Smart Meter Data and Public Interest Issues – The Sub-National Perspective

Discussion Paper 2

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Foreword

Much discussion about smart energy data is understandably focused on its likely use in consumer feedback, in enabling the future smart grid, and in the potential for commercial applications, but it could have wider uses. In summer 2015, TEDDINET*, the Centre for Sustainable Energy and Sustainability First launched a joint 'research challenge' to understand how future household smart-meter energy data might be deployed to serve the public interest. We jointly commissioned two university researchers to consider these questions and for each to write a short discussion paper, one on the national perspective and the other on sub-national issues, for publication and debate.

The sponsors have provided assistance and guidance, and financial support. But the papers and the views expressed in them are those of the researchers concerned.

Following an invited workshop with interested parties, the papers will be published on the TEDDINET, CSE and Sustainability First websites:

https://teddinet.org/

https://www.cse.org.uk/

http://www.sustainabilityfirst.org.uk/

* TEDDINET – Transforming Energy Demand through Digital Innovation NETwork.

TEDDINET is an academic research network addressing the challenges of transforming energy demand in our buildings, as a key component of the transition to an affordable, low carbon energy system. Funded by the UK EPSRC (Engineering and Physical Sciences Research Council), TEDDINET's primary purpose is to share knowledge and enhance the impact of existing research.

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1. Executive Summary

The installation of nearly 50 million domestic gas and electricity meters by the end of 2020 will provide an unprecedented volume and granularity of energy consumption data. Whilst the potential benefits of this data to individual consumers and the broader energy system have been well documented, the potential for smart meter data to improve policymaking and to support other initiatives in the public interest has been underexplored. The complexity of defining the public interest is recognised; however, a working definition is adopted of the public interest as the combined interests of all consumers, citizens, the environment and investors.

This paper – one of two companion papers looking at these issues – aims to consider the public interest opportunities smart meter data may present at a sub-national scale. The other paper in this series looks at these issues from a national perspective (2),(5). The sub-national scale is specifically examined as there is increasing interest in the role of local energy services in the energy transition and it is likely that this scale will offer some unique benefits and encounter some unique barriers.

A number of sub-national public interest uses of smart meter data may be possible within the current arrangements; however, the viability of some of these uses is not always clear at this stage. Despite this, there is clear potential for smart meter data to support the development of the smart city agenda, improve the targeting and monitoring of local energy programmes, support social housing and health services, provide new opportunities for community energy and other local approaches to balancing supply and demand, and for local areas to input into national research programmes.

The current arrangements for the access and use of smart meter data present a number of challenges for these sub-national public interest uses. In particular the complexity, costs and uncertainty relating to DCC and SEC arrangements may act as a barrier for some local actors. More specifically, there may be issues relating to data sharing, aggregation and disaggregation of data at a local scale.

Based on the analysis in this paper, a number of recommendations and priorities for future work are proposed. This includes recommendations on incorporating sub-national public interest uses of smart energy data into existing work on innovation and governance, ensuring that sub-national public interest actors are engaged prior to the 2018 Data Access and Privacy review, development to code governance, development of support and resources for sub-national actors in relation to data sharing, privacy, analytics and disaggregation, and methods to facilitate local, third party access to aggregated

smart meter data, including exploring the potential for a national (or a series of local) public interest smart data hub(s).

It is hoped that this paper, together with the companion report, act to support greater discussion of the potential public interest benefits of smart meter data and how these benefits can be realised at both a national and sub-national level.

2. Introduction

In order to better connect people with their energy consumption and facilitate Britain's transition to a low-carbon economy the Government has required energy suppliers to take all reasonable steps to install nearly 50 million gas and electricity smart meters in domestic properties by the end of 2020. These meters will provide an unprecedented volume and granularity of energy consumption data[1], both directly from smart meters but potentially also from smart appliances and apps connected to the smart meter.

This data will provide many opportunities for energy services and existing and new businesses are exploring how they might offer commercial services related to this data. However, consumers are paying for the roll out of smart meters (through their energy bills) and it is important to ensure that sufficient consideration is given to ensuring that the public interest benefits of domestic smart meter data are realised. To date, assessment of the costs and benefits of smart meters has generally focussed on reduced costs to serve (avoided meter reads, improved debt handling, reduced theft) and reduced energy use from better energy feedback and tariff structures. Whilst these benefits are important, the existence of domestic smart meter data also has the potential to dramatically improve the evidence base underpinning policy and regulatory decision-making and impact on the delivery of energy services at both a national and sub-national level.

Defining the public interest is complex, with different stakeholder groups often holding differing views on the most appropriate definition and the timescales over which public interest should be judged. This report adopts the definition of Sustainability First's New-Pin Project[2] which defines the public interest as the combined interests of all consumers, citizens, the environment and investors (1).

Within this definition improved policy and decision-making in relation to energy have clear public interest benefits at both the national and local scale; however, a number of other uses of smart meter data may also have public interest benefits, as discussed in section 5. These potential uses include community, social enterprise, public sector and other not-for-profit uses of smart meter data which operate with public interest objectives. In addition, there are clear public interest benefits in promoting innovation and new entrants in the energy system, although these models may operate on a commercial basis. The difficulties in defining public interest uses of smart meter data are recognised and this paper aims to stimulate further discussion of which uses should be defined as public interest.

[1] Access to smart meter data will require consumer consent (except for regulated purposes).
[2] New-Pin (New Energy and Water Public Interest Network), www.sustainabilityfirst.org.uk/index.php/new-pin

This paper is one of two companion papers commissioned by CSE and Sustainability First[3] to explore the potential public benefit opportunities and risks posed by smart meter data and to review how these issues are being considered by policymakers, the regulator and other parties as the smart metering agenda progresses. Both documents focus on domestic electricity and gas smart meter data and aim to act as discussion documents and to provide practical recommendations for a range of organisations with an interest in the potential public interest benefits of smart meter data.

Paper one in this series considers the public interest issues and opportunities of smart meter data at a national scale (2). This paper (paper 2) is focussed on how smart energy data may additionally serve the public interest from a sub-national perspective. While these papers are linked and many of the issues cut across the national and sub-national scales, a distinction has been made to recognise that there are also particular issues relating to different scales of uses of smart energy data. In particular, there is increasing interest in the role of sub-national agencies in future energy systems with both Ofgem and DECC acknowledging the importance of local and community energy models in their non-traditional business model work and Community Energy Strategy (3, 4). In this paper, sub-national public interest actors include local authorities, housing associations, health providers, community groups and other not-for-profit locally active groups.

Additionally, there is a great deal of activity looking more broadly at the role of energy in the 'smart city' agenda, increasing interest in sub-national supply and other new business models, and strong evidence that locally based organisations are trusted intermediaries to engage customers in smart meter data. All of these factors mean that it is important to ensure that the sub-national public interest issues of smart meter data are fully considered and this discussion paper aims to support this process. The focus of this report is specifically on smart *meter* data (rather than broader approaches to smart energy systems when combined with smart appliances and a smart grid); however, many of the issues and opportunities rely on both access to smart meter data and the development of smart energy systems, and therefore elements of smart energy systems will be referred to throughout the paper.

