DEPARTMENT OF ENERGY & CLIMATE CHANGE

Smart Metering Implementation Programme

A consultation on draft licence conditions and technical specifications for the roll-out of gas and electricity smart metering equipment.

August 2011

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The consultation can be found on DECC's website:
http://www.decc.gov.uk/en/content/cms/consultations/cons_smip/cons_smip.aspx

Published by the Department of Energy and Climate Change.

Executive summary

This consultation seeks views on draft licence modifications that provide the first elements of the regulatory framework for the roll-out of smart meters. Draft licence conditions are set out in order to: gain stakeholder views on the roll-out completion date; the point from which any meter installed will have to be smart; and on the provision of In-Home Displays. In addition, the Government is seeking views on a number of related policy questions.

The consultation also describes the Government's proposal to establish the technical specifications for the Smart Metering Equipment that suppliers will install in consumer premises (the Smart Metering Equipment Technical Specification or "SMETS"). Views are sought on the Government's proposed approach to developing these specifications, including on specific design requirements, and in particular on the content industry recommends for inclusion in the technical specifications.

The Government is also seeking views on how to manage the technical specifications on an enduring basis and on how suppliers and others may be required to demonstrate compliance with them. In addition, the Government welcomes comments on its proposed approach to the security of the Smart Metering Equipment installed in the consumer premises and more broadly on the security requirements of the End-to-end Smart Metering System

This consultation is one of a number of documents being published as part of the first tranche of the regulatory framework to support the roll-out of smart meters. Other documents being published alongside this document include a consultation on licence conditions for a code of practice for the installation of Smart Metering Equipment and a call for evidence on data access and privacy. In addition two updated Impact Assessments[1] , which support this consultation are being published. Respondents to the consultation document may also wish to refer to the Industry Detailed Technical Solutions (IDTS) document, which was published by the Government earlier this month[2].

Responses to this consultation are requested by **13 October 2011**. Details of how to respond can be found in Section 1.4.

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[1] http://www.decc.gov.uk/en/content/cms/consultations/cons_smip/cons_smip.aspx

[2] The *Industry's Draft Technical Specifications*, published 4 August 2011, available at: http://www.decc.gov.uk/en/content/cms/tackling/smart_meters/smdg/smdg.aspx

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1. Introduction

1.1. Policy context

1. The Government's vision is for every home in Great Britain to be equipped with Smart Metering Equipment, with businesses and public sector users also having smart or Advanced Meters suited to their needs. The roll-out of smart meters will give people far better information about, and control over, their energy consumption and deliver other significant benefits to consumers. For example, it will bring an end to estimated billing and make it easier to switch energy supplier. Smart metering will also play an important role in Britain's transition to a low-carbon economy and help meet some long-term challenges such as ensuring an affordable, secure and sustainable energy supply.

2. The Government's impact assessments[3,4] estimate that the total cost of the roll-out programme will be around £11.7 billion. This investment is needed in order to support Britain's transition to a low-carbon economy. The impact assessments present a strong business case for taking the Smart Metering Implementation Programme forward, estimating benefits across the domestic and smaller non-domestic sectors[5] of over £18.7 billion in the period up to 2030, implying a net benefit of £7.1 billion. These benefits derive in large part from reductions in energy consumption and cost savings in industry processes.

3. Realising this policy goal will be a major undertaking. Regulatory obligations will help make sure gas and electricity suppliers do what is necessary to deliver the roll-out in a way that meets the Government's objectives. This includes during the important period before the market is ready for the mass roll-out to commence, the Foundation phase.

4. The range of issues arising from the roll-out of smart meters has been the subject of considerable attention and extensive consultation, most recently in the Smart Metering Prospectus (the Prospectus)[6], jointly published by DECC and the Office of Gas and Electricity Markets (Ofgem) in July 2010. DECC and Ofgem received 279 responses to the Prospectus consultation. Before, during and after the consultation period, DECC and Ofgem have also had regular contact with a wide range of interested parties.

5. In March 2011, DECC and Ofgem published a Response to the Prospectus consultation (the Response)[7]. The Response set out the Government's proposed approach to the design of the new obligations on energy suppliers to install Smart Metering Equipment in the domestic and in the smaller non-domestic sector.

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[3] DECC, *Impact Assessment for the Smart Meter Roll-out for the Domestic Sector (GB)*, August 2011. http://www.decc.gov.uk/en/content/cms/consultations/cons_smip/cons_smip.aspx

[4] DECC, Impact *Assessment for the Smart Meter Roll-out for the Small and Medium Non-domestic sector (GB)*, August 2011. http://www.decc.gov.uk/en/content/cms/consultations/cons_smip/cons_smip.aspx

[5] Non Domestic Coverage: Electricity, those customers at sites in electricity profile groups 3 and 4. Gas, those customers at non-domestic sites with consumption of less than 732 MWh per annum.

[6] DECC/ Ofgem, *Smart Meter Implementation Programme Prospectus*, July 2010.

[7] DECC/ Ofgem, *Smart Meter Implementation Programme, Response to Prospectus Consultation*, March 2011.

1.2. The smart metering regulatory framework: the Government's general approach

6. In the Response, the Government concluded that, to deliver the roll-out, energy suppliers would be required to procure and install smart meters for their customers. Subject to a limited number of exceptions, the same obligations to deliver the roll-out will apply in the domestic and smaller non-domestic sectors.

The existing framework

7. The current regulatory framework for the gas and electricity sectors is structured under two separate legislative frameworks, the Electricity Act 1989 and the Gas Act 1986. The Acts regulate the delivery and supply of electricity and gas to consumers. Both Acts oblige suppliers to ensure that energy is supplied through an appropriate meter.

8. The transmission, distribution and supply of electricity, and the transportation, shipping and supply of gas, are activities that can only be undertaken under a licence granted by Ofgem, using powers given to it under both Acts. These licences include obligations that licensees must comply with in undertaking their respective functions.

9. In addition to the Acts, relevant statutory instruments and licence conditions, there are also a number of mandatory industry codes and agreements to which the licensees must adhere. These codes, for example, set out the commercial and technical arrangements between the network operators and the users of their networks.

The smart metering regulatory regime

10. Implementation of the Government's smart metering policy will require changes to the existing regulatory and commercial framework governing the electricity and gas markets. The regulatory regime for smart metering will be established using the following:

- licence obligations, compliance with which is monitored and enforced by Ofgem;
- industry codes, to which all relevant licensees are obliged to comply under their licence; and
- compulsory or voluntary codes of practice, to set minimum standards for certain activities of particular parties.

11. The Energy Act 2008 gave the Secretary of State powers to amend existing licences and codes, and to create new licences and industry codes for the purpose of delivering the Smart Metering Implementation Programme. In addition, the Secretary of State also has powers to introduce a new smart metering licensable activity that will allow for the introduction of a new central communications provider (the Data and Communications Company "DCC"). Any changes made under these powers, must first be the subject of consultation, including with the Gas and Electricity Markets Authority, before being presented to Parliament.

12. The Government is developing proposals to establish a new regulatory regime to provide the arrangements for the roll-out and ongoing operation of smart metering, while recognising that existing arrangements will need to continue to apply to traditional meters throughout the transition period until such time as the roll-out is complete.

Delivery of the smart metering regulatory regime

13. The Government is proposing to deliver the required changes to the regulatory framework in a series of tranches. The approach is designed to give stakeholders time to input into and influence the detail of the framework. It will also reduce regulatory uncertainty in the period before mass roll-out of Smart Metering Equipment commences: once issues have been considered and the detailed aspects of policy decided, the Government is committed to introducing the regulatory changes as quickly as possible, to give those parties responsible for installing Smart Metering Equipment as much advance notice of their new regulatory obligations as possible.

Tranche 1

14. This consultation focuses on the regulatory changes for the first tranche. This tranche includes the overall roll-out obligation that will be imposed on suppliers and establishing the requirements for Smart Metering Equipment, which will be installed in consumer premises. Such requirements are needed to give clarity to industry on the technical specifications for Smart Metering Equipment so that manufacturers can begin the process of designing and producing metering equipment which will deliver the functionality required by Government.

15. Specifically, this tranche includes:

- **creating the supplier licence conditions** to require the roll-out of metering equipment that comply with the technical specifications by a specified date, including, where relevant, an obligation to provide an In-Home Display (IHD) and to develop and comply with an Installation Code of Practice;

- **establishing technical specifications (the SMETS)** that will set out the requirements with which Smart Metering Equipment must comply; and

- **necessary consequential changes** to existing legislation, licences and codes.

Future Tranches

16. The Government plans to introduce the regulatory changes on a phased basis and will be considering a range of potential changes including:

- regulatory changes required to establish and licence the DCC;

- privacy, consumer engagement and security policy;

- a new Smart Energy Code to govern the overall arrangements for smart metering and in particular all interactions with DCC;

- any additional regulatory requirements that are identified as necessary; and

- any necessary consequential changes to existing legislation, licences and codes.

Next steps for implementing regulatory changes

17. In addition to the work to support the first tranche of deliverables, the Government is also starting work to develop the regulatory deliverables across all of the other regulatory tranches. Further information on the overall implementation plan for the regulatory changes will be available on the smart meter pages of the DECC website (www.decc.gov.uk).

Spring Package

18. In February 2011, Ofgem set out a range of proposals in response to moves by suppliers to start to install metering equipment with additional functionality ahead of a mandated roll-out[8] of Smart Metering Equipment. This included proposals to update consumer protections and obligations to help ensure consumers do not face barriers to switching where they have a meter with advanced functionalities. On 30 June, Ofgem published a statutory consultation on proposed licence modifications on some of the issues related to the installation of meters with additional functionality ahead of the mandated roll-out, which stakeholders may wish to take into account in their response to the questions set out below.

19. In addition, Ofgem is publishing a consultation letter on further proposals as part of the Spring Package designed to manage the implications of domestic customer switching, where metering equipment with advanced functionalities (such as remote reading capability) have been installed, and are seeking views on the same timetable as for this consultation.. The proposals in this consultation document are designed to be compatible with those proposals from Ofgem.

1.3 Overview of regulatory proposals in this consultation

Scope

20. The obligations set out in this consultation cover Smart Metering Equipment in the home or at smaller non-domestic sites only, it does not cover arrangements related to the DCC or the wide area network (WAN) communications infrastructure for which there will be separate changes to the regulatory framework.

21. For the purposes of this consultation (unless otherwise stated), *Smart Metering Equipment* means equipment installed at the premises which, on the date of installation, and on an enduring basis, complies with the *Smart Metering Equipment Technical Specifications* (SMETS). These definitions include the In-home Display (IHD) and the IHD Technical Specifications, which are treated separately in the licence conditions due to the nature of the requirements that will be placed on suppliers.

Regulatory proposals

22. This consultation addresses five elements of the overall regulatory framework for the implementation of smart metering set out in the Response. As set out in section 1.2, further obligations on industry participants are being developed and will be consulted on in due course. The areas covered in this consultation are:

- the requirement that all licensed energy suppliers must take all reasonable steps to ensure that Smart Metering Equipment (not including an IHD) is installed at their customers' premises by a specified target date in 2019. See section 2.2 – the completion date obligation, and 2.3 – installation of Smart Metering Equipment;

- the requirement that, from the start of the mass roll-out (which is currently envisaged to be in the second quarter of 2014), all reasonable steps should be taken to ensure that meters installed, whether new or replacement, are compliant with the SMETS. See section 2.4 – the new and replacement obligation;

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

- possible further regulatory obligations on suppliers to support the interoperability of equipment that complies with the SMETS. This includes a licence condition on energy suppliers to take all reasonable steps to ensure that the Smart Metering Equipment in consumer premises is interoperable with other Smart Metering Equipment. See section 2.5 – the interoperability obligations; and

- the requirement that when installing Smart Metering Equipment, suppliers should provide domestic consumers an In-Home Display (IHD) that meets the required IHD Technical Specifications detailed in the SMETS. See section 2.7 – the IHD obligations;

- the process that the Government is adopting to develop the IDTS into the SMETS with which Smart Metering Equipment will have to comply. This process includes consideration of responses to the questions set out in Chapter 3 of this document.

23. The Government expects that it will be required to notify these obligations to the European Commission, along with the SMETS, under the requirements in the Technical Standards Directive. Subject to that process, the intention is for these obligations to be introduced into suppliers' licences in the first half of 2012. The obligations will be incorporated in the standard conditions of electricity and gas supply licences, which are enforced by Ofgem.

24. The range of issues surrounding these obligations, including matters raised by interested parties following the publication of the Prospectus, were discussed in detail in the Response document. This consultation document does not repeat that analysis, but describes how the policy set out in the Response will be given effect.

