

Data Privacy Plan

for access to Household Electricity Smart Meter
Consumption Data

Version 5.0 (redacted v2)

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1 Executive summary

- 1.1. To lawfully access and use household electricity consumption data obtained from smart meters relating to a period of less than one month, Distribution Network Operators (DNOs) are required to have a Data Privacy Plan approved by Ofgem. To be approved, each Data Privacy Plan must address eight criteria identified by Ofgem in its open letter to DNOs dated 30 September 2016 (the "Ofgem Letter")¹. The purpose of this Data Privacy Plan is to address each of the eight criteria.
- 1.2. Electricity North West Ltd (ENWL) will only use household electricity smart metering consumption data for the purpose of meeting its duties under Section 9 of the Electricity Act 1989, to develop and maintain a safe, efficient, co-ordinated and economical system of electricity distribution.
- 1.3. For the intended purposes currently identified, the ENWL lawful basis for processing consumption data under the General Data Protection Regulations (GDPR) and Data Protection Act 2018 (DPA 2018) will be Article 6(1)(c) of the GDPR (e.g. that the processing is necessary for compliance with a legal obligation to which ENWL is subject).
- 1.4. Collecting and processing household electricity smart metering consumption data at Section of Low Voltage (LV) Feeder level will allow the greatest benefits to be delivered to customers, as well as supporting the transition to low carbon technologies, which is not possible using traditional household electricity consumption data.
- 1.5. Robust controls will be put in place to prevent household electricity smart metering consumption data from being used for commercial purposes, such as direct marketing, by ENWL or third parties.
- 1.6. ENWL will, so far as reasonably practicable, only store household electricity smart metering consumption data once it has been aggregated and anonymised. Household electricity smart metering consumption data will be permanently deleted once aggregation and anonymisation has taken place.
- 1.7. All household electricity smart metering consumption data will be treated as if it was Personal Data and safeguarded in accordance with the requirements of the GDPR. Anonymisation and aggregation will form a key part of the ENWL privacy solution to ensure that this data is protected.
- 1.8. A Privacy Impact Assessment has been conducted which covers the current intended purposes for processing household electricity smart metering consumption data.
- 1.9. All household electricity smart metering consumption data will be stored in a secure database within the ENWL secure IT environment.
- 1.10. ENWL has constructively engaged with relevant stakeholders. Their feedback has been incorporated into this Data Privacy Plan.

¹ <https://www.ofgem.gov.uk/publications-and-updates/open-letter-dnos-privacy-plans-access-smart-meter-data>

- 1.11. Overall, obtaining access to household electricity smart metering consumption data at a granularity of less than one month is key to enabling ENWL to improve the safety, efficiency and cost-effectiveness of its electricity distribution network, ensuring that it provides the best possible service to its customers. ENWL is in partnership with the Greater Manchester Combined Authority. Access to consumption data will allow ENWL to support the North West and Great Britain in general, meet the opportunities made available through the introduction of low carbon technologies and the move to smarter networks.

2 Introduction

- 2.1. Great Britain's transition to smart meters is being led by energy suppliers, who are required by their Licence Conditions² to take all reasonable steps to roll-out smart meters to all their domestic and small business customers by mid-2025.
- 2.2. Smart meters have the capability to record energy consumption in half-hourly intervals and communicate with energy suppliers and network operators. Traditional meters are not capable of doing this. Replacing them with smart meters is seen as an important step in helping to achieve a more reliable and cost-effective electricity system across Great Britain.
- 2.3. For the purpose of this Data Privacy Plan, ENWL defines household electricity consumption data obtained from smart meters to be consecutive half-hourly active and reactive import readings.
- 2.4. In this document, Smart Meter Consumption Data is referred to as SMCD.
- 2.5. In the future, increasing uptake of solar panels, electric vehicles, heat pumps, battery storage and other technologies are likely to place increased demands on the LV network. It is essential that ENWL is able to effectively manage the network to cope with the increasing demand and generation, in an efficient, coordinated and economical way. SMCD can be used to provide a much clearer view of loads on the LV Network. This is not currently readily available.
- 2.6. Having improved visibility of demand on the LV network across Substation, LV Feeder and individual Sections of LV Feeder will enable ENWL to improve practices and deliver benefits by improving planning and design for: general reinforcement; new load and generation connections; and facilitating the adoption of new technology.
- 2.7. Collecting and processing SMCD raises the possibility of being able to assume certain behaviours within a household whose data has been collected; potentially impacting on the privacy of the household occupants.
- 2.8. To address this privacy concern, access and use of SMCD collected for periods of less than one month is conditional upon meeting the requirements set out in Licence Conditions 10A.4 such that the outcome described in 10A.5 of the Electricity Distribution Licence is achieved.
- 2.9. As well as having to comply with Standard Licence Condition 10A.4, to the extent that it is Personal Data, ENWL will need to comply with the requirements of the General

² The Standard Conditions of Electricity Supply Licence applicable to electricity suppliers in the UK

Data Protection Regulation (GDPR) and Data Protection Act 2018 (DPA 2018) when collecting and processing SMCD.

- 2.10. This Data Privacy Plan demonstrates how ENWL meets the requirements set out in Standard Licence Condition 10A.4 such that the outcome described in 10A.5 is achieved as well as meeting relevant Data Protection laws to collect and process SMCD in a manner that seeks to protect the privacy of households.
- 2.11. In demonstrating this, the Data Privacy Plan sets out the practices, procedures, and systems which ENWL will implement in order to aggregate, or otherwise anonymise, SMCD, so that, so far as reasonably practicable, it can no longer be associated with an individual premise or person.

3 Ofgem Criteria 1 – Data to be accessed

Explain clearly what electricity consumption data will be accessed, in what format, over what period of time, from which consumers, and for which specific purposes. Those purposes must be relevant to the regulatory requirement to develop and maintain efficient, co-ordinated and economical systems for the distribution of electricity.

What electricity consumption data will be accessed?

- 3.1. Smart meters hold half-hourly active and reactive consumption data recorded every 30 minutes with a date and time stamp. The meter holds historic records for up to 13 months, with old data being overwritten by new data. This is the electricity consumption data which will be accessed by ENWL and is covered by this Data Privacy Plan.

In what format and over what period of time?

- 3.2. When a Supplier installs a smart meter at any domestic premise which is then successfully enrolled by the Smart Data Communications Company (DCC) (see section 6.1), ENWL will start to collect SMCD. It will then be routinely collected on a monthly basis to ensure that the most up-to-date information is available.
- 3.3. The SMCD is associated with the Metering Point Administration Number (MPAN) as the identifier for the property. No personal or address data relating to the household is recorded on the meter. As soon as it is received by ENWL, it is subject to anonymisation and aggregation processes described in this document and then deleted. SMCD that has been subject to these processes is referred to as Aggregated Consumption Data (ACD).
- 3.4. SMCD may be requested less than monthly for a specific LV Feeder or Section of LV Feeder. This data will be for up to 2 weeks prior to the date that it is requested and will be processed in the same way as other SMCD such that it becomes ACD. This is primarily operational data to assist in the temporary reconfiguration of the LV network. Typically, it might be for maintenance, in response to a fault or whilst construction or new connections work takes place.

Which consumers?

- 3.5. ENWL will collect SMCD from any smart meter which is successfully enrolled by the Smart DCC. These consumers will be using up to 100 Amps per phase. This Data Privacy Plan encompasses domestic consumers where premises are homes for

people. They may be individual buildings or combined units such as blocks of flats with each flat separately metered.

Which specific purposes?

- 3.6. ENWL will access SMCD solely for the purpose of meeting its duty under Section 9 of the Electricity Act 1989, in particular subsection (a): “to develop and maintain an efficient, co-ordinated and economical system of electricity distribution”.
- 3.7. Use under section 9(a) will enable ENWL to improve practices and deliver benefits generally by:
 - a) Improving planning of reinforcement and operation of the existing network;
 - b) Improving design and planning to accommodate new and increased capacity connections;
 - c) Improving design and planning to accommodate, new small scale generation; and
 - d) Building efficient networks that make use of the available data to respond intelligently to network conditions and the introduction of new technologies³.
- 3.8. The SMCD received from Smart DCC will be used to generate consumption load profiles as generally described below and explained in Appendix D:
 - a) Aggregated half-hourly consumption load profiles for each Substation, LV Feeder and Section of LV Feeder. This is for use in network planning, asset management and new connections (see Ofgem Criteria 2 for a detailed explanation of the benefits and typical scenarios where ACD may be used).
 - b) Load duration curves for each Substation, LV Feeder and Section of LV Feeder. This will be used to assess overload capability for assets. Load duration curves are explained in Appendix E.
 - c) Since the profiles in (a) and (b) above will relate to a period of less than one month, the requirements of Standard Licence Condition 10A.4 apply to this data, and ENWL will need to ensure that, so far as is reasonably practicable, it ceases to be data which is capable of being associated with a domestic customer at relevant premises.
 - d) The monthly maximum, monthly minimum, monthly average and monthly total consumption value for each individual MPAN. Since this information does not relate to a period of less than one month, it will not be subject to the requirements of Standard Licence Condition 10A.
- 3.9. In addition to the above, SMCD will be collected, when required, for specific purposes strictly in accordance with Standard Licence Conditions 10A.7 and 10A.8 for use during:
 - a) Suspected Theft – If ENWL has reasonable grounds to suspect theft or abstraction of electricity and uses SMCD for investigating the suspected theft.
 - b) Trials – If ENWL is conducting a trial that has been approved by the Secretary of State, ENWL must give at least 14 days’ notice to the domestic customer and the customer must not have objected to being included in the trial. In correspondence

³ ENWL innovation strategy <https://www.enwl.co.uk/zero-carbon/innovation/our-innovation-strategy/>

with the customer, ENWL will explain the purpose of the trial and if anything is expected of them.

4 Ofgem Criteria 2 – Use of Consumption Data

Explain how Smart Metering data favourably compare to traditional electricity consumption data in terms of feasibility, cost effectiveness and efficiency in achieving the purposes described in our first criterion, and provide any supporting quantification of the benefits that could be delivered for different groups through access to this data (e.g. network benefits, consumer benefits, future development of smart grids etc).

- 4.1 The roll-out of smart meters will play a crucial role in the North West's transition to a low-carbon economy, helping Great Britain to meet its long-term challenges of ensuring an affordable, secure and sustainable energy supply. Smart meters will enable the introduction of more sophisticated energy management through Time-of-Use Tariffs and Load Shifting that will pave the way for the smart grid and the network of the future.
- 4.2 Although the roll-out is Supplier-led to maximise the potential for consumer benefits, SMCD presents significant opportunities for ENWL.
- 4.3 The transition to low carbon technologies such as domestic micro-generation, heating and the electrification of transport has intensified the need to improve the visibility of demand and utilisation of the LV distribution network. The data from smart meters will assist ENWL in understanding where and when energy is used, allowing for more effective decisions to be made in the areas of network planning, asset management and new connections.

Limitations of traditional meters and network modelling

- 4.4 Currently, ENWL has limited visibility of the current or historic loading on the majority of the LV Network. Traditional meters play no role in determining the demand and consumption profile for the LV Network. The maximum demand at distribution substations can be monitored, although the majority of these devices require manual reading and resetting with no capability to capture load profile data. The maximum demand shown by these devices has no time stamp making it impossible to relate the maximum demand value to network configuration at the time the demand was achieved. Abnormal network running arrangements during faults or constructions could therefore distort the value.
- 4.5 Traditional electricity meters measure the cumulative energy consumed at a property. The information collected from traditional meters, therefore, does not allow a load profile to be created for the LV Feeder so that an analysis can be made for a specific time-period, for example, an annual, monthly, weekly or daily load profile.
- 4.6 Should the load profile be required for a specific LV Feeder, monitoring devices are temporarily deployed at Substations to monitor the performance of the LV Network for specific purposes. They are very effective at collecting the load profile data of the whole Substation or individual circuits. However, depending on the length of time they are installed for, do not provide accurate seasonal demand and consumption information.
- 4.7 Installing monitoring equipment incurs cost and is not possible in many locations, for example, due to physical space constraints. It is, therefore, not feasible to install

permanent monitoring in every Substation for the collection of loading data. The cost of monitoring every Substation may not provide the best value to customers.

- 4.8 A traditional method of modelling the LV Network, and in particular the load on an LV Feeder and Section of LV Feeder from a Substation, is by using an assumed “after diversity maximum demand” (ADMD) figure for each connected customer, or an estimated annual kWh consumption with a hypothetical load profile.
- 4.9 The ADMD data and assumed hypothetical load profiles have been developed from studies carried out many decades ago. They are reviewed annually to provide an average customer load profile that is used for network modelling and understanding load patterns on the LV Network. However, the data used is unlikely to be reflective of the requirements of load patterns from the emergence of low carbon technologies on the LV Network. As the proportion of smart meters installed on the network increases, their data will be able to provide a much more accurate and up to date view of load patterns on many feeders on the LV Network, allowing for improved decisions to be made in the future development of smart grids.
- 4.10 ADMD and hypothetical load profiles have tended to be conservative in their evaluation, resulting in a distribution network with available spare capacity. These assessments are now being challenged by the changes in load profiles from the installation of rooftop solar photo-voltaic systems and the balance between winter and night-time loads due to an increase in the electrification of transport and heating. Access to data from smart meters will help to overcome some of these challenges by improving visibility of the LV Network and providing load profiles much closer to actual consumption.

Consumption Data from Smart Meters

- 4.11 SMCD can be used to generate load profiles for LV Feeders and Sections of LV Feeders. These load profiles will help to provide a more time-based and detailed view of the LV network, allowing more informed decisions to be made on areas for network reinforcement and new connections.
- 4.12 ENWL has licence obligations to sign and comply with the Smart Energy Code (SEC). In turn ENWL has SEC obligations to connect to the national smart metering communications infrastructure, established and managed by Smart DCC under a regulated licence. ENWL is required to pay a charge for connecting to the Smart DCC network, predominately through monthly fixed charges for every metering point on the ENWL network. This charge is irrespective of whether it has a smart meter enrolled onto the Smart DCC network.

Obtaining a detailed view of the performance of the LV Network through smart meter consumption data is potentially a more efficient and cost effective approach compared to traditional methods such as installing temporary, or more permanent, monitoring equipment at every distribution substation. This supports ENWL in meeting its duties under Section 9(a) of the Electricity Act 1989, to develop and maintain a safe, efficient, co-ordinated and economical electricity distribution network. Separate substation monitoring and control systems also deliver significant benefits on the High Voltage (HV) network as it allows for the remote control operation of switches and automation to restore supply to customers following a fault on the HV network and will continue to be used for this purpose.

- 4.13 ENWL plans to explore imaginative and longer term avenues for the use of SMCD so that it can be used to generate further insights into how customers use our network and how the network could be used more effectively and efficiently.
- 4.14 The following describes how SMCD may be of benefit to different groups.

Network condition and planning

- 4.15 ENWL frequently installs temporary load data recording equipment in substations with LV Feeders to gain an understanding of network loads. This method is a time-consuming operation that also incurs additional costs when preparing quotations for customers requesting a new connection or increased connection capacity. Once sufficient smart meters have been installed, use of ACD to understand loads will eventually replace the need for this time-consuming exercise on a large number of LV Feeders and will help to quicken the time to respond to connection customers.
- 4.16 Reinforcement of a network often involves the provision of new, replacement or upgraded assets to increase its electrical capacity or to maintain security of supply to customers. This includes activities such as replacement of assets to relieve potential overload conditions and the provision of load-transfer capability. ACD can be used to provide visibility of the actual load on assets. This will supplement other ENWL initiatives such as the Celsius⁴ project and Smart Street⁵ in allowing over-load situations to be mitigated, subsequently helping to prevent asset failure and, therefore, extending the life and performance of assets.
- 4.17 During faults and routine maintenance, it is often necessary to temporarily reconfigure the LV Network. Observing ACD for the previous two weeks can assist in the decision-making process, potentially reducing the number and duration of outages so improving the customer experience.
- 4.18 The availability of detailed ACD across the network offers the opportunity to significantly improve network planning. For example, ACD will support the identification of specific areas of the LV Network that may need reinforcement or allow informed decisions to be made to defer network reinforcement. ENWL currently relies on assumptions when analysing load allocation on networks which involves the use of safety margins to account for unknown and unexpected loading conditions. Having accurate information regarding the loading of assets (e.g. visibility of real load profiles at each Substation, LV Feeder or Section of LV Feeder) will allow these assets to be utilised more efficiently, while at the same time ensuring they are not overloaded. In turn, this may lead to a reduction in the number of faults on the network, helping to reduce overall operational expenditure and subsequently support keeping charges low for customers.
- 4.19 Under-utilisation and over-loading of assets can lead to premature failure, poor power quality and unnecessary losses. Visibility of the consumption load profiles in Sections of Feeders and Substations can identify locations where there is capacity to transfer load from one Substation to another, deferring reinforcement and better utilising existing capacity.
- 4.20 In future, problematic phase imbalance on LV Feeders may be detectable using ACD in conjunction with phase association techniques or trials. This visibility can help to

⁴ <https://www.enwl.co.uk/zero-carbon/innovation/key-projects/celsius/>

⁵ <https://www.enwl.co.uk/zero-carbon/innovation/key-projects/smart-street/>

balance loads across phases on the Feeder and, therefore, has the potential to release capacity and defer reinforcement requirements.

- 4.21 Accurate load data collected from smart meters will help to improve network studies and assist in the identification and prioritisation of assets and cable replacement. ACD will help network studies to understand whether the network requires reinforcement, minimal reinforcement or whether reinforcement can be deferred until load reaches a specific level.

New and increased capacity connections

- 4.22 Detailed network loading analysis using ACD and parameters such as harmonics obtained from other measuring equipment, can be used to ensure that assets are being utilised within safe limits and are not being subjected to damage. Simulation of planned network changes and operations using ACD to provide accurate load data for modelling tools will help to avoid damage to assets, as it will highlight the conditions that the network would experience as a result of any proposed alteration.
- 4.23 By having a better understanding of the conditions that would adversely affect the network from any proposed changes, new connections or requests for an increased capacity connection could potentially be made more frequently without the need for significant network reinforcement.
- 4.24 ACD can help identify where spare capacity on network assets might be available, but not continuously. This can allow for timed connections to be offered to some customers based on the time of day or day of week, as well as considering any seasonal factors where headroom is identified as available on the network during certain times of the year. The ability to offer timed connections will enable a quicker connection for the customer, help to avoid potential damage to assets and may reduce the need for costly reinforcement.
- 4.25 Standard Licence Condition 52(2)(b) stipulates that ENWL must facilitate competition in the market for new connections to the electricity distribution system. Using ACD to assess load profiles will improve the position, capacity and timing of connections. This may attract a wider variety of independent connection providers, encouraging customers to choose these based on the enhanced accuracy and efficiency of network designs from use of this ACD. Tackling barriers to competition in this way may produce benefits of improved customer satisfaction, improved timeliness of quotations, increased incentives to innovate and reduced prices to those customers.
- 4.26 ACD will help to provide more accurate costs for new connection requests when carrying out network assessments, compared to current processes that often use assumed load data. Additionally, accurate assessments will also support managing loads on the network, avoiding any potential overload situations that could damage assets.

Improved control and access to data

- 4.27 The combination of accurate ACD and asset data with greater control will pave the way for the network of the future. It will provide information and capability to support expansion of low carbon technologies (LCT) with Time-of-Use Tariffs. There will be the ability to undertake Active Network Management (ANM) on the LV Network and defer the need for network reinforcement and new investment, with smart meters forming a foundation of the smart grid.

- 4.28 Increases in the use of small-scale micro-generation from LV connected photovoltaic roof-top systems cause a reduction in network performance, preventing the network from operating at its maximum available capacity. ACD will provide the ability to carry out improved assessments of the performance of the network and allow for mitigating actions to be taken to help ensure that the network is operating as close as possible to its optimum capacity.
- 4.29 ACD can help to identify areas of poor power factor giving ENWL the opportunity to take corrective action. This would improve voltage control and release system capacity by reducing system losses.
- 4.30 Improved knowledge of power flow can help to identify where adverse situations that could have an impact on planning, outage calculations and restoration actions after an outage may exist. ACD at Section of LV Feeder level could help ENWL to better manage and adapt to the changes and impacts associated with the introduction of small-scale microgeneration roof-top systems.
- 4.31 The introduction of electric vehicles (EVs) and charging points, as well as other low carbon technologies such as electric heat pumps, have the potential to increase the rate of load growth far in excess of historic rates. Smart meter consumption data has a crucial role to play in Great Britain's transition to a low carbon technology society. Smart meters are an element of the ENWL DSO roadmap⁶
- 4.32 Traditional network reinforcement is likely to be expensive and may be unable to support this growth, necessitating smarter management of the LV Network. ACD will be used to better understand load related issues on existing infrastructure and provide visibility of which sections of the network may need reinforcement, helping ENWL to support the use and expansion of low carbon technologies. It will provide a more detailed insight into networks by LV Feeder and Section of LV Feeder, enabling ENWL to understand total volumes of energy movement and daily peaks of energy consumption from EVs and other low carbon technologies. Having this understanding will help future development of a coordinated and efficient smart grid that is able to adapt effectively to the demands on the network.

Quantification of benefits

- 4.33 As part of the ENWL ED1 submission, significant benefits relating to smart meters were identified in the Smart Metering Business Plan (see Appendix B). However, with the next stage of the national smart meter roll-out, the lower enrolment/installation rate in the North West and technical issues associated with Power Outage Alerts, the majority of benefits identified will not be realised during the ED1 period. Accordingly, the majority of benefits are likely to be realised once a significant proportion of the ENWL customer base has a smart meter installed (see Appendix B for more details on the quantification of benefits).
- 4.34 ENWL is taking a pivotal role in leading the North West to Zero Carbon⁷. The knowledge gained during the ED1 period about network and consumption data, as well as the systems being used, will help to provide the platform for a transformed DNO role moving towards enhanced DSO functionality that can support extensive low

⁶ <https://www.enwl.co.uk/globalassets/zero-carbon/dso/dso-consultation-documents/dso-strategy-2020-.pdf>

⁷ <https://www.enwl.co.uk/globalassets/zero-carbon/leading-the-north-west-to-zero-carbon/documents/leading-the-north-west-to-zero--carbon.pdf>

carbon technologies and distributed generation. This is a vital step in helping the North West and Great Britain generally to secure long-term sustainable energy provision.

5 Ofgem Criteria 3 – Commercial use

Provide assurance that any commercial use of the data by the DNO or third parties is excluded from these purposes, both before and after the data anonymisation.

Use of Consumption Data by ENWL, Independent Network Operators, Independent Connection Providers and other third parties

- 5.1 ENWL will process SMCD solely for meeting its duties under Section 9 of the Electricity Act 1989. As such, ENWL will only use the data to meet its legal obligations and not for any other commercial purpose.
- 5.2 ENWL will only share ACD with Independent Network Operators (IDNOs), Independent Connection Providers (ICPs) or other third parties appointed by ENWL to carry out work pursuant to meeting its legal obligations. ENWL will implement appropriate policies, procedures and internal controls to ensure that it is only shared when provided with conditions for use.
- 5.3 ENWL will be using SMCD, for the purposes described in Criterion 1 and Criterion 2, to allow it to develop and maintain a safe, efficient, co-ordinated and economical system of electricity distribution network and to support competition in connections. ACD will be shared with ICPs and IDNOs only to the extent necessary to comply with Standard Licence Condition 52.2, allowing them to operate to agreed procedures for network analysis to determine a “self-approved” point of connection on the network. This data will be made available:
 - a) on an equivalent basis and with requirements to ensure that it is not used for any other purpose such as commercial use or marketing; and
 - b) organisations or individuals contracted to ENWL only to the extent that allows them to discharge these responsibilities on behalf of ENWL.

Contractual arrangements with Independent Network Operators, Independent Connection Providers and other third parties

- 5.4 ACD will be made available to ICPs and IDNOs with whom ENWL has entered into a framework agreement relating to the Competition in Connections Code of Practice. The data will only be shared in compliance with Standard Licence Condition 52.2 to facilitate competition in the Local Connections Market. ICPs and IDNOs will only have access to ACD profiles for Substations, LV Feeders and Sections of LV Feeders pertinent to the scope of the individual application.
- 5.5 ENWL may share ACD with consultants and universities who will act as Data Processors and process the data on behalf of ENWL, for example, to support a research project.
- 5.6 The ENWL Company Privacy Policy⁸ includes supplemental information about smart metering data.

⁸ https://www.enwl.co.uk/misc/privacy-policy/#_Toc61600927

- 5.7 Where ENWL is conducting a trial in accordance with Standard Licence Condition 10A.8 (which requires consumers to be advised of the trial and given the opportunity to object) and is working with a university or consultancy as part of the trial due to technical expertise being required, ENWL may share SMCD for the purpose of that trial with the university or consultancy. Before sharing SMCD with these parties, ENWL will ensure that appropriate contractual arrangements are in place, including clauses providing sufficient guarantees that the Data Processor will protect SMCD, ensure compliance with the GDPR, and not use the SMCD for any purposes other than those specified by ENWL. The consumers in the trial will know that they are in a trial and will have a contact at ENWL to whom they can direct any questions regarding data privacy.

6 Ofgem Criteria 4 – Data processing

Explain clearly how, where, when and by whom collation, maintenance, use and deletion of the data would take place securely and cost-effectively (these steps form what is referred to as 'Electricity Consumption Data life cycle' in the ENA's Generic Privacy Framework).

