

Smart Meter Energy Data: Public Interest Advisory Group

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Stimulus paper 2 International Experience – Smart Meter Data Access

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1. Overview

The GB smart metering programme was relatively leading edge at the time it was established, building in the facility for third party access through a variety of channels – aimed in particular at stimulating a range of commercial applications. However, with the delays to the programme we have not yet seen third parties being able to make this work in practice and in the meantime other jurisdictions are becoming more alive to the opportunities. This note summarises some of the key developments in smart meter data access which might point the way to further ideas for GB to pursue.

Most relevant to the PIAG discussions are some leading-edge examples in the US which have moved beyond the provision of data to third parties on request (the Green Button model) to look at how anonymised and/or aggregated data could be made available for research or government purposes. In all cases this makes use of an existing data repository, typically managed by the system operator. GB is unique in not having any central data repository (but relying instead in being able pull data off the meter as required). This limits the opportunities as there is no long-term record of usage (beyond what individual suppliers hold and which may be lost on change of supplier) and precludes the provision of anonymised or aggregated data for public interest purposes. While the commitment not to have a central data store was a key element of the original privacy debate it clearly complicates the provision of data for public interest purposes. As Ofgem explores the data requirements for faster switching and half-hourly settlement it is worth them being mindful of these public interest considerations and potential wider benefits of a central data depository.

2. US - Green Button

In the US the Green Button initiative¹ has been a high profile programme over a number of years launched by President Obama and aimed at enabling consumers to access and share their smart meter data. Individual states can mandate that their utilities participate in the Green Button initiative.

The original model Green Button Share my Data enabled consumers to download their data (ie data that the utility had collected from the smart meter and was stored on the utility's database) and then share it. The fact that Green Button data was in a common format across utilities made it easier for third parties to develop applications. The cost of providing Green Button services is borne by the utility (and recovered through their rate case).

¹ <https://energy.gov/data/green-button>

More recent developments have been:

- Arrangements for certification of Green Button schemes so that third parties can be confident the utility complies with the relevant formats etc
- The introduction of Green Button Connect which allows third parties to register and directly access the daily reads that are taken on an ongoing basis, with the customer's consent (whereas the previous model was based around the customer downloading historical data)
- Competitions for app developers, funded by the DOE, using Green Button or other energy data.

Mission:Data (a coalition of technology companies) and the AEMA (an energy efficiency lobby group) have been pressing for wider implementation of Green Button across US States. They have produced a framework of how they see data sharing working, including authorisation processes etc² to support innovation.

In Texas there is currently a regulatory case underway looking at the effectiveness of the current data access arrangements. Mission:Data argues³ that while Texas was originally a leader in this area (requiring open access to the HAN and signing up early to the Green Button initiative) it has slipped – both by failing to implement Green Button Connect and through poor operational delivery. The current case – plus renewal of IBM's contract in 2018 – are seen as opportunities to address these issues. The fact that after 10 years only 1800 accounts are sharing data shows that it is not simply enough to have regulation on the statute book but the processes need to be designed to be user friendly in a world where most transactions can be completed with a single click.⁴

While the original GB third party access arrangements drew on the Green Button concept (but with the benefit the customer could share their data with third parties without having to share it with their supplier) there are some lessons in terms of data access:

- The Green Button initiative has significant profile which is important in driving through change. To date there has been no effective champion for third party data access in GB.
- The fact that costs are borne by the utility makes it more viable for third parties (in contrast to the DCC or CAD access models which are potentially costly).

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<https://static1.squarespace.com/static/52d5c817e4b062861277ea97/t/5a3a8c66c8302509260492b2/1513786475950/Energy-data-unlocking-innovation-with-smart-policy.pdf>

³ <http://www.missiondata.org/news/2017/9/22/5-things-you-dont-know-about-smart-meter-texas>

⁴ <https://www.greentechmedia.com/articles/read/texas-highlights-the-challenge-of-one-click-energy-services#gs.BzL0Ouc>

3. US and Canada – Wider Third Party Access to Data

Illinois - Anonymised Data Service

Illinois was one of the early adopters of the Green Button initiative with ComEd providing Green Button services since 2012, including the recent introduction of Green Button Connect. As part of Green Button Connect they are establishing a Green Button Directory which will allow consumers to see a list of registered third parties and to then sign up on-line via the ComEd website. The expectation is that this will primarily cover the provision of energy efficiency advice.