Policy questions

25. In addition this consultation seeks views in a number of areas where further policy consideration is required including:

- **setting the completion date** for the roll-out where the Government is seeking views on the impacts of specifying a completion date in the earlier part of 2019. See section 2.2;

- **the appropriate notice period** for the coming into effect of the new and replacement, and IHD obligations. See sections 2.4 and 2.7;

- **Current Transformer (CT) meters in the non-domestic sector** – there are a relatively small number of CT meters in the non-domestic sector and analysis undertaken has shown that it would probably not be cost effective to provide a smart metering alternative to current arrangements. The Government is therefore proposing an exception for CT meters from the requirements for smart metering and proposing that where CT meters exist, they are replaced with Advanced Meters. See section 2.6;

- **gas Smart Metering Equipment installations before electricity** – whether suppliers should have flexibility, such that gas **Smart Metering Equipment** does not have to be installed in advance of electricity **Smart Metering Equipment**. This would be in relation to the new and replacement obligation only and not the completion date. See section 2.6;

- **installation of metering equipment in new developments** – whether relevant parties should be required to install **Smart Metering Equipment** where they are including

metering equipment with new gas or electricity networks as part of a new development. See section 2.6;

- **provision of emergency metering services** – implications of the smart meter roll-out and whether under existing arrangements meters replaced in emergency situations should be required to comply with the SMETS. See section 2.6; and

- **range of questions related to the SMETS, including a number of outstanding technical design issues that need to be resolved.** See Chapter 3.

Annex 1 provides a digest of all the questions in this consultation.

1.4. General information about this consultation

How to respond

26. Your response will most useful if it is framed in direct response to the questions posed, though further comments and evidence are also welcome. Responses to this consultation should be sent to smartmetering@decc.gsi.gov.uk. The consultation closes on 13 October 2011.

27. Responses should be clearly marked Smart Metering Implementation Programme: consultation on draft licence conditions and technical specifications for the roll-out of gas and electricity smart metering equipment (August 2011). Responses and any enquiries related to the consultation, should be addressed to:

Smart Metering Implementation Programme – Roll-Out Team
Department of Energy & Climate Change,
3 Whitehall Place,
London, SW1A 2AW
Tel: 0300 068 6083
Email: smartmetering@decc.gsi.gov.uk
Consultation reference: URN 11D/836

Territorial extent

28. This consultation applies to the gas and electricity markets in Great Britain. Responsibility for energy markets in Northern Ireland lies with the Northern Ireland Executive's Department of Enterprise, Trade and Investment.

Additional copies

29. You may make copies of this document without seeking permission. An electronic version can be found at http://www.decc.gov.uk/en/content/cms/consultations/cons_smip/cons_smip.aspx. Other versions of the document in Braille, large print or audio-cassette are available on request. This includes a Welsh version. Please contact us under the above details to request alternative versions.

Confidentiality and data protection

30. Information provided in response to this consultation, including personal information, may be subject to publication or disclosure in accordance with the access to information

legislation (primarily the Freedom of Information Act 2000, the Data Protection Act 1998 and the Environmental Information Regulations 2004).

31. If you want information that you provide to be treated as confidential please say so clearly in writing when you send your response to the consultation. It would be helpful if you could explain to us why you regard the information you have provided as confidential. If we receive a request for disclosure of the information we will take full account of your explanation, but we cannot give an assurance that confidentiality can be maintained in all circumstances. An automatic confidentiality disclaimer generated by your IT system will not, of itself, be regarded by us as a confidentiality request.

32. The Department will summarise all responses and place this summary on our website at http://www.decc.gov.uk/en/content/cms/consultations/cons_smip/cons_smip.aspx. This summary will include a list of names or organisations that responded but not people's personal names, addresses or other contact details.

Quality assurance

33. This consultation has been carried out in accordance with the Government's Code of Practice on consultation, which can be found at www.bis.gov.uk/files/file47158.pdf. If you have any complaints about the consultation process (as opposed to comments about the issues which are the subject of the consultation) please address them to:

DECC Consultation Co-ordinator
3 Whitehall Place
London SW1A 2AW
Email: consultation.coordinator@decc.gsi.gov.uk

What happens after the consultation

34. Responses should be submitted by 13 October 2011. The Government will consider responses to the consultation and make any appropriate amendments to the draft licence conditions. The Government will also, in light of the responses, develop and publish the SMETS for the purpose of the roll-out obligations. It is envisaged that the licence conditions will be laid before Parliament and come into effect in first half of 2012.

35. Towards the end of the consultation response period the Government will be engaging with potential data and communications providers as part of the formal procurement process for DCC services. Dialogue will be held with potential service providers to solicit feedback on the Smart Metering Implementation Programme's requirements for DCC services. In addition, the Government would encourage potential service providers to respond formally to this consultation. Feedback received from potential service providers will be aggregated with other responses to this consultation in order to inform the Government's decisions in this area.

2. The content of the licence conditions

2.1. Introduction

36. This chapter explains how the draft licence conditions are designed to deliver the policy commitments set out in the Response and sets out some further policy questions for consideration. Draft licence condition AA *Smart Metering Equipment – Roll-out, Installation and Maintenance* covers obligations to: complete the roll-out of Smart Metering Equipment by a specified target date; and install only Smart Metering Equipment from a date to be specified (new and replacement). In particular the Government is seeking views on the appropriate specific completion date for the roll-out.

37. The obligations on the provision and maintenance of IHDs differ in nature from those on the other elements of the Smart Metering Equipment and are therefore set out in a separate draft licence condition BB *Provision of an In-Home Display.* Please note that for the purpose of condition (AA), Smart Metering Equipment does not include an In-Home Display (please see 2.7 for licence conditions related to the provision of IHDs). The proposed licence conditions are referred to throughout the text and are set out in Annexes 2 and 3.

2.2. Completion of the roll-out by a specified date (AA1-2)

38. In the Response, the Government concluded that obligations should be put on suppliers to complete the roll-out of Smart Metering Equipment[9] by a specified date in 2019, and is now seeking views on what the specific date should be. Clarity on the date will incentivise preparations throughout the Foundation phase and maintain the momentum and pace being built up in preparation for the mass roll-out. However, it is necessary to balance ambition for completion as early as possible in 2019 with the risks and additional costs associated with higher installation rates.

39. Responses to the Prospectus consultation, evidence provided by suppliers and international experience indicated that a range of timescales were possible for the effective completion of the roll-out such that it could be completed in 2019. A key message from the consultation process was that accelerating the roll-out would bring forward benefits, but that this could be outweighed by an increase in costs and risks. Stakeholders generally noted that higher installation rates would result in increased operational risk. As the roll-out of Smart Metering Equipment requires a skilled labour force and the availability of SMETS compliant equipment, acceleration would put pressure on the labour and equipment supply chains as well as capital costs. The point at which these risks become unacceptable for consumers or industry is not easy to identify.

[9] This condition does not include IHDs – please see 2.7 for further details on IHD licence conditions

40. The Response set out a central case profile for completing the roll-out at the end of 2019, together with upper and lower bound scenarios for completing roll-out at the end of 2018 and 2020 respectively. It also identified a number of risks and uncertainties associated with accelerating the roll-out. Setting the date earlier or later in 2019 may affect the risks and uncertainties, but evidence is not currently available to quantify or scale these risks with sufficient certainty to identify an optimum completion date.

41. The Government has consistently emphasised the value of an ambitious roll-out timetable, delivering the broad range of benefits to customers and the industry more quickly. This suggests a completion date that is towards the earlier part of 2019. The Government is therefore seeking views on the advantages and potential risks, including increased costs, of setting the completion date for the roll-out earlier than the end of 2019. The Government is also keen to receive further evidence from consultees on this point before confirming a final completion date in suppliers' licences.

42. At this stage, in line with the approach set out in the Response, the Government does not propose to introduce interim targets for the roll-out of Smart Metering Equipment. However, this will be kept under review and consideration will be given to whether the introduction of interim targets might be necessary in the future.

43. Suppliers are responsible for ensuring compliance with the rollout completion date, and Ofgem will be responsible for taking licence enforcement action where necessary in line with its guidelines if monitoring indicates failings. If breaches are found, Ofgem can impose penalties of up to ten per cent of turnover. At this stage, the Government does not propose to introduce any other penalty or enforcement regime, but will keep this under review in the light of suppliers' progress.

Consultation Question	
1.	**The Government is seeking new evidence and views on the impacts of specifying a completion date that is in the earlier part of 2019.**

The obligation

44. The intention of this licence condition is to ensure that, by the specified date in 2019, metering equipment installed in domestic and smaller non-domestic sites meet the SMETS[10], effectively marking "completion" of the roll-out. Setting the completion date in this licence condition will give suppliers certainty about their regulatory obligations so they can develop plans for the roll-out. It also provides a strong incentive to deliver the roll-out, because as with all licence conditions, non-compliance is enforceable by Ofgem through their normal regulatory powers. The obligation would relate to a supplier's customer base at any point in time to allow enforceability throughout the period of the obligation. Future obligations (see section 1.2) will require the submission by larger suppliers of their roll-out plans, which will need to be realistically capable of meeting the completion date obligation.

[10] This condition does not include IHDs – please see 2.7 for further details on IHD licence conditions

45. Suppliers will be required to take all reasonable steps to complete the roll-out by the specified date. The all reasonable steps test will enable account to be taken of cases where installation may be difficult. At this stage, it is not proposed to issue guidance on the minimum steps suppliers would need to follow to fulfil this test. However, guidance may be issued at a later date in the light of more experience of the range of issues encountered during the Foundation phase and roll-out. The Government expects suppliers to develop solutions to deal with scenarios where installations are technically challenging and to address the concerns of their consumers. The Government will also continue its work to understand consumer concerns about smart metering and how best to address these issues.

46. Under existing legislation, suppliers can apply for a warrant where they need to access a property for the purposes of replacing a meter or for safety reasons. The Government would expect suppliers to only seek warrants where it is necessary for reasons other than installing Smart Metering Equipment. For example, these could include situations where the supplier has reason to suspect meter tampering or where they have been unable to gain access to a property over an extended period and there may be safety issues.

Consultation Question	
2.	**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 necessary? Please explain your reasoning.**

2.3. Installation of Smart Metering Equipment (AA 1-2, 9)

47. Licence condition AA sets out that, by a date to be specified in 2019, suppliers must take all reasonable steps to install Smart Metering Equipment[11] in all domestic and smaller non-domestic sites. The licence condition sets out three conditions for apparatus to be defined as Smart Metering Equipment:

- It must be identified in the SMETS;
- It must have the functionality set out in the SMETS;
- It must comply with any other requirements set out in the SMETS.

48. These conditions are focussed on ensuring the Smart Metering Equipment installed in domestic and smaller non-domestic sites delivers the core functionalities required to realise the benefits of smart metering. These conditions also build a platform for delivering interoperability: they require suppliers to install particular equipment based on an openly available set of requirements (the SMETS).

[11] This condition does not include IHDs – please see 2.7 for further details on IHD licence conditions

49. Under condition AA 9, suppliers would be required to install Smart Metering Equipment[12] that complies with the version of the SMETS current at the time of the installation, but also to ensure that the Smart Metering Equipment installed at that premises continues to comply with that version of the SMETS over time. The licence conditions also provide, in principle, for any changes to the SMETS to trigger retrofitting of new or updated smart metering functionality or specifications (i.e. to require the change to be made in relation to Smart Metering Equipment that has already been installed). In practice, the Government recognises that prior to making any decision to change the specifications, it will be appropriate for the Secretary of State to undertake consultation in order to solicit the views of affected parties, and that, in general, changes would only be applied on a prospective basis. The Government expects that changes would only require retrofitting if strictly necessary, for example to protect against newly emerging security threats or safety issues.

Consultation Question	
3.	**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.**
4.	**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.**
5.	**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.**

2.4. Installation of only Smart Metering Equipment from a specified date (new and replacement) (AA3-6)

50. During the Foundation phase, the Government and industry are making the necessary preparations for the mass roll-out of Smart Metering Equipment. The steps being taken include the arrangements to support interoperability of Smart Metering Equipment and to support testing by industry of equipment, systems and processes.

51. Once this preparatory work is complete, it is expected that mass roll-out can begin. All reasonable steps should be taken to ensure that only Smart Metering Equipment[13] is installed, whether as part of suppliers' accelerated replacement of meters necessary to meet the 2019 completion date, or as part of the usual new and replacement cycle of meter installations. This

[12] This condition does not include IHDs – please see 2.7 for further details on IHD licence conditions

[13] This condition does not include IHDs – please see 2.7 for further details on IHD licence conditions

is for installations in new properties and the replacement of meters which have reached the end of their operational or economic life. The "new and replacement" obligation is intended to give effect to this intention.

52. It is envisaged that preparations outlined above will be sufficiently progressed for the market to be ready for the mass roll-out to start at the beginning of the second quarter of 2014, at which point this licence obligation will come into effect. However the exact timing of this obligation coming into effect will be kept under review and will be determined by the Secretary of State at a later date. It is recognised that suppliers and others will require sufficient time to prepare for this obligation coming into effect and therefore the Government is seeking views on what would be an appropriate period of notice.

Consultation Questions	
6.	**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.**
7.	**What period of notice do you think would be appropriate before the new and replacement obligation comes into effect? Please explain your reasoning.**

2.5. Interoperability obligations licence condition (AA 7-8, BB 6-7)

53. The Government is considering the merits of introducing further regulatory obligations on suppliers to support the interoperability of equipment that complies with the SMETS, including the establishment of an assurance framework (which is discussed further in section 3.4 of this document).

