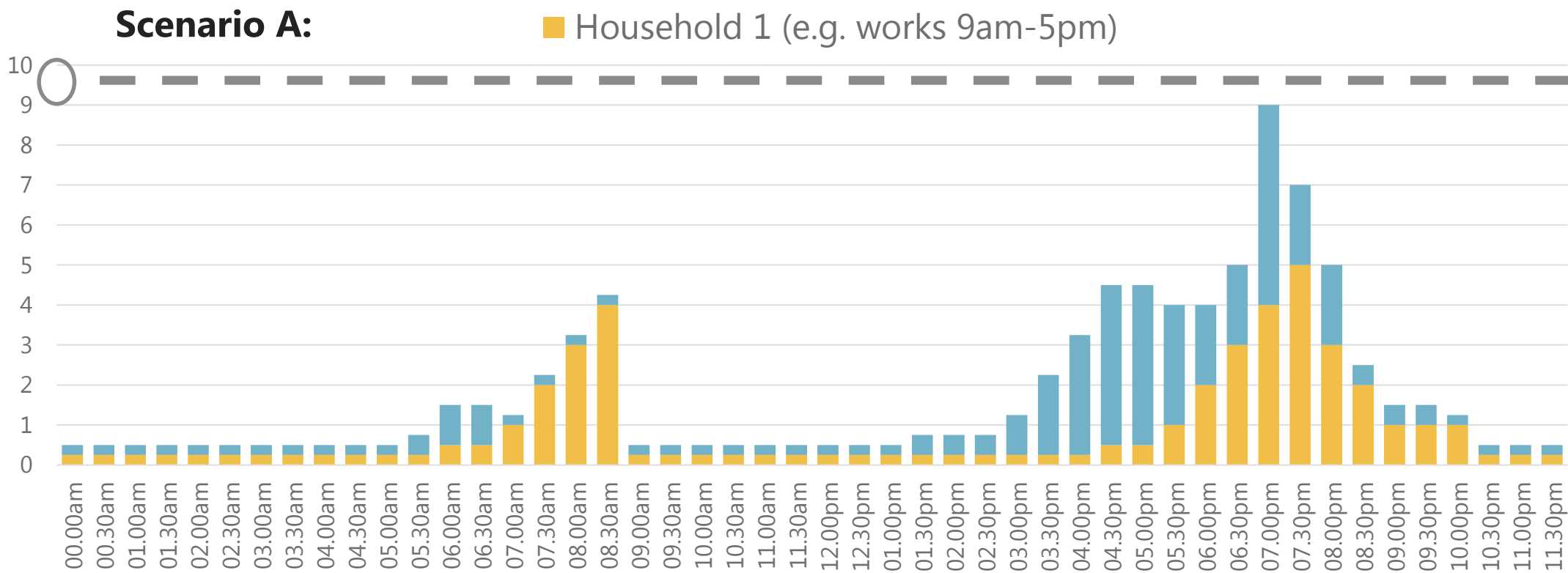
Without access to half-hourly electricity use data, DNOs have to estimate at what times of day people are using electricity and therefore what size of cable would be needed to provide electricity to the street.



Based on annual substation data, imagine a street with two households that uses an

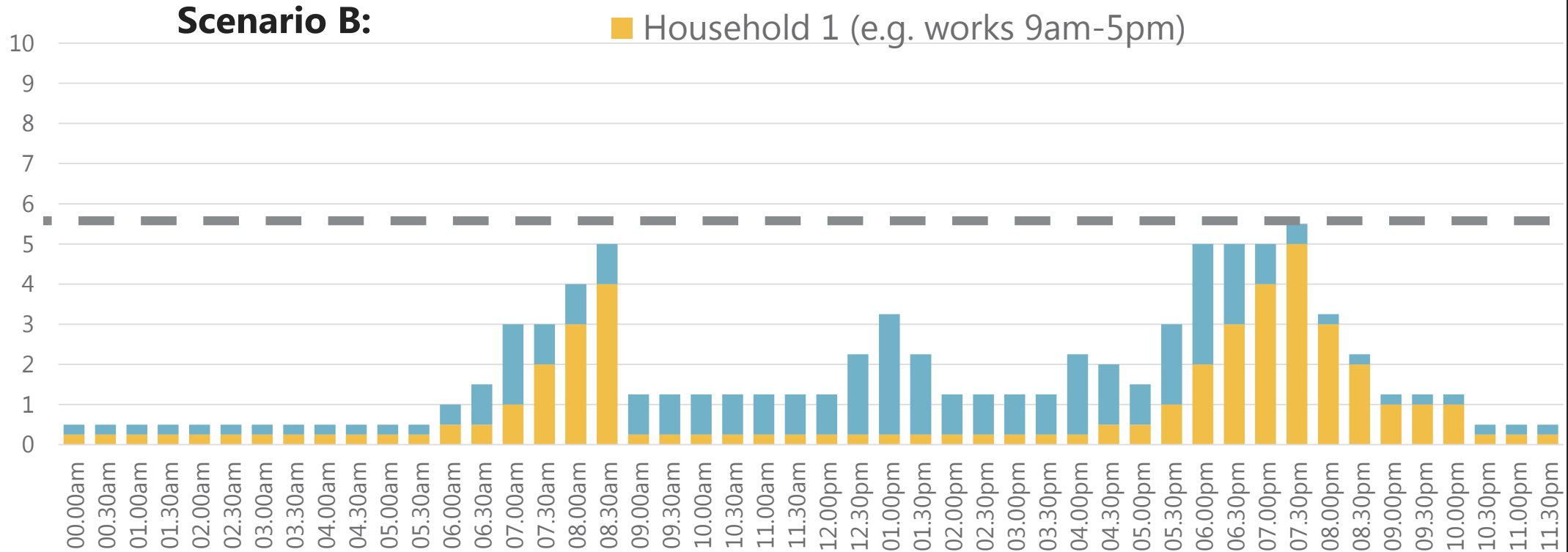
average total of 90kWh per day.