Collation of data

- 6.1 ENWL does not have its own communication network with smart meters. To obtain data from smart meters, ENWL requests data from the smart meter via Smart DCC network infrastructure. On request from ENWL, each smart meter transmits consumption data to servers controlled and operated by Smart DCC. The secure ENWL IT system may only access this information via a gateway connection to the Smart DCC network. Access to the Smart DCC network is strictly regulated and is subject to independent annual security assessments to ensure ENWL, and all Users, are operating secure IT systems in compliance with SEC security obligations.
- 6.2 Smart DCC (a wholly owned subsidiary of Capita Plc) operates under licence (the "Smart DCC Licence") granted by the Department for Energy and Climate Change (now part of BEIS) and regulated by Ofgem (the "Smart Meter Communication Licence"). This licence runs for a fixed term and is granted to a single licence holder. It permits the licence holder to establish and manage smart metering data and communications infrastructure in Great Britain.
- 6.3 ENWL will initiate SMCD requests to obtain half-hourly consumption data stored in smart meters using different mechanisms, dependant on the circumstances:
- a) Monthly automated service requests for all meters within the ENWL footprint. These will be sequenced so as not to overload DCC or ENWL communication and data handling capabilities.
 - b) Manually initiated requests for recent SMCD for a specific LV Feeder or section of LV Feeder covering the two weeks prior to the request. This type of request will typically originate from an operational engineer working on the network.
 - c) A manually initiated request associated with License Condition 10A.7 or 10A.8.
- 6.4 SMCD will only ever be collected by ENWL via the Smart DCC network which has been rigorously tested to ensure its security. The SEC is a multi-party agreement that sets out the terms for the governance of the end-to-end management of smart

- metering. This includes setting out strict requirements which must be met by organisations regarding the security of connecting to the Smart DCC network.
- 6.5 The ENWL Smart Metering Systems Gateway (SSG) IT system interfaces with the Smart DCC network to collect data. Smart DCC publishes and maintains a number of interface specification documents which set out guidance on the interaction of the Smart DCC network infrastructure with the infrastructure of its users. This includes technical and interface specifications which set out technical and security requirements which user interfaces must meet in order to be granted access to smart meter data and enable their systems to interact with Smart DCC services. The ENWL gateway complies with Smart DCC specifications. This compliance was initially tested as part of the process of granting access and User Entry Testing to the Smart DCC network in 2016. Since then, ENWL has undergone an annually security assessment to ensure we are approved to continue to connect to the DCC network.
- 6.6 [REDACTED]
- 6.7 The ACD will be maintained in the Smart Meter Data Store (SMDS) and Network Management System (NMS), accessed as required by ENWL controlled processes and applications.
- 6.8 The SMDS will be configured to only maintain 7 years of ACD, deleting any which is older than this.
- 6.9 NMS has the facility to hold up to 12 months ACD. This will be refreshed periodically in a controlled way such that old data is overwritten and replaced by more current information.
- 6.10 ACD will be available to other applications, [REDACTED]
- 6.11 [REDACTED]
- 6.12 Consumption data for a period of less than one month will only be collected in compliance with Standard Licence Condition 10A and where the requirements of Standard Licence Conditions 10A.4, 10A.5, 10A.7 or 10A.8 are satisfied as follows:
- a) For SLC10A.4 & 10A.5, a Data Privacy Plan has been submitted to and approved by Ofgem, demonstrating that ENWL can implement practices, procedures and systems ensuring that data obtained which relates to a period of less than one month ceases to be data which is capable of being associated with a domestic customer at relevant premises.
 - b) For SLC10A.7, there is suspected illegal activity and ENWL has reasonable grounds to suspect theft or abstraction of electricity.
 - c) For SLC10A.8, ENWL is conducting a trial that has been approved by the Secretary of State. ENWL will have given at least 14 days' notice to the domestic customer and the customer will not have objected to being included in the trial. In correspondence with the customer, ENWL will explain the purpose of the trial and if anything is expected of them.
- 6.13 SMCD which has not been subject to anonymisation and aggregation will not be stored in the SMDS.
- 6.14 In the scenario where ENWL may store SMCD in accordance with Standard Licence Conditions 10A.7 or 10A.8, the data will be held in a secure environment with restricted access to a defined set of users who have an approved business need for access to

the data to investigate a theft or for a trial. Any investigation of theft or trial will be for a defined period of time, whereby the SMCD will be deleted after the investigation and any subsequent prosecution of theft or trial has taken place.

- 6.15 ENWL will treat all household electricity SMCD as if it were Personal Data. This approach means that a consistent, high level of security will be applied to all SMCD. The measures that ENWL will implement to safeguard and anonymise SMCD are set out in the Privacy Impact Assessment in Appendix A of this Data Privacy Plan.
- 6.16 A Section of LV Feeder consists of five exit points (MPANS) whose SMCD has been aggregated to produce a single consumption profile (ACD). This aggregated consumption profile is assigned to each of the five properties.
- 6.17 [REDACTED]
- 6.18 [REDACTED]. ENWL currently has 2,387,835⁹ customers who might eventually have a smart meter connected to Smart DCC communication systems.

Controls for using Consumption Data

- 6.19 ENWL, BEIS, ENA and Ipsos MORI have carried out consultations with various consumer groups and customers to understand their views on the collection of consumption data from smart meters. Where concerns have been raised, these generally focus on SMCD potentially being used for other purposes such as marketing or to profile occupancy of a premise with the intent of burglary. Only authorised users, including third party users who form part of a defined authorised group with the required training will have access to ACD, thus limiting the risk of unauthorised access and incorrect use of ACD.
- 6.20 The majority of authorised users will only have access to the ACD or the monthly total, maximum, minimum and average consumption value. The inherently limited nature of the information, therefore, will make it impractical to use ACD for commercial or marketing purposes.
- 6.21 ENWL will set up organisational processes to ensure that all user applications that will have access to SMCD or ACD will be subject to a Data Protection Impact Assessment (DPIA) before any SMCD or ACD is made available, ensuring that appropriate controls are identified in order to further protect and prevent the data from being used for commercial or marketing purposes. ENWL will also ensure that appropriate contractual arrangements will be in place, including clauses with third parties providing sufficient guarantees that Data Processors will protect SMCD, comply with the GDPR, and not use the data for any purposes other than those specified by ENWL.
- 6.22 Once ENWL is able to collect SMCD, any systems accessing consumption data will be subject to access controls consistent with ENWL policy.
- 6.23 ACD is further protected from unintended use for commercial purposes by the nature and format of the data. ENWL will only make this data available in the form of a Consumption Profile. [REDACTED]
- 6.24 ENWL is registered with the Information Commissioner's Office (ICO) and has a dedicated team under the auspices of the Data Protection Officer (DPO) to oversee all aspects of data protection, including responding to requests received from customers wishing to exercise their rights under the GDPR. The duty of this function is to ensure

⁹ Information based on meter type in MPRS in July 2020

compliance with the GDPR and DPA 2018. Customers who have concerns about how their SMCD is used, where this could include concerns about their data being used for marketing or other commercial purposes, will be able to contact the ENWL to discuss their concerns¹⁰.

- 6.25 ENWL will update its privacy policy on its website, clearly explaining the limited purposes for which it will use SMCD. Any customers who have concerns that their SMCD may be used for other purposes will be provided with appropriate contact details to enable them to raise these concerns with the ENWL DPO function.

Deletion

- 6.26 All source data relating to individual smart meters (SMCD) which is used to calculate the ACD will be automatically, permanently deleted as soon as the data has been anonymised and aggregated.
- 6.27 From the date of collection, ENWL will store ACD for a period of 7-years. The stored data will be permanently deleted, automatically, on a rolling 7-year period. The ENWL IT application support team will ensure that ACD in the SMDS is deleted in compliance with the 7-year retention period. The 7-year retention period is considered to be the optimum period for long term strategic planning of the LV network as it will provide a long term historical load profile with the capability of producing more accurate trends for future load growth. The 7-year retention period also aligns with the RIIO-ED2 reporting period (5-year regulatory period plus an additional 2 years following closure of RIIO-ED2 to respond to any queries). Storing data for a 7-year period will therefore support ENWL regulatory reporting.
- 6.28 ENWL will ensure that ACD is deleted after use by authorised data requesters rather than stored for an uncontrollable length of time by:
- 6.29 Where ENWL collects SMCD in accordance with Standard Licence Condition 10A.7 or 10A.8 to investigate a theft or for a trial, this data will be held in a secure environment with controlled access restricted to specific users.
- 6.30 In accordance with Standard Licence Condition 10A.7, relating to ENWL investigating suspected theft or abstraction of electricity, the SMCD will be deleted following closure of all legal proceedings and any subsequent prosecution for theft or on completion of the investigation where no legal proceedings take place. In the event of any appeals following the conclusion of a legal trial, there may be a requirement to extend the duration that the SMCD is held for until the appeals process is concluded.
- 6.31 When collecting SMCD in accordance with Standard Licence Condition 10A.8, for a trial basis, the trial will have a defined period of time dependent on the purpose of the trial. All SMCD will be deleted following completion of the trial period.

7 Ofgem Criteria 5 – Consideration of techniques to mitigate processing risks

Demonstrate that consideration has been given to the best available techniques for minimisation, aggregation, anonymisation and/or other treatment of data. The ICO's

¹⁰ The ENWL DPO can be contacted on dataprotection@enwl.co.uk

Anonymisation Code of Practice should be used, among other sources, to inform the data anonymisation processes adopted.

- 7.1 In considering the ICO's Anonymisation Code of Practice, ENWL has taken into account the fact that the Anonymisation Code of Practice was published prior to the GDPR coming into effect and that in the future, the ICO is likely to replace the Anonymisation Code of Practice with GDPR-compliant guidance on anonymisation. However, no such guidance has currently been published. ENWL has therefore reviewed and taken into account the current Anonymisation Code of Practice, among other sources, to help identify and adopt the best available techniques to safeguard SMCD with an awareness that parts of the Anonymisation Code of Practice may not reflect current practice or law.
- 7.2 The process of anonymisation can, in principle, be achieved using various techniques to convert Personal Data into anonymised data, with the term 'anonymised data' referring to data rendered anonymous in such a way that the data subject is no longer identifiable. In the case of SMCD, the data subject is a household.
- 7.3 Under the GDPR it remains possible to anonymise Personal Data using the technique of aggregation¹¹. It is acknowledged that the larger the number of properties that are aggregated, the greater will be the contribution to data protection of the individual. The research paper, "Smart Meter Aggregation Assessment" Review of the evidence¹² enumerates the quality of privacy protection at differing levels of aggregation.
- 7.4 ENWL acknowledges that, despite SMCD undergoing different anonymisation techniques, there are different views as to when it has been aggregated to the extent it has been rendered anonymous and therefore no longer constitutes Personal Data. ENWL intends to take the approach that it will treat all SMCD as if it was Personal Data. Therefore, ENWL will comply with the GDPR and Data Protection Act 2018 in relation to its processing of SMCD and apply appropriate techniques to safeguard the data.

Data minimisation

- 7.5 Data minimisation is one of the seven key principles set out in Article 5 of the GDPR and has been taken into consideration in the development of the ENWL data processing techniques for SMCD.
- 7.6 ENWL will implement the principle of data minimisation by:
- a) Only collecting SMCD to the extent that data is needed for specific, pre-determined purposes;
 - b) Ensuring that there is sufficient data to properly fulfil those purposes; and
 - c) Periodically reviewing the approach to data retention to ensure that SMCD and ACD is being stored for a justifiable period of time and that it is deleted when no longer needed. Reviews will be conducted in line with ENWL policy.

Anonymisation through aggregation

- 7.7 ENWL will aggregate SMCD which is to be stored in the SMDS in the following ways:

¹¹ Recital 162 of the GDPR implies that aggregation may, in principle, be used to anonymise personal data.

¹² "Smart Meter Aggregation Assessment" Review of the evidence, George Danezis, 2015

- a) Half-hourly consumption data figures for each meter on a particular feeder will be totalled so that the half-hourly consumption data obtained from a particular meter will be added with that of other meters on the same LV Feeder.
 - b) Half-hourly consumption data figures for each meter on a particular Section of LV Feeder will be totalled so that the half-hourly consumption data obtained from a particular meter will be added with that of other meters on the same Section of LV Feeder
 - c) The half hourly consumption data figures for each meter will be summated and banded to produce a load duration curve for the LV Feeder.
 - d) The half hourly consumption data figures for each meter will be summated and banded to produce a load duration curve for the Section of LV Feeder.
- 7.8 ENWL will aggregate up to 2 weeks of SMCD, which is available on-request, in the following ways:
- a) Half-hourly consumption data figures for each meter on a particular LV Feeder will be totalled so that the half-hourly consumption data obtained from a particular meter will be added with that of other meters on the same LV Feeder.
 - b) Half-hourly consumption data figures for each meter on a particular Section of LV Feeder will be totalled so that the half-hourly consumption data obtained from a particular meter will be added with that of other meters on the same Section of LV Feeder
- 7.9 ACD, made available to authorised end users such as system design and planning engineers, will ensure that no data relating to or identifying individuals is shown, with data being displayed as aggregated consumption values.
- 7.10 Table 1 below shows the current number of customer MPANs connected to an LV Feeder for the entire ENWL customer base (2,387,835¹³ customers). 97.7% of customers are served by an LV Feeder with five or more meters connected to it. This means that, in the majority of cases, ENWL will be aggregating SMCD obtained in respect of at least five smart meters.

Table 1: LV Feeders with a low volume of MPANS

MPANS on feeder	Number of feeders	Total MPANs	Proportion of customer base
1	4,996	4,996	0.21%
2	6,132	12,264	0.51%
3	5,751	17,253	0.72%
4	5,232	20,928	0.88%

- 7.11 [REDACTED]
- 7.12 Overall, ENWL will use aggregation, as well as other techniques detailed in this document, to form part of its privacy solution and minimise the risk relating to processing SMCD. ENWL will adopt a best practice approach and treat all such data

¹³ Information based on meter type in MPRS in July 2020

as Personal Data and will therefore comply with the provisions of the GDPR and DPA 2018 when processing it.

8 Ofgem Criteria 6 – Privacy Impact Assessment

Be accompanied by a Privacy Impact Assessment, consistent with the ICO's code of practice.

- 8.1 ENWL has carried out a Privacy Impact Assessment that is consistent with the ICO's Code of Practice. The Privacy Impact Assessment has been reviewed and approved by the ENWL DPO.
- 8.2 A copy of the Privacy Impact Assessment can be found in Appendix A of this Data Privacy Plan.

9 Ofgem Criteria 7 – IT Security Processes

Demonstrate the conformity of the adopted IT security process to the ISO 27001 and ISO 27005 standards in order to exclude any possibility of the DNO re-associating the granular data to a premises after its anonymisation has been achieved.

- 9.1 SEC code administrator appointed auditors carry out annual security assessments of the ENWL access and gateway connection to the Smart DCC network to ensure compliance with the SEC security obligations. These assessments have allowed ENWL to continue to access the DCC network.
- 9.2 The smart metering network is subject to a defined governance regime incorporating regular operational and management oversight. This ensures that there is continuous improvement of ENWL smart metering systems to meet or exceed the system processes and security standards set by the SEC. Risk and performance management is included as a standard component of the governance framework.
- 9.3 ENWL will only obtain SMCD from the central Smart DCC network using secure data transmission in keeping with the SEC. It is not possible to obtain data from smart meters without using the secure communications link to the Smart DCC network.
- 9.4 Access to the data will be controlled by a governance function providing audited access to a limited number of specific applications used by authorised users, such as the Network Management System used by the control centre or network modelling applications. Ad-hoc access to the data will not be permitted.
- 9.5 Except in the cases of LC10A.7 and LC10A.8, all data accessed through the controlled set of user applications will have undergone aggregation and anonymising techniques and do not obtain any personally identifiable information, such as names, addresses, contact details and MPAN, from the smart meter.
- 9.6 Where LC10A.7 and LC10A.8 apply, all data will be accessed through a controlled user application with separate authorisation and access protocols to ACD stored in the SMDS.
- 9.7 Policies and procedures documenting the governance processes for personal data are published on ENWL internal intranet site. Relevant policies and procedures will be updated where necessary to include the provisions to safeguard SMCD and ACD.

- 9.8 Access to IT systems will be restricted to individuals that need the data to fulfil their roles. ENWL has systems and protocols in place such that an individual login is required to access corporate systems with enforced, routine password changes. Access to IT user interfaces requires manager approval.

10 Ofgem Criteria 8 – Stakeholder Engagement

Demonstrate that, in developing its privacy plan, the DNO has engaged constructively with relevant stakeholders, including consumer groups and those with expertise in approaches to data privacy. The DNO must provide details about the output of such engagement, including how it has responded to the feedback in refining its Data Privacy Plans.

- 10.1 ENWL has engaged constructively with stakeholders during the development of its Data Privacy Plan by carrying out the following activities:
- Telephone surveys with customers;
 - Consultation with ENWL stakeholder groups;
 - On-line surveys with stakeholder groups; and
 - ENA initiatives.
- 10.2 During June and July 2020, ENWL undertook a telephone survey with 206 customers. Using a mixture of scaled responses to questions and qualitative opinions, the telephone survey focused on obtaining views relating to ENWL receiving access to SMCD, as well as views on the safeguards that ENWL will put in place to protect the data.
- 10.3 The ENWL Consumer Vulnerability Stakeholder Advisory Panel and Chief Executive Stakeholder Advisory Panel were briefed on proposals for using SMCD with 11 subsequently responding to an on-line consultation.
- 10.4 The survey sample was statistically robust across domestic customers. Amongst other things, it took account of location, age, vulnerability and socio-economic banding.
- 10.5 The survey sample was statistically robust across business customers in the public, private and charity sectors.
- 10.6 Appendix C shows the results from the June/July 2020 stakeholder consultation.
- 10.7 Responses showed that 65% of people surveyed were “comfortable” with ENWL having access to SMCD to help provide them with a more efficient and reliable service. A further 23% were ambivalent.
- 10.8 There is a direct correlation between awareness of ENWL and the level of comfort that customers have with sharing data. Those that knew at least a little about ENWL being more comfortable than those who knew nothing about them or were not aware of them.
- 10.9 22% of customers who responded believed SMCD to be ‘sensitive’. Of these, 70% were comfortable or ambivalent about ENWL having access to it. The main reasons given for believing it to be sensitive were that it could reveal sensitive information about the property or compromise safety.
- 10.10 Customers were provided with a list of measures that ENWL could put in place to protect their data and asked to rate the importance of each measure using a ten-point scale. The most important safeguard (96%) was that ENWL would not share or sell

consumption information for marketing purposes with third parties. This was closely followed (95%) by ensuring that information was stored securely to prevent unauthorised access.

- 10.11 74% indicated that it was important for ENWL to anonymise and aggregate data so that it cannot be linked to individual properties.
- 10.12 Using the feedback received from stakeholders, ENWL has ensured that the concerns have been included in the Data Privacy Impact Assessment and subsequent Data Privacy Plan. There are commitments, supported by practical measures, to keep the data secure and not to use it for marketing purposes.

Engagement with experts in data privacy and GDPR

- 10.13 Development of this Plan and the associated Privacy Impact Assessment included feedback from expert teams within ENWL from Regulation, IS Cyber Security, Legal and the DPO. Feedback focused on ensuring that ENWL has the correct safeguards in place to protect the data; GDPR and Licence Condition 10A compliance; and the purposes for which SMCD would be used in the business. Feedback was reviewed and used to refine the Data Privacy Plan.

Electricity Networks Association initiatives

- 10.14 In addition to the stakeholder engagements carried out specifically by ENWL as detailed above, a number of ENA sponsored initiatives have also taken place. For example, a Generic Privacy Framework was developed to provide guidance to all DNOs around access to consumption data from smart meters and the Smart Meter Data Privacy Plan.
- 10.15 In 2017, Ipsos MORI published an ENA sponsored report that conducted consumer focus groups, designed to be representative of the GB population, to obtain consumer views and attitudes to DNOs having access to the half-hourly consumption data contained in smart meters¹⁴.
- 10.16 Overall, the results from the focus groups were similar to those of the ENWL telephone surveys and stakeholder panel feedback. Generally, consumption data was not considered overly sensitive information by most participants and many were comfortable with the data being accessed on the understanding that it would be used for its intended purpose, held securely and not used for marketing.

¹⁴ Ipsos MORI report 'Consumer attitudes to DNO access to half-hourly electricity consumption data', 2017, <http://www.energynetworks.org/assets/files/Ipsos%20MORI%20Report%20DNO%20Use%20of%20HH%20Data%20-%20FINAL%2016-03-17.pdf>

Data Privacy Impact Assessment (DPIA)

Access to and use of domestic and small
commercial electricity Smart Metering
Consumption Data

Peter Skirvin

August 2020

EXECUTIVE SUMMARY

About this Privacy Impact Assessment

Electricity North West Ltd (ENWL) wishes to collect and process Smart Meter Consumption Data (SMCD) obtained from customers to meet its duty under Section 9(1) of the Electricity Act 1989 to maintain an efficient, coordinated, and economical system of electricity distribution. SMCD is associated with a premise such as a house, a flat within a communal building or a small business. It may be possible to associate it with an individual or group of individuals and, in this respect, following direction from Ofgem, it is to be treated as personal data.

This Privacy Impact Assessment identifies the key privacy issues relating to the processing of this SMCD and the controls that will be implemented by ENWL to address them.

The aim of ENWL in carrying out this Privacy Impact Assessment is to ensure compliance with the GDPR and the Data Protection Act 2018, ensuring that appropriate controls are put in place to address the issues identified that may affect the privacy of ENWL customers when processing SMCD.

In developing this Privacy Impact Assessment, ENWL has concluded that key privacy risks can be mitigated or removed completely through the implementation of the solutions described in this Privacy Impact Assessment and summarised below:

- a. The ENWL Privacy Policy will be updated on its website before processing of SMCD takes place. The Privacy Policy will follow the requirements set out in Article 13 of the GDPR and will be clear, open and honest.
- b. A Smart meter section on the ENWL website will be developed and introduced to include information relating to how ENWL plans to process and use SMCD. This will be done prior to ENWL processing any SMCD.
- c. ENWL will implement a Data Privacy Plan approved by Ofgem. The document will set out how ENWL can implement the appropriate practices, procedures and systems to aggregate or otherwise anonymise SMCD in line with the criteria set out by Ofgem in their open letter dated 30 September 2016.

- d. ENWL has a Data Protection Officer (DPO) to meet the requirements of the Information Commissioners Office and act as single point of contact for customers wishing to exercise their rights under the GDPR. The DPO is supported by a Data Protection team. Accordingly, the DPO and/or members of the Data Protection team will oversee any personal data requests or privacy queries relating to SMCD.

- e. Rigorous end-to-end industry testing has been carried out as part of the Smart meter roll-out, ensuring robust and secure processes associated with the SMCD that ENWL would receive.

- f. ENWL will only obtain SMCD from Smart Energy Code governed processes and infrastructure linking ENWL to the central Smart Data Communications Company (DCC) system using secure data transmission. It is not possible to obtain data from smart meters without using the secure Smart DCC communications link.

- g. ENWL IT security systems meet the requirements set out in Section G 'Security' of the Smart Energy Code. All employees with access to smart meter systems are screened in accordance with BS7858. ENWL has implemented an Information Security Management System (ISMS) which is compliant with the standard of the International Organisation for Standards in respect of information security risk management known as ISO/IEC 27005:2011 (Information Technology – Security Techniques – Information Security Risk Management and we are also compliant with the standard of the International Organisation for Standards in respect of the security, reliability and resilience of its information assets and processes and its User Systems ISO/IEC 27001:2013 (Information Technology – Security Techniques – Information Security Management Systems). Additionally, as with all DCC Users, ENWL is subject to annual independent audit conducted by the Smart Energy Code (SEC) appointed 'User Independent Security Assurance provider'.

- h. ENWL will produce new policies and procedures or update relevant existing policies and procedures for the handling and management of SMCD. Training, including mandatory data protection eLearning, will be provided to employees handling SMCD.

Principle: SMCD constitutes Personal Data

All SMCD collected will be treated as if it were Personal Data, ensuring that ENWL complies with the requirements of the GDPR and DPA 2018 when processing it.

For the purpose of this Impact Assessment, Smart Meter Consumption Data at a granularity of less than one month obtained from smart meters is referred to as SMCD where this information is considered Personal Data under the GDPR and DPA 2018. As such, ENWL will comply with the provisions of the GDPR and the DPA 2018 when processing it.

ENWL will not be processing any special category Personal Data

Special category Personal Data is data which 'reveals racial or ethnic origin, political opinions, religious or philosophical beliefs, etc.'

ENWL does not regard SMCD to reveal the type of information stated in Article 9(1) of the GDPR. Any inference of special category information drawn from SMCD would be too speculative to warrant that SMCD should be treated as a special category. The requirement to identify a separate condition for processing special category data under Article 9 of the GDPR is, therefore, considered outside the scope of this impact assessment.

Step 1: Identify the need for a DPIA

Explain broadly what the project aims to achieve. A data flow map would be useful to highlight how personal data flows between people, systems and organisations. **Please explain any technical terms and acronyms.**

Electricity meters are installed in premises to record electricity consumption for billing purposes. A new generation of meters, referred to as 'smart meters' is being rolled out nationally. Smart meters are being installed in premises such as houses, flats within a communal building or small businesses.

