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DEPARTMENT OF ENERGY & CLIMATE CHANGE

Smart Metering Implementation Programme

Response to Prospectus Consultation

Overview Document

March 2011

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If you would like alternative formats of this consultation document, such as Braille, audio cassette or large print, these are available on request - please contact the address below. This also includes a Welsh language version.

Information about this publication and the Smart Metering Implementation Programme is available from:

Smart Metering Team
Department of Energy and Climate Change
3 Whitehall Place
London SW1A 2HH
Tel: 0300 068 5163
Email: smartmetering@decc.gsi.gov.uk

This document is available on the DECC website at:
http://www.decc.gov.uk

and on the Ofgem website at:
http://www.ofgem.gov.uk

Foreword by Charles Hendry MP, Minister of State for Energy

Ensuring secure supply, moving to a low-carbon economy and keeping prices affordable are the key challenges that drive our energy and environmental policies. Smart metering - enabling consumer behaviour change, revolutionising industry processes and customer service, facilitating smart grids - is central to that framework. We have therefore made a full rollout of smart meters to homes and businesses a key part of our Programme for Government.

Last July, DECC and Ofgem published the Smart Metering Prospectus - setting out proposals on the key elements of a smart metering rollout and provided a basis to test those proposals and reach conclusions. This document sets out our conclusions.

We have reached this point as a result of the hard work that has been done since July by all those involved. So I should like to record my gratitude for the crucial contributions that individuals and organisations have made to this process including, of course, Ofgem, which has managed the first phase of the Programme.

The conclusions set out here cover areas as wide ranging as how the smart metering rollout will be organised and regulated, its speed, the technical specifications of meters and communications equipment, the role and establishment of the central body that will deal with communications to and from meters and the consumer experience that is so central to a successful rollout.

We have gone through a stringent process because we must be confident that we are taking the right decisions necessary for a successful and more rapid rollout. The smart meter rollout is an enormous logistical undertaking - more than 50 million electricity and gas meters - and a substantial financial investment - over £11 billion.

This programme will directly affect us all. For Great Britain, it provides a platform to help us meet those challenges of energy security and climate change. For our industry, it will change the way in which we operate, the goods and services we use and how we use them. And as individuals - all of us will see smart meters installed in our homes or where we work, and we will need to act to realise the benefits that they can offer. And those benefits are substantial - £7 billion over and above the cost of the rollout.

We now enter the second phase of the Programme – the Foundation Stage. During the Foundation Stage, the metering technical specification will be finalised; suppliers will procure, test and begin to roll out meters; and the Data and Communications Company, which will handle communications to and from smart meters, will be set up. The Foundation Stage will be critical. By delivering a positive consumer experience of smart metering, by ensuring that industry is ready and able to roll out millions of meters, it will build a solid platform for the mass rollout.

The central Programme will be managed by DECC, but its success will depend on the engagement and expertise of industry, national representative organisations, local organisations and individuals, together with government and regulators. That will ensure we deliver the full benefits of the programme; for consumers, for industry and for Great Britain as a whole.

Foreword by The Lord Mogg KCMG, Chairman of GEMA

The rollout of smart meters will lead to a major change in how electricity and gas markets operate. Smart metering will empower consumers by providing valuable, accessible information to help them to use energy more efficiently. It will also help stimulate competition, by facilitating new entry, creating opportunities for innovation and enabling easier, better-informed customer switching. In a wider environment of rising energy prices, the ability to get the best possible value out of each unit of energy is critically important in keeping energy affordable for all consumers.

Ofgem's principal duty is to protect the interests of current and future energy consumers. In this context, we welcomed the opportunity to manage, on behalf of DECC, the policy design phase of the Smart Metering Implementation Programme. Our skills and expertise have, we believe, made a significant and positive contribution for both the programme and consumers in building the right underpinnings for implementation.

The start of the detailed implementation phase is an appropriate point for Ofgem to reposition our involvement in the programme. It is the right time for us to focus more directly on the regulation of the market as it develops in the light of smart metering. We have already initiated this process with the "Spring Package" proposals published for consultation last month. These seek to strengthen consumer protections as activities by suppliers moving ahead of the mass rollout of smart meters become increasingly prevalent.

We will, of course, continue to work constructively with government on this and other issues - such that policy development and implementation can draw on Ofgem's regulatory and market knowledge.

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Executive Summary

This document, together with its supporting documents, represents the Government's response to consultation on the proposals set out in the July 2010 Prospectus for the Smart Metering Implementation Programme ("the programme") and its supporting documents. This is based on joint work carried out by the Department of Energy and Climate Change (DECC) and the Office of Gas and Electricity Markets (Ofgem). These have been informed by the evidence collected through the consultation period. The supporting documents published alongside this document provide more details on the Government's conclusions and the next steps for the programme.

The Government's vision is for every home in Great Britain to have smart energy meters, giving people far better information about, and control over, their energy consumption than today. Businesses and public sector users should also have smart or advanced energy metering suited to their needs.

The rollout of smart meters will play an important role in Britain's transition to a low-carbon economy, and help us meet some of the long-term challenges we face in ensuring an affordable, secure and sustainable energy supply. Consumers' interests lie at the heart of the programme.

Scope

This document sets out the Government's conclusions on the policy design for the implementation of smart metering following the consultation on the Prospectus and its approach in critical areas such as data privacy and consumer engagement. It also sets out how the Government will take forward implementation and the associated legislative and regulatory changes.

The conclusions cover a broad range of issues, from aiming to facilitate investment to the delivery of consumer benefits. In relation to the commercial and technical foundations for the mass rollout of smart metering, these conclusions fall into three parts:

1. The design of new obligations on energy suppliers to install smart meters to a timetable that best delivers the benefits for consumers

2. The definition of functions that each mandated smart metering installation must be capable of supporting – and the translation of this into technical specifications against which meters can be manufactured

3. The allocation of responsibilities and capabilities to manage the large volumes of data from smart metering effectively, efficiently and securely.

New obligations will be placed on industry participants to deliver the policy design. These obligations will be introduced principally using powers under the Energy Act 2008 and will be subject to the appropriate consultation processes. Compliance will be monitored and enforced by Ofgem as part of its wider regulatory responsibilities.

Key Government conclusions

New obligations on energy suppliers to deliver the rollout

To deliver the rollout, energy suppliers will be required to procure and install smart meters for their customers. Subject to a limited number of exceptions, the same obligations to deliver the rollout will apply in the domestic and smaller non-domestic sectors. The Government has concluded the following in respect of these obligations on energy suppliers:

- All energy suppliers should install smart metering equipment meeting required technical specifications by a specified target date. At a minimum, this targeting framework should include a completion date and mandatory reporting of progress. The Government's intention is to consult on an obligation on suppliers to effectively complete the rollout in 2019.

- Steps should be taken in the next phase of the programme to build a solid foundation for the mass rollout of smart metering. These include arrangements to support the technical and commercial interoperability of smart metering equipment and to support testing by industry of equipment, systems and processes. With these steps in place, the Government does not currently propose to oblige suppliers to install specific volumes of smart meters during this 'foundation' stage.

- From the start of the mass rollout, currently envisaged to be in the second quarter of 2014, meters installed, whether new or replacement, should be compliant with the required technical specifications.

Setting the technical specifications for smart metering

It is very important that smart metering equipment is fit-for-purpose and interoperable in order to facilitate the smooth functioning of the competitive market. The Government has concluded the following approach regarding the minimum functional requirements and technical specifications for smart metering equipment:

- The Functional Requirements Catalogue published alongside this document sets out the minimum requirements that the smart metering system must provide.

- These functional requirements will be converted into technical specifications against which meters can be manufactured – to a timetable consistent with compliant meters being commercially available at volume late next year. The technical specifications should reflect security requirements developed in response to rigorous security risk assessments.

Specifications based on robust, open and non-proprietary standards are critically important in controlling costs over time and ensuring that smart meters enhance choices for individual consumers. The Government will develop arrangements for the governance of the technical specifications, such that they can evolve over time.

Managing smart metering data

It will be essential to provide for a cost-effective, coordinated approach to the transfer of the large volumes of data from smart meters. The Government has concluded the following in respect of how responsibilities for managing this data should be allocated:

- Data and communications in the domestic sector should be managed centrally by a new, licensed Data and Communications Company (DCC). This will be regulated by Ofgem in a similar way to other monopoly service providers in the energy sector.

- DCC should be granted its licence following a competitive process run by the Government. Its service levels and means of recovering its costs will be regulated. It will be required to be independent from its contracted service providers, who in turn will need to be appointed following appropriate competitive processes. In the first instance, DCC's scope of activities should be limited to secure communications, access control, scheduled data retrieval and translation services. DCC will subsequently take on the role of meter registration.

- The Government will initiate the procurement process for the first generation of communication and data service contracts in parallel with the process to grant DCC's licence. This supports a process whereby, under current plans, DCC starts providing services to the market at the end of the first quarter of 2014.

The design and robust testing of industry systems, as part of a wider end-to-end system incorporating the smart meters installed at each premises, will be critical in ensuring that the system itself - and the data within it - are adequately protected. This will also help to ensure that efficiency improvements in industry processes more generally can be delivered over time.

Consumer engagement and protection

Positive consumer engagement is vital to delivering smart metering benefits in terms of reductions in energy consumption and carbon emissions. The Government has concluded the following in respect of how to promote consumer engagement and protect the interests of consumers:

- All energy suppliers should comply with a new code of practice governing smart metering installations at customer premises. This licence-backed code will include restrictions on unwelcome sales activities and on upfront or one-off charging for smart metering equipment. This will help to provide consumers with a positive experience when their new meters are installed.

- Consumers will have a choice over how their consumption data is used and by whom, except where data is required to fulfil regulated duties. The Government is minded to define regulated duties narrowly. Regarding access to data for other purposes, the Government can see the strength of the arguments for requiring suppliers to obtain explicit consent from consumers.

- The Government will develop a consumer engagement strategy. As part of this, there is a strong case for some elements of consumer engagement to be carried out centrally or on a coordinated basis. In addition to the role of suppliers in promoting engagement, such an approach could be particularly important in enabling all consumers to access the potential benefits of smart metering. Further work will be carried out in the next phase to develop this strategy.

Next steps

This document sets out a high-level implementation strategy and plan for the programme. This explains the programme of work to be managed and describes how engagement with stakeholders will continue.

This document represents the successful conclusion of the policy design phase, and marks the transition from the policy design phase to the implementation phase of the programme. DECC will be directly responsible for managing the implementation of the programme. Ofgem will continue to safeguard consumer interests and to regulate the energy market as it develops in the light of smart metering.

1. Introduction

1.1. The Government's vision is for every home in Great Britain to have smart energy meters, with businesses and public sector users also having smart or advanced energy metering suited to their needs.

1.2. The Prospectus set out the Government's broad vision of how the rollout of smart metering will play an important role in Britain's transition to a low-carbon economy. It will help to modernise the energy sector and to meet some of the long-term challenges faced in ensuring an affordable, secure and sustainable energy supply.[1]

1.3. Smart metering will help to achieve this objective primarily by enabling a step change in energy efficiency by providing consumers with information to help them to reduce the amount of energy they use. This will be supported by new products and services in a vibrant, competitive, more efficient market in energy and energy management services. It will also create the environment to support smart grids, which will enable the energy industry to manage the generation and distribution system more cost effectively.[2]

The business case for smart metering

1.4. The implementation of smart metering will be one of the largest and most complex changes undertaken by the energy industry. It will entail the almost complete renewal of the stock of electricity and gas meters for domestic and smaller non-domestic customers in less than a decade. This represents a significant acceleration of a process that would normally take around 20 years.

1.5. Approximately 53 million meters will need to be replaced, involving visits to over 30 million households and businesses. The new 'smart' meters will replace existing 'dumb' meters. The Government's impact assessments estimate that the total cost of the rollout programme will be £11.3 billion.[3] As outlined above, this investment is needed in order to support Britain's transition to a low-carbon economy.

1.6. The Government's impact assessment indicates that there is a strong business case for taking the programme forward. This predicts benefits across the domestic and smaller non-domestic sectors of £18.6 billion over the next twenty years, implying a net benefit of £7.3 billion. These benefits derive in large part from reductions in energy consumption and cost savings in industry processes. The costs and subsequent benefits are expected to come through customers' energy bills.

