National Audit Office

Report
by the Comptroller
and Auditor General

Department of Energy & Climate Change

Update on preparations for Smart Metering

HC 167 SESSION 2014-15 5 JUNE 2014

Summary

Scope of the briefing

1 The Department of Energy & Climate Change (the Department) is leading the Smart Metering Implementation Programme (the Programme). Under the Programme, energy suppliers must replace 53 million meters in homes and small businesses across Great Britain with smart electricity and gas meters by 2020. The Comptroller and Auditor General reported on the Department's preparations for the roll-out of smart meters in 2011.[1]

2 The Department provided an update report to the Committee of Public Accounts on 31 March 2014.[2] The Department's report sets out its work to prepare for mass roll-out from 2015 and its responses to the Committee's recommendations.[3] We have prepared this briefing, which focuses on the remaining risks and challenges for the Programme, to complement the Department's report. We have reviewed the progress the Department describes and evaluated the reasons for, and impacts of, any changes to the economic case for the Programme, based on a review of key documents and interviews with Department officials, key industry participants and stakeholders conducted in March and April 2014. We did not fully audit the data the Department provided or statements the Department made and have not sought to come to a value-for-money conclusion. Our methodology is set out in Appendix Two.

Overview

3 The economic case for the Programme remains positive: it is expected to cost £10.9 billion and bring economic benefits of £17.1 billion. The Department has provided strong Programme leadership. It has made good progress with Ofgem in preparing for mass roll-out, and has established much of the necessary regulatory, technical and commercial framework needed to pave the way for passing responsibility to industry. The Department told us that all major suppliers have used the foundation stage to test and trial smart metering equipment, but four of the big six suppliers have not yet installed a significant number of meters. Significant risks remain including potential consumer resistance to smart meters, the need for industry to resolve outstanding technical issues, the readiness of suppliers, network operators and the supply chain for large-scale installation and the robustness of the data security and privacy arrangements.

1 Comptroller and Auditor General, *Preparations for the roll-out of smart meters*, Session 2010–2012, HC 1091, National Audit Office, June 2011.
2 Department of Energy & Climate Change, *Smart Metering Implementation Programme: Progress update report to the Public Accounts Committee*, March 2014.
3 HC Committee of Public Accounts, *Preparation for the roll-out of Smart Meters*, Sixty-third Report of Session 2010–2012, HC 1617, January 2012.

4 The Department's assessment of the likelihood of these risks is low, but the potential impact in some cases is high. The Department's economic case is based on the assumption that the Programme will achieve near universal roll-out. It has allowed about £1.5 billion for higher than expected costs. The Department is relying both on the suppliers' own commercial incentives to bear down on costs, and on competition between suppliers to ensure efficient roll-out and to keep costs under control. The Department and Ofgem have broad powers to intervene through financial penalties, introduction of further regulation and, in extreme cases, revoking licences. During and following the transition from a Department-led Programme to industry-led governance, the Department must retain its ownership of the Programme's key risks, ensure that roles and accountabilities are clear and make appropriate use of its powers to manage risks, costs and benefits.

Background

5 The government wants suppliers to install smart meters in all homes and smaller non-domestic buildings in Britain by 2020. Smart meters are intended to give consumers near real-time energy consumption information and allow suppliers to collect meter readings remotely. The Department expects smart meters to help consumers reduce their energy consumption, shift demand away from peak times, and encourage switching between tariffs and suppliers to reduce bills and carbon emissions. It also expects smart meters to reduce costs for suppliers, network operators and generators. **Figure 1** overleaf illustrates the main components of the planned smart metering infrastructure.