54. It is the Government's aim that the SMETS, and any accompanying assurance framework, will provide for interoperability. However, the Government recognises that, due to the complexity of interoperability, there may be some situations where additional regulatory intervention will be required.

55. In such scenarios, there is a risk that equipment that had not reached the end of its economic life would have to be replaced prematurely. This could create additional costs, impact the consumer experience of Smart Metering Equipment and affect incentives to switch supplier.

56. The Government is hence considering introducing a licence condition on energy suppliers to take all reasonable steps to ensure that the Smart Metering Equipment (including the IHD) in consumer premises is interoperable with other Smart Metering Equipment.

Consultation Questions	
8.	**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.**
9.	**Do you think the licence conditions as drafted effectively underpin the policy intention to ensure Smart Metering Equipment is interoperable? Please explain your reasoning?**

Dispute Resolution

57. The Government is also considering whether a dispute resolution mechanism could help support the objective of interoperability. Such a mechanism would be used to resolve disputes between suppliers or other parties where equipment was found either not to deliver the required functionality or was not capable of being interoperable or supported by parties who did not install the equipment. Such a mechanism could play a role in the enforcement of suppliers' interoperability obligations.

58. For example, a consumer may switch supplier but upon switching the new supplier may be unable to maintain the Smart Metering Equipment. A mechanism may be necessary to identify whether the original supplier has installed equipment which did not comply with the SMETS or whether the new supplier's equipment (for example, a handheld terminal) is incorrectly configured to be compatible with that design of compliant Smart Metering Equipment. In such instances, it might be difficult to determine which party was at responsible for failing to deliver interoperability and as such which party should be responsible for the costs of any equipment replacement necessary. It is important for consumers, suppliers and manufacturers that any disputes are resolved speedily, and faults identified and remedied.

Consultation Question	
10.	**What role could a dispute resolution mechanism have a role in ensuring interoperability? What key features should such a mechanism have?**

2.6. Exceptions and policy issues (AA 10-11)

59. There are some circumstances where the obligations described above should not apply or where flexibility would help achieve the overall aims of the roll-out.

(a) Exceptions for the smaller non-domestic sector – Advanced Meters

60. The licence condition setting out the completion date and new and replacement obligations, applies to the smaller non-domestic sector as well as to the domestic sector. However in the following circumstances, as set out in the Response, exceptions from the completion date and new and replacement obligations will be allowed in the non-domestic sector where:

- A contract for an Advanced Meter has been entered into on or before April 2014; and.
- The contractual obligation to install the Advanced Meter is satisfied before 2019.

These exceptions will end on the completion date for the roll-out as set out in licence condition AA. The Government recognises that this may result in the continuing use of Advanced Meters well beyond 2019, until the meters require replacement.

(b) Exceptions for the smaller non-domestic sector – Current Transformer meters

61. In addition, the need for a further exception in the non-domestic sector associated with Current Transformer (CT) meters[14] has been identified. Around 25,000 of these meters are in use, almost entirely in the non-domestic sector[15]. While CT meters provide some of the advanced functionality that is expected to be delivered by Smart Metering Equipment , they do not allow for remote disconnection and reconnection of supply. The relatively low numbers of meters involved make it unlikely that it would be economic to develop a CT meter providing these additional functions.

62. The use of advanced functionality with CT meters would ensure that many of the benefits available from Smart Metering Equipment would be available to customers. The Government therefore proposes a technical exception for non-domestic sites, so that the obligation relates to the provision of advanced rather than Smart Metering Equipment where the supply is required to be provided through a CT meter. Licence condition AA will provide the exception for CT meters and the positive obligation to install an Advanced Meter will be made through changes to Standard Licence Condition 12 (refer to Annex 4 for proposed draft licence modifications).

63. Given the very small number of domestic premises likely to have CT metering it is not intended to introduce explicit exceptions or obligations in this sector. The Government does not expect such meters to be replaced with Smart Metering Equipment, however where advanced meter functionality could be utilised we would expect that consideration would be given to doing so.

Consultation Questions	
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.**
12.	**Do you think that the licence conditions as drafted effectively underpin the policy intention for Current Transformer meters? Please explain your reasoning.**

[14] Current Transformer Coupled Meters are used for consumers with higher loads, which are metered indirectly via current transformers, these reduce current to a lower level at which it is easier and safer to measure.
[15] Domestic and Non-Domestic CT Metering Options and Considerations, Electricity Meter Variants Working Group (Doc Ref: EMVWG.03).

(c) Installation of gas Smart Metering Equipment before electricity

64. The duty to install smart new and replacement meters currently applies equally to both electricity and gas meters. However, electricity and gas meters will not necessarily be replaced at the same time, because the end of their operational lifetimes do not coincide or because a customer has different suppliers for gas and electricity, with differing roll-out strategies. On some occasions, a gas meter will have to be replaced before electricity Smart Metering Equipment has been installed.

65. Installing a gas Smart Metering Equipment first would be possible under the technical architectures proposed for the Smart Metering Equipment (see also Chapter 3), but some complexities and technical challenges may remain and there may be additional costs depending on the approach taken to the Communications Hub (see section 3.3). The Government is therefore seeking views on whether flexibility in the new and replacement obligation might be advantageous; so that, where there are different suppliers for each fuel, a gas supplier would not be required to install gas Smart Metering Equipment before electricity Smart Metering Equipment was installed[16]. The intention would be to provide gas suppliers with some flexibility to help balance their aims for an effective and efficient roll-out against the additional cost and complexity of installing a gas Smart Metering Equipment ahead of electricity Smart Metering Equipment.

66. The Government would not envisage a prohibition on the installation of gas Smart Metering Equipment first. And is also considering if there are any other barriers to gas Smart Metering Equipment being installed first and would welcome comments on this topic. Any potential flexibility would apply to the new and replacement obligation only; the obligation to complete the roll-out by the specified completion date (AA1-2) would still apply.

Consultation Questions	
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.**
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.**

(d) Obligations related to new developments

67. In a new development (for example, a new housing estate), arrangements for the installation of metering equipment may be made without the involvement of a supplier. The new and replacement obligations as currently drafted apply only to suppliers and there may be a risk that non-compliant metering equipment will be installed, which would subsequently have to be replaced by the supplier when appointed.

[16] For the sake of clarity it should be noted that any flexibility in this area would not affect the regulatory arrangements governing the recertification of gas meters.

68. There may be commercial incentives on the parties involved to minimise the risk of installed meter assets having to be replaced early, which could incentivise the installation of Smart Metering Equipment in new developments. However there may also be competing incentives to offer the lowest cost solution for a particular development. Overall there may be some uncertainty about what meters would be installed, which could lead to some inefficiencies for the roll-out of Smart Metering Equipment. Much of this uncertainty could be removed by placing obligations on relevant parties (Distribution Network Operators, independent Distribution Network Operators, independent Gas Transporters, Gas Distribution Network Operators), which mirror the new and replacement aspects of the draft licence conditions.

Consultation Question	
15.	**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.**

(e) Implications for emergency metering services

69. There are circumstances where a gas transporter or electricity distribution network operator replaces a meter on an emergency basis. These arrangements[17] may be affected by the introduction of Smart Metering Equipment and the new and replacement obligations set out here applying to suppliers. The Government would want to avoid a situation whereby Smart Metering Equipment was removed and replaced with a non-compliant meter. Generally speaking, the Government wishes to encourage the installation of Smart Metering Equipment where any meter replacement is necessary. Changes to the obligations on electricity distribution network operators and gas transporters may be required to achieve this. Through this consultation the Government is seeking views on the implications of the roll-out of Smart Metering Equipment for the emergency metering services arrangements when the new and replacement obligations on suppliers, as currently drafted, are applied.

Consultation Question	
16.	**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.**

[17] The arrangements are the Post-Emergency Metering Services (PEMS) in the gas sector and Urgent Metering Services (UMetS) in the electricity sector.

2.7. Provision of In-Home Displays (BB)

70. As part of the roll-out of Smart Metering Equipment, the Government has previously decided that all domestic consumers should be offered an IHD, capable of displaying near real-time information on their energy consumption in a readily accessible form. The IHD will be the most visible part of the Smart Metering Equipment for the consumer and it will play an important role in promoting consumer awareness of energy use and helping consumers reduce consumption. It is preferable that the IHD is provided at the time of installation of other Smart Metering Equipment giving the consumer an immediate way to easily engage with the information provided by the new smart meter.

(a) The obligation to provide an IHD

71. In the Response, the Government concluded that obligations should be placed on suppliers with regard to the provision, repair and replacement of IHDs. Suppliers will be required to offer their domestic consumers an IHD at the time of installation of Smart Metering Equipment. If the customer initially declines the supplier must, for a period of 12 months after the point of installation, provide an IHD if subsequently requested.

72. The SMETS will include a section setting out information about the requirements for the IHD, the In-Home Display Technical Specification, and in particular the information that it must display. These will form the minimum requirements for a compliant IHD that should be offered to all domestic consumers. It is this compliant IHD that is referred to throughout this section unless otherwise stated.

73. While the IHD is central to the delivery of information to consumers and realisation of benefits, the Response recognised that there may be times when an IHD is not provided at the time of installation of other Smart Metering Equipment. For example, where an IHD is already in place or where a consumer does not want one. The Government expects suppliers to encourage customers to take an IHD, but recognises that some customers may not want one. To avoid waste of resources, the licence conditions therefore make provision for these circumstances. The obligations as they apply in these circumstances are described below, but in general terms the IHD obligations are time-limited and require suppliers to offer a compliant IHD and to provide one where the customer takes-up that offer. The Government expects to monitor the take-up of IHDs and would expect suppliers to gather information to understand and address the reasons given by customers for refusing an IHD.

74. It is envisaged that this obligation will come into effect when Smart Metering Equipment is available in volume, currently envisaged to be around the end of 2012. The Government proposes to introduce the licence condition into licences in the first half of 2012 in a “switched-off” form. The exact timing of its coming into effect will be kept under review and will be determined by the Secretary of State at a later date. The Government recognises that suppliers and others will require sufficient time to prepare for this obligation coming into effect and is seeking views on what would be an appropriate period of notice.

Consultation Question	
17.	**What period of notice do you think would be appropriate before the obligation to provide an IHD comes into effect? Please explain your reasoning.**

(b) The exception to the IHD obligation where one has already been provided

75. An exception to the obligation to provide an IHD described above is where the supplier can satisfy themselves that the minimum information set for their fuel is already accessible to the consumer and is capable of being displayed on an existing compliant IHD. This would apply, for example, where a household receives its electricity and gas from different suppliers and one has already provided an IHD. This approach will help to avoid waste and additional costs for the roll-out (for example, consumers being provided with a second IHD unnecessarily).

(c) Provision of IHDs after installation of other Smart Metering Equipment

76. In general, as described above, the IHD licence condition applies at the time of the installation of Smart Metering Equipment. However, the Response concluded that there were two scenarios where suppliers should be required to provide a compliant IHD to a customer after the installation of Smart Metering Equipment:

i. Before the IHD licence condition takes effect

77. Where Smart Metering Equipment was installed by early mover suppliers before the IHD licence condition takes effect, there would be no obligation to provide a compliant IHD. Whilst activity within the market suggests IHDs are generally part of the offering suppliers are making to their customers, some may not receive a compliant IHD. To ensure that those consumers receiving compliant equipment early, but without the provision of an IHD, do not miss out on the benefits of the IHD, suppliers will be required to provide a compliant IHD, if requested by the customer, in the twelve months after the date Licence Condition BB comes into effect.

ii. After the IHD licence condition takes effect

78. Where a consumer declines an IHD when Smart Metering Equipment is installed, the supplier (at the time the request is made) should be required to provide one if the customer changes their mind and requests one after the installation visit and has not already been provided with an IHD. This obligation would apply for twelve months after the original installation visit. Where a customer makes it clear they do not wish to have an IHD, suppliers will be expected to make alternative arrangements to provide information on energy consumption, for example via customer bills.

(d) Dealing with IHD faults

79. The Response identified the need for obligations to deal with faults with the IHD. It is important that consumers are able to access the information provided by the IHD, which they will not be able to do if it is faulty or breaks down. The Government has concluded that, if the IHD is faulty, the supplier – at the time the customer reports the fault – must take all reasonable steps to either repair the IHD or replace it with a new one meeting the SMETS. There should be no up-front charge for the repair or replacement. The obligation to deal with IHD faults would apply for twelve months from the date of the original installation of Smart Metering Equipment, whether that installation was before or after the IHD licence conditions were 'switched-on'.

(e) Charging for IHDs

80. As with other components of Smart Metering Equipment, there should be no one-off or up-front charge for the provision of a compliant IHD – whether it is provided at the time of installation of the Smart Metering Equipment or at a later date in the circumstances described above. Suppliers will also need to ensure that they comply with their responsibilities under existing applicable legal provisions.