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[1] *Smart Metering Implementation Programme: Prospectus*, DECC/Ofgem, July 2010

[2] A smart grid can be defined as "an electricity network that can intelligently integrate the actions of all users connected to it - generators, consumers and those that do both - in order to efficiently deliver sustainable, economic and secure electricity supplies".

[3] *Smart meter rollout for the domestic sector (GB)* and *Smart meter rollout for the small and medium non-domestic sector (GB)*, DECC, March 2011

The approach to delivering smart metering

1.7. The key elements of the Government's approach for delivering smart metering are as follows:

- Putting consumers' interests at the heart of the programme. This involves empowering consumers to better manage their energy use, engaging consumers to raise awareness and understanding of the benefits that smart metering will enable, and protecting their interests through introducing additional safeguards where necessary.

- Setting requirements for the smart metering system against which suppliers will be required to deliver. These will be based on open, non-proprietary standards in order to promote competition, control costs over time and enable future developments.

- Making structural changes to the energy supply industry to support the new functions being delivered efficiently - and in a manner consistent with the protection of existing and future consumers and the ongoing effective operation of the competitive energy sector.

1.8. To implement this approach, the Government has established a central change programme. The programme is responsible for overseeing the development and implementation of the policy design, including establishing the commercial and regulatory framework to facilitate the rollout. Ofgem E-Serve has managed, on behalf of DECC, the policy design phase of the programme that has informed the Government conclusions set out in this document. Responsibility for the programme is now moving to DECC to implement this detailed policy design.

1.9. The Prospectus and its supporting documents set out a wide range of policy proposals for consultation, consistent with prior Government decisions, including:

- Requiring energy suppliers to install, within a specified timescale, smart meters at domestic and smaller non-domestic sites[4] that comply with a set of minimum functional requirements and technical specifications
- Creating a new GB-wide entity to centrally coordinate communications and data management for smart meters in the domestic sector
- Requiring suppliers to provide their domestic customers with a standalone display device capable of delivering near real-time information on their energy consumption in a readily accessible form
- Putting in place a new industry code, which will set out detailed industry arrangements relating to smart metering and will have governance arrangements to facilitate the development of industry rules and processes.

[4] For the purposes of this document, we define smaller non-domestic electricity and gas sites as those sites in electricity profile classes 3 and 4 and those non-domestic gas sites with consumption of less than 732 MWh per annum. The installation of advanced meters for larger non-domestic sites has already been mandated for completion by April 2014.

Stakeholder engagement

1.10. The support of a wide range of stakeholders is critical for the success of the programme. Our approach has been to draw on a wide pool of technical and consumer-focused expertise.

1.11. We received 279 responses to the Prospectus consultation, from 197 different stakeholders. These included respondents from the energy industry, service providers, consumer groups, academics, and a wide range of energy users and other stakeholders. We also received 17 responses from individual members of the public. Responses have generally welcomed the key proposals in the Prospectus. Many responses gave individual and corporate commitment to the rollout of smart metering. Responses were thoughtful, considered and provided valuable insight and evidence for our analysis. A list of respondents is contained in Appendix 1.

1.12. In developing our thinking we have considered the perspective of consumers, as well as the views of industry participants who will take on responsibility for delivery of the smart metering system. We have worked closely with stakeholders in a range of ways to test proposals and options at a greater level of detail and used extensive evidence submissions. These engagement mechanisms have included:

- We set up a number of specific smart metering advisory groups including: the Consumer Advisory Group made up of consumer groups and experts; and a Privacy Advisory Group to draw on government, industry and wider expertise in the areas of data protection and security. Ofgem also commissioned further research into consumer awareness of, and attitudes towards, smart metering. This is published alongside this document.[5]
- We set up key expert groups to draw on the experience of industry and other stakeholders. The Smart Metering Design Expert Group has considered functional requirements for smart metering equipment. The Data and Communications Expert Group has considered the scope, set up and activities of the central data and communications body. The Security Technical Expert Group has considered issues relating to the security of the end-to-end smart metering system.
- We convened an Implementation Coordination Group to provide the programme with a direct communication channel with key delivery partners and consumer organisations.
- We hosted a significant number of workshops with stakeholders on particular topics to discuss issues arising from consultation.
- We have also drawn on the experience of other European and international smart metering programmes.

1.13. We are very grateful for the commitment shown by the industry, consumer representatives and other stakeholders in responding to the consultation, requests for information, expert groups and other stakeholder events. We look forward to their continuing engagement as the programme moves forward.

[5] *Ofgem Consumer First Panel Year 3 - 2010/2011, Findings from first workshops*, Opinion Leader, March 2011

Legal framework

1.14. The Government's overall approach will be to place licence and code obligations on industry parties to deliver the rollout of smart metering, while providing an environment that provides appropriate certainty for investment and encourages technology and product innovation.

1.15. The regulatory arrangements to provide for this approach will be introduced principally using powers under the Energy Act 2008.[6] These enable the Secretary of State to amend existing licences and associated industry codes and to create a new licence, code and licence application regulations in respect of the new data and communications body. The Government's intention is to bring forward proposals later this year, and for the necessary elements to start coming into effect in the first half of 2012.

1.16. In the period before the Government puts in place these new regulatory arrangements, the gas and electricity markets will continue to be regulated by Ofgem under the prevailing framework. This may include changes following from Ofgem's Spring Package proposals. Ofgem's principal objective is to protect the interests of existing and future consumers, wherever appropriate by promoting effective competition in the gas and electricity markets.

1.17. Once the Government has put in place the licence obligations on suppliers to deliver the rollout of smart metering, Ofgem will monitor compliance with those obligations as part of its wider market surveillance work, where necessary using enforcement powers to secure compliance. Ofgem will look to make sure that regulatory arrangements for the gas and electricity markets remain fit-for-purpose in a smart metering environment.

The structure of this document

1.18. The next five chapters set out the Government's response to consultation on the Prospectus proposals for the introduction of smart metering:

- Chapter 2 sets out the benefits and impacts of smart metering for consumers
- Chapter 3 sets out the obligations on suppliers to deliver the rollout and to promote a positive consumer experience
- Chapter 4 sets out the approach to setting minimum, common standards for smart metering equipment and to maintaining security of the end-to-end system
- Chapter 5 sets out how communication of data to and from smart meters in the domestic sector will be managed centrally by a new GB-wide function
- Chapter 6 sets out the proposed next steps for the implementation of smart metering, including the regulatory and commercial framework, and describes the subsequent phases of the programme.

[6] To provide for the appropriate range of powers during the course of rollout, the Government has brought forward amendments in the current Energy Bill to extend and broaden the 2008 powers.

1.19. Appendix 1 lists all those stakeholders that responded to consultation and sets out where to find summaries of their responses (and the responses themselves). Appendix 2 summarises the key conclusions drawn in response to consultation.

1.20. We are also publishing a number of supporting documents.[7] These set out in more detail the responses received to consultation, other evidence gathered and analysis undertaken. The supporting documents are as follows:

- *Data Access and Privacy*. This expands on specific issues discussed in Chapter 2.
- *Rollout Strategy*. This expands on material contained in both chapters 2 and 3.
- *Design Requirements*. This expands on Chapter 4.
- *Central Communications and Data Management*. This expands on Chapter 5.
- *Implementation Strategy*. This expands on Chapter 6.

1.21. Alongside this document, DECC has published the Government's revised impact assessments for the rollout of smart meters to the domestic sector and for the rollout of smart meters and advanced meters to small and medium non-domestic and public sector sites.[8]

[7] These documents can be found on both the Ofgem and DECC websites (www.ofgem.gov.uk and www.decc.gov.uk).
[8] *Smart meter rollout for the domestic sector (GB)* and *Smart meter rollout for the small and medium non-domestic sector (GB)*, DECC, March 2011

2. Delivering Smart Metering to GB Consumers

The Smart Metering Implementation Programme represents a major investment for Great Britain - to be delivered by energy suppliers. This chapter explains why this investment is needed and how it will manifest itself over time. It also explains how consumers will be supported and protected through this process.

2.1. Consumers' interests are central to the smart metering programme. The introduction of smart metering will deliver important benefits for domestic and smaller non-domestic consumers. This includes near real-time information to help understand and manage energy use, thereby helping them save money and play their part in reducing carbon emissions. Smart metering will also open up new products and services, such as the provision of tailored energy efficiency advice and more innovative tariffs.

2.2. Smart metering will enable suppliers to offer improved customer service. Suppliers will be able to read meters remotely, without a meter reader needing to visit a customer's property, which will lead to an end to estimated bills. In addition, consumers will not need to be at home for their meters to be read. Remote real-time meter readings will help smooth the process when a customer changes supplier or moves home.

2.3. In the longer term, improvements to industry systems will promote competition by enabling a faster, smoother change of supplier process. Customers will also benefit from the cost savings made by suppliers not having to visit their homes to physically read meters. We envisage that these and other savings will be passed through to customers.

2.4. Smart metering will also enable wider customer service benefits. For example, suppliers and networks will be able to receive alerts if a customer goes off supply (ie there is a power cut) and when supply is restored. This will enable corrective action to be taken sooner, thereby minimising disruption to customers.

2.5. The remote functionality of smart meters will allow switching between payment methods (credit or prepayment) and will open up additional payment channels for prepayment customers. Payment options should also become more flexible (eg top-ups over the phone, via the internet or at ATMs), promoting a wider pay-as-you-go market. Consumers will still be able to top-up with cash at payment outlets.

2.6. The prepayment capability of smart meters should also enable suppliers to better manage customer debt, resulting in cost savings that can be passed on to consumers. Consumers will also benefit through alternative approaches to debt management, potentially including load-limiting measures (such as "trickle" or limited duration disconnection) and immediate reconnection when a debt is paid off or if a customer is identified as vulnerable.

Key Government conclusions

- ➔ Suppliers should provide domestic consumers with an IHD that meets the relevant technical specifications. In doing so, consideration will need to be given to consumers' accessibility requirements.
- ➔ Consumers will have a choice over how their consumption data is used and by whom, except where data is required to fulfil regulated duties. The Government is minded to define regulated duties narrowly. Regarding access to data for other purposes, the Government can see the strength of the arguments for requiring suppliers to obtain explicit informed consent from consumers.
- ➔ The Government will develop a strategy for promoting consumer engagement. As part of this, there is a strong case for some elements of consumer engagement to be carried out centrally or on a coordinated basis.
- ➔ Suppliers should develop and comply with a new code of practice governing the installation of smart meters at customer premises. This licence-backed code will include restrictions on unwelcome sales activities and on upfront or one-off charging for smart metering equipment.

Consumer experience of the smart metering rollout

2.7. Energy suppliers will be responsible for the deployment of smart meters to their domestic and smaller non-domestic customers. It is important that the consumer experience of the rollout and installation process is positive and promotes awareness of the benefits of smart metering. This will be important in securing energy savings. Our proposed approach to requiring suppliers to deliver the rollout of smart metering is set out in Chapter 3.

2.8. Given the need to visit over 30 million homes and businesses, the rollout of smart metering across Great Britain will take place over a number of years. Some consumers are already receiving meters with smart functionality, based on voluntary deployments by "early mover" suppliers, such as British Gas, First Utility and Utilita. From around the second half of 2012, suppliers are likely to begin installing smart meters where existing dumb meters are due for replacement. Once the necessary preparations have taken place, estimated to be in early 2014, the pace of rollout will accelerate to hit the completion date, such that existing dumb meters are replaced faster than they otherwise would have been.

2.9. As part of the rollout, consumers will receive a new smart meter and, for domestic consumers, an in-home display (IHD), which will help them to understand their energy use. We envisage that energy suppliers and others will offer consumers new products and services around this standard meter and IHD.

2.10. Consumer take-up of the opportunities facilitated by smart meters and consumers' ability to use effectively the information that meters provide will be vital to the success of the programme. We believe it is important that all consumers are

able to take advantage of the benefits of smart metering and that the rollout is delivered in an efficient and effective manner. It will be important that the necessary conditions and support arrangements are in place to enable vulnerable customers to realise the benefits of smart metering. The Government will not set specific priorities for groups of consumers as part of the early stages of the rollout process. Instead, the need for such measures will be kept under review as the rollout progresses. This review process is discussed in Chapter 3.

Protecting consumers

2.11. It will be important to continue to safeguard consumers' interests in a smart metering environment. There are already significant measures in place, both in suppliers' licences and in general consumer law, to protect energy consumers and enable them to exercise choice as to their energy supplier. As the regulator, Ofgem expects suppliers to meet these obligations in full. Nevertheless, smart metering does present new issues that it will be important to address.

