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Smart Meter Energy Data: Public Interest Advisory Group

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

Annex 2 to PIAG Final Report - Phase 2: Summary of Workshop Findings

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Annex Status

A summary of key findings from the four workshops held in the course of PIAG Phase 2. Please refer the individual report from each workshop for full detail.

Introduction

To build on the conclusions of phase 1 of the Smart Meter Energy Data Public Interest Advisory Group (PIAG) project, in phase 2 the group held four half-day workshops that brought together key stakeholders. These took place between January and November 2020. Each workshop was followed by a snap-shot report, available on the PIAG website via the links below. This annex provides a summary of the workshops' findings.

The main aim of the workshops was to demonstrate the public interest value of making granular smart meter data available to an expanded range of actors, and to develop a non-exhaustive set of use cases through which that value could be realised.

The four workshops held were as follows:

Workshop 1: National Energy Statistics
14 January 2020
Report, slides
Contributions from: BEIS, Centre for Sustainable Energy, Climate Change Committee, MHCLG, National Energy Action, National Grid ESO, Sustainability First, UCL Smart Energy Research Lab (SERL)

Workshop 2: Regulation
23 April 2020
Report, slides
Contributions from: Centre for Sustainable Energy, Frontier Economics, National Grid ESO, Northern Powergrid, Ofgem, Sustainability First, University of Reading

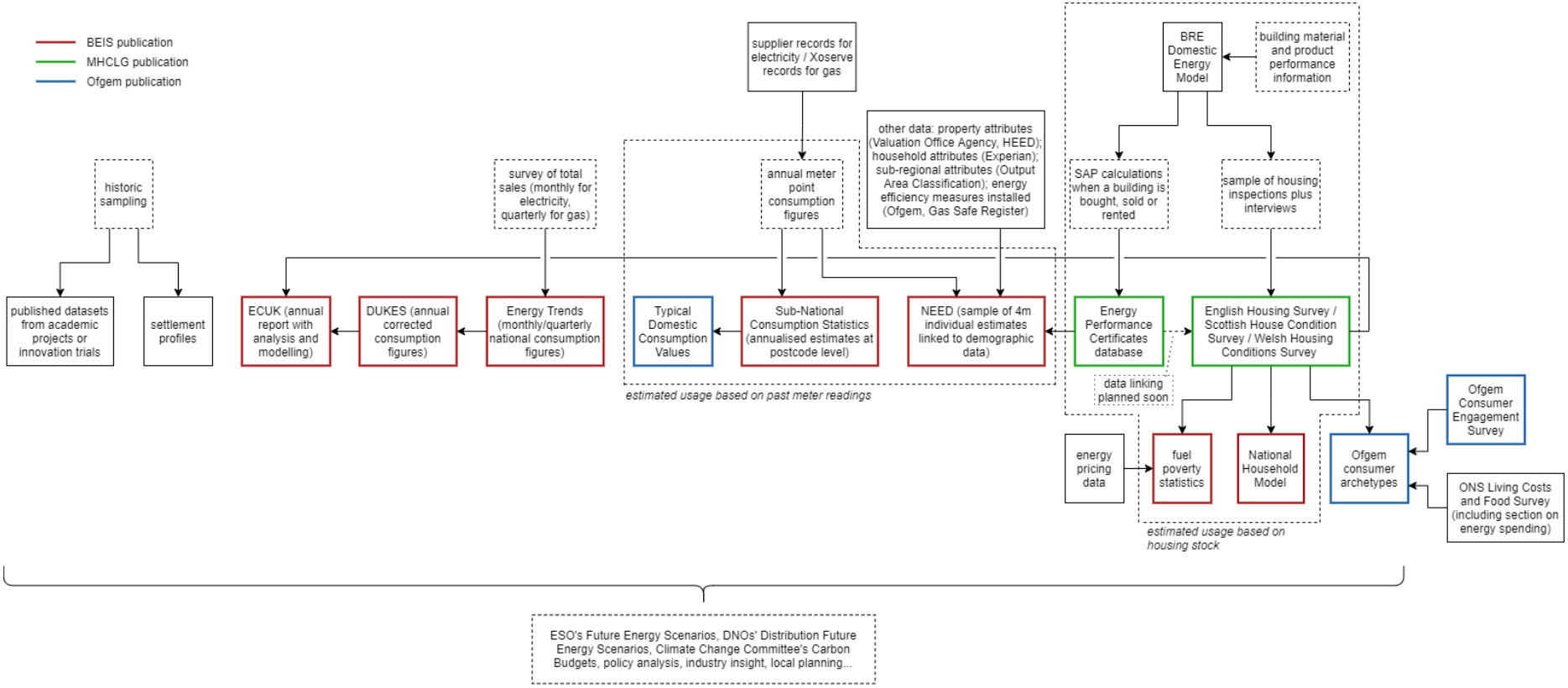
Workshop 3: Local and Devolved Government
10 July 2020
Report, slides
Contributions from: Centre for Sustainable Energy, Energy Systems Catapult, Greater London Authority, Greater South East Energy Hub, Sustainability First, Scottish Government, University of Exeter, Welsh Government