Smart meters record electricity consumption for an individual customer every half hour and this information can be accessed remotely without the need to visit the premise. This information can be used to improve efficiency in operating the electricity distribution network; facilitating the transition to a Distribution Network Operator (DNO); and supporting the move to a low carbon economy. This is done by using the data available from smart meters in distribution system analysis and planning, enabling decisions to be made that minimise the cost (having to build more network) and disruption (digging up roads and turning off power) to customers.

Individual premises are connected to an electricity distribution main, referred to as an LV Feeder. An LV Feeder has one or more individual premises connected to it. An LV Feeder consists of different sized cables joined together with different numbers of customers connected to each section of cable. This is shown in diagram 1.

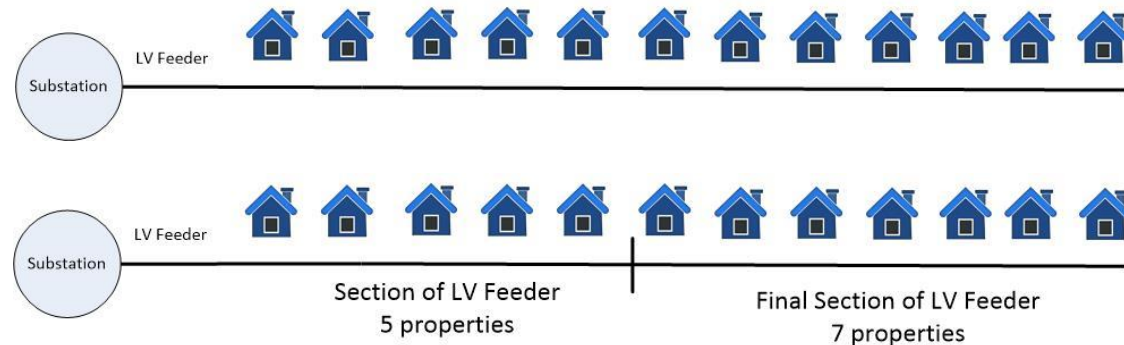
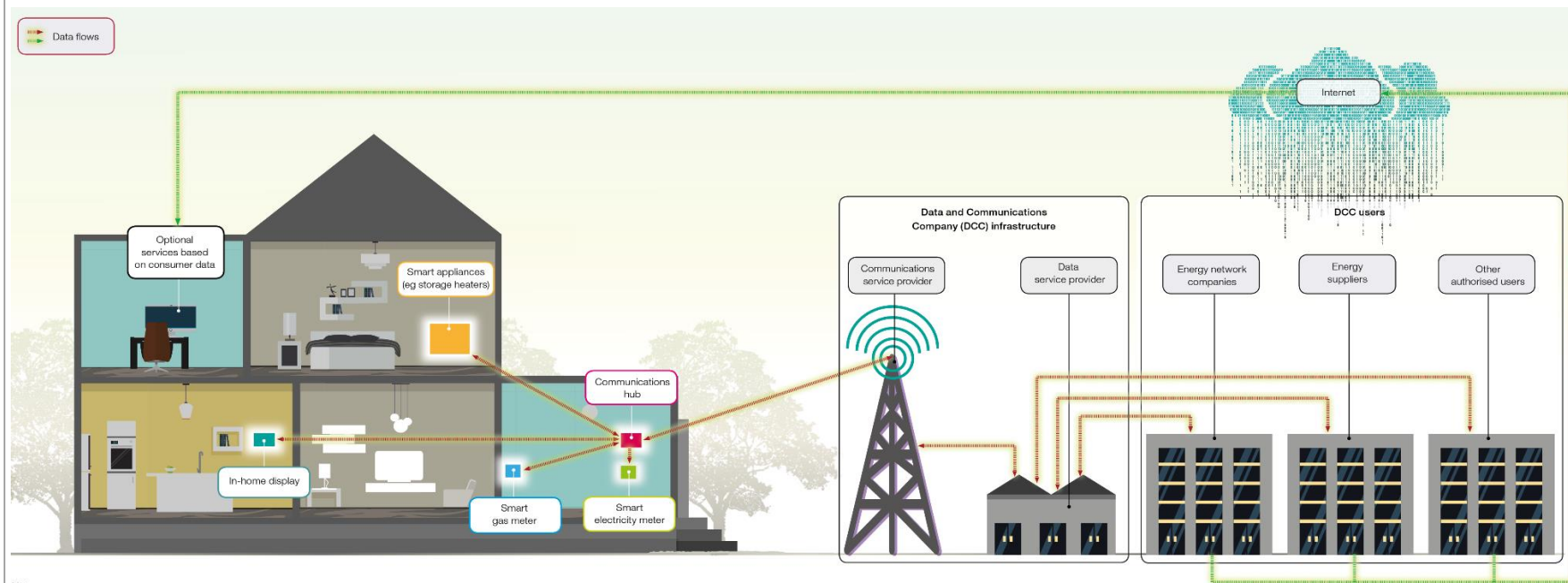


Diagram 1: LV Feeder

How this network performs and is developed relies on modelling. This modelling uses actual data and estimated data. The greater the volume and accuracy of actual data, the more accurate the model will be. SMCD provides more actual data than currently exists.

This project aims to develop and implement practical systems which allow customers, ENWL and other stakeholders to benefit from the enhanced visibility of the demand on the low voltage electricity distribution network (actual data) that SMCD provides. In doing so it must also ensure that the privacy of customers to whom the data relates is protected.

Drawing 1¹⁵ provides an overview of the national SM infrastructure.



Drawing 1: National Smart Meter Communications Infrastructure

¹⁵ National Audit Office – Rolling out smart meters, November 2019

[REDACTED]

Step 2: Describe the processing

Nature of Processing: describe what personal data is involved? how will you collect, use, store and delete data? Will you be sharing data with anyone? What types of processing identified as likely high risk are involved?

What personal data is involved?

The data involved is the electricity consumption for a premise. This will typically be a household or small business. The data is the electricity consumption used in each half hour period. This provides a load profile for the premise.

The technical elements of SMCD are import active kWh unit consumption and import reactive kVArh unit consumption. These elements of SMCD will be collected on a rolling monthly basis for aggregation and storage.

[REDACTED]

How will it be collected and used?

The data is electronic and will be collected using automated systems.

Electricity usage for a premise is recorded by an electricity meter. The meter is the property of an electricity supplier or meter operator. It is used for billing the premise for electricity consumed.

SMCD will be requested from each smart meter on a rolling monthly basis. The ENWL Smart Service gateway (SSG) is the secure application which sends requests for data to, and receives the data responses from, the smart meter device installed in customer's premise. When ENWL requests the SMCD from an individual meter, all requests and responses are securely channelled via the DCC national infrastructure. It is not possible to access the smart meter devices directly. DCC is a separate Regulated authority outside the scope of this Privacy Impact Assessment. When the SMCD arrives with ENWL, it falls within the scope of this impact assessment.

ENWL will maintain a database of the MPANs associated with each LV Feeder and Section of LV Feeder. Prior to storage, the data will be aggregated against the appropriate LV Feeder and Section of LV Feeder. The original SMCD will then be deleted. Being both aggregated and stored against a Section of Feeder useful only to the ENWL asset management system and analysis tools results in the SMCD being effectively anonymized.

After processing, the SMCD becomes Aggregated Consumption Data (ACD) to be used by engineers to model electricity usage on the LV electricity distribution network.

The ENWL proposal for data aggregation is to produce a consumption profile for every 5 properties along the length of a feeder. This is referred to as a Section of LV Feeder. This aggregated profile will then be assigned to each premise on that Section of LV Feeder. Where the last Section of LV Feeder has less than 5 MPANs, the last section will be aggregated with the previous Section of LV Feeder. [REDACTED]

How will we store the data?

Data received via the DCC will be temporarily stored in the SSG whilst the data collection and aggregation process takes place. As soon as the aggregation process is complete, the original SMCD is deleted. The aggregated data is then stored in a secure Smart Meter Data Store (SMDS) which is separate from the SSG system itself. At this stage it has lost any direct linkage to the MPAN and is referred to as Aggregated Consumption Data (ACD) in this impact assessment. The various network management tools employed by ENWL then draw on this data store as and when required. Network analysis tools that use ACD from the SMDS draw on the data as and when required without storing it. Users of the data are required to comply with ENWL policies 'Handling Personal Data' and 'Securing Personal Data' when using data from the SMDS.

When systems are developed, the Network Management System (NMS) will store the most recent 12 month period of ACD for LV Feeder and Section of LV Feeder. It does this by assigning an ACD profile to each relevant premise.

The SMDS will store ACD for a maximum of 7 years. This is the minimum period of time for which the data is expected to provide useful information, reflective of actual use and to show how electricity load is changing over time which is necessary for long term planning. It also aligns with Regulatory Review Periods, allowing for some analysis overlap.

SMCD will only be held temporarily in the SSG whilst the aggregation process takes place. This is necessary because data is returned individually by the smart meter devices so does not arrive simultaneously with others on the same request. It may also be necessary to repeat the instruction to provide the SMCD for an individual meter if there any technical issues.

Where SMCD is required in instances where License Condition 10A.7 and 10A.8 are applicable, the SSG utilises a separate data request, thus providing for separation of data and auditability of data requests. The SSG utilises Role Based Access Controls (RBAC) which ensure that only

employees who have been expressly provided with authority to do so are able to access this data. Users of the data are required to comply with ENWL policies 'Handling Personal Data' and 'Securing Personal Data'.

[REDACTED]

How will we delete data?

After 7 years, ACD data will be deleted from the SMDS using automatic and secure electronic processes such that a rolling 7-year record of the most recent ACD is maintained. Data subject to License Condition 10A.7 and 10A.8 will not be held within the SMDS. These records will be deleted once reasons for the data being held are concluded. For License Condition 10A.7 this would typically be a prosecution and appeal process and, for 10A.8, the conclusion of the customer trial. Information relating to engineering projects is will be held and destroyed in line with the ENWL Data Retention Policy. The retention period is 7 years which aligns with the ACD retention policy.

Who will we be sharing the data with?

SMCD which has been subject to the aggregation process will be available for use by those responsible for short, medium and long-term planning of the electricity distribution network. These may be employees of Electricity North West or of external organisations working on its behalf. Other than in the case of Third Party Connection service providers, described in the risk section below, the ACD will only be available through ENWL controlled systems.

There will also be a limited number of occasions where Licence Conditions 10A.7 and 10A.8 apply. In these instances, processes will be in place to limit and control access.

Risks

[REDACTED]

Scope of the processing: How much data will you be collecting and using? How often? How long will you keep it? How many individuals are affected? What geographical area does it cover?

There are approximately 2,387,835 households and small commercial premises in the ENWL footprint where a smart meter may be installed. Each half hour consumption reading has 2 individual components (kWh and KVAR). Most will not have any active reactive consumption. The majority of

domestic smart meters will record active import consumption only which equates to the collection of approximately 17,520 data recordings per year per premise.

However, the ENWL proposal for data aggregation means that, in the main, once aggregation has taken place, the data is no longer associated with a single premise but with a Section of LV Feeder which will relate to at least 5 premises, reducing the average to 3,504 readings per premise, although the profile will not be attributable to any one premise. Storing this data for up to 7 years means that 122,640 data recordings will be stored for every 5 premises, although, other than a small number of premises, it will not be associated with a single premise.

The half hourly readings will also be summated for each:

- LV Feeder to provide a load duration curve; and
- Smart meter each month

Such that the resultant data no longer constitutes data at a granularity of less than a month.

Although not a requirement of the Ofgem Data Privacy Plan criteria, ENWL will also obtain, process and store, in a similar way to SMCD, the: total monthly; maximum monthly; minimum monthly; and average monthly consumption values for each premise, providing another 50 items of data per premise to be stored.

How much of this data will be used at any one point in time will depend on many factors within a defined geographic area. These include the:

- uptake of low carbon heating and transport technology;
- uptake of local generation;
- extent of new build property and refurbishment;
- maintenance activity taking place; and
- incidence of faults.

Data collection and aggregation will be carried out on a rolling monthly basis.

It is difficult to say how many individuals will be affected as the data relates to a property. Where the SMCD relates to a business, it is also most likely that those working there also have a home to which different SMCD will relate. However, the population of the North West of England is 7,292,093¹⁶ and it is reasonable to assume that the data relates to them all, although not in an individual capacity.

Context of the processing: what is the nature of your relationship with the individuals? Would they expect you to use their data in this way? Do they include children or other vulnerable groups? Are there any alternative methods considered? Are there any current issues of public concern that you should factor in?

As the distribution network operator, the ENWL relationship with the end user is primarily twofold:

1. Maintain the electricity supply to their premise and respond if there are problems with it; and
2. Invest the money they are charged by their supplier, which is then passed on to ENWL, in an efficient and effective way to provide a sustainable and reliable electricity supply.

To this end, all the individuals in a premise are our customer, irrespective of who pays the electricity bill.

In this context, as a critical infrastructure service provider, we believe that our customers would expect us to use all the data available to us to provide a reliable electricity supply in a cost-efficient manner.

Children and other vulnerable groups are included in our overall customer base and their needs are considered in our day-to-day operational activities. However, SMCD contains no individual personal data nor special category personal data. It is not foreseen how being a child or member of another vulnerable group might be inferred from it.

Smart metering data opens up new opportunities for modelling the low voltage distribution network. Currently, one element of network modelling is carried out using data from measuring equipment installed in substations. This equipment is usually installed temporarily as demand dictates. It has limitations because:

- There is a delay whilst the equipment is installed and the monitoring takes place;

¹⁶ Office for National Statistics report Mid-2018: SAPE21DT10b

- It is not always physically possible to install the equipment;
- Assumptions often have to be applied to the results because of seasonal variations; and
- It provides data at the LV Feeder level, not the Section of LV Feeder level.

The main alternative to using smart meter data would be, where practical, to install permanent measuring equipment in all substations. However, this would carry a cost, provide data collection challenges and still not provide data at the Section of LV Feeder level.

There are two main aspects for public concern:

1. The possibility of being able to identify when an individual property is unoccupied, providing an opportunity for thieves. This has been factored in to the anonymisation and aggregation process, enhanced by ENWL security and data retention policies.
2. The cost within a customer's electricity bill for providing an efficient, reliable and sustainable electricity distribution network. This means that ENWL should adopt cost effective ways of working. ENWL is obliged by industry codes to develop and maintain systems to communicate with smart meters and is charged by DCC on a per MPAN basis whether the service is used or not. This carries a cost which is ultimately borne by the customer and so it is beholden on ENWL to use that data wherever possible.

Step 3: Assess necessity and proportionality

Describe compliance and proportionality measures, in particular: what is the goal and why is it legitimate? Are you relying upon consent? Does the processing actually achieve your purpose? How will you ensure data quality and data minimisation? What measures do you take to ensure processors comply? How do you safeguard any international transfers, if any?

The goal of collecting, storing and using smart meter data is to more effectively manage and develop the electricity distribution network, resulting in an overall better experience for users of the network. It is legitimate because ENWL has a statutory duty under Section 9(1) of the Electricity Act 1989 to develop and maintain a safe, efficient, coordinated and economical system of electricity distribution.

ENWL is a Regulated business, as well as a critical national infrastructure service provider. Our Licence to operate is granted by Ofgem. Consent to collect, hold and process SMCD will be granted by Ofgem on behalf of customers if pre-determined conditions are met. The preparation of this PIA is integral to those conditions. Whilst it might be argued that SMCD is not personal data because it is associated with a premise, Ofgem has set out requirements that mean it should be treated as personal data.

Holding and processing SMCD achieves our purpose because it allows more accurate decisions to be made in terms of network management and investment. It supports our legitimate purpose because:

- It contains more granular data than has previously been possible; and
- For some uses, the fact that it is available the same day means that improved operational decisions might be made.

The quality of the data relies on the:

- Accuracy of the electricity meter installed in the customer premise; and
- Reliability of the data transmission systems external to our company.

These are governed by nationally agreed standards and protocols. The same data is used by electricity suppliers to bill their customers for electricity consumed.

The meters must meet a national standard, referred to as SMETS (Smart Metering Equipment Technical Standard). Responsibility for installing compliant meters, and resolving any accuracy issues, rests with the electricity supplier.

The infrastructure for communicating with the smart meter is the responsibility of the Data Communications Company (DCC). The DCC is appointed by Government and has its own data transmission quality standards in place. Protocols are in place for raising any issues ENWL may have with DCC. ENWL requests the SMCD from the smart meter via the DCC. The DCC securely communicates this request to the smart meter. The data from the meter is securely encrypted but DCC has no access to the data content itself.

ENWL has carefully considered what SMCD will be used for and will minimise the data to that which delivers its legitimate purpose whilst also addressing the privacy concerns of premise occupiers. This is further enhanced by the fact that Ofgem agreement is required to be able to access it. A Data Privacy Plan, which details the scope of data that can be held and the uses to which it can be put, must be prepared and submitted to Ofgem, further ensuring data minimisation.

We are the processor of the data and use our own IT systems to store and process it. It will be provided to end users in a controlled manner with safeguards in place.

It is not envisaged that international transfers are required routinely but, should it be necessary, then the release of the data for use would be covered by the same safeguard protocols as domestic (UK) users.

Step 5: Identify the risks

Identification of data protection risks and the steps taken to address the risks

Source of risk and nature of potential impact on individuals.	What measures are in place or will need to be introduced to mitigate or reduce the risk
GDPR Chapter 5, international transfers	It is not envisaged that international transfers are required routinely but, should it be necessary, then the release of the data for use would be covered by the same safeguard protocols as domestic (UK) users. [REDACTED]

<p>GDPR Article 13, information to be provided where personal data is collected from the data subject.</p> <p><i>Customers need to understand how ENWL will be using their SMCD. ENWL use of their SMCD needs to be explained in a clear and transparent way. Additionally, ENWL has a large and diverse customer base and will need to ensure that it is able to communicate its Privacy Notice in an appropriate way so that it reaches all its customer base.</i></p>	<p>The ENWL Privacy Policy will be updated before processing of SMCD takes place, explaining to customers how ENWL will be using consumption data from smart meters. The Privacy Policy is easily accessible via a link on the homepage of the ENWL website. It will continue to be clear, open and honest ensuring that it follows the requirements set out in Article 13 of the GDPR.</p> <p>The website will display a message to inform customers that the Privacy Policy has been updated and draw their attention to the changes.</p> <p>A smart meter section on ENWL website will be developed to include information relating to how ENWL plans to use SMCD. This will be done prior to processing any SMCD. ENWL does not currently have a business as usual process for communicating with all customers directly (e.g. via a newsletter). It will, therefore, be prohibitively costly and logistically disproportionately challenging to set this up to send the updated Privacy Policy directly to customers. As such, based on current processes in relation to communicating with customers, updating the Privacy Policy on the website and developing an information page is seen as the best available solution to make customers aware of how ENWL intends to use their SMCD.</p>
<p>GDPR Chapter 3, rights of the data subject</p>	<p>ENWL has a Data Protection Officer to provide advice and support to the organization in relation to personal data matters. The DPO is supported by a Data Protection team who oversee any Personal Data requests or privacy queries relating to SMCD. Contact details for the DPO and Data Protection team can be found in the ENWL Privacy Policy located on the ENWL website.</p>

<p>ENWL will need to be able to deal with queries, complaints and other issues which customers have in relation to their SMCD. Customers need to be able to contact ENWL in a straightforward way.</p>	<p>ENWL has an internal standing instruction/guide to help staff deal with customer privacy related queries and complaints about data privacy. This will be updated to include SMCD. Where necessary, queries will be escalated to the Data Protection team and/or the Data Protection Officer who will be able to respond to the customer.</p> <p>Training will be provided to ENWL Call Centre teams before ENWL has access to SMCD so that they are able to handle customer queries relating to SMCD and follow the relevant procedures.</p> <p>To help deal with any queries, complaints and other issues that customers may have about data privacy, ENWL already has existing policies and procedures, including the following:</p> <ul style="list-style-type: none"> • Data Protection eLearning • Data Subject Access Request Guidance • Data Breach Reporting Policy • Team Briefs and GDPR/data protection awareness sessions across the organisation
<p>GDPR Article 5(1)(b), principles relating to processing of personal data</p> <p>CD may only be gathered for specific lawful purposes and may not be processed in a way that is incompatible with these purposes. ENWL needs to be clear about the</p>	<p>ENWL will rely on legal obligation as the lawful basis for obtaining and processing SMCD and will ensure this data is processed to help ENWL meet its duty under Section 9(1) of the Electricity Act 1989.</p> <p>A Data Protection Impact Assessment (DPIA) has been carried out for processing SMCD. The DPIA has focused on understanding the envisaged processing operations and the purposes of processing SMCD.</p> <p>Training and procedures will be provided to authorised users who will have access to ACD to ensure that it is used lawfully. Current training covers data protection and will provide authorised users with knowledge about Personal Data in order to ensure the ACD is safeguarded.</p> <p>Access to ACD will be restricted to only recipients that need the data to fulfil their roles, for example, system design and planning engineers who will use the data for network reinforcement analysis or new connections.</p> <p>ENWL will ensure that arrangements are put in place with contracting parties restricting what they are able to use ACD for, thus helping to ensure that it is not used for unintended purposes.</p>

<p>purposes for which it will use SMCD.</p>	<p>Disaggregated data will be used in relation to revenue protection activities. Access to this information will be restricted to those individuals who need the data to fulfil their role and to investigate and prosecute theft of electricity activity. This is to meet Licence Condition 10A.7 requirements.</p> <p>Disaggregated data will be used during trials with clearly defined boundaries. In these cases, permission will be sought from those customers involved in the trial. This is to meet Licence Condition 10A.8 requirements.</p>
<p>GDPR Article 5(1)(c), principles related to processing of personal data</p> <p>ENWL will need to make sure that the SMCD collected and processed is adequate, relevant and limited to what is necessary in relation to the purpose for which it is processed.</p>	<p>Personal data such as name, address, premise occupants or use or the bill payer is not available from the smart meter system. SMCD will be aggregated after receipt in a secure manner. Following this, the SMCD in the SSG will be permanently deleted. This will ensure that once SMCD has been processed, only sufficient information is stored by ENWL to allow it to meet its intended purposes.</p> <p>Other than for meeting the requirements of Licence Conditions 10A.7 or 10A.8, ENWL will only store, where practicably possible, ACD, load duration curve data and the: total monthly; maximum monthly; minimum monthly; and average monthly consumption values. The information that is held equates to the minimum amount of data that ENWL needs to fulfil its intended lawful purpose of processing SMCD to provide and develop an efficient, coordinated and economical electricity distribution system.</p> <p>All stored ACD will be automatically deleted on a rolling 7-year basis in accordance with the data retention policy, ensuring that ENWL deletes data that is no longer needed.</p> <p>In the scenario where ENWL may require half-hourly SMCD in accordance with Licence Conditions 10A.7 or 10A.8, a separate data request is made, thus providing for separation of data and auditability of data requests.</p>
<p>GDPR Article 5(1)(d), principles related to processing of personal data</p> <p>ENWL will need to make sure that the</p>	<p>ENWL will receive SMCD through systems and processes set up with Smart DCC and in line with Smart Energy Code obligations. These systems have gone through rigorous testing in order to ensure that accurate data is collected.</p> <p>In setting up the smart meter programme, BEIS has given energy suppliers the responsibility for procuring, installing and operating smart meters. The responsibility, therefore, is with the Energy Suppliers to install accurate meters that meet the requirements set out by the Smart Energy Code and the Smart Metering Equipment Technical Specification (SMETS).</p>

<p>SMCD collected is accurate and up to date and take any reasonable steps to correct any inaccuracies in the SMCD.</p>	<p>If ENWL is notified by Smart DCC of any inaccuracies in the data it receives, where possible, ENWL will work with Smart DCC and the energy supplier to correct the inaccuracies in the data.</p>
<p>GDPR Article 5(1)(e), principles related to processing of personal data</p> <p>Personal Data must not be kept for longer than necessary. This means that ENWL will need to delete the SMCD, or anonymise it, when it is no longer needed.</p>	<p>ENWL will monitor the Data Retention Policy to ensure that it is storing SMCD and ACD for a justifiable period of time and that it is deleted when no longer needed.</p> <p>ACD will be deleted after a period of 7 years. This will be either by automated processes on a rolling monthly basis or in line with other elements of the ENWL Data Retention Policy. This ensures that data that is no longer needed is deleted.</p> <p>In the scenario where ENWL may retain disaggregated SMCD in accordance with Licence Conditions 10A.7 (to investigate theft) or 10A.8 (for a trial) this data will be held in a secure environment with restricted access. Any investigation of theft or trial will be for a defined period of time, whereby the disaggregated SMCD will be deleted after the investigation and any subsequent prosecution of theft or trial has taken place.</p>
<p>GDPR Article 5(1)(f), principles related to processing of personal data</p> <p>Personal Data must be kept</p>	<p>The technical, physical and organisational security measures that ENWL has in place are designed to prevent the loss or hacking of SMCD or ACD. A security risk assessment has been carried out and controls embody the following principles:</p> <ul style="list-style-type: none"> • Only authorised users can access systems; • An access control method is in place & followed;

secure. ENWL will need to ensure that it has secure IT systems in place, as well as policies and procedures designed to safeguard SMCD.

- Unauthorised software cannot be deployed;
- System enhancements are to a specified quality and are controlled;
- Regular penetration tests on the system are carried out;
- System security vulnerabilities are known and patched on a regular basis;
- Key users have been security checked; and
- Adequate and ongoing user training is in place.