2.12. Ofgem is currently consulting on a range of licence changes that will update the consumer protections in the gas and electricity supply licences to reflect a smart metering environment.[9] These include clear rules around remote switching from credit to prepayment mode and remote disconnection, and measures to enable customers to continue to change supplier during the transition to smart metering.

2.13. At this stage, Ofgem's proposals aim primarily to address the consumer protection issues that arise in the context of "early movers" who are already installing meters with smart functionality. The Government welcomes Ofgem's proposals for updating consumer protections to reflect a smart metering environment. Other consumer protection issues that arise will either be considered by the programme in its next phase of work or by Ofgem as part of its ongoing duties.

Promoting consumer engagement

2.14. Individual suppliers will have an important role to play in promoting positive engagement among their customers. We envisage that suppliers will explore ways of working with local authorities and other organisations to inform consumers about smart metering and what to expect from installation visits. Experience in other areas, such as the Digital Switchover programme, has shown that the involvement of trusted third parties can be very helpful, particularly for vulnerable consumers.

2.15. We have worked with consumer groups and other stakeholders to identify potential mechanisms to promote consumer engagement. Based on our analysis, the Government considers that there is a strong case for some consumer engagement activities to be carried out centrally or on a coordinated basis. These activities may include facilitation of interactions between individual suppliers, local authorities and

[9] *Smart Metering Spring Package - Addressing Consumer Protection Issues*, Ofgem, February 2011

trusted third parties, to increase the efficiency and effectiveness of local engagement. Such an approach could be important both to promote general consumer awareness and confidence and to enable all consumers to access the benefits of smart metering.

2.16. Further work is needed to develop an overarching strategy for promoting consumer engagement. This will include analysis to determine the appropriate objectives, scope, governance and funding arrangements for any centrally-coordinated activities. It will also include further investigation of initiatives to promote engagement, such as activities to build consumer knowledge and awareness, and how to assist particular consumer groups. In the next phase, the programme will take forward this work as a priority.

The installation visit

2.17. A key element of the consumer experience of smart metering will be the installation visit. To protect consumers and promote a positive consumer experience of the installation, the Government has concluded that suppliers in both the domestic and smaller non-domestic sectors should be required by their licences to develop and comply with a new code of practice for the installation process. This licence-backed code will be subject to approval by Ofgem. This will help provide consistent messages for customers about what to expect and to ensure certain standards are maintained.

2.18. The key objectives of the code of practice will be to protect consumers during the smart meter installation process and to help facilitate the longer-term behavioural change necessary to deliver programme benefits. In this way, suppliers will be required, among other things, to provide consumers with information on how to benefit from their smart meters; to deliver a good standard of service to all customers; and to provide appropriate support to vulnerable consumers. The code of practice will complement existing industry codes and consumer protections, such as the Guaranteed Standards of Performance.[10]

2.19. The code of practice will have an appropriate governance regime and monitoring arrangements to enable it to be adapted in the light of experiences from early smart meter deployments. Steps will be taken to ensure that there is broad stakeholder engagement in the development and management of the code. Ofgem will have the right to veto any changes to the code and will be able to instigate changes.

2.20. The installation visit represents an opportunity to engage consumers on energy efficiency issues. However, we share the concerns of consumer groups about the potential for installation visits to be used by suppliers for unwelcome sales and marketing purposes.

[10] As set out in the Electricity (Standards of Performance) Regulations 2010 and the Gas (Standards of Performance) Regulations 2005.

2.21. Suppliers will be required, through the code of practice, not to engage in unwelcome sales activities at the point of installation for domestic sites. In complying with this principle, the Government considers that suppliers should not conclude any sales at the time that smart meters are installed, without the customer's express prior consent. Where customers have given consent, any sales activities should be conducted in a fair, transparent, appropriate and professional manner. The programme will consider further the definition of "sales activities", and whether and how restrictions should be applied to face-to-face marketing activities carried out during the installation visit, given the broader scope of the term marketing. The Government considers that such rules should not preclude leaving marketing materials behind.

2.22. Suppliers will also be required, through the code of practice, not to impose upfront or one-off charges on domestic customers for the smart metering equipment that they are required to provide. Subject to the limitations on unwelcome sales activities at the point of installation, suppliers will still be able to offer their customers value-added products and services, such as an enhanced IHD, for an upfront charge or as part of a new tariff package. Any such sales will of course be subject to general consumer protection rules.

2.23. More detail on the approach to protecting consumers and developing a consumer engagement strategy is set out in the "Rollout Strategy" supporting document.

Helping consumers understand their energy use

2.24. The most visible part of the smart metering system for domestic consumers will be the IHD. This will provide near real-time information on their energy consumption in a readily accessible form. Suppliers will be responsible for providing their domestic customers with an IHD as part of the rollout.

2.25. A substantial proportion of the benefits of smart metering are expected to come from improved energy efficiency. The provision of the display is important in promoting greater consumer awareness of energy usage. Additional measures will also be important, such as those taken up under the Green Deal and the provision of information and energy efficiency advice to consumers.

2.26. At a minimum, every IHD will be required to provide information on:

- Current and historical electricity and gas consumption
- Usage in pounds and pence as well as kilowatts and kilowatt hours
- Ambient feedback that allows consumers to easily distinguish between high and low levels of current consumption
- Account balances.

2.27. More detail on these requirements is set out in the "Design Requirements" supporting document.

2.28. When IHDs are provided in the domestic sector, suppliers will be required to provide advice on their use. This will help customers understand how they can use the information to save money by better managing their energy consumption. This requirement will be set out in the new installation code of practice.

2.29. Where a domestic customer makes it clear that they do not wish to have the IHD, suppliers will be expected to make alternative arrangements for providing consumption information, for example via customer bills. The Government and Ofgem will consider whether additional obligations are needed for this purpose. If, within a year of the installation visit, a customer changes their mind and decides that they would like an IHD, they will be entitled to receive one from their supplier, without an upfront or one-off charge, which meets the relevant technical specifications. This will encourage suppliers to properly explain the advantages of IHDs and encourage take-up at the initial visit. The process for developing these specifications is discussed in Chapter 4.

2.30. The Government will consider how best to ensure that, when providing customers with IHDs, suppliers meet consumers' accessibility requirements. In the next phase, the programme will explore whether the principles of "inclusivity by design" could be included within the technical specifications for the smart metering system.

2.31. More detail on suppliers' responsibilities in relation to providing IHDs is set out in the "Rollout Strategy" supporting document.

2.32. Consumers will have different preferences for the way they would like to receive information about their energy consumption. We envisage that suppliers and other service providers will build on these minimum specifications, for example by providing a wider range of services around information on usage or additional functions.

2.33. By ensuring that open standards are used in the way that smart meters communicate with IHDs and other in-home devices, consumers will, subject to appropriate security controls, be able to add their own display and other devices. For example, we envisage that some consumers may wish to buy more sophisticated devices (such as smart appliances) directly from the consumer electronics market.

2.34. We would also expect to see the development of more options for consumers to access smart metering information through a range of media (eg the internet, mobile phones or locally via a personal computer). The programme will consider further with industry and other stakeholders the practical arrangements for this as part of the technical specification development work.

Data access and privacy

2.35. Smart metering will result in a step change in the amount of data available from gas and electricity meters. This will in principle enable energy consumption to be analysed in more detail by consumers (or other authorised parties) and to be 'read' more frequently by suppliers. Smart meters will allow consumers to view their consumption history and compare usage over different periods.

2.36. As set out earlier, this data will help enable the delivery of significant benefits for consumers. This data is of value to suppliers to help them in managing their wholesale energy costs and other aspects of their operations. It is also of value to network companies in running their networks and planning investment.

Protecting consumers' data

2.37. The availability of this data, particularly at a half-hourly level or more granular form, raises some potential privacy concerns as it could reveal information about the lifestyles of consumers. These concerns need to be addressed to protect consumers and to ensure that consumer confidence in smart metering is maintained.

2.38. In the Prospectus, we proposed the principle that consumers should have a choice as to how their data is used and by whom, except where it is required to fulfil regulated duties. Respondents were generally supportive of this principle, though noted that what constitutes regulated duties is critical, as is how customer choice is given effect. The Government confirms that the overarching principle of consumer choice will underpin the programme's privacy policy.

2.39. We recognise that this is an important issue. The Government is committed to following the principle of "privacy by design", so that privacy issues are considered before and while the smart metering system is designed, rather than afterwards. We have worked closely with suppliers, consumer groups, privacy experts and others to identify possible data uses and options for addressing privacy concerns. This work is continuing and, as yet, no decisions have been taken on how best to give effect to the overarching principle. It is important that the arrangements to put this principle into effect do not interfere with existing and separate statutory provisions that provide for access to data for other purposes.

2.40. The Government is minded to define "regulated duties" narrowly, covering only the data that is essential to meet licence requirements, given that customers would not have a choice over whether to provide data for these purposes. Any data used for these purposes will need to be kept to a minimum (eg through aggregation where possible) and not all regulated duties will require access to half-hourly or other forms of data. The programme has already started working with stakeholders to examine the level of data required for these purposes and will continue this work in the next phase.

2.41. Beyond regulated duties, there are other purposes for which data could be used (eg to inform the development of time-of-use tariffs). We have already stated that consumers should have a choice as to how their consumption data is used for these purposes. In the light of discussions with stakeholders, the Government can see the strength of the arguments for requiring suppliers to obtain explicit, informed consent from consumers to access such data. We remain to be convinced of the case for allowing suppliers access to such data as the default.

2.42. The programme will undertake further analysis in the next phase to inform a decision. This will include assessing the potential impacts on the delivery of smart metering benefits and on the development of a wider market for energy services. The Government continues to see the development of a Privacy Charter as important in helping to address privacy concerns by making clear to consumers how their data will be used and to suppliers and others how they may use consumer data.

2.43. Where personal data is collected it is essential that it is handled securely. Chapter 4 sets out the programme's approach to assuring the security of the end-to-end smart metering system.

2.44. In addition, it is important to address privacy issues for consumers receiving meters with smart functionality from suppliers now. Ofgem set out in its Spring Package consultation that it will work with the Information Commissioner's Office and use its own consumer protection powers where appropriate to make sure companies comply with current legislation and that consumers are aware of the choices open to them. Ofgem will monitor progress in this area.

Enabling access to consumers' data

2.45. It is also important that customers have access to their own consumption data (eg to compare tariffs), and are able to easily share it with third parties (eg energy services companies or switching sites) should they wish to do so. The Government has concluded that at least 13 months of data should be stored locally at the meter. This is important for enabling customers to access their own data and to compare their usage with the corresponding period the year before.

2.46. Further work is required to determine how consumers might then in practice access that data or allow others to do so. This will be taken forward as part of the development of technical specifications for the different elements of the metering system. The process for developing these specifications is set out in Chapter 4.

2.47. More detail on these issues is set out in the "Data Access and Privacy" supporting document.

3. Approach to the Rollout of Smart Meters

This chapter sets out some of the key factors shaping the timetable for the rollout of smart meters in the domestic and smaller non-domestic sectors, including the Government's proposed framework for driving completion. It describes how this framework will be given effect through placing obligations on suppliers, supported by a compliance regime. It also explains how the rollout of smart meters will be facilitated in the short term in a way that supports "early movers" and builds a solid foundation for the mass rollout.

Rollout strategy

3.1. The Government has set ambitious goals for smart metering in Great Britain in terms of the scale and scope of the rollout programme. These include the deployment of both gas and electricity smart meters to domestic and smaller non-domestic consumers, underpinned by a strong emphasis on consumer benefits. The programme is focused on putting in place the building blocks to enable the rollout to get off to a good start and to be completed in a cost-efficient and timely way.

3.2. The Prospectus set out the Government's desire to accelerate the rollout compared to previously published targets in order to secure early delivery of the benefits. We challenged industry to examine the opportunities for realising more ambitious but achievable targets for the rate at which suppliers must install smart meters. In response, industry and other stakeholders have provided us with a large amount of data and analysis. This material and other evidence has helped inform the Government's aims for the completion of the rollout.

3.3. Given the scale and scope of the rollout, there are uncertainties in assessing the costs, benefits and risks associated with different profiles. The meter installation rates required during the mass rollout will be in the order of three or four times higher than the normal rates at which meters are replaced today. In addition, while we can learn from experience in those countries where there have already been relatively large-scale rollouts, the rollout in Great Britain will involve some unique features.

