

Smart Metering Implementation Programme

**Government Response to the
Consultation on draft licence
conditions and technical
specifications for the roll-out of gas
and electricity smart metering
equipment**

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Published by the Department of Energy and Climate Change.

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1. Executive summary

- 1.1 This document is the Government's response to its August 2011 statutory Consultation on draft licence conditions and technical specifications for the roll-out of smart metering equipment¹. The Consultation sought views on the draft licence modifications that provide the first elements of the regulatory framework for the roll-out, as well as related policy issues. Views were also sought on the Government's approach to developing the Smart Metering Equipment Technical Specifications (SMETS) to which smart metering systems² must comply to fulfil the suppliers' roll-out obligation and on a number of specific design issues. The Government's response sets out the regulatory framework for the roll-out of smart metering systems and the approach that will be taken on the SMETS, including a number of decisions on specific technical issues.
- 1.2 The Government has already determined that the roll-out should be completed in 2019; the Consultation explored what specific date in 2019 should be set in the licence conditions. Respondents expressed concern about defining a completion date early in 2019, reflecting the complexity of the roll-out, the time needed to deliver the roll-out in a way that supports benefits realisation, and the impact on delivery if there are delays in delivering key activities of the Smart Metering Programme (Programme). To balance the Government's desire to deliver the benefits of smart metering for consumers as early as possible against the risks to these benefits if the roll-out is rushed, the Government has set an end-date of 31 December 2019.
- 1.3 A major focus of the Consultation was the SMETS. Views were invited on the Government's general approach to developing the SMETS and on the Industry's Draft Technical Specifications (IDTS) which the Government proposed would be the basis of the SMETS. Attention was drawn by respondents to the extent of the challenge in developing these specifications and support was demonstrated for a phased introduction of the SMETS to avoid roll-out being delayed until all the complex technical issues are resolved, in particular in relation to communication standards for the Home Area Networks (HANs) and Wide Area Networks (WANs).
- 1.4 The Government believes that it is important that the policy and regulatory framework for the roll-out of smart metering enables industry participants to manage the costs of preparing for the Mass roll-out stage and making the transition to the enduring arrangements in the most efficient way. In

¹ Smart Metering Implementation Programme – A consultation on draft licence conditions and technical specifications for the roll-out of gas and electricity smart metering equipment.

www.decc.gov.uk/en/content/cms/consultations/cons_smip/cons_smip.aspx

² 'Smart Metering Systems' is the term used in this document to refer in general terms to the collection of individual pieces of smart metering equipment that will be installed in consumer premises in the smart metering roll-out. Smart Metering Systems is a new term introduced in the Roll-out licence conditions (see annexes 1 and 2).

recognition of the time it will take to resolve all the technical challenges involved in developing the SMETS, the Government has chosen an evolutionary approach to the development of the SMETS. The first iteration, which accompanies this document, will provide for core functionality and functional interoperability of smart metering systems. This confirms the position set out in the December 2011 revised Programme Delivery Plan³ on the development of the SMETS. The initial version of the SMETS will be made available on the DECC website.

- 1.5 Although a majority of respondents to the Consultation believed that the roll-out licence conditions as drafted and the associated technical specification for metering equipment would support the Programme's objectives, the Government has considered whether on its own, the requirement for smart metering to comply with the SMETS would provide the necessary certainty that the objectives of the Programme would be delivered. This is because the SMETS have been drafted to ensure that smart metering systems will provide for specified technical capability, but will not usually require that this functionality is actually utilised. The Government is therefore minded to introduce an operational licence condition that will require energy suppliers to utilise the functionality of smart metering systems installed in consumers' premises, including for example a requirement for energy suppliers to make consumption data available to consumers locally. It will consult on proposals for such a condition later this year.
- 1.6 Views were sought on the merits of introducing a licence condition on energy suppliers to take all reasonable steps to ensure that all smart metering equipment installed in consumer premises is interoperable with other smart metering equipment. While the requirement to be compliant with the SMETS should provide for interoperability in most instances, there may be some situations where additional regulatory intervention is required. A licence condition to require interoperability could help prevent the need to replace equipment before the end of its natural life. Respondents to the Consultation were divided in their reactions to a licence condition for interoperability. Those in favour pointed to the need to ensure that all parties work together to maximise the benefits of the roll-out, while those against the proposal argued that the SMETS and any assurance framework should drive interoperability. The Government is minded to introduce an interoperability condition in the future. However, because the detail of such an obligation is dependent on the rest of the policy framework, in particular on assurance and accreditation, the Government does not intend to introduce such a licence condition immediately. The Government will continue work on this issue in conjunction with developing proposals on assurance and accreditation.
- 1.7 Following the August Consultation, the Government sought views on possible exemptions from the roll-out obligations for all energy suppliers and small energy suppliers through two open letters. The exemptions would enable

³Smart Meters Implementation Programme: Delivery Plan:
www.decc.gov.uk/assets/decc/11/tackling-climate-change/smart-meters/3978-smart-meters-imp-programme-delivery-plan.pdf

Smart-type meters to remain in place beyond the roll-out completion date in 2019.

- 1.8 The Government recognised the potential benefits of an exemption for all suppliers ahead of the confirmation of SMETS, but considers that these are outweighed by the risks and potential costs involved.
- 1.9 Additionally, the Government recognises that there are some potential benefits of an exemption that could apply for small energy suppliers, in particular that it could reduce barriers to market entry and growth for some small suppliers with particular commercial models. However, given the concerns and questions raised about the effectiveness of an exemption, the Government is not convinced that an exemption would address the financial investment challenges faced by some small suppliers.
- 1.10 The Government has therefore decided not introduce an exemption from the smart metering roll-out obligation for smart-type meters for either all suppliers, or just small suppliers.
- 1.11 Another key aspect of the licence conditions that was consulted upon was the period of notice that energy suppliers should be given before obligations take effect to install a smart metering system whenever a traditional meter is being replaced or newly installed (the ‘new and replacement’ obligation). Respondents saw the need for a notice period before the new and replacement obligation took effect, but the notice periods that they proposed varied considerably. The Government will work with industry to establish the criteria to be met before the new and replacement obligation enters into force. The Government expects these activities to have progressed sufficiently to enable a new and replacement obligation to take effect around the time that mass roll-out of smart metering commences.
- 1.12 The amount of notice energy suppliers should be given before obligations to offer an In-Home Display (IHD) take effect was also consulted upon. Proposals were also presented for dealing with circumstances where customers had changed energy supplier since an IHD had originally been offered or provided. As with the new and replacement obligation, many respondents agreed that a notice period was necessary but generally believed that less time was needed because the technical complexity of IHDs is much lower. As the licence conditions are now expected to take effect in late 2012, which is the point that the Government proposed that the condition would come into effect in the Consultation, the Government considers that the need for additional notice is no longer needed. The Government has therefore concluded that it will require installing energy suppliers to offer an IHD at the time of installation of any SMETS-compliant smart meter, keep that offer open for 12 months after the installation if initially refused, and require that faulty IHDs are repaired or replaced for 12 months after installation. Obligations on gaining energy suppliers to supply and repair or replace an IHD, following change of energy supplier, will take effect when the technical specifications are further developed.

- 1.13 The Government has also been considering the extent to which requirements to enrol domestic smart meters with the Data and Communications Company (DCC) should apply, as well as the enrolment criteria that all meters will need to meet in order to be enrolled into the DCC. A key principle of the Government's strategy for smart meters is for domestic smart metering systems to be managed through the DCC and for this option to be extended to the small non-domestic market. Given the evolutionary approach taken to the development of the SMETS, specific criteria may be necessary for meters which comply with the initial version of the SMETS to facilitate enrolment into the DCC. The Government recognises, however, that in some cases, this may not be possible. As such, and to facilitate activity in the Foundation stage, the Government proposes that meters which comply with the initial version of the SMETS, installed prior to a firm Government position on enrolment, will not need to be enrolled into the DCC. If an enrolment obligation is introduced, the Government does not currently intend to apply this retrospectively.
- 1.14 The Consultation also considered a number of other policy and regulatory issues relating to roll-out, including exceptions for some specific types of meters, meter replacements in emergency situations, and the installation of a smart gas meter before a smart electricity meter.
- 1.15 The Consultation also explored a number of technical issues. This included whether to require the installation of a Communications Hub as part of the smart metering system within consumer premises. The IDTS had proposed that a Communications Hub was the most effective means of providing a replaceable WAN interface to allow for the possibility that the WAN technology may be replaced during the lifetime of a smart metering system. A majority of respondents agreed that specifying a Communications Hub was an important factor in achieving the business case for smart metering and for enabling interoperability. However, in the absence of including a specific HAN standard in the initial version of the SMETS, the Government will not require that a separate Communication Hub is installed. Instead, it will mandate the communications functionality is delivered but without specifying how this must be achieved. However, given the interoperability and other benefits, the Government intends that a Communications Hub will be defined in a future iteration of the SMETS and that this should be physically separate to or detachable⁴ from the electricity meter. This will allow for replacement of the WAN interface without the need to replace other components of the smart metering system. The Government is continuing to examine which party should have responsibility for the procurement, ownership and ongoing maintenance of the Communications Hub.
- 1.16 Communications standards and protocols were considered in the Consultation, including between the DCC and the systems in each consumer premises. To allow individual messages to be correctly routed between the DCC and specific smart metering systems, a suitable Network Layer addressing scheme will be required as part of the functionality of the WAN. The majority of respondents supported the Government's position on network

⁴ Described as an ‘intimate’ Communications Hub in the consultation

addressing and the Government has concluded that it will not at this stage mandate a Network Layer addressing standard for the WAN and will retain a minimum requirement for provision of a single Network Layer address for the WAN interface.

- 1.17 The Consultation drew attention to the importance of ensuring integrity of smart metering systems at the point of installation in consumer premises, as well as for the End-To-End Smart Metering System, so as to give confidence that the new arrangements will operate as intended and continue to do so. Views were sought on whether there was a need for an assurance framework, the extent to which the regulatory obligations would provide the assurance function and whether a different approach was necessary for the Foundation stage and enduring arrangements. There was general support for some form of assurance framework but no clear preference for any particular mechanism. It was acknowledged that a regulated assurance scheme, in addition to the arrangements suppliers and other parties would be expected to undertake on commercial grounds, may not be feasible in the Foundation stage; as it would take time to establish such a regime and could discourage innovation, which is regarded as an important aspect of this phase. Reflecting the more open approach to communication standards and taking the above into account, the Government has concluded that the technical assurance of the first iteration of the SMETS meters should be market-led but is examining the certification and assurance arrangements that could apply to metering equipment which complies with future iterations of the SMETS.
- 1.18 The Government used the Consultation to seek views and further evidence on the merits of using smart metering to assist Distribution Network Operators (DNOs), in particular in their delivery of smart electricity grids. Views and evidence were sought on issues including maximum and minimum electricity consumption demand reporting, network registers and the ability to disconnect ‘Floating Neutral’ line voltages (a network fault in which excessive voltages can be passed to consumer appliances and devices).
- 1.19 On maximum and minimum electricity consumption demand reporting, benefits were identified by respondents particularly in relation to how this functionality would support smart grids. Those opposing this requirement referred to a lack of evidence regarding its benefits and that equivalent data could be obtained by downloading the half hourly values stored in the meter. The Government believes that maximum and minimum reporting would be valuable and that it offers advantages over data from half hourly values, but as this functionality is not available in existing (or soon to be available) meters, the Government will not require this capability but will consider it for future versions of the SMETS.
- 1.20 A requirement for Network Registers was considered in view of their potential to support flexible system use charges. Such charges would reflect the fact that some of the costs of distributing energy are variable. Among the factors affecting these variable costs is the intermittency of generation due to greater use of renewable sources of energy in the generation mix. Respondents generally opposed this requirement, largely due to lack of evidence on

benefits. The Government has decided not to include this functionality in the SMETS.

- 1.21 The use of smart metering to reduce the impact of Floating Neutral faults was explored. A meter could be required to detect, and to disconnect the supply on detection of such a fault. A majority of respondents were of the view that such smart meters should only be required to disconnect supply on detection of a fault condition if they met far higher specifications which would incur significant costs. The Government has decided that, on the basis of the currently available evidence, there is not a case to mandate this functionality.
- 1.22 The Consultation proposed that SMETS should enable consumers to access their energy consumption data over their Home Area Network (HAN) and transfer consumption information to other devices in the home. Data could be accessed through a “bridging device”. The Consultation invited comments on this approach. There was almost unanimous agreement that a bridging device or Consumer Access Device was the most suitable way to provide the consumer with access to information from smart metering systems. The Government has decided that the capability will be included in the SMETS to provide access to information for consumer devices and will continue to consider how best to support secure and consumer friendly access to consumer data locally. It is intended that the proposed operational licence condition will place a requirement on energy suppliers to make consumption data available to consumers via this bridging device. These requirements will be defined in future iterations of the SMETS as necessary.
- 1.23 As many of the consumer benefits of smart metering relate to providing consumers with better access to information on their energy usage through the IHD, the Consultation sought views on what information should be made available on the IHD and how it should be displayed. This included: Ambient feedback⁵ based on cost; real-time gas demand; information on consumption and cost in the latest bill period; and “Next-tariff” rate and account balance for credit customers. There was substantial support from respondents for a requirement for Ambient display of real-time energy based on usage but not on cost. The Government has decided that Ambient feedback based on level of consumption (low, medium or high) and not cost will be required. Since no material evidence was provided to justify a requirement for the display of information on real-time gas demand, the Government confirms that IHDs will not be required to display this information. A majority of respondents agreed that the functionality should be included in the SMETS to give suppliers the option of providing account balance information to credit consumers. The Government has decided to include in the SMETS a requirement for the capability to calculate and display (on the IHD) the meter balance when operating in Credit Mode (the amount of money due from energy consumption and standing charges since the meter balance was last reset). However, suppliers will not be mandated to use this capability.

⁵ The representation of information in a form that can be perceived at a glance, for example by colour coding.

- 1.24 Views were sought on a requirement to include an isolation switch in the SMETS to allow electrical contractors to work safely between the meter and the consumer unit (fuse box) without requiring the main supply fuse (the cut-out) to be removed. A majority of respondents opposed the requirement on grounds including cost and the delay this would cause to the roll-out. The Government has concluded that there is no material evidence to support regulatory intervention on the grounds of safety or market failure as part of the Programme, but will work with the relevant regulatory authorities to develop a process to help stakeholders find an alternative solution.
- 1.25 The Government will now notify the roll-out licence conditions and the SMETS to the European Commission, as required by the Technical Standards Directive. Once notification is complete, the Government intends to lay the roll-out licence conditions before Parliament in the Summer. Subject to Parliamentary approval, the licence conditions will enter force in late 2012 and the SMETS will be designated as the appropriate specification for smart metering equipment by the Secretary of State.

2. Introduction

Overview of Consultation

2.1 The main proposals of the Consultation on draft licence conditions and technical specifications for the roll-out of gas and electricity smart metering equipment (August 2011) were to:

- require that all licensed gas and electricity suppliers must take all reasonable steps to ensure that smart metering systems (not including an IHD), which complies with the SMETS, is installed at their domestic and smaller non-domestic Customer's premises by a specified target date in 2019. See Section 3 – *Completion of the roll-out by a specified date* (p17-18);
- introduce possible further regulatory obligations on suppliers to support the interoperability of equipment that complies with the SMETS. See section 3 – *Interoperability licence condition* (p19-21);
- introduce an operational licence condition that will require suppliers to utilise the functionality of smart metering systems installed in consumers' premises. See section 3 – *Proposed operational licence condition* (p21-22);
- require that, from a date specified by Secretary of State, all reasonable steps should be taken to ensure that meters installed, whether new or replacement, are compliant with the SMETS. See section 3 – *Notice period before entry into force of new and replacement meter obligation* (p33-44);
- require that when installing smart metering systems, suppliers should offer domestic consumers an IHD that meets the required IHD Technical Specifications detailed in the SMETS. See section 3 – *Provision of IHDs* (p34-37);
- outline the process that the Government proposed to adopt to develop the IDTS into the SMETS with which smart metering equipment will have to comply. See Chapter 4 – *Overall approach to developing the SMETS* (p41-46); and
- the Government also consulted on several issues on which the IDTS did not present firm proposals or where further consideration was needed, for example: on whether to specify communications standards, the configuration of communications equipment in the consumer premises and the information that should be displayed on the IHD. See Chapter 4

- 2.2 A consultation email address (smartmetering@decc.gsi.gov.uk) was set up, to which all consultees were invited to submit their comments. The Consultation was available on the Department of Energy and Climate Change (DECC) website and a paper version of the consultation document was made available on request.
- 2.3 The Consultation invited all interested parties to comment on the proposals by 13th October 2011. DECC also held a number of meetings with the SMETS Stakeholder Advisory Group (SSAG) and the Overall Design Authority Group (ODAG) during the period between the launch of the Consultation and the publication of this response document. These groups, which included experts from consumer bodies, manufacturers, energy suppliers, DNOs and other interested parties, provided advice as the SMETS was developed by the Government. In addition, DECC also convened the Smart Metering Regulation Group to provide advice on the regulatory framework as it was developed.

Consultation responses

Sector	Number of responses
Energy Suppliers	13
Energy Network	8
Industry	8
Other Industry	6
Meter Suppliers	14
Comms & Technology	18
Consumer Group	5
Other	9

- 2.4 Eighty one written responses were received from a wide range of interested parties, including: large and small energy suppliers; Network Operators; meter manufacturers; communications providers; and consumer groups. Annex 3 provides a list of the organisations that provided a written response to the Consultation and annex 4 provides an overview of responses to the Consultation questions. The majority of responses were sent electronically. The collation and summary of responses has been prepared by DECC.
- 2.5 This document summarises the responses received to this consultation and sets out the Government's response to these points and policy decisions. Associated Impact Assessments are available on-line and the licence conditions that will give effect to these decisions are included in annexes 1 and 2.

- 2.6 The responses received to the Consultation, with the exception of those where respondents have requested their response to be treated in confidence, will be available online at www.decc.gov.uk.
- 2.7 In addition the government issued two open letters about potential exemptions from the roll-out obligation. The first letter, dated 22 December 2011, asked for views on a possible exemption to the roll-out obligation for small suppliers only. This was followed by a further open letter on 19 January 2012, asking for views on a possible exemption for all suppliers. The letters asked for additional evidence in relation to the impact of an exemption and requested views on the policy proposal, including variations on how the exemption might be scoped. The summary of responses is set out in Annex 5.

Next steps

Notification

- 2.8 The Government will now notify the roll-out licence conditions and the SMETS to the European Commission, as per the requirements of the Technical Standards Directive (TSD). After notification to the Commission, a standstill period of a minimum of three months applies during which time the draft measures may not be adopted; this period may be extended if the Commission or a Member State believe the specifications represent a serious barrier to trade. On completion of the TSD notification, the Government intends to lay the roll-out licence conditions in Parliament in summer 2012. If the Commission makes comments on the specification or roll-out conditions, it may be necessary for Government to make amendments prior to submitting the conditions to Parliament. Subject to Parliamentary approval the licence conditions will enter force in late 2012 and the SMETS will be designated as the appropriate specification for smart metering gas and electricity systems and IHDs by the Secretary of State.
- 2.9 This Government Response describes the policy positions as a result of the consultation process and the licence conditions in their current form are intended to accurately reflect those policy positions. Because of the EU notification process, there is an extended period between publishing this response and laying the modifications in Parliament. If, during this period, Government becomes aware of any material differences between the published policy position and the effect of the current licence conditions, Government may look to rectify this by modifying the conditions before laying them in Parliament. If any such drafting changes are made, they will be published and made available to stakeholders prior to the laying of the modifications.

Future iterations of the SMETS

- 2.10 Future iterations of the SMETS may be used to address the following issues:
 - HAN selection
 - Remaining technical issues
 - Interface specification definition

- Security

2.11 These categories are explained in more detail below in terms of the specific activities and process.

HAN Selection

2.12 The Programme is currently undertaking a radio frequency propagation trial (120 GB properties and four frequencies 169MHz, 433MHz, 868MHz and 2.4GHz) as part of its HAN evaluation exercise. The objective of this exercise is to make recommendations for a primary wireless HAN (one that will achieve coverage in a majority of GB properties), a primary wired HAN (based on existing in-premises wiring for use where wireless solutions are not an option) and options for hard-to-reach gas meters. The recommendations will specify the relevant standards according to the Open Systems Interconnection (OSI) model⁶ that will ensure technical interoperability. The HAN evaluation exercise will take into account a number of factors including ability to deliver the benefits, the extent of GB coverage, availability of the technology, availability of certification schemes and suitability for gas meters / power consumption. Economic analysis of options will be undertaken and the results used to help form recommendations. The HAN selection process also feeds into other areas such as the definition of Communications Hub requirements as well as ownership of the Communications Hub. It will also influence the selection of WAN Application Layer standards.

Remaining Technical Issues

2.13 A number of technical issues have been deferred to a future iteration of the SMETS. The principal reasons were:

- absence of a defined HAN standard where the inclusion of certain functionalities would not result in benefits; and
- lack of availability of functionalities within the timescales of the first version of the SMETS.

2.14 The main areas for further consideration and possible inclusion into the SMETS are:

- Communications Hub definition;
- electricity smart metering system variant functionality:
 - multiple measuring elements (for installations where electric hot water and space heating are billed on separate circuits);
 - auxiliary switches (to allow specified loads within a premises to be switched remotely or according to a schedule); and
 - randomisation of switched loads (prevents surges by ensuring loads across a distribution network are not switched on simultaneously)

⁶ This reference model provides a common basis for the coordination of standards development for the purpose of systems interconnection, while allowing existing standards to be placed into perspective within the overall reference model.

- capability to support a secure but consumer friendly process for local access to data;
- DNO requirements including: minimum and maximum demand and voltage measurement over a configurable time period; outage management and first breath (the ability to report to the DCC that supply to a premises has been restored) reporting; and additional load limiting capability for the meter to limit load based on the number of times demand has exceeded a configurable threshold
- specification of a hand held terminal interface;
- specification of the Microgeneration meter interface; and
- specification of an enduring PPM interface device

Interface Specifications

2.15 To support the development of companion specifications based on the selected HAN and WAN standards, the Government will draft an end-to-end interface specification that will further define the data items, commands and messages associated with each element of the End-To-End Smart Metering System.

Security

2.16 The Government is undertaking further activities to finalise the high level design of the cryptographic components and access controls to support the smart metering equipment hardware and software specification. In parallel with this there are activities to define the technical tests needed for any certification required, a security-by-design approach and the interactions with the wider smart metering system for the smart metering equipment.

Delivery and Timescales

2.17 A similar process to that used to date will be followed with the Programme leading the activity and using stakeholder advisory groups to provide feedback on documents and issues as they arise. The timescales are set out in the implementation plan, with notification (covering the issues set out above) planned for Q2/3 2012.

3. Licence conditions

- 3.1 The August 2011 Consultation included draft supply licence conditions covering obligations to: complete the roll-out of smart metering systems by a specified target date; install only smart metering systems from a date to be specified (new and replacement); and offer an IHD to domestic customers. The updated licence conditions, which have been amended in line with the discussion in this section, are available in Annexes 1 and 2.

Completion of the roll-out by a specified date

Summary of issue

The March 2011 Response to the Prospectus Consultation⁷ stated that suppliers would be required to complete the roll-out of smart meters in 2019. The August 2011 Consultation sought views on the completion date that should be specified in the roll-out licence condition and, in particular, the impact of setting a date in the earlier part of 2019. It further proposed that suppliers be required to take 'all reasonable steps' to complete the roll-out by the set date.

Government consideration of issue

- 3.2 A significant majority of respondents were concerned that suppliers could be required to complete the roll-out before the end of 2019. Indeed, many felt that December 2019 represented a challenging target, and some argued that the completion date should be linked to the delivery of the DCC, rather than be defined in absolute terms. The concern about setting a completion date early in 2019 reflected the complexity of the roll-out itself, the time needed to deliver the roll-out in a way that supported benefits realisation, and the impact on delivery if there were delays in delivering key Programme activities, including the technical specification for smart metering equipment and a fully operational DCC.
- 3.3 In defining the completion date for smart metering roll-out, an appropriate balance needs to be found between the Government's desire to deliver the benefits of smart metering for consumers as early as possible and the risks to these benefits if the roll-out is rushed. Since the Consultation closed, there have been changes to elements of the Programme plan in areas highlighted by consultation respondents, in particular, the date for notification of the

⁷ Ofgem/DECC, Response to Consultation on the Smart Metering Prospectus, March 2011. www.decc.gov.uk/assets/decc/consultations/smart-meter-imp-prospectus/1475-smart-metering-imp-response-overview.pdf

SMETS to the EU (moved to Q2 2012 from 2011), and the date by when DCC is expected to be operational (moved to Q3 2014 from Q2 2014). The Government believes that the effects of these changes are balanced by its encouragement of early activity by suppliers, for example through the staged approach to development of the SMETS (see section 4) and the wide engagement with industry throughout the development of the SMETS.

- 3.4 The Government therefore considers that 2019 remains a feasible deadline by which suppliers should have completed the roll-out. However, given the need to ensure that the roll-out is delivered in a way that provides a good consumer experience, and recognising some of the practical challenges for suppliers in delivering smart metering installations at scale, it considers it prudent to set a date of 31 December 2019 for completion.
- 3.5 The Government recognises that there will be some circumstances where suppliers may face particular difficulties in installing smart metering systems by the completion date. The requirement on suppliers to take 'all reasonable steps' to ensure that a smart metering system is installed is an acknowledgement of this. This 'all reasonable steps' requirement applies both in situations where the supplier is responsible for installing, or arranging the installation, of a smart metering system and where individual consumers choose to exercise their continuing right to self-provide an appropriate metering system.
- 3.6 Some respondents observed that the 'all reasonable steps' requirement is open to interpretation but there was relatively little demand for guidance at this early stage on the minimum steps that suppliers would need to follow to fulfil an 'all reasonable steps' test. It may, however, be appropriate to provide further clarification, potentially through the licence conditions themselves, for example once there is a greater understanding of the range of challenges that may be encountered during the roll-out of smart meters.
- 3.7 As with other licence conditions, each supplier is responsible for its own compliance with the licence condition. Each supplier must undertake its own assessment of the steps necessary to comply with licence conditions and applicable legislation, and put in place the appropriate systems, processes and procedures to ensure that it takes those steps.
- 3.8 There will not be a legal obligation on individuals to have a smart meter, and the Government does not expect energy suppliers to take legal action (for example by seeking a warrant to enter premises) solely to fit a smart metering system if they cannot get the householder's co-operation.

Government conclusion

The Government will require all gas and electricity suppliers to take all reasonable steps to complete the roll-out of smart metering systems to their domestic and smaller non-domestic customers by 31 December 2019.

Interoperability licence condition

Summary of issue

The Government announced in the Consultation that it was considering the merits of introducing a licence condition on suppliers to take all reasonable steps to ensure that all smart metering equipment installed in consumer premises is interoperable with other smart metering equipment. It was suggested that the SMETS requirements and any assurance regime should provide for interoperability in most instances, but some situations may require additional regulatory intervention. The licence condition could help prevent the early replacement of smart metering equipment, thus making a positive contribution to the business case and consumer experience of smart metering roll-out.

To support the interoperability objective, the Government proposed that a dispute resolution process should be considered. The process could be used to resolve disputes between suppliers where equipment was found not to be interoperable with, or operable by, suppliers who did not install the equipment.

Government consideration of issue

- 3.9 Approximately half of respondents supported the introduction of the interoperability licence condition, with approximately a quarter expressly opposed to its introduction. Those in support included manufacturers, communications providers, consumer groups and some energy suppliers. They argued that this was necessary to ensure all parties work together to achieve Programme benefits.
- 3.10 Those opposed, which included most energy suppliers and some of the data service providers, argued that the SMETS and any assurance framework should drive interoperability. The suppliers argued that the licence condition may expose them to competition law issues.
- 3.11 There was general support across the sectors for the introduction of a disputes resolution process, however some respondents qualified their support by arguing that in most instances disputes should be resolved by the parties involved without the need for formal arbitration (although an arbitration process should be available for more serious disputes). Many respondents noted that the dispute resolution process should form part of the SEC framework and should be linked to an assurance regime.
- 3.12 Interoperability is central to the business case for the roll-out of smart metering, including the realisation of consumer benefits and as such, the Government believes that the regulatory framework should reflect this priority. The draft licence condition proposed in the Consultation reflected the need to ensure that smart metering equipment can be changed in the home without

affecting the operation of other smart metering equipment and that such equipment installed by one supplier can be operated by another supplier, should the customer switch. Given the range of responses to the Consultation, the Government is considering the approach that the final licence condition should take.

- 3.13 The Government believes that the intended approach to the development of the SMETS, including standards and architecture for the communications equipment and the approach to technical assurance, are important in delivering interoperability. The Government is also minded to introduce a general licence condition to help ensure suppliers take all reasonable steps to address any remaining risks. The form that any licence condition would take for ensuring interoperability would be influenced by the development of the assurance regime and any related dispute resolution processes, which will be subject to consultation.
- 3.14 One objective of the interoperability licence condition is to encourage suppliers to work constructively with each other to ensure that their equipment is interoperable. It will also provide a clear regulatory provision should any supplier act in a way that deliberately obstructs the achievement of interoperability.
- 3.15 The Government recognises the issues raised by respondents with regards the link between the interoperability licence condition, and any disputes resolution and any assurance regimes that are introduced for the SMETS. In particular, introducing the interoperability obligation as part of this wider framework is expected to mitigate the concerns raised in relation to the enforcement of the licence condition as currently proposed.
- 3.16 As the dispute resolution and assurance processes will not be in place when the roll-out licence conditions and the first iteration of the SMETS are available, the Government does not consider that the interoperability licence condition should be introduced immediately. Further consideration will be given to the precise role that the interoperability obligation should play in the regulatory framework when decisions are taken on the assurance regime and the dispute resolution processes.

Government conclusion

The Government is minded to introduce an interoperability condition, as part of a wider technical compliance framework including assurance and dispute resolution regimes. The objective of this framework will be to ensure suppliers deliver the interoperable systems that are central to the objectives of the Programme and the experience for consumer.

However, the detail of an interoperability obligation is dependent on rest of this framework, on which the Government is continuing to develop its policy. Therefore, the Government does not intend to introduce such a licence condition immediately. Further consideration will be given to the precise role that an interoperability obligation should play in the regulatory framework once further information is available on the assurance regime and the dispute resolution processes. This will be subject to consultation as appropriate. It is the Government's expectation that when such a licence condition is introduced that it will not be applied retrospectively.

Proposed operational licence condition

Summary of issue

During the course of the Consultation, the Government has considered whether the proposed licence obligation to ensure that equipment is installed that complies with the SMETS (i.e. the roll-out obligation) would provide the necessary certainty that consumers would be able to have access to the functionality needed to deliver the objectives of the Programme. As part of these considerations, the Government has considered the potential role of an additional so-called "operational" licence condition which requires suppliers to utilise compliant smart metering systems to deliver defined outcomes for consumers, based on the high-level functionalities set out in the Prospectus Response.