Workshop 4: Heat
11 November 2020
Report, slides
Contributions from: Centre for Sustainable Energy, DELTA-EE, Ecuity, Energy Systems Catapult, Sustainability First, UCL Smart Energy Research Lab (SERL)

Current provision of energy consumption data

One of the outputs from the workshops, workshop 1 in particular, was to clarify the main sources and channels through which energy consumption data is currently available for public interest uses. For reference, the current provision is outlined in figure 1 below. This highlights the central role played currently by the BEIS sub-national energy consumption statistics and NEED.

Figure 1: key sources of domestic energy consumption data in official statistics



Source: Sustainability First

NB devolved approaches are not fully shown, especially in regard to national housing surveys. For example, fuel poverty statistics are separately produced by the Scottish and Welsh Governments; the National Household Model incorporates data from Scotland but not Wales; etc.

Public interest use cases for smart meter data

There was broad consensus across all four workshops that data collected by smart meters, if made appropriately available subject to proper protections, can unlock a wide range of public interest benefits. Workshop participants raised a number of potential use cases based on the additionality smart meter data could deliver.

1. Replacing meter-reading-based estimates with more accurate and timely data

As discussed in workshop 1, official energy consumption statistics, including the sub-national energy consumption statistics, and the anonymised sample of individual records linked to demographic data (the National Energy Efficiency Data-Framework (NEED)) are all dependent upon an annual consumption figure (annualised estimate) submitted for each electricity and gas meter point. Reliance on the annualised estimates creates limitations regarding both accuracy and poor granularity of the data.

Nevertheless, these statistics are widely used in policy making and analysis – across both the energy and the built-environment sectors. For example:

- The ESO uses them in their system planning work including in the development of the Future Energy Scenarios (FES) (workshop 1 and 2);
- They are used in the demand forecasting and scenario generation that informs the Climate Change Committee's Carbon Budgets (workshop 1).
- They are used by civil society organisations such as National Energy Action to target their advocacy and interventions (workshop 1).
- They provide evidence to inform Ofgem's distributional impact analysis of regulatory decisions, such as their recent Targeted Charging Review (workshop 2)
- They are the basis of the Typical Domestic Consumption Values used by Ofgem in eg setting the retail price cap (workshop 2).
- They are the basis of current modelling approaches used in local energy planning and the DNO Distribution level FESs (workshop 3).
- They are used by BEIS to measure the effectiveness of installed energy efficiency measures. The presence of a range of such measures is captured in the NEED data to enable comparisons (discussed at all four workshops).

In order to optimise these and other use cases, participants stressed the public interest value of replacing these estimated annual figures with accurate smart meter data. The assumption was that this would happen automatically in terms of the current annual data as the smart meter rollout progressed.

As well as being more accurate than conventional meter data, smart meter data should also be easier to process. In particular, BEIS's sub-national level statistics are published with a substantial time lag (roughly a year for the aggregated statistics and two years for NEED). Moving from annualised estimates to a more automated transfer of smart meter data could allow for quicker statistical releases, giving stakeholders a more up-to-date picture. It might also reduce costs. National Grid ESO stated that they would find it helpful to go further, and have access to a 'continuous' data source that might be available in future (workshop 1).