ComEd have now also introduced an anonymised data service⁵ which allows third parties to get access to individual half-hourly smart meter data but on an anonymised basis, by postcode. The postcode level data is available subject to a 15/15 rule instituted by the state regulator which prescribes that there must be at least 15 properties and no property must account for more than 15% of the energy used. A charge is levied for use of this service but a discounted rate (50%) applies for public bodies and researchers.

The data in this case is not aggregated but anonymised. However clearly it is predicated on ComEd having full access to the half-hourly data in the first place – which is standard in the US but not in GB given the desire to allow consumers choice in how much data they share. Similar rules are applied in other states but often relying aggregation rather than just anonymization⁶.

The most recent initiative driven by the Environmental Defense Fund (an environmental charity) and Citizens Utility Board (a consumer body) has been the creation of the Big Energy Data Centre⁷ which provides anonymised data from millions of customers for researchers to utilise. Researchers have then been able to use the data to explore the impact of time of use tariffs, for example.

⁵ <https://www.comed.com/SmartEnergy/InnovationTechnology/Pages/AnonymousDataService.aspx>

⁶ <https://www.elevateenergy.org/wp/wp-content/uploads/1515-Rule-Factsheet-FINAL.pdf>

⁷ <https://citizensutilityboard.org/welcome-big-energy-data-center/>

California

In 2014 the California Public Utilities Commission introduced legislation⁸ which required utilities to provide access to energy usage and usage-related data to state legislators, academic researchers and local government while also protecting consumer privacy. Different standards of aggregation or anonymisation are set out for different use cases under what is called the Energy Data Request Process (EDRP).

As a part of this programme the CPUC has established the Energy Data Access Committee (EDAC), a non-adjudicatory body responsible for advising the Commission on data request issues that arise from the EDRP. The EDAC, which meets quarterly, is comprised of representatives from each of the Investor Owned Utilities, the CPUC, the Office of Ratepayer Advocates (ORA), CEC, local governments, consumer privacy advocates, academic researchers, and rotational interested parties. One issue the group has considered is concerns about the quality of data which was a concern raised by local government.

As an example of a utility implementing this legislation PG&E has a section on its website highlighting the different levels of data access that are available as follows:

- Aggregated monthly consumption by zip code (covering a minimum of 100 households and / or 15 non-residential premises – with no single premise accounting for more than 15%) published and freely available;
- Greenhouse Gas Emissions reports using detailed data to calculate greenhouse gas emissions based on fuel mix available to local authorities to allow them to produce mandated Climate Action Plans (and using the same level of geographic granularity as above);
- EDRP where data at a more granular level can be obtained. Data is available to academic researchers for projects meeting certain criteria (and where a sample of upto 5% of customers can be requested with data going back upto 7 years); to state and federal agencies where the data is needed to comply with mandatory reporting requirements and to local governments, under a confidential terms of use agreement, where the data is needed for climate action planning. In the latter case data can either be aggregated pooling usage from a minimum of 15 residential properties (max 20% usage by any one) or anonymised where a larger pool of 100 properties is needed (max 10% usage by any one). In each case only yearly, quarterly or monthly data is available.

As part of further work, we will review the full CPUC decision as this appears closest to what PIAG is interested in out of the various international examples.

⁸ <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M090/K845/90845985.PDF>

Pecan Street Project in Austin Texas

The Energy Information Agency (part of the DOE) carried out research⁹ in 2015 looking at the options for using interval data for forecasting. It compared the potential for using AMI (ie smart meter data) with sub-meter data (in effect specialist monitoring equipment capturing granular usage data across multiple circuits). It concluded that the wider availability and standard format for AMI data made it preferable but noted the difficulties in getting the third-party access.

The one significant sub-meter project in the US is the Pecan Street project¹⁰ which was funded by the DOE and through which minute by minute electricity data is captured for a sample of 1000 homes on a voluntary basis (plus a smaller sample for gas and water). The data is made available free of charge to academic researchers internationally and through a subscription service to others. This is billed as the largest smart meter data set in the world.

Ontario

Ontario is another leader in the provision of Green Button Connect services¹¹ which includes in their case links to various third party apps to help with energy management / energy efficiency. In Ontario, smart meter data is held in a meter data management / repository run by the licensed Smart Meter Entity, akin to DCC here but a part of the Independent Electricity System Operator (IESO). The Data repository holds data from 60 separate local distribution companies.