The paper is structured as follows: section 3 briefly summarises existing sources and uses of sub-national domestic energy consumption data. Section 4 outlines how smart meter data differs from existing energy consumption data sources and summarises current arrangements for data access and

[3] And funded as a TEDDINET Research Challenge, www.teddinet.org/

privacy. Section 5 details potential sub-national public interest uses of smart meter data. Section 6 suggests how current arrangements are likely to impact on these uses and makes recommendations for development. Section 7 summarises these recommendations and section 8 concludes.

3. Existing sub-national domestic energy data sources and uses

As discussed in the technical annex to the companion paper to this report (5) a range of existing data sets provide information on domestic energy consumption or are relevant to data on domestic energy consumption. Whilst some of these data sets relate to specific trials or are only available in aggregate, a number are relevant to sub-national public interest uses of energy consumption data, as discussed in this section.

3.1 GB sub-national statistics – Electricity and Gas

DECC provides annual sub-national estimates of domestic and non-domestic electricity and gas consumption for England, Wales and Scotland based on meter point data. Data from over 27 million domestic electricity meters and over 23 million domestic gas meters are aggregated and available at Region, Local Authority, Middle Layer Super Output Area (MSOA), and Lower Level Super Output Area (LSOA). For 2013 (the latest year available) experimental statistics are available at postcode level (6). Economy7 consumption is included in the electricity data and estimates of off-grid households are included in the gas data.

This data provides a degree of spatial detail on energy consumption (the average number of households in a LSOA is 700 and the average number of households in a postcode is 15); however, only annualised consumption is available.

3.2 National Energy Efficiency Data Framework (NEED)

DECC's National Energy Efficiency Data Framework (NEED) matches meter point gas and electricity consumption data (sub-national energy consumption statistics) with a number of other property level data sources including:

- Records of energy efficiency measures from the Homes Energy Efficiency Database (HEED), including Green Deal and ECO data held by DECC.
- Property attribute data from the Valuation Office Agency (VOA) and Energy Performance Certificates (EPCs)
- Microgeneration install data from the Central Feed-in Tariff Register and Renewable Heat Incentive (RHI) Register
- Household characteristics data from Experian (7).

In addition to these main data sources there are a number of other indicators assigned to the property based on its geographic location. For example, an index of multiple deprivation and a fuel poverty indicator are assigned based on the Lower Layer Super Output Area (LSOA).

An anonymised public use NEED dataset is available via DECC (consisting of a sample of 50,000 homes) and an end-user licence version (consisting of a representative sample of 4 million homes) is available via the UK Data Service.

Whilst NEED offers a significant and well used resource on energy consumption and priority areas for energy efficiency interventions, the annualised nature of the consumption data and the use of a representative sample of UK households (4 million properties) limits its use. There is significant potential for NEED to be developed with smart meter data (as discussed in the companion paper to this report).

3.3 The Energy Demand Research Project (EDRP)

The EDRP was a suite of large scale trials across Great Britain between 2007 and 2010 involving over 50,000 households. The project trialled a range of energy consumption feedback mechanisms to improve understanding of how consumers react to improved information about their energy consumption over the long term (8). An anonymised dataset from the trials has been made available via the UK Data Service, consisting of 14,621 households, 246 million gas meter readings and 413 million electricity meter readings. In addition to half hourly gas and electricity smart meter data, a third dataset contains geographic data (Government Office Region and Local Authority) and ACORN segmentation data which can be linked to the consumption data via an anonymised household ID (9).

3.4 Additional locally held data

Many local areas have a good understanding of priority areas for fuel poverty and energy efficiency campaigns. However this tends to be limited to an understanding of high priority areas (in terms of building type and vulnerability) and the extent of already installed measures. To date, apart from a small number of trials, there has been little data available on specific energy use in different settings and the most appropriate routes to influencing behaviour (notwithstanding data from trials such as those funded by the Low Carbon Networks Fund).

In addition to the external data sources discussed above[4], many local authorities also have direct access to other data relevant for energy programmes, particularly in relation to housing type, measures installed, benefits data and information on council owned stock. Local energy efficiency survey data and the outputs of door-to-door work may also be held. Other local partners may also hold relevant data including the NHS (data on vulnerable and fuel poor residents); third sector organisations such as Age UK (data on elderly residents); and social landlords (10).

3.5 UK Data Service

To facilitate the use of the data sources discussed above, the UK Data Service provides a range of data support services which are potentially relevant to sub-national uses of smart meter data (11). The Service supports policymakers and researchers with social and economic data and funds several research centres, including a number relevant to sub-national approaches to energy policy. Relevant research centres include:

- ESRC Business and Local Government Data Research Centre (BLG).
  The BLG Data Research Centre aims to help companies, local authorities and researchers use data more effectively. Although primarily focussed on making local authority and commercial data available to academics, they also offer data services including a data catalogue, training, a secure data storage facility and expertise and support in using those data. The BLG is also working with the Local Government Association (LGA) to support local authorities to identify how they can most effectively use data analytics, and bring it together with academic research.

- ESRC Urban Big Data Centre
  Set up by ESRC to address the social, economic and environmental challenges facing cities the Urban Big Data Centre brings together researchers and works on linking and analysing large amounts of multi-sectoral urban big data. The Centre provides an open data portal and support to enable users to access and get the most from the data available. They also offer data storage and access services relating to safeguarded and controlled data.

- ESRC Consumer Data Research Centre (CDRC)

[4] And discussed in more detail in the technical annex to paper 1.

The CDRC provides access for researchers to consumer-related data including energy consumption meter data. They provide a data catalogue as well as services relating to open, safeguarded and secure data.

3.6 How is existing data currently used at the sub-national scale?

Local authorities, housing associations, community groups and other sub-national public interest actors, such as NGOs and social enterprises, commonly use both nationally coordinated data (such as DECC domestic energy consumption data, HEED/NEED) and locally held data (on tenure, housing type, deprivation, income and so on) to support the targeting of programmes and the development of Affordable Warmth Strategies and Local Fuel Poverty Strategies. Often these locally based organisations work in partnership to deliver energy advice services and other energy efficiency support and programmes.

These partnership-based approaches are likely to become more important as local finances continue to be constrained in the future and several major government grant schemes for energy efficiency come to an end. Indeed many organisations have identified that the most effective fuel poverty solutions are those that are tailored to local conditions and approaches (12), and national programmes have been criticised as struggling to reach those most at risk (13).

Whilst local, multi-partner approaches to energy efficiency and fuel poverty are well established, these approaches often require the use of multiple data sets and the linking of consumption data with other information. This can be challenging as the anonymization and aggregation of many current energy consumption data sets makes it difficult to link data sets with other, potentially household specific, data.

In addition there is evidence that data sharing can be problematic with some local authorities interpreting that the Data Protection Act 1998 does not allow them to utilise data from council tax or benefit records in order to inform householders of energy efficiency offers and entitlements. Other councils, however, believe that they are allowed to use name and address information from council records for legitimate purposes.