Background

- 3.17 The SMETS have been drafted to ensure that smart metering systems will provide for specified technical capability, but will not usually require that this functionality is actually made operational. For example, as the SMETS will set out that "the smart metering system shall be capable of storing 13 months of half hourly (kWh and cubic metres) consumption data" but will not require suppliers to actually utilise this functionality.
- 3.18 The business case for smart metering is predicated on smart metering systems being operated in smart mode to deliver a range of functionality to consumers, Network Operators, and other parties. Therefore, the Government

believes it is important to consider whether additional requirements should be placed on suppliers in order to ensure that they utilise the functionality that this equipment is capable of providing.

Government consideration of issue

- 3.19 The SMETS has been developed to ensure that the equipment installed in the consumer premises is capable to delivering the high-level (A-H list) functionality set out in the March 2011 Prospectus Response. In developing the roll-out obligation, the Government has become concerned that by itself, this obligation may not ensure suppliers deliver the benefits of the Programme: while it would be in supplier's interests to utilise the vast majority of the functionality of smart metering systems, having borne the expense, that there is merit in regulating to ensure consumers receive the functionality. This could be particularly important where it may not be in the suppliers' immediate interests to make such functionality available to consumers.
- 3.20 In addition, the Government is keen to ensure that, reflecting the supplier-led roll-out of smart metering systems, the regulatory framework establishes responsibility for the delivering the necessary outcomes for consumers that contribute to the benefits of the Programme, with suppliers. The operational licence condition would regulate the high-level outcomes of the Programme, including the provision of consumption data locally, complementing the roll-out obligation which mandates the deployment of the technology necessary to delivery these outcomes.
- 3.21 The Government has discussed the concept of an operational licence condition with stakeholders and with Ofgem, in part through the Smart Metering Regulation Group. No significant concerns were raised with the proposal, although the stakeholders noted that further information on the format of any such obligation was necessary before final views could be formulated.
- 3.22 This future consultation will also include the extent to which obligations are required on suppliers to provide certain functionality to DNOs.

Government conclusion

The Government is minded to introduce an operational licence condition that would require suppliers to utilise the functionality of smart metering systems installed in consumers' premises.

The Government will consult on the detail of this obligation in Summer 2012, including when such an obligation should come into force, taking into account the policy objective to support an active Foundation stage.

Exemptions from the roll-out obligation for Smart-type meters

Summary of issue

After the formal consultation period had closed, some energy suppliers raised issues about their ability to continue to install Smart-type meters ahead of the confirmation of the SMETS. In response, the Government issued two open letters⁸ seeking views on whether there was a case for an exemption to the roll-out obligation for Smart-type meters installed by small, or all, suppliers.

Background

- 3.23 In late 2011, some of the small suppliers that are already installing meters with smart functionality proposed that an exemption from the roll-out obligation for Smart-type meters, should be offered ahead of the confirmation of the SMETS.
- 3.24 Smart-type meters offer some of the functionalities included in the SMETS, and so deliver some benefits for consumers and the Programme more broadly, but are not fully compliant with the SMETS. Some small suppliers argued that an exemption could support their deployments of Smart-type meters in the period before SMETS compliant meters were widely available and therefore reduce barriers to market entry and growth while also delivering early benefits for consumers.
- 3.25 In addition, an exemption for all suppliers was considered as a number of stakeholders raised the potential challenges of meeting the 2019 completion date if the timetable for finalising the technical specification for compliant smart meters were to be delayed in their responses to the August rollout Consultation.
- 3.26 We therefore sought views on whether additional action is needed to support practical programmes of preparation for the mass roll-out to continue.
- 3.27 In response, the Government issued an open letter on 22 December 2011 asking for evidence on the numbers and types of Smart-type meters being installed now, and views on the merits of a limited exemption for small energy suppliers from the roll-out obligation for Smart-type meters. In particular, the letter noted that it is important that the energy market operates on a fair and effective basis and that the Government avoids exacerbating barriers to entry

⁸ DECC. Open letter: possible exemption for small suppliers from the smart meters roll-out obligation. 22 December 2011. www.decc.gov.uk/assets/decc/11/tackling-climate-change/smart-meters/3971-open-letter-possible-exemption-for-small-supplier.pdf

DECC. Open letter: possible exemption for all suppliers from the smart meters roll-out obligation. 19 January 2012. www.decc.gov.uk/assets/decc/11/tackling-climate-change/smart-meters/4163-open-letter-from-charles-hendry-possible-exemption.pdf

and growth through its approach to smart metering. The letter also indicated that it is important that suppliers are able to continue to install meters with smart functionality during the Foundation stage but that, in considering the option of an exemption, the Government must also ensure that consumers are protected and that the overall business case for the Programme is maintained.

- 3.28 A second open letter was issued on 19 January 2012 asking stakeholders to respond with their views on the merits of a wider exemption from the smart metering roll-out obligation for smart-type meters for all energy suppliers. Again, this highlighted the need to support practical programmes of preparation for mass roll-out, whilst minimising the risks of additional costs to the Programme or interfering with the fair and effective operation of the energy market, or of creating disbenefits for consumers.

Government consideration of an exemption for all suppliers

- 3.29 In response to the open letter on the option of an exemption for all suppliers, respondents recognised that an exemption could reduce stranding costs for Smart-type meters that would otherwise have to be removed before the end of their economic life, and so facilitate continued installation of Smart-type meters before SMETS compliant meters are available.
- 3.30 Some respondents argued that the installation of Smart-type meters should be supported through an exemption as it would enable some consumers to access many of the benefits of smart metering earlier than otherwise, and would contribute to learning during the Foundation stage.
- 3.31 Other respondents highlighted the potential drawbacks and risks of an exemption. In particular, there was concern that consumers receiving Smart-type meters would be placed at a long term disadvantage compared to those with SMETS compliant smart meters. The risk of consumer confusion was highlighted, with questions as to whether people would understand that they had a Smart-Type meter, rather than a fully compliant meter, and how they would relate to communications messages about the benefits of smart metering that may not be available to them. Some respondents also pointed to the potential difficulties for customers with Smart-type meters in switching supplier, particularly if they wanted to maintain smart functionality, and saw this as a particular risk for pre-payment customers. The issue of additional system costs and complexity was also a common theme, with many respondents highlighting the difficulties for suppliers in communicating with Smart-type meters, the costs of replacing these meters with compliant smart meters, and the potential reduced efficiency of the DCC if fewer meters were enrolled and adopted. Some respondents also felt that an exemption could undermine the Programme's focus on delivering the SMETS and were concerned that it would represent a change in the Government's position that early roll-out is at a supplier's own commercial risk.
- 3.32 The Government recognises the potential benefits of an exemption that could apply to all suppliers, but considers that these are outweighed by the risks and potential costs involved. To enable suppliers and meter manufacturers to move towards deployment of compliant smart meters as soon as possible, the

Government has ensured that the developing the SMETS have been shared widely across the industry. Therefore the smart metering roll-out obligation will not be amended to allow all suppliers an exemption for Smart-type meters. Smart-type meters installed now will not need to be replaced until 2019 to comply with the roll-out obligation.

Government consideration of an exemption for small suppliers

- 3.33 In relation to an exemption focused solely on smaller suppliers, there was a wide mix of views expressed by respondents. Some argued that an exemption could help small suppliers to secure investment in the immediate term, so that they could continue to offer Smart-type meters and services to their customers ahead of SMETS-compliant meters being available on the market. Some small suppliers argued that an exemption could help support market growth and so competition in the retail energy market. As with the wider exemption, respondents argued that a small supplier exemption could give more consumers the opportunity to see some of the benefits of functionality earlier than they might otherwise, and help to maintain momentum and learning during Foundation stage.
- 3.34 However, there was also concern that an exemption for just small suppliers could be discriminatory, in that it would be aimed at addressing the concerns of only a particular section of the energy retail market. This concern was raised by both some large and small suppliers, who felt that an exemption would favour one particular group or one specific commercial model over another. In addition, some small suppliers felt that whilst they did face some barriers to growth ahead of the confirmation of the SMETS, an exemption would not provide enough certainty to secure the financing needed to support continued roll-out of Smart-type meters because it could not be guaranteed that Smart-type meters would remain in place on change of supplier, and therefore assets could still be stranded.
- 3.35 Otherwise, the concerns raised were broadly similar to those raised with respect to the exemption for all suppliers covering potential consumer disadvantage, additional costs and complexity. Some respondents noted that, while the number of Smart-type meters installed under a small supplier exemption would be lower than for a wider exemption, even a small number of customers having a poor experience of smart metering early on in the Foundation stage – particularly at the point of trying to switch supplier – could have a disproportionate impact on the success of mass roll-out.
- 3.36 The Government recognises that there are some potential benefits of an exemption that would apply to small suppliers, in particular that it could reduce barriers to market entry and growth for some small suppliers with particular commercial models. However, given the concerns and questions raised about the effectiveness of an exemption, the Government is not convinced that an exemption would address the financial investment challenges faced by some small suppliers, and that a more effective way to provide certainty will be through the confirmation of the SMETS. Smart-type meters installed now will not need to be replaced until 2019 to comply with the roll-out obligation.

- 3.37 To enable suppliers and meter manufacturers to move towards deployment of compliant smart meters as soon as possible, the Government has ensured that the developing the SMETS have been shared widely across the industry. Therefore the smart metering roll-out obligation will not be amended to allow small suppliers an exemption for Smart-type meters.
- 3.38 The Government recognises the importance of the related issues of DCC enrolment and smart change of supplier, which also bear on suppliers' readiness to invest during the Foundation stage. These issues are being considered further by the Programme.

Government conclusion

The Government has decided not to introduce an exemption from the smart metering roll-out obligation for Smart-type meters for either all suppliers, or just small suppliers.

Exceptions from the roll-out obligation: Current Transformer Meters and larger gas meters

Summary of issue

As Current Transformer Meters – of which there are some 25,000, largely in non-domestic properties – cannot be provided with the full range of smart functionality, the Consultation sought views on a requirement that they receive advanced functionality instead. During the consultation period, a range of stakeholders raised similar issues about some larger gas meters, which are also found largely at non-domestic sites, and the case for applying the same exemption to these meters has also been considered.

Government consideration of issue

- 3.39 Almost all stakeholders understood and accepted the limitations on providing Current Transformer Meters, under which customers with higher electricity loads are metered indirectly through current transformers, with smart functionality. Respondents supported the provision of advanced⁹ functionality as the best intelligent solution available, and one that would ensure that many of the benefits of smart metering would be available to customers. Some

⁹ An advanced meter is one that, either on its own or with an ancillary device, can provide half-hourly electricity or hourly gas consumption data and can provide the supplier with remote access to such data.

stakeholders recommended an explicit extension of this exception to the small number of domestic customers with a Current Transformer Meter.

- 3.40 The question of whether a smart technical solution for larger gas meters, commonly known as U16 meters, was technically feasible and economically viable was not discussed in the written consultation. It was, however, raised by some respondents and considered in detail with a wide range of relevant industry stakeholders, as part of the process that has led to the development of the SMETS. There was a consensus that there was little likelihood, now or in the medium-term, of an economically viable smart solution.
- 3.41 For the non-domestic sector, the Government will therefore retain the proposed exception from the smart metering roll-out obligation for existing and new Current Transformer Meters and create a further exception for existing and new larger gas meters, defined as meters designed to manage gas flows of over 11 cubic metres per hour. In both cases, suppliers would be required to provide advanced metering instead.
- 3.42 The Government has also decided to replicate these exceptions for current transformer and larger gas meters for the domestic sector. Whilst the numbers of such meters in use at domestic premises are low - around 1,800 Current Transformer Meters and 10,000 larger gas meters – the Government recognises suppliers' desire for regulatory certainty in this area. This will also ensure that such meters receive advanced functionality, allowing these domestic customers to enjoy many of the benefits of the Programme.
- 3.43 For non-domestic sites, in circumstances where a Current Transformer (CT) meter or larger gas meter is newly installed after 6 April 2014, the meter should be provided with advanced functionality from the outset. For domestic sites, in circumstances where a CT meter or larger gas meter is newly installed after the new and replacement obligation takes effect, the meter should be provided with advanced functionality from the outset.
- 3.44 The Government recognises that metering systems will evolve over time, and does not wish to constrain innovation around larger gas meters. If smart variants for such meters became available in due course, the rules governing them could be revisited by the Government (if before the expiration of the Energy Act 2008 powers in 2018) or Ofgem, under its usual powers.
- 3.45 Some non-domestic suppliers also raised the question of the treatment of smaller non-domestic meters in the property portfolios of multi-site organisations where a mix of smart and advanced metering has been deployed. Larger non-domestic sites¹⁰ will be upgraded to advanced functionality by April 2014 under existing licence conditions and are not covered by the smart metering roll-out obligations. Smaller non-domestic sites¹¹ are covered by the smart metering roll-out obligation but are exempt if

¹⁰ Larger non-domestic electricity sites are defined as those within profile classes 5-8 and gas sites as those with consumption above 732 MWh per annum.

¹¹ Smaller non-domestic electricity sites are defined as those within profile classes 3 and 4, and gas sites as those with gas consumption below 732 MWh per annum.

a meter with advanced functionality is installed before April 2014 or if contracts are in place before April 2014 to install advanced functionality before 2019. Smaller non-domestic meters could therefore sit as part of a mixed advanced and smart metering portfolio.

- 3.46 Multi-site organisations with a mixed portfolio may wish to use a common energy management service across their operations, and to use an advanced, rather than smart, service. The drafting of the SMETS would allow these businesses to provide information from the smart metering system to an advanced data service if they wished to do so, and the licence condition would not prevent their using an advanced data solution with a compliant smart meter. The Government will not, therefore, provide a further exception.

Government conclusion

Current Transformer Meters and larger gas meters (those designed to deal with gas flows of over 11 cubic metres) at both non-domestic and domestic sites will be required to be given advanced, rather than smart, functionality.

SMETS compliance, including retrofitting

Summary of issue

The Consultation sought views on the requirement that smart metering equipment should comply with the SMETS at the time of installation, and be able to continue to comply with the version of the SMETS that was extant at that time throughout its operational life. It also sought views on the case for requiring suppliers to replace or modify meters before the end of their operational lives in exceptional circumstances, such as to protect against newly emerging security threats or safety issues.

Government consideration of issue

- 3.47 Respondents accepted the principle that smart metering systems should comply, and continue to comply, with the version of the SMETS in operation at the time of the installation. The Government has therefore maintained this position, with a clarification in the licence conditions that a compliant meter installed before the conditions take effect should continue to comply with the SMETS as it is when first designated.

- 3.48 Respondents also recognised that the SMETS would evolve over the roll-out period, but there were differing views on whether smart metering systems should be expected to comply with evolving versions of the SMETS throughout their operational lives, partly depending on whether upgrades could be delivered remotely. Respondents stressed that changes to the SMETS – and thus changes in specifications given to manufacturers – should be arrived at through a proper change-management process, with adequate notice of changes being given to parties. Such a process would need, among other things, to take account of the fact that metering equipment would have been manufactured and stored in advance of deployment using the version of the SMETS in operation at a particular time.
- 3.49 Respondents broadly recognised that there could be circumstances where a further visit to the property to modify a metering system or even to replace it might be required. Given the costs involved, respondents were concerned that these circumstances should be narrow and, in essence, limited to safety and security matters.
- 3.50 The Government understands these concerns, although it does not believe it could precisely define and limit ‘exceptional circumstances’ at this point in time, and could not commit to requiring retrofitting or replacement only on safety or security grounds, given that there might be external requirements for change, such as EU Directives.
- 3.51 In due course, responsibility for governance of the SMETS is expected to move from Government to arrangements established in the SEC. This is discussed further in section 4.

Government conclusion

Under normal circumstances, suppliers will be required to take all reasonable steps to ensure that smart metering systems comply, and continues to comply, with the version of the SMETS in place at the time of the installation. In exceptional circumstances, suppliers may be required retrospectively to modify or replace a smart metering system already installed.

New developments

Summary of issue

Smart metering systems at properties in new developments are often installed by parties other than the supplier, such as distribution networks or meter operators. The Consultation sought views on whether the Government should apply new rules to these parties to ensure that smart metering systems were installed once the new and replacement obligation entered into force.

Government consideration of issue

- 3.52 There was broad agreement amongst respondents that responsibilities in this area lay with suppliers, who could control the ultimate metering installation, even if they did not themselves install the metering system.
- 3.53 The Government expects smart metering systems to be installed at all new developments once the new and replacement obligation has taken effect, regardless of which party is responsible for installing the metering system. The Government has concluded that it should be unnecessary to impose new rules for non-supplier businesses that install metering systems, as suppliers should be able to insist on the use of an appropriate meter before they begin to supply a property. In any case, for their part, non-supplier installers will have a strong commercial interest in installing compliant smart metering system equipment, as non-compliant meters would have to be removed relatively early in their life.
- 3.54 Nevertheless, to further mitigate the risk that parties other than energy suppliers might continue to install traditional meters during mass roll-out, the new and replacement obligation will be updated. This change will require suppliers to take all reasonable steps to ensure that a SMETS-compliant metering system is installed in new developments, which includes those circumstances where they are not directly responsible for the installation themselves. The Government will keep this under review as the roll-out progresses and consider whether any further obligations are required.

Government conclusion

The new and replacement obligation will be updated to make it clear that, wherever supply is provided to a new, or newly connected, property, the supplier should take all reasonable steps to supply that property through a smart metering system.

Installing a gas smart metering system before a electricity smart metering system

Summary of issue

Installing a gas smart metering system where an electricity smart metering system is not already in place adds complexity to the installation process. A separate communications link must be established, and the installer is also likely to need to access the electricity supply. The Consultation explored whether, where a supplier provided only gas to a property, and where the gas metering system would ordinarily be made smart first under the ‘new and replacement’

obligation, suppliers should have the option of temporarily installing a traditional gas meter, which would still need to be replaced with a smart metering system by the completion date.

Government consideration of issue

- 3.55 There was broad, but not universal, support amongst suppliers for a supplier who only supplies gas to particular premises to be able to delay a gas smart installation until an electricity smart metering system had been provided. Some DNOs also supported this view. In particular, respondents noted the higher cost of the installation itself, the higher labour costs (including enhanced training) and the likely need for a gas installer to access the electricity supply, which was not permitted under existing electricity industry rules.
- 3.56 However, others noted that a derogation could encourage continued installation of traditional metering, with attendant investment costs and presentational drawbacks. To counter these and other risks, it was suggested that changes should be made to industry rules to facilitate the installation of a gas smart metering system before that of an electricity smart metering system – for example, by allowing a gas installer to access the electricity supply.
- 3.57 The Government notes the degree of support for a derogation that would allow a gas-only supplier to delay a smart gas installation until a smart electricity metering system had been provided. However, a derogation would only be likely to be of interest in a relatively small number of cases as, in general, suppliers control the timing of gas metering system replacements. There is also a risk of being seen to accept, or even to encourage, continued installation of traditional meters during the mass roll-out of smart metering systems. The Government is not, therefore, persuaded that a derogation should be provided.
- 3.58 Nor does the Government propose, at this stage, to require changes to detailed industry rules to enable the installation of a gas smart metering system before that of an electricity smart metering system. However, the Government fully supports such changes, accompanied by appropriate protection for the DNOs, and encourages the industry to work to deliver them, and will facilitate such change where necessary.

Government conclusion

The Government will not provide a derogation from the new and replacement obligation for gas-only suppliers. Nor will it, at present, require changes to industry rules to enable the installation of a gas smart metering system before that of an electricity smart metering system. However, it fully supports such changes, and will facilitate them if necessary.

Providing emergency services

Summary of issue

The Consultation sought views on the implications of the smart metering roll-out for emergency meter replacements once the new and replacement obligations on suppliers are in force.

Government consideration of issue

- 3.59 Respondents commented that, in the existing market, emergency meter replacement sits comfortably with wider network responsibility for dealing with other emergencies, such as gas escapes. Networks have, therefore, been willing and able to provide emergency metering services to suppliers on a contractual basis. Once the smart metering roll-out is under way, whilst the network is likely to continue to be the first port-of-call for a customer in an emergency situation, the demands on emergency metering services, and thus how they are provided, are likely to be very different. Network staff do not currently have the range of expertise required to install smart metering systems. For their part, networks that responded to the Consultation envisaged a changed and reduced role for themselves. Suppliers had varying views on how this service should be provided and by whom. Respondents highlighted that the priority in any emergency situation should be to restore supply to the customer as quickly as possible.
- 3.60 In December 2011, Ofgem published a document that concluded its Review of Metering Arrangements (ROMA), and consulted on some specific further issues. The Review looked at various aspects of how the current regulatory framework for traditional metering operates and whether it does so in the interests of consumers. Ofgem concluded that many aspects of current arrangements were fit-for-purpose, and should not be changed. However, the document also recognised that there may need to be changes to existing arrangements as a result of the roll-out of smart metering systems. It specifically invited views on how emergency services should be provided during the transition to smart metering systems and once the roll-out was complete and this Consultation closed in March 2012. The Programme will consider the conclusions of that consultation, before considering whether and how to progress this issue. However, the Government sees its role as being to work with Ofgem to facilitate new arrangements, not to stipulate their nature and content. These arrangements may in due course lead to consequential changes to other industry rules and codes.
- 3.61 There remains a question about how the new and replacement obligation should operate in the circumstances of an emergency meter change – of which there are around 35,000 each year, primarily gas. The Government has concluded that the general regulatory obligation on suppliers to take all reasonable steps to ensure that a smart metering system is provided is an

appropriate recognition that there will be some circumstances where there may be particular difficulties in installing smart metering systems. As discussed in “Completion of the roll-out by a specified date” (p17-18), it may be appropriate to provide further clarification, for example through the licence conditions themselves, once there is a greater understanding of the range of challenges that may be encountered during the roll-out of smart metering systems. Ofgem has indicated that it will consider how the new and replacement obligation should be applied in emergency situations, this will be done as part of its wider work on how emergency services should be provided during the transition to smart metering and once the roll-out is complete.

Government conclusion

Once the new and replacement obligation has taken effect, suppliers should take all reasonable steps to install a smart metering system when taking emergency action to replace a meter.

Notice periods before entry into force of new and replacement meter obligations

The Consultation sought views on what notice suppliers should be given before obligations to install a smart metering system whenever a meter was being replaced or newly installed took effect.

Government consideration of issue

- 3.62 Respondents saw the need for a notice period before the new and replacement obligation took effect, although they had differing views on its length. Many linked the entry into force of these obligations to decisions on other key issues, in particular, finalisation of the SMETS, the development of an assurance regime, industry trials and a fully operational DCC, as well as intra-industry issues such as supply chains and training. Against this background, the notice period proposed by respondents varied between three and eighteen months, with twelve months being a point referred to by three large suppliers. Some referred to the desirability of the Programme’s setting clear criteria that would have to be met before the new and replacement obligation came into force.
- 3.63 The Government recognises that the timing of the entry into force of the new and replacement obligation is related to other key Programme milestones. The concept of a notice period may, therefore, be less important than

progress towards these milestones and the clarity that will flow from that. It will work with the industry to establish the key criteria that should be met before this obligation takes effect. These will take into account matters such as the development of the SMETS and the time required for the procurement, production and testing of smart metering systems. The Government expects these activities to have progressed sufficiently to enable a new and replacement obligation to take effect around the time that mass roll-out of smart metering commences. The Government is committed to providing suppliers and other industry players as much notice as practicable before such an obligation is to take effect.

Government conclusion

The Government will work with industry to establish the criteria to be met before the smart metering new and replacement obligation enters into force. The Government expects these activities to have progressed sufficiently to enable a new and replacement obligation to take effect around the time that mass roll-out of smart metering commences

Provision of IHDs

Summary of issue

The Consultation sought views on what notice suppliers should be given before obligations to offer an IHD took effect, and included proposals designed to deal with circumstances where customers had changed supplier since an IHD had originally been offered or provided. These included the replacement or repair of faulty IHDs and the provision of an IHD where one had previously been declined. The Consultation sought views on these proposals, and whether there were other issues around IHD provision following change of supplier that had not been fully addressed.

Government consideration of issue: timing of obligation

- 3.64 The August 2011 Consultation document envisaged that the roll-out licence conditions would be introduced in the first half of 2012 but proposed that the IHD obligation should only take effect when smart metering equipment became available in volume, which at the time was envisaged to be around the end of 2012. In this context, many respondents applied similar considerations to the notice period for the IHD obligation as to the new and replacement obligation although, in general, respondents felt that less time would be required because the technical complexity was much lower. Periods

of between three and twelve months were suggested by respondents. Some suppliers and supplier organisations proposed a point twelve months after the finalisation of the SMETS.

- 3.65 The Government has further considered the timing of the IHD obligation in light of developments within the Programme since the Consultation began, in particular the proposal not to specify a HAN standard in the initial version of the SMETS (see “End-to-end messaging and architectures”, p48-52). In doing so, it has taken into account the central importance of the IHD to facilitating consumer behaviour change and so benefits realisation, and progress made with defining the technical specifications relevant to the IHD.
- 3.66 The roll-out licence conditions are now expected to take effect in late 2012, which is the point that the Government proposed that the condition would come into effect in the Consultation, and the Government still expects SMETS complaint IHDs to be readily available on the market at that time. As such, the need for additional notice has become redundant. The Government has therefore decided that the obligation on an installing supplier to offer an IHD at the installation of a SMETS-compliant smart metering system, keep that offer open for 12 months after the installation if initially refused, and repair/replace faulty IHDs for 12 months after installation should come into effect at the same time as the roll-out licence condition comes into effect. However, the Government will not require suppliers retrospectively to offer an IHD where a SMETS-compliant metering system was installed before the licence condition took effect.
- 3.67 The Government has also considered when it would be appropriate to place an obligation on a gaining supplier (following change of supplier) to provide an IHD where a customer has previously declined the offer from the installing supplier, and repair/replace a faulty IHD provided by the installing supplier. As the initial SMTS will not specify the HAN by which IHDs will communicate with the smart metering system, one supplier’s IHD may not communicate with a metering system installed by another supplier. The Government has therefore decided that it would not be appropriate for obligations on gaining suppliers to take effect until the technical specifications are further developed. The licence conditions have been drafted so that these requirements can be ‘switched on’ for gaining suppliers at a later date, to be determined by Secretary of State.
- 3.68 As described above, the installing supplier will have an obligation to keep the offer of an IHD open for 12 months after the smart metering system is installed. The Government has considered that there may be scenarios where the IHD Technical Specification is updated between the date the smart metering system is installed and the date the IHD is requested from the customer. An exception has therefore been drafted in the IHD obligation to ensure that, where a new IHD is not able to function with an existing meter, the supplier must instead provide an IHD that’s meets the IHD Technical specifications on the date the metering system was provided.

Government consideration of issue: obligations on gaining suppliers

- 3.69 Respondents raised a variety of points on the details of the obligation on gaining suppliers, many of them around the provision of an IHD where a customer had initially declined a device offered by a previous supplier, or replacement of a faulty IHD provided by a previous supplier. Suppliers saw no significant problems in providing replacement IHDs if equipment installed by another supplier became faulty during its first year of operation. Respondents noted some areas where customer expectations would have to be managed, such as the likelihood that the IHD would be replaced with a different model or an upgraded IHD with a basic model. Some suppliers suggested that inter-supplier compensation arrangements would be required.
- 3.70 Where a customer moves into a new property, the risk of the previous owner having removed the IHD was identified. Similarly, where a customer moves into a brand new property, respondents identified that an IHD may not have been left by the meter installer. In these circumstances, the Government expect the commercial interest of suppliers to deliver an appropriate response, given that suppliers are likely to wish to use the IHD as a visible marketing tool and to offer or promote add-ons to the basic meter provision. The Government also believes that, whilst new suppliers replacing faulty IHDs may face challenges in respect of customer expectations or experience, these can be managed by the supplier without the application of formal rules.
- 3.71 In respect of arrangements between suppliers to provide information about original IHD installation dates, the Government notes that automating this information flow would require additional industry arrangements. It is not clear that these would be cost-effective. Nor is it clear that an inter-supplier arrangement to enable recovery of costs of replacing faulty IHDs would be necessary. The Government does not propose to prescribe detailed rules for a wide range of circumstances, including these, that could arise during the roll-out. However, it remains open to Government or Ofgem to intervene if problems materialise that industry cannot resolve.
- 3.72 Through the licence conditions that underpin the Smart Meter Installation Code of Practice, suppliers must not charge their customers any upfront or separate costs for standard smart metering equipment, including the IHD. Under current arrangements, domestic customers pay for metering services – including installation and maintenance – over time through energy bills, and the same will apply to smart metering. These rules would also apply in the event of any requirement on suppliers to upgrade smart metering systems that has already been installed.

Government conclusion

The Government will require installing suppliers to offer an IHD at the time of installation of a SMETS-compliant smart metering system, keep that offer open for 12 months after the installation if initially refused, and repair/replace faulty IHDs for 12 months after installation.

Obligations on gaining suppliers to supply and repair/replace an IHD, following change of supplier, will take effect when the technical specifications are further developed. The Government does not propose to set further rules around this obligation within the licence conditions. It remains open to the Government and Ofgem to intervene in future if problems arise.

Enrolment

Summary of issue

A general principle of the Government's strategy for smart metering is for domestic smart metering systems to be managed through the DCC and for this option to be extended to the small non-domestic market.

A further principle is that the Government is keen to see installation of metering systems in the Foundation stage to assist market evolution, to deliver early benefits for consumers and to aid learning.

These meters will ideally be enrolled into the DCC once it is available. This will be subject to specific enrolment criteria. It is important to establish these in order to provide certainty to suppliers wishing to install meters during the Foundation stage. There is a balance between light-touch criteria, which would ease enrolment, but may create difficulties for the DCC in delivering services, and more onerous criteria which would make it more difficult to enrol meters, but would ease the impact on the DCC.

The Government has been considering the extent to which requirements to enrol domestic smart meters with the DCC should apply, as well as the enrolment criteria that all meters will need to meet in order to be enrolled into the DCC. Specific criteria may be necessary for smart metering systems to comply with the initial version of the SMETS.

Government consideration of issue

- 3.73 The Government's March 2011 Smart Metering Implementation Programme: response to prospectus Consultation¹² document suggested that all compliant domestic smart metering systems (i.e. those that would contribute toward supplier roll-out obligations) should be enrolled with the DCC. The Government remains of the view that domestic meters should be managed through the DCC, given its role in interoperability and ensuring system security, with management outside the DCC by exception only.
- 3.74 Suppliers have indicated that, in order to commit to investment during the foundation stage of the roll-out, they require further information on the Government's intended approach to DCC enrolment. The Government is committed to supporting such activity during the Foundation stage. This will deliver early benefits for consumers and allow for education and learning for suppliers and others in implementing the roll-out, including contributing to testing and trialling. However, there are risks in such activity because smart metering systems will be installed in advance of the DCC's technical systems being designed. In particular, the specification of communication standards between the smart metering systems in consumer premises with the DCC's systems.
- 3.75 The Government is considering suppliers' concerns that smart metering systems that meet the initial version of the SMETS may not necessarily be capable of being enrolled with the DCC without changes or updates being made to the equipment. They are particularly concerned that an additional site visit may be necessary, which would incur significant additional costs. At the same time, the Government wants to ensure that all consumers can benefit from the full range of smart metering benefits, many of which will come from the role the DCC will play in managing communications with that meter. The Government recognises that a balance needs to be struck between allowing roll-out to take place during the Foundation stage and ensuring as many meters as possible are enrolled with the DCC.
- 3.76 Therefore, although the Government favours an approach based on the broad premise that smart metering systems installed during the Foundation stage should be enrolled with DCC, there is recognition that, in some cases, this may not be possible. To facilitate Foundation activity, the Government proposes that smart metering systems which comply with the initial version of the SMETS, installed prior to a firm Government position on enrolment, will not be required to be enrolled into the DCC.
- 3.77 The policy may be changed in the future, although it is not expected that any enrolment requirements would apply to smart metering systems already installed by suppliers. The Government is progressing work to develop the policy around any enrolment criteria for smart metering systems (including any specific requirements for those complying with the initial version of the

¹² Smart Metering Implementation Programme: Response to Prospectus Consultation: www.decc.gov.uk/Media/viewfile.ashx?FilePath=Consultations/smart-meter-imp-prospectus/1475-smart-metering-imp-response-overview.pdf

SMETS). Further detail on these criteria will be provided and views sought in a technical paper following on from the SEC Consultation document.