6 The Department designed the Programme to be completed in two phases, the foundation stage and the mass roll-out stage:

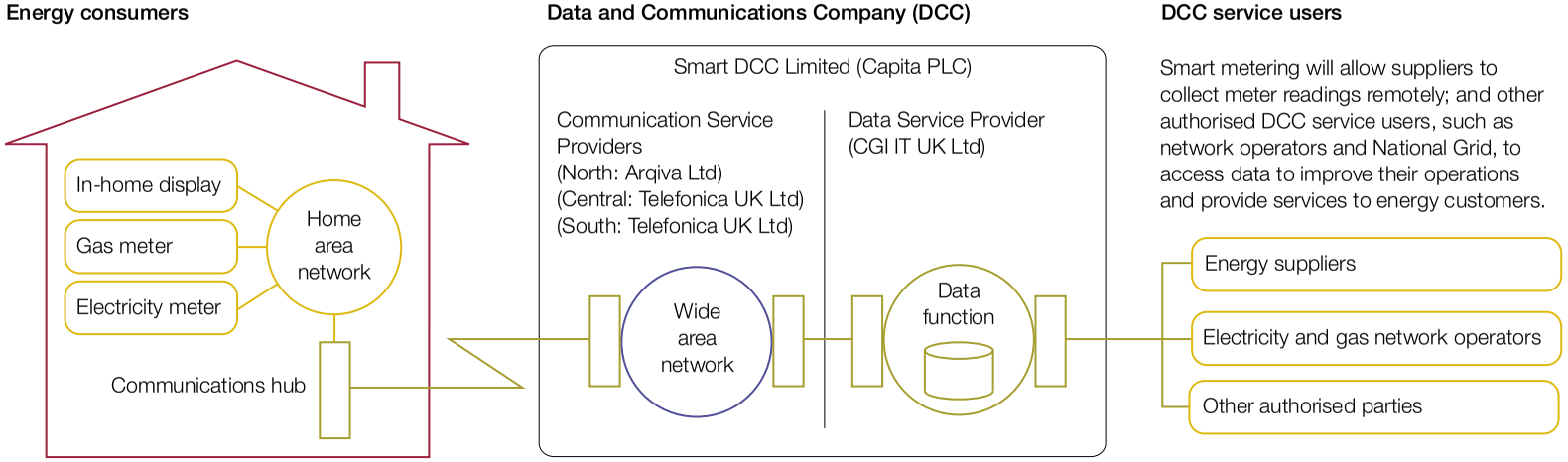
- During the **foundation stage**, which began in April 2011, the Department has played a central role by establishing the policy, regulatory and commercial frameworks that will underpin and drive the delivery of smart meters. In September 2013, it established the shared data and communications infrastructure, to ensure that meters work consistently for all consumers, regardless of their energy supplier. It established the regulatory framework for the Programme, which requires suppliers to install the meters, to provide funding for the Data and Communications Company (DCC)[4] and to fund a new Smart Meter Central Delivery Body (CDB) to increase consumer awareness of the Programme, to prepare consumers for installation and to promote long-term energy consumption behaviour change. The Department expected industry participants to use the foundation stage to gain the experience and learning they need for mass roll-out.

- The **mass roll-out stage** is due to start in late 2015. The regulatory framework that the Department has put in place requires energy suppliers, under licence conditions that will be overseen by Ofgem, to take all reasonable steps to install smart meters in all households and small businesses by the end of 2020.

4 Network operators and other users of the Data and Communications Company's services are also required to fund the Data and Communications Company.

Figure 1

The main components of the smart metering system



Note

1 The DCC, a licensed body established by the Department and regulated by Ofgem, is responsible for two-way communications and the transfer of data between smart meters and energy suppliers, network companies and other authorised third parties. The DCC's data services provider is contracted to develop, host and maintain a software application to allow messaging between DCC service users and consumers' premises; and the communications service providers will provide a wide area network and design, procure and own communications hubs, which will be provided to energy suppliers.

Source: National Audit Office

7 The Department expects the transition to the enduring industry-led governance arrangements to take place progressively over the next two years, as the DCC and industry take up their respective roles. The ongoing development of the technical operation of the Programme will be governed by the Smart Energy Code and its Panel. Ofgem will oversee energy suppliers' and other industry participants' compliance with their licence and code obligations. Once the transition is complete, the Department will retain its current responsibilities to monitor programme delivery, costs and benefits through to the end of the roll-out in 2020 and will have an ongoing but reduced role in challenging and overseeing the progress of the Programme. **Figure 2** overleaf shows the governance arrangements following the transition to the industry-led Programme. The Department has committed to publishing annual progress reports on the roll-out of smart metering and benefits to consumers. The first annual progress report was published in December 2012 and the second in December 2013.