2. Validating or enhancing modelled estimates of household energy demand with accurate data

Across the workshops, it was pointed out that policy makers often have to rely on energy usage estimates at a household level derived from a set of assumptions about building materials, appliance performance, consumer behaviour etc. It was hoped that smart meter data could offer an insight into the performance gap between domestic energy consumption for a building 'as designed' versus 'as used'. This could offer a range of benefits:

- *Checking modelling assumptions:* At workshop 1, MHCLG discussed their interest in using smart meter data to 'validate' the BRE Domestic Energy Model (BREDEM), a widely-used model for projecting energy consumption based on various property characteristics. BREDEM informs the Standard Assessment Procedure (SAP), which in turn feeds into both the National Housing Surveys and the calculation of Energy Performance Certificate ratings. These then underpin a wide range of other uses. For instance, the English Housing Survey is the main data source for the fuel poverty statistics for England published by BEIS. Any inaccuracy in the assumptions in BREDEM would therefore have a significant knock-on effect.
- *Tracking under-heating:* Besides revealing inaccurate assumptions about building material or product performance, validating existing models could also reveal inaccurate assumptions about consumer behaviour, including the assumption that all consumers keep their home adequately heated. In other words, it was pointed out, comparing BREDEM against actual consumption levels could give a valuable insight into under-heating and fuel poverty.
- *Individualising EPCs:* Several participants expressed an interest in using smart meter data to create 'smart EPCs'. At workshop 4, SERL explained their ongoing trial that linked EPC data (based solely on property characteristics) to actual consumption, as well as to weather, demographics and responses to a survey. Such trials can provide a valuable insight into heating behaviours, and if scalable smart EPCs could motivate individual efficiency improvements, better inform housing policy and improve the operation of energy efficiency schemes.

3. Gaining insight into seasonality, time-of-use and other data attributes

A consensus from the workshops was that making existing consumption data more accurate was only the start. Major additional public interest value would come from smart meters' capacity to provide new insights through making additional data available. With the move to more intermittent generation, *when* energy is used is becoming more important than how much is used. As a result, understanding seasonal patterns (through monthly data) and time-of-use (through half-hourly data) were seen as being most important. No specific uses for daily-level data were suggested but there was a general consensus that the more granular the better. Maximum demand (which is captured by the smart meter) could also provide a simple indicator of within day variation. BEIS could in principle collect this data from suppliers using the same powers they use currently for the annual data subject to suppliers holding the data which in turn depends on consumers' level of consent (opt-in for half-hourly data, opt-out for daily data) (workshop 1).

While the focus of PIAG was on energy consumption data, other valuable data attributes mentioned which could be of real value to policy makers were pricing, tariff type and activation of prepayment mode. These metrics are especially important in looking at fuel poverty and at the distributional impacts of policies as well as more timely tracking of e.g. the uptake of time-of-use tariffs.

A number of possible new routes through which the more granular consumption data could be made available were discussed. Though not equivalent, there may be some overlap between these routes, and several of the suggested use cases might be enabled by more than one of them:

- A wide range of smart meter data, up to and including full half-hourly usage (where available), could be added to the 4 million individual records released under NEED (provided this did not compromise anonymity) (workshops 1 and 4)..
- New aggregated data could be added to the sub-national consumption statistics (workshops 1 and 4).
- Similarly, subject to consent, smart meter data could be linked to the c. 6,000 records released annually through the English Housing Survey, to give a small but highly detailed dataset. A parallel arrangement could be made in Scotland and Wales (workshop 1).
- A smart meter dataset is already becoming available through SERL, although a) its present size of 14,000 records would be too small to allow detailed regional comparisons and b) it can only be accessed by academic researchers (workshops 1, 2 and 4).
- A full anonymised dataset could be managed by a new 'trusted processor', such as the ONS as a route to making a properly representative anonymised sample of smart meter data more widely available alongside statistical summaries (workshops 1 and 2).

Use cases for this new data that were discussed include the following:

