Smart Meter Energy Data: Public Interest Advisory Group

A policy dialogue and work programme led by

Centre for Sustainable Energy & Sustainability First

Final Report – Phase 1

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Report Status

This is the final report of Phase 1 of the PIAG project. A draft was considered at the fourth PIAG Workshop held on 4 April 2019 and final comments taken on board.

This paper was prepared as an input to the work programme of the Public Interest Advisory Group on access to smart meter energy data.

Preface

The Public Interest Advisory Group (PIAG) on access to smart meter data for a public-interest purpose is independently convened by two charities, Sustainability First and the Centre for Sustainable Energy (CSE).

This paper is the outcome of an 18-month PIAG process. Sustainability First and CSE have worked to frame the topic in a systematic way, conduct desk-research, and produce background 'stimulus' papers, enabling PIAG members to debate and explore these matters in an iterative way - both collectively via workshops and bilaterally. Through this step-by-step deliberative approach, PIAG has developed a collective understanding of the key issues and challenges.

At the PIAG workshop in April 2019, this paper was considered in draft. There was broad agreement that the paper – together with its principles, conclusions and recommendations – is a fair reflection of the PIAG process. It was acknowledged that individual organisations participating in PIAG may not necessarily support each conclusion & recommendation set out in the paper but that there was support for the broad approach.

We are extremely grateful to all members of the PIAG group for their active participation, expert input and support for the work of PIAG over the past 18 months. Any omissions or errors are the responsibility of Sustainability First and CSE. We look forward to continuing to convene PIAG and to taking forward this work in a second phase. Phase 2 will build on PIAG's work to date and aim to further develop the evidence-base for potential 'public-interest' uses of smart-meter data.

As at June 2019 members of the PIAG group include (*denotes current funding member):

BEIS
Citizens Advice
Committee on Climate Change
Ministry of Housing, Communities and Local Government (MHCLG)
Energy Networks Association
Energy UK
Energy Saving Trust
Energy Systems Catapult*
Elexon*
Electralink
Greater London Authority
National Grid ESO*
National Infrastructure Commission
Northern Powergrid*
Ofgem*
Office for National Statistics
Ombudsman Services
Scottish Government
Smart DCC (Smart Data Communications Company)*
Smart Energy GB
TechUK
Welsh Government
Which?
UK Statistics Authority
Cambridge Architecture Research Ltd
University of Edinburgh / Teddinet
UCL Smart Energy Research Lab*
University of Exeter
University of Reading
UKERC
Xoserve
Centre for Sustainable Energy
Sustainability First

Sustainability First

Sustainability First is an environmental think-tank and charity, rooted in experience, with a clear commitment to promoting long-term sustainability through practical thought-leadership. Sustainability First works in the fields of sustainability policy and practice for energy, water supply, and water management. In particular, Sustainability First promotes a 'public interest' agenda in the energy and water sectors, economic regulation and sustainability duties, innovation and how this can better serve sustainability, and the social justice aspects of sustainability including fair treatment for consumers and citizens in vulnerable situations.

Centre for Sustainable Energy

The Centre for Sustainable Energy (CSE) is an independent national charity that works for a world where sustainability is second nature, carbon emissions have been cut to safe levels, and fuel poverty has been replaced by energy justice. Based in Bristol, CSE undertakes practical work to support individuals, communities, and organisations to take action on energy. CSE shares knowledge and experience to empower people to change the way they think and act about energy by giving advice, managing innovative energy projects, training and supporting others to act, and undertaking research and policy analysis.

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Executive Summary

PIAG background

New sources of data are posing opportunities and challenges for government, business and civil society. Smart meter data is no exception. As energy is an essential service and part of the critical national infrastructure, questions around how data is used in this sector deserve particular strategic attention. This is reflected in the establishment by BEIS of the Energy Data Taskforce that we hope will reinforce the findings of the PIAG work.

The smart meter data Public Interest Advisory Group (PIAG) was established by Sustainability First and the Centre for Sustainable Energy (CSE) to consider how smart meter data can be put to best use to further public policy goals and aid in the energy transition. Members of PIAG include a wide range of consumer, governmental, industry and academic players who together have considered different aspects of the issues through a series of workshops, informed by research and stimulus papers prepared by Sustainability First and CSE.

Why smart meter data has a public interest value

The smart meter rollout is an essential pillar of the energy system transition. But it also raises new challenges for policy makers who have to assess the impacts of major policy reforms and ensure that all customers, including customers in vulnerable situations, are protected and empowered in this new world. Data is key to making informed policy choices, but current provisions for access to smart-meter data for a public interest purpose, leave policy makers at risk of 'flying blind'.

Examples of the challenges that regulators and policy makers may face without access to (suitably aggregated or anonymised) half-hourly consumption meter data include:

- Ofgem, in looking at the opportunities created by half-hourly electricity settlement, has grappled with trying to understand the distributional impacts of such a major reform. Once half-hourly settlement is implemented, unless Ofgem itself has access to aggregated or anonymised half-hourly consumption data, it may struggle to monitor or understand the full impact of its own reforms.
- There is a strong expectation that devolved, regional, city and local energy developments will become more important. Many local authorities are keen to play their part, developing local energy plans and identifying opportunities - such as where to locate public EV charging points or how to use their wider planning powers to support a more decentralised local energy system, including for lower-carbon heat. Presently however, the official energy statistics as a data-source for local plans give only annual energy consumption data, which is not sufficiently granular for those needs.

- Government departments (BEIS, MHCLG, DEFRA) and public advisory bodies charged with public interest duties (eg the Committee on Climate Change, the National Infrastructure Commission) will not have access to suitably granular energy consumption and demand-side data that they will need to enable them to discharge their duties in an increasingly data-driven energy market.

Similarly, for NGOs, charities, think-tanks and universities looking to participate in the wider public debate on the design and potential impacts of future energy systems, more granular consumption data (anonymised and aggregated) would provide a vital source of evidence.

For their part, energy companies are rightly looking at the opportunities presented by big data. If government (defined broadly, including at local, regional, devolved and national level) is to continue to play a strategic role in facilitating new energy markets and ensuring that these work in consumer and citizen interests, and not simply company interests, then it will need to ensure that it too has access to sufficiently granular consumption and demand-side data to do that. Without this access, information asymmetries will be further reinforced. This could increase the risk that the low carbon transition and the development of the future energy system, may not be seen as 'fair'.

Balancing public interest and privacy concerns

This debate on the case for government to have access to data to inform public policy and to improve services is playing out across sectors and across the globe. Through the Digital Economy Act 2017 (DEA) the UK Government has given the Office for National Statistics (ONS) powers to collect data from private and public sector bodies that can then be used for statistical and research purposes. In so doing, the government has had to address the principles that should be adopted to ensure privacy is suitably protected whilst enabling access to data by researchers and linkage of datasets. In looking at how best to balance the public interest with individual protection for smart meter data we advocate adopting those same DEA principles. As a part of that, any arrangements would clearly need to comply with the General Data Protection Regulation (GDPR).

In the case of smart metering, there are particular concerns that worries about privacy could lead to some consumers refusing smart meters. For this reason, a Data Access and Privacy Framework (DAPF) was put in place, giving consumers the choice over how their consumption data is accessed 'except where the data is needed to fulfil a regulated duty'. Thus the framework did not envisage customers having a choice where certain wider public interests were at stake. This thinking is reflected in the arrangements whereby the distribution networks (DNO) can access half-hourly consumption data, with an obligation to aggregate or anonymise the data 'as far as is reasonably practicable' and have their privacy plans approved by Ofgem.

We have explored through a consumer research expert workshop how consumers might be expected to view access to smart meter data for a public interest purpose looking at the evidence from consumer research into smart metering and privacy issues more widely. Consumers consider smart meter data to be less sensitive than some other types of personal data, albeit they find it hard to judge

the risks and benefits involved and hence would generally expect the regulator to determine how best to protect their interests.

The approach adopted towards DNO data access (and indeed ONS work in other sectors) shows how a focus on how best to protect customer data – rather than reliance on individual consumer choice – is appropriate where wider system benefits are at stake. The same argument applies to the provision of smart-meter data for a public interest purpose – and indeed the output data required to meet the various use-cases we have identified should not raise privacy concerns as data would be sufficiently aggregated or anonymised.