3.4. Evidence provided to date by industry and from international deployments indicates that a range of timescales are possible for the effective completion of the rollout. This shows that acceleration is possible such that the rollout could be effectively completed in 2019, a full year or more ahead of previously published targets. The programme will continue to work with the industry and other stakeholders to examine the opportunities to accelerate the rollout in a way that supports the delivery of the programme and protects the interests of consumers. Such further assessment will consider the impact on benefits, costs and risks, and on competition in the energy market.

3.5. More detail on this analysis is set out in the "Rollout Strategy" supporting document.

Key Government conclusions

- ➔ Suppliers should be set licence obligations to deliver the rollout of smart metering in the domestic and smaller non-domestic sectors, underpinned by an appropriate compliance regime.
- ➔ The Government will bring forward a proposal to obligate suppliers to take all reasonable steps to complete the rollout in 2019. It will initiate a consultation on detailed licence obligations on this basis, with a view to these coming into effect in the first half of 2012.
- ➔ From the start of the mass rollout, envisaged to be at the start of the second quarter of 2014, suppliers should be required to take all reasonable steps to install only compliant smart meters.
- ➔ The period before the second quarter of 2014 will provide the opportunity to build a solid foundation for the mass rollout of smart meters. During this foundation stage, measures should be put in place to support technical and commercial interoperability. Industry participants may be required to conduct activities and deliver outputs in accordance with the programme's approach to building market readiness to be developed in the next phase.
- ➔ The programme will review rollout progress during the foundation stage and will propose changes to these arrangements if appropriate ahead of the mass rollout.

Obligations on suppliers to deliver the rollout

3.6. Energy suppliers will be responsible for the rollout of smart meters to their domestic and smaller non-domestic customers. To achieve the goal of rolling out smart meters in a timely way, the Government plans to put completion obligations in suppliers' licences. One key element of the targeting framework will be a completion date. At this stage, the Government is not proposing to introduce interim targets, but will keep the issue under review.

3.7. In line with its policy ambition, the Government will bring forward a proposal to require suppliers to take all reasonable steps to complete the rollout in 2019. The Government's intention is to bring forward proposed licence changes later this year, for consultation, such that the completion date can be introduced into suppliers' licences in the first half of 2012.

3.8. The Government will also introduce a requirement that any meter installed, whether new or replacement, must comply with the required technical specifications for smart meters. Under the baseline plan, this will apply from the start of the second quarter of 2014, when it is envisaged that the market will be ready for the mass rollout to commence. The timing of introduction of the new and replacement obligation will be kept under review. As the programme moves through the next phase towards the start of the mass rollout, the commercial incentives for suppliers to install compliant smart meters will progressively increase.

3.9. The Government will also bring forward proposals to require larger suppliers to submit and maintain plans that are realistically capable of achieving their rollout obligations and to report on progress with their rollout plans on a regular basis.

3.10. The installation of smart meters at smaller non-domestic sites will be required to happen on the same timescale as for domestic sites. As such, the same broad obligations will apply to suppliers in the smaller non-domestic sector. Nevertheless, in recognition that some smaller non-domestic consumers already have meters with advanced rather than full smart functionality, certain exceptions will apply. As proposed previously, if customers have advanced meters installed before April 2014 and wish to retain them, then these meters will not need to be replaced by smart meters. This also applies to meters installed after April 2014 under pre-existing contracts. This approach will help customers to continue to make energy and carbon savings from these meters and minimise disruption and cost.

3.11. Once the Government has put in place the licence obligations on suppliers to deliver the rollout of smart metering, Ofgem will monitor and enforce compliance with those obligations. An appropriate regime to monitor compliance will be established in the next phase.

Building a solid foundation for rollout

3.12. The next phase of the programme will set the foundation for the mass rollout of smart metering. This must be a solid foundation. The deployments and preparations that take place in this period will be vital to build industry readiness and deliver a positive consumer experience during the mass rollout.

3.13. The Government has concluded that a number of specific steps should be taken to create the right environment to build a solid foundation for the rollout in the domestic and smaller non-domestic sectors. Firstly, arrangements will be put in place to support the technical and commercial interoperability of smart metering equipment. This will help ensure that consumers are able to switch supplier during the foundation stage. Secondly, the transition of communications contracts to DCC will be facilitated when it begins providing services. Finally, equipment, systems, processes and consumer engagement strategies will be tested, and lessons learned, before the mass rollout begins. These steps are outlined below.

- Installing suppliers will be obliged to offer to provide data and communications services to an incoming supplier or to novate existing communications contracts. These elements will enable an incoming supplier to retain smart functionality where a compliant smart meter has been installed. This therefore reduces the risk of investment in compliant meters being stranded.

- The programme is working towards the inclusion of a definition of standardised messaging services within the smart metering technical specification. This is an important step towards ensuring that meters are technically interoperable, including by speaking the same language regardless of what communications

technology is installed. The development of the technical specification is discussed in Chapter 4.

- In order to provide certainty to suppliers that have installed compliant smart meters prior to DCC starting operation, the programme will develop a framework whereby DCC will be obliged to adopt communications contracts for such meters, subject to defined criteria. These criteria are discussed further in Chapter 5.

3.14. With these steps in place, the Government has concluded not to mandate a staged approach to implementation. As such, it does not currently propose to oblige suppliers to install specific volumes of smart meters during the foundation stage. Suppliers will therefore have broad flexibility over the volume and pattern of their installations before the mass rollout begins. Nevertheless, the Government and Ofgem are keen to see early smart meter deployments to the extent that they improve consumer choice and levels of service, and facilitate effective competition.

3.15. The detail of the steps that the Government takes will depend on how the current regulatory framework evolves over time. In this regard, Ofgem is currently consulting through its "Spring Package" on measures to improve consumer protections in respect of smart metering.

3.16. Ofgem's "Spring Package" also consults on new obligations to support commercial interoperability. Subject to this consultation, suppliers installing compliant smart meters may be required to offer reasonable and non-discriminatory terms to an incoming supplier for the provision of data and communications services. Prior to confirmation of the technical specifications, we envisage rents paid by suppliers for meters with smart functionality being charged at 'dumb' rates as most suppliers would not have developed systems that can implement any smart functionality. Once the smart metering technical specifications are finalised and bulk supply of compliant meters are available – envisaged to be in late 2012 – the costs and risks attached to smart meters would be passed, on change of supplier, from the installing supplier to the incoming supplier. In this way, the incoming supplier would have to bear the 'smart' rent for that meter.

3.17. Given that smart metering will involve substantial changes, it is important that proper readiness for these changes is achieved across a number of areas to provide a platform for mass rollout. These areas include: consumer readiness; changes to regulatory and commercial arrangements; and the completion of testing and trialling of new processes and systems. In the next phase, the programme will develop its approach to market readiness, with the Government bringing forward any necessary proposals - including any regulatory obligations - for the domestic and smaller non-domestic sectors.

3.18. More detail on the approach to the foundation stage is set out in the "Rollout Strategy" supporting document.

Monitoring and reviewing rollout

3.19. The programme will monitor and review the progress of the smart metering rollout, including the consumer experience of the process, and evaluate the evolving costs and benefits. As noted earlier, this will be informed by data from larger suppliers, who will be required to report regularly on progress against their rollout plans and may be asked to provide other information. The programme may also undertake additional consumer research.

3.20. Drawing on its analysis and evidence from the early stages of the rollout, the programme will review progress towards the end of the foundation stage. This will draw on, among other things, learnings from suppliers' trials and pilots. The Government may then propose modifications to the rollout strategy where these would address issues identified or provide for enhanced benefits. These could include measures to promote consumer engagement or, ultimately, to roll out smart meters on an area-by-area basis. This work will link with the consumer engagement project discussed in Chapter 2. To provide for the appropriate range of powers during the course of rollout, the Government has proposed new provisions in the Energy Bill currently before Parliament.

3.21. As set out earlier, as part of its enforcement work, Ofgem will monitor compliance with the obligations that will be placed on suppliers to deliver the rollout.

Operational aspects of rollout

3.22. The programme has worked closely with industry and other stakeholders to identify operational issues that could impact on the efficiency or consumer experience of the rollout. We have also drawn on learnings from trials conducted as part of the Energy Demand Research Project. For example, there may be benefits in cooperation between suppliers and others to address challenges posed by specific types of buildings (eg blocks of flats) where communications with meters may be more difficult. The programme will help ensure that issues are understood, and will seek assurance that parties who are responsible for resolving these issues have appropriate plans and processes in place. In the next phase, the programme will establish a new stakeholder group to facilitate the identification and discussion of these issues.

3.23. More detail on the approach to rolling out smart metering is set out in the "Rollout Strategy" supporting document.

4. Common Requirements for Smart Metering Equipment

This chapter sets out the Government's conclusions on the minimum functional requirements for the smart metering equipment to be installed in customers' homes and businesses. It also describes the process for developing those functional requirements into technical specifications against which meters can be manufactured. It also sets out how security is to be integrated within this process.

4.1. The rollout of smart metering will involve the introduction of a range of new equipment into customers' premises:

- Gas and electricity meters with smart functionality
- An IHD for domestic customers
- A wide area network (WAN) module to connect to the central communications provider
- A home area network (HAN) to link different meters within customer premises, the WAN module and the IHD (and potentially other consumer devices, such as microgeneration and load control devices).

4.2. This equipment represents the smart metering system within each customer's premises. Once connected together through a central communications function, this will form the end-to-end smart metering system.

4.3. Establishing a set of minimum functional requirements for the smart metering system that can then be developed into technical specifications is important to ensure technical interoperability and promote effective operation of the end-to-end smart metering system. This is important for the smooth functioning of the retail market, as it enables customers to switch supplier without the need to replace their metering equipment each time.

Key Government conclusions

➔ Suppliers should roll out smart metering equipment that meets a set of technical specifications.

➔ The technical specifications should be based on the minimum requirements set out in the Functional Requirements Catalogue published alongside this document.

➔ The technical specifications should also reflect security requirements developed in response to rigorous security risk assessments.

➔ The programme will facilitate the process of converting the functional requirements into technical specifications - such that compliant meters should be available in volume during 2012.

➔ The programme will develop enduring governance arrangements for the technical specifications for smart meters.

Functional requirements

4.4. The Government confirms that the smart metering system will support the high-level functions set out in Figure 1 overleaf. A full list of the functional requirements that must be supported by the smart metering system is included in the Functional Requirements Catalogue ('the Catalogue') published alongside this document. The main features are as follows:

- All electricity meters and domestic gas meters should be required to have functionality to support remote enablement and disablement of supply.
- The HAN should use open standards and protocols – so as to achieve interoperability and enable innovation by equipment manufacturers. This also keeps open the option of extending the smart metering system in future to support additional services such as water metering, where appropriate.
- IHDs should be connected to gas and electricity meters through the HAN. The minimum functionality to be provided by an IHD was described in Chapter 2.
- The WAN module should be capable of being separated from the meter to enable the module to be upgraded without exchanging the meter. WAN communications requirements are discussed further in Chapter 5.

4.5. Based on our analysis of consultation responses and detailed discussions with the programme's Smart Meter Design Expert Group, a broad range of stakeholders supported the vast majority of the proposed functional requirements. There were a limited number of issues raised in relation to these requirements. Some areas needed clarification and some were removed as they were duplicated or out of date. As a result, the Catalogue has been refined to provide further clarity in a number of areas. However, two elements of the Catalogue were subject to strong views. In this context, the following conclusions are drawn out:

- *Loss of supply alerts*. The Government considers that it is reasonable for consumers to expect that smart metering systems should contain the functionality to alert suppliers and networks when a consumer's electricity supply is lost. This will help network operators to respond to outages effectively and quickly. Our analysis indicates that the benefits outweigh the potential costs. Work will continue in the next phase to examine the most cost-effective way to deliver this functionality.

- *Data stored at the meter*. The proposed requirement for metering systems to store at least 12 months of half-hourly consumption data was strongly supported by consumer groups and energy services companies. They felt that this would benefit consumers and promote competition in both retail supply and the energy services markets. Local data storage was also seen as preferable from a data privacy perspective. Again, our analysis indicates that the benefits outweigh the potential costs. To support this requirement, work on the development of technical specifications will aim to ensure there are practicable routes for consumers to easily access their own consumption data.