The ENWL smart metering IT environment is compliant with the relevant ISO standards for information security (ISO27001, 27005, 27035). It is also regularly reviewed and audited by internal and external audit teams.

Rigorous end to end industry testing has been done as part of the smart meter roll-out, ensuring that the SMCD that ENWL will receive is through robust and secure processes.

ENWL will only obtain SMCD from SEC governed processes and infrastructure linking ENWL to the central Smart DCC system using secure data transmission.

The smart metering network is subject to a defined governance regime incorporating regular operational and management oversight. This ensures that there is continuous improvement of ENWL smart metering systems to meet or exceed the system processes and security standards set by the SEC.

Risk and performance management is included as a standard component of the ENWL IT governance framework.

All SMCD will be stored in a secure database within the ENWL secure IT environment.

Security is enhanced by the fact that SMCD will be subject to aggregation. It will be aggregated as soon as it is obtained. No personal data such as name, address, contact details and the like is requested or received. [REDACTED]

This aligns with techniques described in the ICO Code of Practice.

<p>GDPR Chapter IV, controller and processes</p> <p>Customers may not want their SMCD to be shared with third parties. Without adequate measures in place, sharing of SMCD with third parties could mean that the SMCD is put at risk.</p>	<p>ACD will only be made available to Independent Connection Providers (ICPs) and Independent Distribution Network Operators (IDNOs) with whom ENWL has established a Framework Agreement relating to the Competition in Connections Code of Practice. ACD will only be shared in compliance with Licence Condition 52 to facilitate competition in the Local Connections Market. As such, this will ensure that ACD is not put at risk or used for unintended purposes such as marketing.</p> <p>ENWL may share ACD with engineering consultants and universities who will act as Data Processors and process the data on behalf of ENWL, for example, to support a research project or a trial. In sharing any ACD with these parties, ENWL will ensure that appropriate contractual arrangements are in place, including clauses providing sufficient guarantees that the Data Processor will protect ACD and ensure compliance with the GDPR and other relevant data protection legislation.</p> <p>Authorised end users and third parties will not be permitted to use the information for additional purposes (e.g. marketing).</p> <p>External authorised end users will go through a robust procurement process managed by the ENWL procurement team which will consider data privacy aspects associated with authorised access to ACD.</p>
<p>Privacy and Electronic Communications Regulations 2013</p> <p>Customers are unlikely to want their SMCD to be used for direct marketing purposes.</p> <p>ENWL will need to ensure that SMCD accessed and processed by</p>	<p>ENWL does not permit SMCD or ACD to be used for marketing purposes.</p> <p>A Data Protection Impact Assessment (DPIA) has been carried out for the intended processing of SMCD. The DPIA focused on understanding the envisaged processing operations and the purposes of processing SMCD.</p> <p>Third parties will go through a robust procurement process carried out by the ENWL procurement team, including a Data Privacy Impact Assessment. This will help to ensure that SMCD is not used for purposes that differ from the originally specified reasons (e.g. marketing).</p> <p>Only authorised users and third parties who are part of a defined authorised group will have access to ACD, limiting the risk of it being used for unintended purposes.</p> <p>Training for ENWL staff and appointed third party external individuals and organisations using ENWL IT systems which use ACD covers data protection and provides authorised users with knowledge about Personal Data in order to ensure the ACD is safeguarded.</p>

<p>ENWL users and/or third parties is not used for purposes (eg marketing) that differ from its original specified reasons.</p>	<p>ENWL will ensure that contractual arrangements are put in place with third parties restricting what they are able to use ACD for.</p> <p>ENWL is a regulated organisation whose business is the distribution of electricity. It therefore does not market services or products. Additionally, the ENWL customer base is fixed by geography and, therefore, marketing is not a function that provides additional value to ENWL in this regard.</p>
<p>GDPR, Article 24 – Responsibility of the data controller</p> <p>GDPR requires ENWL implement appropriate technical and organisational measures to safeguard the SMCD.</p> <p>ENWL will need to ensure that there is control of who has access to SMCD with appropriate authorisation levels in order to safeguard against use for unauthorised purposes.</p>	<p>The technical, physical and organisational security measures that ENWL has in place are designed to prevent the loss or hacking of SMCD or ACD. A security risk assessment has been carried out and controls embody the following principles:</p> <ul style="list-style-type: none"> • Only authorised users can access systems; • An access control method is in place & followed; • Unauthorised software cannot be deployed; • System enhancements are to a specified quality and are controlled; • Regular penetration tests on the system are carried out; • System security vulnerabilities are known and patched on a regular basis; • Key users have been security checked; and • Adequate and ongoing user training is in place. <p>ENWL has a Data Breach Reporting Policy in place to meet our obligations to investigate and, where required, report certain Personal Data Breaches to the ICO and Data Subjects in accordance with the requirements of the GDPR and data protection legislation.</p>

The following table identifies those elements of the assessment which are not considered risks

Step 5: Identify the risks – aspects assessed as not considered a risk	
The legal and data protection risks for processing personal data in this section have been considered but determined not to be a risk for this PIA	
Legal or Data Protection Principle	Reasoning
GDPR Article 5(1)(a), principles relating to processing of personal data <i>Appropriate steps need to be taken to identify any particular privacy concerns which customers may have about its use of their SMCD. These can then be used to inform the privacy by design approach.</i>	No risk has been identified relating to Article 5(1)(a) due to the following reasons: ENWL has engaged constructively with stakeholders to identify any privacy concerns that they may have about use of SMCD. Engagement has been conducted through: <ul style="list-style-type: none"> • Telephone surveys with customers • On-line meetings with stakeholder groups • ENA sponsored focus groups Stakeholders did not identify any particular privacy concerns beyond those which have been identified and addressed in the Privacy Impact Assessment.
GDPR Article 6, lawfulness of processing	No risk has been identified relating to Article 6 for the following reasons:

<p>ENWL needs to be sure that it has a lawful basis for processing the SMCD; and be as clear as possible about what its lawful basis for processing the SMCD is at the outset of the processing. This is needed to explain the lawful basis on which it is relying to its Customers before any SMCD is collected.</p> <p>In addition, ascertaining the correct lawful basis at an early stage is important as Customers will have different rights in relation to their SMCD, depending on what the lawful basis for processing it is.</p>	<p>ENWL has carried out an assessment of the correct lawful bases for processing SMCD prior to processing any SMCD.</p> <p>Based on the current assessment, ENWL has identified Legal Obligation as its lawful basis for processing SMCD, solely to meet its duty under Section 9(1) of the Electricity Act 1989 to ‘develop and maintain an efficient, coordinated and economical system of electricity distribution’.</p> <p>The assessment will be reviewed and updated before new processing activities commence.</p> <p>The Record of Processing will be updated based on the outcomes of such assessments.</p> <p>The ENWL Privacy Policy will be updated before processing of SMCD takes place and information will be available on the ENWL website as to why ENWL wishes to process SMCD. The Privacy Policy is easily accessible via a link on the homepage of the ENWL website. It will continue to be clear, open and honest ensuring that it follows the requirements set out in Article 13 of the GDPR.</p>
<p>GDPR Article 9, processing of special categories of personal data</p> <p>Certain special categories of Personal Data are deemed to be particularly sensitive and are given special protection. This includes information which reveals an individual's race, ethnic origin, politics, religion, trade union membership, genetics, biometrics (where used for ID purposes), health, sex life, or sexual orientation.</p> <p>ENWL would need to meet certain conditions to process this type of personal data and, in most cases, it would require the explicit consent of the relevant individual.</p>	<p>As per the current assessment, no risk has been identified relating to Article 9 for the following reasons:</p> <p>ENWL does not regard SMCD as being special category Personal Data because it does not contain or reveal information stated in Article 9(1). Any inference that may be drawn from SMCD about special category information would be too speculative to mean that SMCD should be treated as special category Personal Data.</p>

GDPR Article 25, data protection by design and default

ENWL must follow the principle of Data Protection by Design and Default and needs to ensure that the technical solution is designed from the outset with data protection in mind to minimise the risks.

No risk has been identified relating to Article 25.

The ENWL technical solution has been designed with protection in mind from the outset, following the Data Protection by Design and Default principle.

By default, ENWL systems will only collect and process the minimum amount of personal data that is needed in order to meet the stated purpose for why it is collecting and processing SMCD. This will ensure that the data it collects is adequate, relevant and not excessive.

Data aggregation will be used as one of the anonymisation and data protection techniques. ENWL will aggregate SMCD in the following ways:

1. Half-hourly SMCD will be summated to provide a total monthly figure for each smart meter (such that the resultant data falls outside the requirements of Licence Condition 10A).
2. Half-hourly SMCD figures for each meter on a feeder will be summated, so that the half-hourly SMCD obtained for an individual household will be added with that of other households on the same LV Feeder.
3. Half-hourly SMCD figures for each meter on a feeder will be summated to produce a load duration curve for that LV Feeder (such that the resultant data falls outside the requirements of Licence Condition 10A).
4. Half-hourly SMCD figures for each meter on a Section of LV Feeder will be summated so that the half-hourly SMCD obtained from an individual household will be added with that of multiple households on the same Section of LV Feeder.
5. A Section of LV Feeder will consist of at least 5 MPANS, unless the LV Feeder in total contains less than 5 MPANS.

In order to adhere to the GDPR Data Minimisation Principle, only SMCD or ACD will be made available to authorised users who form part of a specific authorised group. This equates to the minimum amount of Personal Data that ENWL needs to fulfil its intended lawful purpose of

processing SMCD to provide and develop an efficient, coordinated and economical system of electricity distribution.

All users with access to SMCD and ACD will have received the necessary training. For example, training for ENWL staff covers data protection and provides authorised users with knowledge about Personal Data to ensure the SMCD and ACD is safeguarded.

ACD will be stored against a unique LV Feeder and Section of LV Feeder identifier, meaning it is associated with a part of the electricity network but without individuals being identified through their MPANs, names and addresses, therefore reducing the risk of re-identification of a premise or individual.

All stored ACD will be automatically deleted on a rolling 7-year basis, ensuring that ENWL deletes data that is no longer needed.

The ENWL smart metering IT environment is compliant with the relevant ISO standards for information security (ISO27001, 27005, 27035). It is also regularly reviewed and audited by internal and external audit teams.

ENWL will ensure contractual agreements with ICPs and IDNOs ensure that robust processes are in place for the secure use of ACD.

Rigorous end to end industry testing has been done as part of the smart meter roll-out, ensuring that the SMCD ENWL receives is through robust and secure processes.

ENWL will only obtain SMCD from Smart Energy Code governed processes and infrastructure linking ENWL to the central Smart DCC system using secure data transmission.

Where ENWL wishes to process SMCD in accordance with Licence Condition 10A.7 or 10A.8 (theft or trial), it will only be processed in accordance with the privacy requirements of those Licence Conditions. Any investigation of theft or trial will be for a defined period of time. The SMCD will be deleted after the investigation and any subsequent prosecution of theft or the trial has taken place.

<p>GDPR Article 28, processor</p> <p>Where ENWL wishes to engage third party sub-contractors to process SMCD on its behalf, it must only use third parties which provide sufficient guarantees to safeguard the SMCD.</p>	<p>No risk has been identified relating to Article 28 for the following reasons:</p> <p>Training is provided to ENWL staff involved in the procurement and appointment of Data Processors, ensuring that they are aware of the obligations and restrictions of Data Processors.</p> <p>Data Processors will go through a robust procurement process carried out by the ENWL procurement team, including a Data Privacy Impact Assessment.</p> <p>This will help to ensure that SMCD is not used for purposes that differ from the originally specified reasons.</p>
<p>GDPR Article 29, processing under the authority of the controller or processor</p> <p>ENWL needs to ensure that any subcontractors which process personal data on behalf of ENWL only do so in accordance with ENWL instructions.</p>	<p>No risk has been identified relating to Article 29 because, as part of its general approach to ensuring compliance with GDPR, ENWL has reviewed third party contracts to ensure that they comply with the legal obligations and liabilities placed on data processors under GDPR and the DPA 2018.</p>
<p>GDPR Article 30, record of processing activities</p> <p>ENWL needs to ensure that it maintains records of processing, along with any third party subcontractors engaged to process SMCD on its behalf.</p>	<p>No risk has been identified relating to Article 30 because ENWL has a Record of Processing in place and maintains this document regularly by verifying it against approved Data Protection Impact Assessments (DPIA). Such reviews will ensure that that all processing activities for SMCD, defined in the DPIA, are reflected in the Data Processing Inventory.</p>
<p>GDPR, Article 33, notification of a personal data breach to the supervisory authority</p>	<p>No risk has been identified relating to Article 33 because of the following reasons:</p> <p>In the event of a suspected Data Breach, the Data Protection Officer will assess the incident in line with the ENWL Data Breach Reporting Policy. The Data Protection Officer will calculate the</p>

<p>As a data controller in respect of SMCD, ENWL must notify the supervisory authority of a data breach without undue delay and in any event no later than 72 hours after having become aware of the breach.</p>	<p>severity of a breach. In accordance with Article 33 of the GDPR, the Data Protection Officer will notify the ICO of a data breach without undue delay. If the Personal Data breach is severe enough to result in a high risk to the data subject(s), ENWL will report the breach to the affected individuals, as required under GDPR Article 34. ENWL assesses and documents all breaches within 72 hours of becoming aware of the breach. Remedial actions and mitigation measures are implemented accordingly.</p> <p>ENWL has agreements with authorised Data Processors specifying that the Processor shall notify the Controller (ENWL) of any personal data breach relating to the data being processed.</p>
<p>GDPR, Article 34, communication of a personal data breach to the data subject</p> <p>ENWL must ensure that, in the event of a data breach, there is a process to notify data subjects about the breach where it is likely to result in a high risk to their rights and freedoms. This must be done without undue delay.</p>	<p>No risk has been identified relating to Article 34 because of the following reasons:</p> <p>In the event of a Data Breach, the Data Protection Officer will assess the data breach in line with the ENWL Data Breach Reporting Policy. The Data Protection Officer will calculate the severity of a breach using a methodology that is based on ENISA guidelines. In accordance with Article 33 of the GDPR, the Data Protection Officer will notify the ICO of a data breach without undue delay. If the Personal Data breach is severe enough to result in a high risk to the data subject(s), ENWL will report the breach to the affected properties, as required under GDPR Article 34. ENWL assesses and documents all breaches within 72 hours of becoming aware of the breach. Remedial actions and mitigation measures are implemented accordingly.</p> <p>ENWL has agreements with authorised Data Processors specifying that the Processor shall notify the Controller (ENWL) of any personal data breach relating to the data being processed.</p>

Step 5: Identify the risks – Data Subject Rights applicable when using Legal Obligation as the Lawful Basis for processing

The lawful basis relied on by ENWL for processing SMCD has an impact on the corresponding rights of individuals under the GDPR. The following table outlines the Data Subject Rights applicable to the Legal Obligation lawful basis for processing and the steps taken by ENWL to address potential issues.

Data subject right	Description of law	Steps taken by ENWL to address potential issues
Right to be informed	<p>Where Personal Data relating to a data subject are collected from the data subject, the controller shall, at the time when Personal Data are obtained, provide the data subject with all of the following information:</p> <ol style="list-style-type: none"> 1. The identity and the contact details of the controller and, where applicable, of the controller’s representative; 2. The contact details of the Data Protection Officer, where applicable; 3. The purposes of the processing for which the personal data are intended as well as the legal basis for the processing; 4. Where the processing is based on point (f) of Article 6(1), the legitimate interests pursued by the controller or by a third party; 5. The recipients or categories of recipients of the personal data, if any; 6. Period for which the personal data will be stored, or if that is not possible, the criteria used to determine that period; and 7. The right to lodge a complaint with a supervisory authority. 	<p>The ENWL Privacy Policy will be updated before processing of SMCD takes place, explaining to customers how ENWL will be using SMCD. The Privacy Policy will continue to be easily accessible via a link on the homepage of the ENWL website and will be clear, open and honest, ensuring that it follows the requirements set out in Article 13 of the GDPR.</p> <p>A smart meter section on the ENWL website will also be updated to include information relating to how ENWL plans to use SMCD. This will be done prior to ENWL processing any SMCD.</p>

<p>Right of access</p>	<p>Data subjects have the right to obtain a copy of their Personal Data and also the following information:</p> <ul style="list-style-type: none"> (a) The purposes of the processing; (b) The categories of Personal Data concerned; (c) The recipients or categories of recipient to whom the Personal Data have been or will be disclosed, in particular recipients in third countries or international organisations; (d) Where possible, the envisaged period for which the Personal Data will be stored, or if not possible, the criteria used to determine that period; (e) The existence of the right to request from the controller rectification or erasure of Personal Data or restriction of processing of personal data concerning the data subjects to object to such processing; (f) The right to lodge a complaint with a supervisory authority; (g) Where the Personal Data are not collected from the data subject any available information as to the source; and (h) The existence of automated decision-making including profiling referred to in Article 22(1) and (4) and, at least in those cases, meaningful information about the logic involved, as well as the significance and the envisaged consequences of such processing for the data subject. 	<p>ENWL will adopt a consistent approach to respond to customers wishing to exercise their 'Right of Access' to SMCD under the GDPR.</p> <p>In practice, only a small percentage of customers (for example, those on single MPANs per Feeder or Section of Feeder; those being investigated for theft; or those who are part of an ongoing trial) will have actionable rights relating to their Personal Data because these customers are the only disaggregated data subjects (and therefore the only ones where ENWL can truly identify the premise). Where SMCD has been aggregated, ENWL cannot subsequently disaggregate that data at the request of a customer because:</p> <ul style="list-style-type: none"> • it may not be possible; and • it could reveal the Personal Data of another customer (for example, if there were two MPANs on a Feeder then extracting Personal Data for one customer would reveal the Personal Data of the other customer through comparison with the aggregated data). <p>The Privacy Policy on the ENWL website currently sets out the customers' rights, including their Right of Access and how to contact ENWL to make a request.</p> <p>The Privacy Policy on the ENWL website will be updated to include information explaining how SMCD will be processed.</p> <p>Training will be provided to ENWL Contact Centre staff to continue to ensure that they are able to recognise and respond to data subject access requests associated with SMCD.</p>
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<p>Right to rectification</p>	<p>Under the GDPR, customers have the right to have inaccurate Personal Data held about them rectified. ENWL must ensure that it has the technical and organisational capabilities to recognise and respond to requests to exercise these rights.</p>	<p>In setting up the smart meter programme, DECC / BEIS has obliged Energy Suppliers to have responsibility for procuring, installing and operating smart meters. Correcting SMCD, therefore, is not within the direct control of ENWL. Issues relating to accuracy will typically be as a result of an issue with the meter itself or with the IT systems controlled by Smart DCC. Inaccurate SMCD will result in inaccurate bills being generated for customers by the Energy Suppliers. It is, therefore expected that the Energy Supplier/customer would report this problem to each other prior to ENWL obtaining the data. As such, ENWL will inform the customer to refer to their supplier if they request rectification of their SMCD.</p> <p>Energy Suppliers are responsible for ensuring the installation of accurate meters that meet national requirements set out by the Smart Energy Code and the Smart Metering Equipment Technical Specification (SMETS).</p>
<p>Right to restrict processing</p>	<p>Customers have the right to restrict processing of their SMCD in the following circumstances:</p> <ul style="list-style-type: none"> (a) The accuracy of the Personal Data is contested by the Customer for a period enabling the controller to verify the accuracy; (b) The processing is unlawful and the Customer opposes the erasure of the personal data and requests the restriction of use of the data instead; (c) ENWL no longer needs the personal data for the purposes of the processing but they are required by the data subject for the establishment exercise or defence of legal claims; (d) ENWL is processing the SMCD based on the legitimate interests ground, and the Customer has objected to the 	<p>Based on the ENWL current intended purpose for processing SMCD in order to comply with a Legal Obligation (duty under Section 9(1) of the Electricity Act 1989), it has ascertained that the Right to Restrict Processing can only be exercised on the basis of inaccuracy or where processing is unlawful and the data subject does not want the data erased (or needs it for legal claims).</p> <p>If accuracy is contested, this will most likely relate to a defective meter which the Energy Supplier has the responsibility for installing and operating. Accordingly, ENWL will inform the customer to refer to their Energy Supplier if they query accuracy with ENWL.</p>

	<p>processing pending the verification of whether the ENWL legitimate grounds for processing override those of the Customer</p>	<p>The ENWL Data Protection Officer will review and respond to requests where the data subject wishes to exercise their right to Restrict Processing.</p>
<p>Right to erasure</p>	<p>Under the GDPR, Customers can require their Personal Data to be erased in certain specific circumstances, including where:</p> <ul style="list-style-type: none"> (a) The Personal Data is no longer necessary in relation to the purpose for which they were collected or otherwise processed; (b) The data subject withdraws consent on which the processing is based, and where there is no other legal ground for processing; (c) The data subject objects to the processing pursuant to Article 21(1) and there are no overriding legitimate grounds for the processing or the data subject objects to the processing pursuant to article 21(2); (d) The Personal Data has been unlawfully processed 	<p>The Right to Erasure under the GDPR is not an absolute right, and for certain processing activities is not applicable.</p> <p>This includes processing activities that are required to comply with a Legal Obligation, and hence the Right to erasure will not be applicable for ENWL activities by virtue of its processing being necessary in order to comply with its duty under Section 9(1) of the Electricity Act 1989.</p> <p>ENWL will have a process to be able to explain to the customer why the Right to Request Erasure does not apply when processing SMCD.</p> <p>The Privacy Policy on the ENWL website sets out the customer rights and how to contact ENWL.</p> <p>ENWL has a Data Deletion Process to handle any data subject request for the 'Right to be Erased' for other scenarios where ENWL processes Personal Data under a different lawful basis and the Right to Request erasure is applicable.</p> <p>Currently, ENWL only intend to process SMCD based on the lawful basis of Legal Obligation for processing. Before any new processing takes place, a Privacy Impact Assessment will be carried out (and approved by Ofgem if required), including an assessment of how ENWL will respond to a data subjects rights if a new lawful basis for processing is applied.</p>

<p>Right to portability of data</p>	<p>In certain circumstances, Customers have the right to receive a copy of their Personal Data from ENWL in a structured, commonly used and machine-readable format, and potentially require the transmission of those data to another controller.</p>	<p>Based on the ENWL intended purpose for processing SMCD in order to comply with a Legal Obligation (duty under Section 9(1) of the Electricity Act 1989), we determine that the Right to Data Portability will not be applicable. The principle here is similar to the comments made above in relation to the Right of Erasure. This is another area where the requirement for ENWL to comply with law means that individuals are restricted in how they can manage actions relating to their Personal Data.</p> <p>Upon request, ENWL will explain to the customer why the Right to Data Portability does not apply when processing SMCD.</p>
<p>Right to object</p>	<p>Under GDPR, the Customer has the right to object, on grounds relating to his or her particular situation, at any time to processing of Personal Data concerning him or her which is based on point (e) or (f) of Article 6(1), including profiling based on those provisions. The controller shall no longer process the Personal Data unless the controller demonstrates compelling legitimate grounds for the processing, which override the interests, rights and freedoms of the data subject or for the establishment, exercise or defence of legal claims. In addition, data subjects have the right to object to processing for direct marketing purposes, in which case the controller must cease processing the Personal Data.</p>	<p>The Right to Object only applies where processing is based on points (e) or (f) or article 6(1) of the GDPR. Based on the ENWL purpose for processing SMCD in order to comply with a Legal Obligation (duty under Section 9(1) of the Electricity Act 1989), it has ascertained that the Right to Object will not be applicable.</p> <p>This is another area where the need for ENWL to comply with law means that customers cannot have full discretion over the use of their Personal Data by ENWL but there are many safeguards built in to this Privacy Impact Assessment to ensure that such use is well controlled and compliant.</p> <p>Upon request, ENWL will explain to the customer why the Right to Object does not apply when processing SMCD</p> <p>Currently, ENWL only intend to process SMCD based on the lawful basis of Legal Obligation for processing. Before any new processing takes place, a Privacy Impact Assessment will be carried out (and approved by Ofgem if required), including</p>

		an assessment of how ENWL will respond to a data subjects rights if a new lawful basis for processing is applied.
Right in respect to automated decision making and profiling	Customers have the right not to be subject to a decision based solely on automated processing, including profiling, which produces legal effects concerning him or her, or similarly significantly affects him or her. This right shall not apply if the processing is authorised by Union or Member state law on which the controller is subject and which also lays down suitable measures to safeguard the data subject's rights and freedoms or legitimate interests or if it is based on the Customer's explicit consent.	In processing SMCD, no automated decision making and profiling will be made. Decisions will be made based on manual analysis of ACD.

12 Appendix B – ED1 Smart Metering Strategy



ANNEX 28: SMART METERING STRATEGY

Electricity North West Limited
Registered Office:
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Cheshire.
WA3 6XG.
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1. Executive summary

Smart Meters will be installed in the homes and businesses of our customers over the next few years. These devices will help our customers realise savings and benefits never before available. As our customers' usage of and reliance on electricity increases smart meters will become a vital part of the network management infrastructure.