A proposed way forward

While the outputs required should not raise privacy concerns, the challenge is how to obtain the necessary input data (which has to be granular) in the absence of any central database of smart meter data, such as exists in most other jurisdictions. There is also a need for a 'trusted processor' who can take the input data, linking it with other data as necessary, to produce the required outputs - as ONS do in other sectors.

Our proposed way forward is to take a phased approach:

- Initially, through a Phase 2 of this project, PIAG should continue to refine its understanding of the data required to support the particular public-interest use cases identified and to pursue options to use existing data sources, which would also help to build evidence on the benefits that improved data would give. This includes exploring with UCL how their Smart Energy Research Lab (using smart meter data linked to wider contextual data for a sample of customers who have given consent) could provide at least summary outputs to a wider set of public interest stakeholders;
- Where this further work continues to support the need for access to this data for public interest purposes, BEIS (or ONS) in the short-term should use their existing powers to start to gather more granular energy consumption data from suppliers (or their agents) as suppliers currently have the most complete records, albeit not comprehensive. This would build on the existing arrangements whereby BEIS collects individual customers' annual gas and electricity consumption data from suppliers, which is then used to create published statistics and anonymised datasets for research. ONS has similar powers under the Digital Economy Act and could equally take on this role. Given the legal and process arrangements are already in place, this proposed approach should not raise any new policy concerns. It would also help BEIS better understand how further data could be of eventual public purpose value;
- In the longer term, BEIS and Ofgem should take account of the wider public interest benefits of access to smart meter data as they develop proposals for enabling wider market access to data – for example, as part of electricity settlement reform. The best route for accessing more comprehensive smart meter data will depend on such wider policy developments. Given rapid developments in data processing, artificial intelligence etc, it is important that decisions in this area are transparent and kept under review.

Exploring these different routes for access to smart meter data for a public-interest purpose is essential if public policy makers are to have access to the data they need as they work to oversee an increasingly data-driven energy sector. It is important to recognise the very rapid rate of data-driven change across the GB energy sector - enabled in part by smart meters themselves - and to understand the significant implications this has for government, the regulator and other public interest users. We hope that through this PIAG process, everyone involved has developed a greater understanding of the potential benefits and the issues at stake that will enable them to support a more open regime for access to suitably aggregated or anonymised data by public policy makers in the long run.

We are pleased that there will be an opportunity through a Phase 2 of the PIAG project to continue this debate and to take forward the conclusions of this initial PIAG report.

Introduction

The smart meter data Public Interest Advisory Group (PIAG) was established by Sustainability First and the Centre for Sustainable Energy (CSE) to consider how smart meter data can be put to best use to further public policy goals and aid in the energy transition – and whether, and under what circumstances, the data might be accessed by government and other organisations for public interest purposes while safeguarding consumers' interests.

The PIAG project has a broad set of collaborators and sponsors – UCL, Ofgem, the Energy Systems Catapult, Elexon, Smart DCC, National Grid ESO and Northern Powergrid.

Members of PIAG include a wide range of consumer, academic, government and industry players who have engaged through an initial kick-off meeting and four full workshops, plus a consumer research workshop[1].

Through the PIAG process and wider policy dialogue we have sought to build a broad consensus around the way forward. In particular, we have:

- **Identified and developed 'public interest' use-cases for smart meter data;**
- **Distinguished between the privacy characteristics of input and output data from smart meters – and set out a potential trusted processor role;**
- **Developed principles for access to smart meter data for a public interest purpose - and mapped out potential workable access-routes which respect individual privacy.**

As set out in our synthesis paper, published as an annex to this final report[2], PIAG has considered a total of 8 Stimulus Papers. This includes papers on international and other sector experience, the legal framework, consumer attitudes, potential use cases identified by stakeholders and routes for accessing the data. All papers are available from the PIAG microsite https://www.smartenergydatapiag.org.uk/

This paper draws from the various PIAG papers and workshop discussions that have been held to develop a set of recommendations and principles to be followed in considering the case for access to smart meter data for public interest purposes.

[1] PIAG members are listed on p 2.
[2] Summary of PIAG Project Papers. Annex to PIAG Final Report. June 2019. https://www.smartenergydatapiag.org.uk/

This paper considers in turn:

1. **The background to smart metering;**
2. **The wider context of government approaches to data more generally;**
3. **Potential use cases and the public interest;**
4. **Data requirements for these use cases;**
5. **Likely consumer reaction;**
6. **Routes to the data – both sources of input data and the role of the trusted processor;**
7. **UCL's Smart Energy Research Lab;**
8. **Principles for policy makers;**
9. **The need for timely action;**
10. **Smart metering in the public eye;**
11. **Next steps**

Conclusions and recommendations.

Our recommendations – noted throughout this report and summarised at the end - are grouped to reflect the different phases of evidence building and data access in terms of:

- **Developing the case for access**
- **Immediate: making best use of existing data sources**
- **Short-to-medium-term: taking forward improved data access**
- **Long-term: keeping options open**
- **Wider smart meter framework.**

We have shared this report in draft with Energy Data Taskforce colleagues and hope through their own conclusions that they will reinforce the recommendations made here.

Looking ahead, we will move forward to a Phase 2 of the PIAG project. In particular we are looking at a programme of workshops through to late 2020 which would include focused deep-dives into different types of user and use-case - policy makers, regulators, local and city level planners, wider stakeholders. This will add to the evidence already gathered on the case for enabling access to the data for public interest purposes.

1. Smart metering: background

Smart meters are being rolled out to all homes and small businesses by 2020[3]. This rollout is central to the energy system transformation under-pinned by the three drivers of digitalisation, de-centralisation and de-carbonisation.

Smart meters will give consumers greater visibility of their energy use and hence support energy efficiency. They will allow for more innovative time-of-use tariffs that reflect the costs of using the system at different times and facilitate flexible 'demand side response' to help efficient balancing of the system, given increased intermittent generation. Smart meters will also support new business models such as peer-to-peer trading and faster switching. For their part, energy companies are rightly looking at the opportunities presented by big data, with potential new-entry from tech and data experts challenging conventional utility players. Collectively, consumers are paying for the smart meter programme and hence they have a strong interest in ensuring that the potential public interest benefits from smart metering are also maximised.

To oversee this new data-driven energy system, Ofgem and BEIS will themselves need better access to data to enable them to take informed policy decisions and to monitor developments in the market. Smart-meter data is key to this but through our work on PIAG our sense is that BEIS and Ofgem have yet to fully recognise how their own data needs will also change as a part of this transition. As a result there has relatively been little 'pull' to date (from the centre at least) for access to the smart meter data. However, we hope that through the PIAG process we have started to stimulate a new debate within both BEIS and Ofgem on these issues. In the meantime, Ofgem have been building their capability to deal with big data[4], drawing on funding from government through the Regulators Pioneer Fund[5] to set up a data hub and data exchange.

Recommendation *(developing the case for access)* – **BEIS and Ofgem** should consider the data that they will need for effective oversight of an increasingly data-driven sector - for market monitoring and for policy design and evaluation, including understanding distributional impacts.

As set out in PIAG Stimulus Paper 1, energy consumption data from smart meters is rightly covered by strong privacy protections through the Data Access and Privacy Framework (DAPF). The aim of having a DAPF was to try to avoid the kind of backlash seen in the Netherlands with consumers refusing smart meters due to privacy concerns, and to encourage those wanting to access data to provide a clear customer proposition. The DAPF reflects the principle that consumers should have a choice over who has access to their data 'except where the data is needed for a regulated purpose'. As a result:

[3] Realistically, timescales may extend

[4] https://www.ofgem.gov.uk/news-blog/our-blog/using-big-data-empower-energy-consumers

[5] https://www.gov.uk/government/news/projects-lay-the-groundwork-for-a-future-of-robolawyers-and-flying-cars

- **Suppliers** can obtain monthly consumption data but consumer consent (opt-out) is needed for daily data and consumers must opt-in for suppliers to access more granular data (eg half-hourly) or for data to be used for marketing purposes.
- **Network operators** (electricity DNOs and gas GDNs) can access half-hourly consumption data subject to having a privacy plan agreed by Ofgem which sets out how they will aggregate or anonymise the data as far as is reasonably practicable. Ofgem in considering these plans have made clear that they will look at whether what the networks propose is proportionate and delivers benefits to customers. So far Western Power Distribution (WPD) is the only network to have a privacy plan agreed and they will collect data which will then be aggregated to feeder level (which in some cases may involve only 1 or 2 properties). WPD will pseudonymise the data (so it is only linked through a separate identifier) to further reduce the privacy risks. Northern Powergrid and a number of other DNOs have now submitted initial versions of their privacy plans to Ofgem. No gas networks currently have plans to do so.
- **Third parties** can collect data with customer consent and subject to signing up to certain privacy protections as Smart Energy Code (SEC) signatories, including arrangements for customer authentication and information provision.