81. Some suppliers may wish to offer their customers IHDs which go beyond the required level of functionality. Under these circumstances a one-off or up-front charge may be made, but the customer must have the choice of whether to a) take the minimum specification IHD or b) pay an up-front charge for an enhanced IHD. These rules are set out in the Installation Code of Practice draft licence condition. This would also be subject to the proposed requirements of the Installation Code of Practice that sales during the installation visit itself should only be undertaken where the consumer has given prior written consent. Licence conditions for the Installation Code of Practice are being consulted on separately [18].

Consultation Questions	
18.	**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.**
19.	**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.**

2.8. Consequential changes to legislation, licence conditions and industry codes

Introduction

82. As described in section 1.2, the Government is proposing to deliver the required changes to the regulatory framework in a number of tranches. Throughout this process the Government will also consider any necessary consequential changes to existing legislation, licences and codes where required as a result of those new obligations.

Consequential changes

83. The proposals for roll-out and use of Smart Metering Equipment will have a number of implications for the existing regulatory framework. The roll-out licence conditions proposed in this consultation may require consequential changes to existing licences, legislation and industry codes. The Government expects there to be a number of consequential changes related to the wider Smart Metering Implementation Programme and will be consulting on these at a later date.

84. For the purpose of this consultation, only the consequential changes that are thought to be necessary in order to ensure that the proposed roll-out licence conditions operate as intended are discussed (i.e. consequential changes on which the roll-out conditions are dependent). This section sets out an initial high-level view of the changes that might need to be made and a brief description of why the changes might be required.

[18] DECC, *Smart Metering Implementation Programme, A Code of Practice for the Installation of Smart Electricity and Gas Meters: a Consultation*, August 2011.

Consequential changes to existing licences

85. This section summarises areas where the Government proposes that consequential changes may need to be made to Standard Licence Conditions (the Electricity Supply Licence Conditions and Gas Supply Licence Conditions[19]) based on the proposed roll-out licence conditions. These are:

- **Condition 2 - Interpretation of standard conditions** – describes the specific application of powers under provision of this licence. The Government proposes that a reference to the Secretary of State is added (in addition to the Authority as in the current condition) in 2.7, 2.8, 2.9 and 2.11. This is necessary as the licence conditions includes certain powers for the Secretary of State, for example, in Condition AA & BB where the condition applies in effect from a date specified by the Secretary of State in a direction issued to the licensee, and therefore a consequential change is required to reflect this in the Standard Licence Conditions; and

- **Condition 6 - Classification of premises** – defines domestic and non-domestic premises. As the roll-out conditions refer to domestic and non-domestic (specifically in the definition of designated premises) premises, it may be necessary to adapt the definitions.

Consultation Questions	
20.	**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.**
21.	**Do you think there are any other consequential changes to existing licence conditions needed in order to make the proposed roll-out obligations work as intended? Please explain your reasoning.**

Consequential changes to existing legislation

86. The Government has not identified any consequential changes to existing legislation that would need to be made in order to make the proposed roll-out licence conditions work effectively. The Government will be considering consequential changes to existing legislation for the wider Smart Meter Implementation Programme in each tranche of regulatory work and will consult at a later date.

Consultation Question	
22.	**Do you think there are any consequential changes to existing legislation needed in order to make the proposed roll-out obligations work correctly? Please explain your reasoning.**

[19] http://epr.ofgem.gov.uk/index.php?pk=folder97241

Consequential changes to codes

87. The Government will work with code administrators and other interested parties to determine if there needs to be any consequential changes to existing codes.

Consultation Question	
23.	**Do you think there are any consequential changes to existing codes needed in order to make the proposed roll-out obligations work correctly? Please explain your reasoning.**

3. Smart Metering Equipment Technical Specifications

3.1. Introduction

88. The Government considers that technical specifications – based on open and non-proprietary standards, building on the Functional Requirements Catalogue (the Catalogue)[20] – are essential to ensure the interoperability of Smart Metering Equipment. In view of this, the Government proposes to introduce a licence condition requiring that suppliers take all reasonable steps to install Smart Metering Equipment[21] that satisfies the SMETS (see section 2.3).

89. Section 3.2 sets out the rationale for the SMETS and the process that the Government will follow to produce them. The Government proposes to use the IDTSas the basis for the SMETS, and so is seeking views on their detailed proposals. As part of the process of developing the SMETS, the Government is also seeking input on a number of specific technical design issues (see section 3.3) – while technical details have been included as necessary, responses that focus on the intent of the requirements, as well as those of a more technical nature, are welcome. In some cases these technical issues will have implications for consumers; these are highlighted as appropriate in each section.

90. The Government will undertake further work to ensure that the SMETS enable the installation of interoperable Smart Metering Equipment in line with the Smart Metering Implementation Programme business case, and to ensure that the SMETS are sufficiently precise to be legally enforceable. Following this consultation, and as part of the formal response, the Government intends to publish the SMETS alongside the final licence conditions.

91. In the Response, the Government also agreed to consider the ongoing development and governance of any technical specifications. The Government proposes to determine the initial SMETS using powers under the Energy Act 2008. Once a market has developed for new metering equipment and standards become embedded in the industry, it is likely to be more efficient and effective for responsibility for the management and evolution of the SMETS to be delivered through industry based structures with appropriate governance arrangements. Such arrangements could be structured in a number of ways, and the Government is seeking further views before setting out how the SMETS may be managed on an enduring basis (see section 3.2). The Government is also seeking views on how suppliers and others may be required to demonstrate compliance (see section 3.4).

92. Section 3.5 introduces some of the options that the Government is considering to mitigate certain aspects of the security risks associated with the End-to-end Smart Metering System.

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[20] Smart Metering Implementation Programme Response to Prospectus Consultation: Functional Requirements Document (Appendix to Support Document 3 of 5 Design Requirements). Available at http://www.decc.gov.uk/en/content/cms/consultations/smart_mtr_imp/smart_mtr_imp.aspx

[21] This condition does not include IHDs – please see 2.5 for further details on IHD licence conditions

3.2. Developing the technical specifications

(a) Rationale for development of the SMETS

93. The business case for the Smart Meter Implementation Programme is predicated on Smart Metering Equipment performing certain minimum functions and for equipment to be interoperable with the Smart Metering Equipment installed by other suppliers and with the DCC. Establishing minimum functions and requirements that support interoperability is considered necessary to ensure that the benefits of smart metering are realised to:

- provide consumption information to consumers to allow them to make better informed decisions regarding their energy use, and deliver a positive experience of smart metering (for example, equipment which delivers the functionalities as promised and a smooth change of supplier process);
- allow Energy Service Companies (ESCOs) and other interested parties to offer innovative products and services to consumers, facilitating new entry to markets through standardisation of technology and assurances that different suppliers' technologies can be supported in the same manner;
- allow suppliers and network operators to run their operations more efficiently and avoid unnecessary replacement of Smart Metering Equipment. These savings should be passed on to consumers; and
- assist in meeting the UK's greenhouse gas reduction targets, as a result of delivering all of the above.

94. In the Response, the Government published the Catalogue, which identified the functional requirements that Smart Metering Equipment should be capable of delivering in order to meet the business case. However, it was also noted that the functional requirements could be delivered in a number of ways, and as such, they were insufficient to ensure interoperability. Without interoperability, Smart Metering Equipment (whether supplier or consumer-owned) could have to be replaced when a consumer changed their supplier or when new devices are connected with pre-existing Smart Metering Equipment.

95. The Government outlined in the Response, plans to *"provide oversight of and facilitation to industry experts to develop the draft technical specifications".* The Government is committed to the development of technical specifications that support interoperability, but also to provide industry with the room to innovate and respond to evolution in technology when delivering the functional requirements set out in the Response.

(b) Process to date

96. The Response noted that the Government would commission (and facilitate the work of) industry experts to help develop draft technical specifications that would deliver:

- the high-level functional requirements that were published in the Response;
- the minimum functionality described in the Catalogue; and
- the interoperability that is central to the Smart Metering Implementation Programme business case.

97. The Government established the Smart Metering Design Group (SMDG), which included experts from consumer bodies, manufacturers, energy suppliers, network operators, meter operators, trade associations and other interested parties, to undertake the task. The main output from this process was the IDTS.

98. The SMDG initiated a number of working groups to consider individual elements of the specifications in detail. The Government then approved the terms of reference (Annex 5) for each of these groups in order to ensure that the framework was established to deliver unbiased and fit for purpose recommendations. In addition to the technical experts, the six largest energy suppliers provided project management support to ensure that all areas covered by the SMDG received appropriate attention and that the working groups' project plans and deliverables were provided on time.

(c) *The Industry Draft Technical Specifications* (IDTS)

99. The IDTS, which was published on 4 August on the DECC website[22] on behalf of the SMDG, includes the following chapters:

- **Architectures** – This section sets out the architectures industry recommend for Smart Metering Equipment. The SMDG considered the different options for where functionality could be located and recommended a main architecture and four variants.

- **Extended Functional Requirements** – This section is the principal component of the IDTS. It builds on the Catalogue requirements, with additional layers of detail specified against each requirement (see table 1).

- **Security Requirements** – This section describes the recommended security functions to be associated with Smart Metering Equipment located within the premises.

- **Supporting documents** – Appendices have been developed to provide further background and clarity on the SMDG recommendations.

[22] http://www.decc.gov.uk/en/content/cms/tackling/smart_meters/smdg/smdg.aspx

Table 1: Structure of the *Extended Functional Requirements*	
Section:	**Purpose relates to:**
Installation and Maintenance	Minimising consumer inconvenience during installation or subsequent maintenance.
Operational	The timing, power consumption, minimum modes of operation and fault recovery of meters.
Display and Storage	The visual interfaces of the Smart Metering Equipment within the consumer premises as well as data storage.
Interoperability	The minimum levels of technical interoperability of the smart metering equipment.
Prepayment and Credit	The necessary common level of functionality associated with credit tariffs and prepayment, including operation in the event of the WAN not being available.
Electricity Specific	Requirements associated with electricity metering including enablement/ disablement, registers for consumption and demand data, smart grids data and support for load control.
Gas Specific	Requirements associated with gas metering including enablement/ disablement, registers for consumption data, local storage of calibration data and battery life.
Diagnostics	Configuration and diagnostics data that can be stored and accessed by third parties.
Security and Privacy	Now in separate chapter of IDTS
Home Area Network	The links between the devices that are on the HAN.
Wide Area Network	The link between the premises and DCC.
In-Home Display	Information provision and power requirements.

100. The SMDG used the requirements set out in the Catalogue as the starting point of their technical requirements to be included in the IDTS. They considered if other requirements were necessary to deliver the business case and the additional layers of detail that would be necessary in each requirement to promote interoperability. Table 2 provides an example of how one of the requirements from the Catalogue has been amended and expanded in the IDTS. Metering equipment manufacturers have indicated the level of detail provided in the IDTS is sufficient to produce manufacturing specifications and build interoperable meters capable of providing the required functionality. Suppliers have also indicated that the IDTS provides the detail necessary for them to commence the procurement process for Smart Metering Equipment.

Table 2: SMDG reworking of Catalogue requirement (for example,IM.05)	
Original *Catalogue* Requirement	IM.05 The smart metering system components shall be uniquely identifiable electronically where applicable.
IDTS Recommendation	IM.5 The smart metering system components shall be uniquely identifiable electronically. IM.5.1 Any authorised device connected to the SMHAN shall contain a non-erasable Smart metering system identifier (serial number) which is unique, and from which it shall be possible to determine: • Manufacturer ID • Type of Product identifier (Device ID) • Year of manufacture (Year ID) IM.5.2 The unique identifier described within IM.5.1 shall correspond to the visual serial number displayed on the label as described in requirement IM.6.2. IM.5.3 The SMHAN interface within each smart metering component shall store a unique MAC address (EUI-64 identifier). IM.5.4 All smart metering components shall contain an electronically coded Device Type reference which shall, by cross referencing with a look up table, describe the various attributes of the device.

101. The Government proposes to use the IDTS as the basis for the SMETS. Responses received to the following consultation questions and other comments on industry's recommendations will be considered as the Government finalises the SMETS.

Consultation Questions	
24.	**Do you think that there are other requirements that the Government should adopt in the SMETS? Please explain your reasoning.**
25.	**Do you agree that all the requirements recommended in the IDTS should be adopted by the Government in the SMETS? Please explain your reasoning.**
26.	**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.**

(d) IDTS Next steps

102. The Government intends to use the IDTS as the basis of SMETS, adopting its recommendations where appropriate. It will carefully consider the IDTS alongside all relevant comments received as part of this consultation. It is also the Government's intention to further develop the SMETS to reflect:

a) any further technical detail needed to deliver the functional requirements set out in the Response;

b) any additional requirements needed to deliver interoperability;

c) security requirements accompanying a) and b) above;

d) the separate obligations that will be placed on gas and electricity licences in and to reflect the separate licence conditions for IHDs; and

e) the conclusions that the Government reaches on the technical issues set out in section 3.3 of this consultation and the architecture of the End-to-end Smart Metering System.

103. Since a requirement to comply with the SMETS will form part of suppliers' licence conditions, it is important that they are drafted in a legally robust and precise manner, such that they can be enforced effectively by Ofgem. The Government is undertaking a legal and regulatory review of the IDTS alongside this consultation to redraft the specifications to meet this objective. Through the redrafting process, the Government will consider whether any of the individual requirements set out in the IDTS are duplicated in another section and whether they are necessary to deliver interoperable systems that meet the business case. The Government intends to engage with industry representatives during this consultation, as part of the regulatory review process.