This annex outlines how we will use smart meter data to improve our services and deliver savings to our customers. As the meter installation programme gathers pace our initial challenge will be to assist Suppliers in ensuring customers receive a safe and trouble free transition to the new meters. In parallel with this installation programme we will upgrade our IT systems to be able to use the meter data for the benefit of our customers. This IT upgrade programme has already started and to ensure we deliver benefits as soon as possible we have commenced several elements of this work in DPCR5. We are also working with suppliers to ensure customers are properly informed about both the installation programme and the benefits on offer.

We have worked through the various industry-led groups to ensure that the functionality of smart meters is suitable to assist Network Operators in meeting the challenge presented by the GB's de-carbonisation of heat, transport and electricity generation. This work will continue for some time and is vital to ensure GB customers receive the maximum possible benefits from their investment in this programme.

The installation programme will take five years to complete and once approximately 70% of meters are installed then customer benefits will start to be delivered. We have outlined below the main benefits to our customers and stakeholders arising from the adoption of smart meter data flows.

In total we forecast that customers will receive over £20 million of direct benefits across our RIIO-ED1 and RIIO-ED2 business plans. These benefits will be realised across the latter third of RIIO-ED1 and increase significantly in RIIO-ED2. To enable these benefits we will invest a total of £18.1 million, £3.1 million of which will be funded from our existing DPCR5 allowances.

2. Our smart metering strategy

The benefits of GB's adoption of smart meter technologies will mirror that seen in a number of countries and will accrue to the customers initially from Supply businesses and then later from Distribution Network Operators (DNOs). In the early years of the roll out programme, immediate benefits such as reduced meter reading costs and access to time of use based tariffs will be realised by customers. The customer benefits accruing from DNOs will be less immediate but eventually include:

- Improved network visibility and hence reduced or deferred network reinforcement costs
- Improved management of power outages
- Improved connection processes
- Reduced costs for micro generation customers
- Access to the benefits offered by demand side response
- Losses reduction
- Improved customer service across a range of routine activities.

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Whilst the introduction of Smart Meters will bring immediate benefits to customers, their full potential in relation to network-related benefits will only be realised as customers increase

their electrical power consumption or install generation. The profile of many benefits therefore follows the adoption pattern for Low Carbon Technologies (LCTs) such as Heat Pumps, Electric Vehicles and micro generation. In addition, in the early years of the smart meter roll out programme the penetration levels for smart meters will not initially facilitate a number of the benefits associated with network management.

Smart meter benefits encompass financial, service and less tangible areas and below we have outlined our thoughts on the main benefit areas. We believe that smart meters have a significant role to play in RIIO-ED1 serving as a platform for a variety of service and cost improvements. Critically, RIIO-ED1 will be the bedding-in period for smart meter technologies and their full integration into network operators' systems in preparation for wider scale LCT adoption and hence greater demand growth in RIIO-ED2.

2.1 How will smart meters improve network visibility?

Smart meters will for the first time allow us to monitor how much power our customers are using or producing in real time. This will allow us to not only influence their usage but to operate our network to be more responsive to their needs. The more responsive we can make our network, the more efficiently it operates and that helps us keep customers bills lower.

For many years we have had monitoring systems covering our extra high voltage (132kV and 33kV) networks enabling these systems to become steadily more efficient. At present we have virtually no visibility of our customers' needs on our low voltage (LV) network, and only limited visibility on our high voltage (HV – 11 & 6.6kV) network. The improved visibility provided through smart meter data will revolutionise network management allowing us to monitor demand across our entire network for the first time ever. This will help us ensure capacity is available for our customers to use when they need it and help us to ensure we only spend money increasing the capability of the network when absolutely necessary.

These benefits have been included in our investment plans and in our attached scenario submissions.

Customers are increasingly adopting micro distributed generation (DG) technologies such as photo-voltaic (PV) and micro-CHP; these generation technologies have huge benefits for both customers and the UK. However they also introduce a number of challenges for us. We have seen the rapid adoption of micro DG by tens of thousands of customers resulting in localised reverse power flows whenever generation output exceeds the demand. This can cause voltages to rise and we need to monitor voltages to ensure statutory limits are not exceeded. At the moment we do this by retro fitting various monitoring devices; smart meters will allow us access to this information at much lower cost. We will pass on these savings to our customers.

Smart meters will provide us with greatly improved visibility of voltage profiles along LV networks enabling better control of voltage and hence more efficient connection costs for all LCT equipment such as heat pumps. Our early work under our First Tier LCN Fund innovation projects clearly indicates that network visibility improvements enable lower connection costs using connect and manage technologies.

We have examined the use of smart meter data across the entire range of LCT penetrations included in the DECC decarbonisation scenarios. The benefits of smart meters allowing visibility of congested networks will be realised once meters reach approximately 70% penetration ie around 2019. We believe that the infrastructure detailed in our IT investment plans coupled with smart meter data will allow our business to respond efficiently to the needs of customers.

To ensure that we have included all likely smart meter benefits within our plans we led work undertaken by all DNOs through the ENA and commissioned KEMA, Redpoint and EATL to identify the potential benefits. These documents can be found as Annex 28 – A1 to A3. Their

work mirrors our internal analyses and indicates that visibility benefits will manifest in two forms:

- a reduction in planning and design costs facilitated by improved visibility of network load and voltage levels and a reduced need to design reinforcement schemes based on the same visibility. These have been estimated at £0.38 million phased over the latter 3.5 years of RIIO-ED1. Prior to this date smart meters will not have penetrated sufficiently to allow the data to be used accurately
- In RIIO-ED2 under all DECC LCT scenarios the volume of connections rises and we would expect these benefits to exceed £2 million in the period
- A reduction in direct reinforcement costs arising from more accurate data, again this will occur in the latter half of RIIO-ED1. In our most likely scenario we have estimated the benefits of smart meters in the latter half of RIIO-ED1 at £1.1 million over and above the benefits of smart grid solutions. At higher penetration levels such as those shown in the DECC medium scenarios, benefits would increase slightly, however in the event of high penetration levels with dense clustering then smart meters offer proportionally diminishing benefits; as network loads go well beyond the existing network capacity.

The use of Smart Meter data in active network management techniques designed to reduce reinforcement costs are included in the Transform model and hence fully included in our business plan and all submitted scenarios. In our best view case based on the low scenario these benefits are relatively modest in RIIO-ED1 at £0.9 million but will increase significantly in RIIO-ED2 exceeding £3 million in the period.

2.2 How will smart meters improve our management of power outages?

Smart meters offer a number of important service benefits for customers experiencing power outages. Whilst approximately 80% of customer interruptions are already detected automatically by our Operational IT systems, detecting the remaining 20% which arise due to LV network faults is dependent on customer calls. Smart meters offer significant functionality for the automatic notification of loss of supply for individual customers and we will incorporate these functions within our trouble management systems.

This will enable more rapid restoration of supplies particularly during storm events. Whilst SMETS1¹ compliant meters do not offer this functionality the proportion of SMETS2 compliant meters will be sufficient to allow outage detection on the vast majority of low voltage network events in the latter half of RIIO-ED1. The primary benefit for customers of early outage detection manifests in the form of a slightly earlier mobilisation of our operational response and hence earlier supply restoration. Our analysis of call patterns versus time of interruption indicates that this will result in an average 2.5 minute earlier detection and mobilisation. This will not result in an additional IIS reward as both the incident notification time and restoration time will be advanced by the same amount and hence all benefits will accrue to customers in slightly shorter outage duration times. This benefit will recur in all future RIIO periods; for RIIO-ED1 we estimate this benefit to be £0.3 million and for RIIO-ED2 £0.8 million based on the number of such event per annum, the number of customers per feeder and the RIIO-ED1 IIS incentive rate.

There will be a secondary benefit in terms of fault unit cost performance which arises through the more accurate diagnosis or the network section affected by open circuit LV cable faults. We have estimated this at £0.1 million over the last four years of RIIO-ED1; as high levels of smart meter penetration are required to enable this functionality. This will have an associated IIS benefit of a total of £0.64 million in the period arising from slightly faster localisation of such faults.

¹ DECC's Smart Metering Equipment Technical Specifications

Smart meters offer additional benefits for customers during storm events; as they enable more accurate diagnosis of LV network faults and hence better prioritisation of available repair resources and earlier supply restoration for some customers. These do not result in any reduction in repair costs as the same numbers of faults need to be repaired. Whilst more customers will benefit from earlier supply restoration, there is little appreciable IIS benefit as storm events are generally exempt from IIS. For non exempt events there is an IIS benefit to the DNO however this is outweighed by a larger disbenefit for DNOs as all faults are identified immediately as opposed to waiting for customers to contact a call centre agent to report no supply. We estimate the IIS equivalent benefit to customers in exempt storms will be approximately £1 million per annum post 2019.

We anticipate that smart meters will be of assistance in diagnosing LV network faults underlying HV faults post HV network repairs. Again this will allow some customers to be restored earlier leading to improved service at the macro level however similar to above there are no net reductions in repair costs or IIS benefits accruing to us. Use of last gasp functionality will be likely to evolve over RIIO-ED1 as penetration levels increase and communications and IT systems bed in. It is not possible to fully evaluate the financial benefits of this functionality until tested; however the benefits for customers are very apparent and we are committed to maximising all possible service benefits.

Whilst the so called 'first breath' and associated 'pinging' functionality has an important role to play in positive confirmation of supply restoration, our customers and particularly our vulnerable customers consistently tell us that they prefer a warm voice contact post supply restoration so as to enable them to understand the cause of the interruption and the likelihood of a repeat interruption. As such we do not propose to reduce the number of proactive voice contacts made and have not included any associated call centre savings in our plan.

Smart meters will enable us to automate the verification and identification of a number of standards such as the 12 hour restoration standard. This will not necessarily reduce the number of payments made as at the margins of the standard as many will be shown to fall inside as outside the set time. Processing of claims will be speeded up with customers benefiting from faster payments however given the relatively small number of projected events we do not forecast a material financial benefit to our current cost base.

2.3 How will smart meters improve our connection processes?

Improved network visibility as described above will also enable us to process connection applications more quickly and provide customers with greater certainty of efficient costs. Customers will benefit from a reduction in associated quotation and installation times. We have estimated the reduction in associated back office planning and design costs at £0.29 million for the RIIO-ED1 period and £0.8 million for RIIO-ED2. All direct cost benefits arising from smart meter data enabling more effective designs will accrue to customers in reduced connection costs. We estimate these to be in the order of £0.25 million in RIIO-ED1 and £1.1 million in RIIO-ED2. Note that LCT-driven costs for domestic customers are included in general reinforcement.

2.4 How will smart meters facilitate demand side response?

A significant potential benefit from Smart Meters arises from their potential to change customer demand patterns; either via a Time of Use Tariff signal or by use of the load switch. Our present understanding of both SMETS1 and SMETS2 is that we will not have direct access to either of these facilities.

In assessing the benefits associated with such behavioural change in customer profile classes 1-4 inclusive we have limited our modelling to examine the likely benefits to DNOs arising from similar signals sent by suppliers. In examining such potential alignment of price signal benefits we have considered the following points:

- Our work with Suppliers, National Grid and consultants such as Pöyry shows that price signals from Suppliers and the Transmission System Operator are likely to be dominated by hedging positions and real time balancing. Such markets signals span the entire load cycle; for example STOR², and do not necessarily align with peak network demand periods.
- Our customer engagement work on DSR generally and projects such as C₂C and CLASS shows that customers have a relatively low appetite for peak demand reduction DSR services unless offered a very strong price signal in the region of £20 000 per MWh³. These findings are confirmed by other DNO projects. This payment level is adverse to the equivalent reinforcement NPV cost.
- Industrial & Commercial (I&C) customers have a greater appetite for so called "N-1 DSR" at much lower costs ranging between £14 000 and £24 000 / MWh⁴. However this service cannot be used as effectively on secondary network feeders penetrated by LCTs as I&C customers are in the main fed by dedicated LV networks feeders or are connected at higher voltages.
- Our recent work with Baringa-Redpoint indicates that suppliers will put Time of Use (ToU) tariffs in place; however their effect is complex and not necessarily beneficial to DNOs. International trials show that peak price tariffs have little sustained effect on customer behaviour unless the price signal is extremely strong. Where a proportion of customers adopt sufficiently strong static ToU tariffs, then over the peak demand period 5 to 8pm their demand is reduced, but is increased at other times, most markedly between 4 to 5pm and 8 to 9pm. As a result the system peak may be moved outside of the 5 to 8pm window, although the reduction in system peak demand may be less than that observed in the domestic sector alone given higher demand from other sectors during the times that domestic load is shifted to, particularly 4 to 5 pm. This movement of domestic demand into the pre-system peak period may actually increase the net system peak. This effect is outlined fully in the attached Baringa-Redpoint report however the overall conclusion is that the effects of Supplier led ToU tariffs on peak demand is unlikely to be material before the early 2020s under all likely scenarios.
- Beyond RIIO-ED1 then automated appliance response coupled with ToU tariffs will allow more significant peak demand shaping reducing peak demand by up to 3GW nationally in 2025 and up to 7GW by 2031.
 - In our best view scenario LCT penetration levels are low and hence reinforcement costs are low and highly localised. The probability therefore of Suppliers sending a ToU signal that successfully or partially alleviates a reinforcement need is considered very low. Under the most optimistic viable ToU tariff scenario our work with Baringa-Redpoint indicates the effect on peak demand nationally to be 1000MW by 2025. This equates to less than 80MW against Electricity North West present peak demand of 4 500 MW. Given that this will be across our entire network and with the scarcity of LCT or other smart demand under the low scenario we are unable to identify an associated reinforcement expenditure reduction in RIIO-ED1.

² STOR – Short term Operating Reserve etc...

³ Early work on our C₂C project and on Low Carbon London indicates that domestic customers require a price signal of at least 10p / kWh. This is borne out by our work with Baringa-Redpoint which shows that the value of ToU signals in RIIO-ED1 is likely to be low particularly under our best view low scenario.

⁴ C₂C trials have indicated this is the viable price range for commercial scale DSR contracts.

- For micro DG the structure of FIT⁵s limits the effectiveness of generation side response to constrain output and hence reinforcement costs. These technologies respond more readily to smart grid solutions and the associated efficiencies are included in our reinforcement plans.
- We have examined in detail the potential affects of so called 'Wind Following' on market price fluctuations and peak demand levels. Our work with EATL and Baringa-Redpoint indicates that these are negligible in RIIO-ED1 but in RIIO-ED2 may exacerbate network constraints.

Given the above, our view is that ToU price signals issued by other market participants such as Suppliers will have limited, if any, benefit under low LCT penetration scenarios during RIIO-ED1. Further into the future as LCT volumes increase or under higher LCT penetration scenarios the effect of increased marginal plant costs are likely to produce stronger price signals and hence greater customer demand response. We have not therefore included additional smart meter benefits over and above those indicated by the Transform model in our most likely scenario.

Our innovation strategy requires us to continue to explore new ways of engaging with customers to mitigate the effect LCTs on the network. We are at the forefront of change and development in this area; for example the development of new local energy market services such as C₂C, the use of third party services such as aggregators, social landlords or communities of customers to effectively purchase distributed resource services to deliver network benefits. These new services have the potential to marginally reduce costs under our most likely scenario but have much greater potential to reduce costs under higher LCTs scenarios.

We have worked with Ofgem on the development of suitable uncertainty mechanisms to ensure the benefits of such work are appropriately shared between customers and other stakeholders. We believe that the structure of efficiency incentives and re-openers outlined in the RIIO-ED1 strategy decision provides a strong incentive to continue to develop and realise such DSR benefits.

Critically, our submission is based on a number of benefit assumptions contained within the Transform model, specifically the forecast cost of services such as DSR, storage and other new technologies. In the event that costs or other assumptions vary then the associated benefits may change and hence trigger the load re-opener.

2.5 How will smart meters aid losses reduction?

It is inevitable that as energy flows increase network losses will increase, however the effects of smart meters on peak energy demand may assist DNOs in helping to curtail this rise. In particular improved network visibility will allow us to progressively improve the management of feeder voltage profiles and hence losses management.

Our work with EATL indicates that smart meters will cause customers to become significantly more aware of their energy usage. This will have a forecast benefit on losses driven by price visibility, energy usage visibility and energy awareness. At GB level EATL forecast this to be in the region of £35 to £45 million over the period 2015 to 2031. This equates to £3.1 million for our region occurring predominantly in RIIO-ED2 and will accrue directly to Electricity North West's customers.

⁵ Feed-In-Tariff.

2.6 How will smart meters improve dataflow management?

The introduction of smart meters will allow some simplification of our billing and dataflow management processes. However these will only be realised towards the end of the installation programme; in RIIO-ED2 we expect these to total £0.8 million.

2.7 Other customer service benefits

Our customers and other stakeholders consistently rank CIs, CMLs and price as their top priorities. Our engagement also shows that they also place value on other factors such as the speed of response and information provision across a range of requests. Smart meter functionality enables a number of features including real time polling:

Meter messaging

We do not consider the messaging functionality available to DNOs to be sufficiently developed in SMETS2 to allow services such as Planned Supply Interruption notifications to be effectively migrated to smart meters. We do however foresee potential to provide supplementary updates of value to customers on forthcoming Planned Supply Interruptions such as timings and other information such as severe weather warnings. We have included the associated data costs within our submission however these are only minor transaction charges. The benefits arising from this improved information flow will benefit customers however we do not believe they will be material as observed in mechanisms such as the customer satisfaction incentive.

Voltage enquires

We receive a small number of routine enquiries from customer regarding their supply voltage. At present we fit monitoring equipment to the customer's installation to check if their voltage is within statutory limits. Smart meters will provide an almost instant means by which we can check the customers supply voltage and hence reduce our measurement costs. We estimate these savings to be £0.1 million in RIIO-ED1 and £0.4 million in RIIO-ED2 and these have been included in our business plan.

Guaranteed standards

Smart meters will enable us to proactively check and verify if customers are entitled to a guaranteed standards payment. This will improve the efficiency of our back office processes and importantly ensure customers receive any payments due promptly. We estimate these savings to be £0.1 million in RIIO-ED1 and £0.34 million in RIIO-ED2 and these have been included in our business plan.

As the functionality of smart meters and the surrounding IT infrastructure evolves we will continue to develop new services and benefits to customers based on this valuable data source. The greatest value from smart meters will arise once demand levels increase significantly on our network which we forecast will occur in RIIO-ED2 and RIIO-ED3.

3. Customers' smart meter benefits

3.1 – Customer benefits for our best view scenario

In Table 1 below we have summarised both the financial benefits for customers included within our plan and those they will receive external to our plan.

Table 1: Smart meter benefits summary

Benefit area	RIIO-ED1 period value £m	RIIO-ED2 period value £m	Savings included in RIIO-ED1 WJBP
Network visibility	£0.9	£3.0	Yes
Power outage management	£0.74	£1.5	Yes
Connections	£0.29	£0.8	Yes
Planning and design costs	£0.38	£0.9	Yes
Dataflow management	-	£0.8	Yes
Voltage investigations	£0.1	£0.4	Yes
Guaranteed standards	£0.1	£0.34	Yes
Benefits within plan	£2.51	£7.74	
Additional benefits realised by customers external to Electricity North West's business plan			
Reduced power outage duration	£0.3	£0.8	No
Reduction in network losses*	£0.2	£3.1	No
Storm benefits	£2	£8	No
Reduced connection costs	£0.25	£1.1	No
Additional benefits	£2.75	£13.0	
Total benefits	£5.26	£20.74	

3.2 Savings arising under alternate LCT adoption scenarios

The above savings are based on the DECC low LCT adoption scenarios. Savings under higher adoption scenarios are likely to be much larger.

In particular, the forecast reduction in losses is the minimum value likely to be observed, however under higher LCT growth scenarios coupled with the introduction of active time of use tariffs by Suppliers, then this benefit could rise to as much as £9M pa by RIIO-ED2, equating to over £72M of additional benefits for customers over the RIIO-ED2 period.

In addition to losses savings, time of use tariffs under the high scenario would be likely to add a further £4.8M of reinforcement savings pa by 2025 totalling an additional £29M by the end of the RIIO-ED2 period.

4. IT system changes

4.1 Scope

New IT systems and integration with existing IT systems will be required to support the roll out of smart metering within Electricity North West. The IT system changes that will be delivered within the remainder of the DPCR5 period and throughout the ED1 period to support the roll out smart meters to customer premises include; interfaces to DCC, integration into our network management (NMS), customer response management (CRM) and registration services.

The key objectives during the RIIO-ED1 period are:

- Support the Supplier smart meter rollout via the introduction of new scheduling and appointment tools (to be implemented in DPCR5)
- Connect to DCC systems to enable smart meter interaction (Alerts and Services)
- Improve network visibility to reduce or defer network reinforcement costs
- Improve customer service across a range of routine activities
- Provide the foundation for the future Smart Grid

4.2 Business Change drivers

The adoption of smart metering will require us to undertake a number of mandatory activities. In addition there are several non mandatory data transactions offered by the DCC which the business will adopt driven by the business benefits as outlined in this annex:

Smart meter rollout - DNO interventions

- The network operator is obliged to inspect and potentially undertake remedial works where a meter operator advises they are unable to complete a smart meter installation at a premise due to safety or other issues affecting the service termination. It is likely that many such referrals will come through industry data flows however it is also likely that our contact centre will experience an increase in customer or meter operator calls relating to smart meter installations. In order to ensure that we are able to offer excellent service to customers, whatever the communication route, we will implement enhanced work scheduling systems within DPCR5.

Industry interfaces – business systems changes mandated by licence condition:

- Registrations interface changes
 - Changes to existing interfaces to accommodate unique property reference number (UPRN) and SMETS data items
 - New interfaces from the DCC to inform us of the enrolment of each smart meter and to the DCC to update supplier registrations and agent appointments.

Further changes may also be mandated at a future date, potentially including:

- Additional registration and billing interface changes deemed required by DECC to support the smart meter roll out
- Billing methodology changes. Small/medium commercial sites may in future be billed from half hour consumption data obtained from smart meters. Billing of domestic properties is currently based upon aggregated profiled consumption, it is not currently envisaged that this would change
- Centralised registrations. It has been suggested that meter point registration systems may be centralised within DCC at a future date to be advised
- Requirements to certify the organization (or parts thereof) to standards such as ISO27001
- Costs for delivering future mandated changes such as described above are not included within the plan and any costs incurred as a result of additional mandated

requirements or change would be expected to be treated as pass through if they occurred – ie additional to this plan

Network operator participation and use of smart meter data is not currently mandated by DECC or Ofgem. We believe however that smart meter technology offers benefits for customers and therefore intends to be early adopters. For this reason, an investment of £1.5m has been brought forward from RII0-ED1 to DPCR5 for DCC integration enabling Electricity North West to fully align with DECC and industry expectations that DNOs will actively invest and participate in smart meter readiness activities during the DPCR5 period.

Interaction with the DCC will be required in order to access smart meter data:

- Communications
 - Interface specifications are defined by the DCC; network operators will need to comply with interfaces specifications and communication protocols in order to access smart meter data.
- Privacy and security
 - Access to smart meter data will be subject to strict privacy and security requirements - to be defined within the smart energy code (SEC). Network operators will be required to achieve certification against the SEC obligations before being able to access smart meter data
 - Formal security risk assessments will be carried out on an annual basis, and an independent third party will undertake an audit of information security management.

Access to smart meter data services will enable customer and business benefits as outlined in our smart meter strategy. Examples of smart meter data flows that support the identified benefits include:

Improved network planning

- Read profile consumption data
- Read network data (voltage and power quality logs)
- Read maximum demand registers

Improved network management

- Manage device (configure event alert thresholds)
- Read network data (voltage and power quality logs)
- Read maximum demand registers

Improved outage management

- Last gasp/first breath alerts
- Read supply status

Improved customer service

- Read supply status
- Read network data (voltage and power quality logs)

Some services will bring immediate benefits eg the ability to remotely interrogate a smart meter device and determine supply status without the need to despatch a fault technician. Other benefits will only be realised in the longer term when sufficient volume of smart meter data becomes available eg detailed consumption data assisting in long term network planning.

Network Management System solution vendors are expected to significantly upgrade their product offerings in order to fully exploit the capabilities and benefits of smart meter data and for this reason the expected procurement of a new Network Management System has been partially deferred in order to ensure that we obtain the best fit of functionality and integration of smart meter data, as a result £1.5m of NMS smart metering development costs have been

pushed back into the RIIO-ED1 period from DPCR5. Note that in cash terms this move when considered with our advancement of DCC interface, as noted above, nets to zero.

4.3 IT system landscape

To have access to smart meter data we will require a new communications interface to the DCC. We are working closely with other DNOs to help understand and define the requirements of such a system and to ensure comprehensive review, and where appropriate challenge and feedback to DCC interface design drafts. It is intended that we may partner with one or more interested network operators to specify and procure the necessary IT systems for the interface, sharing costs equitably and hence delivering benefits at the lowest possible cost to customers. It should be noted that some potential solution vendors have given prior indication that they may seek to licence DCC communications software and services to the corporate entity rather than to individual distribution licence holders, in such case our total IT costs will be proportionately higher and may not compare favourably with a direct comparison of other DNOs who are able to leverage a single solution purchase to service their multiple distribution entities.