In this section, sources of existing local scale energy consumption (and related) data have been briefly summarised (see the technical annex for more detail) and key issues identified. These issues can be summarised as:

- Lack of temporal resolution in sub-national data – data tends to be annualised only.
- Aggregated nature of much data – the lowest spatial disaggregation of data tends to be at LSOA level. Where data is available at a household level (such as through trials), it tends to be anonymised.
- Data sharing – there are existing problems in sharing energy consumption and related data between agencies and differing interpretations of the Data Protection Act 1998 may prevent effective local utilisation of data (this issue is discussed further in the context of smart meter data in section 6.4).

4. What's new about smart energy data, compared to what's already out there?

This section sets out how smart meter data differs from existing energy consumption data sources and summarises the current access requirements as specified in the Data Access and Privacy Framework (DAPF) (14).

Understanding the spatial and temporal variation in energy demand is extremely important to develop an improved public policy understanding of energy consumption at both a national and local scale. Historically local areas have lacked the ability to map temporal variation in energy demand and only limited fine resolution spatial data has been available. A key benefit of smart meter data is that households will have more understanding and visibility of their energy usage. However sub-national uses of smart meter data could allow integration of spatial/temporal data with local public policy and other projects motivated by the public interest.

As outlined in the Smart Metering Equipment Technical Specifications, the smart meter itself will be capable of storing half-hourly energy consumption data. More granular (10-second, near real-time[5]) data can be displayed via the In-Home display and could also be collected and made available for the consumer to access using a Consumer Access Device that the consumer would have to obtain and connect securely to the Home Area Network. Only the consumer will be able to see this near real-time data, unless they have authorised another party to access that data (15).

There are currently no plans for any central repository of smart meter data for public interest purposes. Organisations wishing to access smart meter data will need to access the data, with individual customer consent, from the smart meter itself via the Data Communications Company (DCC) or through a consumer access device (CAD). This will limit access to the customer's electricity and gas supplier, the DNO and others with the customer's permission.

Following a consultation, the Data Access and Privacy Framework (DAPF) was published in December 2012 and details the levels of access that suppliers, network operators and third parties can have to energy consumption data from smart meters. It also establishes the purposes for which data can be collected and the choices that are available to consumers. The DAPF currently recognises that 'as technologies evolve and consumers gain confidence in their smart metering system, the Framework

[5] CADs can request 10-second information for electricity and half hourly information for gas.

may need to be updated to enable further benefits to be realised' (16). Initially the Government committed to conducting a review by June 2016 however DECC consulted on the timing of the DAPF review in March 2015, and in December 2015 published their response that, due delays in the expected date of the DCC offering services, a mid-2016 review would be severely limited in scope and usefulness and the review will therefore conclude in 2018 (16).

The current Data Access and Privacy Framework details access requirements for consumers, suppliers, DNOs and third Parties as detailed below. Access and privacy requirements are discussed in more detail in paper 1 in this series (2).

- **Consumer Access:** Easy, direct access through either the In-Home Display, the connection of Consumer Access Devices (CADs) to the Home Area Network (HAN), or by requesting information from the energy supplier.

- **Supplier access to data:** Domestic consumers will have control over how their energy consumption data is used, except where this is required for billing or for other regulated purposes. The DAPF sets out a basic framework for supplier access together with a number of exceptions. Under the basic framework suppliers will be allowed to access monthly (or less granular) energy consumption data for billing and for the purposes of fulfilling any statutory requirement or licence obligation without customer consent. In addition suppliers will be able to access daily (or less granular) energy consumption data for any purpose except marketing, provided customers have a clear opportunity to opt out. Suppliers must receive explicit (opt-in) consent from the customer in order to access half-hourly energy consumption data, or to use energy consumption data for marketing purposes.

  A number of exceptions to this basic framework have been specified allowing suppliers to access daily energy consumption data on an ad hoc basis, without customer consent, where the supplier has reasonable suspicion of theft, or for the purposes of accurate billing (such as to enable a change of tenancy, supplier or tariff) and to address customer queries. Suppliers may also access half-hourly energy consumption data for use in approved trials, with clear opportunity for the consumer to opt out.

- **Network operator access to data:** Distribution network operators will be able to access domestic customers' energy consumption data without consent for regulated purposes only. However network operators must aggregate or otherwise treat the data such that it can no longer be

associated with individual customers at individual premises, and will be required to have plans for such access approved by Ofgem. A number of uncertainties remain regarding how DNOs may wish to use data in the future, the level of granularity required and the progress for aggregation or anonymization; however, the Government has stated that it remains open to new evidence about the need for DNOs to access data from individual households in the longer term (14).

- **Third party access to data**: The term 'third party' refers to a wide range of non-licensed parties, such as energy services companies and switching sites. Suppliers wishing to provide services, such as a tariff quote, to a customer for whom they are not currently the registered supplier would also be considered to be a third party for these purposes (14). In addition many sub-national users of smart meter data (such as those discussed in section 5) would be considered to be third parties.

  There are three routes for third parties wishing to access smart meter data:

  - Firstly third parties wishing to access data remotely via the DCC must be registered as DCC Users and be Smart Energy Code (SEC) signatories. They will be required to take steps to verify that the request for third party services has come from the individual in question (although more work will be done to define the precise mechanism for verification); obtain explicit (opt-in) consent from consumers before requesting data from the DCC; and provide reminders to consumers about the data that is being collected. To ensure that these requirements are complied with, assurance arrangements will be developed by the Smart Energy Code Panel.

  - Secondly, third parties can contract with an existing DCC user in order to access data. This would involve the DCC user and third party entering into a commercial arrangement to enable data access. Under these arrangements the privacy requirements of DCC users would still apply to the third party and the third party would be required to gain individual consent to access data. As business models relating to such services are unclear (until the DCC is 'live') there are currently a number of uncertainties relating to the costs and viability of such models.

  - Thirdly, as customers have direct access to data themselves (e.g. through a CAD connected to the HAN), they can directly exchange this data with a third party outside of the arrangements detailed in the Privacy and Access Framework. Such arrangements would be governed by a contract between the consumer and third party, and third parties would be bound by relevant legislation such as the Data Protection Act (15).

Householders are already able to benefit from smarter heating controls without the need for a smart meter. These services (which at present in GB relate mostly to gas) can be accessed directly by the householder or through a third party and are not subject to the smart meter Data Access and Privacy Framework.

5. What could smart meter data be used for in the public interest?

Smart meter data could potentially be used for a wide range of sub-national public interest uses including: providing direct local public policy evidence; feeding into energy efficiency, fuel poverty and energy planning activity by local authorities, social housing providers, community groups and other social enterprises; and, facilitating the development of sub-national energy service models with a public benefit.

This section summarises some potential sub-national uses of smart meter data, including referring to emerging examples where possible.

5.1 Smart cities and local energy planning

There is a great deal of interest in the concept of 'smart cities' across the globe. Whilst 'smart city' is a somewhat contested term, it is generally taken to mean using new technologies (mainly information and communication technologies) and data to improve service delivery and address various economic, social and environmental challenges at a city scale (17). Within this context, cities are increasingly seeking to incorporate energy into broader 'smart city' agendas and strategically plan local energy systems. These approaches generally bring together many of the smart energy data uses discussed in the rest of this section to provide central, public interest focussed, coordination of smart energy data uses (and other smart data more broadly).

Many cities believe that a city-scale approach to smart energy data will provide most opportunities for the public interest benefits of the data to be realised and are currently exploring if 'the city' is a viable organising scale for the management and application of smart energy data and how this might be operationalised.

