

The Smart Meter Rollout: Social questions and challenges

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Summary

Smart meters have the potential to bring benefits to consumers in terms of reduced energy bills through a more efficient (and hence cheaper to run) energy system and through reduced energy consumption, stimulated by improved information about energy usage. The Main Rollout Stage of the smart meter programme in Great Britain started in November 2016 and the intention is for every household to have been offered a smart meter by their supplier by the end of 2020.

Much of the debate around the progress of the rollout to date has focused on technical issues. However, there are a number of *social* issues that have the potential to help or hinder the rollout. To accelerate the diffusion of smart meters, it is important that these aspects receive greater attention. In this briefing, we highlight four key areas:

1. Consumer acceptance: if consumers reject the offer of a smart meter, they will not be able to realise all of the benefits (but will still pay a contribution towards the cost of the rollout through their energy bill). A better understanding is needed on what has influenced the acceptance rate and the reasons for rejection.



2. Changes in energy consumption:

The provision of In-Home Displays (IHDs) alone is unlikely to lead to significant levels of behaviour change and reductions in energy demand. A package of supporting policies (covering information, advice, voluntary schemes and economic incentives) is needed to deliver greater reductions in energy use.

3. Vulnerable consumers: The potential distributional impacts of the programme across income groups and vulnerable groups, such as older people, those with long-term health

conditions and those with disabilities, need to be better understood and documented, especially now that large-scale implementation has begun.

4. Other environmental impacts: Steps should be taken to minimise waste from the rollout, in particular in relation to the old meters that are removed as part of the programme. Lifecycle and recycling standards may need to be strengthened for both smart meters and IHDs.

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Introduction

Smart meters are replacing traditional meters for monitoring gas and electricity consumption in homes and small businesses in Great Britain. Smart meters measure, store and share energy consumption data on digital networks. It is hoped that smart meters combined with IHDs will transform energy use, leading to demand reductions and a shift in peak demand.

Replacing old, often unreliable traditional meters with the new smart meters is expected to create many benefits, including:

- More accurate readings and billing.
- Automated communication of information, removing the need for site visits from suppliers to read meters.
- Improved information about energy

consumption, allowing consumers to make informed decisions about their energy use.

- Better management of distribution networks.

The rollout may facilitate additional benefits, such as shifting energy consumption away from times of peak demand and/or times when the generation mix is higher carbon through the introduction of new services and products.

The scheme consists of two phases – the Foundation Stage (for testing and trialling), which was originally scheduled to run 2011-14, and the Main Rollout Stage, which started in 2016 and is due to finish by the end of 2020.¹ It had been expected that more advanced, second generation technology (“SMETS2”) would

be deployed as soon as the second phase began, but delays as a result of testing have meant that first generation “SMETS1” meters were still being installed in 2017. After 13 July 2018, suppliers will not be able to count newly installed SMETS1 meters towards their rollout targets.²

These technical issues have been the focus of much debate and discussion around the rollout to date (see ‘Our research’). It is important to note, however, that *social* factors will also have an impact on the success of the smart meter rollout. In this briefing we highlight four aspects that need greater attention: consumer acceptance, changes in energy consumption, vulnerable consumers and wider environmental impacts.

Consumer acceptance of smart meters

The Government has set an obligation for energy suppliers to take all reasonable steps to *offer* a smart meter to all domestic and small non-domestic customers by the end of 2020.³ Customers do not have to accept this offer however, so the final number of smart meters installed by 2020 will depend on the extent to which households and small businesses are willing to say “yes”.

Smart Energy GB – an independent organisation tasked with promoting smart meters – is delivering a £100 million marketing campaign to this end.⁴ Marketing Director Gavin Sheppard has described the challenge involved as one of “shifting people from a position of absolute disinterest and apathy to a position of positive, enthusiastic engagement”.⁵ A 2012 report from the Department of Energy and Climate Change (DECC) noted that while there was greater “awareness of smart meters” among the public, this often meant no more than “the terms sounding familiar” and only “a minority had more informed understanding.”⁶ In its own Summary of Key Findings, DECC noted in 2014 that surveys over consumer acceptance were complicated by “confusion about what constitutes a smart meter” and that “smart meters are often confused with IHDs.”⁷ It also noted that only 31% of participants were “supportive” and that

only 39% were “interested in having a smart meter installed in their home in the near future.”