One side-lesson from PIAG has been about the difficulties third-parties face in becoming DCC users and gaining the right to access data. UCL as a well-resourced organisation has found it a challenge to navigate through the system and to meet the stringent requirements around, for example, customer verification in securing customer consent and technical security standards. While these are vital protections this is potentially concerning given that this would be the route that we would expect to be used by third parties looking to offer tailored services to support those in fuel poverty, for example.

Smart DCC is actively working on initiatives to help enhance access including through the development of an innovation hub to allow early stage trialling and testing and through streamlining the on-boarding process.

Recommendation *(wider smart meter framework)*: **BEIS** and **Smart DCC** should continue to monitor the ease with which third parties can register as DCC users and access smart meter data (with the consumer's consent), given that certain potential public interest related uses could be delivered through that route.

In addition to the present routes for accessing smart meter data set out above there is also potential for approved Consumer Access Devices (CADs) to collect highly granular (10 second) data via the Home Area Network (HAN)[6] which would then be passed to the company concerned over the customer's broadband. These CADs have to be installed and 'paired' with the meter by a supplier or other registered DCC user. This level of data granularity does get close to enabling companies to identify different types of appliance use, for example.

[6] HAN is a secure wireless system in the home that links the smart meter with the in-home display and any Consumer Access Devices (CADs).

Early in the PIAG process we discussed the risk of creating a 'walled garden' of carefully regulated access to smart meter data – and where public interest actors would be unable to access it - while outside the walled garden there would be the potential for a 'wild west' of companies accessing very granular data through CADs with more limited consumer protection. Other technologies such as clip-on current monitors present similar risks and sit yet further outside the regulatory regime.

PIAG has highlighted that while CADs can deliver real benefits, abuse of the arrangements could raise potential privacy issues and that customers will not necessarily distinguish between their data accessed via the CAD route and the smart meter data – over which there is far more control. This creates reputational risks for the smart meter rollout programme. Smart DCC holds data on CAD deployment and is assessing what support it can provide in this area.

Recommendation *(wider smart meter framework)* – **BEIS** should monitor the deployment and use of CADs and what data is being collected on what terms - and if necessary be ready to act, to improve the transparency of the arrangements to consumers.

Visibility of who has access to their smart meter data (including via CADs) is important to customers who are known to value transparency and control. In July 2018, Citizens Advice published their useful proof-of-concept for a smart-meter Data Dashboard, which would allow consumers to see who is accessing their data. It would be helpful for Citizens Advice to take forward their work in this area.

Recommendation *(wider smart meter framework)* – **Citizens Advice** should take forward their Data Dashboard concept to a next stage to provide consumers with transparency over who has access to their data.

A wide range of data is available from smart meters. The focus of the PIAG work has been on consumption data, given that this is where individual privacy issues are strongest. However, it is important that all players look also at wider data that is available through smart meters including measures like maximum demand and export - both of which could be of strong interest from a public interest viewpoint. Such data is still almost certainly considered personal, and hence covered by GDPR, but is not covered by the smart-meter energy consumption data specific Data Access and Privacy Framework (DAPF). This means that parties do not need customer consent to access this other meter data under the terms of the DAPF. They would still need a legitimate basis for processing the data under GDPR, but this may provide slightly more flexibility than exists for consumption data.

Smart DCC is currently assessing the use of other smart meter data and would welcome input from stakeholders on this as part of Phase 2 of PIAG. In parallel the Energy Data Taskforce is proposing the creation of a data catalogue including metadata for all energy systems data that organisations hold which would provide more transparency in this area.

Recommendation *(developing the case for access)* in addition to gas and electricity consumption data **all parties** should reflect on the potential for other smart meter data to serve a public interest purpose.

GB has taken a unique approach to the rollout of smart meters with a supplier-led rollout and strong privacy rules. All other countries we have identified (see Stimulus Paper 2) have some central repository of smart meter data and in the US there is growing interest in then providing access to aggregated / anonymised data from this repository to academics and government to inform public policy. The lack of a central repository in GB (albeit for understandable reasons) makes it much less clear how the data could be collected and provided for public interest purposes even where there is a strong case and privacy issues could be addressed. We return to this issue later.

2. Wider context of government thinking on data across sectors

As set out in Stimulus Paper 3, there is strong interest from across government in the use of data to improve the delivery of services and to aid public policy making, in the context of the growth of big data and artificial intelligence. A number of think-tanks and institutions have been exploring these issues including the interplay with privacy concerns and highlighting the need to think more broadly about such issues from an 'ethics' perspective.

Many of these 'ethics' issues have been thought through in particular in the context of health where the data is more sensitive but there are clear societal benefits in being able to research and analyse patterns in that data.

This is an area which is developing fast. Since the PIAG Stimulus Paper was produced the Centre for Data Ethics and Innovation has now been established and has published its work plan. It is an independent advisory body set up by Government to investigate and advise on how we maximise the benefits of data-enabled technologies, including artificial intelligence. Its work plan includes a strong focus on public engagement around many of the issues related to the use of data.

Similarly, the Geospatial Commission, an independent committee set up to maximise the value of data linked to location, is now up and running and has issued an initial Call for Evidence.

To support the wider use of data, government put in place the Digital Economy Act 2017 (DEA). This gives the Office for National Statistics (ONS) a role as a trusted processor and gives it powers to collect data from public and private organisations to support its statutory objectives which include:

- producing official **statistics** and
- undertaking statistical **research** that meets identifiable user needs for the public good.

As a trusted processor the ONS has to set out the guidance it will follow (and which would also have to be followed by others such as the UK Data Archive who already follow a similar approach). The principles it has articulated for how it will exercise its functions are:

- **Confidentiality** – protecting confidentiality and adhering to legislation;
- **Transparency** – publishing information on how they exercise their functions (including what data is collected and how it is used);

- **Ethics and the law** – observing relevant ethical standards, producing Privacy Impact Assessments;
- **Public interest** – a duty to promote and safeguard the production and publication of official statistics that serve the public good;
- **Proportionality** – minimising burdens associated with providing access to data, costs proportionate to benefits – including thinking about the granularity of data required;
- **Collaboration** – consulting with data providers before issuing a notice.

In relation to the specific powers that the ONS has been given around linking and sharing of data the DEA requires that:

- Data should be de-identified before disclosure;
- The risk of accidental disclosure should be minimised;
- Disclosure should only be made by the relevant public body (or someone appointed by it);
- The research must be accredited;
- The individuals involved (in disclosing or using the data) must be accredited – but need not necessarily be academics;
- The individuals must have regard to the statutory Code of Practice.

The ONS's statutory Code of Practice then essentially follows the '5 safes' principles which are also followed by the UK Data Service and the Administrative Data Research Partnership[7] (ADRP) where individual level data is being linked or shared. The 5 safes are:

- **Safe projects** - approved by a panel;
- **Safe people** - accredited researchers – but not necessarily academics;
- **Safe data** - de-identified;
- **Safe outputs** - report findings reviewed;
- **Safe environments** - research done in secure sites.

At a practical level the ONS Data Science Campus has been established, with an external advisory board in place from last year, to investigate the use of new data sources (including administrative data and big data) for public good and to help build data science capability for the benefit of the UK.

Building on this wider government framework, we would expect any party looking to make use of smart meter data for a public interest purpose to adopt the relevant ONS / DEA principles.

[7] The successor to the Administrative Data Research Network (ADRN)

Consumer bodies should be confident that applying the DEA principles to smart meter data affords suitable protection and, with use of a trusted processor plus anonymisation, need not require a trade-off between individual privacy and the public interest.

Since the DEA came into force the National Statistics Authority has published a report 'Joining Up Data for Better Statistics'[8] in which it urges government departments to do more in this space. Launching the report, the Director General at the National Statistics Authority, Ed Humpherson, said:

"*This points to a gap between what's possible in terms of valuable insights, especially now the Digital Economy Act creates new legal gateways for sharing and linking data, and the patchy results on the ground.*

It leads us to conclude that value is being squandered because data linkage is too hard and too rare."