For example, the 'Bristol Smart Energy City Collaboration' is aiming for Bristol to be the UK's first smart energy city and has a vision that by 2020, 'Bristol will have a public-interest organisation coordinating the smart use, distribution and supply of heat and power across the city for the benefit of its people and businesses. The city will have the capabilities and systems to access, manage and interpret local energy supply and demand data, enabling co-ordinated city and neighbourhood-scale interventions to:

- balance heat and power demand and supply across the city in real time
- curb energy waste and reduce peak demand

- enhance the financial value of renewable heat and power generated in the city, particularly from variable sources like wind, solar and tidal
- reduce network losses and manage system constraints
- provide commercial leverage in the energy market to capture for the city, its businesses and households, the economic benefits of an optimised local energy system' (18).

5.2 Area-based energy programmes (targeting and monitoring).

Access to property-specific energy consumption data at a high level of temporal resolution provides many opportunities for improving the roll out and evaluation of energy efficiency programmes. Whilst many of these uses of data may be made by central government, national suppliers or other national agencies (such as the Energy Saving Trust), in practice energy efficiency programmes are delivered locally and local partnerships tend to be central to successful programmes. One of the difficulties in thinking about the potential for smart meter data to deliver public benefits through fuel poverty reduction is that fuel poverty is a cross-cutting issue and effective solutions will rely on bringing together public, private and third sector partners working in areas such as housing, income support, public health and energy efficiency. However, if access to smart meter data can be coordinated across these diverse partnerships, there is great potential for improved targeting of local programmes.

The mapping of high resolution energy consumption data against other sources of local data, such as housing type and occupancy, could enable better targeting of energy efficiency measures to ensure that installations are correctly matched to circumstances. In addition smart meter data can enable the evaluation of energy efficiency measures in order to determine whether installations are delivering against projected deemed savings (19). Using smart meter data to monitor and target local energy efficiency activity may be particularly important in a period of constrained public sector finances and significant cuts to many energy efficiency programmes in order to ensure that resources are allocated effectively.

Smart meter data could also support the development of innovative outreach and targeting approaches. For example, a member of staff from the Warmer Worcestershire Partnership is already placed on the mobile library service to reach those residents in rural communities who do not travel to access services. These sorts of outreach services may wish to ask residents to share their smart meter data to better tailor services. There may also be opportunities to use existing local data to identify target groups (such as the fuel poor, tenants, students or vulnerable groups) and carry out specific studies on the most effective means to engage them with energy efficiency programmes.

Finally, smart meter data is likely to provide the potential for better coordination between national and local programmes. For example smart meter data is likely to enable significant development of DECC's National Energy Efficiency Data-Framework (NEED), as discussed in paper 1 (2). This could include the development of far more accurate energy benchmarks which would identify consumption benchmarks for given building types. Local data (such as on housing characteristics) could feed into this process and also utilise these benchmarks in specific interventions with individual households or areas.

Whilst smart meter data potentially offers a range of opportunities for local, public interest organisations it also raises a number of issues including the requirement for local agencies to gain consent from individual participants. Councils have a strong track record in fostering effective partnerships on the ground (12); however, it is as yet unclear what this means for data sharing and joint working in the context of smart meter data. These issues are discussed further in section 6.4.

5.3 Management of social housing

Over 2000 Registered Social Landlords provide social housing to several hundred thousand tenants across England, Wales, Scotland and Northern Ireland (20–23). Many social landlords already operate active fuel poverty and energy efficiency programmes, often as part of local Affordable Warmth Partnerships; however smart meter data may provide additional opportunities to develop these programmes and work to protect vulnerable customers. For example, landlords may wish to offer monitoring services to vulnerable tenants which utilise smart meter data and other CAD monitoring equipment, such as temperature monitors, to alert tenants and/or support workers if a property is underheated. In addition, landlords may wish to gain customer consent to access smart meter data in order to analyse the performance of different types of property assets.

It is also significant to note that a number of social landlords have also expressed an interest in becoming energy suppliers themselves; in particular Our Power (24) has been founded by 35 housing associations and local authorities and is seeking to launch as a not-for-profit supplier in 2016.

5.4 Health

Local health providers are often key partners in fuel poverty schemes with several areas already operating referral schemes between GPs/health workers and fuel poverty schemes. However the advent of smart meter data could enable far greater integration of health and energy efficiency priorities for vulnerable groups. These approaches could include opt-in monitoring of energy

consumption in vulnerable households or could go further and seek to integrate consumption data with other monitoring devices such as internal temperatures, moisture levels and movement. CADs could also be used to transmit other health-related data and support assisted living, as discussed in paper 1 (2).

5.5 Development of community energy projects

DECC estimate that there are over 5000 community energy groups in the UK working to generate low carbon energy, co-ordinate awareness raising and energy efficiency campaigns and facilitate collective switching; and community organisations are expected to play an important role in the roll out of smart meters (3, 25).

Similar to the uses discussed in section 5.2 ('Area based energy programmes'), community groups could potentially use smart meter data to engage, target, monitor and evaluate community energy programmes, and the data could provide valuable information on 'what works' in terms of household engagement. Community energy groups also operate on the scale where it may be possible to use smart energy data to co-ordinate community energy saving competitions and explore tailoring energy advice at a household level.

In addition to these extensions to existing community energy programmes, a number of community energy schemes are interested in the potential for smart energy data to allow them to scale up their ambitions on energy efficiency, self-generation and local supply. These new models of supply are still in their early days, but several projects are due to be trialled across the country. For example, a project in Wadebridge, Cornwall has brought together Western Power Distribution (WPD), Wadebridge Renewable Energy Network (WREN), Tempus Energy and Regen SW to explore the potential for an offset connection agreement to shift local consumption to when photovoltaics (PV) are generating. The scheme links community-owned PV generation with a local 'sunshine' tariff to reduce congestion in a grid-constrained area (26).

Trials of the tariff are taking place in 2016; however, a number of challenges have already been encountered in progressing the project, including: decision-making regarding the tariff structure (e.g. static or dynamic, subsidised or cost neutral), identifying value streams for the generators and DNO, and data protection issues regarding utilising time of use consumption data. Participation in the trial has also meant that WREN has needed to develop their knowledge and expertise on data protection. Although this has delayed project development to some degree, support and legal advice from WPD and Tempus has enabled the project to progress but raises questions about the resource implications

for community groups of developing data management expertise and how learning from trials can be shared across community energy schemes.

5.6 New (local) approaches to balancing supply and demand

One of the key areas of interest in relation to smart meter data is its potential to support domestic demand side response through the provision of innovative tariffs and other incentives to reduce or shift demand. A wide range of size and type of organisations may seek to offer services related to demand side response; however, under current arrangements, there may not be sufficient incentives for new models to enter the market, as it is difficult for aggregators to collate large numbers of very small loads from individual households as potential income is small and households could risk penalties for breaching contract if load is not shifted (19, 27).

Whilst discussion of the incentives required to enable the emergence of a broader smart energy services market to emerge is outside of the scope of this paper, there is also considerable interest in the potential for reducing or shifting peak demand to be coordinated at a local scale rather than between national suppliers/aggregators and consumers. Additionally, there is particular interest from new business models (both commercial and public interest) in local approaches to balancing supply and demand, with the idea of buying their 'own power' resonating with many local energy projects and a desire to access increased revenues from 'local' supply from many small generators.