In addition to confusion and apathy, some consumers have specific concerns about smart meters or even misperceptions that will need to be overcome. Examples include:

- A dislike of the idea that energy suppliers might manage their energy consumption for them;
- Scepticism that smart meters will actually deliver savings and a perception that suppliers will somehow use them to profit at the expense of consumers;
- Concerns relating to privacy and security of data generated by the smart system;
- Beliefs that there may be health risks associated with wireless technology.⁸

Smart Energy GB’s own consumer survey shows a very high awareness of smart meters across the population – 97% of people said they had heard of them.⁹ Of those who haven’t yet got a smart meter, 49% say they would request a smart meter or accept an offer for one in the next six months – an improvement from the 2014 DECC survey.¹⁰ There is however very little data available about acceptance rates.¹¹ The *Telegraph* ran

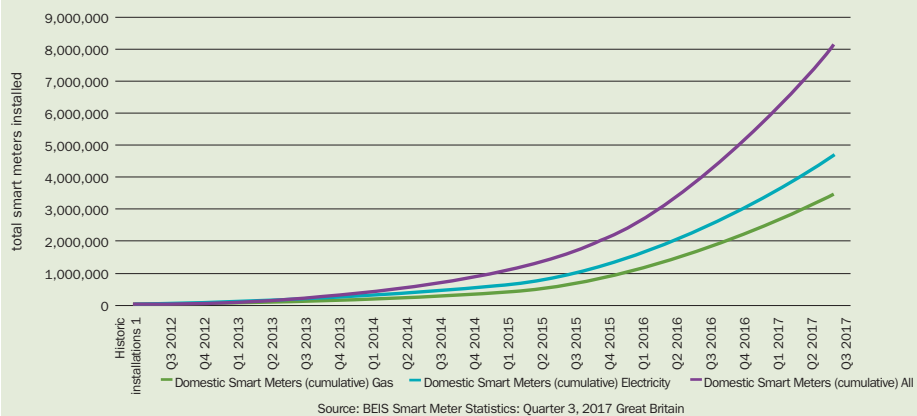
a recent investigation where “less than half of households” contacted indicated they accepted a smart meter. They also reported uptake rates for smart meters “as low as one in five”.¹²

★ Recommendation

In order to better understand the reasons for rejecting smart meters and to maximise the number of smart meters delivered, greater monitoring and transparency is needed about the proportion of consumers who accept a smart meter when offered one and the reasons for rejection, or which arguments proved the most effective for acceptance.

According to the most recently available Department for Business, Energy and Industrial Strategy (BEIS) data shown in Figure 1, 8.25 million meters have been installed as of November 2017. This is equivalent to 14.7% of the target number of 56 million. In order to meet its targets, suppliers will need to install smart meters at a rate of about 40,000 per day for the duration of the programme. The rate of installation has increased dramatically over the last few quarters as suppliers have ramped up their installation capacity and this trend looks likely to continue.

FIGURE 1: CUMULATIVE TOTAL OF SMART METERS INSTALLED BY THE LARGE ENERGY SUPPLIERS IN DOMESTIC PROPERTIES, BY FUEL TYPE AND QUARTER



Changes in energy consumption

Reducing energy demand is one of the most cost-effective routes to meeting the UK's carbon budgets. It is widely recognised that the combination of smart meters and IHDs offer an opportunity to trigger a reduction in energy consumption. This might come about in a number of ways:

- Real time feedback on energy use and costs may encourage consumers to reduce their energy consumption (for example by taking steps to improve the energy efficiency of their home or appliances or by curtailing their usage);
- Smart meters open the potential for new incentives to reduce energy use and/or shift it away from times of peak demand (for example through time of use tariffs);
- In the long run, they also open the opportunity for smart appliances and home energy systems, which might allow for automated demand side response or optimised energy use.¹³

The Energy Demand Research Project, which was managed by Ofgem on behalf of DECC, sought to understand how domestic consumers responded to information about their energy consumption. It found that providing a smart meter and real time display resulted in a reduction in electricity usage of 2-4% and reduction in gas consumption of about 3%.¹⁴ The Government's 2016 cost benefit analysis of the smart meter rollout assumes gross annual reductions in demand of 2.8% for electricity, 2% for gas credit and 0.5% for gas pre-payment meters.¹⁵ However, BEIS recently conducted a survey of 2,015 households and found that 18.9% of consumers said that they did not look at their IHD at all.¹⁶

What is more, the energy efficiency policy landscape has changed significantly since the plans to roll out smart meters were first introduced. Most notably, the Green Deal

– which was intended to encourage energy efficiency improvements through a pay-as-you-save mechanism – was shelved in 2015. The ambition of successive “supplier obligations” (ECO, CERT, EEC and predecessors), which delivered efficiency measures to homes, has also reduced over time.¹⁷ The lack of a supportive mix of policies, initially intended to co-exist with the rollout, reduces incentives for consumers and landlords to adopt retrofit measures to reduce energy demand. A package of measures is needed to deliver on the potential that smart meters offer in terms of stimulating behaviour change and catalysing energy efficiency improvements to buildings.¹⁸

The Government's recently published Clean Growth Strategy sets out an aspiration for as many homes as possible to be EPC Band C by 2035 where practical, cost-effective and affordable.¹⁹ BEIS has also published a call for evidence on building a market for energy efficiency, which notes that there is “no ‘silver bullet’ policy for improving energy efficiency” and that policies “must be aligned”.²⁰

★ Recommendation

In order to reduce the energy demand from homes and small businesses, a comprehensive and coordinated policy mix is needed to facilitate a transformation to low energy and efficient building stock. Smart meters provide a first stimulus but need a package of measures to encourage further consumer action. The Government's current consultation on ‘building a market for energy efficiency’ provides an opportunity to ensure that new policies are aligned and build on the opportunity provided by the smart meter rollout.