The focus of the DEA and of the above report is on the use of administrative data. The term '**administrative data**' refers to information obtained by a public or private sector organisation in the course of undertaking its normal operations, rather than with a view to its use for statistical purposes. As such where smart meter data is *already* being collected by suppliers or network operators it can be seen as administrative data.

Recommendation *(developing the case for access)* – **BEIS** should consider the role that improved use of smart meter consumption and other data could play in discharging the expectations from wider government on use of administrative data for better statistics.

More generally we are aware that the landscape around data processing, artificial intelligence and machine learning is developing rapidly. It is important that decisions taken around smart meter data take account of this shifting context and are transparent and kept under review.

Conclusion 1:

Access to smart meter data for public policy purposes is essential to avoid policy makers 'flying blind' into the energy transition

- The smart meter rollout will deliver significant benefits in helping transform the GB energy system;
- Regulators and policy makers will need better data if they are to oversee this more data-driven energy system, facilitated by the rollout of smart meters;
- Smart meter data therefore has a clear public interest value to support better decision making and evaluation, in line with the broader government agenda;
- Making anonymised granular consumption data available will also enable new sources of value and new actors to emerge.

[8] https://www.statisticsauthority.gov.uk/wp-content/uploads/2018/09/Data-Linkage-Joining-Up-Data.pdf

3. Potential use-cases and defining the Public Interest

Early in the PIAG process we considered whether we should be trying to define the 'public interest' to help in focusing the project. Sustainability First has led previous work (New Energy and Water Public Interest Network – New Pin[9]) which has identified long-term public interest outcomes as spanning value for money, quality service, clean / sustainable / low carbon, resilience, place-based well-being, fair / affordable. We also noted other definitions that exist in GDPR and the DEA, although in all cases there remains an element of judgment involved.

Ultimately our conclusion was that for our purposes what was more helpful was to have a *process* for considering the questions raised rather than a formal definition. However, we did clarify that our focus was primarily on improving **public policy-making** not the provision of individual services (even where the provision of those services might be considered to be in the public interest). We did however identify that providing anonymised data could also be of help to innovators looking to develop such new services.

Example Use-Case A: Understanding the distributional impacts of design choices for smarter energy markets

As energy market players start to access smart meter data, public bodies such as BEIS and Ofgem who decide on policy, regulatory and market design, will also need to be able to assess and understand the potential costs, benefits and distributional outcomes of different options. This would include the impact of changes to charging regimes, settlement processes, market access and participation rules etc. To fulfil its regulatory duties, Ofgem will also wish to understand the distributional impacts of these decisions and have insight into emerging practices by market actors (licensed/unlicensed) - from retailers to aggregators to network operators.

Analysing the costs, benefits and distributional impacts of market developments will require access to a socio-demographically representative data-set with broad equivalence in terms of resolution as the energy system itself (e.g. half-hourly)– and already accessible to market actors. This smart meter data-set would need to be accessed and accurately linked with address-matched socio-demographic data (by the trusted processor at individual record level) to enable the representativeness of the dataset to be assured and the distributional consequences to be properly modelled. The resulting representative dataset for use in such analysis would be fully anonymised.

[9] https://www.sustainabilityfirst.org.uk/index.php/new-pin

Example Use-Case B: Planning the siting and scale of local energy infrastructure to optimise value to the wider energy system and benefits to local citizens

Bristol City Council is planning the implementation of a 10-year programme of £1 billion of energy infrastructure investment across the city. It ranges from heat networks and building energy upgrades to energy storage, new renewable energy generation (including green gas) and flexible smart demand. The plan represents a key component of the city's strategy to accelerate progress towards carbon neutrality. It also reflects a growing need for energy infrastructure to reflect specific place-based characteristics to ensure effective integration of heat and power systems and optimise system response to variable renewable output and localised network constraints.

For effective design of a plan which can be well-executed on a sustained basis and genuinely serve the interests of Bristol's citizens, the city will need access to detailed temporal and spatial fine-grain energy consumption and peak / maximum demand data. To select, site and scale these different types of infrastructure and intervention Bristol city will need historic rather than real-time smart-meter data which can be anonymised and aggregated (to an appropriate level). The city would integrate this with other datasets held to create a comprehensive and detailed picture of energy demand and generation patterns and associated building and socio-demographic characteristics across the city.

Example Use-Case C: Widening participation in the policy dialogue

Charities, think-tanks and NGOs that wish to engage in policy debates around the energy transition need data to inform and support their arguments. Such groups have limited resources. Having access to ready-analysed statistical information on, for example, energy consumption patterns for different types of customer, would enable them to contribute in a well-informed way to policy development.

Example Use-Case D: Creating an innovation test-bed

Effective innovation to improve services and reduce costs is in the public interest and could justify establishing a 'test-bed' of representative, anonymised smart meter energy data in the public interest (such as would be produced for Use-Case A above). Without such an innovation test-bed, there will be higher barriers to entry for early-stage innovators. They will be unable to secure the low-cost access to smart meter data enjoyed by incumbents to test their prototype innovations.

For example, innovators at the early stages of designing new smart energy solutions will either have to bear the considerable costs of recruiting customers or find an academic partner who has a dataset (without knowing if their idea is potentially viable in the 'real world') or rely on developing a partnership with an incumbent (which can be a dampener on positive but disruptive innovation). These are barriers to entry. As the promoters of open data routinely highlight, the best innovation occurs when the data is made available at no- or low-cost so that barriers to entry are as low as possible.

The process that we followed involved deliberative engagement with PIAG members to test PIAG thinking as it developed – plus interviewing 'public interest' stakeholders to develop a taxonomy of use cases (see Stimulus Papers 4 and 5). Example use cases are given in the boxes. In broad terms they can be thought of as:

- **National statistics** - publicly available summary information which can be used by government and by wider stakeholders (regulators, parliament, policy community, academics) to enable them to contribute to wider public policy debates on energy;
- **Local area statistics** - again publicly available aggregated information but at a more granular local level to support devolved, regional, city and local government in thinking about issues associated with local energy systems planning; and
- **A representative and anonymised** dataset including linked socio-demographic data which could be used by modellers and researchers (not just academic) to carry out more in-depth assessments of public policy options including, for example, the distributional impacts;
- This same representative dataset could also be of value as a testbed for those looking to develop innovative services and wanting to understand their potential value based on an understanding of usage patterns.

While the research we undertook has provided evidence that there are clear opportunities to make use of smart meter data for a public interest purpose, further detail will be needed to support the case in BEIS and to take this work forward.

Recommendation *(developing the case for access)* – PIAG members (e.g. **Committee on Climate Change, National Infrastructure Commission, Scottish & Welsh Governments,** and the **Greater London Authority**) to help articulate in more detail their requirements and the benefits that could be delivered through improved access to smart meter data.

4. Data requirements for Public Interest Use Cases

In thinking about the data requirements for the different public interest use cases we looked at what smart meter would be needed (the level of granularity – temporal and spatial, how frequently it would need to be collected, and the type of data - just consumption data or also other data). We also considered what other categories of data might be needed - both energy data such as business energy consumption or export data and wider socio-demographic data.

For each use-case in Stimulus Paper 5, we looked at what was needed as **'input'** data - and what the **'output'** data would look like – as well as considering the role of the **trusted processor** who would take the input data and develop the outputs.

At the outset we had assumed that a key judgment for the PIAG process would be in making a trade-off between individual customers' privacy and the wider public interest. In practice, our core conclusion was that the outputs required for every PIAG public interest use-case would actually be an aggregated or anonymised dataset. Hence, making the output data available should not raise privacy

concerns. The challenge comes in how the input data might be collected and how privacy plays into that process.

In the context of anonymised outputs, we are aware that artificial intelligence (AI) and machine learning (ML) increase the risks around re-identification of anonymised data but consider that this is a wider issue impacting every sector of the economy and should primarily be addressed at that level. Moreover in relation to smart meter data the level of aggregation or anonymisation required for the outputs described above could be set to minimise such risks.

Working on the basis that the outputs do not raise privacy concerns, the challenge then becomes one of how to obtain the input data, given that, as noted above, there is no central repository of smart meter data in GB. Moreover, to ensure privacy risks are minimised it would be vital that the process of collecting and converting input data to outputs is done in a privacy-friendly way (and specifically by a trusted processor).