Figure 1 - High-level functions of the smart metering system

	High-level functionality	Electricity	Gas
A	Remote provision of accurate reads/information for defined time periods ▪ delivery of information to customers, suppliers and other designated market organisation	✓	✓
B	Two way communications to the meter system ▪ communications between the meter and energy supplier or other designated market organisation ▪ upload and download data through a link to the wide area network, transfer data at defined periods, remote configuration and diagnostics, software and firmware changes	✓	✓
C	Home area network based on open standards and protocols ▪ provide "real time" information to an in-home display ▪ enable other devices to link to the meter system	✓	✓
D	Support for a range of time of use tariffs ▪ multiple registers within the meter for billing purposes	✓	✓
E	Load management capability to deliver demand side management ▪ ability to remotely control electricity load for more sophisticated control of devices in the home	✓	
F	Remote disablement and enablement of supply ▪ support remote switching between credit and prepayment modes	✓	✓*
G	Exported electricity measurement ▪ measure net export	✓	
H	Capacity to communicate with a measurement device within a microgenerator ▪ receive, store, communicate total generation for billing	✓	

* Domestic sector only

4.6. The Government considers that these conclusions support delivery of the right level of minimum functionality at a reasonable cost to consumers. Based on discussions with network operators and other stakeholders, among other things, this approach to the delivery of smart metering will provide functionality with the potential to support other initiatives:

- Smart grids - including setting functional requirements that support a wide range of potential smart grid requirements and by making it possible for the WAN module to be exchanged for improved communications technology without changing the meter.

- Electric vehicles - by providing the potential for consumers to charge these vehicles at home using smart meter controls or to refuel at alternative charging points while paying for the electricity through the customer's energy bill.
- Additional services, such as energy management and smart water metering.

4.7. There are some differences between the functional requirements for the domestic and non-domestic sectors. In particular, the Government has previously decided that meters for the smaller non-domestic sector will not be mandated to include functionality to support remote enablement and disablement of gas supply (a "gas valve") and suppliers will not be required to provide IHDs to their non-domestic customers. Nevertheless, suppliers may choose to offer meters with gas valves and to provide IHDs to consumers in this sector.

4.8. Details of the functional requirements for the smart metering system are set out in the "Design Requirements" supporting document. As noted earlier, an updated Functional Requirements Catalogue is also published alongside this document.

Technical specifications

4.9. Building on the functional requirements outlined above, the Government has concluded that technical specifications should also be mandated, based on open, non-proprietary standards. These specifications are considered important to provide for the technical interoperability of all metering equipment such that equipment at customer premises does not need to change with a change of supplier. They will provide certainty to meter manufacturers (who need to gear up production lines) and to suppliers (who need to procure equipment).

4.10. There was strong support for the proposal that stakeholders should be closely involved in the production of a technical specification; indeed, industry holds expertise in this area. The programme will therefore oversee the work of the Smart Metering Design Expert Group (comprised of industry and consumer groups) to convert the functional requirements into technical specifications against which meters can be manufactured.

4.11. This process will be carried out to a timeline consistent with notification of the technical specifications to the European Commission later this year, such that meters that comply with the specifications can be commercially available at volume during 2012.

4.12. The governance arrangements for the initial and ongoing development of the technical specifications will be considered during the next stage of development of the regulatory and commercial framework for smart metering. This will cover arrangements prior to the establishment of new industry code arrangements and on an enduring basis. These will include setting out how the technical specifications may be modified; how suppliers and others will be required to comply with them; and how existing obligations in licences and codes will need to be modified in the light of their introduction.

System security

4.13. It is essential that arrangements are put in place for the security of the end-to-end smart metering system that are proportionate to the risks faced and that, on an enduring basis, protect consumers and meet the needs of stakeholders. To this end, the initial design needs to be right, which includes security being embedded into the design process from the start ("security by design"). As implementation of smart meters evolves, there need to be systems and processes in place to ensure that the design continues to be fit for purpose as security risks, technology, and the requirements continue to develop.

4.14. The equipment to be installed in homes and businesses (including meters, WAN and HAN modules and IHDs) is a key component of the end-to-end system. Security therefore needs to be integrated into the development of the technical specification for smart metering equipment, and recognised as a fundamental component of the end-to-end system. In addition, security needs to be embedded in the communications and data management processes that extend to DCC, suppliers, network operators and other entities.

The approach

4.15. The programme will continue to adopt an approach to security based on risk identification, assessment and treatment. In line with received best practice, identified risks are managed in a proportionate manner to reflect "security by design" principles. The programme has put in place systems and processes to help ensure that risks continue to be identified and addressed as they change over time. We have applied this approach during the current phase of work.

4.16. To inform our work on security, we have engaged specialist security expertise and are using the contribution of government experts and industry specialists who are members of the programme's Security Technical Expert Group (STEG). This holistic approach should ensure the best possible basis for ensuring that security is embedded into the GB smart metering system.

4.17. Over the past six months, we have undertaken a security risk assessment based on the policy design proposed in the Prospectus. We have used expert external advisers to support this work. We have also gained valuable contribution and peer review of this work through engagement with security experts across government and industry.

4.18. The risk assessment has considered risks on an end-to-end basis, both before and after DCC is operational. It highlights a range of risks and threats, such as cyber attacks, viruses and malicious software, which could, if not adequately managed, compromise consumers' interests and critical smart metering operations such as remote disablement, prepayment top-ups and meter firmware upgrades.

Next steps

4.19. The next phase of the programme will focus on developing the security requirements in the areas of technical security and security governance across the end-to-end smart metering system. The programme will analyse the costs and benefits of different security options to inform decisions on the appropriate way to address each risk. This work will be an integral part of developing the design of smart metering equipment, DCC and its services, smart metering communications and equipment installation for before and after DCC is operational.

4.20. Finally, the programme's work on security will continue to liaise closely with the design expert groups. Going forward, STEG will be used as an important channel to enable security representation to inform and review programme design considerations. Looking forward, the programme is considering whether a group similar to STEG should be established to oversee the security of the end-to-end smart metering system on an enduring basis as the threat landscape evolves and mitigating controls need to be revisited.

4.21. More detail on the approach to assuring the security of smart meters and the associated equipment in consumer premises is set out in the "Design Requirements" supporting document.

5. Smart Metering Communications and Data Management

This chapter sets out the arrangements for the management of smart metering communications and data services. This includes the scope of the central function, the regulatory and commercial framework it will operate under and its governance regime. It also sets out the process for establishing the central function and the transitional arrangements to apply once the new function is established.

5.1. Communication of data to and from smart meters in the domestic sector will be managed centrally by a new, GB-wide function covering both the electricity and gas sectors. We refer to this new function as the central Data and Communications Company ("DCC"). This will provide benefits of efficiency and interoperability. DCC will also enable the simplification and improvement of industry processes, including change of supplier, and the development of smart grids.

5.2. DCC will provide two-way communications to smart meters, to which smart meter service users (suppliers, network companies and other authorised third parties) will be given access for specified purposes.

Key Government conclusions

- ➔ DCC should be created as a new licensed entity, responsible for the procurement and contract management of data and communications services that will underpin the end-to-end smart metering system. The Government will run a competitive application process for the DCC licence.
- ➔ The scope of DCC's activities and services should be limited initially to those functions that are essential for the effective transfer of smart metering data, including secure communications, access control, scheduled data retrieval and translation services (where necessary). DCC should, at a later date, take on the role of meter point/supplier registration service provider.
- ➔ Suppliers in the smaller non-domestic sector should not be obliged to use the services of DCC for meters with smart functionality, but may elect to do so. This position will be kept under review.
- ➔ DCC should be responsible for procuring the necessary equipment and services to provide WAN communications, including the WAN module.
- ➔ The Government will initiate procurement of service provider contracts in parallel with the DCC licence applications process in order to deliver the early establishment of DCC's services.
- ➔ DCC should be required to adopt communications contracts associated with compliant meters installed before its services are available, subject to these contracts meeting pre-defined criteria. There should be a limit on the number of contracts that DCC would guarantee to accept, subject to the adoption criteria being met.

Scope and services

5.3. The scope of DCC's activities and services will be limited initially to those functions that are essential for the effective transfer of smart metering data, including secure communications, access control, scheduled data retrieval and translation services (where necessary).

5.4. A phased approach to DCC's scope of activities will allow the new function to be set up as soon as possible, while enabling wider benefits - including improved processes for customers changing their supplier - to be delivered over time.

5.5. Around two to three years after it is established, DCC will take on the meter point/supplier registration role.[11] This will be important in order to maximise the benefits of smart metering. For example, registration functions play an important role in the change of supplier process. The detailed arrangements for DCC taking on registration, including the plan and timescales for implementation, will be developed in the next phase of the programme.

5.6. Further work will be undertaken to assess whether any additional functions should be brought within the scope of DCC's activities at some point and the mechanisms available for facilitating this. This might include the functions of data collection, processing and aggregation, where initial analysis indicates significant potential benefits of centralisation within DCC. Consideration will need to be given to the potential competitive impact of any such changes. The practicality and implications of including (or not) such functions is complex and will require significant input from industry, given the necessity for consequential changes to their systems and processes. Further analysis will also need to be undertaken about the role DCC should play in relation to prepayment processes.

5.7. As outlined in Chapter 4, smart metering will help facilitate the development of smart grids. As part of its activities, DCC will facilitate access to smart meters by network operators (subject to appropriate protections around data privacy). From the outset, DCC will support some smart grid-related functions required to provide better network data to inform planning and investment decisions. As network requirements evolve, DCC will be able to enhance communications services, including by upgrading the WAN communications specification at the point contracts are retendered, should that be required.

5.8. Other smart grid functions will be capable of being added incrementally driven by demand for added services (for example, remote management of smart appliances). While DCC will provide important infrastructure to support smart grids, there will also need to be appropriate regulatory and commercial arrangements in place, including who has access to data and for what purposes.

[11] Meter point/supplier registration services are currently provided by the network operators in electricity and primarily by xoserve in gas.

5.9. Suppliers will be responsible for the installation, end-to-end testing and ongoing maintenance of all metering equipment in customer premises. The Prospectus proposed that suppliers should also be responsible for the procurement of the WAN modules at the consumer premises. In the light of feedback from the consultation exercise, the Government has concluded that DCC should be responsible for procuring the necessary equipment and services to provide WAN communications, including the WAN modules. This will enable DCC to adopt a strategic approach to the overall procurement of WAN communications. The cost of the WAN modules will be recovered by DCC in the same way as for the rest of its services.

5.10. Suppliers in the smaller non-domestic sector will not be obliged to use the services of DCC for meters with smart functionality given that there is a competitive market already established for the data and communications services in this sector. Instead, suppliers will be able to choose to use DCC if they wish to do so. This should allow smaller non-domestic customers better access to the competitive market, increase competitive pressure on industry costs and improve interoperability. This position will be kept under review and action may be taken if, for example, evidence emerges of serious interoperability issues or if the development of smart grids is being hampered. Market participants would still be able to offer value-added services, including energy management services and energy efficiency advice. Given DCC's position in the domestic market, its ability to offer energy management services to domestic or non-domestic consumers will be restricted by the terms of its licence.

Regulatory and commercial model

5.11. DCC will be created as a new licensed entity to deliver these central data and communications activities. It will be responsible for the procurement and contract management of data and communications services that will underpin the end-to-end smart metering system.

5.12. As a procurement and contract management entity, DCC will be well placed to adapt to developments in the industry and will allow requirements to evolve over time. DCC will help facilitate the transformation of industry processes and manage the resulting changes with data and communications service providers.

5.13. DCC will be a new licensed entity, which is granted an exclusive licence in relation to the domestic sector. It will be independent of its service providers. In addition, appropriate controls will need to be considered during the development of the DCC regulatory framework to provide confidence that any user or group of users do(es) not have the ability to exert undue influence over the activities of DCC. The DCC licence will be granted through a competitive licence application process, which will be specified in licence applications regulations. The process should ensure that the successful applicant is the best qualified to deliver these services and drives the best value for money. The licence is expected to be granted for a fixed term. Ofgem will be responsible for regulation of this new licensed entity and will be able to take action if DCC fails to meet its licence obligations.

5.14. The governance framework for this new entity will be provided in two ways. Firstly, DCC's licence will set out its licence obligations. Secondly, a new 'Smart Energy Code' will be established, spanning gas and electricity, to provide arrangements for the introduction and ongoing operation of smart metering. Among other things, the Code will detail the relationships between DCC and the users of its services around the new data and communications activities. Suppliers, network operators and other users of DCC's services will also need to comply with the Code.