Government conclusion

The Government's general principle is that smart metering systems should be operated through the DCC, however at this stage, meters complying with the initial version of the SMETS will not be required to be enrolled into the DCC.

Work is underway to develop the Government's policy for enrolment criteria and a paper will be published following the SEC Consultation, which will include more detailed coverage of enrolment issues and an opportunity to provide views on the Government's proposals.

Consequential changes

Consequential Changes to Standard Supplier Licence Conditions

- 3.78 Respondents agreed that consequential changes were required to Condition 2 of Standard Licence Conditions (Gas & Electricity) in order to add in a specific reference to the Secretary of State. This is necessary as the licence conditions include requirements that will be 'switched on' by a date specified by the Secretary of State in a direction issued to the licensees. The text for this consequential change can be found in Annexes 1 and 2.

Managing consequential changes to existing industry regulation

- 3.79 The Government is working to identify changes to regulation that will need to be made as a consequence of the regulatory output of the Programme. This is being undertaken by working closely with industry experts including Ofgem, energy suppliers, networks, meter operatives and central bodies responsible for administering industry codes - through Smart Metering Regulation Group Working Group 4 (SMRG Working Group 4). The group will be responsible for preparing a catalogue of changes that may be necessary across industry, with consideration given to impacts on industry systems and associated costs, as well as the time-frame for drafting and clearing changes to codes, and testing and trialling changes to systems.

Consequential changes resulting from obligations on suppliers for roll-out

- 3.80 As with all the regulatory outputs, SMRG Working Group 4 will consider the government's conclusions following this Consultation, and whether the licence condition changes to facilitate roll-out will require subsequent consequential changes to other regulation to enable the framework to function as a whole. This process is ongoing, with working group members providing expert input on specific issues for consideration on not only what changes might be necessary, but also to what extent the Government needs to support changes

(versus industry making its own arrangements using existing code modification processes or through non-regulatory mechanisms). These include, for example, what changes to industry codes may be necessary to facilitate a single-fuel gas suppliers to access an electricity supply when installing gas smart meters first, before an electricity smart metering is installed.

4. Technical specifications

Overall approach to developing the SMETS

Summary of issue

The development of the technical specifications for the equipment that suppliers will be required to ensure is installed in consumer premises to comply with their roll-out licence conditions – the SMETS – is a central component of the smart metering roll-out. Establishing the SMETS will help ensure that energy suppliers, consumers, DNOs, Energy Service Companies (ESCOs) and other interested parties have access to the minimum functionality necessary to deliver the benefits described in the Programme impact assessment. It is also key to the development of interoperable Smart Metering Systems, which will allow suppliers and DNOs to run their operations more efficiently and avoid the early replacement of metering equipment.

In the Consultation, the Government noted its intention to ensure the SMETS reflected:

- the functional and security requirements identified in the Prospectus Response¹³;
- any additional requirements needed to deliver interoperability;
- the conclusions reached on the technical issues raised in the Consultation; and
- the regulatory framework in which the SMETS will sit.

The Government also proposed that in developing the SMETS it would utilise the work that had already been undertaken by suppliers, manufacturers and consumer groups (in particular, the Industry Draft Technical Specifications or “IDTS”) and that it would continue to engage with interested parties as it developed the SMETS. Consultees were asked to comment on the contents of the IDTS and on the proposed approach to developing the SMETS.

The Consultation suggested that the current SMETS governance arrangements, in which the SMETS are managed by the Government, were unlikely to constitute an appropriate enduring governance structure and made the case for transferring the function to the SEC. Respondents were asked to consider whether the SMETS should ultimately be governed under the SEC or under alternative arrangements.

¹³ Response to the Prospectus Consultation available at:

www.decc.gov.uk/en/content/cms/consultations/smart_mtr_imp/smart_mtr_imp.aspx

Response to Prospectus Consultation: Functional Requirements Document available at:

www.decc.gov.uk/en/content/cms/consultations/smart_mtr_imp/smart_mtr_imp.aspx

Government consideration of issue

SMETS development

- 4.1 A number of respondents noted the SMETS was likely to evolve over time and suggested that the Government should seek to ensure that its first iteration captures core smart metering functionality without necessarily trying to resolve some of the more complex issues. In particular, respondents noted that until the communications standards and protocols are defined it would be difficult to achieve the level of interoperability that may ultimately be desired. Many respondents noted the importance of testing and trialling in the development cycle (which could take considerable time) for smart metering, as is the case for any advanced technological project of this scale. They argued that testing and trialling would be the best way to understand the functional and interoperability issues that would need to be addressed in the next iteration of the SMETS.
- 4.2 To assist in the development of the SMETS and to ensure that the knowledge gained in the IDTS development process was transferred into the SMETS development process, the Government formed the SMETS SSAG to which it invited experts from consumer bodies, manufacturers, energy suppliers, Network Operators and other interested parties. The SSAG offered guidance and advice as the SMETS was developed, considering early drafts of the documents and commenting on design issues that were raised through the drafting process. The ODAG also continued its role of providing strategic guidance to the Government as the Programme developed. The Government would like to acknowledge and thank all the organisations involved in these groups for making their time and expertise available on a voluntary basis.
- 4.3 The Government recognises the concerns raised by respondents, and in response is taking an evolutionary approach to the development of the SMETS, with an initial version) that reflects the uncertainty over the communications standards that will be used over both the HAN and WAN. This document confirms the approach set out in the updated delivery plan published in December 2011¹⁴.
- 4.4 The first iteration of SMETS has been designed to achieve functional interoperability¹⁵. This will enable suppliers to install and operate meters in the Foundation stage. However, it may be that to achieve technical¹⁶ and commercial interoperability¹⁷ at change of supplier, additional action will be required by suppliers.

¹⁴ www.decc.gov.uk/assets/decc/11/tackling-climate-change/smart-meters/3978-smart-meters-improgramme-delivery-plan.pdf

¹⁵ **functional interoperability** – functional requirements are required to be delivered in a consistent, defined way, such that any supplier will be capable of operating any meter with a clear understanding of the processing the equipment will undertake and the outputs they, and their customers, will receive

¹⁶ **technical interoperability** – a supplier's SME is interchangeable and inter-connectable with any other suppliers' SME in any particular premises

¹⁷ **commercial interoperability** – suppliers are capable of operating SME installed by another supplier without the need to replace any equipment in the premises.

- 4.5 The Functional Catalogue¹⁸ described the functionalities that will be required to deliver the main objectives of the Programme and in particular the list of “A-H Functionalities” as set out in the March 2011 Prospectus Response. These requirements were further developed in the IDTS, which was used as part of the process of developing the SMETS. In developing the SMETS, the Government reviewed the Functional Catalogue and the IDTS by asking several questions against each of the requirements they proposed. In the first instance, the Government considered whether the requirements identified in the Functional Catalogue should be regulated through the SMETS, or if existing legislation or the emerging smart metering regulatory framework negated the need for its inclusion in the SMETS.
- 4.6 While all the A-H Functionalities have been retained in the SMETS, a number of the Functional Catalogue requirements were not carried forward through the SMETS. These requirements and the reason they are not included in the SMETS are summarised in Annex 6.
- 4.7 The Government also considered whether the IDTS adequately captured the intent of the Functional Requirements and if the proposed drafting was proportionate to the achievement of the intended policy outcome and therefore, appropriate for inclusion as part of the regulatory framework. In developing the SMETS, the Government has been aware of the need to differentiate between the more detailed specifications necessary to support the manufacturing of equipment, from the specifications appropriate as regulatory instruments setting out the core requirements for such equipment. In many instances this led to the SMETS including less detail than the IDTS had proposed. In addition, the Government considered the drafting of each of the requirements to ensure that they were robustly defined so that they can consistently be interpreted by suppliers and manufacturers and, where necessary, Ofgem.
- 4.8 The product of this approach is the first iteration of the SMETS, which is being published separately. The SMETS is made up of the following sections:
1. Introduction – providing context and explanation of the regulatory requirements placed on suppliers to install SMETS compliant equipment;
 2. Gas Smart Metering System Technical Specifications;
 3. Electricity Smart Metering System Technical Specifications ;
 4. In Home Display Technical Specifications; and
 5. Glossary – listing and defining the key terms used in the specifications.
- Including physical,
functional, interface
and data
requirements

SMETS content

- 4.9 A large number of respondents suggested requirements that were not included in the IDTS for inclusion in the SMETS. The issues raised were covered

¹⁸ Smart Metering Implementation Programme: Response to Prospectus, Functional Requirements catalogue

www.decc.gov.uk/assets/decc/consultations/smart-meter-imp-prospectus/1480-design-requirement-annex.pdf

separately in the Consultation and are addressed in more detail in corresponding sections below. Some respondents called for the removal of IDTS requirements, for example DNO requirements (see “DNO requirements”, p60-63). In addition, although a majority of respondents thought that most of the requirements in the IDTS should be reflected in the SMETS, several commented that certain requirements, for example, on prepayment, were unnecessarily complex or prescriptive. It was also argued by a number of respondents that a thorough editorial review was necessary to ensure that the SMETS was fit for purpose from a technical and regulatory perspective. These comments were considered as part of the SMETS drafting process, as described above.

European Notification

- 4.10 The Government will now notify the roll-out licence conditions and the SMETS to the European Commission, as per the requirements of the Technical Standards Directive (TSD). The TSD requires Member States to notify new technical regulations that impose restrictions on the characteristics of products. After notification to the Commission, a standstill period of a minimum of three months applies during which time the draft measures may not be adopted; this period may be extended if the Commission or a Member State believe the specifications represent a serious barrier to trade.
- 4.11 Current and developing European standards have been reflected in the GB specifications where possible, however, the GB specifications will be more detailed than those submitted by other member states. This is required to achieve interoperability in the GB energy market which operates in a more liberalised way compared to most European countries. The GB specifications also reflect the scale of the GB prepayment market, which is larger than those in other Member States, and the Government’s adoption of a supplier-led roll-out. The Government has undertaken significant and very useful engagement with the Commission ahead of the SMETS notification.
- 4.12 On completion of the notification process, the Government intends to lay the roll-out licence conditions before Parliament. Subject to Parliamentary approval, the licence conditions will enter force and the SMETS will be designated as the appropriate specification for smart metering equipment by the Secretary of State.
- 4.13 The Government identifies several issues in this document that it will consider further and expects that these will lead to the SMETS being updated. Any changes will be subject to consultation and as indicated in “next steps” (p14-16), it is envisaged that in most instances these changes will not be applied to equipment already installed. Any substantive changes would require the notification process under the TSD to be completed again.

Ongoing Governance

- 4.14 There was support from respondents to the proposal for SMETS governance to form part of the SEC. A sizeable number of respondents did not refer explicitly to

the SEC but stressed the importance of effective enduring governance arrangements which could foster innovation. Several respondents also noted that due to the technical nature of the SMETS, a technical advisory group may need to be established if the SMETS were to be governed by the SEC Panel. Many respondents commented that designing a governance regime for the SMETS would be a challenging task and that particular care would be needed in designing the change management process. During the consultation period, some stakeholders also noted that it was important that consumer benefits were considered as part of any modification process.

- 4.15 The Government believes that passing responsibility for the ongoing management of the SMETS to industry (with appropriate oversight) by establishing governance arrangements in the SEC would be in line with the approach taken by comparable industry codes. However this decision and the precise arrangements can only be confirmed as SEC arrangements are further developed. Advantages of including SMETS governance arrangements within the SEC were identified in the Consultation, including:
- providing a more formalised and explicit governance structure involving stakeholders;
 - providing an opportunity for the provisions of the SMETS to be contractually enforced; and
 - allowing a wider accompanying certification, assurance and enforcement framework to be introduced.
- 4.16 The Government will publish a consultation on the standard governance arrangements for the SEC. This will acknowledge that these standard arrangements may need to be amended given the nature of the SMETS and the role it plays in delivering the objectives of the Programme. In considering this issue, the Government will take into account the specific issues raised during this consultation.

Government conclusion

The Government is taking an evolutionary approach to the development of the SMETS. The initial version has been designed to deliver functional interoperability and to give certainty to suppliers to enable an early roll-out of smart metering systems during the Foundation stage.

The Government will publish the initial SMETS separately to this document. This establishes the minimum requirements for the equipment that suppliers will be required to install to comply with their roll-out licence conditions. The SMETS includes the key functionalities required to deliver the objectives of the Programme, as identified in the Prospectus Response. It defines these functionalities as part of a specification, taking into account the IDTS and the responses received during the consultation process.

The SMETS will now be notified to the European Commission under the Technical Standards Directive. Following completion of the notification process, the roll-out licence conditions will be laid in Parliament. Depending on the passage through these processes, the Government intends that the licence conditions and so the SMETS will come into force in late 2012. The roll-out licence condition has been drafted so that metering systems which comply with the SMETS and are installed before it comes into force will count towards suppliers' compliance with the licence condition.

The Government will continue to consider several technical issues that would add to the functional capabilities of the smart metering systems or improve the technical and commercial interoperability of the systems installed by the suppliers, in particular defining communication standards. The Government will continue to engage with industry working groups and consult more widely when appropriate as these policies develop. The SMETS will be updated and notified to the European Commission as necessary.

The Government intends that the SMETS should be governed under arrangements to be specified in the SEC. However alternative arrangements may be necessary for certain aspects of the SMETS. Detailed governance arrangements will be developed and be subject to future consultation.

Cost Erosion Assumptions

The Consultation also asked interested parties to consider cost erosion assumptions, i.e. the rate at which the cost of procuring Smart Metering Equipment would fall over time, that were made in the Programme Impact Assessment.

- 4.17 A limited number of consultees responded to the question concerning the cost erosion assumptions for smart metering equipment made in the Impact Assessments. The largest proportion of respondents agreed that higher cost erosion may be achieved over time however some felt that the current assumptions were accurate and some felt the assumptions were optimistic.
- 4.18 Based on the consultation responses, with many arguing that the global supply of smart metering equipment will ultimately outstrip demand, it cannot be ruled out that the current cost reduction assumptions are too low. However, on balance (given the possible lifetime of smart metering equipment) and in light of a lack of new evidence submitted the Government does not consider it prudent to update the current assumptions used in the Impact Assessment at this stage.

Government conclusion

Cost erosion assumptions for smart metering equipment will not be amended at this stage (see associated Impact Assessments¹⁹).

¹⁹ ‘Smart meter roll-out for the domestic sector (GB)’ and ‘Smart meter roll-out for the non-domestic sector (GB)’ www.decc.gov.uk

End-to-end messaging and architectures

Summary of issue

The Government sought views on what should be specified in terms of end-to-end messaging, including:

- the HAN standards that should be specified for use in smart metering systems (the WAN standards are to be chosen as part of the Communications Service Provider (CSP) Procurement);
- whether the WAN and HAN Application Layers, DLMS and Zigbee SEP 1.X, recommended by industry should be adopted;
- whether there should be regulatory obligations to underpin a systematic approach to testing HAN standards during the Foundation stage;
- whether translation between standards was a necessity and if so, whether it should occur at the DCC or in the smart metering systems at the consumer premises.

The Government stated in the Consultation that it was minded:

- not to specify a single HAN standard as part of the SMETS – at least for the Foundation stage as this would allow flexibility for suppliers to test a range of technologies and so help identify the most appropriate standard(s) for the End-to-end Smart Metering System.
- That, to support interoperability, all HAN interfaces should comply with published standards issued by internationally-recognised standards bodies.

Government consideration of issue

HAN standard recognition and testing

- 4.19 A majority of respondents agreed that there should be restrictions applied to the HAN standards used in smart metering systems, primarily to ensure that technical interoperability is achieved. There was broad agreement among suppliers that a HAN standard should be specified, subject to testing and trialling, and that it should be a recognised European or international standard (or expected to be recognised as a standard by the relevant standardisation bodies by 2014). The principal reason given was to provide confidence for investors and minimise stranding risk.
- 4.20 In general there was support for limiting the number of acceptable standards and that Government should have a role in selecting these standards. Many respondents pointed out that standards are constantly evolving and so monitoring and robust change control processes should be introduced to accommodate any changes needed. In addition, one supplier noted that multiple

standards (whether recognised or not) could hamper technical interoperability and therefore a single standard would be preferable.

- 4.21 However, some respondents disagreed that a limited number of standards should be prescribed. They felt that this would limit innovation. In addition it was noted by some respondents that there may not be European or internationally recognised standards available in the required timescales that meet all the Government's requirements. One supplier indicated that the Foundation stage should be used as a trialling phase to allow an enduring standard to be chosen for the Mass roll-out stage.
- 4.22 A majority of respondents felt that regulatory obligations were needed to underpin a systematic approach to testing of HAN standards during the Foundation stage, although some added caveats, such as that the Government should choose a HAN standard. The principal reason given was to provide continuity and consistency of testing to ensure there was sufficient control of the HAN standard. Imposing regulatory obligations on suppliers to undertake testing and trialling of HAN standards would also ensure that only those solutions with sufficient evidence of successful performance are used for the enduring phase. Opinion among suppliers was divided with some preference for Government coordination in areas such as trialling rather than using regulatory obligations enforced by Ofgem. The main reason given for using regulatory obligations was to ensure some consistency and continuity in testing, gathering and analysis of results. However, there were also views that obligations were not necessary as commercial incentives are strong enough to ensure that working solutions would prevail and existing certification schemes would suffice.
- 4.23 Regarding a choice of HAN standards, the Government agrees with respondents that while it may be necessary to specify particular HAN standards for use in smart metering systems if technological interoperability is to be achieved, there is currently insufficient evidence available to inform the selection of the most appropriate standard for the first iteration of the SMETS. The Government is currently undertaking a trial to provide evidence on whether any HAN standard or standards should be specified for use in smart metering systems. In parallel the Government will conduct further work to consider if regulatory obligations are needed to underpin a systematic approach to testing HAN standards during the Foundation stage.
- 4.24 While the Government is not specifying a HAN standard in the initial version of the SMETS, so as not to preclude interoperability, any HAN technology used during the Foundation stage must be based on open standards and protocols. In the future, the Government's intention is to only specify HAN standards and protocols that are internationally recognised.

WAN and HAN Application Layer standards for end-to-end messaging

- 4.25 Opinion was divided with regards to the use of DLMS as an Application Layer standard (also known as a messaging protocol) for the entire End-to-End Smart Metering Systems, i.e. across the WAN and the HAN. Approximately a third of respondents agreed, a third disagreed and a the other third provided a caveated

response. Reasons for agreement included that DLMS is widely used. Reasons against adopting DLMS as the sole Application Layer were primarily centred around complexity in the smart metering system actually increasing if translation in the premises was required, as well as concerns about its effect on gas meter battery life.

- 4.26 In general, allowing multiple WAN Application Layers that could be used end-to-end without the need for translation was the preferred alternative to specifying a single standard on the WAN that could require translation if it was different to the Application Layer on the HAN. A majority of suppliers were against the adoption of a single standard for the reasons outlined above and that a single standard only makes sense if it can be used in all end devices which is difficult for products on the market today.
- 4.27 There was a small majority who agreed with the recommendation of using both DLMS (for electricity smart metering equipment) and Zigbee Smart Energy Profile (SEP)1.X (for gas smart metering equipment). The main reasons given included the availability of the standards on the timescales needed for the smart metering roll-out and the adverse impact that DLMS may have on the gas meter battery life, compared to Zigbee SEP1.X. There was disagreement about the need to install necessary translation equipment in consumer premises to enable the use of both standards, with some respondents making the point that this would be better achieved in the DCC. One supplier raised concerns that the Zigbee SEP1.x Application Layer standard was tied into other aspects of the Zigbee protocol, which is only currently available in volume products at 2.4GHz, and that this frequency has not been tested at scale in GB.
- 4.28 Regarding the choice of WAN Application Layer standards, the Government agrees with the argument that specifying a single WAN Application Layer may lead to increased complexity and costs associated with the smart metering systems installed in consumer premises. The Government has decided therefore, that the choice of the underlying communications technology for the WAN will be determined as part of the competitive procurement of the CSPs. The procurement process will also be used to establish the technical and cost impacts of specifying different WAN Application Layer standards for each of the proposed communications technologies.

End-To-End Smart Metering System architecture

- 4.29 Overall there was no clear agreement on the IDTS proposals for the technology architecture of the End-To-End Smart Metering System. Consistent with the arguments above relating to Application Layer standards, arguments were advanced for and against either the incorporation of translation at the smart metering systems within the consumer premises or in the DCC. Some respondents even advocated avoidance of translation altogether – either through multi-standard support or via a single end-to-end standard.
- 4.30 Reasons for supporting translation in the smart metering systems included the need to manage potential hardware conflicts and different end devices. While security weaknesses were highlighted by some respondents, it was also

suggested that the provision of this functionality in the consumer premises would allow for greater control of data privacy requirements, for example allowing data to be aggregated locally. Additional supporting arguments included the ability to optimise traffic over the WAN to the consumer premises which requires a translation capability; and the underlying differences in current WAN and HAN communications technologies resulting in the unavoidable requirement for a certain degree of translation.

- 4.31 Those who disagreed with the proposal, cited the potential security and ongoing maintenance issues that maintaining translation in 30 million locally installed devices would create. It was also highlighted that the incorporation of multiple standards in different parts of the end-to-end system, would introduce a 'standards/protocol' management overhead, i.e. the WAN would need to include all of the same capabilities as available in the HAN and ensure that any future extensions to the HAN were also included in the WAN to maintain compatibility. Finally concerns were also raised relating to processing and memory requirements within the smart metering system. A small number of respondents believed that the need for translation could be obfuscated entirely by running dual protocols and that this ought to have minimal impact on the WAN overheads.
- 4.32 It is clear that there are a number of technical approaches that could be considered for ensuring an optimised set of communications from the DCC to smart metering systems, each of which has their own pros and cons. These individual concerns need to be considered within the wider context of the end-to-end architecture to identify an optimum solution that considers aspects wider than those just relating to protocol translation. The Government does not believe that a decision should be taken at this point on the location of translation in the end-to-end system because this will depend on further developments in the HAN trial and a possible selection of an enduring HAN standard, the WAN technology to be used by the CSPs and the end-to-end security architecture.

Government conclusion

Specific HAN standards will not be mandated in the first iteration of the SMETS; however the HAN standards used by suppliers must be based on “open standards”²⁰. For any future HAN standards specified in the SMETS, the Government will seek to use only standards and protocols that are based on internationally recognised standards, subject to their compatibility with GB requirements and the availability of products.

The Government will make a decision on whether to specify a HAN standard or HAN standards in a future iteration of the SMETS in line with the published Delivery Plan, using evidence gathered from the HAN trials that are currently underway and from feedback on Foundation stage installations. The Government will conduct further work to consider if regulatory obligations are needed to underpin a systematic approach to testing HAN standards during the Foundation stage.

The decision as to where and how translation will occur will be taken following:

- the HAN trial and selection;
- selection of the WAN technology/technologies to be used by the CSPs;
- WAN Application Layer selection, which will be decided as part of the CSP procurement process; and
- the design of the end-to-end security architecture.

²⁰ The definition of an "open" standard is based on the European interoperability framework. The requirements for an open standard are as follows:

- the standard has been approved and is maintained by a non-profit organisation, and an ongoing development is undertaken in an open decision-making process in which any interested party can participate (consensus or majority decisions etc[DN: by a fair governance structure?]);
- the standard has been published, and the specifications document of the standard is either freely available or obtainable at a nominal charge. It should be possible for anyone to copy, make available and use the specifications document at no more than a nominal charge;
- the intellectual property with respect to any patents of (parts) of the standard has been irrevocably made publicly available without payment of royalties; there are no restrictions for any reuse of the standard

Configuration of communications equipment in premises

Summary of issue

The Prospectus Response included a requirement that smart metering systems should have a replaceable WAN interface (i.e. the technology that provides the interface with the DCC's systems, or supplier head-end systems in the Foundation stage). This reflected the possibility that the WAN technology may be replaced during the lifetime of a smart metering system.

The IDTS proposed that a Communications Hub (comprising a HAN interface, WAN interface and gas meter proxy/mirror functionality) was the most appropriate way of meeting this requirement. In response to the industry proposals, the Government stated in the Consultation that it was minded to:

- specify a Communications Hub as a component part of the equipment installed in consumer premises;
- specify that fully integrated electricity meters and Communications Hubs (i.e. where they are a single unit) would not comply with the SMETS;
- mandate a single configuration of communications equipment: i.e. a separate Communications Hub without an exchangeable WAN interface (or “module”); and
- include a requirement for the Communications Hub to provide electricity outage detection (so-called “last gasp” functionality), and that the specific nature of this equipment should be specified by the DCC CSPs (once appointed).

Government consideration of issue

WAN interface exchangeability

4.33 A large majority of respondents agreed WAN interfaces should not be fully integrated with electricity meters. The principal reasons given included:

- enabling gas smart metering systems to be installed before an electricity smart metering system, as the communications equipment could be separate to the electricity meter;
- avoiding premature replacement of metering equipment given the likelihood that communications technology could evolve rapidly and as such it would minimise the risk of stranding of metering assets as a result of early replacement.

4.34 A single respondent opposed the recommendation that a fully integrated approach should not be compliant with the SMETS. They argued that in

circumstances where there was certainty in the lifespan of the communications technology, an integrated approach would be the cheapest option.

- 4.35 The Government agrees with respondents that, if a fully integrated WAN interface and electricity meter were SMETS compliant, additional costs would be incurred if the WAN interface needed to be exchanged during the life of the meter. The risk of this is not insignificant given the expected development of additional smart grid functionalities. For this and the other reasons outlined above, and in the Prospectus Response, the Government will require in the SMETS that the WAN interface is not fully integrated with the electricity meter.

Communications Hub Requirement.

- 4.36 A majority of respondents agreed that specifying a Communications Hub was a key element of achieving the business case and interoperability. Common reasons for this were that it would:

- enable and support Gas First deployments;
- ensure logical separation of and access to gas and electricity data;
- optimise the Communications Hub design to support alternative WAN standards;
- simplify common architectural elements such as security, device mirroring, Firmware image store and forward;
- provide a logical boundary between the HAN and WAN technologies; and
- better support potential smart grid requirements by allowing connection of other devices to the HAN.

- 4.37 While the Government agrees with these arguments, they are predicated on the equipment in the consumer premises being interchangeable. However, in the absence of a HAN standard there is no guarantee that Smart Metering Equipments installed by energy suppliers will be interchangeable. The Government has therefore decided that the initial version of the SMETS will set-out communications functionality, but it will not mandate a Communications Hub.

- 4.38 However, as noted in the previous section, the Government is undertaking further analysis of the HAN standards that are currently available and has indicated that it may define a standard or standards within a future iteration of the SMETS. If this is the case, the Government agrees, for the reasons outlined by respondents, that a Communications Hub should be defined and would be included in future versions of the SMETS as appropriate. Therefore the following paragraphs consider whether the Government should mandate any particular Communication Hub configuration.

- 4.39 A majority of respondents favoured giving suppliers some flexibility in the configuration of the Communications Hub. They felt that rather than mandating that systems will only comply with the SMETS if the communications Hub is separate, hubs which are “intimate” (i.e. detachable) should also be acceptable. The principal reasons cited focussed on providing for flexibility in installation, thereby minimising the time needed on-site for each installation. Some noted that a one size fits all solution may lead to additional installation costs.

- 4.40 The principal reason given by respondents who supported only allowing a separate Communications Hub, was that it would obviate the need for agreeing, developing and testing standard connectors and associated protocols that would be necessary for the detachable solution.
- 4.41 One respondent favoured an integrated Communications Hub and electricity meter with an exchangeable WAN interface. The Impact Assessment calculated that, if all smart meters had this configuration, for a scenario where only the WAN functionality is upgraded, this option would have the lowest overall cost (approximately £100million NPV saving compared with the other options). However, this option has a number of disadvantages that create practical, commercial and regulatory complexity; in turn risking delay in delivery and cost escalation.
- 4.42 The Government agrees that suppliers require flexibility with respect to Communications Hub configuration, as this will allow different solutions to develop for different installation scenarios. Therefore, it is proposed that both options – detachable and fully separate Communications Hubs – will be permitted if a Communications Hub is defined in a future iteration of the SMETS. However, to reduce the number of variants and therefore complexity for suppliers, the interfaces between electricity meters and Communications Hubs for both separate and detachable options will need to be standardised by industry. Standardisation will at a minimum need to cover the shape of the Communications Hub case (for the detachable option), and the interface between the Communications Hub and the electricity meter.

Detection of outage and restoration of supply

- 4.43 The Prospectus Response set out the Government's conclusion that the minimum functional requirements of the smart metering system should include the capability to provide precise and timely information about electricity outages (outage detection). It undertook to conduct further work to determine the most appropriate technical way to deliver this functionality and whether this might be performed through the WAN network (i.e. through the DCC²¹) or in the smart metering system. In the Consultation, the Government sought views on this issue, and also the related issue of whether the technical solution should include detection of restoration of supply.
- 4.44 Responses on this issue were evenly split as to whether there was a positive case for inclusion of this functionality in the Communications Hub. A majority of energy suppliers and meter manufacturers disagreed with the estimated costs of outage detection, however no new material evidence was provided to support their position. Other responses indicated that such functionality was likely to increase in importance as transport and heating become increasingly reliant on electricity.
- 4.45 Some respondents indicated that the functionality could be better delivered by detection at substation level. Respondents noted that in the instances when the

²¹ In practice, it is expected that this would be delivered by the DCC's CSP

Communications Hub is physically separate to the electricity meter, there may be a risk of false alarms if the Communications Hub loses supply but the electricity meter remains powered.

- 4.46 There was a split of opinion with respect to whether the DCC's CSPs should implement the functionality for outage detection. A number of respondents made the point that the requirements should be specified by industry (i.e. DNOs) and that the CSP should be involved in implementing the solution. Others, including some potential CSPs, argued that the CSP should be involved in defining and implementing the solution – chiefly because they are better placed to assess feasibility in terms of what their technology can provide.
- 4.47 The Government notes that outage detection functionality does not exist in the currently available, or soon to be available, smart metering equipment. Furthermore, no new material evidence was presented with respect to the inclusion of outage detection capability in the smart metering system. Dialogue with CSPs has highlighted that options to deliver outage detection that do not require extra functionality in the smart metering system may still be possible. The Government has therefore decided that outage detection will not be included in the initial version of the SMETS. However, the Government will undertake further work with CSPs to determine the most cost-effective way of providing outage detection. This may be achieved by either adding additional requirements for smart metering systems in future versions of the SMETS, or by an alternative means without adding extra equipment at the consumer premises.
- 4.48 Regarding detection of restoration of supply (i.e. when power is back on in the premises), the majority of respondents argued that so-called "first gasp" detection should be provided by whichever solution is chosen for outage detection. Respondents said that there are a number of considerations that might influence how the service might be delivered, including clarification of roles and responsibilities and the process for sending and handling notifications.
- 4.49 The Government confirms that detection of restoration of supply functionality should be performed by whichever solution is chosen to deliver outage detection functionality.

