Smart Metering Data Dashboard

Helping consumers see what their smart meter data is used for.

citizens advice

1 Context: the need for a data dashboard

As the statutory consumer watchdog for energy consumers, Citizens Advice has been closely involved in the smart meter rollout. We have worked with government and industry to ensure the needs of consumers are at the heart of the programme.

An area of ongoing concern for us has been the handling of consumer data. Primarily, the way in which energy consumers can easily see who accesses their energy usage data and control this access. This report is a 'proof of concept' for a smart data dashboard - a tool that we have developed to understand what is needed to ensure consumers can see and control their own data.

Smart meters are capable of collecting meter reads on a half-hourly basis and rely on the creation of a 'Home Area Network' (HAN) - a mini network in the home - to provide near-real-time data to the consumer through their in home display (IHD). The HAN can also be used to provide energy data to other bodies, if paired to a consumer access device (CAD), such as a mobile application.

This data has the potential to provide insight into the products/services people use and how they behave in their homes. It's data that can be valuable to organisations if they want to know how their customers use energy in the home, as well as to other less obvious organisations like government, academia and charitable organisations.

Over the years our research on smart meters has tried to understand what consumers want, need and expect from data-driven services. This research has found that whilst consumers might have different opinions about data security and privacy, two themes are consistent across all consumer demographics.

- Consumers need, want and expect transparency and control of their data[1]

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[1] http://webarchive.nationalarchives.gov.uk/20140728011208/http://www.consumerfutures.org.uk/reports/smart-and-clear-customer-attitudes-to-communicating-rights-and-choices-on-energy-data-privacy-and-access

- Consumers are increasingly wary of data-driven services while still making extensive use of them[2].

At the heart of this uncertainty is a sense that information about these services tends to be asymmetric. Most consumers do not clearly understand the value of data relating to their lifestyle and how businesses could use this to make money. This makes it harder for them to determine whether they are getting a good deal, even with seemingly free services.[3]

We appreciate smart meter data has the potential to generate benefits for consumers. Particularly if new services are created that allow them to save time or money or makes it easier for them to engage with the energy market.

But it also poses possible risks, including the risk of data being used without permission or understanding in order to profile consumers. This could lead to products/services being sold without consent or to exclude them from accessing certain services if they are not seen as a 'desirable' customer.

Since the beginning of the rollout, we have argued that if consumers are to actively engage with new innovations in the market, they should be able to understand and control how their data is used. As well as building trust, this approach gives consumers some leverage with energy suppliers and third parties with an interest in collecting and using consumer data. By keeping consumers in control over the extent to which their data is shared, other parties will have to offer something of value to the consumer in exchange for access.

When energy suppliers install smart meters, suppliers are allowed to collect a daily meter reading by default, and consumers are then able to opt-out to less regular readings (with a minimum of a reading once a month). If suppliers - or indeed, other parties - want to take more detailed readings (half-hourly through a meter or near-real-time through direct access to the consumer's HAN) an explicit opt-in from the consumer is needed.

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https://www.citizensadvice.org.uk/about-us/policy/policy-research-topics/consumer-policy-research/consumer-policy-research/fairness-and-flexibility/
3
https://www.citizensadvice.org.uk/Global/Public/Corporate%20content/Publications/Personal%20data%20empowerment%20report.pdf

The Data Communications Company (DCC)

A key body in the smart meter data infrastructure is the Data Communications Company (DCC). The DCC allows energy suppliers and other authorised parties (DCC users) to access smart meter data via the creation of a Wide Area Network (WAN) - which is a mobile data network, much like that used by mobile phones.

Third party (i.e. non energy supplier) DCC users will include energy networks, price comparison sites, academic and research organisations and any other company with an interest in using smart meter data. DCC users are likely to offer a range of services including:

- switching (including tailored advice on the best tariffs for specific usage patterns)
- detailed energy usage reports
- remote healthcare
- security systems
- smart-home related services
- tailored home energy saving advice

This is list is neither exhaustive or definitive. As opportunities to combine energy data with other personal information grows we anticipate that other potential services will also develop. For example, a combination of financial data and energy usage data could lead to more tailored lifestyle advice.