Key findings

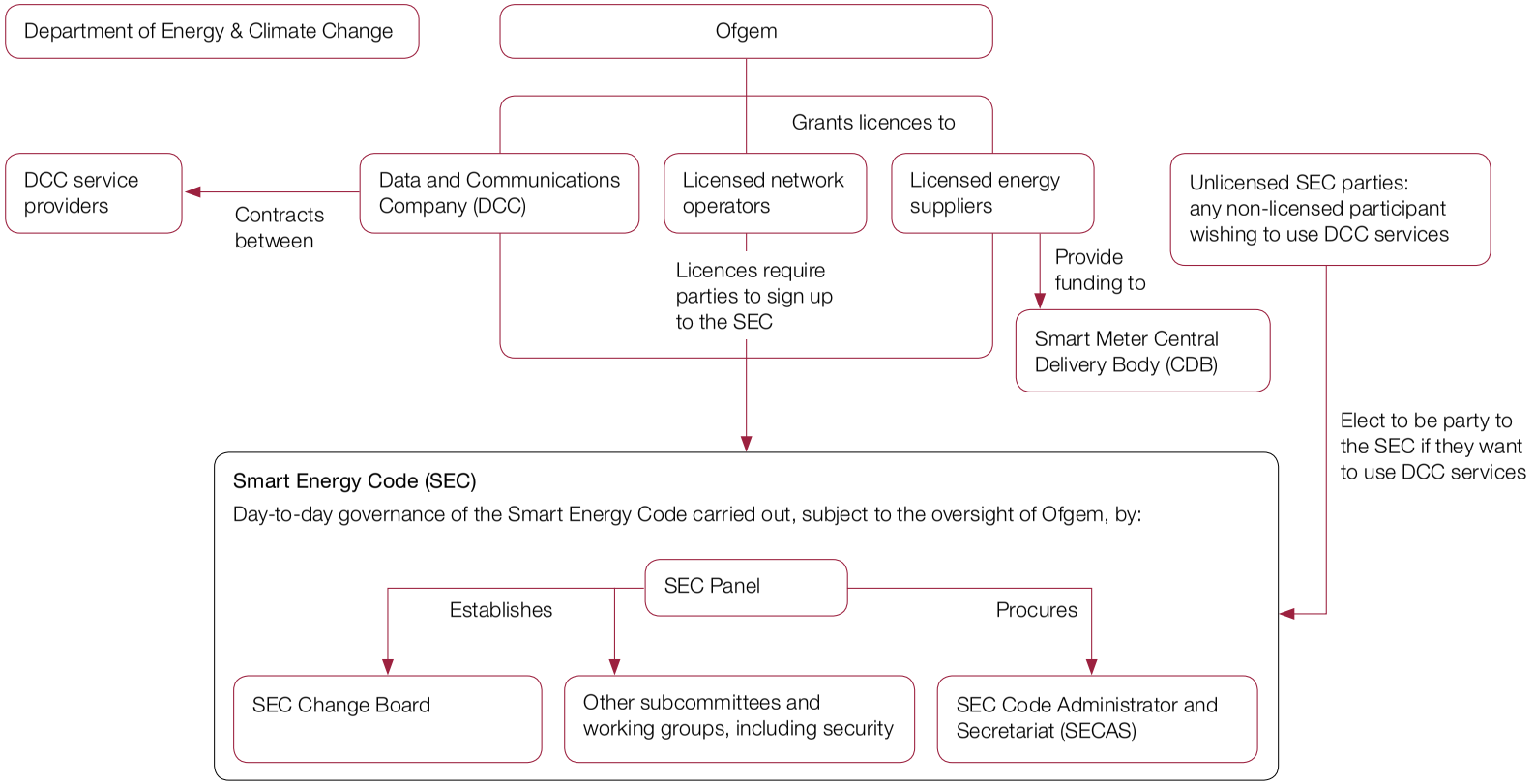
8 The Department has kept the Programme on track for completion by 2020, which, if achieved, will be broadly in line with the timetables of other European countries' smart metering programmes. Many other European countries' plans are for universal smart electricity metering by 2020 or earlier. In 2013, in consultation with industry and other stakeholders, the Department put back the planned start and end dates of mass roll-out by a year, to late 2015 and the end of 2020 respectively, to give the Department and industry more time to prepare. The Major Projects Authority reviewed the decision to reschedule the Programme in July 2013 and found that it was strongly endorsed by all stakeholders. The DCC is now consulting on its recommendation to further delay the start of mass roll-out by 8–10 weeks to allow sufficient time to build and test the smart metering communications systems. This would allow the mass roll-out to start in the fourth quarter of 2015 as intended, and is not expected to delay the completion of mass roll-out (paragraphs 1.1 to 1.3).

