Smart Meter Energy Data:
Public Interest Advisory Group

A policy dialogue and work programme led by
Sustainability First & the Centre for Sustainable Energy

Annex 1 to PIAG Final Report - Phase 2: Working Paper on DNO Privacy Plans

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Annex Status

This background paper is based on the appendix from the Phase 2 Final Report - shared at the PIAG meeting on 19 April 2021 - and also incorporates material from an earlier Phase 1 report for context

Executive Summary

The Data Access and Privacy Framework (DAPF) was put in place to clarify who has rights to access smart meter and on what basis. DNOs can access half-hourly smart meter consumption data without customer consent to help them in delivering an efficient and economic network and discharging other regulatory duties. However, they must first have a Privacy Plan approved by Ofgem which sets out the uses they will make of the data and how they will aggregate / anonymise the data, as far as practical.

In Phase 2 of the PIAG project we have considered how the smart meter data collected by DNOs, suitably aggregated and anonymised, could be of value in delivering wider public policy objectives, for example to help with development of local area energy plans. We see this as being in the spirit of the "presumed open" requirement of the Modernising Energy Data Best Practice guidance which DNOs are expected to follow.

To inform PIAG thinking this paper provides an update on where DNOs are with their Privacy Plans and what data they plan to collect.

Five out of six DNOs now have their Privacy Plans approved by Ofgem. This paper provides a summary of the approaches that each of the companies is taking. In all cases the data is being aggregated at feeder level with a recognition that in a small number of cases where there are only 1 or 2 customers on a feeder then additional privacy protections will be required. In most cases DNOs will also collect other smart-meter data that is not covered by the DAPF (but still covered by GDPR) such as monthly consumption data, maximum demand, voltage, and export.

From reviewing the Privacy Plans and, for example, relevant sections of draft RIIO-ED2 Business Plans published so far, it is clear that smart meter derived data is increasingly seen by DNOs as a part of the wider data held about their networks – alongside data collected through eg substation monitoring - and which is used for network planning. Increasingly, system data held by DNOs, once suitably anonymised, must feed into information more widely shared by DNOs with stakeholders, including via DNO Network Development Plans. This leads us to conclude in our final PIAG Phase 2 paper – recommendation 3 – that depersonalised smart meter data held by DNOs should be treated as "presumed open".

Introduction – Regulatory background

The Smart Metering Data Access and Privacy Framework (DAPF) was put in place by government in 2012 to provide clarity around the arrangements for accessing smart meter data and to build confidence in the smart meter rollout. The basic principle (which is reflected in the Article 29 working party opinion on smart metering) is that consumers should have a choice about the use of their data except where that data is required for regulatory purposes. The DAPF is focussed on consumption data and is geared towards domestic consumers although microbusinesses are also within scope.

A full explanation of the DAPF and wider privacy legislation is given in the PIAG Phase 1 Stimulus Paper 1 – available [here](#). This updated background paper focuses in particular on the arrangements for DNOs to access smart meter data and what each DNO now aims to do.

Under the terms of the DAPF, DNOs can access granular electricity consumption data (ie below monthly) without customer consent, to enable them to meet their regulatory obligations. However, Ofgem must first approve the company's 'Data Privacy Plan', in which they state how they are going to anonymise / aggregate this data and what benefits they expect from access to such data.

Specifically, the requirement in Standard Licence Condition SLC10a is that each Distribution Network Operator (DNO) submits "proposals to demonstrate to the satisfaction of Ofgem that it can implement practices, procedures and systems which are designed to ensure that, so far as is reasonably practicable, Electricity Consumption Data which is obtained by the licensee and which relates to a period of less than one month ceases (through its aggregation with other Electricity Consumption Data or by means of any other process) to be data which is capable of being associated with a domestic customer at relevant premises".

Other data available from smart meters (eg maximum load, voltage, export) is not covered by the DAPF and hence is not considered in the Privacy Plans, although all data will be covered by the DNOs' wider GDPR obligations in so far as it is considered to be personal data.

In September 2016 Ofgem set out in an open letter 'Overall criteria for the assessment of Distribution Network Operators' data privacy plans for access to household electricity smart metering data' what it expected the DNO Privacy Plans to cover[1]. These are expected to cover what data will be accessed and for what purposes, the benefits of using smart meter data rather than other sources, assurance that commercial uses of the data are excluded, the process that will be used to collate the data, consideration of best-available techniques for minimisation / aggregation / anonymisation / other techniques (based on the ICO's

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[1]

https://www.ofgem.gov.uk/system/files/docs/2016/09/open_letter_on_dnos_privacy_plans_for_the_access_to_smart_meters_data_0.pdf

Anonymisation Code of Practice[2]) and evidence of engagement with stakeholders including consumers and privacy experts.

In November 2018, BEIS published a Review of the Data Access and Privacy Framework[3] which included evidence from potential users of the data as well as a review of available consumer research. At that time only one DNO had submitted a Privacy Plan to Ofgem. The BEIS Review noted that issues had been raised around the restrictions on networks' access to the data and also the potential use that could be made of smart meter data for public interest purposes (in essence the issues raised by PIAG). However, it concluded that there was insufficient evidence at that stage to support a change to the Framework. BEIS did however commit to keeping the Framework under review as part of their ongoing monitoring of smart metering.