5.15. The Smart Energy Code will be developed by the programme, in consultation with industry and other stakeholders. This will include work to develop the governance arrangements for the Code. This includes who should be party to the Code, the process for modifying the Code, the detailed role of the Code Panel, its membership and voting structure.

5.16. DCC will be responsible for procuring communications and data services to satisfy the obligations placed on it by its licence and the Code. The licence and Code will not specify the technology or technologies to be used for WAN communications but rather will set out the functional, including security, requirements of the end-to-end communications system. Technology choices will ultimately be made through competitive procurement processes. The Government is confident that a competitive framework can be established for the appointment of DCC and the procurement of its services that will deliver an efficient, effective, flexible, value for money service for consumers and industry. The process for the establishment of DCC's initial services is outlined below.

5.17. DCC will be responsible for ensuring that obligations under its licence and the Smart Energy Code are met. For example, DCC will be required to demonstrate that its competitive procurement processes have been structured so as to meet objectives set out in the licence. We envisage that these objectives will recognise both short and longer-term factors, and that contracts for services will be retendered on a regular basis to deliver value for money and to enable services and technologies to evolve as requirements develop (eg for smart grids purposes).

5.18. From the date on which DCC starts provision of services, suppliers will be required to use these services for all new WAN communications with smart meters in the domestic sector. Smart meters installed prior to that time which comply with the relevant technical specifications will be migrated to DCC's services. The criteria for the acceptance by DCC of communications contracts established before DCC starts providing its services are discussed later.

Cost recovery and incentivisation

5.19. DCC will be in an exclusive position with respect to the provision of communications access to smart meters in the domestic sector. An effective incentive regime for DCC will be put in place in order to promote cost efficiency and thereby provide an appropriate level of protection to users of its data and communications services. This will include imposing regulatory incentives for DCC to manage its own costs efficiently.

5.20. DCC's costs will be recovered through service charges to suppliers and other service users. Service charges will comprise a mix of standard and variable charges designed to reflect different types of service (eg routine reads per month, charges per prepayment top up). The general principles of the DCC charging methodology will be set out in its licence, while the detailed charging methodology will be set out in the Code. DCC is likely to be allowed to make additional charges to recover the additional costs of provision of elective services requested by individual users or groups of users.

Establishment of DCC's services and transitional arrangements

5.21. The establishment of DCC and its services will involve creating a complete new GB-wide entity with reach into every home, which has the potential for significant growth of its services. We received a range of responses on the timescales required to establish DCC's services to an appropriate degree of robustness. We have worked closely with industry and potential service providers to inform our analysis of the process and timescale for establishment of these services.

5.22. The Government is committed to delivering a robust procurement strategy for DCC and its services. The Prospectus proposed a sequential approach, whereby DCC is granted its licence and then starts the process of procuring service providers. To deliver the early establishment of DCC's services, the Government has decided instead that it will initiate procurement of service provider contracts in parallel with the DCC licence application process. This will bring forward the date at which DCC services can be provided, thereby reducing risks to the consumer experience and potential impacts on competition in the market for WAN communications services.

5.23. In the next phase, the programme will continue to develop the strategy for procurement of DCC services. Prospective users of DCC's services and other stakeholders will be involved in the process for defining the functional requirements that will underpin the procurement of service providers. The programme will also engage with prospective service providers and DCC applicants. We are already seeing a strong appetite in the marketplace from companies seeking to become DCC, or to become service providers to DCC.

5.24. DCC will be required to adopt communications contracts associated with compliant meters installed before its services were available, subject to these contracts meeting pre-defined criteria. There is likely to be a limit on the number of contracts that DCC would guarantee to accept, subject to the adoption criteria being met. DCC will have the discretion to adopt contracts in excess of this limit where it is satisfied this is consistent with the procurement strategy objectives set out in its licence. In the next phase, the programme will work with stakeholders to develop appropriate adoption criteria and adoption limit, seeking to provide certainty for suppliers as they finalise their rollout strategies.

5.25. More details on the approach to data and communications are set out in the "Central Communications and Data Management" supporting document.

6. Managing the Programme

This chapter describes the approach to managing the change programme to introduce smart metering across Great Britain. It sets out who has responsibility for the programme and how the programme will be managed, including governance arrangements and methodological approach. It also sets out what the programme will deliver as outputs and outcomes and the plan to deliver these. This includes how stakeholders will continue to be closely engaged in the delivery process.

6.1. The rollout of smart metering is a major venture that will touch every home and many businesses across Great Britain over several years. To achieve this transformation will require significant investment and commitment by many stakeholders. It will involve the development of complex new commercial and technical arrangements, significant amendment of the regulatory framework, a massive meter deployment exercise and, importantly, positive adoption by consumers. All these activities must be sustained over time.

6.2. This breadth and complexity requires strong programme management. It is critical therefore to have a central programme to drive the implementation of smart metering. Ofgem E-Serve has managed, on behalf of DECC, the policy design phase of this central programme. This has been successfully completed and the Government has drawn a robust, coherent and integrated set of policy conclusions. The central programme is now moving to implement this detailed policy design.

Responsibility for the programme

6.3. DECC will be directly responsible for managing the central smart metering programme. This is appropriate given the scale of the programme, the importance of government accountability for its delivery and because the legal powers sit principally with the Secretary of State. These new arrangements were announced late last year and will take effect immediately.

6.4. DECC has established a dedicated smart metering team for this programme, which will report to the Senior Responsible Owner (SRO) in DECC. The SRO is accountable to Ministers for the successful delivery of the programme. A senior programme director will lead the programme.

The role of Ofgem

6.5. Ofgem has an independent role in regulating the electricity and gas market to ensure that the interests of existing and future consumers are protected through this complex change process and in the enduring market arrangements. In the context of the programme, Ofgem will have additional regulatory functions to establish and regulate DCC, and new obligations on suppliers and others to monitor and enforce, which will be integral to delivering the programme's business case. Its regulatory expertise and advice will be a valuable input to the design of what will be a complex set of sequenced changes to the overall regulatory framework.

Governance and management of the programme

6.6. In designing the governance and structure for the next phase, DECC has built on the successful elements of the preceding phase, in particular the close stakeholder involvement in expert groups. DECC has also taken account of the findings and recommendations from a series of government and external reviews.

6.7. The SRO will be accountable to Ministers as now. The SRO will own the plan and business case and will continue to chair a Strategic Programme Board. This will be responsible for the strategic direction and oversight of the programme, will manage strategic change and will seek to ensure alignment with other government initiatives.

6.8. The programme will be managed according to rigorous best practice disciplines by the programme director, supported by a programme management office, a design authority function and key project leads. The programme will comprise a number of projects to drive the key elements of delivery, and several cross-cutting workstreams to manage aspects that straddle the projects, for example data privacy and security.

6.9. It is vital in a programme of this scale and with such a range of participants that clear baselines are established and change is rigorously and transparently managed against them. The government policy positions outlined in this document will constitute the initial baseline. This will be developed into specifications for regulatory, governance, process and system components, which in turn will become a more detailed baseline. Formal change control will be applied against the baseline.

6.10. Industry, consumer groups and other stakeholders will continue to be involved in the programme and it is envisaged that their involvement will intensify. The programme will retain much of the current approach that has successfully driven Phase 1, with evolution to reflect the changing nature of the programme and feedback received from stakeholders.

6.11. The broad approach to engagement through a number of coordination, expert and advisory groups will be retained to provide advice and support to the programme in their respective areas. Membership of these groups will be revisited to ensure it is appropriate for the next phase.

6.12. Further groups will be created as necessary as the phase develops and the programme will continue to use workshops to consider key issues, such as data privacy. The programme will continue with its policy of openness and transparency for these groups and workshops.

The programme plan

6.13. The programme plan comprises three key phases, as shown in Figure 2:

Phase 1: Policy Design

6.14. The key objective for this phase was to establish robust policy positions for the implementation of smart metering. These positions are set out in this document and represent the end of this phase.

Phase 2: Foundation

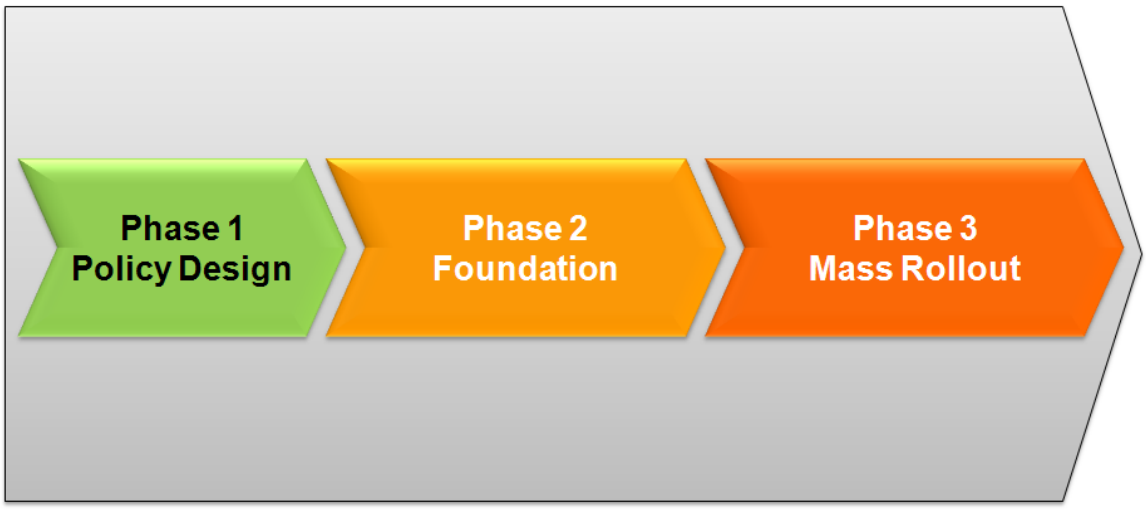
6.15. The key objective of this phase is to create a solid foundation for the mass rollout, including to:

- Establish readiness across all participants, including consumers
- Establish the appropriate regulatory and commercial framework that will enable an active market in smart metering
- Develop appropriate consumer protection provisions and a consumer engagement strategy.

Phase 3: Mass Rollout

6.16. The key objective of this phase is to achieve the mass rollout by suppliers of smart meters to the programme timescales in a safe, secure, efficient and effective way, which delivers the programme business case and protects the interests of consumers.

Figure 2: Key phases of the implementation programme



The Phase 2 plan

Phase 2 deliverables and outcomes

6.17. The primary planning focus will be on developing arrangements for the foundation stage and on establishing the enduring regulatory framework. In this way, both the central programme and industry will aim to deliver the elements necessary to support mass rollout. The key deliverables and desired outcomes of this phase will be:

- Consumer awareness, confidence and protection measures that will facilitate positive adoption and enable benefits realisation
- Technical specifications for the smart metering system, consistent with the minimum functional requirements, which will provide for appropriate levels of interoperability
- A new regulatory regime that will provide certainty and hence underpin investment, create appropriate governance and enforce the right behaviours
- Establishment of a new licensed entity (DCC), ready to provide centralised data and communications services to the market
- Business readiness across the industry, including the availability of compliant meters and installation staff, the establishment of appropriate commercial arrangements, the development of central and distributed processes and systems, end-to-end testing and trialling of the market infrastructure and preparation for the migration to the DCC environment
- A market framework that will enable an active market in smart metering prior to DCC starting operation, for suppliers whose strategy involves early deployments, including arrangements to support commercial and technical interoperability.

Phase 2 activities

6.18. The key activities and timelines that will drive these deliverables and outcomes are considered below. These represent current plans and will be subject to the appropriate consultation processes.

Consumers

6.19. Consumer protection measures will be further developed. In the light of enhanced protections following Ofgem's Spring Package proposals, the programme will work closely with Ofgem to take forward the development of other protections, including those relating to data privacy and the installation code of practice.

6.20. The foundation stage also presents an excellent opportunity to build consumer awareness and confidence, to gain experience from early installations and to take account of lessons learned in developing the approach for mass rollout. The programme will develop a strategy for promoting consumer engagement in liaison with stakeholders, including suppliers and consumer groups.