Vulnerable consumers

In theory, if smart meters can reduce costs for suppliers and Distribution Network Operators (DNOs) in meter reading, network operation, grid reinforcement, electricity generation and so on, then all consumers should stand to benefit from lower energy prices, regardless of whether they make any behavioural changes. Research also shows that vulnerable consumers, including those where English is not their first language, can benefit from smart metering and save money on their energy bills.²¹

To realise the maximum benefit from the rollout, however, consumers will need to act upon the information provided by the IHD. The Government's “Early Learning Project” found that:

*“Older smart meter customers, those from lower social grades, those with the lowest total annual household incomes (below £16,000), those with no formal qualification and those who lived with someone who had a long-term health condition or disability were less likely to say the IHD [In-Home Display] was easy to use or to say they knew how to operate its different functions”.*²²

In 2014, the House of Commons Public Accounts Committee noted that the impact of smart meters on vulnerable and low income consumers was unclear.²³ It recommended that the Government should monitor the impact of the mass rollout on different groups to ensure that vulnerable and low-income households are obtaining the benefits available from smart meters. The BEIS 2016 cost benefit analysis does not explicitly consider energy bill impacts on different household types and income groups owing to “the lack of evidence on distributional impacts at this point in time”.²⁴

Under the Smart Meter Installation Code of Practice, suppliers should use “all reasonable endeavours” to identify whether customers have any specific needs or are vulnerable.²⁵ This should be taken into consideration during installation, for example when demonstrating the system. As an encouraging sign, in March 2017, Citizens Advice recommended that the Government should establish industry-wide standards on follow-up support for vulnerable consumers, informed by the government's working group to develop principles for post-installation support.²⁶ Other concrete partnerships are now in place between Smart Energy GB and National Energy Action²⁷, Age UK²⁸ and

the National Housing Federation.²⁹ Work is also being done in the area of distributional impacts and vulnerability downstream from the smart meter itself. Ofgem have done work on distributional impacts of half-hourly settlements³⁰ and UCL have done work with Citizens Advice and Brattle on system value of time-of-use tariffs.³¹

★ Recommendation

Greater attention must be paid to the distributional impacts of the smart meter rollout as well as the impact on vulnerable groups, such as older people or those with long-term health conditions or disabilities, in the next cost benefit analysis undertaken by BEIS. The Government needs to publish this information, drawing from recent partnerships and ongoing trials, as soon as possible to allow time for any corrective measures to be put in place before the end of the rollout.

Other environmental impacts

The smart meter programme will result in the removal of millions of old (and soon to be obsolete) meters. In addition, the new smart meters and IHDs may have a shorter lifespan than the older meters, which in some instances, have been in place for decades. About 1.4 million meters are replaced and removed each year in the UK, but only about a quarter were being recycled as of 2011.³² The rollout clearly has the potential to create a large volume of waste.

Greater consideration should be given to what will happen to old meters and IHDs at the end of their lifetimes so that as far as possible, they are repurposed and recycled, rather than disposed of. Although it appears that companies have responsibilities under the European Union's Waste Electrical and Electronic Equipment (WEEE) Directive, neither smart meters nor traditional meters are explicitly listed in the ten categories of

regulations.³³ Smart meters and traditional meters are also not mentioned as a type of waste in the annexes to the most recent Waste Framework Directive.³⁴ Moreover, it is unclear how well both Directives are enforced, and whether such guidelines also apply to IHDs (with liquid crystal displays that may contain mercury).

★ Recommendation

As the UK withdraws from the EU, it is important to ensure that equivalent UK legislation is in place to ensure that waste from the smart meter programme is minimised. More clarity is also needed as to the scope of the WEEE Directive, and the extent to which it is enforced and applies to smart meters, old meters, and IHDs.

Our research

This briefing is based on an independent review of nine years of peer-reviewed academic articles on smart meters published between March 2008 and March 2017, and a supplemental collection of relevant government reports and media news articles. The review was accompanied by attending and analysis of public transcripts of seven high-level smart meter events aimed at the policy community in the UK.

The full paper is available here: <http://www.sciencedirect.com/science/article/pii/S0301421517304688>

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