Local supply models are an emerging theme in the energy system and the public benefits of the range of possible approaches are not always clear. However many of these models operate under public benefit objectives, such as the recent launch of Robin Hood Energy (28) - a not-for-profit energy company wholly owned by Nottingham City Council; Bristol Energy (29) - similarly a municipally owned energy supply company; and the expected launch of Our Power (24) in 2016 - a not-for-profit supplier founded by a consortium of Scottish housing associations and local authorities. In addition to the growth in interest in new, locally based and not-for-profit suppliers there has been increasing focus on alternatives to full supply such as Licence Lite and White Label Agreements. This has included several local authorities entering into white label supply agreements with OVO and the GLA applying to Ofgem for a 'lite' supply licence (30, 31).

Whilst none of these models rely on access to smart meter data most have ambitions to access smart meter data to provide additional services to customers and to access new sources of revenue. For example Robin Hood Energy are offering new customers smart meters and are exploring using smart meters to deliver better tariffs for prepayment customers. Smart meter data has significant potential

to support such models but will rely on sufficient system value being created and retained locally for schemes to be viable and for the development of market rules and regulations which do not explicitly disadvantage small, local, or community based models. This may include ensuring that partnership-based supply models are accommodated in smart meter data access and privacy arrangements or that DCC and SEC arrangements are not prohibitively complex or costly for sub-national public interest users.

An example of how such new approaches to balancing local supply and demand could operate in practice is found in the Power Matching City[6] concept in Hoogkerk, Netherlands. The concept has created an integrated smart grid solution for a small number of homes in the City of Groningen based, in large part, on smart meters. Houses were equipped with small renewable energy generators, smart appliances, electric vehicles and smart meters and business models were developed and tested for new services, including demand response pricing mechanisms. The technology enables the energy retailer to operate local demand and production as a virtual power plant to help to integrate variable power sources like wind and solar with appliances reacting automatically to the incentives of the supplier and grid operator.

5.7 Collective switching campaigns

Access to smart meter data will provide an important resource to improve tariff switching and ensure consumers are on the best tariff for them. This could include power of attorney services where customers can elect to switch automatically when a more preferential tariff becomes available (32). There is likely to be significant interest from price comparison sites in offering improved switching services based on smart meter data and a range of not-for-profit collective switching campaigns, often with an emphasis on vulnerable consumers, could also utilise smart meter data.

In recent years many local authorities and locally based not-for-profit organisations (sometimes in collaboration with national 'switching specialists') have run collective switching campaigns. This includes DECC supporting 31 collective switching and purchasing schemes in 2012/13 through the 'Cheaper Energy Together' initiative. Evaluation of the scheme found that the involvement of local trusted organisations was an important factor in encouraging people to sign up, particularly those who hadn't switched before.

[6] https://www.dnvgl.com/technology-innovation/broader-view/sustainable-future/vision-stories/power-matching-city.html

Some switching campaigns may operate under public benefit objectives, delivering energy efficiency campaigns or investing revenue in energy efficiency and fuel poverty. For example, Cornwall Together[7] invested 10% of the revenue generated from each energy switch into a fund to address fuel poverty and Community Energy Direct (CED), Which? and numerous local authorities in Yorkshire and the North West of England have worked together on collective switching and behaviour change campaigns. These small organisations may wish to access smart metering data in the future to inform their services and, under the current DAPF, would need to access data as a third party, through a contract with a DCC user, or via a CAD.

5.8 Local areas feeding into national research programmes

As discussed in paper 1 there is great potential for smart meter data to inform national research programmes and to build evidence about which approaches to energy advice are most effective at helping households cut waste and spend less on energy. Local organisations have the potential to be important partners in many of these projects – providing local knowledge and acting as trusted agents – and there are particular opportunities for smart meter data to be utilised to build knowledge relating to the impact of community energy projects. Many of these projects are likely to include a wide range of partners and raise questions regarding data privacy and sharing in multi-partner projects.

[7] A collective switching partnership between the Eden Project, Cornwall Council and a number of other local partners.

6. Implications of the current arrangements for sub-national uses of data and recommendations for development.

Many of the opportunities identified above may be taken forward on a local or national basis or from a public benefit or a commercial perspective. However the issues for locally based public interest models are likely to be somewhat different from other large scale and commercial projects, particularly in relation to data access and sharing, resourcing and ensuing that the development of market rules and regulations allow sub-national public interest benefits to be realised.

Bristol's Smart City Energy Collaboration have set out the conditions that need to be met to enable sub-national smart meter data uses to be realised, across five categories of technical, social, regulatory, commercial and data (see figure 1). This demonstrates the complex number of factors that need to be realised in order for sub-national public interest smart meter data opportunities to be realised.

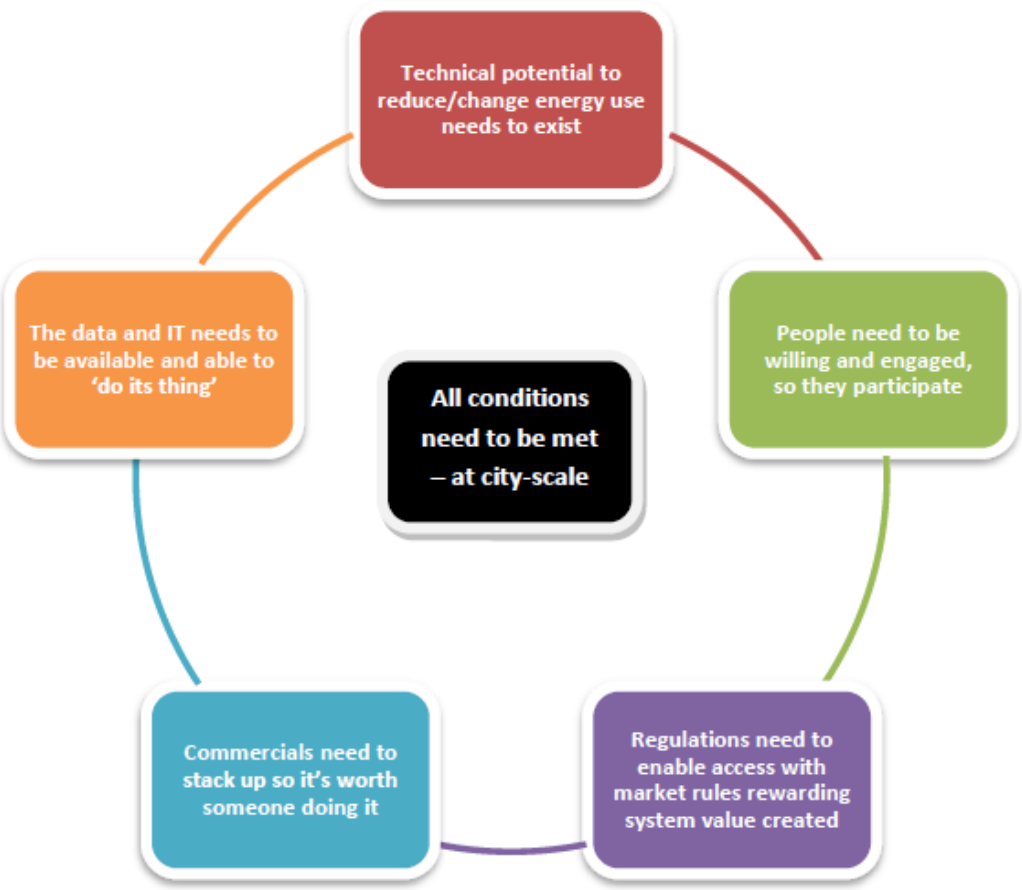

Figure 1: Conditions for Bristol's smart energy city aspiration to be realised (CSE, 2015).