- *Understanding seasonality:* Greater availability of monthly data at the regional, postcode or household level would give stakeholders an important new measure of seasonal variation. This would improve National Grid ESO's Future Energy Scenarios and grid operation (workshop 1), local authorities' ability to model seasonal demand (workshop 3) and policy makers' understanding of heating behaviour (workshop 4).
- *Understanding consumer behaviour:* Current assumptions on within-day patterns of domestic energy use are often based on relatively small historic trials. A larger half-hourly dataset on both electricity and gas could allow a better, more granular understanding of habits and needs. For instance, this could give new insight into behaviours around heating, including the split of gas usage between hot water and space heating (workshop 4).
- *Tracking prepayment and tariff type:* At present, NEED data does not include whether a given meter is prepay (or in the case of smart meters, set to prepay mode), nor the tariff type. A smart meter dataset that included these attributes would be a useful resource in understanding consumer choices (workshop 1).
- *Assessing in-home measures and interventions:* At present, NEED data is used to assess the impact of a limited range of energy efficiency measures (PV, condensing boilers, and various forms of insulation). A smart meter dataset that captured the presence of other measures could provide a similar function on a broader scale. Furthermore, in the case of several existing and new measures, half-hourly time resolution and/or maximum daily demand data would shed new light on their usage and efficiency.
    - National Grid ESO and the Climate Change Committee both indicated that their analysis would benefit from a better understanding of the usage profiles associated with low-carbon technologies such as PV generation, electric vehicles, domestic battery storage and heat pumps) (workshop 1).
    - Several participants discussed a particular evidence gap around the usage and performance of heat pumps (including hybrid heat pumps) and electric storage heaters, which the right smart meter dataset could help fill (workshop 4).

- *Developing new products and services:* It was discussed in several of the workshops that a half-hourly dataset could serve as a testbed for assessing the viability of new services, such as domestic flexibility (workshop 1) or heat-as-a-service (workshop 4). It was also suggested that demonstrating the actual performance of new products and appliances could help build consumer trust and accelerate uptake (workshop 4).

4. Understanding local network usage

At present, the highest level of local granularity at which consumption data is available is per postcode, in BEIS's sub-national consumption statistics. Adding new data attributes to those statistics would give a valuable new regional understanding. However, it was suggested in the workshops that a further opportunity arises from the new access that the electricity distribution networks will have to smart meter data, typically aggregated to local feeder level.

- *Improving investment and benchmarking:* For electricity networks, smart meter data at feeder level should allow more efficient network operation and investment. Gas networks do not currently collect smart meter data but in future it should provide a useful tool in understanding where certain assets may become redundant over time. Gas and electricity smart meter data should also lead to improved regulatory oversight, provided Ofgem has access to the same data (workshops 2 and 4).
- *Using network data for LAEPs:* DNO- (and potentially GDN)-held smart meter data could offer an important tool in local energy planning. If made available, it could allow local stakeholders a direct understanding of demand and capacity in a way postcode-level data does not. The need for LAEPs to take account of network topology means that starting from DNO feeder level data has a natural logic (workshop 3).
- *Modelling local demand:* The models used in Local Area Energy Plans could benefit from a larger and more granular dataset, and in particular from data on time-of-use that would help to understand local energy network constraints (see below) (workshop 3).

Appendix: overview of PIAG papers

Phase 2

Phase 2 final report	Final Phase 2 paper
Annex 1 to final report	Working paper on DNO Privacy Plans
Annex 2 to final report (this paper)	Summary of findings of workshops 1 to 4
Workshop Paper 4	Analysis of domestic heat – possible added insight from smart-meter data
Workshop Paper 3	The potential 'public-interest' value of access to smart-meter data for devolved governments and local authorities
Workshop Paper 2	Regulatory assessments and system efficiency: potential benefits of smart-meter energy consumption data
Workshop Paper 1	Government approaches to published data and statistics for energy consumption

Phase 1

Phase 1 final report	Final Phase 1 paper (Workshop – April 2019. Publication – June 2019.)
Annex to PIAG final report	Summary of PIAG project papers
Stimulus paper 8	Capability requirements of public interest data user organisations
Stimulus paper 7	Possible routes to smart meter data for public interest uses
Ipsos MORI research report	Customer thinking on privacy in relation to smart meter data for 'public interest' use
Stimulus paper 6	Consumer research on access to smart meter energy data
Stimulus paper 5	Public interest use-cases: data attributes, data requirements, and associated privacy and access implications
Stimulus paper 4	Stakeholder perspectives on smart meter energy data and potential public interest use-cases
Stimulus paper 3	Data ethics – a review of the landscape
Stimulus paper 2	International experience – smart meter data access
Stimulus paper 1	Background to ICO Guidance on anonymisation and annex on data access privacy legal framework
Working Note	Clarifying what smart meter data could add to the public interest: public interest questions to frame PIAG's work
Kick-off stimulus paper	Initial Meeting – 30 November 2017