Government conclusion

The SMETS, in line with the Government's previous position, will require that the WAN interface must be exchangeable without the need to replace the electricity meter.

The Government will include communications requirements in the first iteration of the SMETS but it will not require that a separate Communication Hub is installed. However, the Government intends that a Communications Hub will be defined in a future iteration of the SMETS and that this should be physically separate or detachable from the electricity meter. The Government considers that a standardised connection to the electricity supply and the electricity meter should be developed to support the introduction of the Communications Hub requirements. Integrated meters with exchangeable WAN Transceivers will be proscribed when the Communication Hub is defined in the future iteration of the SMETS.

Outage detection functionality will not be included in the initial iteration of the SMETS, but the Government will continue to work with the CSPs to better understand how outage and restoration of supply detection can be delivered in the future.

Communications network standards and addressing

Summary of issue

Communications between the DCC and the communications equipment in each consumer premises will be provided by the WAN. To allow individual messages to be correctly routed between the DCC and specific smart metering systems, a suitable Network Layer addressing scheme is required as part of the functionality of the WAN.

The Government recognises that there may be advantages from specifying a standard protocol for network addressing such as:

- providing for enforced interoperability of different physical layer WAN technologies; and
- simplifying the addressing scheme that must be managed by the DCC and its service providers by providing a single common approach for all potential WAN technologies.

However, the Government also recognises there is a trade-off between simplicity and consistency of message addressing through mandated standards and the increases in cost and inefficiency that may be driven by forcing all potential WAN

technologies to adopt a common standard.

The Government therefore proposed through consultation that the following position could be adopted:

- At this stage in the DCC services procurement, the Government does not propose to mandate a Network Layer addressing standard for the WAN. Instead, CSPs should specify the Network Layer protocol that would be used by the WAN and that would need to be supported by the Smart Metering System (incorporating the appropriate WAN interface for the relevant WAN physical-layer technology).
- To facilitate interoperability, the Network Layer addressing protocol should be based on open standards. It should also, as a minimum, provide the DCC with a unique, static address for each WAN interface connected to the WAN for the purposes of routing messages from the DCC to the appropriate consumer premises.

Government consideration of issue

- 4.50 The majority of respondents, including most meter manufacturers, supported the Government's proposal not to mandate a specific Network Layer standard for WAN communications. However, three major energy suppliers and a number of other organisations opposed the Government's view and suggested that a standard should be mandated to provide for interoperability. IPv6 was highlighted as a choice that could support long-term growth requirements given its adoption as the future standard for internet network addressing and its very high scalability (the ability to provide an extremely large pool of unique addresses). Other respondents highlighted some of the potential benefits of both IPv4 and IPv6 protocols for smart meter and Smart Grid applications (for example, that they are widely used and understood), but did not clearly state whether or not they agreed with the Government's position. The approach proposed in the Consultation would still allow the benefits of such standards to be demonstrated during the procurement process, but it would not preclude alternative standards being proposed or ultimately selected in the SMETS.
- 4.51 Those respondents who were opposed to mandating Network Layer standards prior to the start of the CSPs procurement process, argued that it was unnecessary as long as the CSPs are required to meet industry's requirements in a secure and reliable manner. They indicated that to specify a standard at this stage may be restrictive and increase costs unnecessarily.
- 4.52 A number of respondents took a counter view, stating that competition in the provision of metering equipment may be greater where a common standard is specified. It was also pointed out that standards such as IPv4 and IPv6 are well established and understood as a result of their almost ubiquitous use across communications applications. In addition, they should provide a stable, scalable

and long-term solution for the Network Layer standard with a very large address space.

- 4.53 Regardless of the chosen Network Layer standard, a majority of respondents, again including most meter manufacturers, also agreed with the position that a single, Network Layer address for the WAN interface would provide sufficient functionality to support smart metering. However, respondents across all sectors identified that multi-occupancy buildings may represent a significant challenge to this approach, because of the potential need for shared equipment which could result in a single address for multiple properties. Those supporting this view were largely of the opinion that either the WAN interface should perform address translation or individual device addresses should be managed at the Application Layer, rendering additional Network Layer addresses unnecessary.
- 4.54 Those opposed to the Government position cited the potential growth of HAN applications and the ‘internet of things’ (where everyday household appliances may increasingly be connected to data communications networks), as factors that might necessitate all the equipment that make up the smart metering system having a network address. Security concerns were also raised with one respondent suggesting it may be desirable to provide separation at the Network Layer for multi-supplier households.
- 4.55 A significant number of respondents, including a number of energy suppliers and meter manufacturers, while agreeing in principle that a single Network Layer address per WAN interface would be a sufficient requirement, pointed out that insufficient understanding exists as to how smart metering systems will be deployed in multi-occupancy homes. Depending on the approach taken for these installations, a single address may not prove sufficient.
- 4.56 To allow potential CSPs to propose solutions that optimise the efficiency of their particular communications technology, the Government has decided not to mandate a single Network Layer standard at this stage, though future scalability and interoperability issues will be assessed through the DCC services procurement. The current approach does not preclude eventual selection of IPv4 or IPv6 as a common specification after evaluation of all available proposals from potential CSPs.
- 4.57 As responses to the Consultation provided no compelling evidence that multiple Network Layer addresses should be mandated for each smart metering system installation, the Government will retain the minimum requirement for the provision of a single Network Layer address for the WAN interface.

Government conclusion

The Government is not at this stage mandating a Network Layer addressing standard for the WAN. This does not preclude the eventual selection of IPv4 or IPv6 as a common specification after evaluation of all available proposals from potential CSPs.

The Government will retain a minimum requirement for provision of a single Network Layer address for the WAN interface. The Government will further investigate and refine technical proposals for multi-occupancy buildings as part of procurement process for the CSPs. The potential benefits and cost impacts of providing wider address ranges to cover other devices in the home will also be investigated.

DNO requirements

Summary of issue

The IDTS recommended a number of requirements designed to benefit the DNOs, in particular their delivery of smart electricity grids.

The Government used the Consultation to seek further views and evidence on the costs and benefits of these proposals, stating that the evidence gathered would help inform whether the proposed additional functionalities should be included as minimum requirements in the SMETS for the electricity smart metering system.

In particular views and evidence were sought on maximum and minimum consumption demand reporting; network registers; and ability to disconnect line voltages for ‘Floating Neutrals’.

This section also considers the inclusion of dual-porting requirements in the SMETS.

Government consideration of issue

Maximum and minimum consumption demand reporting

- 4.58 DNOs have indicated that understanding the maximum and minimum electricity consumption demand at individual metering points will allow them to better understand where and why the network is under stress. As such, the Government sought views on the inclusion of the capability to detect maximum and minimum consumption demand in the SMETS.

- 4.59 There was a mix of views on whether this functionality should be included in the SMETS. Arguments in favour centred around the contribution that this functionality would make to implementing smart grids, reduced communications costs (sending a minimum and maximum value would obviate the need to send half hourly profile data across the DCC's WAN) and that the function was standard in some electronic Polyphase Meters available today.
- 4.60 Those against including this functionality highlighted a lack of evidence regarding the related benefits, that equivalent data to provide any benefits was available through access to half-hourly readings, and that existing supervisory control and data acquisition systems at low voltage substation level should be able to detect if the network is under stress.
- 4.61 However, provision of this functionality is not provided by smart metering equipment currently available, or soon to be available. Meter manufacturers have confirmed that while it will take some time to include and test the functionality in future equipment, this should not significantly add to equipment costs. The Government has therefore decided not to include the capability to record the minimum and maximum consumption demand values over a configurable period in the initial version of the SMETS, but the Government does intend that the functionality will be considered in a later version of the SMETS.

Network Registers

- 4.62 The DNOs have indicated that as the electricity generation mix moves to a higher percentage of intermittent generation from renewable energy sources such as wind or solar, the ability to influence demand load according to the availability of generation output will become more important. They have proposed that varying Distribution Use of System (DUoS) charges²² could be introduced for certain time periods to reflect the differing costs they experience. Suppliers could then pass the costs or savings onto consumers via time of use tariffs.
- 4.63 The DNOs have argued that the provision of dedicated network registers within the End-to-End Smart Metering System would be the most appropriate way to provide additional flexibility to deliver varying DUoS charges, rather than including the requirements within existing generic registers. The network registers would contain all metering data relevant to performing their regulatory duties.
- 4.64 On this issue, a majority disagreed with the inclusion of network registers in the SMETS. The main reasons being a lack of evidence regarding the benefits, availability of the required data in another format and potential confusion with existing settlement systems. A small minority was in favour of the recommendation on the basis of reduced communications costs, although a robust estimate of the increased cost of smart metering equipment was not factored in to the calculation of costs and benefits.

²² The Distribution Use of System charge, which is applied by DNOs to electricity suppliers, covers the costs of installing, operating and maintaining the regional distribution network.

- 4.65 Meter manufacturers have indicated that including network registers on in the SMETS would increase the cost of the metering equipment and add complexity and delay. Given the lack of evidence around network benefits, and in light of the availability of data by other means, the Government has decided that network register functionality will not be included in the SMETS.

Floating Neutrals

- 4.66 A ‘Floating Neutrals’ network fault arises where there is a break in the neutral connection, causing no, or a poor, connection to earth within a consumer’s premises. While this is uncommon, the prevalence is increasing due to the theft of copper cables from DNOs’ equipment.
- 4.67 A load switch has been included in the SMETS to provide prepayment functionality (principally disconnection upon exhaustion of credit). Voltage monitoring capability has been included to provide voltage quality measurements for DNOs. A number of DNOs proposed that consideration should be given to whether these two capabilities could be combined to enable the opening of the load switch upon detection of voltages indicative of a Floating Neutrals event. In the Consultation therefore the Government sought further evidence on the feasibility, costs, risks and benefits of including this capability.
- 4.68 Respondents in favour of this functionality pointed to cost information relating to insurance claims and financing rectification work on consumers’ premises, arguing that these costs could be avoided by including the functionality in the SMETS. However, the majority of respondents to the Consultation (more than two thirds) argued that the load switch should not be used for the purposes of protecting against the risks of Floating Neutrals. Many respondents explained that the majority of single phase smart meters have a narrow operating range, usually defined by the electricity supply quality regulations. Floating neutral events are much higher than this range, and responses indicate that upgrading both the meter and load switch to extend the range would result in significant additional cost in terms of hardware, certification and testing. Without such upgrading, a Floating Neutral event could result in wider damage to the meter such that it, including the load switch, would no longer be operational. Some respondents also argued that use of the switch would not necessarily protect consumers’ equipment from damage since damage would occur before the load switch was opened, and therefore it offered limited benefits.
- 4.69 To date no evidence has been presented to support the use of the load switch to protect against Floating Neutral faults without an additional requirement to upgrade the meter and load switch. In light of the responses to the Consultation the Government does not consider a case has been made for imposing additional requirements in this respect in the initial iteration of the SMETS. The Government notes that this is not specifically an issue arising out of the introduction of smart metering, and that relevant new evidence or arguments should therefore be considered in the context of the wider regulatory framework governing the electricity system. DECC therefore intends to work with the relevant regulatory authorities to identify the most appropriate framework for considering any further evidence or argument.

'Dual-porting' option

- 4.70 Representations were made during the consultation period, principally by the Institution of Engineering and Technology, for smart metering systems to be designed such that equipment in consumers' premises could be configured to communicate with the local DNO as well as with the DCC. The argued that this direct communications link would support smart grid functions, for example, real-time load management in response to network conditions.
- 4.71 This functionality was not within the scope of smart metering as defined in the Prospectus Response. No benefit or cost estimates were submitted to support the inclusion of dual porting and the possible implications on CSPs has not been fully explored. It is also unclear what the implications would be for the security of the end-to-end system, nor for the regulatory and commercial relationships with the DCC, which could be undermined by the provision of a direct relationship between the networks and the CSPs.
- 4.72 The Government will therefore not include dual porting requirements in the first iteration of the SMETS, but will invite CSPs to present ways in which their solution could evolve to support smart grid functions, including dual-porting. This issue will be kept under review.

Government conclusion

The Government has decided that the capability to record and report maximum and minimum consumption demand and minimum and maximum RMS voltage will not be included in the first iteration of the SMETS.

The Government has decided not to include network registers in the SMETS, given the additional costs and lack of evidence of the benefits.

The Government has decided that the SMETS will not include the capability to disconnect line voltages for Floating Neutrals.

The Government will not include dual-porting requirements in the first iteration of the SMETS.

Consumer access to consumption data

Summary of issue

The Consultation proposed that SMETS should enable consumers to access their energy consumption data over their HAN and enable transfer of consumption information to other devices in the home. Having considered three options (a “bridging” device, a physical port within the smart metering system, or inclusion of a second transmission system), the Government proposed that access to data should be enabled via a “bridging device”. The Consultation invited comments on this approach.

The Consultation also stated that the Government intended to develop a secure but consumer friendly connection process to enable access.

Government consideration of issue

- 4.73 An important requirement of smart metering systems is the capability to store 13 months of half hourly consumption data and provide real time and historic consumption and pricing information to consumers. Through the Consultation, the Government examined how to enable consumers to access their own consumption data locally, i.e. in their home and not via their supplier, taking into account the need to protect data privacy and ensuring that the security of the End-to-End Smart Metering System is maintained.
- 4.74 On this issue there was almost unanimous agreement that a bridging device or Consumer Access Device (CAD) (envisaged to be a secure wireless connection that will convert and transmit the information available via the HAN interface to equipment in the home such as routers and dongles) was the most suitable way to provide the consumer with access to information from smart metering systems.
- 4.75 This option was favoured compared with adding extra physical hardware to all smart metering systems. The main arguments cited was the additional cost, and lack of guaranteed associated benefits (due to uncertainty regarding the number of consumers who will utilise the functionality). There was also agreement that the Government should limit its design input for this device to defining its security and access arrangements, and the information that should be available.
- 4.76 The Government agrees with respondents' views that specifying extra physical hardware will add cost and complexity and could stifle innovation. Therefore, the focus of the SMETS will be to ensure that the data required for innovative hardware and services is capable of being made available to consumers locally, should they choose to pursue this option.
- 4.77 The capability of a (wireless) consumer device access port has been included in the initial version of the SMETS. This defines the information which smart

metering systems must be capable of making available over the consumer port. Arrangements setting out Government policy regarding consumer access to data will be outlined in the consultation on data access and privacy.

Government conclusion

The Government has decided that the capability will be included in the SMETS to provide access to information for consumer devices. The Government has decided to introduce an operational licence condition (see section 2). The Government intends that this would include a requirement for energy suppliers to make energy consumption data available to consumers from the smart metering system.

Electricity isolation switch

Summary of issue

Including an isolation switch in the SMETS would allow electrical contractors to work between the meter and the consumer unit (sometimes referred to as the fuse box) without requiring the main supply fuse (also called the ‘cut-out’) to be removed (which may only be done lawfully with the permission of the DNO).

In the Prospectus Response, the Government’s position was that insufficient evidence had been identified to justify the additional costs that would be incurred by requiring an isolation switch in the SMETS, or mandating the installation of a separate isolation switch at the same time as the installation of smart metering systems. In the Consultation, the Government sought further evidence on the costs, risks and benefits of the options to tackle the risk of electrical contractors working unsafely on live metering equipment.

Government consideration of issue

- 4.78 Electrical contractors sometimes need to work on equipment between the meter and the consumer unit (for example, when replacing the latter). To allow safe working, the supply needs to be isolated. Where a separate isolation switch has not been installed, isolation is achieved by removing the main supply fuse. As the main supply fuse is DNO-owned equipment, there are obligations under the existing regulatory framework for DNOs to control its removal and replacement. Some parties have raised concerns about the effectiveness and efficiency of these arrangements.

- 4.79 Isolation of a customer's electrical supply prior to the consumer unit could either be facilitated by engineering solutions (modifying metering equipment, or adding an additional switch); or by a procedural approach (improving the existing arrangements for removal of the DNO main supply fuse, which requires a contractor to arrange for a DNO to attend at the site and remove the main supply fuse).
- 4.80 In their consultation responses, the majority of stakeholders did not support the use of any of the engineering solutions. They noted cost implications, possible delays to the Programme and some also expressed the view that smart metering systems should not be used as safety devices. In addition, one respondent expressed the view that a solution built into the meter may not be installable in all situations due to size-constraints. There was no support for use of the meter's load switch for this purpose as this was considered unsafe. Suppliers indicated that provision of a safe engineering solution to provide isolation would cost between £180 million and £600 million to implement, depending on the solution chosen.
- 4.81 A minority of respondents (including the Electrical Safety Council, and electrical trade associations) supported inclusion of an isolation switch in the SMETS. The main reasons given were: safety of electrical contractors, electricians and consumers; and cost savings to consumers who have a consumer unit replaced over the lifetime of the meter.
- 4.82 The Government hosted a workshop on this issue in December 2011. It was attended by suppliers, DNOs, ERA, ENA, meter manufacturers, HSE, Electrical and Safety Council. The workshop highlighted that for the many years that this issue has been discussed, there has been very little material evidence to suggest that the current DNO procedure was not being adhered to by electrical contractors, as evidenced by there not having been significant numbers of prosecutions for non-adherence or safety incidents related to non-adherence. Equally, there was little evidence of consumers being offered the installation of an isolation switch on meter exchange or consumer unit exchange, which might have been expected if there were significant risks and concerns with the current arrangements. There was broad, although not universal, agreement by the workshop attendees that this was not a smart metering issue and that there was no rationale for Government to mandate the installation of an isolation switch.
- 4.83 On the basis of these considerations, the Government has concluded that there is no material evidence to support regulatory intervention on the grounds of safety or market failure as part of the Programme. While the Government recognises there are some concerns amongst some stakeholders on this issue, it considers that if a regulatory intervention is required that it should be considered as part of the "normal" regulatory processes for the sector. As such, the Government has decided not to include this capability in the SMETS. The Government will work with the relevant regulatory authorities to facilitate an industry working group to undertake further analysis of current proposed regulatory and commercial solutions.

Government conclusion

Following consideration of consultation responses, and further work with stakeholders, the Government has decided that the functionality will not be included in the SMETS, but that the Government will work with the relevant regulatory authorities to develop a process to help stakeholders find an alternative solution.

In-Home Display (IHD) Functionality

Summary of issue

The IDTS proposed requirements for the IHD relating to:

- consumer accessibility and inclusivity;
- ambient display of real-time energy usage and cost; and
- display of meter (account) balance for credit customers, real-time gas demand, consumption and cost in latest bill period, and “next-tariff” rate

The Consultation sought views on these recommendations.

This section also considers the inclusion of Welsh language capabilities in the SMETS.

Government consideration of issue

Consumer accessibility and inclusivity

4.84 Many of the consumer benefits of smart metering relate to providing better access to information on energy usage. It is anticipated that consumers will, at least initially, primarily access this information through the IHD. Therefore, it is integral to the delivery of the Programme’s benefits that IHDs are designed to meet robust accessibility and inclusivity principles. The Government has applied these principles in developing the requirements that will be included in the SMETS, such that the information displayed on the IHD should be easily accessed and easy to understand, including by consumers with: impaired sight; memory and learning ability; perception and attention; or dexterity.

4.85 Consumer Focus, working with suppliers, is developing best practice guidelines for suppliers on how to ensure that IHDs are designed to be inclusive. This will assist suppliers in meeting the requirements of the SMETS.

- 4.86 The SMETS provide the minimum requirements for a compliant display, but it will not necessarily meet the needs of consumers with disabilities such as blindness or partial sight. In these instances suppliers have separate requirements under the Equality Act to ensure that consumers with disabilities are not treated in a discriminatory manner.

Ambient Feedback based on cost

- 4.87 Ambient display of real-time energy usage, but not cost of energy, was supported by nearly half of those who responded to the Consultation. They argued that there was a risk of confusion associated with mandating the display of two types of information in an ambient manner. In addition, during the early years of the roll-out, it was felt that customers are unlikely to demand complex, dynamic ‘Time of Use’ (ToU) tariffs and so for most customers there would be a linear relation between the amount of energy used and its cost. Some argued that the display of energy usage is the key deliverable of the Programme and was therefore the more appropriate information to display in ambient form. However, some respondents felt that Ambient feedback based on cost could encourage end-users to make use of different tariff structures including time-of-use tariffs, when these are available.
- 4.88 While the Government’s work on consumer engagement demonstrated that consumers prefer information in monetary terms (and therefore a key functionality required in the SMETS), the Government concluded that for Ambient feedback the energy usage would provide a consistent and meaningful metric to supplement detailed cost information. The requirement will therefore be that as a minimum the display is capable of providing Ambient feedback on energy usage. Through testing and trialling the Government expects to learn more about consumer interactions with the IHDs, which will assist suppliers in designing the most effective presentations of Ambient feedback. Information available over the HAN interface should allow Ambient feedback to be provided in monetary terms should suppliers conclude that this would be helpful for their customers.

Real-time gas demand, information on consumption and cost in latest bill period, “Next-tariff” rate

- 4.89 No material evidence was provided to challenge the Government’s minded-to position on the display of information on real-time gas demand, information on consumption and cost in latest bill period, and “Next-tariff” rate. The Government confirms therefore that the minimum capabilities required of IHDs will not include the display of this information.

Account balance for credit customers

- 4.90 The Consultation also sought views on whether the SMETS should include a requirement to support the calculation and display of an account balance for credit customers. The Government has concluded that this functionality should be included, although it will not mandate suppliers to apply it.
- 4.91 During the development of the IDTS, the account balance was defined as the amount of money due from a customer from the energy consumed including

adjustments due to debit payments and other balance adjustments (for example, direct debit payments, discounts etc). Consumer bodies point to the results of an omnibus survey, commissioned by Consumer Focus in May 2011²³, indicating that up-to-date information on account balances would be welcomed by consumers. They set out a number of arguments for mandating provision of up-to-date account information including that it would help low income customers in particular manage their energy bills and debt as well as providing more transparency for direct debit customers. Arguing against the requirement, some energy suppliers provided evidence that provision of account balance information would increase their back-office costs. The main costs would be those arising from increasing the frequency with which suppliers must process and reconcile payments with consumption information in their billing systems with that held in the meter. Presently this only needs to be done periodically in line with either a monthly or more likely, a quarterly billing cycle, but including this information on the IHD might require that the calculation is performed in real time.

- 4.92 There is currently limited evidence to suggest that credit consumers who already receive real-time information on the cumulative cost of their consumption (cost of consumption so far today, this week, this month) would further benefit from the provision of account balance information (including payments and other balance adjustments) via their IHD.
- 4.93 The Government accepts that, given the way suppliers' billing systems currently work, mandating the display of real-time account balance information would impose costs which would be passed on to consumers, who may not benefit from the additional information for credit customers. However, the cost of providing the capability for this in the meter and IHD is low, and the Government recognises the arguments about the potential of account balance to provide benefits to consumers. The Government has therefore concluded that this capability should be mandated so as to keep open the option of providing this information to consumers should evidence establish that the benefits would outweigh the costs of changes to the billing system. The following section explains how the capability has been included in the SMETS.

Meter balance for credit customers

- 4.94 The Government has decided to include the capability to calculate and display meter balance in Credit Mode in the SMETS. The meter balance differs from the account balance in that it does not necessarily include adjustments due to payments and other balance adjustments. It represents the amount of money due from energy consumption²⁴ and standing charges since the meter balance was last reset. The SMETS also includes the capability for the energy supplier to adjust the meter balance remotely.

²³ For further information see joint letter to the Programme, dated 13 July 2011

²⁴ kWhs consumed multiplied by the price(s) of that consumption as determined by the metering equipment

Welsh language capability

- 4.95 The Prospectus Response and the IDTS included requirements relating to the provision of messaging on smart metering systems in Welsh (for equipment installed in Wales). The Government has considered this requirement further as part of its process for developing the SMETS, taking into account the need to encourage activity during the Foundation stage and the powers that are available to Welsh Ministers under the Welsh Language (Wales) Measure (2011) (the WLWM).
- 4.96 The Government understands that the smart metering equipment that is currently available or is soon to be available on the market does not include Welsh language capability and is concerned that the inclusion of the requirement now could discourage activity in Wales in the Foundation stage due to the extra costs that would be incurred by energy suppliers. Furthermore, as the data that will be displayed by smart metering systems will in the main be numerical or graphical rather than in text format it may be disproportionate to regulate that energy suppliers include the functionality to display text in Welsh when in practice other solutions, such as the provision of supporting information in Welsh may achieve the same outcome. The Government has also considered that the WLWM gives Welsh Ministers the powers to require energy suppliers to adhere to standards to ensure the equal treatment for the Welsh Language. Therefore, in time it may be most appropriate that the Welsh Government define the requirements that should be placed on energy suppliers in this regard. The Government has therefore decided not to include this requirement in the first iteration of the SMETS.

Government conclusion

The capability to display Ambient feedback based on cost will not be included in the SMETS. Ambient feedback based on level of consumption (low, medium or high) will be required.

The capability to display information on IHDs on real-time gas demand, consumption and cost in latest bill period and “Next-tariff” rate will not be included in the SMETS.

Smart Metering Equipment will be required to be capable of calculating and displaying (on the IHD) the meter balance when operating in Credit Mode (the amount of money due from energy consumption and standing charges since the meter balance was last reset). However, suppliers will not be mandated to use this capability to provide the account balance.

Welsh language capabilities have not been included in the first iteration of the SMETS. The Government will continue to engage with the Welsh Government on Welsh language issues.

Enduring prepayment interface device

Summary of issue

A prepayment interface device is a piece of equipment which is physically separate to the electricity or gas meter which allows customers to perform prepayment functions (for example, to top-up their credit or to enable supply following a self-disconnection) without having to access the meter. Use of a prepayment interface device will allow customers to use a smart metering system in prepayment mode where the electricity or gas meter is not easily accessible.

In the consultation document the Government proposed to work with industry to further develop a wireless solution, as a variant to the basic requirement in the SMETS.

- 4.97 The Prospectus Response concluded that all smart metering systems should be capable of being operated in Prepayment or Credit Mode. The first iteration of the SMETS includes this overarching requirement and a requirement for a user interface associated with the gas and electricity smart metering systems. This user interface provides functionality required by prepayment consumers, including local top up of credit and enabling supply. In most instances this will enable suppliers to operate meters in Prepayment mode and satisfy their obligation to offer this service to consumers only where it is safe and reasonably practical to do so.
- 4.98 The Government has considered the inclusion of a separate prepayment interface device in the first iteration of the SMETS. However in the absence of a specified HAN standard, it would not be possible to ensure that such an interface would be interchangeable with equipment installed by other suppliers. Therefore the requirement will not be included in the first iteration of SMETS. The Government will continue its work with industry to consider the requirement for a separate and interoperable prepayment interface device for premises where the meter is not easily accessible. This may include the development of a technical interface specification which would enable the prepayment interface device to communicate with meters via the HAN.

Government conclusion

The initial version of SMETS will not specify how the user interface requirements should be delivered or that a separate prepayment interface (wireless or wired) must be provided. Further work will be carried out in the coming months to consider how requirements for an enduring prepayment interface device should be addressed within future versions of SMETS.

Technical Assurance of smart metering equipment and Assurance of the end-to-end systems

Summary of issue

The Government recognises that there is a necessity to demonstrate the integrity of smart metering equipment at the point of installation and for the end-to-end system so as to give confidence that the new arrangements will operate as intended and continue to do so. The Consultation indicated that this could be made up of a variety of mechanisms and either underpinned by regulatory obligations or left to the market to deliver. It was also recognised that the options for what might be done could vary between the Foundation stage and the enduring arrangements.

The Consultation asked whether stakeholders felt that there was a need for an assurance framework to support the delivery of functionality, interconnectivity, interoperability and security of smart metering equipment and, furthermore, whether this should be supported by a testing regime. The Consultation asked to what extent this should be covered by regulatory obligations and whether a different approach was necessary for the Foundation stage and the enduring arrangements.

Government consideration of issue

- 4.99 Whilst the responses to the Consultation indicated general support for some form of assurance framework, there was no clear preference for any particular mechanism. However, specifically with regard to the Foundation stage, a number of respondents indicated that a “market-led” approach was acceptable. For the Enduring phase it was felt that a more rigorous approach might be needed – however there was some disagreement on the format of technical assurance measures or whether this should be backed by regulation. Some smaller suppliers cautioned against a bureaucratic approach. Some larger suppliers advocated a voluntary approach with suppliers working together.

- 4.100 Although there was a general desire for an assurance regime to be implemented for the Enduring phase, there was acknowledgement that for Foundation stage this may not be feasible because of the time it might take to develop a regime and the desire not to delay the Programme or stifle innovation. Some respondents pointed to the Foundation stage as an opportunity to trial technologies, assurance options and the governance framework that assurance would sit within for the Enduring phase.
- 4.101 The Government has considered the existing assurance framework for current metering equipment and the context of the regulatory environment that supports the roll-out of smart meters.
- 4.102 The core elements of smart metering equipment are already governed by existing standards. In addition, energy suppliers and manufacturers have clear commercial incentives to implement arrangements that ensure that equipment does not have to be replaced. It is anticipated that suppliers will work with their supply chains, including with Meter Asset Providers, Meter Operators and manufacturers (and their relationships with Notified Bodies and/or Test Houses) to ensure the integrity of what is installed. Suppliers will therefore be responsible for the assurance of equipment that complies with the initial version of the SMETS.
- 4.103 The Government anticipates that suppliers will keep evidence to demonstrate that what they install meets the first iteration of the SMETS so that this can be provided to the Authority if necessary. In addition, the Government will continue to discuss with suppliers what voluntary steps they may take to test or certify meters and how they might work together on this.
- 4.104 The Government is examining the assurance arrangements that could apply to smart metering systems which complies with future iterations of the SMETS, in particular those meters which will be required to be enrolled into the DCC. In addition, alongside the development of the SMETS, the Government is considering whether specific requirements in relation to the assurance and accreditation of smart metering systems should be introduced to further support interoperability and the establishment of the End-To-End Smart Metering System, including the DCC. This will be the subject of a future paper, on which stakeholders views will be sought.

Government conclusion

Suppliers will be responsible for the assurance of equipment that complies with the initial version of the SMETS. The core elements of the metering equipment are already governed by existing standards. In addition, suppliers and manufacturers have clear commercial incentives to implement arrangements that ensure the equipment does not have to be replaced. Alongside the development of the SMETS, the Government is considering whether specific requirements in relation to the assurance and accreditation of smart metering systems should be introduced to further support interoperability and the establishment of the End-To-End-Smart Metering System, including the DCC.