Regulatory regime

6.21. The Secretary of State will amend the existing regulatory framework to drive the right behaviours and provide an appropriate compliance and monitoring regime. These changes will be developed working closely with Ofgem. It is intended that the core components of these changes will be:

- Licence changes for suppliers to incorporate the rollout obligations under the targeting framework, consumer protections and the technical specifications
- A new Smart Energy Code to govern the overall arrangements for smart metering and in particular all interactions with DCC
- Consequential licence and code changes
- A prohibition order to define the monopoly activity for DCC
- A new licence for DCC.

Smart metering design

6.22. The functional requirements set out in the Catalogue published alongside this document will be developed into a technical specification through close working with industry and other stakeholders in the expert groups. The aim is to notify the functional requirements and technical specifications to the European Commission later this year, to enable completion of the process by early 2012.

Central communications and data management

6.23. The DCC licence and the regulations to provide for the associated application process will be developed by the programme. These will undergo appropriate consultation and refinement and be laid before Parliament. The application process for DCC will start later this year and the aim is for a licence to be granted to DCC in the fourth quarter of 2012.

6.24. The Government will initiate procurement of data and communications service providers in parallel with the DCC licence application process. The expectation is that DCC will be appointed in time to undertake final assessment and negotiations and appoint the service providers. Following their appointment, service providers will start designing, building and testing of the required communications and data systems. The target is for DCC to start providing services at the end of the first quarter of 2014.

Business readiness

6.25. Business readiness must be achieved for all key activities and participants. We envisage that meter manufacturers will work closely with suppliers to review the technical specification and plan any necessary changes to their meter designs and production processes. Installers will need to adapt their training and planning to reflect new meter designs and regulatory obligations. Suppliers will want to establish

funding sources, undertake procurement exercises and develop relationships with meter asset providers.

6.26. The programme will work closely with industry as it develops the necessary changes to industry processes, data flows and systems. Suppliers, central bodies and others will need to adjust their operating model and IT systems to incorporate the changes. In parallel, suppliers will need to develop their organisation processes and systems to meet their own strategies. Rigorous end-to-end testing and market trials will be required.

6.27. The activities outlined above all require further development work and consultation before the associated elements of the framework can be put into effect. Our baseline view of the timetable of key milestones is as follows:

Baseline plan key milestones	
Draft technical specification complete	July 2011
EU notification period for the technical specification complete	Jan 2012
First tranche of regulatory obligations on suppliers comes into force, including: ▪ Mandated rollout completion date ▪ Installation code of practice	Q2 2012
DCC licence application process commences	Q2 2012
'Smart' change of supplier arrangements become standard	Q4 2012
DCC licence awarded	Q4 2012
DCC service providers appointed	Q4 2012
Start of mass rollout	Q2 2014

6.28. The baseline plan is based on currently available information and will be tested further as we enter the implementation phases of the programme. As with all large, complex programmes, it will be subject to regular, structured review and there will be ongoing communications with stakeholders throughout the programme.

6.29. More detail on the approach to managing the change programme is set out in the "Implementation Strategy" supporting document.

Appendices

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Appendix 1 - Consultation Responses

The Prospectus consultation document published on 27 July 2010 sought the views of interested parties in relation to a package of proposals. We received 279 responses from 197 different stakeholders. This appendix lists all those that responded.

Responses to the 115 questions asked in the Prospectus and its supporting documents are summarised in the supporting documents being published alongside this document.

List of Respondents

	Name
1	Accenture
2	Association for the Conservation of Energy (ACE)
3	Acute Technology
4	Age UK
5	Alcatel Lucent
6	AlertMe
7	ARQIVA
8	Association for the Conservation of Energy (ACE)
9	Association of Convenience Stores (ACS)
10	Association of Meter Operators (AMO)
11	Astrium
12	Atmel
13	BGlobal
14	British Electrotechnical and Allied Manufacturers' Association (BEAMA)
15	Beecher Comms Consultants
16	Bio Electromagnetic Research Initiative
17	Bluetooth SIG
18	BRE Environmental Assessment Method (BREEAM)
19	British Approvals Board for Telecommunications (BABT)
20	British Gas
21	BT
22	C and C
23	Cable & Wireless
24	Cambridge Consultants
25	Capgemini
26	Capital Meters & Macquarie Leasing
27	CE Electric UK
28	Chartered Institution of Building Services Engineers (CIBSE)
29	Cisco

30	Citizens Advice
31	Consumer Focus
32	Convergys
33	Cornwall Residential Landlords Association
34	Corona Energy
35	CPL Concordia
36	CSC Computer Science
37	Current Group
38	Department for Regional Development Belfast
39	Detica
40	Dr Neuhaus Telecoms
41	EDF Energy
42	Electralink
43	Electrical Safety Council (ESC)
44	Electricity North West
45	Electromagnetic Compatibility Industry Association (EMCIA)
46	ElectroSensitivity UK
47	Elexon
48	Elster
49	Ember Corporation
50	Emeter
51	Energy Networks Association (ENA)
52	Energy Action Scotland
53	Energy Metering Technology
54	Energy Retail Association (ERA)
55	Energy Services Network Association (ESNA)
56	EON
57	Ernst and Young
58	ES Pipelines
59	Energy Services and Technology Association (ESTA)
60	Everything Everywhere
61	Federation of Small Businesses
62	First Utility
63	Foundation for Information Policy
64	Fuel Poverty Advisory Group
65	G4S
66	Gas Utility Services
67	Gazprom
68	GE Energy
69	Gemserv
70	GMB
71	Good Energy

72	Green Alliance
73	GridMerge
74	Haven Power
75	Hayball
76	Hewlett Packard
77	Health Protection Agency (HPA)
78	IBM
79	Information Commissioner's Office (ICO)
80	I&C Shippers and Suppliers (ICoSS) Group
81	Institution of Engineering and Technology (IET)
82	Infineon
83	Inside Contactless
84	Intellect
85	Intelligent Energy
86	Iskraemeco
87	Itron
88	Joint Radio Company
89	KEMA
90	KPMG
91	Landis and Gyr
92	Lickorish Consulting
93	Local Government Association (LGA)
94	Logica
95	London Energy Project
96	Macquarie
97	Mahler Ventures
98	Meterfit
99	Meter Operators
100	Metering Tech
101	Micro Hydro Association
102	Microsoft
103	Moat Homes
104	MRA Executive Committee
105	MWA Technology
106	NPower
107	NAPIT Group
108	National Grid
109	Northern Gas Networks
110	National Skills Academy for Power (NSAP)
111	OPower
112	O2
113	OFWAT

114	Onzo Ltd
115	Orsis UK Ltd
116	Ovo Energy
117	Pilot Systems
118	Powerwatch
119	Qualcomm
120	Radio Society
121	Renewable Energy Association (REA)
122	Real Wireless
123	Renesas Electronics
124	Renewable Energy Company
125	Research Institute for Consumer Affairs (RICA)
126	Royal National Institute of Blind People (RNIB)
127	Royal National Institute for Deaf People (RNID)
128	Roke Manor Research
129	Royal Academy of Engineering
130	Salient Systems
131	SBGI Utility Networks
132	Scottish Government
133	ScottishPower
134	Secure Meters
135	SELECT
136	Sharp Labs
137	Shell Gas Direct
138	Siemens
139	Smart Save Energy
140	Smartest Energy
141	SSE and SGN
142	SSL
143	Stark Software
144	T-Systems
145	Telenor Connexion
146	Thames Water
147	TIBCO
148	Trilliant
149	Truread
150	UK Broadband
151	UK Metering Forum
152	UK Revenue Protection Association
153	Unison
154	Unite
155	University of Cambridge Computer Laboratory

156	Utilita
157	Utilities Intermediaries Association (UIA)
158	Utility Partnership Limited (UPL)
159	Veolia Environment
160	Verdanarch
161	Vodafone
162	Wales and West Utilities
163	Water UK
164	Welsh Assembly Government
165	Western Power Distribution
166	Which?
167	Wi-Fi Alliance
168	xoserve
169	ZigBee Alliance
170-197	Members of the public and other respondents who requested their identity remain confidential

Responses received by the programme that were not marked as being confidential have been published on Ofgem's website (www.ofgem.gov.uk).

Appendix 2 - Summary of Key Conclusions

Data Access and Privacy

- ➔ Consumers will have a choice over how their consumption data is used and by whom, except where data is required to fulfil regulated duties. The Government is minded to define regulated duties narrowly. Regarding access to data for other purposes, the Government can see the strength of the arguments for requiring suppliers to obtain explicit informed consent from consumers.

Rollout Strategy

- ➔ Suppliers should be set licence obligations to deliver the rollout of smart metering in the domestic and smaller non-domestic sectors, underpinned by an appropriate compliance regime.
- ➔ Suppliers should provide domestic consumers with an IHD that meets the relevant technical specifications. In doing so, consideration will need to be given to consumers' accessibility requirements.
- ➔ The Government will bring forward a proposal to obligate suppliers to take all reasonable steps to complete the rollout in 2019. It will initiate a consultation on detailed licence obligations on this basis, with a view to these coming into effect in the first half of 2012.
- ➔ From the start of the mass rollout, envisaged to be at the start of the second quarter of 2014, suppliers should be required to take all reasonable steps to install only compliant smart meters.
- ➔ The period before the second quarter of 2014 will provide the opportunity to build a solid foundation for the mass rollout of smart meters. During this foundation stage, measures should be put in place to support technical and commercial interoperability. Industry participants may be required to conduct activities and deliver outputs in accordance with the programme's approach to building market readiness to be developed in the next phase.
- ➔ The programme will review rollout progress during the foundation stage and will propose changes to these arrangements if appropriate ahead of the mass rollout.
- ➔ The Government will develop a strategy for promoting consumer engagement. As part of this, there is a strong case for some elements of consumer engagement to be carried out centrally or on a coordinated basis.
- ➔ Suppliers should develop and comply with a new code of practice governing the installation of smart meters at customer premises. This licence-backed code will include restrictions on unwelcome sales activities and on upfront or one-off charging for smart metering equipment.

Design Requirements

- ➔ Suppliers should roll out smart metering equipment that meets a set of technical specifications.
- ➔ The technical specifications should be based on the minimum requirements set out in the Functional Requirements Catalogue published alongside this document.
- ➔ The technical specifications should also reflect security requirements developed in response to rigorous security risk assessments.
- ➔ The programme will facilitate the process of converting the functional requirements into technical specifications - such that compliant meters should be available in volume during 2012.
- ➔ The programme will develop enduring governance arrangements for the technical specifications for smart meters.

Central Communications and Data Management

- ➔ DCC should be created as a new licensed entity, responsible for the procurement and contract management of data and communications services that will underpin the end-to-end smart metering system. The Government will run a competitive application process for the DCC licence.
- ➔ The scope of DCC's activities and services should be limited initially to those functions that are essential for the effective transfer of smart metering data, including secure communications, access control, scheduled data retrieval and translation services (where necessary). DCC should, at a later date, take on the role of meter point/supplier registration service provider.
- ➔ Suppliers in the smaller non-domestic sector should not be obliged to use the services of DCC for meters with smart functionality, but may elect to do so. This position will be kept under review.
- ➔ DCC should be responsible for procuring the necessary equipment and services to provide WAN communications, including the WAN module.
- ➔ The Government will initiate procurement of service provider contracts in parallel with the DCC licence applications process in order to deliver the early establishment of DCC's services.
- ➔ DCC should be required to adopt communications contracts associated with compliant meters installed before its services are available, subject to these contracts meeting pre-defined criteria. There should be a limit on the number of contracts that DCC would guarantee to accept, subject to the adoption criteria being met.

Appendix 3 - Glossary

A

Access control

The mechanism used to ensure that access to smart meters and the data that they hold is only available to properly authorised parties.

Advanced meters

Advanced meters are defined in standard supply licence conditions as being able to provide measured consumption data for multiple time periods (at least half hourly for electricity and hourly for gas) and to provide the supplier with remote access to the data.

C

Catalogue

The minimum functional requirements of the smart metering system are brought together in the Smart Metering System Functional Requirements Catalogue (the "Catalogue"). This covers the smart metering system for both the domestic and smaller non-domestic sectors.

Codes

Industry codes establish detailed rules that govern market operation, the terms for connection and access to energy networks. The supply and network licences require the establishment of a number of industry codes that underpin the gas and electricity markets.

Commercial interoperability

The ability of an incoming supplier to agree mutually acceptable commercial terms with the meter owner for the use of the meter and related equipment when a customer changes supplier.