Recently the Ontario regulator has placed a requirement on the IESO to provide wider third-party data access. The implementation plan the IESO has developed and is now consulting on¹² would involve the provision of de-identified half hourly smart meter data from the repository to government agencies, academics or private industry looking to develop new applications. Examples of potential uses include design, development and implementation of conservation and demand response programs; electricity system planning; policy development; academic research; outage management; predictive billing; and development of new products and services that support the potential of big data. Users would need to be clear about the purpose for which they

⁹ <https://www.eia.gov/consumption/residential/reports/smartmetering/pdf/assessment.pdf>

¹⁰ <https://www.eia.gov/consumption/residential/reports/smartmetering/pdf/assessment.pdf>

¹¹ <http://www.energy.gov.on.ca/en/ontarios-electricity-system/green-button/>

¹² <http://www.ieso.ca/en/sector-participants/engagement-initiatives/engagements/smart-metering-entity-third-party-access-implementation-plan> (See in particular the FAQs)

require the data. The de-identification process that the IESO proposes to use is based on the standards set by the Ontario Information and Privacy Commissioner¹³.

The original data repository which is used for billing and settlement purposes does not contain any geographical location data or other identifiers. In order to make it useful for third party access postcode and other (non-personal) data is being added. Ontario has been a leading thinker in terms of privacy and smart grids for many years¹⁴ (and the privacy by design concept which they promoted was adopted by the DECC smart metering programme).

Again as part of further work we will keep an eye on developments in Ontario over the coming year.

4. Europe and the rest of the world

In Europe there has been a widespread interest in smart meters and while there is high level guidance at an EU level on the broad functionality that is needed (eg including the ability for consumers to share their data with third parties) and the privacy approach (which positions consumers as having a choice), the actual approach being taken varies considerably between member states. A recent CEER overview document highlighted that a number of countries were moving to more centralised data management¹⁵.

A leading example of this is Norway where a new central data store (Elhub¹⁶) is being established replacing the previous many to many relationships that were needed between retailers and distributors. This is also expected to make it easier for consumers to access their own data and to agree to it being shared with third parties.

One commentator¹⁷ has described the arrangements in most of Europe as being in effect a Retail hub model where the driver for more centralised data management is to have a central database

¹³ <https://www.ipc.on.ca/wp-content/uploads/2016/08/Deidentification-Guidelines-for-Structured-Data.pdf>

¹⁴

[https://www.smartgrid.gov/files/Privacy by Design Achieving Gold Standard in Data Protection 201006.pdf](https://www.smartgrid.gov/files/Privacy%20by%20Design%20Achieving%20Gold%20Standard%20in%20Data%20Protection%20201006.pdf)

¹⁵ <https://www.ceer.eu/documents/104400/-/-/1fbc8e21-2502-c6c8-7017-a6df5652d20b>

¹⁶ <http://elhub.no/en/elhub>

¹⁷ <https://www.enerquire.com/blog/smart-meter-data-management-platforms-why-the-european-discussion-about-retail-data-hubs-doesnt-fit-germany>

to support switching and settlement as competition develops. This aligns with work on switching and settlement in GB which are both prompting the need to look again at some of the data arrangements. Germany is considered to be going down a different path with the focus on the grid and the need for data on local generation and usage to help operate the system.

A report by Eurelectric¹⁸ considers the different position of smart meter data (needed for billing etc), smart grid data (providing technical information on network performance) and smart market data (including smart appliance monitoring etc). The report notes the trend to more centralised data management to support switching and settlement.

An earlier report by the DSO group¹⁹ makes the case that placing responsibility for data management with the DSO builds on existing responsibilities they have as neutral market facilitators.

There does not seem to be any discussion in any of these sources of how smart meter data might be used by third parties and / or the effectiveness of arrangements for third party access.

Similarly, in general, third party access to data does not seem to be such a big issue in Australia and New Zealand although the official policy is that smart meter data should be made available to the customer and third parties (with the customer consent).

In New Zealand, as in UK, the smart meters are being rolled out by retailers who then share the information with distributors. The New Zealand information commissioner has recently published an open letter²⁰ raising concerns about bulk data being passed to distribution networks arguing that aggregated data (at street or equivalent level) should be adequate for network planning purposes.

¹⁸ http://www.eurelectric.org/media/278067/joint_retail_dso_data_report_final_11may_as-2016-030-0258-01-e.pdf

¹⁹ <https://www.edsoforsmartgrids.eu/wp-content/uploads/public/EDSO-views-on-Data-Management-June-2014.pdf>

²⁰ <https://www.privacy.org.nz/assets/Uploads/Open-letter-to-retailers-and-distributors-re-smart-meters-A504260.pdf>