This section reviews the main implications of existing arrangements for sub-national public interest uses of data and makes a number of recommendations to address these issues. The recommendations are then summarised again in section 7.

6.1 Uncertainty

Whilst the smart metering framework is established, the DCC is currently not expected to go live until August 2016 and the SEC is being developed in a phased approach. These factors may result in some uncertainty regarding the exact operation of smart meter data procedures for organisations who have not been involved in the ongoing development of the framework. Similarly, there are currently only a limited number of smart meters installed in households and this is likely to remain the case until the roll out gets underway from 2016 (and possibly beyond depending on the timing of supplier mass roll out). Although there is a great deal of interest from sub-national public interest organisations in exploring how they can exploit the opportunities presented by smart energy data, these uncertainties are likely to discourage some small and sub-national energy organisations from engaging with the agenda as they are not directly involved in the roll out in the same way as large suppliers and have limited resources to commit to an uncertain and changing agenda.

Recommendation:

- DECC, Ofgem and Gemserv should identify how they will engage sub-national public interest users of smart meter data in their ongoing work.
- Consideration should be given to the establishment of a new expert advisory group to advise DECC, Ofgem and ONS on smart meter data and the public interest, including subnational potential. Any plans should recognise the limitations these organisations may face in taking part in working groups and attending London-based events.
- Potential sub-national public interest users of smart meter data should explore how they can engage with DECC, Ofgem and Gemserv in a coordinated manner regarding the key barriers and uncertainties for sub-national groups.

6.2 Regulation

Several local areas (for example Bristol and Cornwall) are exploring the potential for the collection of smart meter data to be coordinated at a city or county level and community groups may wish to coordinate data collection and analysis at even more local scales in the future. However these approaches rely on local frameworks for the collection, management and analysis of data to be

coordinated. It is as yet unclear how these would operate and how issues of consumer consent, privacy and data management would be managed.

In particular the procedures, rules and regulations relating to smart meters are already extensive and complex, creating challenges for locally based approaches to smart meter data. For example DCC users will need to follow the same application process regardless of the uses of data they wish to make (see figure 2). This means that third parties will have to follow the same processes as large national suppliers and energy service providers.

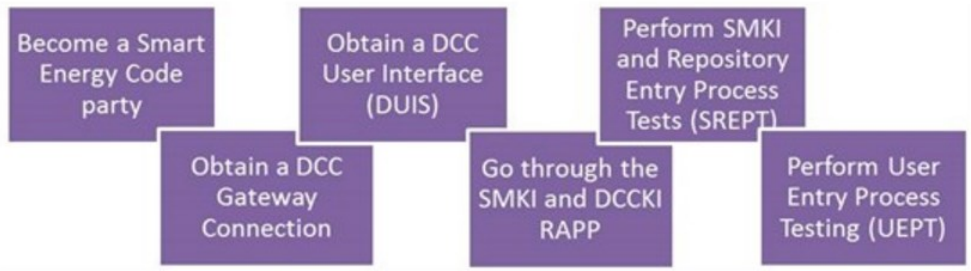

Figure 2: Process for becoming a DCC user (Gemserv, 2015).

Within the existing Data Access and Privacy Framework the 'third party' data user category is also very broadly defined, including any non-supplier or non-DNO use of smart data – ranging from international data management companies to local community groups. Reference to community groups, in particular, was omitted from the Data Access and Privacy Framework and there is a need to recognise that the ability of community groups and other small/not-for-profit organisations to engage in data management processes will not be the same as commercial third parties. Specifically the strict consent requirements and rigorous auditing processes of the DCC and SEC are likely to create barriers for these sub-national groups (19).

There is extensive work underway by DECC and Ofgem to explore how best to support innovation in the energy system, promote smart energy systems and ensure that regulation encourages new business models (33–35). This work is welcomed, particularly DECC's focus on 'removing regulatory barriers to smart solutions' and ensuring 'that DECC innovation funding supports those areas critical to the development of a smarter energy system' (36). Additionally, Ofgem have recognised that prescriptive rules can stifle innovation in relation to the smart meter roll-out and propose to increase its one-to-one support to suppliers on their policies, procedures and processes.

Ofgem have also suggested there may be potential to create an 'innovation space' within regulatory arrangements in order to test out new approaches and have constructive dialogue with the regulator and other market governance organisations (4). While this is a positive development there is a need to explore how this would operate in relation to sub-national uses of smart meter data.

Recommendations:

- The DAPF should recognise the differing ability of small and local organisations to engage with the smart meter agenda and to comply with data access and privacy requirements. As part of this process, sub-national public interest actors (particularly those involved in smart meter trials or actively progressing local public interest smart meter data models) should be actively engaged in the DAPF review process from an early stage.
- Feedback from sub-national actors involved in smart meter trials should be specifically analysed prior to the 2018 review of the Data Access and Privacy Framework.
- Sub-national actors, who are seeking to utilise smart meter data, should work collaboratively with each other and Government to explore how they can contribute to an evidence base of the benefits and barriers of sub-national public interest uses of smart meter data.
- There is a need to explore in detail the specific rules and regulations that might impede local public interest uses of smart meter data. This could take place through the DAPF review process.
- More clarity is needed on the operation and objectives of Ofgem's innovation space. Development of the innovation space should engage with local energy models, possibly through detailed work with a small number of areas who are actively working on this agenda or through the operation of a working group specifically tasked with these issues (see the recommendations in section 6.1).
- Practical case studies of sub-national public interest uses of smart meter data should be developed and disseminated.

6.3 Smart Energy Code (SEC)

In relation to the SEC, although it is positive that a checklist for small suppliers has been published (37) and small suppliers are included in the SEC panel membership, small suppliers must procure and lodge Credit Support with the DCC (SEC Reference – J3 'Credit Cover') which may be a significant undertaking for small organisations.

There may also be issues relating to broader energy industry code governance which are relevant to the SEC. Whilst these issues do not exclusively impact on public interest uses of smart meter data they are particularly relevant to small and new market entrants and are likely to apply to many aspiring sub-national public interest uses of data.

Consistent with other industry codes, the SEC is self-governed by a panel drawn from SEC parties, with administration carried out by Gemserv and regulation by Ofgem. Whilst it is positive that the SEC is the only energy code with an explicit objective to facilitate innovation for a secure and sustainable energy system, Lockwood et al. (38) have questioned the suitability of the existing 'self-governance' approach to code governance given the challenges facing the industry and the pace of change. Similar concerns have been raised by Ofgem and the CMA (39, 40).