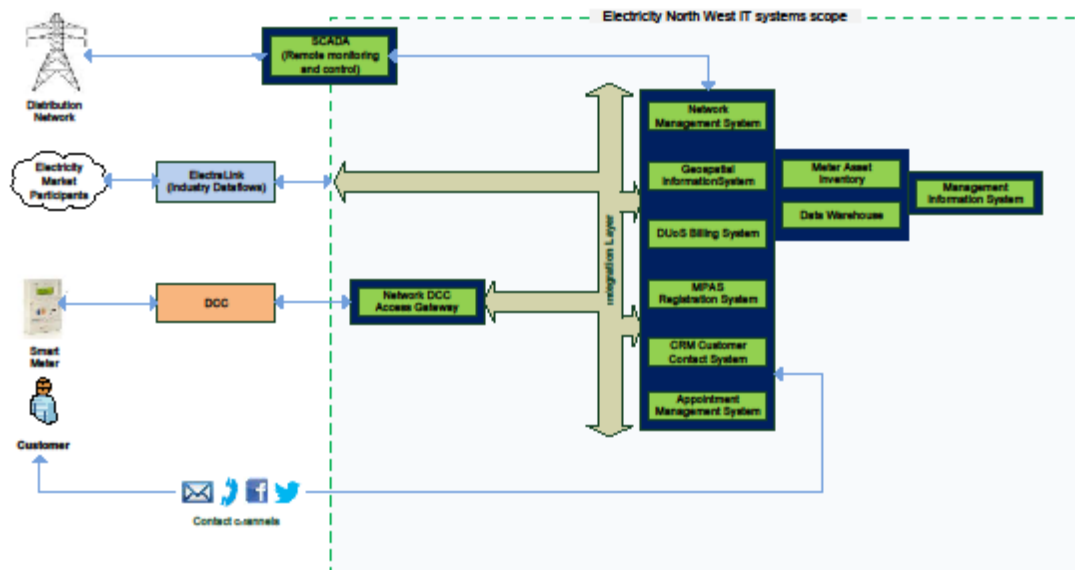
Connection to the DCC will require us to meet a defined set of security criteria affecting systems, process and staff resource. Our investment plan accounts for achieving and maintaining ISO27001 compliance which we believe fulfils the information security and privacy requirements currently required by SEC for our DCC User Systems. In the event that SEC changes mandate ISO27001 certification any costs arising will be additional to our plan and we have assumed these costs will be allowed as efficient smart meter related implementation costs under the uncertainty mechanism. Further work will be required to then integrate the use of smart meter data into our systems and processes to realise the forecast benefits.

Changes to industry data flow interfaces will be mandated to support the exchange of smart meter data between other industry parties and data and licence charges will be mandated for the use of smart meter data.

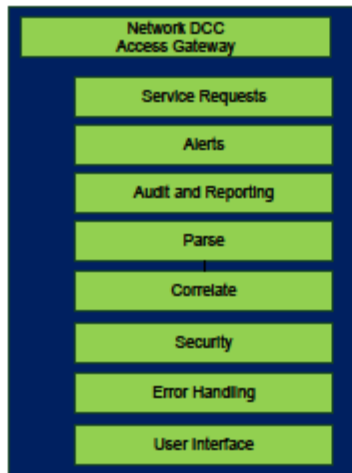
With the introduction of smart meter data there will be a requirement for secure storage and access control of sensitive data (consumption profile data) and data integration with the network management system to aid fault diagnosis and future network planning.

From mid to late 2015 the supplier rollout of smart meters is forecast to ramp up significantly. At the peak we will expect 8,500 meters installed per week across the region, with an anticipated rate of between 2 - 5% of installations requiring network operator intervention to support the installation process. This represents a 400% increase on normal installation volumes and will require a corresponding ramp up of engineering resource. New and amended IT systems will be required to help manage and support the increase in workload in resource scheduling and customer appointments management.

Conceptual Systems schematic



Network DCC Access Gateway

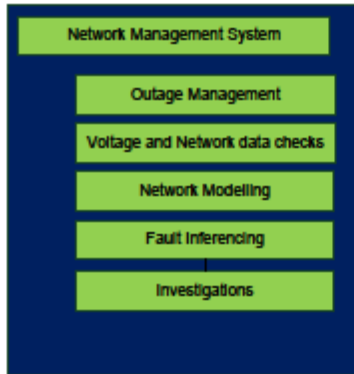


Smart meters deliver the capability to be remotely interrogated and collect engineering and consumption data. Access to smart meter data can only be achieved via the DCC, direct meter access is not permitted. A new IT solution is required which will handle the communication, security, audit and control of all data exchanged. The gateway will provide both machine to machine interfaces and a user interface to allow the full range of network operator smart meter commands to be utilised.

Minimal business logic will be embedded within the gateway although some common responses and orchestrated activities may be specified as a part of the common requirements definition taking place in partnerships with the other DNOs eg automatic change of meter security keys and configuration of network parameters whenever a new smart meter is installed.

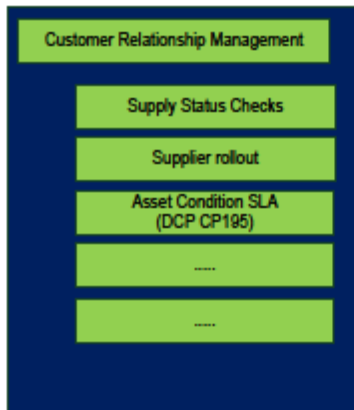
The gateway is expected to maintain the inventory of smart meter device ID to MPAN mappings but will not store any transactional smart meter data, acting only as the interface to Electricity North West's back end systems.

Network Management System (NMS)



Separate to the introduction of smart meters, we are replacing our existing NMS with an up-to-date system that will provide smart grid functionality. The new NMS will use smart meter data to fulfil its potential, including loading data and alerts from smart meters. Given the emerging nature of smart grids, it is expected that the interface requirements between the DCC Access Gateway and the NMS will continue to develop.

Customer Relationship Management (CRM)

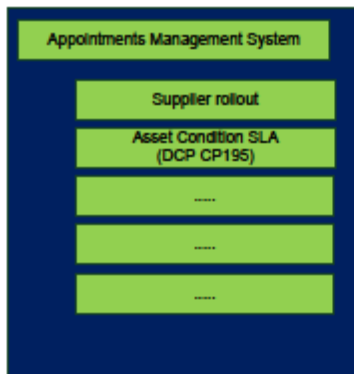


Separately to the introduction of smart meters, we are introducing a new Customer Relationship Management (CRM) system with the aim of centralising and improving all the interactions with customers.

The CRM will be integrated with the DCC Access Gateway and NMS systems so that call agents can provide the customers with more accurate information regarding the scope, nature and expected resolution timescales for any incidents, including those related to metering issues.

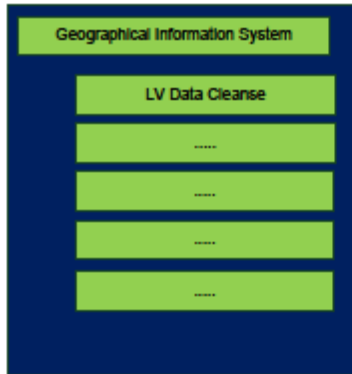
The CRM system will be enhanced to support all aspects of the smart meter rollout, including introduction of Asset Condition SLAs (DCP CP195).

Appointments Management System



During the smart meter rollout, the meter operator may identify problems at the service position and where the network operator will be required to undertake work before the smart meter can be installed, eg replacement of the cut-out fuse assembly. Electricity North West needs to enhance its appointments management system to manage the expected volumes of interventions triggered by the smart meter rollout. We intend to use the appointments system to schedule both direct and contract labour. The appointments system will interface to the CRM to provide a seamless service for customers.

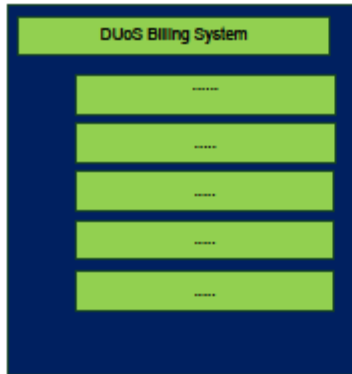
Geographical Information System (GiS)



The introduction of smart meters should not directly affect the GIS system; however to make any realistic use of available smart meter data it will be critical to modify GIS system data to make accurate the LV network connectivity model. For example without a completely accurate connectivity model, last gasp alerts for fault inferencing will not work efficiently. A comprehensive programme of LV data cleansing work is required to map meter assets to LV service terminations

We have included £4m investment to undertake this LV data cleanse activity.

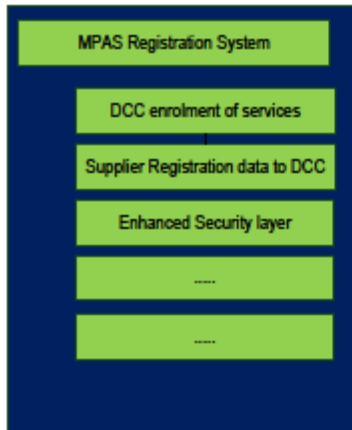
DUoS Billing System



There is unlikely to be any significant changes to the DUoS billing system during the early part of RIIO-ED1 but as smart meters become more prevalent the industry may develop new tariffs and charging initiatives which, for example, need to send appropriate Demand Side Response cost signals to consumers.

Although these could require billing system changes, we have not included any significant costs within plan.

MPAS Registration System

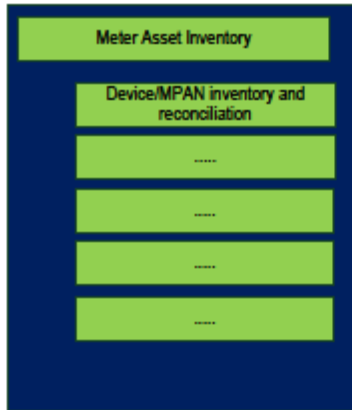


DECC have mandated changes to existing registration interfaces to cater for the exchange of new smart meter data attributes and also defined new interfaces to enable exchange of registration data with the DCC. We will have to change to our existing systems to meet the security requirements for the DCC and in line with DECC timescales.

From circa 2017 there is also the likelihood that Registration systems will be centralised within the DCC. This will require the development of existing, or new, interfaces for billing and other purposes.

We have not included any costs for centralisation of the DCC registrations system, assuming that we would be able to achieve it within the existing DCC interface capabilities rather than require any new infrastructure.

Meter Asset Inventory



The introduction of smart meters introduces new data attributes into several different business areas. To manage the relationship between smart meter devices, MPANs and notifications of DCC enrolled MPANs in registration systems a new meter asset inventory system is required.

We note that Ofgem has begun the process of consulting with industry on the potential creation of a centralised meter asset database. Centralisation will require the development of existing or new interfaces for billing and other purposes.

We have not included any costs for any significant integration to a centralised DCC asset inventory system. We assume that we will be able to achieve this within the existing DCC interface capabilities rather than require any new infrastructure.

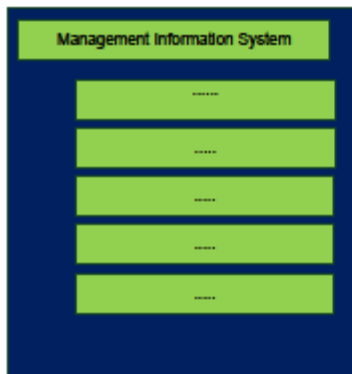
Data Warehouse



Smart meter data will allow more detailed and accurate modelling of gross customer demand which will improve our network planning and help reduce or defer network investment. There are significant security implications in using customer data in this way, and we will have to implement appropriate data security systems including aggregation

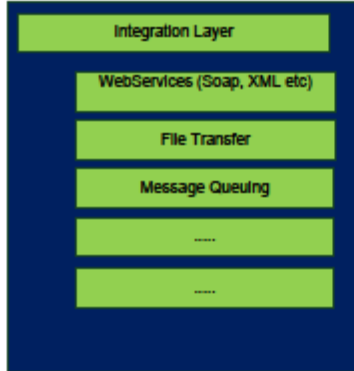
Large volumes of smart meter data may be collected from smart meters, a typical consumption profile data read from a 90 day period may contain up to 18 000 data points for one customer. We will introduce a new secure data warehouse which will maintain and control access, security and auditing of the use of data consistent with the requirements of Ofgem, DECC, and the Information Commissioner's Office.

Management Information System



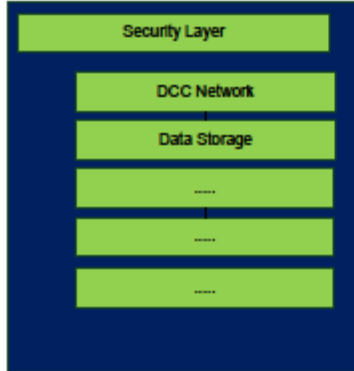
Smart meter data will allow more detailed and accurate modelling of aggregated customer demand which will improve our network planning and help reduce or defer network investment. New management information will be developed to help control, simplify and enhance network management, analysis and reporting.

Integration Layer



The integration layer will provide for the technical integration middleware and infrastructure required to join the various system components together. At present no one specific integration product or platform has been defined, it is expected that the layer will comprise of one or more of the technologies listed to the left. There may be different levels of integration applicable at different phases of the smart meter rollout as the volumes of smart meters installed grows and the resultant business benefits become more valuable.

Security Layer



Additional security compliance and audit requirements apply to connecting to the DCC network and also to storing smart meter data (disaggregated consumption profile data). Provision has been made for complying with relevant aspects of ISO27001 and the Data Protection Act.

Attaining actual ISO27001 certification or achieving compliance for wider system and process requirements are not currently included in the plan.

4.4 Costs

Smart Meter rollout

The following table indicates the ongoing Indirect/IT and data services costs with regards to smart meter rollout:

	DPCR5	ED1 Pass through	2022	2023
IT set up costs for scheduling and appointments management (during DPCR5)	0.5			
Registrations and additional scheduling and call centre resource (during rollout FY16-FY21)		1.2		
Total	0.5	1.2		

Smart meter data and DCC integration

The following table indicates the ongoing data services costs with regards to smart meter data and DCC integration:

	DPCR5	ED1 Pass through period	2022	2023
DCC Licence Fee through ED1 (assumed costs)		2.4	0.4	0.4
Smart meter transaction data charges through ED1 (assumed costs)		0.6	0.1	0.1
Total		3		

The following table indicates the ongoing Indirect/IT vices costs with regards to smart meter data and DCC integration:

	DPCR5	ED1 Pass through period	2022	2023
Network DCC Access Gateway	1.5	1.2		
Integration and Analytics	0	3.0		
Asset Inventory	0	0.5		
Data Storage	0	0.5		
Data Centre/Hardware	1.0	0		
NMS (enhancements enabling utilisation of smart meter data)	0.5	2.3		
LV Data Cleanse	0	4		
Project Management, business support, Infrastructure support and maintenance	0	1.5	0.5	0.5
Hardware/software refresh	0	0	0.5	0.5
Security	0.1	0		
Total	3.1	13.0	1.0	1.0

4.5 Benefits

The aforementioned IT system changes are required in order to deliver the benefits as defined in this annex.

13 Appendix C – Stakeholder consultation



Smart Meter Consultation

Customer and stakeholder feedback report

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Background and objectives





Introduction

To lawfully access and use Consumption Data obtained from Smart Meters relating to a period of less than one month ENWL are required to have a Data Privacy Plan (DPP) approved by Ofgem.

Ofgem Criteria 8 – Stakeholder Engagement states: *Demonstrate that, in developing its privacy plan, the DNO has engaged constructively with relevant stakeholders, including Customer groups and those with expertise in approaches to data privacy. The DNO must provide details about the output of such engagement, including how it has responded to the feedback in refining its data privacy plans.*



Ofgem have stipulated the need for a DDP before Consumption Data at the more granular level can be used and stored

- The roll out of Smart Meters provides the capability to record energy consumption in half-hourly intervals and for this information to be used by network operators.
- Traditional meters are not capable of doing this, and replacing them with Smart Meters is seen as an important step in helping to achieve a more reliable and cost-effective electricity system across Great Britain.
- However, access to this Consumption Data raises the potential privacy issues, along with concerns over data storage and GDPR.

Business objective

To understand customer 'comfort' with ENWL having access to half hourly consumption data

More specifically, to understand the importance of the **protections** ENWL would need to put in place, including, but not limited to:

- Not sharing or selling information for marketing purposes
- Storing information securely to prevent unauthorised access
- Only using consumption information to operate the network more efficiently and reliably
- Ensuring that only authorised ENWL staff have access to the data
- Collecting and storing information in a way that cannot be linked to individual properties.
- Only using data to create historic profiles



Smart meter consultation methodology



Quantitative customer survey lasting 26 minutes on average



206 domestic and business customers took part between 29/06/20-19/07/200



Telephone methodology mitigated possible digital exclusion



Wider stakeholders invited to respond to consultation online (11 participants)



Results



Statistically robust & representative research

Survey sample



131 households took part

Quotas were set to ensure the survey sample was representative of the North West region



Gender



Location



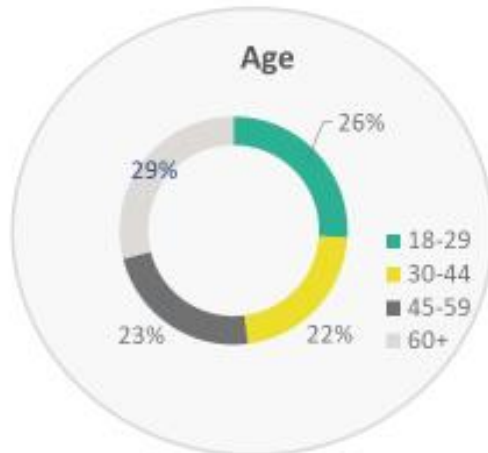
Vulnerable customers

Customers registered on PSR 33%

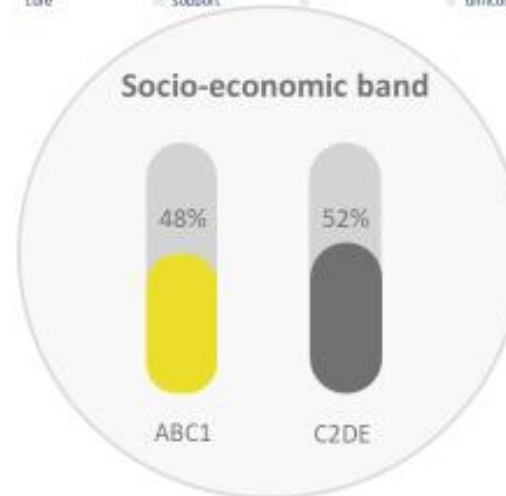
Customers identifying as vulnerable in survey 33%



Age



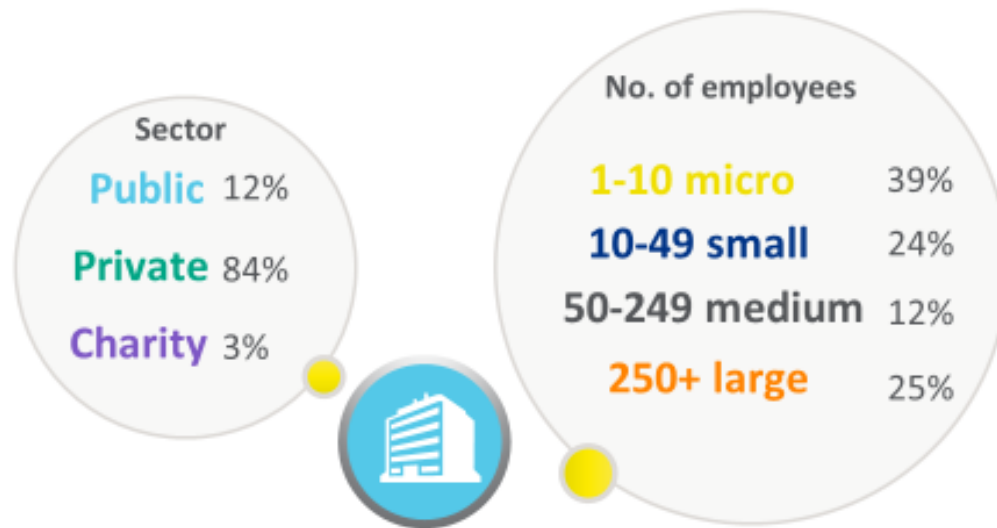
Socio-economic band



Demographic data was obtained from Office for National Statistics (ONS)


75 businesses took part

Quotas were set to ensure the survey sample was representative of the North West region



Business sector	
Agriculture, mining and utilities	3%
Food, Drink & Tobacco Manufacturers and Other Manufacturing	12%
Construction	5%
Total services	80%
of which	
Retail	20%
Transportation	4%
Accommodation and food	8%
ICT	3%
Financial and insurance	3%
Real estate activities	1%
Professional and scientific	11%
Administrative and support	12%
Education	0%
Health and social work	11%
Arts and recreation	3%
Other service activities	5%

Results for the business customer segment have been analysed at a total level to ensure statistical robustness.



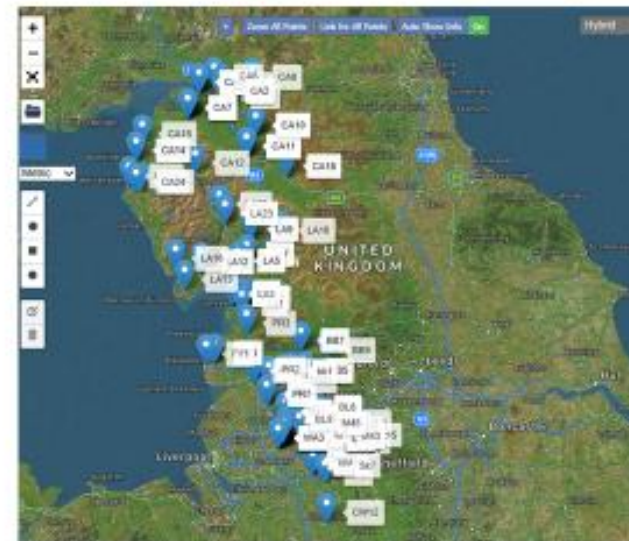
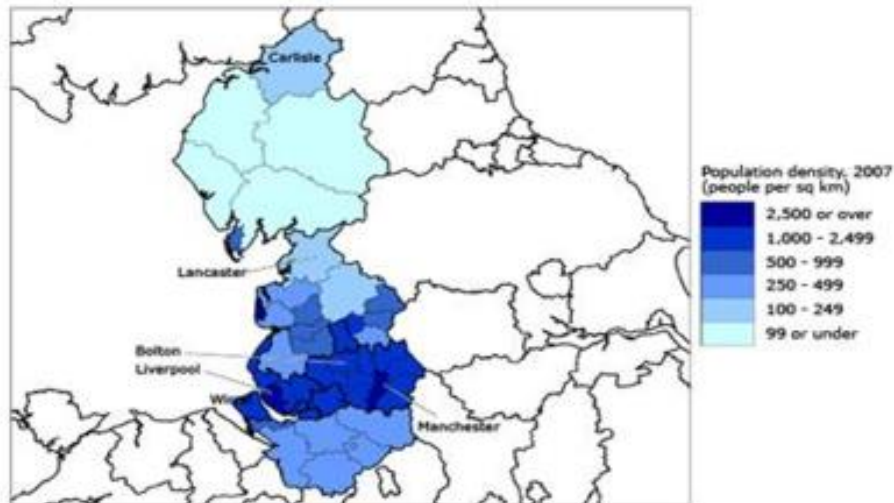
The socio-demographic profile of the survey population is within 5% of the true incidence of customer groups within the region, therefore the data did not require weighting.

Data representative based on: gender, age, socio-economic class, vulnerable population, smart meter ownership.

The survey population is closely correlated to population density



We have used postcode mapping to illustrate the spread of customers surveyed, ranging from densely populated cities to sparsely populated rural areas.



Q2. To ensure we are speaking to people in the right areas, please can you tell me the first part of your postcode. We will not be using this information for any other purposes than for analysis.

11

Key findings

BIG & CLEAR

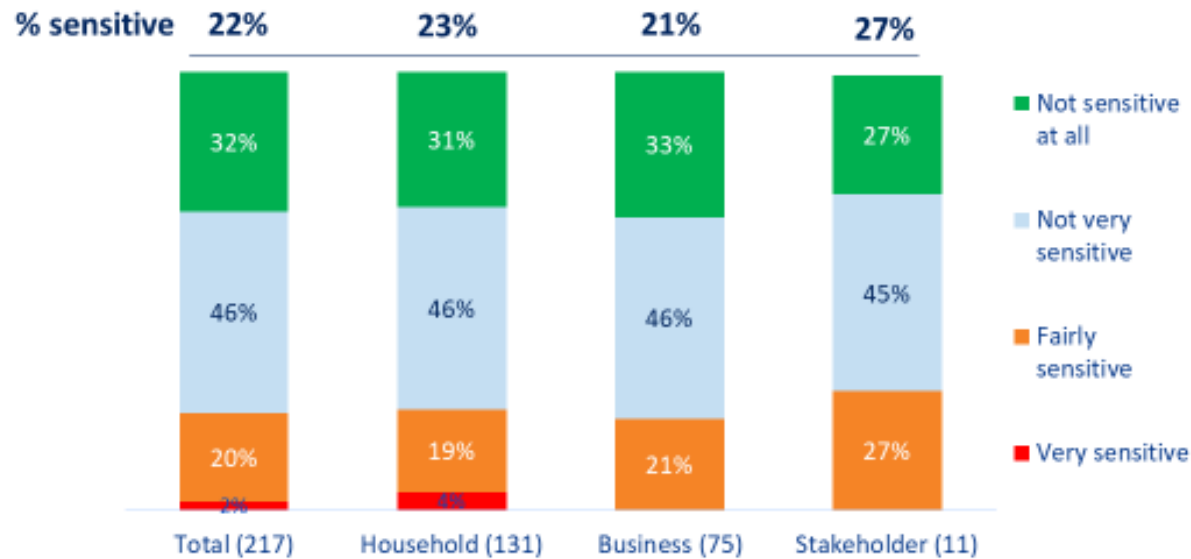
Customers and wider stakeholders support half hourly smart meter data being accessed by ENWL

An equitable level of comfort exists for energy suppliers and DNOs to access the data. A range of safeguards need to be in place and it is important to use the data to improve services, particularly delivering a reliable network.