Key to the success of the smart meter rollout, and therefore to the delivery of the consumer benefits, will be consumer trust in the systems that are put in place to ensure data are handled appropriately.

However, the DCC has no consumer interface. This presents two significant problems for consumers:

1. **A lack of transparency:** consumers will not know who is accessing their data, when, and in what detail. To find out, they will have to rely on contacting organisations individually if they believe their data is being collected without their permission or in more detail than agreed. This approach could carry several risks:
   a. If a consumer is concerned that their data is being accessed by an unauthorised party they will have no way to know who to approach

b. If a consumer suspects a DCC-user of collecting data without their consent they are unlikely to trust that same DCC-user to be honest when responding to questions about what they are collecting

2. **A lack of control:** the DCC cannot restrict access to specific DCC users, if requested by consumers. Instead, consumers will have to approach the organisations accessing their data directly and request that they not collect it. This entails the same risks around trust as outlined above.

One way to address this issue would be for the DCC to implement a system, where it passes consumer data onto DCC members only once it has confirmed that consent has been given. In the absence of this functionality, Citizens Advice has created a proof of concept for the 'Data Dashboard'.

2 - The Data Dashboard

The data dashboard is a tool that allows consumers to see:

- who is accessing their smart meter data;
- whether this access is one-off or ongoing
- if ongoing, at what intervals it is being collected and if one-off what detail of data was collected;
- when this data access began; and
- an explanation of who the data collector - the person or organisation, processing the data - is and, where possible, an explanation of what they are using the data for.

This functionality would enable increased transparency, providing consumers with key information about what is happening to their data. A further step would be to complete the second half of the consumer requirement: "control".

This would be executed by ensuring consumers are able to:

- query access - possibly through a direct link to the organisation that is collecting the data, allowing the organisation the opportunity to explain who they are and what they are using the consumer's data for;
- flag access of concern - this could be a simple marker highlighting that a consumer does not know what this access is for allowing follow-up communication to clarify; and
- amend access - this could range from blocking access from an unknown party to amending the intervals at which specific parties are permitted to collect it.

While a data dashboard would not address all of our concerns around consent-checking it could provide more transparency and control for those consumers who wished to use it.

Creating a proof of concept:

Having identified these needs and a concept of what such a tool could look like we then built an online proof-of-concept. This included dummy data in order to spur discussion and identify key challenges and issues.

We organised a stakeholder workshop attended by energy suppliers, the department for Business Energy and Industrial Strategy (BEIS), Ofgem, the DCC and other key experts from energy networks, service providers and academia.

During the workshop we presented the background and a draft version of the dashboard. We also held discussions broken into three categories:

- Challenges and Limitations
- Opportunities
- The future

The proof of concept

The dashboard will have a number of features, allowing consumers to:

Check recurring/one-off data access

The consumer will be able to see which DCC users have ongoing access to consumer data. Further tabs will provide information on one-off access of historical data, for example switching sites who accessed historical usage to offer tailored energy tariff comparisons.

Check paired devices

The dashboard will include information on what has been paired with the smart meter. This would include CADs as well as smart refrigerators or other smart home equipment which could make use of the HAN data.

Query access

A query button will be available, which provides a brief description of the company and what they use smart data for. There may also be scope for DCC users to provide their own short description here. For example, an energy network could use this to explain who they are and what they use the smart data for.

Control access

The 'control' aspect of the dashboard requires clicking through to a separate menu in which the user can amend or end their data sharing. Users will be prevented from opting out entirely where they would not be able to do so (for example there is no option to completely opt-out of any data collection from the energy supplier). Users will also be warned that opting out of data sharing may impact any services they are currently using or breach the terms of some energy tariffs that require specific levels of data access to deliver.