Under scenario A, the two households have fairly similar electricity consumption patterns. With access to combined HH data the DNO knows that not all the electricity is used at the same time, and that the network cables need to be big enough to deliver a value of 9kWh per half hour.

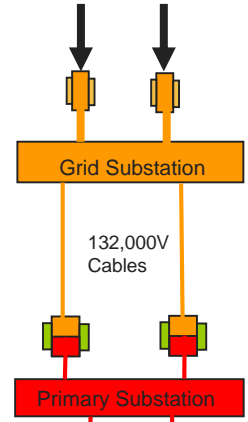


Based on annual substation data, imagine a street with two households that uses an average total of 90kWh per day.

Under scenario B, the households have two completely different consumption patterns. Although the overall amount used in a day is the same, access to HH electricity use data shows that the peak capacity is now only 5.5kWh per half hour. The DNO is therefore able to build a smaller and cheaper network.



National Grid Infeed
at 275,000V

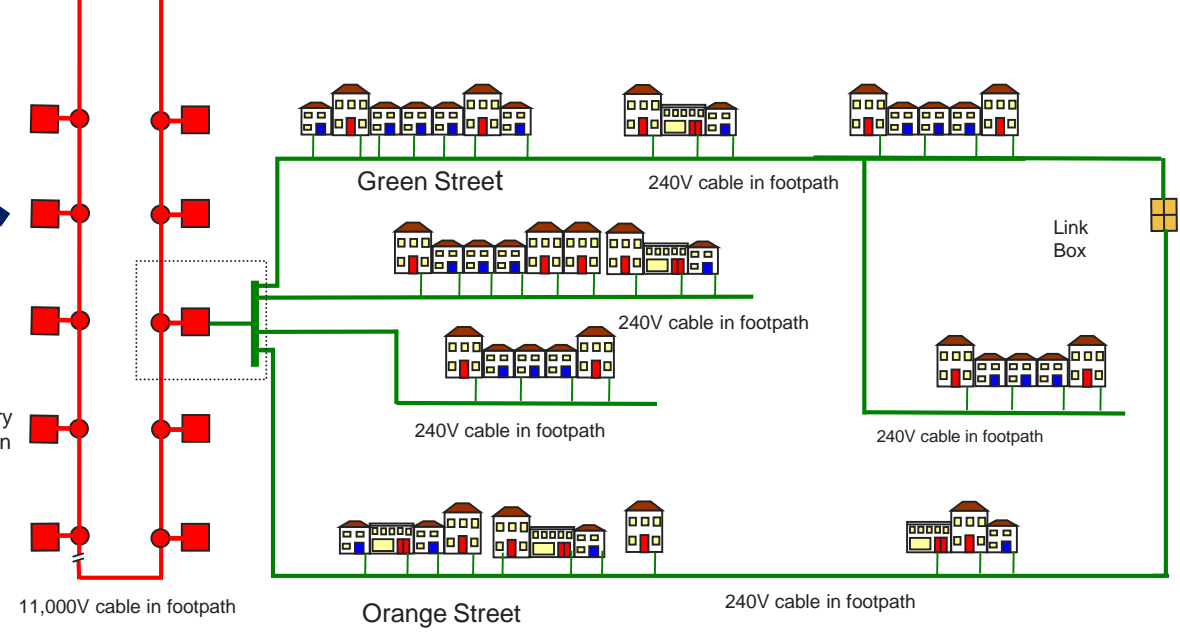


Two transformers to reduce
275,000V to 132,000V

Two transformers to reduce
132,000V to 11,000V

Transformers to reduce
11,000V to 240V

Secondary
Substation



National Grid Infeed