Principles for how data should be handled are already set out in the DEA. As set out above we recommend that – whether DEA or other powers were to be used to collect the data - these principles should be followed (given they are deemed suitable for a wide range of data sources across different sectors).

As noted above the focus of PIAG's work has been on smart meter consumption data. However various industry parties have access to other data including Smart DCC which has transactional data and ElectraLink which also tracks various industry processes. DNOs will have access to other smart meter data, as indeed some third parties may do. As part of exploring these use cases in more depth there would be value in testing how far other data could be of value in helping meet them. Again the Energy Data Taskforce proposals on a data catalogue could be relevant here.

Recommendation (*immediate*: *making best use of existing data sources)* – Central bodies (**Smart DCC, Xoserve, Elexon and ElectraLink**) should identify relevant data that they hold that could help meet the PIAG public-interest use cases now, both to provide immediate solutions and to help inform decisions on the way forward.

5. Likely consumer reaction

In order to help PIAG understand how consumers might react to the sorts of public interest use cases we had identified we carried out a review of existing consumer research (Stimulus Paper 6) and commissioned Ipsos-MORI to run a roundtable, the conclusions of which are on the PIAG microsite. In the absence of funding for a large programme of new consumer-facing research, and to leverage the value of research already conducted by a range of parties, the roundtable looked to gauge likely consumer views by discussing the existing research evidence-base (both specific to smart metering and looking at privacy more broadly) with those who had commissioned or delivered relevant research studies or who had a particular public policy interest in this area.

Discussion at the roundtable confirmed, in terms of consumer attitudes overall, that there was a low level of awareness around smart meter data and energy market issues more widely. Consumers were typically disengaged and, as with other sorts of data, did not feel that they had much choice over data-sharing if they wanted services delivered. That said, smart meter data was generally considered less sensitive than, for example, health or financial data.

Where consumers were likely to show concern, this often linked to specific issues such as: the potential for being subject to increased marketing; safety concerns where the data might reveal patterns of behaviour, or; the potential for differential pricing (eg at peak times). It could also reflect a general unease about the proliferation of data generally being shared, with people aware they didn't really know how it might be used or who else might gain access to it, including more general concerns about hacking.

Given all this, consumer attitudes to sharing their smart meter data were believed to be heavily dependent on who was gaining access for what purpose and levels of trust in those organisations. It was felt that consumers were typically focused on the benefits to themselves as individuals from sharing their data but – once it was explained to them – could also see and recognise the wider benefits to society from a more efficient energy system even if the direct personal benefits were unclear.

In reflecting on the potential 'public interest' use-cases that had been developed by PIAG, the use of smart-meter data to improve national statistics around energy use was seen as something consumers were likely to support. Similarly, the use of data for modelling to inform energy policy was thought likely to be viewed positively. On the use-case for local system planning there was thought to be a risk that consumers might fear that this could lead to their area being in some way disadvantaged against others and as such would need careful explanation. Having a neutral third party carry out the data aggregation could help increase trust in the process.

It was acknowledged that these views on PIAG's potential 'public-interest' use-cases were judgments and that further research would be helpful in this area. However, as with all issues around smart meter data, it was noted that these were difficult issues for consumers to engage with - other than through extended deliberative sessions – and even then the results could be heavily influenced by how the issues were presented. This prompted a question around whether it was right to rely on consumer consent as the basis for accessing data in such circumstances. There was some evidence that consumers would rather government or regulators took such decisions as they would be better placed to really understand the issues.

Since this work was carried out, Northern Powergrid have carried out research with over 1000 consumers to support their privacy plan, using a short video to help explain the network role and the future challenges that they need the data to address. This research reached similar conclusions to earlier research. In addition, Citizens Advice are currently undertaking quantitative research in this area having thought carefully about how best to deal with what are complex issues in this sort of

research. The results are due to be published in the summer. That said there remains a need for further research focused specifically on public interest use cases.

Recommendation *(developing the case for access)* – **BEIS or Citizens Advice** (and/or other PIAG members) should commission research on how consumers would feel about access to their smart meter data for a range of different public interest purposes.

6. Possible routes to data for a public interest purpose – sources of input data and the role of the trusted processor

Sources of input data

Looking at potential sources for input data, in Stimulus Paper 7 we considered the various options (suppliers, DNOs, settlement and other bodies) against a set of criteria including availability of data in the short and long term and complexity (eg in terms of the number of parties involved).

Short term options

In the short term, our conclusion was that the only option which would cover all customers for gas and electricity would be to collect input consumption data from suppliers, as BEIS do now for annual consumption using their Statistics of Trade Act 1947 powers. Once the smart meter rollout is complete suppliers should have more accurate consumption data on all households, albeit for some customers who opt out of providing detailed data they may have only monthly data (which would still be an improvement on current annual data and would provide evidence on seasonal patterns of use).

The challenge is that there are a large number of suppliers, with issues around change of supplier as well as potential future trends such as the possibility of having multiple suppliers per customer (eg if someone else provides the electricity for the customer's EV as part of a leasing package). This makes data collection through suppliers relatively complex.

Initial feedback from suppliers is that they recognise there is a role they could play in providing such data and, if legally required to provide the data (to avoid any GDPR risks), could potentially accept that responsibility. As now this may be discharged through their agents[10], but suppliers remain the data controllers from a GDPR perspective. Suppliers indicated they would expect to have their costs covered and would want a level playing field (in terms of all suppliers being required to participate). Timing would also be a key consideration e.g. waiting until after enrolment by the DCC of all SMETS1 meters to simplify the process and avoid wasted effort.

[10] Gas data is provided by Xoserve. Electricity consumption data is provided by each supplier's 'data collector' with address-MPAN matching provided by Gemserve

Longer term options

Looking to the future, electricity distribution networks (DNOs) could become a potential source of electricity consumption or other smart meter data given that we understand they have now all submitted privacy plans to Ofgem, or will be doing so shortly, to enable them to start collecting half-hourly data which they would then aggregate or anonymise for their own purpose. There is however a concern that DNOs are all adopting different approaches which from a data stand-point might make it harder to develop a whole-systems view – albeit in terms of complexity it should prove simpler than engaging with a far larger number of suppliers.

Recommendation *(keeping long term options open)* – Within the terms of their privacy plans, **DNOs** should take steps to work collaboratively on processes for collection and storage of electricity meter-data in standardised formats to facilitate potential future use of that data at a whole systems level.

Another potential source of input data on electricity could be the settlement process, given Ofgem's plans to move to 'market wide' half-hourly settlement. Drawing on the PIAG discussions Sustainability First and CSE responded to Ofgem's consultation on access to data for half-hourly settlement arguing that access to half-hourly consumption data should be mandated for settlement to prevent future cost-distortions in the electricity system and also noting the wider public-interest uses that potentially could be facilitated for the long-run. Ofgem have now decided to move beyond the current 'opt-in' arrangements for allowing suppliers access to half-hourly customer consumption data. Instead, they will introduce a customer 'opt-out' for data for settlement. From a PIAG stand-point, a customer 'opt-out' could eventually limit the potential usefulness of the electricity settlement system as a comprehensive data source for the future, although Ofgem has signalled that data-access arrangements will be kept under review.

Ofgem and Elexon have also been consulting on the Target Operating Model which sets out how in practice the data would be collected and fed into settlement. The final decisions on this will be important in terms of what information Elexon (as the settlement body) and ElectraLink (as the Data Transfer Network provider) might hold and how, including how data might eventually become available for public interest purposes.

Recommendation *(long term: keeping options open)* – in considering options for development of settlement and other system reforms for market purposes **Ofgem** should also take into account the long-run opportunities to improve the availability of data for public interest purposes.

For gas the options are more limited given that gas distribution networks have no plans at present to collect smart meter data. Equally while the gas settlement arrangements can handle daily reads there is currently no incentive on suppliers to submit these (and cash flow impacts can discourage them from so doing). However, this could change over time. Given the enormous challenge of heat de-carbonisation there would seem to be real value in having improved data around gas usage and a potential role in the long-run for gas distribution networks in facilitating this.

Recommendation *(long term: keeping options open)* – **BEIS** should work with **gas distribution networks, Ofgem** and others to develop a clearer view of how gas smart meter data could be expected to deliver system benefits (eg supporting assessment of options for heat de-carbonisation) and the potential role in the long-run of the gas distribution networks in that.