9 The Department's economic case for smart meters remains positive. The benefit–cost ratio for the Programme to 2030 has remained at around £1.60 of benefit for every £1 spent. Since we last examined the Programme in 2011, net programme benefits have reduced from £8.3 billion to £6.2 billion.[5] The primary reason for this is the one-year delay to the completion of mass roll-out. The Department expects the Programme to deliver additional benefits, which it has not quantified, from increased competition through easier switching between suppliers and from the opportunities offered by developing smart grids (paragraphs 2.2 and 2.15 to 2.17).

5 For the purposes of this briefing, we have converted the estimated benefits and costs contained in the Department's impact assessments into 2011 prices and a 2013 present value base year (see paragraph 2.16 and Appendix One).

Figure 2
Planned enduring governance arrangements

The Department will monitor programme delivery and Ofgem will oversee the governance of the Smart Energy Code



Notes

1 The organisation chart describes the governance arrangements for smart metering following the transfer of programme responsibilities from the Department to industry.

2 The SEC Change Board is a subcommittee of the Panel that is responsible for developing and considering proposed changes to the Smart Energy Code.

Source: Department of Energy & Climate Change

10 Estimated benefits are based on the assumption that smart meters are rolled out to virtually all consumers by the end of 2020. Energy suppliers must show that they have taken all reasonable steps to roll out smart meters to all their customers. But they are concerned at the costs of engaging reluctant customers. One supplier told us that, during the foundation stage, the average number of telephone calls they had to make and the proportion of failed appointments were higher than they had anticipated. The Department's tracking survey shows that 40 per cent of households have expressed an interest in having a smart meter installed in their home, which is in line with the Department's expectations at this stage of the Programme (paragraphs 2.19 and 2.20).

11 Stakeholders consider the Department's assessment of consumer energy savings (an average of 2.8 per cent for electricity and 2.0 per cent for gas up to 2030) to be realistic and achievable. Our review of existing evidence from UK and international trials also supports the Department's estimates, but evidence for behaviour change in the longer term is limited, because the technology is new and most trials have not yet been in place very long. The Department estimates that if these savings are achieved, energy bills will reduce by an average of £26 a year for each household by 2020, and by £43 a year in 2030. These figures rely on industry passing on their operational cost savings to consumers, and energy savings being maintained until 2030. The CDB, which will play a key role in promoting behaviour change, is expected to remain in existence until a year after the end of mass roll-out and the Department expects to keep under review its policy on engagement with consumers beyond that date (paragraphs 1.11 to 1.14, 2.8, 2.9 and 2.21 to 2.25).

12 The Department is relying both on the suppliers' own commercial incentives to bear down on costs, and on competition between suppliers to ensure that suppliers achieve universal roll-out efficiently. There is a risk that Programme costs will escalate during mass roll-out, but the Department is confident that suppliers have incentives to control the cost of roll-out both for commercial reasons and to remain competitive. Consumers will be able to switch away from suppliers that do not keep their customer offer and prices competitive and the Department and Ofgem have a range of initiatives to maintain competitive pressures, for example by making switching easier and quicker. Alongside this, in March 2014, Ofgem proposed to refer the retail energy market to the Competition and Markets Authority to investigate if features of the market are having an adverse effect on competition and, if so, what reforms would make competition more effective (paragraphs 2.5, 2.27 and 3.11).