Security

- 4.105 The Consultation document set out that the security requirements identified by the Programme's Security Technical Experts Group (STEG) suggested that cryptographic functionality may be needed to protect against unauthorised modification and disclosure of sensitive data and critical commands.
- 4.106 The document then asked questions around three broad areas relating to cryptographic functionality. The first was whether an end-to-end cryptographic security trust model specified by the Government was a suitable way of achieving interoperability in a secure manner. The second area was around the different aspects of Cryptographic Key management and cryptographic solutions. The third area was concerned with whether the same end-to-end trust model and cryptographic functionality approach should be applied to both domestic and non-domestic customers. These discussions covered solutions managed by the DCC (i.e. the enduring period). Subsequently, with the introduction of the initial version of the SMETS to support Foundation, the Government has given further consideration to these security arrangements. The Foundation arrangements are discussed below.
- 4.107 Most respondents were in broad agreement with the activities undertaken by the Programme with regards to defining a security trust model for the End-To-End Smart Metering System. Energy suppliers, in particular, were supportive of the activities undertaken and one respondent stated that without adoption of these activities, the solution would be more complex, expensive and risky.
- 4.108 High level options for cryptographic solutions and their relevance to the End-To-End Smart Metering System were presented in the Consultation. Most respondents across all groups of respondents, including all energy suppliers, were in agreement that some form of Cryptographic Key management was necessary to secure the End-To-End Smart Metering System. However, some stipulated that the details of the solution should not be prescribed by

Government but left to the discretion of industry instead. Some suggested that energy suppliers could build and manage their own Cryptographic Key management solution whilst others suggested independent bodies, such as the National Technical Authority for Information Assurance (CESG), should be responsible for key management. The Government is considering the different options around Cryptographic Key management of the system but agrees that some prescription of the cryptographic solution by the Government is necessary.

- 4.109 The Government confirms that a Cryptographic Key management solution will be necessary to secure the End-To-End Smart Metering System. Cryptographic solution options are currently being developed by the Government with engagement from industry and bodies including the Centre for the Protection of National Infrastructure (CPNI) and CESG. These different options take account of the cryptographic solution assessments presented in the Consultation as well as those provided by respondents.
- 4.110 There was broad agreement from respondents that the DCC should be best placed to have responsibility of the Cryptographic Key management. For those who disagreed, there was no common alternative to the DCC. One respondent pointed out that although the DCC may be the most logical place to manage Cryptographic Keys, security best practice suggests that the responsibility for security should lie with those that stand to suffer if there is a security incident, with the implication that the energy suppliers would be the party that suffers most as a result of a security incident. Consumers, on the other hand, through loss of energy supply, and taxpayers, via Government having to step in to help any security incident, would also be severely affected by any security incidents.
- 4.111 Following the Consultation, the Government continues to believe that a central party, independent to the rest of the energy industry, should be responsible for Cryptographic Key management. This would increase protection for consumers and provide for clear management of cryptographic security incidents, such as a compromise of credentials. The cryptographic options being developed by the Government will consider whether the DCC or a specific organisation (service provider) appointed by the DCC, such as a Key Management Authority, should be responsible for the Cryptographic Key management.
- 4.112 The consultation document presented a high-level summary assessment of the different cryptographic solutions and respondents were asked if they agreed or disagreed with the assessments given. Whilst there was general agreement with the assessments given, some respondents suggested that there were other advantages and disadvantages such as patent issues with certain asymmetric and hybrid solutions. For those respondents that gave an opinion on which cryptographic solution should be taken forward by the Government, the 'Hybrid' option, incorporating both asymmetric and symmetric encryption, was unanimously favoured.
- 4.113 The Government is currently gathering further evidence to support its detailed assessment of the different cryptographic options presented in the Consultation. This will be combined with the views of respondents in developing

recommendations for review by the Security Technical Experts Group and other interested parties.

- 4.114 Respondents across all segments, including the energy suppliers, were split on whether the same security approach should be applied to opted-out non-domestic sites. At one end, some respondents felt that such sites should not be able to opt-out and allowing them to do so had complicated the Programme. At the other end of opinion, some respondents believed that non-domestic sites opted-out of the DCC should continue to use Advanced Meters under the current arrangements.
- 4.115 The Government is examining how the trust model can best support both the wider technical security architecture, and the security governance framework required to ensure that end-to-end security is appropriate initially and maintained on an ongoing basis in the future.
- 4.116 The security governance framework will seek to establish clear accountability of security roles and responsibilities between all participants, which is key to establishing risk ownership. This will determine who will require assurance that security has been implemented robustly, and is operating correctly. Coupled to the assurance regime, is the necessity to maintain the security requirements in the future, through ongoing proactive risk management, as the threats and systems evolve.

Government conclusion

The Government confirms that, for the Enduring Stage, Cryptographic Keys should be managed centrally for all meters operated through the DCC. Arrangements for the opted-out non-domestic sector are still under consideration.

Security arrangements during the Foundation stage

- 4.117 As indicated in “Technical Assurance of smart metering equipment and Assurance of the end-to-end systems” above (p71-73), the Government is currently examining options for the assurance of equipment which complies with future iterations of the SMETS. It is expected that this will include assurance of the security capabilities of smart metering systems given that equipment will be operated by the DCC. Independent assurance would provide the DCC with confidence that smart metering systems – which will be purchased and installed by energy suppliers outside its control – can be operated securely within its system. This would be coupled with assurance of the DCC’s communications and data services, and of the user systems which are connected to the DCC (i.e. energy suppliers, DNOs and others). Typically assurance of equipment such as smart meters will be gained through a certification regime which assesses each product (and Firmware version) against recognised security standards, such as FIPS-140, the European Union’s ‘common criteria’ model, or CESG-based assurance schemes.

- 4.118 A key feature of the enduring arrangements is that parties – especially the DCC – will be reliant on the assurance provided by others in the value chain: for example the DCC will rely on the certification of equipment against a defined standard. These assurance arrangements will be mandatory for all equipment manufacturers but will take time to establish.
- 4.119 By comparison, during the Foundation stage, energy suppliers can choose the rate of deployment and will have end-to-end responsibility for the smart metering solution, including equipment which complies with the initial version of the SMETS. The initial version of the SMETS sets out security requirements that smart metering systems must support, including requirements relating to the encryption of data and authentication of the source of commands received. In later versions of the SMETS it will be necessary to specify the standards (for example, FIPS-140 or European Union ‘common criteria’) that equipment will need to be certified against as well as the certification procedures to be followed: these will need to be notified to European Commission under the Technical Standards Directive.
- 4.120 While suppliers are in control of all aspects of the value chain they will not need to rely on assurance provided by others. Accordingly suppliers can implement their own security assurance regimes through their procurement, contract and internal management processes. These regimes can be developed to ensure that equipment (and Firmware) will support the security requirements appropriate to their risk assessment and solution design.
- 4.121 All smart metering solutions – including the smaller scale solutions that will be implemented during the Foundation stage – need to address security threats to data privacy and confidentiality and from unauthorised access to smart metering functions. To reflect and underpin suppliers’ current responsibilities for the security of their smart metering systems, the Government is minded to place a specific obligation on suppliers in relation to the security of their smart metering systems, through a new licence condition. This condition would require suppliers to be responsible for the end-to-end security of their smart metering systems. In fulfilling this obligation, suppliers might also be required to conduct a risk assessment of their end-to-end systems and to have an annual security risk audit conducted by suitably qualified, independent, external specialists (such as CESG approved CLAS/CHECK/CTAS consultants). The security risk audit report would enable suppliers to address any security risks that are identified. The Government will consult on this issue in due course, including on the parties that might have rights of access to risk audit reports.
- 4.122 Suppliers may subsequently wish to enrol equipment which complies with the initial version of the SMETS into the DCC, when it becomes operational. As with other aspects of the end-to-end solution which are outside its control, the DCC will require assurance that equipment being transferred will not compromise its security. The Programme will therefore develop enrolment criteria – including security criteria – which equipment will need to meet and will consult on these criteria in due course.

Glossary

Advanced Meter

A meter which, either on its own or with an ancillary device, stores measured electricity or gas consumption data for multiple time periods, and provides remote access to such data by the licensee.

Ambient display/feedback

The representation of information in a form that can be perceived at a glance, for example by colour coding.

Application Layer

Application Layer, in this context, is taken from the ISO standard Open Systems Interconnection (OSI) model for communications systems. In the OSI model, the Application Layer is the layer which provides the functionality required to deliver the end service. For Smart Meters the Application Layer would facilitate, for example, the ability to read or set variables within a standard scheme of data items related to Smart Meter operation.

Communications Hub

A device or set of devices located at the customer's premises which will have the capability to communicate with the HAN and the WAN

Communications Service Provider (CSP)

Bodies awarded a contract to be a service provider of the DCC's communications services.

Credit Mode

A mode of operation whereby consumers are generally billed for their energy use retrospectively.

Cryptographic Key

A sequence of numbers that controls the operation of a cryptographic transformation (for example, encryption, decryption, cryptographic integrity functions, signature generation, or signature verification).

Current Transformer (CT) Meters

An electricity meter which uses a current transformer as part of the mechanism for measuring the electric current.

Data and Communications Company (DCC)

The new entity that will be created and licensed to deliver central data and communications activities. The DCC will be responsible for the procurement and contract management of data and communications services for the End-to-end Smart Metering System.

Device Language Message Specification (DLMS)

An Application Layer protocol

Distribution Network Operators (DNOs)

Companies that are licensed to take electricity off the high-voltage transmission system and distribute it, over low-voltage networks, to consumers.

End-to-end Smart Metering System

The End-to-end Smart Metering System covers all relevant equipment, communication links and connections from every consumer premises through the DCC to suppliers, DNOs and authorised third-party service providers.

Energy Service Company (ESCO)

A professional organisation, scheme or trust that delivers energy services and/or other energy efficiency improvement measures in a user's facility or premises.

Firmware

Software that is embedded in devices for the purpose of controlling that device. It cannot be changed under the normal operation of the device in which it resides.

Floating Neutrals

This is a type of network fault which arises where there is no, or a poor, connection to earth within a consumer's premises. This fault effectively means that excessive voltages can be passed to consumer appliances and devices, where it may cause damage to equipment or render a presumed earthed device as 'live'.

Foundation stage

The period prior to the start of the Mass roll-out stage.

Head End

The entry and exit point for messages flowing from and to the DCC Data Service Provider over the WAN.

Home Area Network (HAN)

The Home Area Network is the means by which communication between Smart Meters, IHDs and other smart metering devices in premises is effected.

In-Home Display (IHD)

An electronic device, linked to Smart Metering System, which provides information on a consumers energy consumption and ambient feedback.

IPv4/IPv6

IPv4 refers to Internet Protocol version 4: a Network Layer standard defined in IETF publication RFC 791 (September 1981).

IPv6 refers to Internet Protocol version 6: a Network Layer standard defined in IETF publication RFC 2460 (December 1998).

Interoperability

The ability of diverse systems, devices or organisations to work together (interoperate).

Load Switch

A component that can close or open (including on receipt of a Command to that effect) to Enable or Disable the flow of electricity to/from the Premises.

Mass roll-out stage

The period between the date at which the DCC starts providing core communications services and the fulfilment of the roll-out obligation as specified in the roll-out licence conditions.

Network Layer

Network Layer, in this context, is taken from the ISO standard Open Systems Interconnection (OSI) model for communications systems. In the OSI model, the Network Layer is the layer which routes data packets across point-to-point links within a communications system that has multiple endpoints.

Network Operators

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

Outage detection

The ability for an electricity supply interruption to be identified and communicated to the WAN.

Polyphase Meter

A meter that can measure more than one phase of electrical supply.

Prepayment Mode

The mode of operation whereby customers generally pay for their energy before using it.

RMS Voltage

Root mean squared voltage

Smart Energy Code (SEC)

The Code, spanning gas and electricity, will be established to provide arrangements for the introduction and ongoing operation of the End-to-end Smart Metering System. Among other things, the Code will detail the relationships between the DCC and the users of its services for the new data and communications activities. Suppliers, Network Operators and other users of the DCC's services will also need to comply with the Code.

Smart Grid

Building a 'smarter' grid is an incremental process of applying information and communications technologies (ICTs) to the electricity system, enabling more dynamic 'real-time' flows of information on the network and more interaction between suppliers and consumers.

Smart-type meters

Smart-type meters offer some of the functionalities included in the SMETS, and so deliver some benefits for consumers and the Programme more broadly, but are not fully compliant with the SMETS.

Transceiver

A device that has both a transmitter and receiver to enable communication with other authorised devices.

Wide Area Network (WAN)

The network that is used for two way communication between smart metering systems and the DCC.

Zigbee SEP1.X

An application layer protocol

Annex 1: Electricity licence modifications

Amendments to Condition 1. Definitions for standard conditions

The following definitions to be included in standard condition 1:

Current Transformer Electricity Meter	means an Electricity Meter which uses a current transformer as part of the mechanism for measuring the electric current;
Designated Premises	means Non-Domestic Premises at which a metering point falls within profile class 3 or 4 as defined in the Balancing and Settlement Code on [date];
In-Home Display (or IHD)	means a device provided at premises which, on the date on which it is provided (or, if later, the date on which a Smart Metering System is installed at the premises), as a minimum: <ul style="list-style-type: none"> (a) is a device of a type identified in; (b) has the functional capability specified by; and (c) complies with the other requirements of, the IHD Technical Specification applicable at that date;
In-Home Display (or IHD) Technical Specification	means the document (or part of a document) which: <ul style="list-style-type: none"> (a) identifies itself as such; (b) applies in respect of the device referred to in that document as an in-home display; and (c) is designated by the Secretary of State, as it may be amended from time to time by a direction issued by the Secretary of State to all licensed gas and

electricity suppliers;

Smart Metering System

means a system installed at premises for the purposes of the supply of electricity to those premises which:

- (a) if installed after the Smart Metering Designated Date, on the date on which it is installed; or
- (b) if installed on or before the Smart Metering Designated Date, on the Designated Date,

as a minimum:

- (i) consists of an Electricity Meter and any associated or ancillary devices identified in;
- (ii) has the functional capability specified by; and
- (iii) complies with the other requirements of,

the SME Technical Specification applicable at that date;

Smart Metering Designated Date

means the date on which the SME Technical Specification is designated by the Secretary of State;

Smart Metering Equipment (or SME) Technical Specification

means the document (or part of a document) which:

- (a) identifies itself as such;
- (b) applies in respect of an Electricity Meter and any associated or ancillary device installed or provided for the purposes of the supply of electricity (excluding an IHD); and
- (c) is designated by the Secretary of State,

as it may be amended from time to time by a direction issued by the Secretary of State to all licensed gas and electricity suppliers;

Amendments to Condition 2: Interpretation of standard conditions

Specific Application of Powers – Secretary of State

- 2.12 Unless a contrary intention appears, any power of the Secretary of State under [standard condition - insert numbers] of this licence to give a direction is a power:
- (a) to give it to such extent, for such period of time and subject to such conditions as the Secretary of State thinks reasonable in all the circumstances of the case; and
 - (b) to revoke or amend it (after consulting with the licensee) or give it again under that power.
- 2.13 Any direction given by the Secretary of State under [standard condition – insert numbers] will be in Writing.
- 2.14 In each case in which the Secretary of State may specify a date under [standard condition - insert numbers] of this licence, he may specify:
- (i) that date; or
 - (ii) the means by which that date is to be determined.
- 2.15 Without prejudice to the generality of paragraph 2.10, every direction given by the Secretary of State in relation to [standard condition - insert numbers] of this licence, which is in effect immediately before that standard condition is modified, has continuing effect for so long as it is permitted or required by or under the modified standard condition.

Condition AA: Smart Metering System - Roll-out, Installation and Maintenance

The roll-out duty

- 1 The licensee must take all reasonable steps to ensure that a Smart Metering System is installed on or before [31 December 2019] at each Domestic Premises or Designated Premises in respect of which it is the Relevant Electricity Supplier.
- 2 The requirement in paragraph 1 is subject to paragraphs 8, 9 and 10.

The duty in relation to replacement meters and new connections

- 3 The licensee must take all reasonable steps to ensure that, at each Domestic Premises or Designated Premises in respect of which:
 - (a) it is the Relevant Electricity Supplier, any replacement Electricity Meter which is installed or is arranged to be installed forms part of a Smart Metering System;
 - (b) it is to be the first Relevant Electricity Supplier, any new Electricity Meter which is installed or is arranged to be installed forms part of a Smart Metering System.
- 4 For the purposes of paragraph 3:
 - (a) a 'replacement Electricity Meter' is an Electricity Meter that replaces another Electricity Meter previously installed at the premises; and
 - (b) a 'new Electricity Meter' is an Electricity Meter that is the first Electricity Meter to be installed, or arranged to be installed, at the premises.
- 5 The requirement in paragraph 3 applies only with effect from any date specified by the Secretary of State in a direction issued to the licensee in accordance with this paragraph.
- 6 The requirement in paragraph 3 is subject to paragraphs 8, 9 and 10.

The duties after installation

- 7 The licensee must take all reasonable steps to ensure that, at each Domestic Premises or Designated Premises in respect of which it is the Relevant Electricity Supplier and at which a Smart Metering System has been installed:
 - (a) subject to sub-paragraph (b), the Smart Metering System continues to satisfy the requirements of the SME Technical Specification that was applicable:

- (i) where the Smart Metering System was installed on or before the Smart Metering Designated Date, on the Smart Metering Designated Date;
 - (ii) where the Smart Metering System was installed after the Smart Metering Designated Date, on the date of its installation; and
- (b) where any direction which amends the SME Technical Specification states that the amendment is to have effect in relation to a Smart Metering System (or any part of it) installed prior to the date specified in the direction, the Smart Metering System (or the relevant part of it) is replaced, modified or reconfigured so as to comply with the amended requirements of the SME Technical Specification.

Exception – Domestic and Designated Premises

- 8 The requirements in each of paragraphs 1 and 3 do not apply in respect of any Designated Premises or Domestic Premises at which either:
- (a) the existing Electricity Meter is a Current Transformer Electricity Meter; or
 - (b) any new or replacement Electricity Meter installed or arranged to be installed by the licensee is a Current Transformer Electricity Meter,
- and where in either case:
- (c) that Current Transformer Electricity Meter meets any requirements which apply to it by virtue of paragraph 12.24 or 12.26 of standard condition 12.

Exception – Designated Premises Only

- 9 The requirement in each of paragraphs 1 and 3 does not apply in respect of any Designated Premises in respect of which:
- (a) the licensee (or any other person) has, on or before 5 April 2014, made arrangements for an Advanced Meter to be installed at the Designated Premises (**the relevant arrangements**); and
 - (b) the obligation under the relevant arrangements to install the Advanced Meter is to be satisfied by a date which is on or before 5 April 2014;
- and either:
- (c) the date for satisfying that obligation to install the Advanced Meter has not yet passed; or
 - (d) an Advanced Meter has been installed at the Designated Premises.

10 The requirement in each of paragraphs 1 and 3 does not apply in respect of any Designated Premises in relation to which:

- (a) the licensee (or any other person) has, on or before 5 April 2014, entered into a contract to install or arrange the installation of an Advanced Meter at the Designated Premises (the **relevant contract**); and
- (b) the relevant contract provides that the obligation to install the Advanced Meter is to be satisfied by a date which is on or before [31 December 2019];

and either:

- (c) the date for satisfying that obligation to install the Advanced Meter has not yet passed; or
- (d) an Advanced Meter has been installed at the Designated Premises.

Definitions

11 For the purposes of this condition:

Advanced Meter	means an Electricity Meter which satisfies the definition of 'advanced meter' in paragraph 12.19 of standard condition 12 but which does not form part of a Smart Metering System.
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Condition BB: Provision of an In-Home Display

The general duty

- 1 The licensee must, where it installs or arranges for the installation of a Smart Metering System at any Domestic Premises on or after the Smart Metering Designated Date, ensure that it:
 - (a) provides to the Domestic Customer at the premises complete and accurate information, which does not mislead the Domestic Customer, concerning the availability and benefits of an In-Home Display;
 - (b) communicates that information in plain and intelligible language;
 - (c) offers the Domestic Customer the opportunity to have an In-Home Display provided at the Domestic Premises from no later than the date the Smart Metering System is installed; and
 - (d) where the Domestic Customer accepts the offer, provides the In-Home Display at the premises from no later than that date.
- 2 The requirement in paragraph 1 is subject to paragraph 3.

Exception to the general duty

- 3 The licensee is not required to comply with paragraph 1 if a device has been provided by any person at the Domestic Premises which on the date on which the Smart Metering System is installed at the Domestic Premises meets the requirements of the IHD Technical Specification.

The duty on request of Domestic Customers

- 4 The licensee must take all reasonable steps to provide an In-Home Display at Domestic Premises in respect of which it is the Relevant Electricity Supplier where:
 - (a) the Domestic Customer at the premises makes a request for it to do so within the Relevant Period; and
 - (b) prior to that request an In-Home Display has not been provided at the premises.
- 5 The requirement in paragraph 4 is subject to paragraphs 6 and 11.

Exception to the duty on request of Domestic Customers

- 6 The licensee is not required to comply with paragraph 4 where, in respect of any Domestic Premises:
- (a) the IHD Technical Specification is amended on a date which falls:
 - (i) after the Smart Metering System has been installed at those Domestic Premises; and
 - (ii) before the licensee has provided an In-Home Display to the Domestic Customer at those premises in accordance with a request made by that Customer;
 - (b) if an In-Home Display were to be provided it would not be able to operate, together with the Smart Metering System at the premises, so as to permit the intended use of the functional capability of that In-Home Display; and
 - (c) the licensee has provided to the Domestic Customer at the premises, within the Relevant Period, a device meeting the minimum requirements of the IHD Technical Specification applicable at the date on which the Smart Metering System was installed at the premises.

The duty during the Relevant Period on and after provision of an IHD

- 7 The licensee must take all reasonable steps to ensure that, at each Domestic Premises in respect of which it is the Relevant Electricity Supplier and at which an In-Home Display has been provided:
- (a) subject to sub-paragraph (b), the In-Home Display continues during the Relevant Period to satisfy the requirements of the IHD Technical Specification that was applicable at the date of its provision; and
 - (b) where any direction which amends the IHD Technical Specification is issued during the Relevant Period and states that the amendment is to have effect in relation to an In-Home Display provided prior to the date specified in the direction, the In-Home Display is replaced, modified or reconfigured so as to comply with the amended requirements of the IHD Technical Specification.
- 8 The requirement in paragraph 7 is subject to paragraph 11.

The duty to deal with IHD faults

9 Where:

- (a) the licensee is notified that there is a fault in an In-Home Display provided at a Domestic Premises in respect of which it is the Relevant Electricity Supplier;
- (b) the consequence of the fault is that the In-Home Display is no longer meeting the minimum requirements of the IHD Technical Specification applicable at the date on which the In-Home Display was provided;
- (c) the Smart Metering System at the Domestic Premises was installed:
 - (i) on or after the Smart Metering Designated Date; and
 - (ii) no more than 12 months prior to the date on which the licensee is notified of the fault; and
- (d) the licensee is in its reasonable opinion satisfied that the fault in the In-Home Display is not due to a failure by the Domestic Customer to take all reasonable steps to keep the In-Home Display in good working order,

the licensee must take all reasonable steps to repair or replace the faulty In-Home Display.

10 The requirement in paragraph 9 is subject to paragraph 11.

Exceptions

11 Paragraphs 4, 7 and 9 apply:

- (a) in all cases in respect of any Domestic Premises at which the licensee installed or arranged for the installation of the Smart Metering System; and
- (b) in any other case, only from such date and to such extent as specified in a direction issued by the Secretary of State under this paragraph.

Definition

12 For the purposes of this condition:

Relevant Period	means, in respect of a Smart Metering System installed on or after the Smart Metering Designated Date, the period which commences on the date on which the Smart Metering System is installed at the Domestic Premises and ends 12 months after that date.
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Condition 12 Amendments

Advanced meters - Designated Premises

- 12.23 This paragraph has effect on and after [6 April 2014] and applies where the licensee installs or arranges for the installation of a Current Transformer Electricity Meter at any Designated Premises.
- 12.24 If paragraph 12.23 applies, the Current Transformer Electricity Meter installed or arranged to be installed at the Designated Premises must be an advanced meter.

Advanced meters – Domestic Premises

- 12.25 This paragraph has effect from the date specified by the Secretary of State in a direction issued to the licensee under this paragraph and applies where the licensee installs or arranges for the installation of a Current Transformer Electricity Meter at any Domestic Premises.
- 12.26 If paragraph 12.25 applies, the Current Transformer Electricity Meter installed or arranged to be installed at the Domestic Premises must be an advanced meter.

Current Transformer Electricity Meters from 2020

- 12.27 After [31 December 2019], the licensee must not supply electricity to any Designated Premises or Domestic Premises through a Current Transformer Electricity Meter which is not also an advanced meter.

Customer Access to Data

- 12.28 The licensee must ensure that a Customer supplied with electricity at Designated Premises or Domestic Premises through an advanced meter, or that Customer's nominated agent, has timely access, on request, to the data provided by that meter.

Exception

- 12.29 The prohibition imposed by paragraph 12.27 does not apply where the licensee is unable to install or arrange for the installation of an advanced meter at the Designated Premises or the Domestic Premises in question despite taking all reasonable steps to do so.

Annex 2: Gas licence modifications

Amendments to Condition 1. Definitions for standard conditions

The following definitions to be included in standard condition 1:

Designated Premises	means Non-Domestic Premises at which the measured annual consumption of gas is 732,000 kWh or less;
Large Gas Meter	means a Gas Meter designed to operate with a maximum flow rate of greater than 11 cubic metres per hour;
In-Home Display (or IHD)	means a device provided at premises which, on the date on which it is provided (or, if later, the date on which a Smart Metering System is installed at the premises), as a minimum:
(a)	is a device of a type identified in;
(b)	has the functional capability specified by; and
(c)	complies with the other requirements of,
	the IHD Technical Specification applicable at that date;
In-Home Display (or IHD) Technical Specification	means the document (or part of a document) which:
(a)	identifies itself as such;
(b)	applies in respect of the device referred to in that document as an in-home display; and
(c)	is designated by the Secretary of State,
	as it may be amended from time to time by a direction issued by the Secretary of State to all licensed gas and electricity suppliers;

Smart Metering System

means a system installed at premises for the purposes of the supply of gas to those premises which:

- (a) if installed after the Smart Metering Designated Date, on the date on which it is installed; or
- (b) if installed on or before the Smart Metering Designated Date, on the Designated Date,

as a minimum:

- (i) consists of a Gas Meter and any associated or ancillary devices identified in;
- (ii) has the functional capability specified by; and
- (iii) complies with the other requirements of,

the SME Technical Specification applicable at that date;

Smart Metering Designated Date

means the date on which the SME Technical Specification is designated by the Secretary of State;

Smart Metering Equipment (or SME) Technical Specification

means the document (or part of a document) which:

- (a) identifies itself as such;
- (b) applies in respect of a Gas Meter and any associated or ancillary device installed or provided for the purposes of the supply of gas (excluding an IHD); and
- (c) is designated by the Secretary of State,

as it may be amended from time to time by a direction issued by the Secretary of State to all licensed gas and electricity suppliers;

Amendments to Condition 2: Interpretation of standard conditions

Specific Application of Powers – Secretary of State

- 2.12 Unless a contrary intention appears, any power of the Secretary of State under [standard condition - insert numbers] of this licence to give a direction is a power:
- (a) to give it to such extent, for such period of time and subject to such conditions as the Secretary of State thinks reasonable in all the circumstances of the case; and
 - (b) to revoke or amend it (after consulting with the licensee) or give it again under that power.
- 2.13 Any direction given by the Secretary of State under [standard condition – insert numbers] will be in Writing.
- 2.14 In each case in which the Secretary of State may specify a date under [standard condition - insert numbers] of this licence, he may specify:
- (i) that date; or
 - (ii) the means by which that date is to be determined.
- 2.15 Without prejudice to the generality of paragraph 2.10, every direction given by the Secretary of State in relation to [standard condition -insert numbers] of this licence, which is in effect immediately before that standard condition is modified, has continuing effect for so long as it is permitted or required by or under the modified standard condition.

Condition AA: Smart Metering System - Roll-out, Installation and Maintenance

The roll-out duty

- 1 The licensee must take all reasonable steps to ensure that a Smart Metering System is installed on or before [31 December 2019] at each Domestic Premises or Designated Premises in respect of which it is the Relevant Gas Supplier.
- 2 The requirement in paragraph 1 is subject to paragraphs 8, 9 and 10.

The duty in relation to replacement meters and new connections

- 3 The licensee must take all reasonable steps to ensure that, at each Domestic Premises or Designated Premises in respect of which:
 - (a) it is the Relevant Gas Supplier, any replacement Gas Meter which is installed or is arranged to be installed forms part of a Smart Metering System;
 - (b) it is to be the first Relevant Gas Supplier, any new Gas Meter which is installed or is arranged to be installed forms part of a Smart Metering System.
- 4 For the purposes of paragraph 3:
 - (a) a 'replacement Gas Meter' is a Gas Meter that replaces another Gas Meter previously installed at the premises; and
 - (b) a 'new Gas Meter' is a Gas Meter that is the first Gas Meter to be installed, or arranged to be installed, at the premises.
- 5 The requirement in paragraph 3 applies only with effect from any date specified by the Secretary of State in a direction issued to the licensee in accordance with this paragraph.
- 6 The requirement in paragraph 3 is subject to paragraphs 8, 9 and 10.

The duties after installation

- 7 The licensee must take all reasonable steps to ensure that, at each Domestic Premises or Designated Premises in respect of which it is the Relevant Gas Supplier and at which a Smart Metering System has been installed:
 - (a) subject to sub-paragraph (b), the Smart Metering System continues to satisfy the requirements of the SME Technical Specification that was applicable:

- (i) where the Smart Metering System was installed on or before the Smart Metering Designated Date, on the Smart Metering Designated Date;
 - (ii) where the Smart Metering System was installed after the Smart Metering Designated Date, on the date of its installation; and
- (b) where any direction which amends the SME Technical Specification states that the amendment is to have effect in relation to a Smart Metering System (or any part of it) installed prior to the date specified in the direction, the Smart Metering System (or the relevant part of it) is replaced, modified or reconfigured so as to comply with the amended requirements of the SME Technical Specification.

Exception – Domestic and Designated Premises

- 8 The requirements in each of paragraphs 1 and 3 do not apply in respect of any Designated Premises or Domestic Premises at which either:
- (a) the existing Gas Meter is a Large Gas Meter; or
 - (b) any new or replacement Gas Meter installed or arranged to be installed by the licensee is a Large Gas Meter,
- and where in either case:
- (c) that Large Gas Meter meets any requirements which apply to it by virtue of paragraph 12.27 or 12.29 of standard condition 12.

Exception - Designated Premises Only

- 9 The requirement in each of paragraphs 1 and 3 does not apply in respect of any Designated Premises in respect of which:
- (a) the licensee (or any other person) has, on or before 5 April 2014, made arrangements for an Advanced Meter to be installed at the Designated Premises (**the relevant arrangements**); and
 - (b) the obligation under the relevant arrangements to install the Advanced Meter is to be satisfied by a date which is on or before 5 April 2014;
- and either:
- (c) the date for satisfying that obligation to install the Advanced Meter has not yet passed; or
 - (d) an Advanced Meter has been installed at the Designated Premises.

10 The requirement in each of paragraphs 1 and 3 does not apply in respect of any Designated Premises in relation to which:

- (a) the licensee (or any other person) has, on or before 5 April 2014, entered into a contract to install or arrange the installation of an Advanced Meter at the Designated Premises (the **relevant contract**); and
- (b) the relevant contract provides that the obligation to install the Advanced Meter is to be satisfied by a date which is on or before [31 December 2019];
 - and either:
- (c) the date for satisfying that obligation to install the Advanced Meter has not yet passed; or
- (d) an Advanced Meter has been installed at the Designated Premises.