Looking to the longer term there are clearly a much wider range of options that could be considered and we are aware from our assessment of the options that other parties could bring particular capabilities and strengths in supporting the process.

Recommendation *(long term: keeping options open)* **- Other parties** - ONS, Energy Systems Catapult, Smart DCC, the settlement bodies (Elexon and Xoserve), ElectraLink, energy retailers and Smart Energy GB - should all actively consider what future role their organisations might eventually play, if any, in enabling access to smart meter data for a regulated or for a public interest purpose.

The trusted processor role

In considering the options for a trusted processor, to process individual household-level consumption data and produce the outputs, an obvious candidate is the Office for National Statistics (ONS) as it already fulfils that role in other sectors. It also has access to other household-level data which could be linked with smart meter data before then being aggregated or anonymised. The ONS could use its powers under the DEA to collect data from suppliers, or their agents, for statistical and research purposes (where suppliers already hold that data). Whether ONS would be in a position to take on that role will depend on their current priorities and resources.

Alternatively, as suggested above, BEIS could take on a trusted processor role in the short-term (or commission ONS to do so on its behalf), building on what they already do, in terms of collecting annual consumption data at a household level. This data is currently used to create the NEED database[11] which provides both a statistical reporting service (with linked socio-demographic and building data) and also a research database for accredited researchers. However, compared with ONS, BEIS has less access to other household-level data which would limit the range of output datasets that could be created for public interest purposes.

ElectraLink's Energy Market Data Hub offers another potential model of a trusted processor relying on governance through industry agreements (the Data Transfer Service Agreement) with Ofgem oversight. ElectraLink provides aggregated and anonymised data to industry players and to Ofgem itself, according to a set of governance rules which rely on the "legitimate purpose" gateway in GDPR, with different levels of access dependent on who the party is. They have also been able to link pseudonymised data to other publicly available demographic data in a project for WPD. At present the data that ElectraLink has access to relates primarily to switching and meter installations but they do also have access to certain consumption data feeding into settlement.

[11] National Energy Efficiency Data Framework. BEIS.

Short to medium term solution

As a near term solution we can see no legislative barrier to BEIS or ONS collecting data from energy suppliers (as BEIS do now but on a more granular basis). However, in order to progress this work it is important to be clear which of BEIS or ONS would take a lead and how the data would subsequently be processed to create the data outputs required for the public interest use cases

Recommendation *(short-medium term: taking forward improved data access)* – **BEIS** and **ONS** to consider where responsibility should sit between them for developing smart meter data collection under existing legislative powers.

Longer term solutions

In the long run, as noted above there are a range of options for how comprehensive smart meter data for public interest purposes might be accessed. In addition to the networks and settlement bodies, other parties (e.g. National Grid ESO, Smart DCC or ONS) could potentially be given a formal role in this space. However, a generally accepted principle – being cited by the Energy Data Taskforce for example - is that data should be 'collected once and used often'. This may point to the need for more fundamental thinking around any long-term arrangements for access to smart-meter data - and industry data more widely. Which route offers the best long-term solution will depend on wider industry developments such as in relation to settlement.

It is also clear that most of the longer-term options would need legislative change. The specific changes required would need further consideration but could include:

- For **DNOs** placing a regulated duty on them to pass the data to ONS. Although ONS can collect data from private companies, under the terms of its privacy plan WPD can only hold the half-hourly data on a transitory basis before aggregating / anonymising it. The DNOs might therefore need a regulated duty to provide data into government to allow them to collect and hold the data under the DAPF for long enough to enable it to be accessed by the ONS (or other trusted processor).
- For electricity **settlement** there are still questions around whether half-hourly settlement might ultimately become fully 'market wide' and how the data will be held. Implementing this would need legislative change as part of the wider half-hourly settlement programme but would then facilitate access to that data by ONS (or other trusted processor). For gas settlement the changes required would be about improving the granularity of data held by Xoserve.
- If **another party** were to play the role of providing the input data (e.g. ONS collecting data directly from meters) then that would be likely to require changes to the DAPF and potentially also the DEA, if the ONS's role were being extended. Similarly changes to Smart DCC's role to facilitate any of these developments would require changes to their licence.

Recommendation (*long term: keeping options open*) – As the regulatory framework develops, policy makers in **BEIS and Ofgem** should identify what these changes mean for access to smart meter data

for a public interest purpose and should reflect this in the regulatory framework to provide a potential legal route for access to the data.

7. The UCL Smart Energy Research Lab

UCL, one of the funders of the PIAG project, are leading a consortium to develop a Smart Energy Research Lab (SERL)[12] aimed at utilising smart meter data to enable scientific research in the public interest. They are proposing to recruit around 10,000 consumers and, with consent secured from each of them individually, to collect half-hourly smart meter data via Smart DCC. This data could then be matched with other socio-demographic data and will be made available to accredited UK academic researchers via a robust governance framework with oversight by an independent data governance board, that mirrors the principles set out in section 2.

SERL is clearly a welcome development that can provide a valuable tool to policy makers who can commission academics to carry out research on their behalf.

However, we do not believe this fulfils the requirements of our research / modelling use case in that:

- Identifiable personal data would be available only to accredited UK academic researchers;
- By requiring consent there is a risk of response bias and that the data may not be fully representative of the population (although SERL will attempt to understand and minimise any impact of response bias);
- Even if the sample chosen is representative in terms of socio-demographic and other characteristics there is arguably no way to tell if it is representative of consumption patterns without a better understanding of the consumption patterns of the population at large, given that individual profiles are known to vary quite significantly[13];
- Given the sample size it would not be possible to use the data to look at specific regional or local issues as required for use-cases associated with local energy planning, for example.

Thus, while we fully support the work of the UCL Smart Energy Research Lab, we continue to believe that there is also a need for a broader capability such as might be provided through the routes set out in section 6.

In the meantime, we would also encourage UCL to explore whether there is potential for non-academic partners to access at least subsets of the data or statistical outputs that could be helpful in building broader understanding around energy usage patterns and enabling a wider set of stakeholders to contribute to public policy debates. Even provision of summary statistics by socio-demographic group would be of huge value to Ofgem and those seeking to engage in the debate around distributional impacts of charging reforms for example.

[12] previously the Smart Meter Research Portal
[13] Grid Edge Policy "Distributional Impacts of a move to Half-Hourly Settlement" - link

Considering the analogy with the ONS, the requirements for access to the most sensitive ONS data (controlled data) is that researchers must be accredited but do not have to be academics. Safeguarded data has less onerous requirements (registration and special conditions for download of certain datasets), whilst there is a growing range of open data, which is fully anonymised. This could provide a model for access to the UCL Smart Energy Research Lab data.

Recommendation *(immediate: making best use of existing data sources)* **– UCL** and **BEIS** should consider how aggregated or anonymised outputs from the UCL Smart Energy Research Lab could be put to wider use outside the academic community to support public interest purposes including public policy making.

One specific opportunity that has been highlighted in the context of the SERL is the potential to link together smart meter data with the English Housing Survey. This would require an additional layer of consents which may be problematic for historical data but would be of significant interest to MHCLG.

Recommendation (*immediate*: *making best use of existing data sources*) – BEIS and MHCLG should explore how smart meter data could be collected alongside the English Housing Survey, drawing on ONS experience as necessary.

Conclusion 2:

Government should draw on existing arrangements used in other sectors to enable access to smart meter data for a public interest purpose while protecting privacy

- In considering the privacy implications there is a need to distinguish the ***inputs*** (which may raise privacy issues) from the ***outputs*** (which do not, because they will comprise only sufficiently aggregated or anonymised data);
- The role of the ***trusted processor*** adopted in other sectors can bridge that gap;
- Existing principles under the Digital Economy Act for data handling by a trusted processor should be considered adequate for addressing any privacy concerns around smart meter data;
- This focus on secure handling of the data means that there does not need to be a trade-off between respecting and protecting consumer privacy and using data to serve the public interest;
- There are incremental actions that can be taken now under existing legislation to provide improved data and these should be taken forward.

8. Principles for policy makers

In considering how best to move forward on access to smart meter data for a public interest purpose, we believe responsibility sits with policy makers to determine where the public interest lies.