Generally industry codes, including the SEC, were developed based on the needs of large commercial generators, network operators and suppliers and present a number of difficulties for the range of new actors that are starting to enter the energy sector, including community groups, municipalities, cooperatives and aggregators (41). In particular the complexity of code governance and the dominance of larger actors means that codes can act as a barrier to new entrants and changing codes can be difficult. In relation to smart meter data, the emergence of a demand side response market will necessitate changes to a number of codes including the charging methodologies in the DCUSA, locational charging arrangements in the D-Code and DCUSA, amendment to Engineering Regulations P2/6 (and probably a wider review), and additional changes to the BSC and the CUSC (38). Under current code arrangements no one is responsible for addressing such cross-code matters.

In relation to broader code governance issues Lockwood et al. (38) propose a shift in code governance from self-governance to public governance and a number of changes to code guidance that would be beneficial to the SEC and sub-national data uses.

<u>Recommendations:</u>

- SEC requirements and code change proposals should be translated from legal and technical language into plain English;
- A process for addressing cross-code matters should be established;
- A 'one-stop shop' guidance service to support actors to determine the relevant code documentation should be developed. This could provide specific guidance for local public interest groups on the requirements and implications of the SEC.

- In line with Ofgem's consultation on Code Governance, the Code Administration Code of Practice (CACoP guidance) should be reviewed to better promote inclusive, transparent code governance and better communicating the Critical Friend role to small participants (39).

6.4 Data access

As detailed in section 4 there are a number of potential routes for third parties to access smart meter data; however, sub-national users of such data may be faced with particular issues relating to 1) the costs and complexity of becoming a DCC user and a SEC signatory; 2) a lack of clarity regarding how arrangements for accessing data via a contract with an existing DCC user will operate (and if such a market will develop); and, 3) consent and cost issues related to sourcing data direct from consumers (via CADs). There is therefore a need for more focus on how third party access arrangements will operate.

In particular a number of sub-national public interest uses of smart meter data may only require access to half hourly data on an aggregated basis. For example local energy efficiency programmes may seek aggregated data for a block of flats or social housing estate where the physical characteristics of properties are similar. In these circumstances the level of aggregation may be relatively low (likely 10s-100s of properties) but still serve to anonymise the data and potentially avoid the need for customer consent.

Additionally, for many demand-side response uses of smart meter data, half hourly data aggregated at the substation or low voltage feeder level would be sufficient to indicate areas of grid constraint. This scale of data would potentially be useful to DNOs, local authorities, social housing providers and community energy projects. Currently DNOs hold data on total demand and maximum demand at this scale but this data it is not available at a half hourly resolution, limiting its use for demand management purposes.

Sourcing this locally aggregated data direct from suppliers would not be viable as it is unlikely that one supplier will hold comprehensive local data (as they would not be the supplier for 100% of residents). It is also probably that cost and practicality issues would limit the ability of local public interest organisations to access this data direct from consumers. This locally aggregated data could potentially be sourced through a contract with other existing DCC users, although it is currently unclear how such arrangements would operate.

This raises a number of questions regarding both what level of local aggregation is sufficient to ensure

consumer privacy (exclusively for public interest uses) and how best to facilitate this type of access. Potential options to facilitate aggregated access include the development of a national public interest smart meter data platform or local coordination of access by either DNOs or local public interest data hubs. Either approach would need to co-ordinate a process whereby consumers were asked to give consent to the protected collection of their data for public interest uses. There are also outstanding issues relating to practicality, costs and the apportionment of costs between actors for all these options. It should also be noted that DECC has already considered a position where consumers could agree to make a single agreement as to the quality of data to be made available, but Ofgem objected to this on the grounds that it was likely to become the default (14, 44).

In relation to DNOs facilitating access by local public interest organisations, it is currently unclear the costs DNOs will incur in accessing this smart meter data (and the impact this may have on their willingness to access it). There is also a need to clarify whether, under the requirements on DNOs to anonymise and/or aggregate data, this data may be passed to third parties. Likewise DNOs would presumably levy a charge on third parties for accessing this data and this could be prohibitive for small public interest focussed organisations.

It would therefore be beneficial if smart metering data access arrangements explored the levels of aggregation required to safeguard consumer privacy and to further explore how public interest organisations could directly receive aggregated data, particularly where individual consumer consent may be impractical or costly.

Recommendations:

- Smart meter data access arrangements should investigate the levels of local aggregation required to safeguard consumer privacy and explore how public interest uses of locally aggregated data could be facilitated.
- The options to facilitate local public interest access to smart meter data (both aggregated and at a household level) should be reviewed, including the implications of establishing a national smart meter data hub or a number of local hubs.

6.5 Data sharing

A number of problems already exist in sharing energy-related data between and within local organisations. For example data sharing between agencies on issues such as housing stock and benefits claimants was identified as a key barrier to energy efficiency programmes and funding in a

survey of London Boroughs and delivery agents (10). Work by the ESRC Business and Local Government Data Research Centre (BLG) (42) has suggested that existing problems around data sharing in Local Government and Public Health Services are largely the result of cultural rather than legal barriers, often with a lack of expertise, a lack of awareness at a senior level and difficulties with the interface between systems resulting in poor utilisation of the potential for data-driven solutions[8].

There is a significant risk that these issues will continue as smart meter data becomes available and local organisations seek to use that data in the public interest. For example there are limited resources within local authorities and other sub-national agencies to exploit data analytics and the BLG Data Research Centre identify that expertise and knowledge is not effectively disseminated from Central Government with regards to data analytics and sharing.

In particular local supply organisations may seek to share data with other local partners in order to deliver public interest benefits and it is yet unclear whether these models will face unique issues in relation to data sharing. Current arrangements suggest that data can be shared between parties provided consent and privacy requirements are followed and the requirements of the Data Protection Act met. There is also a lack of clarity regarding obligations and data sharing processes in partnership-based local supply arrangements such as white label and Licence Lite arrangements. Current Licence Lite guidance suggests that obligations on all parties, including security and data privacy, need to be negotiated within commercial agreements. The development of the first Licence Lite agreement has already been in process for several years and has incurred extensive legal and developmental costs with the addition of further contractual requirements in relation to SEC compliance likely to add to costs and slow this process further.

The use of smart meter data directly from a consumer with consent (i.e. outside of the Privacy and Access Framework) may also present challenges as this data will be subject to the Data Protection Act 1998. A study by the GLA in 2010 (10) suggested that councils interpret the Act in different ways, finding that some councils believe that this means they cannot use name and address information to let householders know about energy efficiency grants or financial offers they may be entitled to, as this may be considered unlawful by the Information Commissioner. Other councils, however, believe

[8] The ESRC BLG Data Research Centre's findings apply to local authority data driven solutions broadly, however many of the conclusions are relevant to energy data.

that they are allowed to use name and address information from council records for legitimate purposes[9].

Recommendations

- The BLG Data Research Centre should explore how it can facilitate local data analytic capabilities in relation to smart meter data. This should include training programmes which communicate the public interest opportunities offered by smart meter data and create a common understanding of privacy and access requirements.
- Central support should be provided for local agencies to explore how smart meter data can be linked with other data sources and utilised across services and by multi-partner projects. This should include the publishing and promotion of best practice and engaging public sector senior management (local authorities, health providers and social landlords) in the potential of smart meter data.
- Trials and pilot projects should be supported that link data sets.