Definitions

11 For the purposes of this condition:

Advanced Meter	means a Gas Meter which satisfies the definition of 'advanced meter' in paragraph 12.22 of standard condition 12 but which does not form part of a Smart Metering System.
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Condition BB: Provision of an In-Home Display

The general duty

- 1 The licensee must, where it installs or arranges for the installation of a Smart Metering System at any Domestic Premises on or after the Smart Metering Designated Date, ensure that it:
 - (a) provides to the Domestic Customer at the premises complete and accurate information, which does not mislead the Domestic Customer, concerning the availability and benefits of an In-Home Display;
 - (b) communicates that information in plain and intelligible language;
 - (c) offers the Domestic Customer the opportunity to have an In-Home Display provided at the Domestic Premises from no later than the date the Smart Metering System is installed; and
 - (d) where the Domestic Customer accepts the offer, provides the In-Home Display at the premises from no later than that date.
- 2 The requirement in paragraph 1 is subject to paragraph 3.

Exception to the general duty

- 3 The licensee is not required to comply with paragraph 1 if a device has been provided by any person at the Domestic Premises which on the date on which the Smart Metering System is installed at the Domestic Premises meets the requirements of the IHD Technical Specification.

The duty on request of Domestic Customers

- 4 The licensee must take all reasonable steps to provide an In-Home Display at Domestic Premises in respect of which it is the Relevant Gas Supplier where:
 - (a) the Domestic Customer at the premises makes a request for it to do so within the Relevant Period; and
 - (b) prior to that request an In-Home Display has not been provided at the premises.
- 5 The requirement in paragraph 4 is subject to paragraphs 6 and 11.

Exception to the duty on request of Domestic Customers

- 6 The licensee is not required to comply with paragraph 4 where, in respect of any Domestic Premises:
- (a) the IHD Technical Specification is amended on a date which falls:
 - (i) after the Smart Metering System has been installed at those Domestic Premises; and
 - (ii) before the licensee has provided an In-Home Display to the Domestic Customer at those premises in accordance with a request made by that Customer;
 - (b) if an In-Home Display were to be provided it would not be able to operate, together with the Smart Metering System at the premises, so as to permit the intended use of the functional capability of that In-Home Display; and
 - (c) the licensee has provided to the Domestic Customer at the premises, within the Relevant Period, a device meeting the minimum requirements of the IHD Technical Specification applicable at the date on which the Smart Metering System was installed at the premises

The duty during the Relevant Period on and after provision of an IHD

- 7 The licensee must take all reasonable steps to ensure that, at each Domestic Premises in respect of which it is the Relevant Gas Supplier and at which an In-Home Display has been provided:
- (a) subject to sub-paragraph (b), the In-Home Display continues during the Relevant Period to satisfy the requirements of the IHD Technical Specification that was applicable at the date of its provision; and
 - (b) where any direction which amends the IHD Technical Specification is issued during the Relevant Period and states that the amendment is to have effect in relation to an In-Home Display provided prior to the date specified in the direction, the In-Home Display is replaced, modified or reconfigured so as to comply with the amended requirements of the IHD Technical Specification.
- 8 The requirement in paragraph 7 is subject to paragraph 11.

The duty to deal with IHD faults

9 Where:

- (a) the licensee is notified that there is a fault in an In-Home Display provided at a Domestic Premises in respect of which it is the Relevant Gas Supplier;
- (b) the consequence of the fault is that the In-Home Display is no longer meeting the minimum requirements of the IHD Technical Specification applicable at the date on which the In-Home Display was provided;
- (c) the Smart Metering System at the Domestic Premises was installed:
 - (i) on or after the Smart Metering Designated Date; and
 - (ii) no more than 12 months prior to the date on which the licensee is notified of the fault; and
- (d) the licensee is in its reasonable opinion satisfied that the fault in the In-Home Display is not due to a failure by the Domestic Customer to take all reasonable steps to keep the In-Home Display in good working order,

the licensee must take all reasonable steps to repair or replace the faulty In-Home Display

10 The requirement in paragraph 9 is subject to paragraph 11.

Exceptions

11 Paragraphs 4, 7 and 9 apply:

- (a) in all cases in respect of any Domestic Premises at which the licensee installed or arranged for the installation of the Smart Metering System; and
- (b) in any other case, only from such date and to such extent as specified in a direction issued by the Secretary of State under this paragraph.

Definition

12 For the purposes of this condition:

Relevant Period	means, in respect of a Smart Metering System installed on or after the Smart Metering Designated Date, the period which commences on the date on which the Smart Metering System is installed at the Domestic Premises and ends 12 months after that date.
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Condition 12 Amendments

Advanced meters – Designated Premises

- 12.26 This paragraph has effect on and after [6 April 2014] and applies where the licensee installs or arranges for the installation of a Large Gas Meter at any Designated Premises.
- 12.27 If paragraph 12.26 applies, the Large Gas Meter installed or arranged to be installed at the Designated Premises must be an advanced meter.

Advanced meters - Domestic Premises

- 12.28 This paragraph has effect from the date specified by the Secretary of State in a direction issued to the licensee under this paragraph and applies where the licensee installs or arranges for the installation of a Large Gas Meter at any Domestic Premises.
- 12.29 If paragraph 12.28 applies, the Large Gas Meter installed or arranged to be installed at the Domestic Premises must be an advanced meter.

Large Gas Meters from 2020

- 12.30 After [31 December 2019], the licensee must not supply gas to any Designated Premises or Domestic Premises through a Large Gas Meter which is not also an advanced meter.

Customer Access to Data

- 12.31 The licensee must ensure that a Customer supplied with gas at Designated Premises or Domestic Premises through an advanced meter, or that Customer's nominated agent, has timely access, on request, to the data provided by that meter.

Exception

- 12.32 The prohibition imposed by paragraph 12.30 does not apply where the licensee is unable to install or arrange for the installation of an advanced meter at the Designated Premises or the Domestic Premises in question despite taking all reasonable steps to do so.

Annex 3: Responses received

Written responses received		
Acute Technology Ltd	Esta	Ombudsman Services
Alert Me	E-on	Onstream
AMDEA	Gemalto	Onzo Ltd
Arqiva	Gemserv	Opower
Association of Meter Operators	General Electric	Passivsystems
BAE	Good Energy	Pilot Systems
Beama	Green Energy Options	Ricability
British Gas	Grid Merge	SBGI
BT	Haven Power Ltd	Scottish Power
Cable & Wireless	Health Protection Agency	Secure Electrans
Cambridge Consultants	Hirst Solutions Ltd	Secure Meters (UK) Ltd
CE Electrical	NXP Semiconductors	Sensus
Chameleon Technology (UK) Ltd	First Utility	Sigma Designs Inc
Citizens Advice Bureau	Foundation for Information Policy Research	Silver Spring Networks
Community Energy Scotland	IBM	Smart Energy Networks Ltd
Current	Invensys	Spark Energy
Daniel Kelly (PHD Student)	IMServ	SSE
Ecotricity	Itron Metering Solutions Ltd	ST Microelectronics
EDF	Landis & Gyr	Trilliant
EDMI	Local Authority Forum	UK Power Networks
Electrical Contractors Association	Logica	Vodafone
Electrical Safety Council	Lowri Beck	Utilita
Electricity Northwest	National Grid Gas Distribution	Western Power Distribution

Written responses received		
Elexon	Neeraj Punmiya & Hemant Jangid	Wales & West Utilities
Elster Metering Limited	Northern Gas Networks	Wood, Elizabeth
Energy Retail Association	Npower	ZigBee Alliance
Energy Networks Association	Ofgem	Z-Wave Alliance

Annex 4: Summary of responses to Consultation Questions

Summary of responses	
Q1	<p>The Government is seeking new evidence and views on the impacts of specifying a completion date that is in the earlier part of 2019.</p> <p>Most respondents were concerned about the implications of setting an earlier end-date for completing the roll-out: many felt that completion by the end of 2019 was itself challenging.</p> <p>Some suppliers noted that the start of Mass roll-out stage could be delayed by a number of factors such as: finalisation of the SMETS; delivery of DCC services; and the accreditation of suppliers to operate with the DCC. These could in turn affect the ability to meet an early end-date. Some stakeholders suggested it would be more appropriate if the final deadline for the roll-out of smart meters were linked to the availability of the DCC rather than set in absolute terms. Broadly, suppliers considered that it would not be possible to complete the roll-out earlier in 2019 without adverse effects to Programme costs and benefits.</p> <p>There were mixed views amongst those involved in various aspects of meter provision, energy networks and communications companies. Within this group there were those who felt that an end-date at the end of 2019 would be very challenging, and some who were confident that it could be reached, including at an earlier point. None actively argued for setting an earlier end-date.</p> <p>The cost of the roll-out was a central concern for suppliers. They suggested that costs would increase if the timetable for roll-out were compressed by initial delay and/or an earlier end-date. Installers would have to be trained more quickly, and more would have to be employed; there would be more stranded assets; DCC process failures and the number of service defects would increase; and calls on networks would grow.</p> <p>Some suppliers were concerned that accelerating the roll-out would also have adverse impacts on delivery of benefits, including those that relied upon changing consumer behaviour: the customer experience was central to the success of the roll-out, and the Government should be wary of diminishing it and jeopardising the benefits of the Programme by aiming for an earlier end-date. However, other respondents suggested that bringing forward mass deployment would accelerate benefits realisation.</p>
Q2	Do you think the licence conditions (AA1-2) as drafted effectively underpin the policy intention to complete roll-out of Smart Metering Equipment by a specified date? Are there any areas where you consider further clarification is

	<p>necessary? Please explain your reasoning.</p> <p>Respondents focused on the terminology in the licence conditions, especially the concept of taking “all reasonable steps” to roll-out smart meters; the relationship of the roll-out licence conditions to the DCC; the completion date for the roll-out; and further guidance.</p> <p>Some respondents felt that the requirement to take ‘all reasonable steps’ was excessive, and that “reasonable steps” or “all reasonable endeavours” would be preferable. Respondents said that, in applying the test, Ofgem would need to take into account a range of factors that lay outside the supplier’s control, including unusual or difficult installations and the effect of customer switching on a supplier’s portfolio. There was some limited support for the early issuing of guidance on the interpretation of ‘all reasonable steps’.</p> <p>Suppliers and other industry parties were concerned about the relationship between the licence requirements and the availability of DCC services. One respondent suggested that the draft licence conditions did not reflect the dependency on the DCC or the difficulty that customers in certain geographical areas would have in connecting to it. Another thought the DCC’s data-handling capacity could affect the ability to roll-out smart meters.</p> <p>Some small suppliers felt that the end-2019 deadline could only be met if larger volumes of meters were installed before fully compliant meters became available. They noted that the number of non-compliant smart meters installed would be relatively small, and their continued presence would not materially affect Programme benefits. Their remaining in place would also reduce stranding risks and thus customer costs. Parallels were drawn with the exceptions for some advanced metering installations in the non-domestic sector.</p> <p>Some suppliers were concerned that, by focusing on an end-date, the licence conditions could encourage concentration of roll-out towards the end of the period. They suggested that suppliers should have annual completion targets and publish roll-out plans to demonstrate their compliance.</p>
Q3	<p>Do you agree that the licence conditions as drafted effectively underpin the policy intention to deliver Smart Metering Equipment with the functionality and interoperability required to meet the business case? Please explain your reasoning.</p> <p>A majority of respondents believed that the licence conditions as drafted underpinned the business case for smart metering, although a number qualified their support by suggesting that the conditions be strengthened. Larger energy suppliers were more inclined to disagree that the licence conditions would support the business case.</p> <p>The most frequently cited weakness of the licence conditions was that they would be unlikely to deliver interoperability. This was because the rules were perceived as being insufficiently prescriptive, detailed and closely defined. A number of respondents pointed to the need for a requirement for testing and trialling of equipment to build confidence in Smart Metering Equipment. The “all reasonable steps” requirement was seen by some respondents as too open to interpretation. Concern was also raised at the need to address interoperability of pre-SMETS</p>

	<p>meters.</p> <p>Some respondents commented that delivery of the business case was also dependent on other outputs of the Programme, particularly the completion of the SMETS and the DCC licence condition.</p>
Q4	<p>Do you agree that Smart Metering Equipment should be compliant with the SMETS extant at the time of installation and that it should continue to be compliant with that version of the SMETS through the operational life of the equipment? Please explain your reasoning.</p> <p>Respondents had a range of views on compliance. Some felt the meter should only have to be compliant at the time of installation; others that it should remain compliant throughout its operational life.</p> <p>Some respondents thought it would be impossible to ensure that equipment could comply with unknown future specifications. It would thus be more appropriate to focus on ensuring that meters complied with the version of SMETS extant at the time that it was manufactured. Some said that maintaining equipment to evolving specifications would result in higher additional manufacturing costs and the stranding or replacement of relatively new equipment.</p> <p>Several others thought that, in the main, Firmware could be remotely upgraded to reflect changes in SMETS designed to support supplier or network requirements. The real challenge was compliance with new SMETS versions if hardware had to be changed: this should only happen in exceptional circumstances. One respondent suggested that retrofitting should only take place if there were a justifiable business case, with any costs paid by the beneficiary.</p> <p>There were a number of comments on the effects on procurement and manufacture. Some suggested that the key was to have appropriate notice of changes to the SMETS to allow manufacturers to run down old stocks and to manufacture and certify meters that met a new version of the SMETS. Several suppliers said that penalising suppliers for holding stock would risk reducing early investment in technology.</p> <p>Many respondents pressed the Government to offer clarification on change control processes: clear governance and rules giving adequate notice of change would help address such concerns. The Government should encourage innovation, but companies should not lose investment they had made in metering. Some suggested that the Government should specify a minimum life for SMETS revisions to allow planning to take place.</p>
Q5	<p>Do you agree that in some exceptional circumstances suppliers should be required to retrofit Smart Metering Equipment that has already been installed? Please explain your reasoning.</p> <p>Respondents broadly agreed that there were limited circumstances – chiefly involving safety and security - where retrofitting smart metering equipment could be necessary, but saw this as a measure of last resort. This reflected the fact that the prospect and act of retrofitting could, among other things, disincentivise early roll-out or penalise those who had made the most effort to install meters rapidly; reduce meter asset life and thus increase stranding; undermine consumer confidence; and, by introducing additional cost, adversely affect the overall business case for</p>

	<p>smart meters.</p> <p>Respondents sought greater clarity about what would constitute ‘exceptional circumstances’, how those circumstances would be determined, and about what would constitute ‘retro-fitting’, given the significant difference between remote updating of Firmware to ensure continued compliance with the SMETS and physically adding components to meters. Respondents made a number of suggestions in respect of handling proposals for retrofitting, including the establishment of processes around SMETS changes that would test the costs and benefits of retrofitting against a “do nothing” option.</p>
Q6	<p>Do you think that the licence conditions (AA3-6) as drafted effectively underpin the policy intention for the new and replacement installation of Smart Metering Equipment? Please explain your reasoning.</p> <p>The majority of respondents agreed that the drafting underpinned the policy intent. One respondent said that the licence condition should be brought forward in line with the Foundation stage to ensure that more Smart Meters were installed earlier. Another said that the licence condition should reflect the dependency on the DCC’s ability to provide communication services.</p> <p>Some respondents commented on the treatment of non-standard installations, for instance, where meters were difficult to install situations, where a meter was being installed at newly connected premises or where there was an emergency meter change.</p>
Q7	<p>What period of notice do you think would be appropriate before the new and replacement obligation comes into effect? Please explain your reasoning.</p> <p>Respondents had varying views on the length of notice required before a new and replacement obligation took effect. The periods proposed ranged from three to eighteen months, but, in the main, suppliers suggested a six, nine or twelve-month notice period to provide time to order meters, negotiate with third party installers, and allow the supply chain to develop. Meter manufacturers felt that they would need three-to-six months’ notice.</p> <p>However, respondents were most concerned about the activities that needed to take place before a new and replacement obligation took effect. Suppliers and communications companies thought that the notice period should depend on SMETS’s being defined and agreed, as well as taking account of the time needed for manufacturers to scale up product development, production testing and shipping to suppliers. Many also saw DCC-readiness as key, and some large suppliers were concerned that the DCC would not be established on schedule.</p> <p>Respondents also referred to the need to have in place an operational assurance and testing regime to ensure that smart meters were compliant, certified and approved, and to testing and trialling of the meters themselves and their relationship to the DCC and supplier systems. This testing would establish whether the DCC and supplier systems were fully operational. This too would affect the starting date. Some mentioned the need for other industry parties whose assistance would be needed during the roll-out, such as distribution networks, to be appropriately prepared. There was interest in having a set of agreed criteria against which the decision to bring the obligation into effect would be measured.</p>

Q8 & Q9	<p>What contribution do you think the interoperability licence condition as drafted could play in ensuring that suppliers work together to ensure Smart Metering Equipment is interoperable? Please explain your reasoning.</p> <p>Do you think the licence conditions as drafted effectively underpin the policy intention to ensure Smart Metering Equipment is interoperable? Please explain your reasoning?</p> <p>Approximately half of those who responded to this question believed that the interoperability drafting would be effective in ensuring that Smart Metering Equipment is interoperable. Energy suppliers tended to be less inclined to this view than other respondents, while meter manufacturers were more much more likely to expect the condition to be effective. Over one quarter of respondents provided comments but did not offer an overall view on the efficacy of the licence condition, while slightly less than one quarter were of the opinion that it would not be effective.</p> <p>A substantial amount of respondents, from across industry sectors, expressed the view that interoperability would be more likely to be achieved if provision was to be made for testing and trialling, with some also mentioning certification and accreditation. The need for assurance and compliance measures was also mentioned. A substantial number, particularly energy suppliers, stressed the importance of defining a set of HAN and WAN standards as a precondition for interoperability. There were also a number of comments that the term 'interoperability' should be clearly defined, with some also calling for definitions for 'technical interoperability' and 'commercial interoperability'. Several respondents, from different sectors, expressed doubts at the phrase 'reasonable steps' which they thought was insufficiently clear and should be replaced with a more precise and tightly defined formulation to ensure compliance. Some meter manufacturers expressed the view that energy suppliers were placing high expectations on the clarity and assurance necessary from DECC and were failing to recognise the importance of the Foundation stage.</p>
Q10	<p>What role could a dispute resolution mechanism have a role in ensuring interoperability? What key features should such a mechanism have?</p> <p>A majority of respondents to this question, across industry sectors, favoured a dispute resolution process for ensuring interoperability. Many qualified their support by making it clear that dispute resolution should only be used as a last resort where it has not been possible for parties to resolve an issue. Several were of the view that it was important to minimise the occurrence of disputes by ensuring that the SMETS are clearly defined and unambiguous. A number of respondents believed that dispute resolution should be seen within the context of SMETS governance and change management more broadly, with clarification or revision of the SMETS being undertaken if this was found to be necessary in the course of resolving a dispute. Dispute resolution was liked to assurance, with some respondents calling for it to be dealt with under the Assurance framework that supports the Smart Meter roll-out. Testing verification and certification were also mentioned in the same context as important means of ensuring interoperability.</p> <p>Many of those who favoured a dispute resolution process believed that it should form part of the SEC. The need for independence in the operation of the process and for a balance of stakeholders to be represented in its governance was also</p>

	mentioned a number of times.
Q11 & Q12	<p>11. For the smaller non-domestic sector do you agree that where there is a Current Transformer meter then suppliers should be required to install an advanced rather than Smart Metering Equipment? Please explain your reasoning.</p> <p>12. Do you think that the licence conditions as drafted effectively underpin the policy intention for Current Transformer meters? Please explain your reasoning.</p> <p>There was almost complete agreement amongst respondents that, for technical reasons, a fully smart current transformer meter could not be developed. In these circumstances, respondents agreed that an advanced metering solution should be used for these meters, and an appropriate requirement incorporated in the Electricity Licence Condition. Some respondents suggested that, rather than this requirement being confined to the non-domestic market, the small number of current transformer meters in the domestic sector should also be covered by rules. Such an approach would give suppliers and others involved in installations regulatory certainty.</p> <p>The draft Licence Conditions attached to the Consultation did not address the question of larger gas meters – often known as “U16 meters” - which are principally in use in the non-domestic market. However, some respondents referred to these meters, for which the scope for developing a “smart variant” of the existing design had been considered during the development of the technical specification. An approach had not been finalised during that process. It was raised again during the consultation period.</p> <p>During the consultation period, the Programme held discussions with the range of interested industry parties with a view to arriving at an agreed approach. There was consensus that there was little likelihood in the short- or medium-term of the industry’s developing an economically or technically feasible large gas meter. This reflected the relatively low number of these meters in use – around 450,000, compared with around 23 million smaller gas meters – and the high cost of developing a smart variant.</p> <p>In light of this consensus, the Programme concluded that a further technical exception, and a requirement to provide an advanced solution, should be made for these meters. After further discussion, the Programme decided that, as with current transformer meters, the same approach should also be applied to the domestic sector.</p>
Q13 & Q14	<p>13. Do you think under the new and replacement obligation gas suppliers should be given the option to wait for the installation of electricity Smart Metering Equipment before installing the gas Smart Metering Equipment? Please explain your reasoning.</p> <p>14. Do you think there are any other barriers to gas Smart Metering Equipment being installed before electricity Smart Metering Equipment? Please explain your reasoning.</p>

Many respondents saw benefits in offering gas-only suppliers flexibility in installing smart meters where a smart electricity meter had not already been provided. Others referred to the need to change industry rules to allow gas installers to access the electricity supply during “gas first” installations.

Respondents had differing views on the degree of flexibility that might be offered, including a restriction to exceptional technical reasons or for a short defined period. One respondent suggested that a mechanism be devised to advise a gas supplier if a smart electricity meter had or had not been installed. Concerns about the effects of offering flexibility included the fact that an assumption that gas must or should follow electricity introduced unnecessary constraints into the roll-out, and risked concentrating gas installations at the end; and that relaxing the obligation could result in installation of a significant number of dumb gas meters that would have to be replaced by 2019, requiring a disruptive third visit. In addition, one respondent said that there should be tight controls over electricity suppliers to ensure that they did not unnecessarily delay installation to prevent gas installation going ahead.

A number of respondents commented on the higher costs that “gas first” installations would entail. Some noted that “gas first” would require a more highly skilled workforce and that installers would take longer to install the meter and a stand-alone Communications Hub: such costs were not reflected in the Impact Assessment. Respondents said it was vital that installers be correctly trained. The set of skills required lay outside the current scope of Gas Safe because the gas installer would have to access the electricity supply to install the Communications Hub. This in turn meant that the gas installer would need the permission of the DNO to access the supply and of MOCOPA to receive approved installer status. DCUSA and MOCOPA would therefore have to be modified to let gas-first installations proceed. One supplier pressed for these changes to industry arrangements to take place in the near-term.

In terms of problems at the property, respondents raised a number of concerns:

- the space required to fit the additional technology
- the operation of the battery
- the need for further wiring work when the electricity meter was fitted
- the risk that modular communications units would be installed in series, rather than as a removable component of the electricity meter
- a separate gas communications module linked to the electricity supply would result in the module’s being unmetered and could introduce new potential points for electricity theft.

Respondents had differing views about the practicality of a wired connection to a dumb electricity meter or main fuse cut-out. One suggested that, where the electricity meter had a pulse input channel, this could be used, either hard-wired through isolators or through radio frequency. One respondent said that a battery might last for up to ten years, but, if the gas meter were used in prepay mode or received Firmware upgrades, that life would be considerably reduced, requiring a further visit to replace the battery. However, another respondent noted that a battery could ‘expire’ once the smart electricity meter was installed.

Q15	<p>What do you think the implications would be of extending the new and replacement obligations to the licences of other relevant parties in relation to installing Smart Metering Equipment in new developments without the involvement of a supplier? Do you think mechanisms other than licence conditions should be considered to achieve the policy objective? Please explain your reasoning.</p> <p>Respondents were broadly against applying rules to other parties, such as networks or developers, on the basis that suppliers could ensure installation of appropriate meters at new developments.</p> <p>Several suppliers made clear that the principle of a supplier-led roll-out should not be infringed by extending responsibilities to other parties that otherwise lacked a role in either the physical roll-out or its supporting elements such as customer engagement and protection. Respondents said suppliers could contract with accredited parties to undertake metering work where such work was offered and that supplier choice should prevail.</p> <p>Some respondents referred to commercial drivers pointing out that if a non-compliant meter were installed by a third party without the supplier's involvement, the supplier would have no choice but to replace it. Any loss would fall to the meter asset provider, whose equipment would be returned without rental payment.</p> <p>Some respondents said that obliging other parties to install smart meters would require those parties to make significant and costly investment in systems, equipment and training. Some respondents said that arrangements such as MAMCoP (Meter Asset Manager Code of Practice) and MOCoPA and SMICoP would need to be amended to accommodate smart metering: new developments should be appropriately captured within their scope.</p> <p>However, some respondents felt that new and replacement obligations might be extended into licences of any other parties involved in meter installation. This could reassure customers and overcome problems around non-compliant technology. Some argued that obligations should be placed on Independent Gas Transporters to ensure that any meter they installed was SMETS-compliant.</p>
Q16	<p>Do you think the roll-out of Smart Metering Equipment has any specific implications for the provision of emergency metering services? Please explain your reasoning.</p> <p>Respondents had differing views on future arrangements for providing emergency metering services, but agreed that the current arrangements would have to be revisited. Overall, there was agreement that the primary objectives of an emergency visit should be safety and the restoration of supply. However, there were varying views on whether a smart meter should be installed during an emergency visit, whether in replacement for a dumb meter or a smart meter.</p> <p>In terms of revisiting the current arrangements, respondents noted the potential complexity and cost to networks of holding stock of various types of smart meter, communications modules and IHDs and of having to install them. Installers would require training on a variety of different meter types and communications equipment. If networks were to continue to provide the emergency metering service, they would need to train large numbers of staff before mass roll-out began. Others felt that a</p>

	<p>common technical specification would ease installation problems. Some respondents said that, in most cases, smart functionality should enable remote identification of the most appropriate action to be taken.</p> <p>Several respondents said that suppliers should arrange twenty-four hour support to customers for all issues relevant to smart meters and associated communications equipment.</p> <p>On other points, respondents referred to the need to take into account exceptional circumstances and the needs of vulnerable customers. For example, smart meters removed during an emergency would contain personal information that might need to be removed.</p>
Q17	<p>What period of notice do you think would be appropriate before the obligation to provide an IHD comes into effect? Please explain your reasoning.</p> <p>Respondents' views on the appropriate notice period before application of the IHD obligation varied between six and twelve months. As with the new and replacement obligation, many respondents linked the entry into force to other key developments during the Foundation stage.</p> <p>Some respondents thought that, while it was likely that suppliers could supply IHDs more rapidly, six months' notice would help those small suppliers delivering a roll-out via third parties. Manufacturers anticipated six-to-eight week ramp-up times for manufacturing plant, and possible 26-week lead times on critical components. Some respondents linked the obligation to the finalisation of the SMETS, and suggested a deadline of twelve months after that point. Some suppliers said that entry into force of the obligation should be in line with the new and replacement obligation, with no requirement to provide an IHD before the DCC had been established, but another said that suppliers installing smart meters before the new and replacement obligation took effect should provide an IHD. Some suggested that, instead of a specified notice period, the trigger should be the meeting of certain preconditions. For example, suppliers needed enough compliant meters and IHDs, the end-to-end testing process should have been undertaken and the DCC should be in place.</p>
Q18	<p>Would the consumer changing their supplier raise any particular issues with regard to the approach set out for the provision of IHDs? Please explain your reasoning.</p> <p>Respondents – principally suppliers, but also other industry parties - suggested that the change of supplier process could lead to problems in respect of the IHD, especially around changes to information available from the IHD and arrangements for dealing with faulty IHDs.</p> <p>One respondent said that IHD design and functionality could become a differentiator for suppliers. In this context, respondents referred to the fact that different supplier systems would not necessarily support enhanced functions on the IHD, and thus the information that could be provided through it. One respondent suggested that an IHD should be returned to its basic compliance mode when a supplier was changed. Another suggested that new suppliers might need to explain possible impacts to avoid consumer dissatisfaction.</p> <p>By contrast, others said that any customer with a minimum specification IHD should be able to switch suppliers and expect no difference in display of data on that same</p>

	<p>device. A number of respondents said that, if a supplier agreed to offer a new IHD, the previous obligation to maintain the IHD over the warranty period should transfer to the new supplier.</p> <p>Respondents also discussed arrangements for dealing with malfunctioning IHDs. Some respondents had views on the approach to compensation where a supplier replaced a previous supplier's faulty IHD. Some were interested in developing formal industry arrangements, whilst others felt a reciprocal arrangement to re-allocate costs could be devised, but appeared unlikely to be cost-effective given that most IHDs could be expected to function reliably for more than a year.</p>
Q19	<p>Do you think the licence conditions as drafted effectively underpin the policy intentions set out for the provision of IHDs to domestic consumers? Please explain your reasoning.</p> <p>Most respondents agreed that the drafting met the policy intent for IHD provision. Some stakeholders asked for further information on what would form 'accurate' information. There were also general comments around clarifying the business processes related to IHD's and change of supplier.</p>
Q20	<p>Do you agree that the Standard Licence Conditions identified above require consequential changes in light of the roll-out licence conditions? Do you agree with the Government's proposed approach? Please explain your reasoning.</p> <p>Respondents agreed that a consequential change is needed to Standard Licence Condition 2 in order to allow Secretary of State to specify in a direction when some conditions take effect.</p> <p>Respondents also agreed that the Designated Premise definition did not need to be altered and that this was a wider issue. Some responses noted that Ofgem are clarifying definitions of domestic and non domestic.</p>
Q21, Q22 & Q23	<p>Do you think there are any other consequential changes to existing licence conditions /legislation/existing codes needed in order to make the proposed roll-out obligations work as intended? Please explain your reasoning.</p> <p>Respondents commented that there would need to be a range of consequential changes to licence conditions, legislation and existing codes as a result of Smart Metering in general. One example related to roll-out was the need to consider consequential changes to allow installation of gas smart metering before electricity.</p> <p>Other suggestions related to Smart Metering more widely and included:</p> <ul style="list-style-type: none"> - an obligation on suppliers to communicate roll-out plans with DNOs; and - changes to industry codes to facilitate exchange of information during change of supplier
Q24	<p>Do you think that there are other requirements that the Government should adopt in the SMETS? Please explain your reasoning.</p> <p>A large majority of respondents agreed that there were other requirements that should be adopted in the SMETS. These are summarised below:</p>

	<ul style="list-style-type: none"> • HAN protocols – these need to be clearly and explicitly defined. • Hand held terminal (HHT) - clearer definition of the functionality, security and pairing mechanisms need to be provided. • Communications Hub – physical and logical requirements, gas mirror functionality, and the process for Firmware upgrades should be specified. • Consistent end-to-end data model – a model that is demonstrably consistent with the models developed by the business process modelling workstream. Consider using existing work by industry groups such as SSWG where appropriate. • Wired HAN – more information is required on how devices will connect via a wired HAN. • Physical security – greater definition of secure integrated circuits should be specified, for example the level of tamper resistance for any “crypto” microprocessors and related hardware. • Push / Pull – more detail is required on which messages will be pushed / pulled from the smart metering equipment. • Messages – greater definition of the messages into and out of the smart metering equipment in terms of size and frequency. • Consumer HAN – clearer description of how consumer devices will interact / connect with the smart metering equipment. • Accessibility / Inclusivity – clearer requirements should be provided on customer accessibility and inclusive design. • 13 month storage on gas meter – to ensure continuity if the Communications Hub is exchanged. • Last Gasp – clearer definition needed of the functionality once a decision has been made on which piece of equipment in which it will be implemented. • Asset life – clearer definition needed in terms of failure rates, • UTRN generation – clearer definition required.
Q25	<p>Do you agree that all the requirements recommended in the IDTS should be adopted by the Government in the SMETS? Please explain your reasoning.</p> <p>A majority of respondents agreed that the requirements in the IDTS should be adopted, although some with caveats. Many respondents identified the same additional requirements and clarifications which are covered in the summary of responses to question 24 and not repeated here.</p> <p>Comments on the IDTS requirements are summarised as follows:</p> <ul style="list-style-type: none"> • Prepay requirements are overly complex, especially with regard to debt collection. • IHD requirements are overly complex. • Firmware requirements are inconsistent with Welmec guidelines. • Single WAN protocol requirement will limit innovation and increase Communications Hub complexity and cost.