In developing the Data Access and Privacy Framework (DAPF), and in line with guidance from the EU Commission at the time, the principle was established that customers should have control over who has access to their smart meter data except where that data is needed to discharge a regulated duty. Implicit in that principle is the idea that there are certain data uses where there is a wider public interest at stake on which government and / or the regulator would decide where the balance of interest lies.

For example, network companies can collect half-hourly consumption data without consent for the purpose of complying with licence and statutory duties such as the duty to maintain an economic and efficient network. To ensure they are taking a proportionate approach in what they collect they have to aggregate or anonymise the data as far as practical, with Ofgem the arbiter of whether network privacy plans achieve that right balance.

Following the same principle, should Ofgem consider that full 'market wide' half-hourly settlement was in the wider public interest, and that it was proportionate to do so, then the DAPF licence conditions could be amended to permit half-hourly consumption data to be collected for that purpose, and a new regulated duty placed on suppliers to provide half-hourly data into settlement.

This principle is also reflected in GDPR where 'consent' is not the only basis for processing data (including accessing and storing data). Under GDPR, legitimate grounds for processing data are that it is necessary for compliance with a legal obligation or for the performance of a task carried out in the public interest (and which has a clear basis in law).

An example of how this then applies outside the energy sector is the legal obligation that sits on ONS to collect data for research and statistical purposes, as discussed in section 2 above.

In line with this broad principle, where smart meter data is required for other public interest purposes such as public policy making, we do not believe that individual customer consent should be a necessary requirement.

The question of proportionality in this case is essentially around whether a comprehensive dataset is needed - or whether the same benefits could be delivered in a less intrusive way. In our view the public interest use-cases we have considered through PIAG will, in the end, require a comprehensive dataset. We are aware that AI and machine learning enable more to be done with profiles which may

be sufficient for wider system management. However, for the use cases we have considered:

- In allowing customer opt-out there are risks that the dataset then ceases to be representative (if e.g. those with particularly peaky load decide to opt out because of concerns about the risk of penal pricing);
- Facilitating local energy system plans requires a level of spatial granularity in the data that can only be achieved with a comprehensive dataset;
- Understanding distributional impacts requires a focus on variation in individual consumption patterns. These vary considerably between households - even if *on average* the patterns are similar across broad socio-economic groups.

The underlying rationale for the DAPF principle or the GDPR gateways is that there is a collective public benefit from the particular body having access to the data which would be undermined should it depend on customers giving consent. In our view this applies equally to the public-interest use-cases explored so far in PIAG where enabling customers to opt-out of providing data would reduce the benefit to society as a whole.

Moreover, through our review of the relevant consumer research in this area - and the expert roundtable conducted for PIAG by Ipsos MORI - it is clear that this is a difficult area on which to ask individual customers to provide an informed view. This is particularly so, given the need to understand the industry structure, the potential public-interest uses of the data and protections that already exist. We do believe that consumers can engage in complex issues given enough time for a proper deliberative process, and we would encourage further research to be done in this area. However, it is not fair or reasonable to ask individual consumers to form a judgment on whether or not to consent to the use of their data for wider public interest purposes absent even a preliminary understanding. In general, consumers seemed to be looking to government or the regulator to ensure that their interests were protected in this area.

Our conclusion is therefore that it should be for policy-makers to take the lead on coming to a decision on where the public interest lies and the onus should not be placed on consumers through expecting them to consent to the use of their usage-data for a public interest purpose.

Our thinking is that, within existing remits, it should be for government, together with the regulator, to start to identify broad use-cases where access to smart meter data would serve a demonstrable public-interest purpose. This would not necessarily involve government deciding on individual requests for access to data. However, if desired, another agency could be charged with testing the merits of individual use-cases, within a framework established by or agreed with government.

As well as potential privacy concerns, part of the thinking behind the DAPF was that, where companies would stand to benefit from access to smart meter data, they should share those benefits with customers, creating an incentive for them to participate (as for example with Tesco Clubcard). In the case of access to smart meter data for public interest purposes this issue does not arise. Customers overall will stand to benefit from public interest uses of their anonymised or aggregated data, albeit in some cases indirectly as citizens rather than directly as individual consumers.

9. The need for timely action

We have identified above how in the short-run the data that is available to policy makers and others involved in the public policy process could be improved simply by using the existing data-collection powers and existing arrangements by which BEIS currently collect annual energy consumption data from suppliers. Improving the granularity of the current data – even just to collect monthly data as it becomes available or a sample of half-hourly data – would lead to a step-change improvement in the quality and timeliness of the energy usage data that is currently available to government, the regulator and other public policy-makers.

BEIS have acknowledged that the rollout of smart meters should allow more accurate annual consumption figures to be obtained (recognising that current data includes estimated reads) and exploring the practicalities of that with suppliers might highlight opportunities to go further.

Through the PIAG use-cases and the brief public-interest examples outlined in section 3 we have highlighted the real benefits that better data could bring and how a failure to keep-up with wider industry and societal shifts risks leaving both BEIS and Ofgem in the dark, rooted in yesterday's world, as they look to navigate through the energy transition. Existing market actors and new entrants are already making decisions based on availability of this data. The window of opportunity for BEIS and Ofgem to get a suitable framework in place to ensure they also have access to necessary data may be narrowing. Ofgem's action to build its data capabilities, noted in section 1, is a timely and essential first step.

While the smart meter rollout still has some way to go to completion it will take time to put arrangements in place for collection of more granular smart-meter data for a public-interest purpose and doors may unintentionally close. As such there is a clear need to start preparatory work now.

Recommendation *(short-medium term: taking forward improved data access)* – **BEIS / ONS** should open a discussion with Energy-UK and relevant central bodies about preparatory work to allow more granular data to be collected (under existing legislative provisions) as the smart-meter rollout approaches completion.

10. Smart Metering in the Public Eye

As noted, one of the things that has slightly surprised us through the PIAG process has been the limited 'pull' from BEIS in terms of obtaining access to smart meter data to support their own policy work.

We are aware that some of the concerns around doing more in this space are linked to the perceived risks of negative media and the adverse impact this could arguably have on completion of the rollout.

We are well aware that the smart meter programme has been the subject of significant negative coverage and that, according to Smart Energy GB research, privacy is currently an area of concern for around 5% of customers. However, what is also clear from Smart Energy GB's approach on building support for smart metering is that consumers are looking to be convinced that the programme delivers wider societal benefits as well as personal savings (given these can be relatively small). Smart Energy GB have termed this the 'me and we' strategy. Most recently they commissioned Delta-EE to produce a report on the wider societal benefits of smart metering which talks about the role of smart meters in supporting the transition to a more flexible, de-centralised, de-carbonised energy system, supporting innovation and new business models. While for some consumers the privacy implications in taking a smart meter could be a concern, for others the fact that the data would be used to help make informed decisions about the country's future energy supplies could perhaps be a positive.

Similar tensions have arisen in relation to discussion of smart meters being a potential tool to enable health-monitoring – for example for the elderly or for customers with dementia, enabling a care organisation to be alerted to a lack of energy usage (as a proxy for presence in the home) or uncharacteristic usage patterns (as a signal of possible problems). While this has prompted some media comment around privacy it has also been show-cased as an innovative use of the technology and a potential wider benefit of smart meters.

Smart Energy GB will continue to build its understanding more broadly of the sorts of use-cases that resonate with consumers and are encouraged to share any relevant insights with PIAG going forward.

Conclusion 3:

Decisions on the types of uses of smart meter data that are in the public interest should sit with government or the regulator and should not rely on securing the consent of individual consumers

- Existing privacy frameworks see government or the regulator determining where the public interest lies;
- The public interest benefits of smart meter data are dependent on having a comprehensive picture based on a comprehensive dataset;
- Consumers at large should stand to benefit from the use of smart meter data for public interest purposes;
- Decisions on the nature of public interest uses of smart-meter data must therefore be taken by government (or the regulator) rather than be left to individual choice;
- To inform such decisions policy makers should seek out and assess the evidence of the public interest value of the data;
- Engaging the public in debate about the use of data for public interest purposes is vital but difficult and requires carefully structured and deliberative approaches to explain the issues and understand consumer perspectives.

11. Next steps

In order to provide more evidence for BEIS and others in government on the benefits of improved energy consumption data for public policy-making, one suggestion has been a potential trial. We will continue to talk to potential partners, such as the DNOs, about what could be done via a trial in support of improved regional energy statistics. For other use-cases however, comprehensive coverage remains a key requirement.