104. Table 3 is included to give an indication of the types of changes that may be made as part of the Government's legal and regulatory review of the IDTS. This is not necessarily

indicative of the final revision of the SMETS, which will be finalised following this consultation and Government's further consideration of the matters in (a)-(e) above.

Table 3: Example of Government redrafting of Catalogue requirements DI.1- DI.4

Original *Catalogue* ID code and Requirement	**Possible legal redrafting in preparation for licence condition specifications**	**Supply licence**
DI1: The smart metering system shall support logging of meter events such as faults, tampers, thresholds associated with extreme levels etc. This will include but is not limited to the time and date stamping and recording of the originating device for the event	The Smart Metering Equipment shall be capable of recording Meter Events (such record to include as a minimum the time and date of the Meter Event and details of the component of the Smart Metering Equipment that caused the Meter Event), storing that information for a period of at least 6 months, being configured Remotely to set Meter Event thresholds and sending an alarm to the DCC following a Meter Event threshold being breached.	Gas and Electricity
DI2: The smart metering system shall support remote configuration of logs, alarms and thresholds	Merged to DI1	Gas and Electricity
DI3: The smart metering system shall support configuration of alarms associated with usage thresholds	Merged to DI1	Gas and Electricity
DI4: The smart metering system shall store its configuration data in non volatile memory	The Smart Metering Equipment shall be capable of storing its Configuration Data in Non Volatile Memory.	Gas and Electricity

105. The Government plans to publish the SMETS alongside final licence modifications as part of the formal response to the consultation. The Government then intends to commence the notification to the European Commission under the Technical Services Directive (98/34/EC) before the end of this year. This will require a minimum three month "stand-still" period, which may be extended to six months if any detailed opinion is raised by the European Commission. If the notification period is not extended, the Secretary of State currently intends to introduce the licence amendments in the first half of 2012.

106. This process should allow metering equipment manufacturers sufficient time to undertake the necessary detailed design of Smart Metering Equipment and the manufacturing processes against the SMETS during the next year, such that mass volume of SMETS compliant meters should be commercially available towards the end of 2012.

Consultation Question	
27.	**Do you agree that the process outlined above is a suitable way forward to develop the SMETS? Please explain your reasoning.**

(e) Ongoing governance

107. As part of the introduction of the roll-out licence conditions, it is proposed that suppliers take all reasonable steps to install Smart Metering Equipment[23] by the specified date. Based on the initial arrangements proposed, when they are introduced, only the Secretary of State will be able to modify the SMETS.

108. The Government recognises that these initial governance arrangements are not likely to constitute an appropriate enduring governance structure for the SMETS and considers that both more explicit involvement of relevant stakeholders and a more formalised governance process should be introduced to apply on an enduring basis. One example of such a governance arrangement would be for the SMETS to be governed by the provisions of the Smart Energy Code. While the detailed governance arrangements of the SMETS remain to be determined. The Government has identified a number of benefits of governing the SMETS under the Smart Energy Code. This approach would:

- provide a more formalised and explicit governance structure involving stakeholders;
- provide an opportunity for the provisions of the SMETS to be contractually enforced. This is the approach used to enforce the metering codes of practice under the Balancing and Settlement Code; and
- allow for a wider accompanying certification, assurance and enforcement framework to be introduced (see section 3.5).

109. The Government is also considering if, on an enduring basis, the Smart Energy Code (and potentially licence conditions) will include provisions which set out how Smart Metering Equipment that complies with the SMETS will need to be configured and operated to deliver the requirements of the Smart Metering Implementation Programme.

Consultation Question	
28.	**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.**

[23] This condition does not include IHDs – please see 2.7 for further details on IHD licence conditions

(f) Cost reductions of meters compliant with SMETS

110. The Impact Assessment accompanying this consultation assumes a 13% unit cost reduction for Smart Metering Equipment over the next 20 years. Initial views from industry suggest that our cost reduction assumptions are low. To refine the economic analysis we are seeking further evidence of potential cost reductions over time.

Consultation Question	
29.	**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.**

3.3. Outstanding technical issues

111. There are a number of issues covered in the IDTS on which the industry working group was unable to reach an agreed consensus or where additional consideration is needed from Government. This section of the chapter seeks views on the following issues:

(a) Configuration of communication equipment in the premises:

i. Outage detection;
ii. Communications Hub Options.

(b) End-to-end Smart Metering System messaging:

i. Specifications for the HAN;
ii. Specifications for the Application Layer.

(c) Communications network standards and addressing.

(d) Network operator requirements;

i. Maximum and Minimum Demand detection;
ii. Network Registers;
iii. Floating Neutrals.

(e) Consumer access to consumption data:

i. Access to data over the WAN;
ii. Access to data over the HAN.

(f) Electricity isolation switch.

(g) End-to-end smart metering system architecture.

(h) In-home display functionality:

i. Consumer accessibility and inclusivity;
ii. Ambient display of real-time energy based on usage and cost;
iii. Account balance for credit customers;
iv. Real-time gas demand;
v. Consumption and cost in latest bill period;
vi. “Next-tariff” rate.

(i) Enduring prepayment interface.

(j) Update from the Prospectus Response.

(a) Configuration of communications equipment in the premises

This section discusses requirements that could be included in the SMETS for the communications equipment to be installed in the premises. Particular consideration is given to:

i. Outage detection; and

ii. Communications Hub Options.

112. Electronic communications are a key element of the End-to-end Smart Metering System. Communications technology is needed to transmit and deliver data throughout the system reliably, securely and on demand. The Response presented a number of conclusions about the provision of communications technology as part of the design requirements, which are reflected in the IDTS.

113. Since the Response, industry working groups have considered how communications technology in the premises could be best provided to meet the Government's requirements that:

- equipment which communicates with the DCC's systems - "the WAN module" - should be exchangeable without having to replace metering equipment; and
- equipment enabling in-home communications - HAN transceivers - does not need to be exchangeable without having to replace metering equipment, but suppliers may choose to install modular transceivers if they wish.

114. Full details of the industry conclusions on where equipment or components should be placed in the premises (the 'architecture') is available as part of the IDTS. In making recommendations, industry considered a range of issues in relation to the WAN module. This included location issues (there is unlikely to be a one-size fits all approach to the physical location for technology needed to support WAN and HAN communications) and the needs for power and tamper protection. In undertaking this task, industry has also considered how other requirements that were set out in the Response should be delivered, principally the requirement for consumers to have access to thirteen months of consumption data.

115. The recommendation from the industry working groups is to include a new component within the Smart Metering Equipment: the Communications Hub. Their proposals are that the following components and functionality should be placed in the Communications Hub:

- WAN transceiver (replacing the WAN module);
- HAN transceiver;
- "Common functionality" that is essential for the operation of the Smart Metering Equipment, for example, gas meter data buffering, gas meter data store, HAN network management; and

- Possible “extended functionality”, for example, for demand side management (but this would not be part of the scope of the initial SMETS).

116. The rationale for including the Communications Hub as a discrete new component in the Smart Metering Equipment was based on the following arguments:

- **preservation of gas battery life.** The IDTS sets out requirements for the battery which powers the gas meter to last for fifteen years. Recording and providing access to thirteen months of consumption data would make the battery life requirement difficult or very costly to deliver. As an alternative, industry has proposed to include the data storage (and other functions needed to support the gas meter) in the Communications Hub (which would be mains powered). This will allow the gas meter to only be required to update relevant data to the Communications Hub on a 30 minute frequency with all functionality requiring higher power requirements residing in the Communications Hub.

- **to support gas first installations**. There will be instances where a gas supplier may want to install a smart gas meter before the installation of a smart electricity meter. This is especially the case for consumers who receive their gas and electricity from different suppliers. The concept of a separately powered Communications Hub allows additional flexibility for both WAN and HAN communication coverage and reduces stress on the gas meter’s battery. From a business case and commercial perspective, the Communications Hub would need to be interoperable with the smart electricity meter when it is eventually installed. This would allow shared services, leading to lower operational and capital costs.

- **to provide the flexibility to decouple WAN and HAN application layers.** The Communications Hub allows flexibility to use different application layers within the premises to that used between the home and DCC, or in the Foundation phase, the supplier. As discussed in section 3.3(c), the Communications Hub could hold functionality to translate the messages and commands to the application layers format used over the HAN or WAN (i.e. for bi-directional communications).

117. Alongside the SMDG considerations, the Government has reviewed the Impact Assessment for the Smart Metering Implementation Programme. Since March, further information on the costs of the Smart Metering Equipment to be installed in the premises has become available, in particular in relation to communications equipment. Table 4 below summarises the main changes in the costs associated with communications technology in the premises.

Table 4: Costs of communication devices in Smart Metering Equipment			
	Communications equipment costs (as per IA in March)	**Configuration with Communications Hub (costing as per IA in August)**	**Description of change**
WAN transceiver cost of £15	£15	£15	March 2011 assumption is retained
Gas mirror cost of £4	n/a	£4	This component had previously not been included in March 2011 analysis
Power supply unit of £2	n/a	£2	This component had previously not been included in March 2011 analysis
HAN transceiver for electricity / gas meter	£1 / £3	£0 / £0	Further work since March has established that these components are already captured in the meter costs
HAN transceiver cost in Communications Hub	n/a	£2.50	Preferred approach of standalone Communications Hub requires additional HAN
Housing & seal at cost of £1.1	n/a	£1.10	To reflect preferred approach of stand-alone Communications Hub
Outage detection	n/a	£1	Outage detection component cost has been moved from the electricity meter into the communications equipment
Total cost per premises	**£19.00**	**£25.60**	

Government position:
The Government is minded to include a requirement in the SMETS to include a specific Communications Hub component as part of the equipment installed in customer premises.

Consultation Question	
30.	**Do you agree that the Government should include a requirement for a Communications Hub in the SMETS? Please explain your reasoning.**

i. Outage detection

118. The Government's intention is to require outage detection/loss of electricity supply alerts. The Response stated that it was reasonable for consumers to expect Smart Metering Equipment to contain the functionality to alert suppliers and network operators (via the DCC) when their electricity supply was lost. This would allow the problem to be detected immediately and corrective action to be actioned as swiftly as possible. The Government committed to undertake further work on the most cost-effective way to deliver this outage detection functionality. Industry working groups have been consulted on this analysis, and have concluded that the most cost-effective way of delivering outage detection is through functionality in Smart Metering Equipment in the premises.

119. Industry has also concluded that costs are minimised by locating the necessary components to deliver this functionality as close as possible to the WAN transceiver. Economic analysis of the outage management benefits that can be expected as a result of providing outage detection has concluded that the break-even point for the cost increase per unit is around £3.60 in a scenario where 15% optimism bias is assumed and £1.40 in a scenario with more uncertainty about the eventual costs and an optimism bias uplift of 150%. Therefore, given the current cost estimate of £1 with a 150% optimism bias uplift the Government believes there is a positive economic case for the inclusion of outage detection functionality.

120. The delivery of this functionality will be dependent on the technology adopted by the DCC for the WAN. The Government is minded that, in addition to setting the specifications for the WAN module element of the Communications Hub, the DCC Communication Service Providers should also specify the requirements for outage detection. This could have implications during the Foundation phase as Smart Metering Equipment installed before establishment of the DCC Communication Service Providers may not be required to have outage detection functionality. However, this obligation will take effect on any subsequent Communications Hub exchanges or upgrade following the appointment of the DCC Communication Service Providers. The Government is seeking views on the advantages and limitations of this approach.

Government position:
The Government is minded to include a requirement in the SMETS for the Communications Hub to include the equipment necessary to provide electricity outage detection, and that the specific nature of this equipment will be specified by the DCC Communication Service Providers (once appointed).

Consultation Questions	
31.	**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.**
32.	**Do you agree that the DCC Communication Service Providers should specify the requirements for outage detection as part of their general role in specifying the WAN technology? Please explain your reasoning**
33.	**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.**

ii. Communications Hub Options

121. There are a number of options for how a Communications Hub could be included as part of the configuration of Smart Metering Equipment in the premises. In order to decide whether to mandate a particular configuration as part of the SMETS, the Government has analysed the options against a number of criteria (implications for costs and future flexibility,

implications for gas-first installations, implications for Foundation phase and implications for meter variants and complexity for suppliers). The five options that have been considered are:

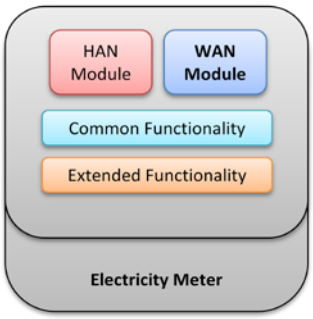
1. *Fully Integrated:* the Communications Hub functionality is built into the electricity meter with no modular components.

2. *Integrated with replaceable WAN:* the Communications Hub functionality is built into the electricity meter, but with a replaceable WAN transceiver, in line with the policy set out in the Response document on WAN exchangeability.