Challenges and Limitations:

Developing and maintaining a tool like this will inevitably entail several key challenges, these include but are not limited to:

Identity verification

It should be possible to identify the consumer by a combination of unique data, including MPxN, postcode and a customer identification number.

One of the challenges still remaining is how to ensure that nobody else can access the consumer's smart data dashboard. Balancing the need to have personally identifiable information which cannot, for example, be gleaned from a single energy bill (such as name, address and account number), but which a consumer is likely to have ready access to will be a challenge.

A challenge which is also being debated elsewhere in the smart meter rollout is where the bill-payer is regarded as a proxy for the consumer in question. This may cause issues where, for example, a landlord includes utilities in rental costs but the personal energy data remains that of the tenant who is using it.

Data flows via Consumer Access Devices (CADs)

One limitation of the proposed model is that, by working via the DCC, the dashboard would only be able to show consumers data flows occurring through the DCC. If a consumer has connected a Consumer Access Device (CAD) and is using that to share data with a service provider this would not be visible on the dashboard, as initially thought.

The second iteration of the proof-of-concept (created after the workshop) added this functionality to show what devices are connected but how it would be achieved in a live tool has yet to be fully established. Providing this functionality may prove an additional challenge if proposals for local (rather than via the DCC) pairing of devices come to pass in the future. CADs that are paired via the DCC may be logged so information could at least be provided about what devices are connected if not what data they are collecting. As such this is functionality that could be added a later date.

DCC User 'hubs'

Given the costs and lengthy processes required to become a DCC user, many organisations are looking to set themselves up as DCC 'hubs' - effectively becoming a DCC user and acting as a gateway for other organisations. An example of this is University College London (UCL)'s intention to become a hub for academic institutions, allowing multiple universities to access smart meter data for research purposes via UCL's DCC user status.

The issue for transparency will be that current DCC data flows would show all such access on a dashboard as coming from UCL, rather than whichever university the consumer had chosen to share their data with. The existence of what are effectively 'mini-DCCs' raises the question of whether further dashboards would be needed or how to integrate those with the existing one such that consumers could see where exactly their data are going.

Preventing Abuse

Information on who a consumer is sharing data with is, in itself, potentially sensitive data. Accessing someone's data dashboard would allow you to see which services they make use of and a particular users' apparent propensity to share data, as well as which services they appear to value most. Specific risks could include:

- an energy supplier noticing that a consumer is using an independent energy efficiency advice service and using that information to tailor marketing materials to the consumer,
- or the energy supplier gaining the knowledge that a consumer has started making use of services that help them switch to a better tariff and then courting them with better rates as a retention strategy.

The company or organisation that hosts the tool will have to be a trusted party. We have designed the dashboard such that no record should be made of what is shown to the consumer when they log in, and that the host (for the proof of concept this was Citizens Advice) would not be able to access that information. This is because it would only exist in the form of transitory data, which is not retained. Should a consumer wish to keep a record of the dashboard on a given date the option to print or email reports would be the primary means to do so.

Accurately communicating who the DCC user is

Current DCC data flows do not necessarily provide easily understood identifiers to DCC users so, for example, a consumer's energy supplier may be named using an alphanumeric code rather than the name a consumer may be accustomed to. For example even company names could cause confusion where, for example, a consumer is unaware that British Gas is a subsidiary of Centrica leading their dashboard to display 'Centrica' in place of the more familiar name of their supplier. There may be further confusion caused by 'white label' energy suppliers if they still use the energy suppliers' back-office systems.

Following discussions with DCC we have confirmed that this issue is surmountable through 'enhanced data' which will allow us to present meaningful information to the homeowner.

Becoming a DCC user and interfacing with the DCC

While delivery of the dashboard as described is technically possible using the data flows that will exist it may still require the provider of the service to have a unique level of membership to access the specific data needed.