Data sensitivity



1 in 5 regard consumption data as sensitive



Segments more likely to view data as sensitive

- ***Females (31%)**
- **60+ (30%)**

**Statistical significance tested at 90% level*

Segments less likely to view data as sensitive

- **18-24 (13%)**

N.B. There are no statistically significant differences in sensitivity by smart meter ownership (yes -27%, no 18%)

Q19. To what extent do you feel Electricity Consumption Data collected at 30-minute intervals is sensitive information? Would you say this information is? N.B. % sensitive is a NET of 'fairly sensitive' and 'very sensitive' combined.

Voice of the customer – verbatim comments

Feedback from customers who believe consumption data is not sensitive

<p>"If it improves the service offered to customers then I think it's a good thing to do. I do not think it is sensitive."</p> <p>Household</p>	<p>"It doesn't reflect anything about our business or our turnover."</p> <p>Business</p>		<p>"It has no personal information in there. I can't see that this information (on its own) is valuable to anyone else."</p> <p>Household</p>	<p>"It's not something I'd object to with people knowing my electricity consumption."</p> <p>Business</p>
<p>"For us as a company, anything like this that allows us to have a better service we are all up for it and would be interested in working with ENW to achieve this."</p> <p>Business</p>	<p>"I feel that the information is only about how much electricity is being used so therefore not that sensitive."</p> <p>Household</p>		<p>"It must all be covered by GDPR so it doesn't worry me at all and in this day and age anyone can find out anything they want to anyway.."</p> <p>Business</p>	<p>"My electricity use isn't a sensitive topic."</p> <p>Household</p>

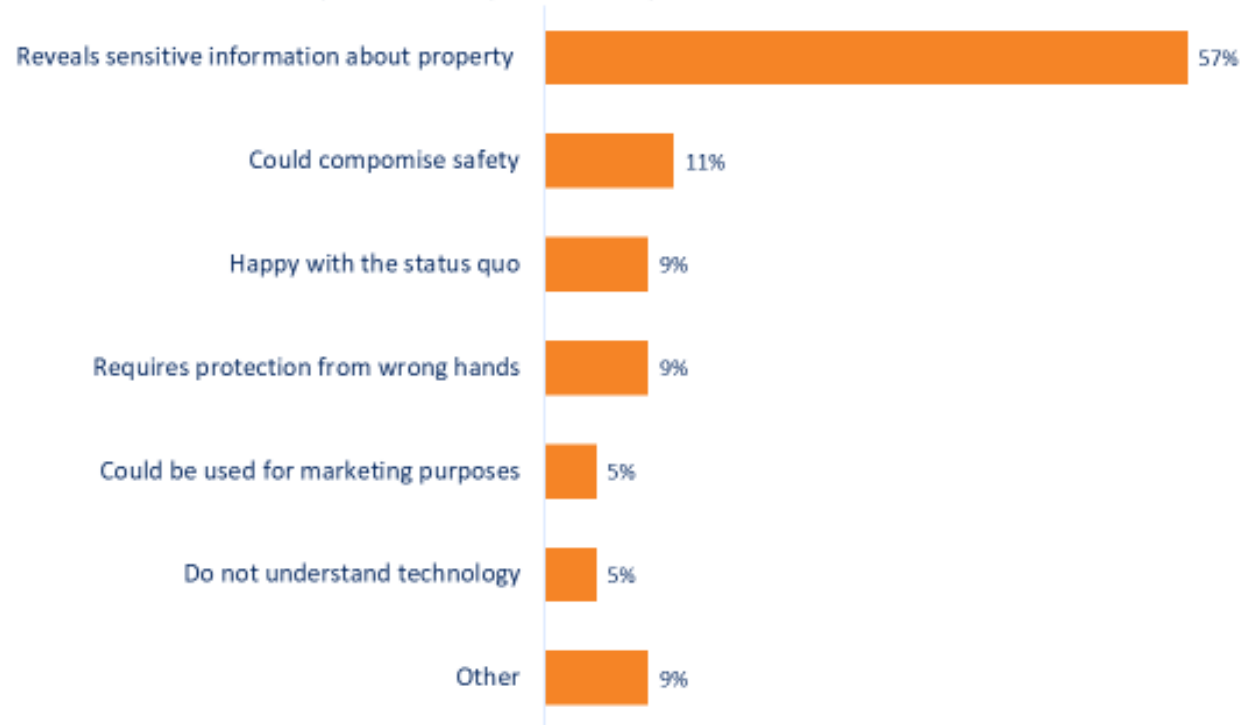
Q20. Why do you say that consumption data is not sensitive? (n=156)

Consumption data is sometimes perceived as personal to individuals and commercially sensitive to businesses



Of the 22% of customers perceiving the data to be sensitive

Why is consumption data perceived as sensitive?



Q20. Why do you say that? (n=44)

Voice of the customer – verbatim comments

Feedback from the 22% of customers who believe consumption data is sensitive

"I do not like the idea of people knowing my business of **any kind**. I do not really understand all this modern technology and it frightens me. I like things the old fashioned way"

Household

"It is information about our company, so it is **sensitive**. I would not want the information to be accessed by other companies."

Business



"Because it's quite **private** in terms of what you're doing in your own house - and sounds like it's collecting a lot of information. Every 30 mins seems **intrusive**."

Household

"It is information about our company, so it is **sensitive**. I would not want the information to be accessed by other companies."

Business

"I am sure there are **marketing people** who are interested in this and I would not want them to have these details."

Business

"Because it **shows when you're home**, it can give an indication when people are out of the house."

Household



"It can give indications of when the **property is occupied**, or the trend for that street. It can show spikes of usage and can be used to build up a picture of **behaviour**."

Business

"They can use it to figure out **when you are in or not**, how many people are in the house, I have heard they're **bad for you health** if you stand near them.."

Household

Q20. Why do you say that consumption data is sensitive? (n=44)

Comfort with data being shared

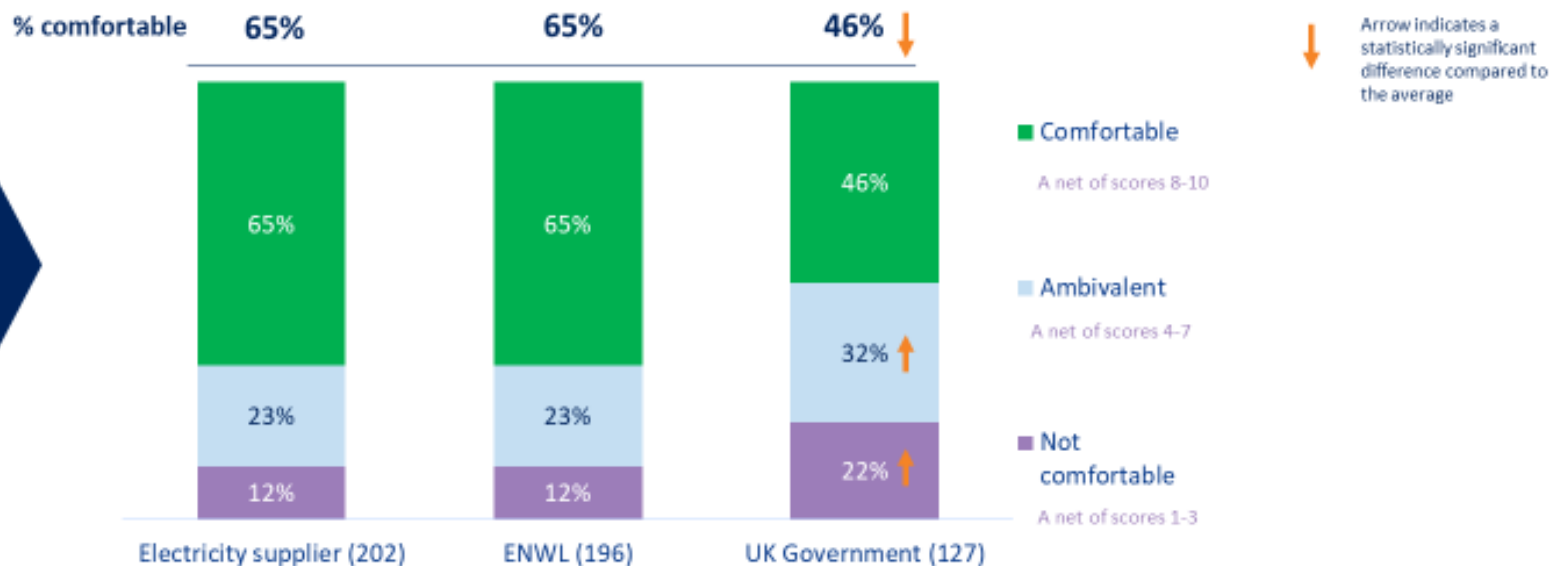


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The majority of customers are comfortable with ENWL accessing data



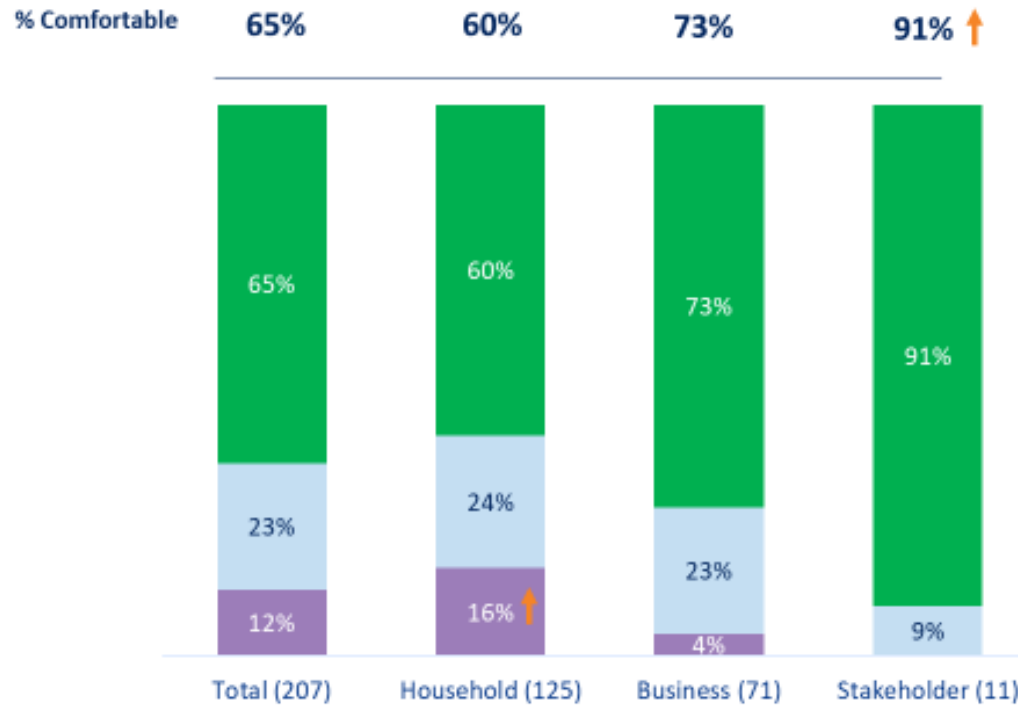
Customers are *as* comfortable with ENWL accessing data as energy suppliers



Q21. Based on what you know, how comfortable are you with half-hourly electricity consumption data from smart meters being shared with:

1. Your electricity supplier – e.g. British Gas, SSE, EDF, npower, E.ON and Scottish Power
2. Your local electricity distributor – Electricity North West
3. The UK government.

Households are less comfortable with ENWL accessing consumption data than businesses and wider stakeholders



Segments more likely to be comfortable:

- **Cheshire (85%)**
- Know a fair amount about ENW (79%)
- Rural 76%
- 45-59 year olds (73%)
- Heard of ENW before (72%)

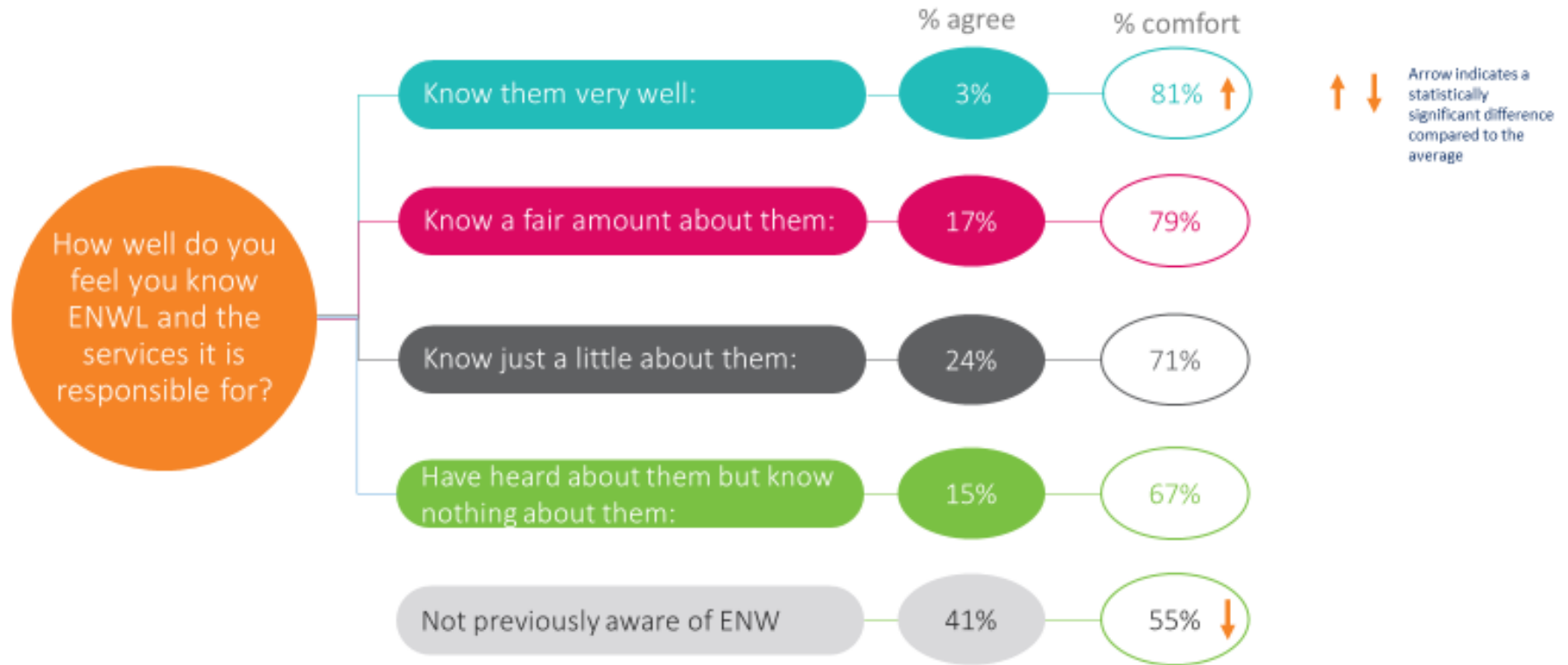
Segments less likely to be comfortable:

- Urban (57%)
- **Not heard of ENW before (55%)**
- Vulnerable (54%)
- **Lancashire (52%)**
- **60+ (49%)**

N.B. There are no significant differences in trust by smart meter ownership (yes -56%, no 62%)

Q21. Based on what you know, how comfortable are you with half-hourly electricity consumption data from smart meters being shared with your local electricity distributor – Electricity North West

There is a direct correlation between awareness of ENWL and the level of comfort customers have with data sharing



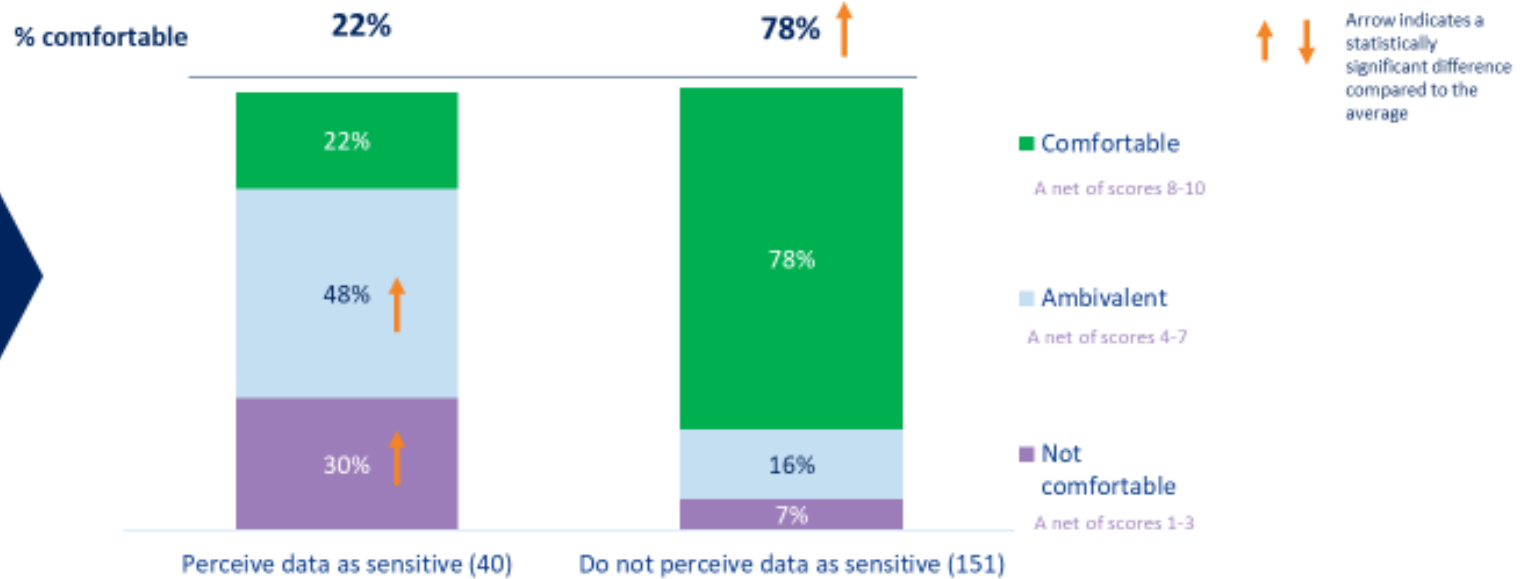
Q18. How well do you feel you know Electricity North West and the services it is responsible for? (Asked to those aware of ENWL)

Q21. Based on what you know, how comfortable are you with half-hourly electricity consumption data from smart meters being shared with your local electricity distributor – Electricity North West

A large proportion of customers who perceive the data as sensitive are ambivalent about how comfortable they are with it being shared with ENWL



There is a direct correlation between the perceived sensitivity and level of comfort felt



Q21. Based on what you know, how comfortable are you with half-hourly electricity consumption data from smart meters being shared with:
 1. Your local electricity distributor – Electricity North West

Building trust

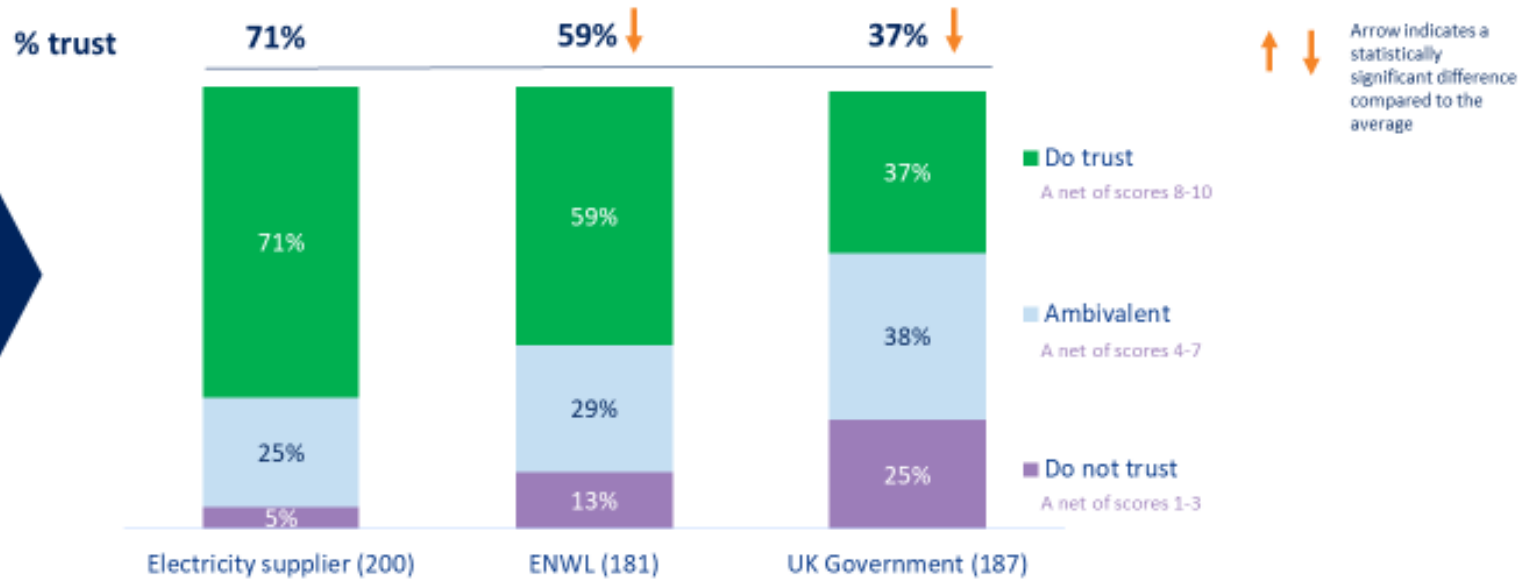


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Despite equitable levels of comfort, energy suppliers are trusted significantly more than ENWL to keep customers data safe

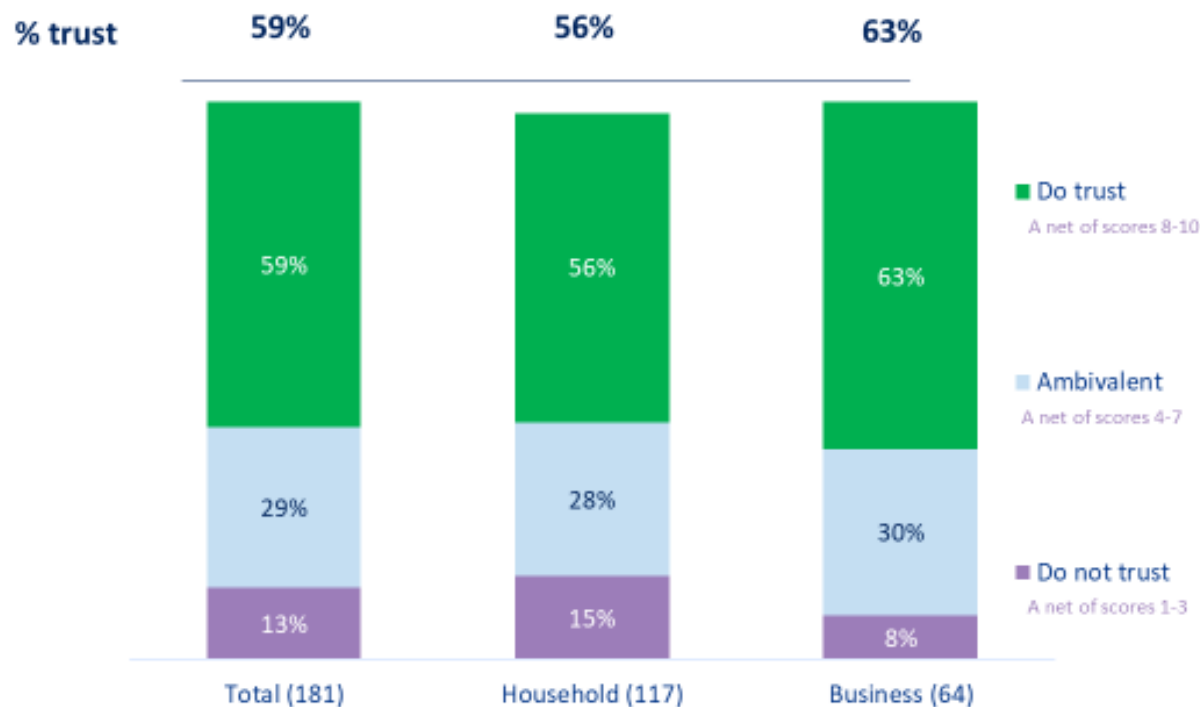


Trust reduces the more distanced customers feel to the organisation



Q23 How much do you **trust** your electricity supplier? And how much would you **trust** the following **organisations** to keep your electricity consumption data safe? Your local electricity distributor – Electricity North West The UK government.