Recommendation *(short-medium term: taking forward improved data access*) – **Sustainability First / CSE** to work with **DNOs** and other parties to examine at a city scale the granularity of data required in practice to meet the city energy-planning use-case and the benefits of having access to this level of granularity of data compared to that currently available.

More generally, Sustainability First and CSE are most grateful to PIAG members for their active support, encouragement, time, inputs and challenge throughout the 18-month PIAG process so far. We are looking now at Phase 2 and will continue to convene PIAG through to late 2020. We will build on PIAG's work to date and continue to provide high-quality thought-leadership, analysis and stakeholder engagement on the topic of access to smart meter data for a public interest purpose. Feedback from PIAG members and consistent high-level attendance at PIAG workshops shows that PIAG 'fills a vacuum' and that the PIAG forum provides real benefit. We have secured initial funding and plan a programme of PIAG workshops to build the evidence base and take the debate forward.

Specifically, the objectives of Phase 2 will be to :

- Continue to provide a valuable information-hub for PIAG members on the topic of public interest access to smart meter data and progress by the various parties in delivering on the recommendations in this Phase 1 report.
- Create a strengthened evidence-base for BEIS, the regulator and others of the additional value which the PIAG public-interest use-cases could potentially unlock. The four proposed workshops would therefore consider the use-case for one or more 'public interest' actors (for example: BEIS & other government departments; Ofgem; advisory bodies such as the CCC, NIC and ESC; devolved, regional and local government; potential users of innovation test-beds; the NGO, community energy sector and academic community).
- Contribute to the debate on the developing energy policy landscape and its digitisation, to highlight how future system and market changes enabled by smart meter data will in turn necessitate access to that data for effective oversight and regulation by government, regulators and other public interest actors.

PIAG has provided an in-depth look at a sub-set of the issues the BEIS Energy Data Taskforce has been considering. We hope that PIAG has helped point the way on some of the more strategic questions to be addressed - as well as providing a particular focus on consumer smart-meter data - which is not being considered by the Taskforce. We will continue to liaise with BEIS Energy Data Taskforce colleagues.

Recommendation (*developing the case for access)*: **Sustainability First / CSE** to work with BEIS Energy Data Taskforce colleagues to ensure their recommendations and follow-through reflect PIAG learning.

Overleaf, we provide a summary of :

- **Our conclusions** - presented as **principles for policy makers** to take into account.
- **Our recommendations** - these **focus on proposed next-steps by different actors** to help move forward the work which PIAG has begun. We look for the support of BEIS, Ofgem, the ONS and PIAG members more widely to help take forward these actions. We look forward to returning to these topics in PIAG's second phase.

PIAG Conclusions – Principles for Policy Makers

1) **Access to smart meter data for public policy purposes is essential to avoid policy makers 'flying blind' into the energy transition**
    - The smart meter rollout will deliver significant benefits in helping transform the GB energy system;
    - Regulators and policy makers will need better data if they are to oversee this more data-driven energy system, facilitated by the rollout of smart meters;
    - Smart meter data therefore has a clear public interest value to support better decision making and evaluation, in line with the broader government agenda;
    - Making anonymised granular consumption data available will also enable new sources of value and new actors to emerge.

2) **Government should draw on existing arrangements used in other sectors to enable access to smart meter data for a public interest purpose while protecting privacy**
    - In considering the privacy implications there is a need to distinguish the ***inputs*** (which may raise privacy issues) from the ***outputs*** (which do not, because they will comprise only sufficiently aggregated or anonymised data);
    - The role of the ***trusted processor*** adopted in other sectors can bridge that gap;
    - Existing principles under the Digital Economy Act for data handling by a trusted processor should be considered adequate for addressing any privacy concerns around smart meter data;
    - This focus on secure handling of the data means that there does not need to be a trade-off between respecting and protecting consumer privacy and using data to serve the public interest;
    - There are incremental actions that can be taken now under existing legislation to provide improved data and these should be taken forward.

3) **Decisions on the types of uses of smart meter data that are in the public interest should sit with government or the regulator and should not rely on securing the consent of individual consumers**
    - Existing privacy frameworks see government or the regulator determining where the public interest lies;
    - The public interest benefits of smart meter data are dependent on having a comprehensive picture based on a comprehensive dataset;
    - Consumers at large should stand to benefit from the use of smart meter data for public interest purposes;
    - Decisions on the nature of public interest uses of smart-meter data must therefore be taken by government (or the regulator) rather than be left to individual choice;
    - To inform such decisions policy makers should seek out and assess the evidence of the public interest value of the data;
    - Engaging the public in debate about the use of data for public interest purposes is vital but difficult and requires carefully structured and deliberative approaches to explain the issues and understand consumer perspectives.

Summary of PIAG recommendations on access to smart meter data for a public interest purpose

Developing the case for access

BEIS and Ofgem should consider the data that they will need for effective oversight of an increasingly data-driven sector - for market monitoring and for policy design and evaluation, including understanding distributional impacts.

In addition to gas and electricity consumption data, **all parties** should reflect on the potential for other smart meter data to serve a public interest purpose.

BEIS should consider the role that improved use of smart meter consumption and other data could play in discharging the expectations from wider government on use of administrative data for better statistics.

PIAG members (e.g. **Committee on Climate Change, National Infrastructure Commission, Scottish and Welsh Governments** and the **Greater London Authority**) to help articulate in more detail their requirements and the benefits that could be delivered through improved access to smart meter data.

BEIS or Citizens Advice (and/or other PIAG members) should commission research on how consumers would feel about access to their smart meter data for a range of different public interest purposes.

Sustainability First / CSE Sustainability First / CSE to work with BEIS Energy Data Taskforce colleagues to ensure their recommendations and follow-through reflect PIAG learning.

Immediate: making best use of existing data sources

Central bodies (**Smart DCC, XOServe, Elexon and ElectraLink**) should identify relevant data that they hold that could help meet the PIAG public-interest use cases now, both to provide immediate solutions and to help inform decisions on the way forward.

UCL and BEIS should consider how aggregated or anonymised outputs from the UCL Smart Energy Research Lab could be put to wider use outside the academic community to support public interest purposes including public policy making.

BEIS and MHCLG should explore how smart meter data could be collected alongside the English Housing Survey, drawing on ONS experience as necessary.

Short-to-medium term: taking forward improved data access

BEIS and ONS to consider where responsibility should sit between them for developing smart meter data collection under existing legislative powers.

BEIS / ONS should open a discussion with Energy-UK and relevant central bodies about preparatory work to allow more granular data to be collected (under existing legislative provisions) as the smart meter rollout approaches completion.

Sustainability First / CSE to work with **DNOs** and other parties to examine at a city scale the granularity of data required in practice to meet the city energy planning use case and the benefits of having access to this level of granularity of data compared to that currently available.

Long-term: keeping options open

Within the terms of their privacy plans, **DNOs** should take steps to work collaboratively on processes for collection and storage of electricity meter-data in standardised formats to facilitate potential future use of that data at a whole systems level.

In considering options for development of settlement and other system reforms for market purposes **Ofgem** should also take into account the long run opportunities to improve the availability of data for public interest purposes.

BEIS should work with **gas distribution networks, Ofgem** and others to develop a clearer view of how gas smart meter data could be expected to deliver system benefits (eg supporting assessment of options for heat de-carbonisation) and the potential role in the long-run of the gas distribution networks in that.

Other parties - ONS, Energy Systems Catapult, Smart DCC, the settlement bodies (Elexon and Xoserve), ElectraLink, energy retailers and Smart Energy GB - should all actively consider what future role their organisations might eventually play, if any, in enabling access to smart meter data for a regulated or for a public interest purpose.

As the regulatory framework develops, policy makers in **BEIS and Ofgem** should identify what these changes entail for access to smart meter data for a public interest purpose and reflect this in the regulatory framework to provide a potential legal route for access to the data.

Wider smart meter framework

BEIS and **Smart DCC** should continue to monitor the ease with which third parties can register as DCC users and access smart meter data (with the consumer's consent) given that certain potential public interest related uses could be delivered through that route.

BEIS should monitor the deployment and use of CADs and what data is being collected on what terms - and if necessary be ready to act to improve the transparency of the arrangements to consumers.

Citizens Advice should take forward their Data Dashboard concept to a next stage to provide consumers with transparency over who has access to their data.

Sustainability First & CSE
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