The DCC has raised the fact that, while historical data going back three months is easily attainable, data going back further would be more difficult to provide as it is currently a manual task to retrieve data for requests dated over three months.

Opportunities and the Future

Hosting

The question of who would host the Data Dashboard tool remains open. The proof of concept is currently branded as a Citizens Advice product with an assumption it would be offered by Citizens Advice. If we were to develop it, we would consider using methods that will allow the underlying code to be handed over to other parties to run or brand without difficulty.

Other possible hosts were discussed at the workshop. Supplier-hosted dashboards were dismissed both for the reasons listed above under 'preventing abuse' (a consumer may not be comfortable with their energy supplier potentially knowing who else they have agreed to share data with) and because a fragmented market, with multiple dashboards would increase confusion.

Hosting the tool may entail becoming a DCC user which is currently a lengthy and costly process.

Availability and access

The current iteration is built to work on a desktop or mobile browser, the question of access for those who either lack internet access or are not confident using the internet could be addressed through call centres. For example, the Citizens Advice Consumer Service Helpline could be able to access the dashboard on a consumer's behalf or in person at a Local Citizens Advice, libraries or similar. There may also be scope to create a widget that could be embedded on other websites (for example those of energy suppliers) or a mobile app.

Additional uses

Although built for smart meter data the dashboard, and the principles underpinning it, also seem applicable to other areas of consumers lives where data are becoming a key element. The most obvious extension is into the smart home. Appliances and other smart home equipment will generate an ever-increasing flow of consumer data. Consumers may want to challenge these in order to check what is being collected and with whom it is being shared.

There are also obvious connections to industries which, like energy, are participating in the MiData programme, such as financial services and telecoms. If all of these data flows could be viewed by a consumer through a single tool it could significantly increase the visibility of such data flows and help consumers understand how their data are being used.

3 - Where we go from here

While clear challenges remain, a consensus emerged from our workshop with representatives from industry, academia and government that a data dashboard would be a valuable tool for consumers and a necessary step to address the existing lack of transparency and control for consumers via the DCC model.

The feasibility study has not identified any issues that would prevent the development and deployment of the Smart Meter Data Dashboard.

The point was made during the workshop that it would be particularly useful to reassure consumers in the event of any high-profile media stories of poor handling of smart meter data. However, the Data Dashboard should not be viewed as an alternative to implementing a robust consent-check mechanism into the DCC.

The implementation of a consent-check mechanism would provide reassurance that a DCC-user is only able to access consumer data when the consumer has given their consent, the data dashboard will simply provide a means for consumers to confirm who is accessing it after the fact and, potentially, to request changes to this.

Following the workshop, we updated the proof-of-concept to address issues raised. Specifically, we separated the 'transparency' from the 'control' aspects as the former were regarded as less problematic to implement than the latter. Allowing consumers to change the detail of data they share could, for example, create a scenario in which the consumer unwittingly breaches their supply contract where a specific tariff relies upon a certain detail of data to be shared. This seems most likely to occur where Time of Use tariffs are available.

Acknowledging these challenges, there remained an appetite to allow for such functionality even if it were to be implemented at a later date. The new proof-of-concept includes it on a separate page that the consumer must navigate to, with an added note warning that changing settings may have implications on service provision and contractual arrangements.

At the time of development and drafting this report, the DCC was not fully operational: at the time of publication SMETS2 meters have not yet been deployed at scale. Therefore the data flows necessary to support the proof-of-concept tool are not yet available. As a result, the dashboard will remain a proof-of-concept in the immediate term. Citizens Advice will use it to help visualise and explain how the product could address the key issues of consumer transparency and control over smart meter data, and provide a vision for how such services should work in other sectors.

BEIS are scheduled to review the smart metering data privacy framework in 2018. This proof of concept of a data dashboard should play a key role in these

discussions, given its potential to help consumers better understand and potentially control how their smart meter data are shared.