Communications service providers

Providers of communications services that will enable the transfer of data to and from smart meters.

Consumer

Person or organisation using electricity or gas at a meter point.

Consumer Advisory Group

The Consumer Advisory Group consists of members from groups representing a broad range of domestic consumers. It was set up to help inform the programme and to promote understanding of key consumer issues, particularly more complex issues that cannot be fully explored through primary consumer research.

Customer

Any person supplied or entitled to be supplied with electricity or gas by a supplier.

Customer premises equipment

All smart metering equipment in a customer's home or business

D

Data and Communications Expert Group (DCG)

One of several expert groups established by the programme, following publication of the Prospectus, to draw on the experience of industry and other stakeholders. DCG has considered the scope, set up and activities of the central data and communications body.

DataCommsCo (DCC)

The new entity that will be created and licensed to deliver central data and communications activities. DCC will be responsible for the procurement and contract management of data and communications services that will underpin the smart metering system.

Data retrieval

Obtaining a reading (either manually or remotely) from a meter.

Data service providers

Providers of any data service to DCC, including systems integration, IT hosting and application management.

E

Early movers

Suppliers who are already installing meters with "smart" functionality.

Electricity meter

A measuring instrument that records the quantity of electricity supplied.

End-to-end smart metering system

The end-to-end smart metering system covers all equipment, communication links and connections from every customer through DCC to suppliers, network operators and authorised third-party service providers.

Energy Demand Research Project (EDRP)

The EDRP is a suite of large scale trials across Great Britain that seeks to better understand how consumers react to improved information about their energy consumption. The EDRP has trialled a range of methods of providing customers with improved feedback on their energy consumption and other associated interventions. These interventions include smart meters, enhanced energy consumption information on bills, energy efficiency information, visual display units, incentives to reduce or shift consumption and community engagement.

Energy supplier

A company licensed by Ofgem to sell energy to and bill customers in Great Britain.

Estimated bills

Where a supplier is unable to obtain a meter reading, a customer's bill will be estimated based on past usage.

F

Firmware

Firmware is software that runs on a hardware device such as a smart meter or IHD that provides the instructions for how the device operates. As with other types of software, firmware can also be updated.

Foundation stage

The period before market readiness for the mass rollout is fully established. This is also referred to as Phase 2 of the Smart Metering Implementation Programme.

Fuel Poverty

Households are considered as being in "fuel poverty" if they spend more than 10 per cent of their household income on fuel to keep their home adequately heated.

Functional requirements

The minimum functions that must be supported by the different elements of the smart metering system to ensure the delivery of the benefits of smart metering. These describe what the smart metering system must do (not how it must do so).

G

Gas and Electricity Markets Authority (GEMA)

The Authority is Ofgem's governing body. It consists of non-executive and executive members and a non-executive chair. The Authority determines strategy, sets policy priorities and takes decisions on a range of matters, including price controls and enforcement. The Authority's principal objective is to protect the interests of existing and future consumers in relation to gas conveyed through pipes and electricity conveyed by distribution or transmission systems. The interests of such consumers are their interests taken as a whole, including their interests in the reduction of greenhouse gases and in the security of the supply of gas and electricity to them. The Authority's powers are provided for under the Gas Act 1986, the Electricity Act 1989, the Utilities Act 2000, the Competition Act 1998 and the Enterprise Act 2002.

Gas meter

A measuring instrument that records the volume of gas supplied.

Gas valve

A gas valve may be incorporated into a gas meter to regulate the flow of gas into consumer premises. It is distinct from the isolation valve.

Green Deal

The Green Deal is the Government's initiative to establish a framework that will enable private firms to offer consumers energy efficiency improvements to their homes, community spaces and businesses at no upfront cost, and to recoup payments through a charge in instalments on the energy bill.

Guaranteed Standards of Performance

The Guaranteed Standards of Performance set out service levels that must be provided to individual customers by electricity and gas suppliers and distribution companies. These are contained in the Electricity (Standards of Performance) Regulations 2010 and the Gas (Standards of Performance) Regulations 2005. If a company fails to meet a guaranteed standard of performance it must make a payment to the customers affected, subject to certain exemptions.

H

Home area network (HAN)

The smart metering HAN will be used for communication between smart meters, IHDs and other devices in consumers' premises.

I

Implementation Coordination Group

A stakeholder group established by the programme, following the publication of the Prospectus, to provide a direct communication channel with key delivery partners and consumer organisations.

Inclusivity by design

A design philosophy promoting the use of products, services and systems by as many people as possible without the need for adaptation for users with differing needs.

Information Commissioner's Office

The Information Commissioner's Office is the UK's independent authority established to uphold information rights in the public interest, promoting openness by public bodies and data privacy for individuals.

In-home display (IHD)

An IHD is an electronic device, linked to a smart meter, which provides information on a customer's energy consumption.

Installer

Person or persons appointed by the suppler who physically installs, configures, commissions or repairs equipment, as appropriate, in a consumer's premises.

Interoperability

The ability of diverse systems, devices or organisations to work together (interoperate) on both a technical and commercial basis. See also commercial interoperability and technical interoperability.

K

Kilowatt hour (kWh)

Kilowatt hour is a unit used to measure energy consumption in both electricity and gas. The kilowatt hour is a unit of energy equal to 1000 watt hours or 3.6 megajoules. Energy in watt hours is the multiplication of power in watts, and time in hours. A 100W light bulb left on for one day will consume 2.4 kWh (0.1*24).

L

Licence

Transporting, shipping and supplying gas; and generating, transmitting, distributing and supplying electricity are all licensable activities. Ofgem grants licences that permit parties to carry out these activities in the GB market. The licences require the establishment of a number of multilateral industry codes that underpin the gas and electricity markets. Licensees need to be signatories to codes in order to operate in the gas and electricity markets (see codes).

Licence application regulations

The regulations that will define the different steps in the competitive licence application process to grant the DCC licence.

Load limiting

Restriction of the flow of energy to a home by means such as limiting the consumer to a defined amount of energy over a specified time or keeping below a defined rate of consumption. This allows the consumer to use limited levels of electricity to keep within defined thresholds that could be set by the consumer or supplier. It could be used by suppliers as an alternative to full disconnection in cases of non payment by electricity or gas customers.

M

Meter Asset Provider (MAP)

The party responsible for the ongoing provision of the meter installation at a meter point. In electricity, the Meter Asset Provider is responsible for: supplying electricity metering equipment for the purpose of satisfying the electricity settlements process; the requirements of the relevant Use of System Agreement; and the relevant primary and secondary legislation.

Microgeneration

Microgeneration is the on-site generation of lower carbon heat and power by individuals, small businesses and communities at a small scale.

N

Network operators

The companies that are licensed by Ofgem to maintain and manage the electricity and gas networks in Great Britain.

O

Ofcom

The independent regulator and competition authority for the UK communications industries.

Ofgem

The Office of the Gas and Electricity Markets (Ofgem) is responsible for protecting gas and electricity consumers in Great Britain. It does this by promoting competition, wherever appropriate, and regulating the monopoly companies that run the gas and electricity networks. Ofgem is governed by the Gas and Electricity Markets Authority.

Ofgem E-Serve

Ofgem E-Serve is responsible for Ofgem's support and delivery functions. It focuses on administering environmental programmes and the delivery of sustainability projects such as the policy design phase of the Smart Metering Implementation Programme.

Open standards

The European Union definition of an open standard (taken from "European Interoperability Framework for pan-European eGovernment Services") is:

- The standard is adopted and will be maintained by a not-for-profit organisation, and its ongoing development occurs on the basis of an open decision-making procedure available to all interested parties (consensus or majority decision etc).
- The standard has been published and the standard specification document is available either freely or at a nominal charge. It must be permissible to all to copy, distribute and use it for no fee or at a nominal fee.
- The intellectual property - ie patents possibly present - of (parts of) the standard is made irrevocably available on a royalty-free basis.
- There are no constraints on the re-use of the standard.

P

Prepayment mode

Smart meters are capable of switching between prepayment and credit mode. When operating in prepayment mode customers have to pay for their energy before using it.

Privacy by design

A design philosophy whereby privacy issues are considered before and while a system is designed, rather than afterwards.

Programme

The Smart Metering Implementation Programme ("the programme") is the central change programme established by the Government. It is responsible for overseeing the development and implementation of the policy design, including establishing the commercial and regulatory framework to facilitate the rollout. Ofgem E-Serve has managed, on behalf of DECC, the policy design phase of the programme that has informed the Government conclusions set out in this document. DECC will be directly responsible for managing the programme during the implementation phase.

R

Remote meter functionality

Functions of a smart meter that can be updated/switched between remotely without the need for manual interaction with the meter.

S

Security by design

A design philosophy targeted at ensuring that the security of a system is designed from the ground up to be secure. It is an established concept where security risks and issues are identified early in the system's development lifecycle.

Security Technical Expert Group (STEG)

One of several expert groups established by the programme, following publication of the Prospectus, to draw on the experience of industry and other stakeholders. STEG has considered issues relating to the security of the end-to-end smart metering system.

Senior Responsible Owner (SRO)

The individual responsible for ensuring that a government project or programme of change meets its objectives and delivers the projected benefits.

Smaller non-domestic sector

For the purposes of this document, smaller non-domestic electricity and gas sites are those sites in electricity profile groups 3 and 4 and those non-domestic gas sites with consumption of less than 732 MWh per annum.

Smart appliances

An appliance that can alter the way in which it uses energy (consumption level or time of use) in response to an external signal, eg a price signal.

Smart Energy Code

The proposed new industry code that will cover both gas and electricity and will contain the detailed regulatory, commercial and technical arrangements applicable to smart metering during rollout and on an enduring basis.

Smart grids

As part of an electricity power system, a smart grid can intelligently integrate the actions of all users connected to it - generators, consumers and those that do both - in order to efficiently deliver sustainable, economic and secure electricity supplies.

Smart meter

A meter which, in addition to traditional metering functionality (measuring and registering the amount of energy which passes through it) is capable of providing additional functionality for example two-way communication allowing it to transmit meter reads and receive data remotely. The proposed minimum functionality of smart meters is set out in the Functional Requirements Catalogue.

Smart Metering Design Expert Group (SMDG)

One of several expert groups established by the programme, following publication of the Prospectus, to draw on the experience of industry and other stakeholders. SMDG has considered functional requirements for smart metering equipment.

Smart metering regulatory regime

The regime that will provide the arrangements for the introduction and ongoing operation of smart metering. These regulatory arrangements will be introduced principally using powers under the Energy Act 2008 to amend existing licences and codes, and to create a new licensable activity and a new licence.

Smart metering system/equipment

The smart metering system refers to smart metering equipment in customers' premises. In the domestic sector, this equipment comprises the electricity meter, the gas meter, the HAN, the WAN module and the IHD.

Strategic Programme Board

The Strategic Programme Board is responsible for the strategic direction and oversight of the programme, manages strategic change and seeks to ensure alignment with other government initiatives. The Board comprises DECC, Ofgem, Ofcom and a number of interested government departments.

T

Technical interoperability

Technical interoperability is the ability for different smart metering system components to exchange data and work together independent of manufacturer. This ensures that different suppliers can install in premises without having to change existing equipment at change of supplier, thereby minimising disruption to the consumer. It is also the capability of systems or devices to provide and receive services and information between each other, and to use these services and information exchange to operate effectively together in predictable ways without significant user intervention. Within the context of smart metering, this means the seamless, end-to-end connectivity of hardware and software from consumer premises equipment through to DCC, suppliers, network operators and other authorised parties.

Technical specifications

The technical specifications for the smart metering system will be an explicit set of solutions and guidelines as to how the smart metering system will fulfil the minimum functional requirements.

Time-of-use tariff

Under a time-of-use tariff, a supplier varies its charges based on when energy is used (eg day/night, peak/off-peak or by season). Such tariffs can be dynamic (changes in real time) or static (changes at predictable times).

Translation services

Centralised services that ensure messages between authorised users and smart metering systems are translated into formats that can be interpreted by the smart metering system or user in a consistent manner.

Trickle disconnection

See load limiting.

W

Wide-area network (WAN)

The smart metering WAN will be used for two-way communication between smart meters and DCC (via the WAN module in the customer‟s premises).

WAN module

The WAN module connects the meter to DCC.

X

xoserve

xoserve delivers transportation transactional services on behalf of all the major gas network transportation companies, and provides a consistent service point for the gas shipper companies.

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