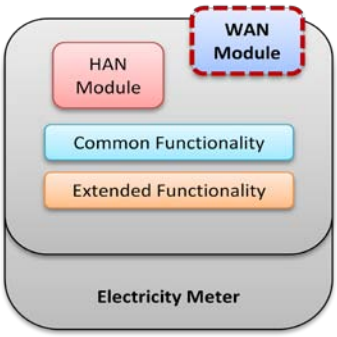
3a. Separate *Communications Hub with fixed WAN:* a separate Communications Hub with a wired or wireless connection to the electricity meter with no modular components.

3b. *Intimate Communications Hub with fixed WAN:* replaceable Communications Hub which forms part of the electricity meter with no modular components, which shares a HAN transceiver with the electricity meter. The Communications Hub could be replaced (wholesale) without replacing meter.

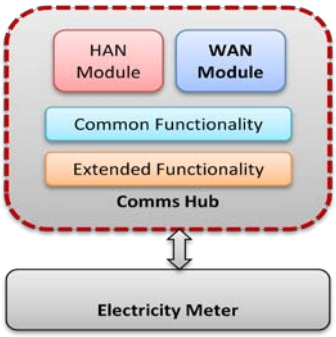
4. *Separate Communications Hub with replaceable WAN:* Separate Communications Hub with a wired or wireless connection to the electricity meter with a replaceable WAN transceiver.



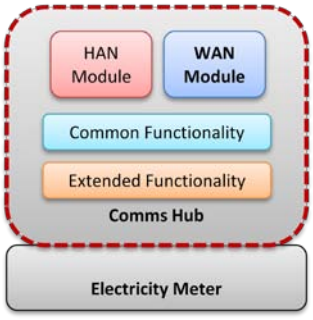
Option 1



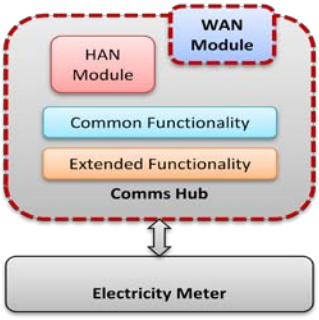
Option 2



Option 3a



Option 3b



Option 4

Implications for costs and future flexibility

122. The first criterion considered was the cost of the different options (as reflected in the Net Present Value (NPV) of the Smart Metering Implementation Programme), both for the "day-one" installation cost, and for an illustrative scenario where WAN technology is changed

in 2024. The replacement scenario has been designed as a representative scenario where the WAN technology might be upgraded to support new smart grid functionality.

Table 5: Cost comparison of identified options

Communications Hub configuration	Overall Net Present Value reflecting day one cost (millions)	Replacement costs (millions)
1. Fully Integrated	£7,225	£1,479
2. Integrated with replaceable WAN	£7,064	£742
3a. Separate Communications Hub with fixed WAN (preferred option)	£7,058	£889
3b. Intimate Communications Hub with fixed WAN	£7,175	£853
4. Separate Communications Hub with replaceable WAN	£6,900	£742

123. The key conclusion from this analysis is that the fully integrated option is initially attractive because the day one costs are lower. However, because the option is inflexible, where there is an upgrade to the WAN (which the Government does not consider to be unlikely within the operating life of the meter) that requires new transceivers to be installed in the premises, all metering equipment would also need to be replaced because the communications equipment is integral to the meter. As such, fully functioning equipment would be unnecessarily replaced, and additional costs created.

Implications for gas-first installations

124. The options also have implications for situations where gas Smart Metering Equipment is installed in advance of electricity Smart Metering Equipment, a flexibility the Government would like to retain. In those options where the Communications Hub is either integral to, or reliant directly on the smart electricity meter there are likely to be additional costs associated with gas-first installations. Where gas Smart Metering Equipment is installed first, the supplier would have to provide a Communications Hub to ensure compliance with their regulatory obligations. However, when the electricity supplier subsequently undertakes their installation, they would unavoidably need to install a second Communications Hub either because it is part of their smart electricity meter, or because the smart electricity meter is designed to work with an intimate Communications Hub. As such, options 1, 2 and 3b are unattractive from this perspective.

Implications for Foundation phase

125. In designing the obligations on suppliers to roll-out Smart Metering Equipment, a key issue is the impact of these obligations on the Foundation phase. In order to meet the Government's objectives of testing and building capability during the Foundation phase, a balance is needed between the requirements for consumer protection and maintaining incentives for parties to roll-out Smart Metering Equipment in advance of DCC. The early roll-out of Smart Metering Equipment is an important means by which to put in place the right foundations for the mass roll-out and to build industry readiness.

126. As set out in the Response, where suppliers choose to roll-out Smart Metering Equipment in advance of the DCC becoming operational, transitional arrangements will be put in place whereby the DCC is required to adopt the communications contracts associated with Smart Metering Equipment installed before its services were available, subject to these contracts meeting pre-defined criteria, for example on costs of services. Where the DCC does not adopt these meters into its systems, the installing supplier will need to install new equipment in the customer's premises in order to comply with their roll-out licence obligation. As such, with the fully integrated solution (option 1) where WAN communications equipment cannot be replaced without also replacing metering equipment, the risks of rolling out Smart Metering Equipment during the Foundation phase are greatest, because the potential liability for the supplier is greatest. For other options, where the WAN transceiver or Communications Hub can be replaced without the need to replace the electricity meter, the risks during the Foundation phase are more manageable.

127. A second potential implication for a successful Foundation phase is the availability of Smart Metering Equipment that meets the requirements of the SMETS. There are currently no agreed standards for a WAN module or Communications Hub to be universally replaceable or exchangeable, including physical interfaces, such as connectors and case work configurations, against which manufacturers could design equipment. It is estimated that a further twelve months might be necessary for industry to agree on a set of standards for this type of communication equipment. As such, with options 2, 3b and 4, which have exchangeable components for which there are no agreed standards, Smart Metering Equipment would not be available at least until mid-way through the Foundation phase.

Implications for meter variants and complexity for suppliers

128. As discussed in the previous section on HAN standards, while it is important that equipment is standardised, the use of multiple standards does add complexity for suppliers and other parties. Where there are differences in the design of equipment, suppliers will need to accommodate these in the range of meters and communications equipment that they procure.

129. Options that integrate metering and communications equipment into a single component will create additional complexity and require the procurement of a wider range of equipment. This complexity would be expected to translate into additional procurement and supply chain costs. It would also increase the difficulty of the physical roll-out of meters for suppliers (they may not know which WAN technology or meter variant will work best in any one premises, so will need to carry a range of equipment), which could potentially have a negative impact on the customer experience, as the installation process could be more protracted.

130. As such, options 3a and 4 where communications equipment is not connected to the electricity meter offer the greatest flexibility for procurement by suppliers. The most effective

way to reduce complexity would be for the Government to mandate a single configuration of communications equipment in the premises.

131. Based on the analysis above, the Government considers that while there is merit in allowing suppliers the flexibility to choose the configuration which is the most appropriate now and in the future (capturing the benefits of evolution in technology and other factors), these arguments are likely to be outweighed by the benefits from standardisation resulting from a single mandated approach to the Communications Hub.

Government position:
The Government is minded to specify that fully integrated electricity meters and Communications Hubs will not comply with the SMETS. The Government is also seeking views on whether to mandate a single configuration of communications equipment: a separate Communications Hub without exchangeable WAN transceivers (options 3a).

Consultation Question	
34.	**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.**
35.	**Do you think the Smart Metering Implementation Programme objectives would be better met by:** **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 Hub[24]?** **Please explain your reasoning.**

(b) End-to-end Smart Metering System Messaging

This section discusses requirements that could be included in the SMETS in relation to the messages between components of the Smart Metering Equipment, and the Smart Metering Equipment and the DCC. Particular consideration is given to:
i. Specifications for the HAN; and
ii. Specifications for the Application Layer.

132. The transfer of data across a network requires the use of communication protocols which are 'understood' by equipment on that network. Such protocols are generally defined in

[24] This would be subject to standard specifications being agreed where components are exchangeable between different manufacturers products and excluding the option of a fully integrated electricity meter and Communications Hub.

relation to the Open Source Interconnection (OSI) seven layer model[25], which for simplicity may be condensed to two layers: application and transport. The application layer defines the content of messages and the way in which they are presented. The transport layer defines the physical communications interface and the methods by which data packets are transmitted and validated.

133. In relation to the End-to-end Smart Metering System, messages need to be transferred between devices within the premises (across the HAN, for example, between a smart meter and the Communications Hub) and between the premises and the DCC (across the WAN). In order for messages to flow between devices and DCC, suppliers of equipment need to understand both the application and transport layer messaging arrangements across both the HAN and the WAN.

134. The transport layer for the WAN (for example, GPRS, Long Range Radio, RF MESH, PLC) will be determined through the procurement of DCC's communications services. Given the potential need for 'core' and 'infill' technologies and the possibility of different contractors being appointed in different regions, there are likely to be a variety of WAN transport layers in use in GB.

i. Specifications for the Home Area Network (HAN)

135. There are a range of possible transport layer protocols (for example, M-Bus or Zigbee) which could be used to support communication across the HAN. Each device connecting to the HAN must be equipped with communication technology that enables the transport layer protocols to be "understood". A range of HAN solutions were reviewed by the SMDG. These comprised standards issued by the EU and internationally recognised standards bodies, and others which are seeking approval. The different options offer different characteristics, for example whether wireless or wired, or the ability of different wireless options to penetrate different building materials.

136. The IDTS proposes that the "HAN interface", shall be available for adoption as a standard by 31st December 2014 as one of the following:

- a European (CEN, CENELEC or ETSI) standard;
- an International (IEC or ISO) standard; or
- formally accepted as a work item by a European or International Standards Organisation."

137. The Government's current view is that to support interoperability, all HAN interfaces should comply with published standards issued by internationally-recognised standards bodies. A standards-based approach to HAN interfaces is important because it provides a platform for:

- supporting the installation of single-fuel Smart Metering Equipment. The party installing Smart Metering Equipment for the second fuel in a premises would be able (where physical or other reasons allow) to install equipment which is compatible with the Smart Metering Equipment from the first-fuel installation (because it would be based on a recognised, open standard), such that there is a standard based HAN in each premises;

[25] These layers are:- Physical, Data Link, Network, Transport, Session, Presentation, Application. Further information available at www.iso.org (ref. ISO/IEC 7498-1:1994- section 6)

- supporting a market for ESCOs and other Authorised Third Parties. Basing equipment on internationally-recognised standards will enable providers of energy efficiency or other services to select equipment which is compatible with the HAN.

- providing a positive consumer experience. Consumers will have confidence that they will be able to interface with the End-to-end Smart Metering System through additional communications equipment and smart appliances that are compatible with the HAN; and

- enabling meter operators ready access to Smart Metering Equipment. Meter operators, when commissioning Smart Metering Equipment or when visiting consumer premises (for example on a routine safety check, or to perform maintenance) can be confident that their hand-held terminals will interact with the HAN, because it is based on an internationally-recognised standard.

138. The industry working groups also considered the merits of mandating a single HAN standard for Smart Metering Equipment in GB. However due to the diversity of property types, building materials and other physical characteristics and the need to provide wired and wireless solutions, they recognised that it was unlikely that a single HAN standard will be suitable for all properties in GB. As such they could not recommend a single HAN standard, instead they provided criteria for selecting a HAN as part of the IDTS.

Specifying HAN standard(s)

139. The Government recognises there are attractions to using the criteria proposed by the industry working group to limit suppliers to using a small number of acceptable standards. It would reduce the cost and complexity of the Smart Metering Equipment, and contribute towards delivering interoperability (in the same way that mandating the configuration of the Communications Hub would, as discussed in the above section). Suppliers would also benefit from the reduction in complexity because they would need to procure and support a smaller range of equipment because of the restrictions on the number of HAN standards. Meter manufacturers and meter operators would also benefit, because they would have greater certainty about the manufacturing requirements and requirements for hand-held devices to support installation and maintenance of equipment.

140. Consumers would also benefit directly from the simplicity of a system based on a limited number of standards: decisions to purchase a smart consumer appliance would be more straightforward because there would only be a limited number of standards from which they would have to choose (i.e. they would only need to know the HAN standard installed in their premises by their supplier in order to purchase compatible equipment).

141. However, there is insufficient evidence of performance of different HAN standards to support a decision by the Government now on which standard(s) to mandate in the SMETS. Specifying a limited number of HAN standards now would create a risk that certain homes may not receive the full desired functionality of Smart Metering Equipment. The Government is also concerned about taking such a decision based on the information currently available, because of the risk risks of selecting suboptimal standards or locking in technology obsolescence. Therefore, the Government is not proposing at this stage to mandate a list of acceptable HAN standards as part of the SMETS.

142. The Government also recognises a particular advantage of allowing flexibility in HAN standards, in particular during the Foundation phase, which the Response noted as a period to

build a base of consumer, business, market and regulatory confidence. Allowing suppliers to choose which standards to adopt would provide an opportunity to assess the practical experience of operating different HAN solutions. It would:

- build evidence of the appropriateness of specific standards for individual premises; and
- test experiences for consumers and other parties in dealing with interconnecting devices from multiple manufacturers, including consumer appliance manufacturers.