	<ul style="list-style-type: none"> Removal of DNO requirements (several respondents repeated their position on the additional DNO requirements as they had set out in their responses to questions 31, 43 and 44). <p>A number of suppliers noted that the SMETS should be developed in stages with a focus on the core functionality first and adding detail later.</p> <p>A number of meter suppliers asked that derogations for premises where full smart functionality cannot be achieved for technical reasons (for example, HAN and WAN not available) be considered.</p>
Q26	<p>Do you agree that the security requirements recommended in the IDTS are proportionate to the level of risk that the End-to-end Smart Metering System faces? Please explain your reasoning.</p> <p>There were mixed opinions on whether the security requirements presented in the IDTS are proportionate to the level of risk to the End-to-end Smart Metering System, across all types of organisations that responded.</p> <p>Energy Suppliers were comfortable that the Security Technical Experts Group (STEG) had correctly identified the threats. However while a number believed that the security requirements were proportionate, others felt that they should be less prescriptive. There was also concern that some security requirements for the End-To-End Smart Metering System may have consequential impact on the smart metering equipment.</p> <p>Other respondents felt that the security requirements are, in the main, appropriate to the level of risk, but that DECC should focus on the core high level requirements to allow the Foundation stage to proceed effectively. In addition, a minority of respondents felt that the requirements did not go far enough, for example the requirement for the level of tamper evidence and resistance of equipment (SP.23).</p> <p>A number of respondents across industry commented on the STRIDE (spoofing, tampering, repudiation, information disclosure, denial of service and elevation of privilege) assessments on which the Smart Metering Risk Assessment and Security Requirements were based. It was pointed out that STRIDE is not holistic and that it assesses technology without taking into account people and process.</p>
Q27	<p>Do you agree that the process outlined above is a suitable way forward to develop the SMETS? Please explain your reasoning.</p> <p>A number of respondents said that the process for developing the SMETS should promote a layered approach to their development with more than one iteration. Reasons given for this approach were:</p> <ul style="list-style-type: none"> the hardware and core functionality should be resolved as soon as possible and the more burdensome or unclear functionality be added in later versions of the SMETS; and good practice for developing a functionally suitable, interoperable and robust solution requires the specification to be iterated with real system building and testing. This process should involve the manufacturers. <p>In common with views expressed in responses to other questions, some felt that a further level of detail was needed above that given in IDTS in a number of key areas</p>

	<p>to ensure full interoperability. The need to address the certification testing details that were necessary for interoperability was raised. This would ensure that all commands and requests for data from authorised parties are treated in an identical way by each smart meter and that each response is in an agreed and consistent format. The SMETS development process should involve a thorough editorial and technical review, and tightening of the wording, whilst ensuring that the meaning is not altered.</p> <p>One respondent said that early adoption of the SEC in a scaled back version will help to resolve outstanding issues and could provide robust change control. Another said that a layered approach would be necessary if a specification is released before the communications structure has been completely specified.</p> <p>Some expressed concern that the timescale between the completion of EU notification and the expected availability of compliant product does not allow for an adequate development period. Others pointed out that the time required to properly test a meter with all IDTS functionality prior to production volume manufacturing can be significant.</p>
Q28	<p>Do you think that the SMETS should ultimately be governed as part of the Smart Energy Code? What alternative arrangements could be adopted for the ongoing governance of the SMETS? Please explain your reasoning.</p> <p>A majority of those who responded to this question agreed that SMETS governance should form part of the SEC or that the SEC could be a means of achieving the required governance, with only one respondent disagreeing outright. Support was particularly strong among energy suppliers. Meter manufacturers tended to support SEC governance of the SMETS whereas meter operators were more agnostic. A sizeable number of respondents did not refer explicitly to the SEC in their answers but stressed the importance of there being effective enduring governance arrangements which could foster innovation and for there to be a technical panel.</p> <p>Arguments in favour of SMETS governance as part of the SEC included evidence of this approach working in other comparable industry codes, such as the Balancing and Settlement Code and the Meter Asset Manager's Code of Practice. A centrally managed SMETS governance framework was also seen as important in ensuring interoperability.</p> <p>Many respondents expressed the view that designing a governance regime for the SMETS would be a challenging task and that particular care would be needed in designing the change management process. Attention was often drawn to the need for the industry as a whole to be represented in any SMETS governance framework. The need for a strong and transparent governance regime to remain in place up to the point that the SEC takes effect was also mentioned.</p>
Q29	<p>What unit manufacturing cost reduction do you think can be achieved for Smart Metering Equipment over the next 20 years? Please explain your reasoning. Please also provide any other comments (accompanied by evidence) on the estimated costs of the Smart Metering Equipment as set out in the Impact Assessment.</p> <p>Of those respondents who offered an opinion, a large proportion agreed that the current cost reduction assumptions were low and expressed an expectation that a</p>

	<p>higher cost erosion will be achieved. A slightly smaller proportion felt that the current assumptions were accurate, while a smaller number said that the Impact Analysis assumes higher cost erosion over time than will be experienced.</p> <p>Small suppliers and communications solution providers generally were more optimistic about the realisation of high cost erosion over time. The larger suppliers generally thought the current assumptions were accurate. The majority of meter manufacturers did not think that the predicted cost erosion would be achievable.</p> <p>Respondents who agreed with the current cost erosion assumptions, or expected higher reductions, expressed the view that global supply would ultimately outstrip demand, resulting in cost erosion as observed for other electronic goods (references included consumer electronics and digital domestic appliances). Some believed that cost erosion figures for the communications components could be considerably higher than for metering equipment.</p> <p>Responses supporting lower assumptions for cost erosion over time pointed out that smart meters will be expected to have a longer lifetime than most consumer electronics, resulting in lower volumes and lower price erosion over time.</p> <p>Respondents also outlined that some of the raw materials required within equipment could potentially increase in price over years to come. Exchange rate fluctuations were referred to as another source of uncertainty that would affect long term price development.</p>
Q30	<p>Do you agree that the Government should include a requirement for a Communications Hub in the SMETS? Please explain your reasoning.</p> <p>With one exception, respondents agreed that specifying communications functionality was vital to business case and interoperability. Many of the responses related to the question of whether the Communications Hub should be separate or included in another device.</p> <p>The majority favoured specification of a separate Communications Hub. Common reasons for this were that it would: enable and support 'gas first' deployments, ensure logical separation of access to gas and electricity data, optimise the universal hub design to support alternative WAN solutions (with different power supplies), enable HAN technology options for tall or difficult buildings, simplify common architectural elements (such as security, device mirroring, Firmware image store), provide a logical boundary between the HAN and WAN technologies, and better support potential smart grid requirements by allowing connection of other devices to the HAN.</p> <p>Some respondents believed that interoperability could be achieved even with a detachable Communications Hub. Similarly, one respondent stated that, whilst it was important that the system meets the specification IM.3, a Communications Hub may not be the best solution to achieve the requirement during Foundation stage.</p>
Q31	<p>Do you agree with the estimated costs and benefits for outage detection and the Government proposal to require the Communications Hub to include the equipment necessary to provide electricity outage detection? Please explain your reasoning.</p> <p>A large proportion of energy suppliers and meter suppliers disagreed with the estimated cost and benefits. Reasons given for why costs and benefits were</p>

	<p>overvalued included:</p> <ul style="list-style-type: none"> • underestimated costs; • suppliers gain no benefits yet bear the costs. DNOs will be benefit but it is not clear how consumers will gain; • consumer perception needs to be weighed against real benefits; • complexity will increase; • implementation at substations may be preferable; • concern about the physical size of the super-capacitor or battery storage facility necessary to support the requirement that only outages of at least 3 minutes are reported; and • while the provision of the means of outage detection in the base smart meter specification will provide substantial benefits to consumers and DNOs at minimal marginal cost, the case for providing positive outage detection (so called 'last gasp' capability) was less clear. <p>Others argued that the benefits case for outage detection is actually undervalued and that this level of management will be vital as we move closer to an environment with 20% renewable energy (where a residential outage may well also form a generation loss) and volume deployment of Electric Vehicles as both loads and power sources.</p> <p>Energy networks and communications and technology providers generally agreed with the estimated cost benefits. Reasons given included:</p> <ul style="list-style-type: none"> • Outage detection has proven to be an invaluable tool both in detecting failures in a prompt fashion, but also ensuring, for large scale outages, maintenance crews can be sure that service has been restored • Case for positive outage detection is less clear now, but will become more important with shift to renewables and electric vehicles. • One respondent noted that the provision of outage detection in the base smart meter will provide substantial benefits to consumers and DNOs at minimal marginal cost but that the case for providing positive outage detection (so called 'last gasp' capability) was less clear. <p>On the question of where the outage detection functionality should reside, a majority of those who responded indicated that the Communications Hub was the most appropriate place. Other respondents indicated that detection at substation level may be preferable. Respondents noted that in the instances when the Communications Hub is "stand alone" there may be a risk of false alarms if it loses supply but the electricity meter does not.</p> <p>Respondents also welcomed the clause that outage management is only required for DCC roll-out, but that consideration needs to be given to ensure this does not result in asset stranding from Foundation stage.</p>
Q32	<p>Do you agree that the DCC Communication Service Providers should specify the requirements for outage detection as part of their general role in</p>

	<p>specifying the WAN technology? Please explain your reasoning</p> <p>There was a broad split of opinion with no particular pattern across the different categories of respondents.</p> <p>The majority of those that replied who said "No" made the point that the requirements should be specified by the Industry (DNOs) and that the CSP should be involved in providing the solution.</p> <p>Of those who said 'Yes', a number (including some CSPs) argued that the CSP should be involved in specifying the requirements – chiefly because they have a better understanding of what CSPs can realistically provide.</p> <p>A number made the point that while they believe the CSP should have a hand in developing requirements, this should be based on some minimum functional requirements managed by the DCC.</p> <p>A number argued that the Government should not be acting in this area as it is beyond the scope of the Programme's business case.</p>
Q33	<p>Do you think that the Communications Hub should also have the functionality to send a communication to the DCC when power is restored? Please explain your reasoning.</p> <p>Broadly respondents agreed with the proposal - if 'last gasp' was adopted then 'first breath' should also be delivered but that there were a number of considerations that might influence how this should be delivered;</p> <ul style="list-style-type: none"> • Volume of data will swamp - identify key nodes to report back or ping • Needs to be low cost and can be used as extra confirmation that supply has been restored • business case to be clarified with distributors • configurable so can be switched off to prevent network swamping • DNOs will potentially need to be able to process very large numbers of messages • Should the electricity meter also store details of the outage? Would need battery • Additional costs on the hub will be significantly higher than those quoted and there will be additional costs for the DNOs in adapting systems and processes - needs further business case review. This comment came from Secure Meters arguing in answering Q31, 32, 33 & 35. • More work required on associated roles and responsibilities <p>Those respondents that argued that 'last gasp' was out of scope and should not be performed on the Communications Hub also continued to argue 'no' for 'first breath'.</p>
Q34	<p>Do you agree with the Government's proposal that fully integrated electricity meters and Communications Hubs will not comply with the SMETS? Please explain your reasoning.</p> <p>There was a large majority in agreement with the recommendation that fully</p>

	<p>integrated electricity meters and Communications Hubs will not comply with the SMETS. This was also the view a large majority of suppliers, meter manufacturers and communications technology providers. The principal reasons given included support for gas first installations, communication technology evolving rapidly and minimising stranding risk. Many also indicated that any fully integrated solution would not comply with the original Functional Requirements catalogue.</p> <p>One supplier indicated that this issue should be considered separately in the context of specifications for foundation and enduring meters. Another supplier indicated that there may already be fully integrated solutions deployed in the non domestic sector and that special consideration should be given to these installations. A Communications and technology provider pointed out that creating and supporting a business model around fully integrated electricity meters during the Foundation stage would add unnecessary complexity and risk when the solution is transferred to the DCC.</p> <p>The single respondent who opposed the recommendation indicated that if there was certainty in the life of the communications technology then an integrated approach would be the cheapest option.</p>
Q35	<p>Do you think the Smart Metering Implementation Programme objectives would be better met by:</p> <ul style="list-style-type: none"> a. Using the SMETS to mandate a separate Communications Hub with a fixed WAN Transceiver? Or b. Giving suppliers flexibility over options for configuration of the Communications Hub24? <p>Please explain your reasoning.</p> <p>A majority favoured giving suppliers flexibility over options for configuration of the Communications Hub. There was a degree of confusion around the term 'separate' which some interpreted as meaning 'stand alone' and other as being intimately attached to the electricity meter. This interpretation in some cases drove a preference for Option b.</p> <p>The other principal reasons for supporting option b included:</p> <ul style="list-style-type: none"> • Allows for flexibility in installation, thereby minimising time on site • Allows future flexibility - savings far outweigh the cost of any SMHAN components that might be lost during a communication hub replacement <p>A majority of suppliers, meter suppliers and communications and technology providers supported option b. Some added a caveat that option b should be restricted to a number of configuration options with standard physical and logical interfaces, although this was seen as a longer term goal due to the timescales associated with developing them.</p> <p>The principal reasons for supporting option a included:</p> <ul style="list-style-type: none"> • agreeing, developing and testing standard connectors and associated protocols for the WAN and HAN modules will take time and delay the Foundation stage ; • if the DCC is responsible for the specification of the Communications Hub

	<p>option B cannot work;</p> <ul style="list-style-type: none"> • adopting a standard Communications Hub specification will simplify all elements of installation. Other more flexible options could cause interoperability issues. Meter manufacturers may not have an incentive to standardise single solution; and • for ease of delivery and future interoperability. <p>A number of respondents also indicated that the Communications Hub (rather than just the WAN module) should be procured by the DCC. This would set clear delineations of responsibilities in the market, and create an environment that will allow for a lower-risk transition from the Foundation stage to the enduring phase. Having a proliferation of different solutions – integrated or standalone hub, modular or fixed WAN, etc. – will create a proliferation of business processes.</p>
Q36	<p>Do you agree there should be no restrictions on the HAN standards adopted by suppliers, provided they are available as a European (CEN, CENELEC or ETSI) or International (IEC or ISO) standard? Please provide evidence to support your position.</p> <p>A majority of respondents agreed that there should be restrictions, primarily to ensure that technical interoperability is achieved. Where respondents were in favour of no restrictions, the main reason was to allow innovation.</p> <p>There was broad agreement among suppliers that the HAN should be specified, subject to testing and trialling, and that it should be a standard (or recognised as a standard by 2014). One supplier disagreed saying that in there may not be standards available in the timescale that meet all the requirements. Another supplier indicated that the Foundation stage should be used as a trialling period to allow an enduring standard to be selected for the Enduring phase.</p> <p>Some meter manufacturers wanted to see a market lead approach where the energy suppliers select the standards whilst others agreed that either government or the energy suppliers should choose them.</p> <p>A majority of communications and technology providers agreed that there should be restrictions for technical interoperability reasons.</p> <p>Other reasons for not restricting standards included:</p> <ul style="list-style-type: none"> • Consumers – A HAN standard will simplify the process of adding smart appliances or Advanced IHDs to the household • IHD and meter manufacturers – A HAN standard will give manufacturers some certainty to invest in developing products for the Foundation stage without risking stranding • Suppliers – A HAN standard will reduce the likelihood of having to re-visit consumers to exchange the Communications Hub • Networks – A HAN standard will allow the development in plans for in home demand response to assist in balancing the network
Q37	<p>The IDTS has recommended that all standards should be recognised or be in the process of being recognised by 31 December 2014; do you agree with this</p>

	recommendation? Please explain your reasoning. A majority of respondents agreed that all HAN standards should be recognised or in the process of being recognised by 31 December 2014. The principal reason given was to provide confidence for investors and minimise stranding risk. Many respondents also pointed out that any standards are constantly evolving and should be monitored. The Programme should have a robust change control process to accommodate any changes. Opinion amongst suppliers was divided with concerns expressed that the 2014 timescale does not provide certainty for the Foundation stage and could give rise to stranding risk. Another supplier noted that multiple standards (whether recognised or not) could hamper technical interoperability and therefore a single standard would be preferable. A majority of meter suppliers agreed that standards should be recognised and that early recognition would be preferable to minimise stranding risks. One meter supplier noted that the European definition of "openness" should be considered during the Foundation stage. The principal reason for opposing recognition of standards was that it could preclude technical solutions and therefore restrict consumer choice.
Q38	Do you think that regulatory obligations are needed to underpin a systematic approach to testing of HAN standards during the Foundation phase? Please explain your reasoning. A majority of respondents agreed that regulatory obligations are needed to underpin a systematic approach to testing of HAN standards during the Foundation stage, although some with caveats such as the need for the Government to choose a HAN standard. The principal reason given was to provide continuity and consistency of testing to ensure there was no "loss of control" of the HAN environment. A regulatory environment for testing would also ensure that only those testing approaches which could be supported by solid evidence are used for the enduring arrangements. Principal reasons given for not having obligations were that commercial incentives are strong enough to ensure working solutions prevail and existing certification schemes would suffice. Opinion amongst suppliers was divided with some preference for Government coordination in areas such as trialling rather than using regulatory obligations. The main reason given for using regulatory obligations was to ensure some consistency and continuity in testing, gathering and analysis of results. Meter suppliers were divided on this issue with some favouring obligations, especially to take difficult properties into account, while others noted that industry would be likely to coordinate any testing and gathering of results. Communications and technology providers were broadly in agreement that an obligation would be required. One noted that the obligation should only be used if there has been no evidence of interoperability testing to date. Some responses indicated that industry would coordinate testing in any case.
Q39	Do you agree with industry's recommendation that DLMS should be adopted as the application layer for communications with the DCC? Do you believe

	<p>there are any consumer, economic or technical issues with this solution which could be circumvented by an alternative approach? Do you have any economic, technical or consumer evidence to assist Government in evaluating industry's proposal?</p> <p>Opinion was divided on whether DLMS should be adopted as the application layer for communications with the DCC, with approximately a third of respondents agreeing, a third disagreeing and a third providing a caveated response. Reasons for agreement included that DLMS is widely used and that a single application layer would result in a less complex Communications Hub if it was required to carry out translation. Reasons against adopting DLMS as the sole application layer were primarily centred around complexity in the Communications Hub actually increasing if translation at the hub was required. A number of respondents indicated that translation in 30 million Communications Hubs is far more complex than doing the translation in the Head End. In general, running native application layers end-to-end was the preferred alternative to only specifying a single standard.</p> <p>A majority of suppliers were against the adoption of a single standard for the reasons outlined above, and that a single standard only makes sense if it can be used in all end devices which is difficult for products on the market today.</p> <p>Opinion among meter suppliers was also split, again for the reasons outlined above concerning translation complexity. Others highlighted that use of a mandated standard could frustrate innovation and possibly lead to higher costs. A compromise suggestion was to mandate the capability but not to oblige suppliers to use the protocol.</p> <p>Communications and technology providers were also divided on this issue.</p>
Q40	<p>Do you agree with industry's recommendation that DLMS and Zigbee SEP 1.x should be adopted as the application layer for communications within the consumer premises, provided they install the necessary translation equipment? Do you believe there are any consumer, economic or technical issues with this solution which could be resolved by an alternative approach? Do you have any economic, technical or consumer evidence to assist Government in evaluating industry's proposal?</p> <p>A small majority agreed with the recommendation of using DLMS and SEP1.X. The main reasons given included the availability and maturity of these protocols for roll-out timescales. There was disagreement about the need to install translation equipment in the home with some respondents making the point that this would be better achieved in the DCC.</p> <p>The main issues identified by respondents were technical and economic. Technical issues were associated with Zigbee being tied into 2.4GHz with concerns raised about how well this frequency will propagate in GB properties. Solutions suggested included use of lower frequencies and undertaking trials to determine which frequencies would work. Economic issues that were raised related to the availability of alternative solutions within the roll-out timescales. There was concern that solutions not available today would take several years to develop and test.</p> <p>Opinion among suppliers was divided. One supplier made the point that SEP1.x was tied into the rest of the Zigbee protocol which is only currently available at 2.4GHz, which has not been tested at scale in GB, and that it is unclear whether</p>

	<p>equipment running 1.x could be upgraded to 2.0, which will offer more flexibility in terms of physical layers.</p> <p>Meter suppliers broadly supported the recommendation, primarily for the reasons of compatibility with roll-out timescales due to the availability of equipment running the protocols today. A minority commented that over specification could restrict innovation and that 868MHz may be a better physical layer to choose than 2.4GHz for reasons of propagation in GB properties.</p> <p>A majority of communications and technology providers supported the recommendation. Some responded with the caveat that SEP2.0 may be a better choice as it can run on more physical layers. There were mixed views on where translation should occur, with evidence against relating to increased Communications Hub complexity and cost.</p>
Q41	<p>Do you think the Smart Metering Implementation Programme objectives would be best met by the proposed approach above? Or should a single, network-layer technology standard such as IPv6 be mandated? Please explain your reasoning.</p> <p>A majority of respondents supported the Government position without caveats. Those opposing the position, generally cited the advantages of using proven, IP-based standards.</p>
Q42	<p>Is the provision of a single network-layer address for each Communications Hub a reasonable and sufficient functional requirement for the Smart Meter WAN? Will this requirement limit potential future capability or present challenges, for example, in multi-occupancy buildings?</p> <p>A substantial minority of respondents supported the Government position without caveats. Those in agreement largely considered wider provision of multiple network addresses per household an unnecessary additional overhead.</p> <p>Some respondents, including some meter manufacturers and energy suppliers, supported the position but with qualifications which highlighted potential issues in providing only a single network address for multi-occupancy households.</p> <p>Opponents of the Government's position included a number of consultancies and other industry bodies. Most cited the potential advantages of innovation, flexibility and future growth that might be enabled by allowing individual smart metering elements to have unique network-layer addresses.</p>
Q43	<p>Do you think that maximum and minimum demand functionality should be included in the SMETS? Please provide supporting evidence for your response.</p> <p>Respondents to this question were close to being evenly divided on whether this functionality should be included. Arguments in favour centred around support for smart grids, reduced communications costs (through lower volumes of data) and that the function was standard in some electronic Polyphase Meters available today. Those against highlighted unproven cost benefit analysis, availability of the data through access to half hourly readings and that existing supervisory control and data acquisition systems at low voltage substation level should be able to detect if the</p>

	<p>network is under stress.</p> <p>A majority of suppliers and meter manufacturers were against inclusion of network registers for the reasons outlined above. Many emphasised the need for a robust CBA. A few respondents indicated that the requirement could be included in later version of the SMETS once a robust CBA has been established.</p> <p>A majority of DNOs were in favour of including this requirement. The principal reasons were for network planning and smart grid purposes.</p>
Q44	<p>Do you think that network registers should be included in the SMETS? Please provide supporting evidence for your response (including the cost implications for Smart Metering Equipment, and any alternative approaches that would provide this functionality).</p> <p>A majority disagreed with the position that network registers should be included. The main reasons against included unproven cost benefit, availability of the required data in another format and potential confusion with existing settlement systems.</p> <p>A majority of suppliers and meter manufacturers were against inclusion of network registers for reasons outlined above. Meter manufacturers emphasised the considerable amount of development work associated with implementing a completely independent tariff structure and that no metering product in the UK currently works in this way. The introduction of independent tariff structures and registers could also have an impact on access rights to the meter. Suppliers also indicated that the DNOs should pay for this requirement.</p> <p>There were mixed views among Network Operators with a small majority in favour of the recommendation on the basis of reduced communications costs, although a robust estimate of increased meters cost was not factored in. In addition some respondents in this category also noted that the data is available through existing smart metering functionality and the main issue is clarifying how it is accessed.</p>
Q45	<p>Do you think that the prepayment meter contactor switch should be utilised to protect consumer premises from 'Floating Neutral' network faults? Please provide evidence on the costs and benefits to support your reasoning.</p> <p>The majority of respondents argued that the contactor switch should not be used. The main reasons given were: the contactor should not be used as a safety switch as it has not been tested for safety purposes; it would shift liability for provision of the device to the meter operator; it would lead to an expectation that the damage to consumers' equipment would have occurred before the switch was tripped and ; it would add significant cost and could delay development of meters. An alternative was suggested of just using voltage detection to send an alert to the DCC for DNO notification. Another respondent suggested that high voltage could be identified though a single detector at each substation or transformer.</p> <p>No suppliers supported the proposal. The majority opposed it, with some saying that it should only be included if a robust business case is presented and that it should not be allowed to delay the publication of the minimum specification.</p> <p>One manufacturer agreed with the proposal, saying that in a correctly designed meter the costs should be minimal. Most network companies supported the proposals, providing cost information for claims and/or financing rectification work</p>

	<p>on consumers' premises.</p> <p>Mandatory provision of the capability to switch off on detecting a Floating Neutral fault should only be pursued if it can be demonstrated that it is cost effective and sufficiently reliable.</p> <p>One supplier noted that early drafts a new standard IEC 62052-31 (Electricity metering equipment (AC) - General requirements, tests and test conditions - Part 31: Safety requirements). This preliminary standard seeks to establish a product safety for some aspects of electricity metering equipment and would require meters compliant with this standard to withstand over-voltage of up to two and a half times the current nominal voltage.</p> <p>The Programme should also give further consideration (in conjunction with appropriate advice from meter manufacturers) to the incorporation of thermal protection for the electronic components within the smart metering system and Communications Hub. This may mitigate potential asset damage and may lessen the prospect of a fire hazard at the meter point.</p>
Q46	<p>Do you agree with the proposed approach for consumers to access data and transfer it from the HAN via a separate “bridging” device? Please explain your reasoning.</p> <p>A large majority favoured using a separate bridging device as the means of data access. The main reasons given included flexibility, cost and consumer choice. Those respondents against the approach cited risk of lack of consumer engagement if easy access to data was not available on day one as well as the possibility of delaying the take up of smart appliances.</p> <p>Many respondents, particularly meter manufacturers, also indicated that an “Enhanced IHD” could be the bridge and that this could be the vehicle that would encourage consumer take up from day one.</p> <p>Meter suppliers broadly supported the recommendation primarily for the reason of compatibility with roll-out timescales due to the availability of equipment running the protocols today. A minority commented that over specification could restrict innovation and that 868MHz may be a better physical layer to choose than 2.4GHz as it will propagate further in GB properties, resulting in greater coverage.</p> <p>A majority of communications and technology providers supported the recommendation. One pointed out that 100,000's of IHDs had been deployed in GB that use SEP at 2.4GHz. Others answered with the caveat that SEP2.0 may be a better choice as it can run on more physical layers. There were also mixed views on where translation should occur, with evidence against relating to increased Communications Hub complexity and cost.</p> <p>Some respondents indicated that although the Government should not specify the bridging device, further clarity will be required in terms of the data that will be made available over the bridge and whether it would support two way communications.</p>
Q47	<p>Do you have any views on the options presented to ensure that electrical contractors can work safely and efficiently between the electricity meter and the consumer unit/fuse box? Please provide evidence to support your reasoning.</p>

	<p>1. modify the design of the currently-specified single-pole ‘load switch’³⁰ in the smart meter to permit manual isolation by an electrician;</p> <p>2. incorporate an additional manually-operated single-pole or double-pole switch in the smart meter to provide for isolation;</p> <p>3. install a separate double-pole isolating switch at the same time as the smart meter; and</p> <p>4. introduce a system for the authorisation of competent non-supply industry personnel to withdraw cut-out fuses.</p> <p>Some suppliers, the ERA, the ENA and one DNO said that prior to a decision the Programme should carry out a full financial and technical exploration of the options available.</p> <p>No one supported option 1 which was considered unsafe. A majority opposed option 2 on the grounds of cost, possible delay to Programme and the view that the smart meter should not be used as a safety device</p> <p>Very few respondents supported Option 3, mainly on the grounds of cost.</p> <p>Most suppliers were against option 4 pointing out that this is not a smart metering issue. Network companies were opposed to this option as any regime under option 4 would be costly, difficult to implement and could be heavily bureaucratic. It could effectively simply legitimize all electrical contractors in continuing with the unsafe practices and a more practicable and a safer option would be the use of an isolator in the meter.</p>
Q48	<p>Do you agree with industry’s proposals for an overall architecture of an application layer standard with translation through a Communications Hub to a HAN? Do you believe there are any consumer, economic or technical issues?</p> <p>Overall there was no clear agreement with counter arguments for; the incorporation of translation at the Communications Hub, translation at the DCC, and the avoidance of translation altogether – either through multi-protocol support or via a single end-to-end protocol (including the incorporation of a dual protocol approach to allow the tunnelling of the native device/HAN protocol over a single WAN protocol).</p> <p>A small majority disagreed with the proposal, for reasons generally concerning potential weakness in the architecture, both from a security perspective and from an ongoing maintenance perspective, due to the need to decrypt/re-encrypt and translate in over 20 million locally installed devices. In addition, it was highlighted that the incorporation of a non end-to-end protocol introduces a ‘standards/protocol’ management overhead, i.e. the WAN would need to include all of the same capabilities as available in the HAN and ensure that any future extensions to the HAN were also included in the WAN to maintain compatibility. Whilst many of the responses discussed avoiding translation all together there were also those who felt that translation should be carried out at the DCC Head End due to both the availability of processing power and the ease with which the physical implementation of evolving standards could be maintained.</p> <p>For those respondents that agreed, issues relating to potential hardware conflicts and the added complexity introduced to Communications Hub to enable support for</p>