13 The Department described the foundation stage as "a vital opportunity to test and trial both smart metering technology and approaches to consumer engagement",[6] but four of the big six suppliers have not yet installed significant numbers of smart meters. The Department told us that all larger suppliers were preparing or undertaking tria ls of smart metering equipment, building and testing new systems and processes, and recruiting and training installers and customer service staff. The Department is monitoring the likelihood and impact of the risk that not all suppliers will be ready for large-scale installation in line with current plans and is confident that the regulatory regime will ensure all suppliers meet their obligations by 2020. Network operators are also important for the roll-out, but they cannot yet fully plan their work to ensure that they will have the necessary resources in the right place and at the right time. This is because suppliers have not yet provided their roll-out plans in sufficient geographical detail (paragraphs 1.21 to 1.26).

14 Suppliers are still developing a home area network radio system for up to 30 per cent of premises. The home area network that enables consumers to connect in-home displays and other consumer devices to their smart meters currently operates at a frequency of 2.4 GHz and is not suitable for some properties, such as many high rise flats or buildings with thick walls, which limit or prevent the components of the smart metering system from communicating with each other. Suppliers are leading the development of a home area wireless network that operates at a frequency of 868MHz which is expected to work in all but 5 per cent of premises. The Department told us that it expects meters that communicate on the 868MHz frequency to be available within a year of the start of mass roll-out and is consulting on the technological approach to be taken for the remaining 5 per cent of premises (paragraph 1.19).

15 Not all energy suppliers have developed a viable prepayment smart meter solution. The Department told us that two smaller suppliers have a smart meter prepayment offering and one larger supplier has begun trialling smart prepayment services with its customers. The Department is confident that all major suppliers will be able to offer smart meter prepayment services by the end of 2015 and, in April 2014, the Secretary of State for Energy & Climate Change challenged suppliers to ensure that, by the end of 2016, current prepayment meters are only replaced with smart meters and that all prepayment customers are offered smart meters. Suppliers are considering their response to this challenge (paragraph 1.20).

16 The Department has considered how smart metering will affect different sectors of society, for example fuel poor consumers, but it has not been able to quantify these impacts. The Department's impact assessment included evidence of the potential distributional impacts of smart metering from trials carried out in Great Britain and elsewhere that indicate that households living in areas with a high propensity for fuel poverty may benefit at least as much as other households. But the Department has not quantified the impact of smart meters on the bills of different household types and income groups because the evidence is not robust enough (paragraph 2.10).

6 Department of Energy & Climate Change, Smart Metering Implementation Programme: *Progress update report to the Public Accounts Committee,* March 2014.

17 The Department has worked closely with security experts in industry and relevant government agencies, including the Communications Electronics Security Group, the government's national technical authority for information assurance, to understand the information security risks the smart metering systems are likely to face and possible control measures. The Department has sought to assess the outcomes of these risk assessments through a series of published specifications, such as the smart metering equipment technical specification (SMETS) and by obligations within the Smart Energy Code and the DCC licence. However, the extent of the ongoing security challenges should not be underestimated. Security threats could evolve rapidly so the end-to-end information security testing will need to be maintained once in place and re-assured regularly. The Department told us that it and Ofgem are making arrangements for ongoing monitoring and control of such threats and risks (paragraphs 1.7 to 1.10 and 3.8).

18 The Department has provided strong Programme leadership, and many of the stakeholders we spoke to volunteered positive views about how the Department is implementing the Programme. It is now ensuring that other parties, such as the DCC and industry, deliver on their responsibilities to ensure a successful roll-out. The realisation of any of the major remaining risks could significantly undermine delivery of the Programme, reduce benefits or add to costs. Clarity of roles and accountabilities is paramount for the consumer confidence needed to ensure efficient delivery. The Department instigated an internal review of governance arrangements in April 2014 to examine, among other things, whether the arrangements provide sufficient leadership, and was due to report its findings to the Department by the end of May 2014 (paragraphs 3.6 and 3.7, and 3.10 to 3.12).