6.6 Data disaggregation

Although access to energy consumption data down to a half-hourly resolution could facilitate a great deal of activity in relation to energy service innovation and the public interest benefits discussed in section 5, there is a limit to what can be achieved without more information about exactly what appliances are using the energy. Energy data disaggregation techniques are therefore likely to be important to ensure the full benefits of smart meter data are realised[10]. Energy disaggregation is a computational technique for estimating appliance-by-appliance energy consumption from a whole-house meter signal (19).

Under the current specification smart meter data will typically be available on a half hourly basis but Consumer Access Devices (CADs) can request data every ten seconds. Disaggregation techniques can be carried out on data at a range of reporting rates but the number of individual appliances it is possible to identify increases dramatically as data logging frequency increases (i.e. to 1 second data or higher) (43). It should however be noted that greater disaggregation of gas usage is likely to be possible from half hourly data as gas accounts for fewer domestic appliance uses (mainly space heating, water heating and cooking) (19).

[9] It should be noted that in some cases the ability to use data may vary depending on which data protection notices were included in the original benefits application process.
[10] Although it is recognised that appliance level disaggregation techniques have encountered some technical problems to date.

Energy data disaggregation is an active area of research with initiatives such as the UK-DALE[11] (based at Imperial College) aiming to enable more collaboration in disaggregation research through the provision of an open-access dataset of appliance level data from a number of sample houses, and the TEDDINET research network[12] coordinating several research projects aiming to develop disaggregation techniques.

Despite the potential of disaggregation techniques to play an important role in many of the sub-national opportunities identified in section 5, particularly in relation to energy efficiency programmes and advice, there is currently little awareness of these techniques within local policymakers and practitioners and it is unlikely that sub-national energy enterprises will have the resources to explore disaggregation potential directly. Therefore, although many of the applications of disaggregation techniques may be at a national or commercial scale, it is also important that sub-national users of smart meter data are kept informed of the potential of disaggregation techniques and current development in order to ensure that forward planning takes account of its potential.

Recommendations:

- Training and resources for sub-national agencies relating to smart meter data should include discussion of the latest disaggregation research and facilitate access to this research.
- There should be co-ordination between national and local users regarding data availability and format e.g. use of anonymised data and disaggregation techniques.

[11] http://ukedc.rl.ac.uk/cgi-bin/edc_search.pl?GoButton=Detail&WantComp=41&WantResult=&WantText=EDC0000001
[12] http://teddinet.org

7. Recommendations and next steps

The recommendations proposed in the previous section are summarised again in this section.

7.1 Uncertainty

- DECC, Ofgem and Gemserv should identify how they will engage sub-national public interest users of smart meter data in their ongoing work.
- Consideration should be given to the establishment of a new expert advisory group to advise DECC, Ofgem and ONS on smart meter data and the public interest, including sub-national potential. Any plans should recognise the limitations these organisations may face in taking part in working groups and attending London-based events.
- Potential sub-national public interest users of smart meter data should explore how they can engage with DECC, Ofgem and Gemserv in a coordinated manner regarding the key barriers and uncertainties for sub-national groups.

7.2 Regulation

- The DAPF should recognise the differing ability of small and local organisations to engage with the smart meter agenda and to comply with data access and privacy requirements. As part of this process sub-national public interest actors (particularly those involved in smart meter trials or actively progressing local public interest smart meter data models) should be actively engaged in the DAPF review process from an early stage.
- Feedback from sub-national actors involved in smart meter trials should be specifically analysed prior to the 2018 review of the Data Access and Privacy Framework.
- Sub-national actors, who are seeking to utilise smart meter data, should work collaboratively with each other and government to explore how they can contribute to an evidence base of the benefits and barriers of sub-national public interest uses of smart meter data.
- There is a need to explore in detail the specific rules and regulations that might impede local public interest uses of smart meter data. This could take place through the DAPF review process.
- More clarity is needed on the operation and objectives of Ofgem's innovation space. Development of the innovation space should engage with local energy models, possibly through detailed work with a small number of areas who are actively working on this agenda or through the operate of a new working group specifically tasked with these issues.

- Practical case studies of sub-national public interest uses of smart meter data should be developed and disseminated.

7.3 Smart Energy Code (SEC)

- SEC requirements and code change proposals should be translated from legal and technical language into plain English;
- A process for addressing cross-code matters should be established;
- A 'one-stop shop' guidance service to support actors to determine the relevant code documentation should be developed. This could provide specific guidance for local public interest groups on the requirements and implications of the SEC.
- In line with Ofgem's consultation on Code Governance the Code Administration Code of Practice (CACoP guidance) should be reviewed to better promote inclusive, transparent code governance and better communicating the Critical Friend role to small participants (39).

7.4 Data access

- Smart meter data access arrangements should investigate the levels of local aggregation required to safeguard consumer privacy and explore how public interest uses of locally aggregated data could be facilitated.
- The options to facilitate local public interest access to smart meter data (both aggregated and at a household level) should be reviewed, including circumstances where data could be received directly from the DCC and the implications of establishing a national smart meter data hub or a number of local hubs.

7.5 Data Sharing

- The BLG Data Research Centre should explore how it can facilitate local data analytic capabilities in relation to smart meter data. This should include training programmes which communicate the public interest opportunities offered by smart meter data and create a common understanding of privacy and access requirements.
- Central support should be provided for local agencies to explore how smart meter data can be linked with other data sources and utilised across services and by multi-partner projects. This should include the publishing and promotion of best practice and engaging public sector senior management (local authorities, health providers and social landlords) in the potential of smart meter data.
- Trials and pilot projects should be supported that link data sets.

7.6 Data disaggregation

- Training and resources for sub-national agencies relating to smart meter data should include discussion of the latest disaggregation research and facilitate access to this research.
- There should be co-ordination between national and local users regarding data availability and format e.g. use of anonymised data and disaggregation techniques.

8. Conclusion

Many of the issues discussed here go beyond smart meter data specifically and touch on broader issues relating to the engagement of non-traditional, innovative and public interest energy models in the development of policy, rules and incentives. However a range of specific priorities for maximising the potential of sub-national public interest smart meter data uses have been proposed, particularly in relation to engaging sub-national users in policy development and the DAPF review, identifying specific regulatory barriers for sub-national uses, developments to code governance processes, exploration of the costs of third party access to data (particularly in relation to locally aggregated data) and the development of local data analytic capabilities. It is also recognised that there is a lack of evidence regarding the extent of the real and perceived barriers to the engagement of sub-national actors in public interest uses of smart meter data. A number of the recommendations seek to extend this evidence base and engage sub-national actors in future development.

Going forward, it will be important to strike a balance between protecting customers' privacy and removing so much content from the data that useful conclusions cannot be drawn. However, this report, together with its companion paper, has demonstrated that there are significant public interest benefits that could be realised from the use of smart meter data. The upcoming DAPF review and ongoing work by DECC and Ofgem on innovation and smarter markets provide an opportunity to revisit current arrangements and ensure that the right balance is struck between privacy and public interest.

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