143. The Government anticipates that this approach will support any future decisions to mandate a limited number of acceptable standards and help industry to coalesce around the most effective standards for GB. The Government wishes to understand stakeholders' views on the practical and economic implications of allowing different approaches to HAN specifications. The Government will keep this issue under review, including the implications of the proposed approach on interoperability and efficiency of Smart Metering Equipment.

Government position:
The Government is minded not to specify a single HAN standard as part of the SMETS – at least for the Foundation period. Instead the Government is seeking view on allowing flexibility for suppliers to test a range of technologies to help identify the most appropriate standard(s) for the End-to-end Smart Metering System.

Consultation Questions	
36.	**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.**
37.	**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 recommendation? Please explain your reasoning.**
38.	**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.**

ii. Specifications for the Application Layer

144. As with the HAN transport layer, a number of application layers were reviewed by the SMDG in terms of their ability to support the security requirements, the range of WAN and HAN transport layer standards they could support, their ability to support GB-specific functionality (for example, prepayment), and the availability of equipment complying with the standard.

145. Based on the industry's assessments, the IDTS proposes the DLMS standard (with GB companion specifications) for messages between the Communications Hub in the premises and the DCC. Within the premises (i.e. between the Communications Hub and devices

connected to the HAN) the IDTS proposes Zigbee Smart Energy Profile (SEP) 1.x for gas meters, electricity meters and the IHD, with the option of using DLMS for electricity meters.

146. The proposal to use a single application layer standard for messages transported across the WAN would provide clarity for bidders for the DCC's data and communications services. Application layer standards will need to be specified in these contracts as they impact on the message content and handling. If the DCC is required to support multiple application layer standards it will also need to acquire and operate multiple message translators. This would add costs and introduce the risk that, over time, the standards (which are administered by international bodies not controlled by the Government) may diverge, resulting in ambiguity between messages and thus interoperability.

147. The IDTS proposal does not however present a full analysis of the practical, economic and security implications of translating messages between application layer standards in the Communications Hub in the premises or within the DCC.

148. Therefore, the Government wishes to understand stakeholders' views on the proposals set out in the ITDS, including the implications that would need to be considered in relation to translation being performed in the Communications Hub.

Government position:

The Government is seeking views on the IDTS proposals that:

- **DLMS should be specified in the SMETS as the application layer for communications with the DCC; and**
- **suppliers should be given flexibility to install and use a range of application layers for communications within the consumer premises, provided they install the necessary translation equipment.**

Consultation Questions	
39.	**Do you agree with industry's recommendation that DLMS should be adopted as the application layer for communications with the DCC? Do you believe 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?**
40.	**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?**

(c) Communications network standards and addressing

This section discusses requirements that could be included in the SMETS to help ensure individual messages are capable of being correctly routed between the DCC and Communications Hubs in consumer premises.

149. Communications between the DCC and the Communications Hub in each consumer premises will be provided by the WAN. To allow individual messages to be correctly routed between the DCC and specific Communications Hubs, Communications Service Providers will be expected to provide a suitable network-layer addressing scheme[26] as part of the functionality of the WAN[27].

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.

150. Network-layer addressing standards such as IPv4 (IETF publication RFC 791) and IPv6 (RFC 2460) have been developed to deliver interoperability and simplicity of systems, and are widely used across a number of sectors. The use of such standards allows a user to send messages to others without needing to know anything about the infrastructure being used. In the case of smart metering, this would mean that the DCC could send messages to Communications Hubs without needing to know details of the WAN service to which that Hub is connected. However, the use of such addressing standards imposes an overhead on all messages. In the case of the public internet, this overhead is small in relation to the size of messages (emails, graphics, etc.) being carried. In the case of smart metering – where messages are much smaller – the overhead is a much more significant proportion of the total volume of data.

151. The DCC communications service must provide high levels of coverage at a low cost and therefore it is reasonable to expect that viable communications solutions will have either limited bandwidth, higher levels of latency or a combination of both. This assumption is supported by the responses to both the Prior Initiation Notice (PIN) and Project Information Memorandum (PIM) for DCC service provider procurement. Potential Communications Service Providers have proposed a range of wireless (cellular 2G, long range radio and mesh radio) and wired (power line communications) options which have specific capacity limitations.

[26] The network addressing layer is one of the 7 layers of the OSI model. The generic 'transport' layer referred to in the earlier discussion on end-to-end messaging includes network addressing.
[27] Note that the communications network layer addressing scheme does not necessarily uniquely identify each device within the Smart Metering System. This is a functional requirement listed in the Catalogue.

152. Accordingly, the Government recognises there is a trade-off between simplicity and consistency of message addressing (which could be realised in terms of lower cost DCC systems) and having efficient communications and a wider range of WAN options.

153. To facilitate interoperability, the network-layer addressing protocol should be based on open, non-proprietary standards. It should also, as a minimum, provide the DCC with a unique, static address for each Communications Hub connected to the WAN for the purposes of routing messages from the DCC to the appropriate consumer premises.

154. However, at this stage in the DCC Services Procurement, the Government does not propose to mandate a network-layer addressing standard for the WAN. Instead, Communications Service Providers should specify the network layer protocol that would be used by the WAN and that would need to be supported by the Communications Hub (incorporating the appropriate WAN transceiver for the relevant WAN physical-layer technology).

Government position:
The Government is minded not to specify a network-layer addressing standard for the WAN, instead requiring potential Communications Service Providers to specify the network-layer standard they propose using for the WAN.

Consultation Questions	
41.	**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.**
42.	**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?**

(d) Network operator requirements

This section discusses requirements that could be included in the SMETS to help support the delivery of smart electricity grids. In particular:

i. **Maximum and Minimum Demand detection;**
ii. **Network Registers; and**
iii. **Floating Neutrals.**

155. The Smart Metering Equipment roll-out could deliver significant benefits for the Distribution Network Operators (DNOs) delivery of smart electricity grids, which use active response measures and pricing signals to manage grid loads and optimise forward planning of

generation and grid reinforcement. In order to support these potential benefits, a number of functional requirements for Smart Metering Equipment were identified by the industry working groups. The Government recognises that these requirements have the potential to become more important as electricity demand and generation patterns alter over time.

156. During the development of the IDTS a number of additional requirements for networks were proposed. It was evident through this process that the proposed additional functions were contentious and that a divergence of views on their costs and benefits existed. The Government has therefore decided to use this consultation to seek further views and evidence in order to allow a conclusion to be made on whether the proposed additional functionalities should be included as minimum requirements in the SMETS.

i. Maximum and Minimum Demand detection

157. 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. This should allow DNOs to pinpoint issues swiftly and respond accordingly through, for example, informed investment decisions. DNOs have suggested that this functionality should be provided as a minimum and best be provided within a separate network register (see below). However, this approach was not supported by energy supplier representatives or meter manufacturers who argued that there would be an uplift in costs with unconfirmed benefits.

Government position:
The Government is seeking further evidence on the costs and benefits of mandating maximum and minimum demand detection as requirements in the SMETS.

Consultation Questions	
43.	**Do you think that maximum and minimum demand functionality should be included in the SMETS? Please provide supporting evidence for your response**

ii. Network Registers

158. The DNOs have indicated that as the electricity generation mix moves to a higher percentage of intermittent generation, such as wind or solar renewables, 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 charges 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.

159. 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 Distribution Use of System charges, rather than including the requirements within existing generic registers. The network register would contain all metering data relevant to performing their regulatory duties. DNOs suggest that separating their information at the meter will also be more efficient than relying on back office processes to strip out and sub-divide DNO data requirements. The DNOs have also suggested that wide area

communications costs would be reduced as they would be able to configure the registers to record only the data they require (i.e. specific time based periods) rather than incurring the burden and costs of communicating all data over the system when most of which would not be useful.

160. In taking the electricity tariff requirements forward, the industry working group considered whether dedicated registers were necessary for DNO use. The provision of dedicated network registers within the End-to-end Smart Metering System may simplify the route for access to data by the DNOs. However, meter manufacturers stated that providing network registers would add cost to the Smart Metering Equipment. It should also be noted that the use of and access to data, and availability of such registers, would have to be considered in line with the privacy policy framework that Government is developing and with data protection legislation.

161. In order to assess the benefits of these additional registers the Government intends to identify:

- the cost of the additional storage requirements;
- the flexibility to use existing registers to provide this functionality (thus avoiding an increase in memory capacity) and;
- the benefits that this separate storage might be expected to provide.

162. The Government also requests further information on the efficient delivery of necessary data to DNOs by alternative means. This will enable the Government to quantify the burden of dealing with DNO data requirements using back office systems and any uplift in WAN costs.

Government position:
The Government is seeking further evidence on the costs and benefits of mandating the provision of equipment to support network registers as requirements in the SMETS.

Consultation Questions	
44.	**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).**

iii. Floating Neutrals

163. Another issue that has been raised by DNOs is whether Smart Metering Equipment could be used to reduce the impact of 'floating neutrals'. This type of network fault 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'. Whilst this is uncommon, the prevalence is increasing due to theft of copper cabling from DNOs' equipment.

164. The minimum functional requirements of the Smart Metering Equipment provides for an alarm to be triggered where an over or under voltage beyond a specified threshold is detected and recorded. This can then be communicated back to the DNO via the DCC.

165. The DNOs have proposed that the functionality is extended further so that, on the detection of excessive voltage, that the prepayment contactor switch is opened to cut the supply to the premises. This action would protect the consumer's equipment between the time the alarm is registered and when the DNO can resolve the problem.

166. While there was broad support for the concept from the industry working group, it was noted that the prepayment contactor switch was not designed for this functionality and that there were concerns that excessive voltage may cause the meter to respond in unexpected ways (for example, the supply could continue to flow by arcing across the switching points). The potential for the meter to disable supply based on automatic alerts also has an impact on consumer service and potentially provides an additional security risk.

167. The industry working group noted that a solution that does not rely on additional functionality is preferable. However, it was acknowledged that appropriate governance is required to ensure supply is only disabled where it is essential for the protection of consumer safety. DNOs have therefore suggested that a technical study and risk assessment is carried out before any such automatic system is introduced. This work is due for completion by early Autumn.

168. There is also indication from work being carried out within European standards that there may be a long-term requirement for electricity meters to be able to withstand temporary 'floating neutral' type voltages[28]. If the standard is approved then this will become a normative requirement for all meters. However, this standard is not due for completion until 2014. Hence there is uncertainty as to whether this requirement will be included in the final standard. If this standard is introduced then additional functionality may need to be included within the SMETS.

Government position:
The Government is seeking further evidence on the costs, risks and benefits of mandating as requirements in the SMETS that the prepayment meter contactor switch is used a safety feature to protect against "floating neutrals" faults.

Consultation Questions	
45.	**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.**

[28] Work carried out under IEC 62052-31 which proposes that a meter should be able to withstand a temporary line to earth voltage value of the normal live to neutral voltage above 250V

(e) Consumer access to consumption data

This section discusses requirements that could be included in the SMETS to help support consumer access to their consumption data In particular:

i. Access to data over the WAN; and

ii. Access to data over the HAN.

169. An important requirement of Smart Metering Equipment is the capability to store 13 months of half hourly consumption data. Consumers will be able to use this information to understand their pattern of energy use and see where it might be modified. The information will also be useful in helping them to find the most appropriate energy tariff. Consumers will be able to share the consumption data stored with third parties to enable them to access innovative energy services and tailored energy efficiency advice.

170. In the Response, the Government stated that further consideration would be given to ensure customers can easily access their own consumption data, taking into account the need to protect data privacy and ensuring that the security of the End-to-end Smart Metering System is maintained. To ensure that all consumers will have access to their data, the industry working groups have identified the following technical options:

i. Access to data over the WAN

171. When Smart Metering Equipment and the DCC are in place, a consumer will be able to give permission to either their supplier or a third party to retrieve their consumption data via the WAN. The supplier or third party can then provide the data to the consumer by various methods (for example, by post, email, telephone, web portal, etc.). This will ensure that all consumers, not solely those who have computers or who purchase devices to connect to the HAN (see below), will be able to access their data. Consumers could also elect for their current supplier or a potential supplier or third party to use this data to provide tailored energy efficiency or tariff advice.

ii. Access to data over the HAN

172. The Government has considered how the information that is available on the HAN can be easily accessed by consumers, in a way that remains secure. This information could be sent to smart appliances in the home or transmitted via a different communications network, which could be picked up by other devices (for example, a smart phone or computer).

173. Whilst it might be technically possible for the consumer to connect directly to the HAN, this would require smart devices to meet a higher level of security. A further complication is that the HAN may not use technologies that are prevalent or are sub-optimal for use in consumer devices. As such, three options were proposed by the industry working groups to facilitate consumer access to information from the HAN. These have subsequently been assessed by the Government:

- **Option A**: A consumer owned “bridging” device (envisaged to be a wireless connection) that will provide a secure connection, and converts and transmits the signals from the HAN onto another communication network that can be used by other devices.