This high-level look at the five published DNO smart meter privacy plans has informed the key recommendation in the [final PIAG Phase 2 report](#) that de-personalised smart meter data held by DNOs should be treated as "presumed open". The report also argues for a formal review of the networks access to data under the DAPF now it is clearer how DNOs propose to make use of the data. We hope that his summary would be helpful in informing any such future review.

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[2] https://ico.org.uk/media/for-organisations/documents/1061/anonymisation-code.pdf

[3]
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/758281/Smart_Metering_Implementation_Programme_Review_of_the_Data_Access_and_Privacy_Framework.pdf

Summary of DNO Smart Meter Data Privacy Plans

As of May 2021, five out of six DNOs had their Privacy Plans approved and can start collecting consumption data.

While the DNOs have all followed a broadly similar approach there are some notable differences both in the uses they expect to put the data to and the levels of aggregation that they propose to adopt. All DNOs plan to collect the half-hourly data on a monthly basis but then to aggregate (or anonymise) it immediately so the individual MPAN data is never stored in a way that makes it identifiable.

All DNOs define Electricity Consumption Data to be both Active Import (AI) HH readings and Reactive Import (RI) HH readings.

None of the plans include sharing the data more widely once aggregated although all make reference to sharing aggregated data with ICPs and IDNOs where that is seen as an essential input for them to deliver competition in connections.

Notably, the summaries below give a sense of how the approaches vary across companies in terms of rationale for accessing the data, approaches taken to aggregation and pseudonymisation, and data-retention policy.

In particular there are differences in how feeders with a small number of customers are treated; whether data is held for sections of feeders where there are larger numbers of customers and the use of statistical measures of demand at an individual MPAN level to give insights into the profiles of usage without storing the full half-hourly data.

WPD[4] (Approved 2018)

Rationale: Consumption Data derived from smart meters may be used to provide a more detailed view of the network by LV Feeder and distribution substation. This will provide a more comprehensive understanding of where there are issues on the network and where there is adequate capacity to accommodate additional connections or more LCTs. The time-of-day load data will enable WPD to work out which smart solutions can be applied to manage load, at what time of day, as an alternative to reinforcement.

Approach to aggregation: Half-hourly data will be collected each month and immediately aggregated. The monthly total consumption per meter will be stored as will the half-hourly profile aggregated up to feeder level. It is recognised that on some feeders there may only be one or two customers. However the details of the feeder will not be stored with the consumption data but will be held separately so that the data is pseudonymised.

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[4]

https://www.ofgem.gov.uk/system/files/docs/2018/06/wpd_data_privacy_plan_for_access_to_household_smart_meters_data.pdf

Data will be retained for 5 years.

UKPN[5] (Approved Feb 2020)

Rationale: Consumption data obtained from smart meters can be used to provide DNOs with a much clearer view of loads on the low voltage network, which is currently not available. By having an improved visibility of the demands on the low voltage network across substation, feeder and section of feeder, UK Power Networks will be able to improve practices and deliver benefits by: a) Improving planning of reinforcement of the existing network. b) Improving the design and planning to accommodate new and increased capacity connections. c) Building efficient networks that make use of the available data to respond intelligently to network conditions and the introduction of Low Carbon Technologies.

Approach to aggregation: The following data will be stored:

a) Aggregated monthly half-hourly consumption load profiles for each substation, feeder and section of feeder.
b) The monthly maximum, monthly minimum, monthly average and monthly total consumption value for each individual MPAN

It is acknowledged that some feeders will have only one or two MPANs associated with them. No personal identifiers will be stored with the data to protect privacy in this situation.

UK Power Networks makes clear that despite consumption data undergoing various 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). As there is no industry-wide consensus on this issue, UK Power Networks intends to take the approach that it will treat all consumption data as if it was Personal Data for the purposes of GDPR.

Data will be retained for 7 years (ie price control period plus 2 years).

SSEN[6] (Approved April 2020)

Rationale: Certain benefits are attributable to the use of aggregated half-hourly consumption in enabling SSEN to fulfil its regulatory duties and deliver improvements to its network and to customers, such as:

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[5]

https://www.ofgem.gov.uk/system/files/docs/2020/02/uk_power_networks_smart_meters_data_privacy_plan.pdf

[6]

https://www.ofgem.gov.uk/system/files/docs/2020/05/ssen_smart_meter_data_privacy_plan_redacted_final.pdf

- Avoided costs of network investment on the low voltage network
- Reduction in network reinforcement
- Better visibility of network load profiles
- Proactive intervention of issues causing power failures
- Improved understanding of energy use during the transition to a Distribution System Operator (DSO) and uptake of low carbon technologies

Approach to aggregation: An LV feeder will typically be associated to around twenty MPANs and transformers with over a hundred. SSEN will never obtain consumption data from LV feeders that contain less than five MPANs associated to it in isolation. Where an LV feeder contains less than five MPANs SSEN may choose to combine the MPANs from another LV feeder on the same transformer to collectively increase the total MPANs to five or more.