	<p>multiple translations were cited. In addition some of the respondents highlighted the need for translation to exist in the Communications Hub due to the differing end devices with which the DCC will communicate and those devices that sit completely within the HAN environment; for example, the IHD.</p>
Q49	<p>Where do you believe that translation is best managed:</p> <p>a) At the Communications Hub; Or</p> <p>b) At the DCC?</p> <p>Do you have any economic, technical or consumer evidence to assist Government in evaluating the options?</p> <p>Approximately a quarter of respondents to this question believed that translation is best managed at the Communications Hub, with some highlighting the advantages of it allowing greater flexibility and control in relation to the end devices that are being communicated with. In addition, although security weaknesses have been highlighted in responses to question 48, the provision of functionality at Communications Hub could allow for greater control over data privacy by allowing data to be aggregated locally. Additional supporting arguments included the ability to optimize traffic back out to the WAN via the Communications Hub, thus necessitating translation, and underlying differences in WAN and HAN communication technologies meaning that a certain degree of translation always being required.</p> <p>About another quarter of respondents had a preference for translation at the DCC as it would ensure that interoperability can be centrally managed, thus simplifying change management. Many said that the cost of translation will be lower when performed at the DCC. Concerns relating to the processing power and memory required by the Communications Hub are also given as potential reasons to perform any required translation at the DCC.</p> <p>A smaller proportion argued that translation should be carried out at both the Communications Hub and the DCC due to the need to manage differences between data objects relevant to individual devices, the gas meter, the electricity meter and the IHD.</p> <p>Another small proportion believed that translation should not be carried out at neither the Communications Hub nor the DCC as running dual protocols would obviate the need for translation and have minimal impact on the WAN overheads.</p>
Q50	<p>Do you agree that the IHD should only be required to display ambient feedback based on energy usage? Please explain your answer.</p> <p>Nearly half of those who responded agreed with the proposal, for reasons including:</p> <ul style="list-style-type: none"> • mandating the display of two types of information could create confusion; • In the early years of smart metering customers are unlikely to go straight to complex Time of Use tariffs and so there will be a high degree of correlation between kWh and £/p; and • Display of energy (i.e. consumption) is the key deliverable of this programme and therefore a better candidate for a mandated item. <p>A number agreed with the proposal, but with caveats. For example, an IHD</p>

	<p>manufacturer agreed but provided evidence that some customers find ambient light distracting and choose to turn off the ambient light feature of their hub.</p> <p>For the relatively small number who disagreed with the proposal, reasons that were given included:</p> <ul style="list-style-type: none"> • when time of use tariffs are in place, cost will be a more relevant factor – ambient feedback based on cost could encourage end-users to make use of different tariff structures and time-of-use concepts; and • consumers should have some input in defining the reference point for their ambient feedback.
Q51 & 52	<p>51. Do you agree that Smart Metering Equipment should be designed to support the calculation and/or display of account balances as described above, even though suppliers may not initially be mandated to invoke such functionality for credit customers?</p> <p>52. What do you think the costs and benefits are of mandating suppliers to display an account balance (over-and-above those arising from display of information on cumulative cost of consumption) for credit customers on their IHD?</p> <p>The majority of respondents agreed that the functionality should be included in the SMETS to give suppliers the option of providing account balance to credit consumers.</p> <p>No respondents provided any hard evidence on the benefits of providing an account balance, but two argued that this provision could in theory help consumers to determine how well their payments match their energy consumption. Meter manufacturers in general stated that the cost of local calculation is relatively low. It was suggested that there could be extra testing costs for the meter/gas mirror and that the cost of messaging an account balance to the In-home Display should be low.</p> <p>Suppliers provided evidence that provision of account balance information would increase back-office costs. The main costs would be those arising from increasing the frequency with which suppliers must process and reconcile payments with consumption information in their billing systems. These costs were estimated to be several million pounds per supplier. Presently this only needs to be done periodically in line with either a monthly or more likely, quarterly billing cycle.</p>
Q53	<p>Do you agree with or have any comments on the Government's proposals for the outstanding issues from the Response? Please explain your reasoning.</p> <p>The majority of responses to this question focussed on security matters which are reflected in the summaries to the relevant consultation questions. A frequently raised issue which was not covered in answers to other questions was the need for a data model. At least one respondent from each key industry sector raised the need for further work to define a data catalogue to help with assessment and mapping of application protocols for both the HAN and WAN standards.</p> <p>Comments by individual respondents included:</p> <ul style="list-style-type: none"> • the need for further engagement with respect to health issues surrounding

	<p>Extremely Low Frequency and Electro Magnetic Field radiation;</p> <ul style="list-style-type: none"> • the need to develop a consistent description and application with respect to tariffs; • a request to allow for greater resolution of data – five second or one second granularity; and • a significant level of concern raised by one Industry body with regards to the adequacy of the security requirements.
Q54	<p>Do you think that an assurance framework, underpinned by regulatory obligations, is needed to support the delivery of the required functionality, interconnectivity, interoperability, and security of Smart Metering Equipment? Please explain your reasoning.</p> <p>The vast majority of respondents were in favour of an assurance framework. Some respondents were specifically in favour of a regulatory backed approach with a number expressing a strong preference for the introduction of an independent central body to provide functional and interoperability assurance. Others, including a number of larger suppliers, favoured a non-regulatory assurance framework, and number of other respondents commented that assurance needed to be proportionate to the risks. Of the small number of respondents who disagreed with the need for an assurance framework, the majority indicated that they believed that choosing appropriate standards would remove the need for specific or separate standards. A number of respondents favoured an assurance framework for the enduring arrangements, but believed a different approach was required for Foundation stage in order to avoid slowing development and creating a risk for suppliers.</p>
Q55	<p>Do you agree that as part of any assurance framework adopted, there should be a testing regime in place to support the delivery of the required functionality, interoperability and security? Please explain your reasoning</p> <p>Almost all respondents to this question favoured a testing regime of some description, although there were a wide variety of opinions on how this may work in practice (see Q56). A number of respondents suggested that any arrangements would need to vary for the Foundation stage and enduring phase. (see Q57)</p>
Q56	<p>What are your views on the options outlined for a testing regime? Are there other options that should be considered?</p> <p>There was no clear preference for any of the individual suggested options. The majority either suggesting a combination of the options presented or alternatively proposed other options.</p> <p>Of the options proposed, relatively few respondents favoured a market-led approach in isolation, although a number did suggest it would naturally occur or could be used in isolation during the Foundation stage prior to one of the other options coming into force for the enduring period. Alternatively, a testing regime could be combined with the certification scheme. A roughly equal number of respondents were in favour of a mandatory industry code and body (to deliver and govern a testing regime) as were</p>

	<p>in favour of a certification or accreditation scheme. However an equal number again suggested a mixture of these two options.</p> <p>Some respondents suggested using a mixture of all 3 options, and even when respondents expressed a particular preference, in most cases they saw arguments in favour of certain aspects of the other options.</p>
Q57	<p>Do you think that a different approach to assurance is necessary for the Foundation and enduring phases? Please explain your answer.</p> <p>There was no consensus as to whether the approach to assurance in the Foundation stage and enduring phase should differ. There were some respondents who indicated that the approach should remain the same but the scope or governance arrangements should differ.</p> <p>Of the respondents who believed that a different approach was necessary, there was a split between those who believed that the approach needed to be more rigorous during the Foundation stage and those who believed that the approach would need strengthening as roll-out became mandatory. Generally, respondents indicated that the Foundation stage would allow the assurance framework to evolve. A number pointed to the cost differences in assurance.</p>
Q58	<p>Do you think that the activities outlined above are a suitable way for achieving interoperability across Smart Metering Equipment cryptographic functionality? How else could this be achieved?</p> <p>Respondents generally agreed that the activities outlined within the Consultation are a suitable way of achieving interoperability across smart metering equipment cryptographic functionality.</p> <p>Energy suppliers, in particular, were supported the activities presented. One respondent stated that without the adoption of these activities, the solution would be more complex, expensive and risky.</p> <p>Other respondents across the industry qualified their agreement, suggesting other activities or outputs that would be required for interoperability. For example:</p> <ul style="list-style-type: none"> • a trust hierarchy and a cryptographic key management should be mandatory actions for achieving interoperability; • common certificate policies and PKI standards should be agreed and adhered to; and • cryptographic controls, such as those to ensure and verify integrity, are consistent across organisations involved in the End-To-End Smart Metering System. <p>A common point of concern that was expressed across a number of respondents was that STEG needed to draw upon expertise from a wider variety of industry and government to assess possible options and solutions. Others were more specific in stating that the DCC procurement restrictions had made it difficult for certain industry members to be involved in STEG.</p>
Q59	<p>Do you agree that cryptographic/ key management is necessary to secure the End-to-end Smart Metering System? Please explain your reasoning.</p> <p>Most respondents across industries were in agreement that cryptographic and/or</p>

	<p>key management is necessary to ensure the security of the End-To-End Smart Metering System.</p> <p>All Energy Suppliers were in agreement that cryptographic and key management is necessary. A number of meter suppliers also agreed that key management is required (especially for secure Firmware upgrades) but stipulated that the details should not be prescribed by Government.</p> <p>Some respondents also gave specific details that the key management platform would have to accommodate such as key lifecycle. This includes but is not limited to key storage, distribution, change and destruction.</p>
Q60	<p>Do you agree with the Government's assessment of the advantages and disadvantages of the cryptographic solutions identified above? What other options should the Government consider? Please explain your reasoning.</p> <p>There was a general agreement with the Government's assessment of the advantages and disadvantages of the cryptographic solutions identified. A number of respondents stated that their preferred cryptographic solution for the End-To-End Smart Metering System is the Hybrid solution.</p> <p>Energy suppliers, DNOs and meter suppliers were in broad agreement with the advantages and disadvantages presented. For those respondents that gave an opinion on which cryptographic solution should be taken forward by the Programme, the 'Hybrid' option, incorporating both asymmetric and symmetric encryption, was unanimously favoured. Evidence was given by some meter suppliers that mains powered devices, current 'smart' meters and Communications Hubs can support the Hybrid solution. Gas Smart Meters (battery powered) can also support the Hybrid option with the appropriate use of symmetric and asymmetric algorithms.</p> <p>Other respondents identified advantages and disadvantages in the cryptographic options in addition to those that had not been identified. In particular, with the Asymmetric and Hybrid solutions, some respondents suggested that another disadvantage could be patent issues of some cryptographic systems such as Elliptic Curve Cryptography (ECC). However, the Hybrid solution was still preferred by these respondents.</p>
Q61	<p>Do you think that it would be appropriate for the DCC to be responsible for cryptographic key management for the End-to-end Smart Metering System? What other options should the Government consider? Please explain your reasoning.</p> <p>There was broad agreement that the DCC should be responsible for cryptographic key management for the End-to-end Smart Metering System. However, for those respondents that did not agree there was no common theme to the other options the Government should consider.</p> <p>There was an expectation by some respondents that if the DCC was responsible for cryptographic key management that it would procure these services from the market place. It was noted that when appointing the appropriate service provider in the area for the DCC, the Programme should clearly outline the requirements for cryptographic key management and choose an experienced operator with a proven track record. Some respondents added that commercial arrangements need to be in place so that the DCC delivers this service to the industry participants.</p>

	<p>Whilst a number of respondents agreed that the DCC seems the most logical place to manage the cryptographic keys, a few suggested that it is security best practice that the responsibility for security lies with those that stand to suffer if there is a security incident - in this case the energy suppliers. Another option stated was to totally outsource the cryptographic key management or public key infrastructure to a third party. In both of these cases the Energy Supplier or third parties would have to build or run their own public key infrastructure and create interoperability processes (as is being done for the Foundation stage).</p> <p>Another option suggested by a small number of respondents was that an independent body should be responsible for the cryptographic key management and that this body should be a Government department or at least overseen by CESG.</p>
Q62	<p>How do you believe the security approach should be applied to opted-out non-domestic consumers? Do you see any issues with the approach? Please explain your reasoning.</p> <p>There was a mix of opinions, across the respondents, as to whether the security approach should also be applied to opted-out non-domestic consumers.</p> <p>Energy Suppliers were split on how they felt the security approach should be applied to this category of consumers. One energy supplier stated that the ability of non-domestic suppliers to “opt out” of DCC usage has seriously complicated all aspects of the Programme. There are different risks associated with the different types of opted-out non-domestic consumer and these risks should be mitigated against in the development of the security requirements. Another energy supplier stated that security for opted-out non-domestic meters should be to the same standard and accreditation criteria as opted in sites. In addition, standards based approaches must be applied consistently across all types of sites.</p> <p>Some respondents did not believe that there should be any requirement to apply this security approach to opted out non-domestic consumers.</p> <p>Respondents outside the energy industry were also mixed in their responses. While some only went as far as saying that it would be beneficial for opted-out non-domestic sites to adhere to security best practice and industry standards, such as ISO27001, others felt that to ensure consistency and integrity the same process should be applied to opted-out non-domestic sites.</p>

Annex 5: Summary of responses to open letters on exemptions

Further to the smart metering roll-out obligations Consultation, the government issued an open letter on 22 December 2011 asking for views on a possible exemption to the roll-out obligation for small suppliers. This was followed by a further open letter on 19 January 2012, asking for views on a possible exemption for all suppliers.

The letter on 22 December 2011²⁵ set out the reasons for considering an exemption from the roll-out obligation for small suppliers:

- Some small suppliers are already installing meters with smart functionality and have argued for an exemption from the replacement obligation for such meters, ahead of the confirmation of technical specifications for compliant meters.
- The Government has pledged to consider how it can reduce barriers to market entry and growth, and DECC has made provisions to ensure that barriers have been addressed in other policy areas, for example, the CERT and CESP programmes.
- It is vital that the energy supply market operates on a fair and effective basis and that the Government avoids creating barriers to entry and growth through its approach to smart metering.
- It is also important that suppliers are able to continue to install meters with smart functionality during the Foundation stage.
- However, in considering an exemption approach, the government must also ensure that consumers are protected and that the overall business case costs of the Programme do not significantly increase.

The open letter asked for additional evidence in relation to the impact of an exemption by 13 January 2012, listing a series of specific questions. It also requested views on the policy proposal, including variations on how the exemption might be scoped, by 27 January 2012. Responses were sent to the Programme via a named contact and email address.

The open letter on an exemption for all suppliers was issued on 19 January 2012²⁶. This set out the reasons why this was being considered:

- In the response to the roll-out obligation Consultation, a number of stakeholders raised the potential challenges of meeting the 2019 completion

²⁵ <http://www.decc.gov.uk/assets/decc/11/tackling-climate-change/smart-meters/3971-open-letter-possible-exemption-for-small-supplier.pdf>

²⁶ <http://www.decc.gov.uk/assets/decc/11/tackling-climate-change/smart-meters/4163-open-letter-from-charles-hendry-possible-exemptio.pdf>

date if the timetable for finalising the technical specification for compliant smart meters were to be delayed.

- Given these consultation responses and the revised timetable, the government wanted to understand stakeholder views on whether additional action is needed to support practical programmes of preparation for the mass roll-out to continue, enabling a range of stakeholders to test their approaches ahead of mass roll-out, whilst minimising the risks of additional costs to the Programme, of interfering with the fair and effective operation of the energy market, or of compromising consumer benefits.
- As with the small supplier exemption, the government recognised that there will be a period before compliant meters are available in volume on the market, and that ahead of this suppliers who wish to install smart meters are doing so at their own risk.
- The open letter was issued to explore further the particular issues that suppliers may face in rolling out smart meters in this interim period.

The open letter asked for any additional evidence in relation to the impact of an exemption by 30 January 2012, over and above that sent in response to the open letter of 22 December, including whether and how roll-out numbers would differ if there was an exemption in place. The letter also requested views on the policy proposal, including variations on how the exemption might be scoped, by 13 February 2012. Responses were sent to the Programme via a named contact and email address.

Both open letters were posted on the DECC website and were emailed to a range of interested parties. DECC also held a stakeholder event on 20 January 2012 where exemptions for small and all suppliers were discussed.

Consultation responses

Twenty responses were received to the open letter about the possible exemption for small suppliers from the roll-out obligation, and 19 responses to the open letter about the possible exemption for all suppliers. Responses were from a range of interested parties, including: large and small energy suppliers; meter manufacturers; meter asset providers, communications providers; and consumer groups.

The following table shows the breakdown of respondents for those that did not mark their responses as confidential.

Sector	Number of responses: small supplier open letter	Number of responses: all suppliers open letter
Energy Suppliers	6	7
Energy Network	0	1
Industry	2	1
Meter Suppliers	1	0
Comms & Technology	2	2
Consumer Group	3	2
Other	0	0

This Annex provides an overview of the responses. The collation and summary of responses has been prepared by DECC.

The responses received to the Consultation, with the exception of those where respondents have requested their response to be treated in confidence, will be available online at www.decc.gov.uk. A list of respondents is provided below.

Open Letter – 19 January 2012: Possible exemption for all suppliers from the smart meters roll-out obligation

	<p>Summary of views on the policy proposal</p> <p>The large majority of respondents, including most suppliers and consumer groups, did not support an exemption for smart-type meters from the roll-out obligation. There were wide-ranging concerns about the possibility of the wider exemption going ahead. These broadly fitted into concerns about potential:</p> <ul style="list-style-type: none"> • detrimental effects on the reputation of the Programme and the consequent impact this might have on mass roll-out; • increased complexity of operating additional metering systems, which could lead to increased costs for suppliers and consumers; • lack of full functionality and therefore potential disbenefits for consumers; • difficulties for consumers wishing to switch suppliers, particularly those with pre-payment meters. <p>A minority of respondents thought a wider exemption would be a positive step for the Programme. They raised the following broad points:</p>
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- consumers getting smart metering benefits as soon as possible
- increased learning through the Foundation stage
- potentially reduced stranding costs.

Detailed summary

Programme impacts

There was a broad level of concern that a wider exemption for all energy suppliers would disrupt the broader operation of the Programme and distract from the focus on installing compliant smart meters. Many respondents suggested it could make the roll-out of smart meters more expensive and it could increase the complexity of the Programme. In addition, a couple of respondents suggested that the exemption could make the development of smart grids more difficult as there could be a high volume of Advanced Domestic Meters which may not have the same functionality as SMETS-compliant meters.

There were mixed views on the benefit of an exemption from the roll-out obligation in relation to testing and trialling. Of those who supported the wider exemption, some thought it would accelerate the Programme's ability to gain early learning from being able to install ADMs in a range of consumers' homes and give some financial protection for testing to take place. However, those who did not agree with the wider exemption suggested it would damage the programme of trialling and testing as they thought energy suppliers would be more interested in installing ADMs than testing new technology which was more likely to be compliant with the SMETS.

There were a number of strong reactions from stakeholders who did not agree with a wider exemption from the roll-out obligation due to its potential effect on the energy market. They considered that it could distort the energy market, disrupt competition, create perverse incentives to roll-out non compliant smart meters, and there would be a high risk of the meters not being interoperable. In particular, many respondents highlighted that those who rolled out meters in advance of the technical specification being agreed had done so at their own commercial risk.

Another area of contention surrounding a possible wider exemption was whether it should be applied retrospectively to ADMs already installed. The stakeholders who were against the exemption were very strongly against a retrospective exemption as this would vastly increase the number of exempted meters, and therefore the potential costs and complexity. Even between the respondents who did agree with the exemption going ahead for all suppliers, there were some that disagreed with a retrospective exemption as they thought this could increase complexity for energy suppliers. However, others who agreed with the exemption wanted it to be applied retrospectively.

Costs and complexity

There were mixed views on whether an exemption would reduce or increase costs.

Those who agreed with the exemption going ahead thought it would lower the risk of stranded assets, as exempt meters could remain in place beyond the roll-out completion date. However, those who disagreed with the exemption for all energy suppliers thought that the exemption could increase costs for suppliers, as the exemption would introduce additional complexity in terms of types of meters and ranges of communication systems that would need to be accommodated. These respondents suggested that it would be likely that exempt meters would be replaced with a compliant smart-meter if a customer switched supplier. There might also be the need for additional IHDs having to be supplied if the customer had different electricity and gas suppliers.

Consumers

Stakeholders who disagreed with the possible exemption for all energy suppliers from the smart meters roll-out obligation going ahead were particularly concerned about the effect the exemption could have on consumers. Comments were received highlighting the risk of confusion amongst consumers about whether they had a smart meter or not, which could make large-scale communications about the benefits of smart metering less effective, or more difficult to administer. There was consensus amongst these respondents that it could adversely affect consumer privacy; disincentivise switching or lead to consumers losing the benefits of switching; and it could mean that consumers would not benefit from the full functionality of a compliant smart meter. There was also a specific concern that consumers with an exempted meter would find it difficult to switch supplier close to the 2019 roll-out deadline.

In contrast, those who agreed with the exemption going ahead suggested having an ADM installed rather than a dumb meter would benefit consumers as they would be able to enjoy the functionality of their meter without requiring it to be replaced prematurely.

Open Letter – 22 December 2011: Possible exemption for small suppliers from the smart meters roll-out obligation

Summary of views on the policy proposals

The views from respondents were divided on whether an exemption from the smart meters roll-out obligation for small suppliers should be pursued, including among small supplier themselves. A number of stakeholders thought that it was right that the Government should support small energy suppliers, noting the specific difficulties that smaller suppliers face in raising finance to invest in smart-type meters. Those in favour of the exemption also pointed to the early benefits that

some consumers could realise from a smart-type meter.

However, there were also strong responses arguing against an exemption for small suppliers. There were concerns that an exemption could cause complexity and distortions within the energy market if the exemption was to apply to just one set of energy suppliers and there could be a potential negative impact on consumers if the exemption was to go ahead. Some also questioned whether the exemption would address the underlying challenges faced by smaller suppliers in securing investment, and indicated that alternatives might be more effective.

Detailed summary

Programme impacts

A mixture of views were received on the potential impact on the costs and benefits of the exemption on the Programme. There were respondents who thought an exemption would protect suppliers from the additional costs of replacing a smart-type meter earlier than necessary, and that small suppliers were not as able to absorb costs these costs as the large suppliers.

There were a number of arguments both for and against the exemption going ahead for small suppliers. It was agreed that small suppliers should not be unduly disadvantaged by Government policies and that uncertainty may prevent small suppliers from raising finance to invest in smart-type meters ahead of the first version of SMETS being confirmed and compliant smart meters being available on the market. Respondents suggested an exemption could reduce the regulatory burden on small suppliers and encourage new entrants, competition and the roll-out of meters with smart functionality in the Foundation stage.

Some serious concerns were voiced by stakeholders who suggested it would be discriminatory if the exemption was to apply to just small suppliers. Others also thought it risked distorting the market and could damage competition.

Costs and complexity

There were respondents who suggested an exemption would have a negative impact on the costs of the Programme. Some thought that an exemption would require energy suppliers to track exempted assets, which would be a cost transferred onto customers. The gaining supplier would need to operate a large variety of meters with smart functionality at low volume which could be very expensive. Respondents also suggested the if a customer switched supplier, an exemption would not necessarily protect that meter from being replaced, and so the stranding of assets could not always be avoided. They suggested that this might be an issue for small suppliers wishing to raise finance for exempt meters.

A number of stakeholders suggested there should be some parameters set if the exemption did go ahead. It was suggested that there could be an extension for the exempted meters of up to 5 years (2024) for meters installed before 1st April 2014. There was another suggestion that practicalities of delivering the exemption could

	<p>be overcome by exempting the meter or model type rather than specific suppliers. It was also thought that only an exemption for the life time of the meter would remove the risk for small suppliers, but others recognised that this could create a burden for gaining suppliers.</p> <p>Consumers</p> <p>There were a number of mixed views on the impact of the exemption for small suppliers from the smart meters roll-out obligation. There were some respondents who suggested it would result in consumers receiving the benefits of meters with smart functionality sooner than they might otherwise. However, there were other respondents who thought that the exemption would be detrimental to consumers' interests and could damage the reputation of the Programme. In particular, respondents noted the potential difficulties for consumers in switching supplier if they had an exempt meter. Some others noted the potential impact that early poor customer experiences could have on the later roll-out of the Programme.</p>
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List of written responses received to the open letters

Written responses received to 22 December 2011 letter for small supplier exemption		
Consumer Focus	IBM	Spark Energy
EDF Energy	Landis + Gyr	Utilita
Energy Services and Technology Association	Logica	Utility Funding Limited
Fuel Poverty Action Group	NPower	Which?
Haven Power Ltd	Scottish and Southern	

Written responses received to 19 January 2012 letter for all supplier exemption		
British Gas	IBM	UK Power Networks
Consumer Focus	Logica	Utilita
EDF Energy	NPower	Which?
Energy Services and Technology Association	OVO Energy	
Haven Power Ltd	Scottish and Southern	

Annex 6: Summary of Functional Catalogue Requirements not included in the SMETS

Functional Catalogue Requirement	Rationale for exclusion from the SMETS
IM 9 The smart metering system shall allow in situ maintenance for non safety critical maintenance	<p>Not included in the SMETS. The roll-out licence condition requires that the smart metering systems that are installed by suppliers must be compliant with the SMETS on an enduring basis. Therefore, there are clear regulatory requirements that the smart metering equipment would be maintained. This in turn creates commercial incentives for suppliers to procure systems that match the most cost effective maintenance strategy. Suppliers have indicated that in most instances where any significant repair is needed it is likely that they will remove the device for offsite repairs and fit a replacement component in the consumer premises. The Programme defines that the WAN must be interchangeable without the replacement of the metering device, however, it no longer considers that further prescription on the modularity of the equipment will necessarily deliver consumer benefits. For example, the time suppliers spend in consumer premises may be reduced by suppliers conducting maintenance or repair activity on devices offsite.</p>
IM 11 The smart metering system shall support a simple installation without the need for manual data entry to the system components	<p>Not included in the SMETS. The objective behind the requirement was to minimise the length of the installation visit at the consumer premises. However, there are already strong commercial incentives on suppliers to achieve this outcome and furthermore the Installation Code of Practice includes a requirement on suppliers to take all reasonable steps to ensure that no undue inconvenience is caused to domestic customers as a result of an installation visit. The Government considers that this includes unnecessarily long installation visits. In addition, a number of suppliers argued manual entry is legitimate mechanism for inputting some information, which would not necessarily increase the length of the installation visit.</p>
IM 12 The smart metering system shall be installed and maintained in a manner that protects public safety	<p>Not included in the SMETS. There are several pieces of existing legislation that contribute to the delivery of this objective. For example, Electricity Safety, Quality and Continuity Regulations 2002 Regulation 3 provides that meter operators shall ensure that their equipment is—</p> <ul style="list-style-type: none"> • sufficient for the purposes for and the circumstances in which it is used; and • so constructed, installed, protected (both electrically and mechanically), used and maintained as to prevent danger, interference with or interruption of supply, so far as is reasonably practicable.

Functional Catalogue Requirement	Rationale for exclusion from the SMETS
	Similar requirements exist for gas and wider provisions exist in Health and Safety legislation.
OP1 The Smart Metering Equipment components shall not rely on systems or services that are owned or operated by third parties, including consumers, where there is no specific provision to ensure the availability of such systems or services	Not included in the SMETS. The roll-out licence conditions requires that a supplier must take all reasonable steps to continue to comply with the requirements defined in the SMETS. The Government believes that this will provide sufficient direction to suppliers in terms of the objective to maintain the availability of systems and services.
OP3 The smart metering system shall support “last gasp” communications to notify loss of energy supply	Not included in the SMETS. The technical solution to best enable outage management (or “last gasp” communications) has not yet emerged. See section 4.
OP6 The smart metering system shall support a default mode of operation which is the minimum functionality	Not included in the SMETS. The roll-out licence conditions and SMETS describe that all smart metering systems should support a minimum functionality, which achieve the intended objective of this requirement.
OP7 The smart metering system shall support Firmware upgrades while maintaining normal metrology functionality	Not included in the SMETS. The Measuring Instruments Regulations (2006) require that metrology should not be affected by any devices connected to the meter. The MID requirements will not be superseded by the SMETS and therefore suppliers will have to comply with MID on an enduring basis.
IN 1 The smart metering system shall be capable of supporting at least two suppliers (i.e. for gas and electricity) in the same premises as well as switching between any licensed suppliers	Not included in the SMETS. The goal of the first iteration of the SMETS is functional interoperability and so suppliers may have to adopt certain technical and commercial approaches beyond those described in the SMETS to achieve this outcome. This requirement will be reconsidered as decisions are taken on HAN and WAN standards.
GS8 The smart metering system shall support 15 year battery life under normal operating conditions including prepayment operation.	Not included in the SMETS. Suppliers are required to provide metrology functionality and smart capability on an enduring basis under MID and the Roll-out licence condition respectively. The Government considers that it is appropriate to rely on commercial incentives to determine the life of the battery, which is in any case dependent on how it is used and importantly the configuration of the smart metering system. As one of the major benefits of smart metering is the avoidance of site visits, the Government would expect suppliers to specify equipment with a reasonable battery life. The IA assumes that a 15 year battery life will be the norm.
HA5 The HAN interface shall be certified and tested for interoperability.	Not included in the SMETS. See section 4. The Government will not, at least initially, define the HAN standards to be used in smart metering systems. Without defining a HAN it would be hard to test interoperability. This requirement will be reconsidered when decisions are

Functional Catalogue Requirement	Rationale for exclusion from the SMETS
	taken on the HAN standard.
HA14 The HAN shall support a defined application profile for devices that connect to the HAN. This profile shall support the smart metering services, meter requirements and IHD requirements defined in the Catalogue	Not included in the SMETS. Application layer not to be defined as there is no HAN standard – see section 4. This requirement will be reconsidered when decisions are taken on the HAN standard.
HA15 The HAN shall support alphanumeric messaging	Not explicitly defined, but the SMETS define the data items for communication over HAN, so this functionality is implicitly required.
HA17 The HAN shall be capable of supporting other utility meters where the data or physical (eg range) requirements do not exceed those of gas and electricity smart meters	Not explicitly defined, with the exception of Microgeneration meters. However, as the HAN and WAN standards utilised must be based on Open or Common Standards and as smart metering systems will support remote Firmware upgrades, the systems will be capable of supporting this functionality. Possible addition of utility port for future iterations of the SMETS.
HA19 The HAN shall support addition of new devices classes	Not explicitly defined. However, as the HAN and WAN standards utilised must be based on Open or Common Standards and as the smart metering systems will support remote Firmware upgrades, the equipment will be capable of supporting this functionality. Possible addition of utility port for future iterations of the SMETS.
HA20 The HAN shall be backwards compatible	Not included in the SMETS. Backward compatibility cannot be assured across multiple HAN standards and so as there is no HAN standard defined in the first iteration of the SMETS – see section 4 – this requirement has not been included. This requirement will be reconsidered when decisions are taken on the HAN standard.
HA21 The HAN applications profile shall be used by all smart metering system components in a consumer premises where possible	Not included in the SMETS. A HAN standard and application profile will not initially be defined for the SMETS – see section 4.
HA22 The HAN shall not interfere with existing prevalent premises networks	Not included in the SMETS. The objective behind this requirement is already achieved by existing legislation; i.e. the Radio Equipment and Telecommunications Terminal ('R&TTE') Regulations 2000 (which give force to the R&TTE Directive). The R&TTE Regulations set out the procedures, including conformity assessment, that must be applied before radio (or telecommunications terminal) equipment can be placed on the market.
WA2 The WAN interface shall support interrogation of WAN enabled devices in line with agreed DCC service levels	Not explicitly included in the SMETS as DCC service levels have not yet been defined.

Functional Catalogue Requirement	Rationale for exclusion from the SMETS
WA3 The WAN interface shall support acknowledgement signals	Not explicitly defined in the SMETS, but as acknowledgement alerts are defined for communication over the WAN this functionality is implicit.
WA4 The WAN interface shall be certified and tested for interoperability	Not included in the SMETS. No WAN has been defined in the SMETS and so interoperability testing is not appropriate at this stage.
WA6 The WAN interface shall be capable of being disabled and re-enabled by authorised personnel	Removed during the IDTS process. As WAN module is replaceable the intended outcome can, however, be achieved.

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