Households and businesses show similar levels of trust in ENWL to keep consumption data safe



Segments more likely to trust:

- Know a fair amount about ENW (75%)
- Cheshire (75%)
- 30-44 (78%)

Segments less likely to trust:

- 18-29 (40%)
- Lancashire (37%)
- 75+ (36%)

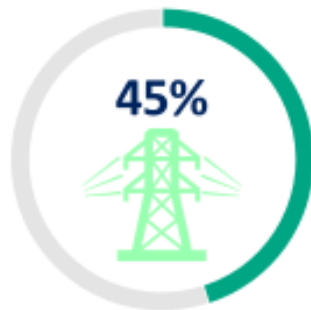
N.B. There are no significant differences in trust by smart meter ownership (yes -61%, no 68%)

Q23 And how much would you **trust** the following **organisations** to keep your electricity consumption data safe? Your local electricity distributor – Electricity North West

Benefits of data being shared



The greatest priority is using consumption data to deliver a reliable network (consistent with other priorities research)



Identifying areas of the **network** which need upgrading, enabling **improved reliability**

64% of stakeholders agreed this was the key benefit

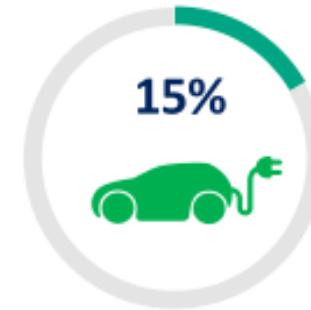


Improving efficiency to make better use of existing equipment to **defer or avoid** the need for roadworks and disruption that is caused by **upgrading the network** (e.g. substations)

Groups more likely to value improving efficiency:
Rural (35%) & 2+ LCT in home (43%)



Identifying areas of the network which are experiencing **power cuts** for faster repair



Identifying trends in **electric car** and **solar panel** ownership and upgrading the network to allow more customers to connect these technologies to **reduce emissions** and the effects of climate change

Groups more likely to value enabling connection of LCTs
25-29 (44%)

Q25. Which of the following factors do you think should be the greatest priority for Electricity North West, should they access half-hourly electricity consumption data? Please select one option.

Putting in place the right protections

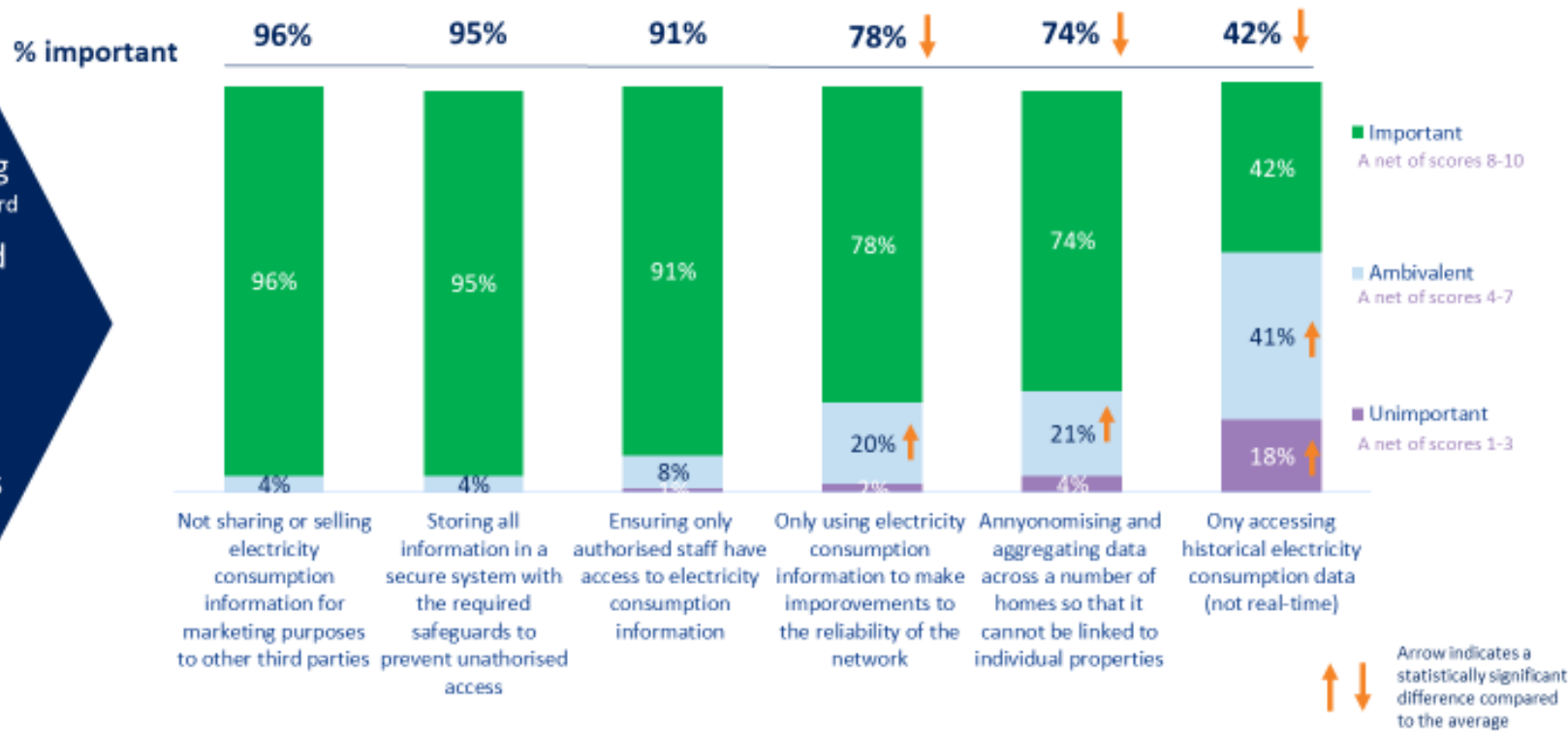


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A range of measures are required to safeguard consumption data



Not sharing data with 3rd parties and restricting access are the most important safeguards



Q26 I am now going to read out a list of measures that Electricity North West could put in place to ensure smart data security.

How important are these to you on a scale where 1 is not at all important and 10 is very important?

Customers want to hear from ENWL in the future to receive reassurance, but also how the service is being improved



Other mentions

- 4. Prevent unauthorised access 10%
- 5. No access to personal data (name, address) 7%
- 6. Contact number to ask questions 1%
- 7. Don't know 5%
- 8. Other (e.g. nothing would reassure me) 14%

Q27. If Electricity North West were talking to you in the future, what would you want to hear from them to reassure you about the security of smart meter electricity consumption data?

30

Voice of the customer – verbatim comments

Feedback from customers who would like further information/ evidence to feel reassured

"I find it hard to understand so I would like to **see it in writing** and then I can ask advice on it to other family members who are a younger generation to me to see if they think its all safe."

Household, 6/10 comfortable

"Just **evidence** of what measures they have in place, so some kind of proof of what they are saying is true."

Household, 10/10 comfortable



"To give some kind of **guarantee** saying that the things they have in place ensure they keep it all safe and secure.."

Household, 10/10 comfortable

"By highlighting how much they have **spent** on keeping data safe."

Business, 5/10 comfortable

"**Open and informative** with communication that the systems are all secure and that the information is *only* been used to **improve reliability and service**. No information is to past to a third party."

Business, 10/10 comfortable

"That any data collected was just to monitor and to **improve the service** and guarantee that it would not be used for anything else."

Household, 8/10 comfortable



"Just that the information is covered by **GDPR**.."

Business, 8/10 comfortable

"I would want them to give me a cast iron **guarantee** that my information is safeguarded."

Household, 1/10 comfortable

Q27. If Electricity North West were talking to you in the future, what would you want to hear from them to reassure you about the security of smart meter electricity consumption data? (n=93) Scores out of 10 are how comfortable the respondent felt with ENWL accessing consumption data

31

Voice of the customer – verbatim comments

Feedback from customers who felt there is little ENWL can do to further reassure them

“Data security **cannot be fully guaranteed** 100% however much protection they put in place.”

Household, 1/10 comfortable

“They can promise lots of things but data can still be stolen, it is **never 100% safe.**”

Household, 1/10 comfortable



“I am a very cautious person after being scammed 3 years ago. The person responsible is still in prison. **Nothing is safe** no matter how much reassurance they can give. There is a way around everything..”

Household, 3/10 comfortable

“That is a good question. **Technologies can fail** and information can be leaked out. I would want to know that they are doing their best to store the material safely.”

Business, 8/10 comfortable

“Anything can be said or written down but data can easily get stolen or used inappropriately.”

Business, 3/10 comfortable

“The system cannot be 100% safe no matter what the company tells you, and there isn't anything they could say to me . **Everything is hackable.**”

Household, 2/10 comfortable



“I think it is too invasive and can be used to identify patterns of behaviour I would not like them to have. I think it should be collected on a daily basis..”

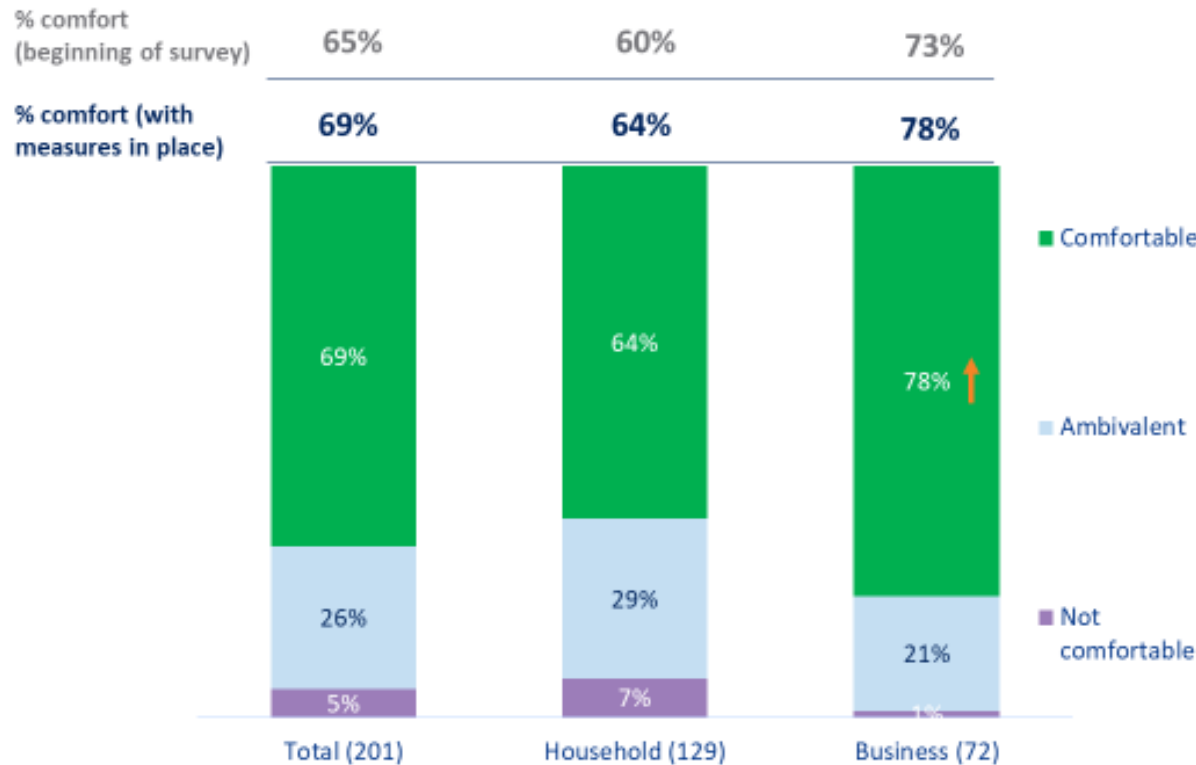
Business, 4/10 comfortable

“Somebody needs to be **accountable** and who is going to be governing them”.

Household, unsure of comfort level

Q27. If Electricity North West were talking to you in the future, what would you want to hear from them to reassure you about the security of smart meter electricity consumption data? (n=29) Scores out of 10 are how comfortable the respondent felt with ENWL accessing consumption data

Customers largely expect the security measures that are important to them to be in place – comfort comes through evidence



Segments more likely to feel comfortable:

- Cheshire (85%)
- Rural (81%)
- Cumbria (78%)
- Heard of ENWL (76%)
- 30-59 (75%)

Segments less likely to feel comfortable:

- 60+ (57%)

N.B. There are no significant differences in comfort by smart meter ownership (yes -64%, no 73%)

Q28. If all of the data security measures that are important to you were in place, how comfortable would you be with Electricity North West having access to half-hourly smart meter data?

Research conclusions



Research conclusions (1)



- 1 in 5 regard consumption data as sensitive
- Most participants are comfortable with ENWL accessing consumption data (*an equitable level to energy suppliers*) because it is not regarded to be personal, or commercially sensitive data
- Some are more comfortable than others
 - Customer groups, such as those aged 60+, require more reassurance than businesses and stakeholders
 - Of those who did not feel comfortable, the prevailing reason is a general suspicion that data could be used to monitor their daily lives and because ENWL is not widely known.
- Low awareness of ENWL and customers limited understanding of the electricity sector means that energy suppliers are trusted more than ENWL to keep consumption data safe.

Research conclusions (2)



- Using the data to make improvements to service is the greatest priority for customers and stakeholders
 - Delivering a reliable network is the top priority / most valued benefit
- The most important safeguard (96% net importance) is that ENWL will not use, share or sell consumption information for marketing purposes with third parties
- Customers expect a range of safeguards to be in place and assuming that they are does little to put them at ease. In essence, seeing is believing. Therefore, there is an opportunity to communicate with customers and wider stakeholders in the future to reassure them:
 - ✓ How data is stored and kept safe, such as from cyber attacks
 - ✓ Which legislation and security standards are upheld e.g. GDPR
 - ✓ No personal or sensitive data is processed from smart meters
 - ✓ Data is not passed to third parties for sales and marketing purposes
 - ✓ The recovery processes ENWL has in place for data breaches
 - ✓ How customers can find out more and ask questions



A simple customer leaflet that explains the DPP would be beneficial (further research to be conducted with ENWL Voice of the Customer Panel)



Thank you

Stay connected...



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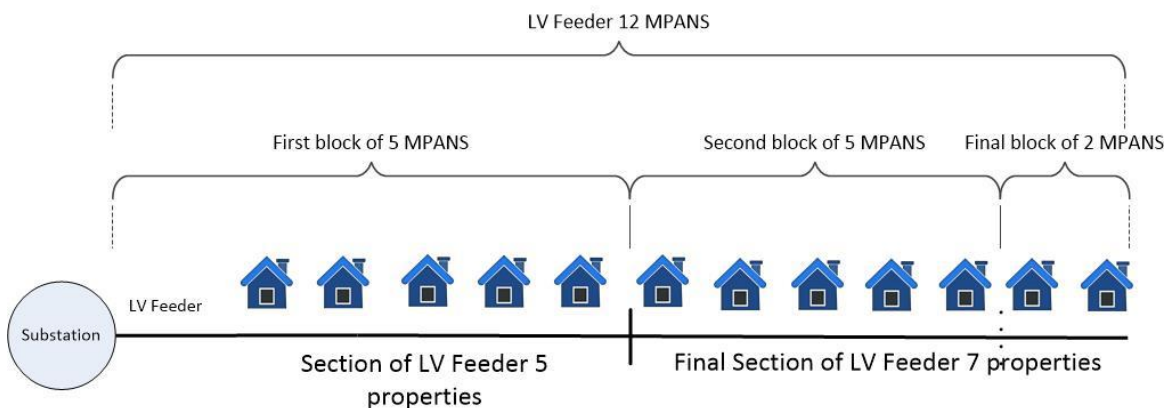
14 Appendix D – Principles of aggregation

Principles of aggregation for smart meter consumption profile data

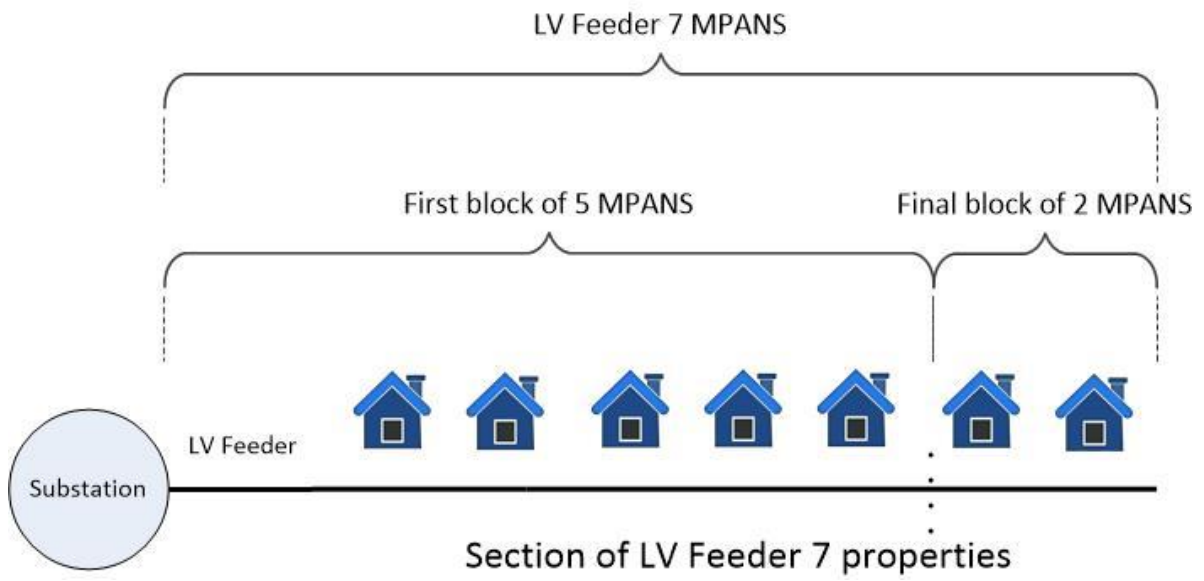
For this methodology, MPAN refers to MPANs which have, or are envisaged to have, a smart meter installed in the property. It does not include those MPANs connected to an LV Feeder for those consumers which are referred to 'maximum demand' or 'current transformer' metered customers.

Load profile aggregation

- The consumption data for each half hour period for each MPAN on an LV Feeder will be summated to generate an aggregated consumption profile for that LV Feeder. This aggregated consumption profile will then be allocated to that LV Feeder.
- The consumption data for each half hour period for each MPAN on a Section of LV Feeder will be summated and averaged to generate an aggregated consumption profile for that Section of LV Feeder. This aggregated and averaged consumption profile will then be allocated to each MPAN in that Section of LV Feeder.
- Starting at the supply end, each LV Feeder will be split according to the length of LV mains cable between joints as recorded in the ENWL GIS database, and the MPANs supplied from this section of mains cable identified. Where the cable serves less than 5 MPANs, the next section will be combined with it until a defined section supplies as least 5 MPANs. This is referred to as a Section of LV Feeder.
- Where there are less than 5 MPANs on the last Section of LV Feeder, the MPANs on the final Section of LV Feeder will be included in the previous Section of LV Feeder, ensuring that each Section of LV Feeder contains at least 5 MPANs. See drawings D1 and D2.
- [REDACTED].
- Where a Section of LV Feeder contains an MPAN which does not have a smart meter enrolled by the DCC, the MPAN will be allocated the average half hour consumption profile for the LV Feeder that it is on.



Drawing D1: Aggregation with multiple blocks (more than 9 MPANs)



Drawing D2: Aggregation with two blocks (less than 9 MPANS)

[REDACTED]

15 Appendix E – Load duration curves

- A load duration curve profiles the percentage of time that an asset is at peak load. An example of how this relates to a consumption profile is shown below. Figure E1 shows a consumption profile. Figure E2 shows how this translates into a load duration curve.
- The benefit of a load duration curve is that it can be used in assessing cyclical overload of assets, informing decisions on how short-term overload might be balanced with detriment to asset life and facilitate identification of situations where flexibility services might be offered.
- Once the half hour data has been converted into a percentage of the Maximum Rateable Asset Load and the data has been re-ordered from the highest to the lowest value, then the data can no longer be reverse engineered to identify the time period that a particular demand occurred. In addition, as it is expressed as a percentage of the capacity of the asset, it does not show the actual demand.

Figure E1: Example of consumption profile

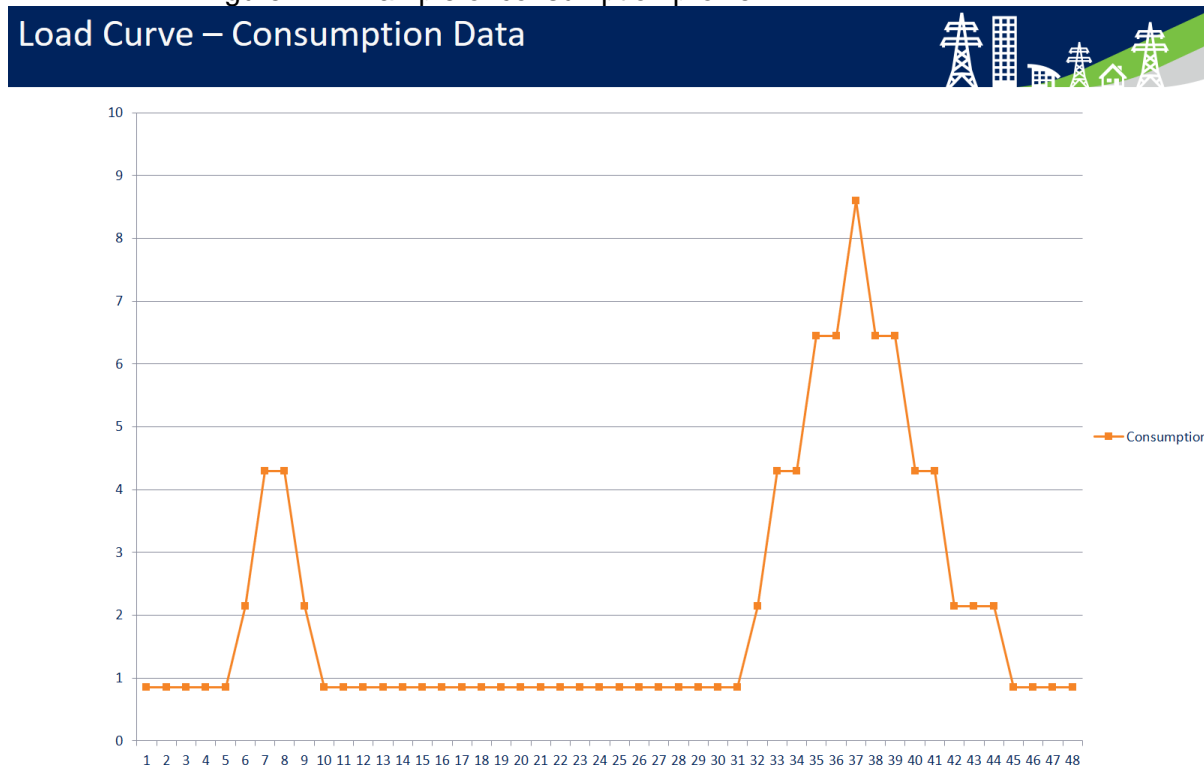
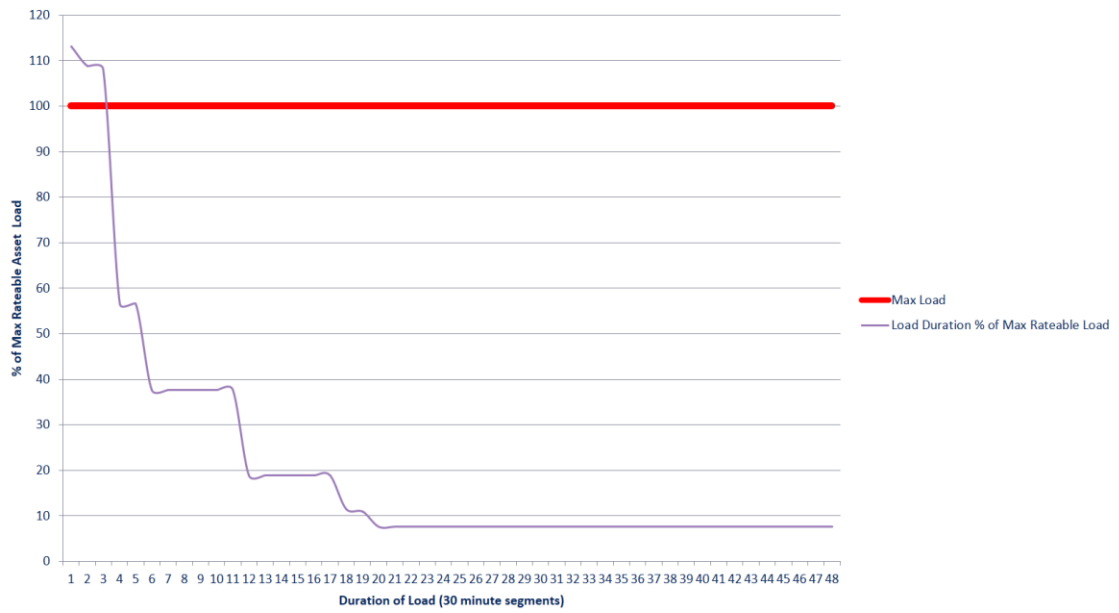


Figure E2: Example of the corresponding load duration curve

Load Duration Curve - % of time at peak load



16 Appendix F – Data requests and aggregation

[REDACTED]