Where a LV feeder and/or distribution transformer has five or more MPANs SSEN will typically aggregate all the MPANs together which could be twenty or thirty MPANs, however SSEN may also choose to aggregate separate blocks of five or more MPANs from the same LV feeder (i.e. thirty MPANs on a LV feeder aggregated in three blocks of ten). Aggregation validation would reject repeated attempts to obtain data from the same MPAN with an overlapping time period within twelve months to prevent disaggregation through repeated requests.

When carrying out network planning, or new connections work on an LV feeder of four to two MPANs the half-hourly consumption data can be derived through scaling. Data will be taken from similar feeders, locations, customer profiles with five MPANs and scaled to provide the required information.

The data stored will therefore be:

- Total monthly consumption of each MPAN; and
- Monthly consumption profile for each customer (or MPAN) connected to a LV feeder and/ or distribution transformer with half-hourly consumption profiles aggregated from the associated multiple MPANs.

SSEN carried out extensive consumer research building on the earlier ENA research. This confirmed the main messages from the ENA research (as reflected in the PIAG Phase 1 report). While there was broad support for SSEN having access to the data there were a range of views across consumers, typically reflecting their underlying attitudes to smart meters. The SSEN Data Privacy Plan includes a helpful summary of the research.

SP Energy Networks[7] (Approved July 2020)

Rationale: The benefits cover:

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[7] https://www.ofgem.gov.uk/system/files/docs/2020/07/spen_smart_metering_data_privacy_plan_-_july_20_final_redacted.pdf

- Improved network planning - Increased visibility of the LV network; facilitating the move from DNO to DSO, as smart meters will provide feedback on local balancing actions; better understanding of the impact of LCTs connecting to the network and the challenges in managing increased loading on localised sections of the LV network; better understanding of the impact of dynamic control devices in the LV network.
- Improved connections: - Improving the calculation to assess the location and requirements for new connections in the LV network
- Losses analysis: - Determining locations and causes of losses in the LV network, hence reducing costs to SPEN and their customers.

Approach to aggregation: The disaggregated consumption data received by SPEN will be used to generate:

- Total monthly consumption in respect of each meter
- Monthly maximum and minimum demand for each meter
- Aggregated monthly HH profile data in respect of the feeder to which the customer is connected. Again it is acknowledged that there will be some feeders with only one or a small number of customers connected but these will be linked to the feeder identifier not the MPAN.

Data will be retained for 7 years.

Northern Powergrid[8] (Approved Nov 2020)

Rationale: Low Carbon Technologies are already changing the energy flows on the LV network and demand for electricity is expected to rise significantly. In future, electricity demand will be more unpredictable. Some houses might be importing large amounts of power, whilst at the same time others may be exporting large amounts of power. Where the LV network becomes stressed and power flows become more complicated, more detailed analysis is required and, therefore, access to more granular and specific data is vital.

To manage future energy flows, substantial investment will be required in both new equipment and in the operational measures necessary to ensure that voltages and electrical currents are kept within the capability of equipment and strict, regulated limits. Better network investment decisions can be taken, if detailed analysis of electricity consumption patterns can be undertaken.

Approach to aggregation: NPG will store the following, which are derived from disaggregated half-hourly electricity consumption data:

a. Aggregated half-hourly consumption data for each distribution substation;

b. Aggregated half-hourly consumption data for each feeder;

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[8] https://www.ofgem.gov.uk/system/files/docs/2021/01/npg_data_privacy_plan_-_approved_november_2020_final.pdf

c. Aggregated half-hourly consumption data for each feeder section;

d. Masked half-hourly consumption data in circumstances where only one premises is connected to a feeder;

e. For each MPAN, metadata including:

    i.   The total monthly consumption value;

    ii.   The highest consumption value each month and the associated date / time;

    iii.   The lowest consumption value each month and the associated date / time;

    iv.   Mean of the maximum daily half-hourly consumption values over a month;

    v.   Standard deviation of the maximum daily half-hourly consumption values over a month;

    vi.   Mean of the minimum daily half-hourly consumption values over a month; and

    vii.   Standard deviation of the minimum daily half-hourly consumption values over a month.

Data retained for a rolling 7-year period.

NPG carried out bespoke consumer research to supplement that carried out by the ENA. This was shared with PIAG and informed the PIAG Phase 1 work on consumer research.

NPG had originally hoped to be able to store more granular data to allow them, for example, to test the impacts of reallocating MPANs between feeders but this was rejected. Prompted by Ofgem, in February 2020 NPG wrote to BEIS formally requesting a review of the SLC10A licence obligation.

Conclusion

This updated paper on DNO privacy plans for access to smart meter consumption data informs the conclusions and recommendations of the final Phase 2 PIAG Report. In particular, the widening understanding that DNO smart meter data is in effect 'system data' and therefore – as per recommendation 3 - that de-personalised smart meter data held by DNOs should be treated as "presumed open".

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