- **Option B**: A physical port within the Smart Metering Equipment where the consumer can 'plug-in' a device (similar to the 'Bluetooth' or '3G' adapters already used to connect laptop computers to a peripheral device such as a mouse, or for mobile internet access) that can communicate with a network within the home.

- **Option C**: Provide the ability to directly connect through a second transmission system (for example, Wi-Fi or Bluetooth chip etc) that would be embedded into the Smart Metering Equipment. This would allow consumers to communicate with Smart Metering Equipment through their own communications network (in a similar manner to a wireless hard drive, or a wireless printer).

174. All of the options have advantages and disadvantages. Option A offers the most flexibility for consumers to elect the type of communication network that they would like to install in their premises (or not to install one if they would prefer). This mirrors the arguments that there is no one-size-fits-all standard for the HAN which will be installed and maintained by suppliers. It also offers future flexibility as consumers will be able to easily upgrade their systems as improvements are made in home network communications,. The main disadvantage of option A is that those consumers who wished to have this functionality through the HAN and not via the DCC would need to purchase their own equipment. The estimated unit price of such a "bridging" device is approximately £20.

175. Option B offers similar advantages and disadvantages to option A, except that the cost of a device that can be plugged directly into a meter is expected to be lower. However, option B raises a number of safety concerns arising from consumers being encouraged to "plug and play" with their Smart Metering Equipment. Option B would also require additional functionality to be built into the meter, potentially delaying the availability of compliant meters as additional design work would be necessary, which could hinder the achievement of the Government's objectives for the Foundation phase. Finally, it is unlikely that the physical port could be guaranteed to support all future evolutions of communications technology, or that it could be guaranteed to continue to operate throughout the operational life of the Smart Metering Equipment.

176. Option C offers the benefits of simplicity: the equipment needed to transfer data from the HAN to another network in the consumer's premises would already be installed in the Smart Metering Equipment, meaning the consumer would not need to purchase any additional equipment to access this functionality. However, like option B, it would require additional design work, in particular as there would need to be an assessment of which communications technology should be selected to be installed as part of the Smart Metering Equipment. As such, it could also potentially undermining the Government's objectives for the Foundation phase. In addition, option C is inflexible: consumers would be locked into a particular communications technology, which creates the risk of technological obsolescence. In addition to the risk of an initial sub-optimal decision, but the technology selected may be superseded by competitor technologies or the market may not continue to offer products or support the Government's mandated approach.

177. On balance, the Government is minded to support option A: that consumers who wish to have the functionality of accessing their consumption data over the HAN and transferring it to other devices in the home will need to purchase a "bridging" device. This would not create any additional costs for the suppliers (and by extension consumers at large), rather those consumers who wished to have the additional flexibility can choose to make the investment. More importantly, this option provides the necessary flexibility for innovation and market

developments by avoiding locking consumers into a single technology that may become obsolete. This flexibility is important because smart metering is a new concept and it is unclear how the market will develop smart appliance and "bridging" devices, and flexibility is needed to be able to respond to unforeseen developments. The Government will continue to monitor the development of this market during the Foundation phase.

178. The Government also recognises that the process of connecting a "bridging" device needs to be straightforward for consumers to avoid creating a disincentive for them to participate in this market. Any link that is established between consumer devices and the HAN increases the security risk to the End-to-end Smart Metering System associated with unauthorised access to data or functionality residing in the HAN. As the level of internet connectivity associated with many consumer devices increases, the Government recognises that proportionate security controls (covering authentication of devices as well authorisation) will need to be maintained. Therefore, the Government intends to develop an appropriately secure but consumer-friendly connection process.

179. This issue is considered further in the Data Access and Privacy Call for Evidence, published alongside this consultation[29].

Government position:
The Government is minded to introduce requirements in the SMETS that will enable consumers to access their data over their Home Area Network via a "bridging" device. The Government also intends to develop an appropriately secure but consumer-friendly connection process.

Consultation Questions	
46.	**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.**

(f) Electricity Isolation Switch

This section discusses the proposal to include requirements in the SMETS for an electricity isolation switch.

180. Electrical contractors sometimes need to work on equipment between the meter and the consumer main switch (for example, when replacing a consumer unit/fuse box). To allow safe working, the supply is switched off by removing the main supply fuse. There are

[29] http://www.decc.gov.uk/en/content/cms/tackling/smart_meters/smart_meters.aspx

obligations as part of the existing regulatory framework in place on DNOs to control this activity.

181. Under existing regulatory framework, the situation, as described by the ESC, is that electrical installers must arrange with the supplier, or through its meter operator, to remove the fuse. Other bodies (for example, electrical installers) are not permitted to remove the fuse. Anecdotal evidence suggests that complying with this obligation causes inconvenience and cost to electrical installers. The ESC has argued that this incentivises, in some instances, contractors to circumvent the obligation by either removing and replacing the main supply fuse themselves or alternatively working without removing the main supply fuse (i.e. “working live”), placing themselves and their customers at risk.

182. The Electrical Safety Council (ESC), supported by a number of electrical installer trade associations, proposed that Smart Metering Equipment should include an electricity isolation switch as an additional minimum functional requirement. This would allow electrical installers to work safely on equipment between the meter and the consumer's main switch without requiring the main supply fuse to be removed.

183. In the Response, the Government acknowledged this issue and undertook to consider whether inclusion of an isolation switch as part of the Smart Metering Equipment or alternative approaches should be adopted as part of the Smart Meter Implementation Programme. As such ESC was asked to consider the provision of an isolation switch alongside other potential options.

184. Working with the Energy Networks Association (ENA) and the Association of Meter Operators (AMO), ESC presented to Government a business case that covered four potential options:

1. modify the design of the currently-specified single-pole ‘load switch’[30] in the smart meter to permit manual isolation by an electrician;

2. incorporate an additional manually-operated single-pole or double-pole switch in the smart meter to provide for isolation;

3. install a separate double-pole isolating switch at the same time as the smart meter; and

4. introduce a system for the authorisation of competent non-supply industry personnel to withdraw cut-out fuses.

185. Through the industry working group process, the ESC, trade representatives of electrical installers, ENA and AMO were strongly supportive of options 1 and 2. BEAMA, the trade association of meter manufacturers, supported option 3. High-level costs and benefits were included in BEAMA’s submission that allowed an initial comparison of the options.

186. On the basis of evidence presented to date, the Government does not believe that sufficient benefits have been identified to justify the additional costs that would be incurred by amending the functional requirements (and related industry drafted technical specifications) or

[30] Switch used for prepayment or remote enablement/ disenablement for supply purposes

the approach to roll-out to support options 1, 2 or 3. Option 4 is an option that goes beyond the scope of the Smart Metering Implementation Programme.

187. The Government recognises the importance of resolving the issue raised by ESC as a matter of urgency. As such, the Government will continue to work with Ofgem, HSE and other relevant stakeholders to ensure that the most appropriate solution is developed and implemented.

Government position:
The Government is seeking further evidence on the costs, risks and benefits of the options to tackle the risk of electrical contractors working unsafely on live metering equipment.

Consultation Questions	
47.	**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.**

(g) End-to-end Smart Metering System architecture

This section discusses the IDTS proposals for the technology architecture for the End-to-end Smart Metering System.

188. As noted in section 3.3(d), the individual components above need to be drawn together into a coherent, holistic, end-to-end technical architecture. The Government will consider individual responses in developing this architecture.

The IDTS implicitly proposes an architecture which comprises:

- Specified devices in the premise;
- HAN standards to govern interoperability between devices;
- A Communications Hub to act as an interface between the consumer premises and the WAN (providing physical connectivity and language translation); and
- An application layer to provide consistent data format and standards.

189. The Government recognises that the industry working groups have concentrated on the architecture of Smart Metering Equipment. However, this does have implications for the End-to-end Smart Metering System architecture. The government is seeking views on the

IDTS proposals and the influence they have on the End-to-end Smart Metering System architecture.

Government position:
The Government is seeking views on the IDTS proposals for the technology architecture of the End-to-end Smart Metering System, in particular in relation to the Communications Hub and the best locations for translation functions .

Consultation Questions	
48.	**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**
49.	**Where do you believe that translation is best managed:** **a) At the Communications Hub; Or** **b) At the DCC?** **Do you have any economic, technical or consumer evidence to assist Government in evaluating the options?**

(h) In-Home Display (IHD) Functionality

This section discusses requirements that could be included in the SMETS in relation to the design and functionality of the IHD. In particular:

i. **Consumer accessibility and inclusivity;**
ii. **Ambient display of real-time energy based on usage and cost;**
iii. **Account balance for credit customers;**
iv. **Real-time gas demand;**
v. **Consumption and cost in latest bill period; and**
vi. **"Next-tariff" rate.**

190. The Prospectus Response set out a number of proposals for further exploration for IHD functionality. To examine these issues, the Government established a working group of industry experts and consumer representatives. The conclusions of this working group are reflected in the IDTS, and the key considerations are summarised below.

i. Consumer accessibility and inclusivity

191. The Response proposed the adoption of inclusivity by design principles to ensure that the IHD meets the needs of as wide a range of consumers as possible, including those with particular accessibility requirements. However, it did not propose any detailed requirements in relation to accessibility and inclusivity.

192. The Government is continuing to work with suppliers, manufacturers and other interested parties, including Consumer Focus and Ricability[31], to develop a high-level list of accessibility and inclusivity design principles. It expects these principles to be adopted as best practice and will keep this issue under review.

ii. Ambient display of real-time energy based on usage and cost

193. The working group considered whether there would be additional benefits of providing ambient information (for example, a red / amber / green status) of the costs of energy and on usage levels at a given point in time. The group considered that there was the potential for confusion in providing ambient information based on both usage and cost. The group concluded that showing cost in a simple ambient form was less valuable than using ambient feedback to reflect the level of energy being consumed. This was because energy usage, unlike energy prices, is something which the consumer can influence and alter with immediate effect through their actions.

Consultation Questions	
50.	**Do you agree that the IHD should only be required to display ambient feedback based on energy usage? Please explain your answer.**

iii. Account balance for credit customers

194. The Response included a requirement on suppliers to provide their credit customers with at least a monthly update of their account balance on their IHD, in addition to separate requirements to provide real-time account balance information to prepayment customers. The industry working group considered options to implement this requirement, but did not reach consensus on the way forward.

195. The Government has considered the potential costs and benefits of this requirement. According to information provided by suppliers, the costs of mandated provision would be significant. These include costs arising from:

- Changes to billing systems;
- Communicating messages for payments;
- Reconciliation between back-office systems and the metering system; and
- Call centre handling costs.

196. In addition to the uncertainty regarding the potential costs of this requirement, concerns have been raised about duplicating the requirement for the IHD to make available

[31] Consumer Focus has worked with Ricability to publish an expert evaluation of IHDs and energy displays, and a literature and research review; both of these documents look at the usability of IHDs. **Getting to grips with smart displays** - An expert appraisal of the usability of in-home energy displays (Consumer Focus & Ricability 2011); **Usability of in-home energy displays for use with smart metering** - A research & literature review (Consumer Focus & Ricability 2011).

indicative cumulative daily/weekly/monthly consumption information (in £). The Government is also aware that for credit customers, account balance information may be less relevant than for prepayment customers. For example, for credit customers paying by fixed direct debit, payments are not directly proportionate to the level of consumption in the last billing period. Payments are calculated based on average consumption across the year. A customer's payments are therefore likely to be higher than the actual cost of energy consumed in the summer months and lower in winter. Therefore displaying a running account balance during the summer may provide confusing or misleading signals to the consumer about their consumption behaviour.

197. The Government acknowledges that some credit consumers would find real-time account balance useful. However, there is insufficient evidence to show that credit consumers who already receive real-time information on the cumulative cost of their consumption, will further benefit from the provision of account balance information via their IHD. The Government also recognises that other parties have suggested that more cost-effective ways exist to deliver this information.

198. Metering equipment manufacturers have also confirmed that, based on the recommendations in the IDTS, they would intend to manufacture meters that would be capable of being configured to calculate real-time account balance information to credit customers. This suggest that the cost of remotely configuring a meter to calculate account balance for a credit customer in real-time should be no greater than the cost of configuring a meter to switch from credit to prepayment mode. It is however reasonable to assume that there will be costs from developing and testing the new meter configuration. Therefore, there remains some uncertainty around the total costs for suppliers to meet this requirements.

199. Given the current evidence base, the Government is minded not to include the requirement to provide account balance information to all credit customers via their IHD. The Government is inviting interested parties to provide evidence through this consultation on the benefits that would arise from providing credit customers with account balance information via an IHD and the potential costs. This will help the Government build a more robust evidence base of the costs and benefits before making a final decision on this issue.

200. The Government is minded to mandate through the SMETS that:

- Smart Metering Equipment be capable of calculating an account balance for credit customers (providing the tariff is compatible with the tariff 'table' specified in the IDTS for prepayment accounts);

- the End-to-end Smart Metering System should support messaging of an account balance (i.e. will contain functionality that allows suppliers to send an account balance message to Smart Metering Equipment); and

- the IHD be capable of displaying an account balance.

201. By including this functionality in the SMETS, suppliers will be able to offer credit customers a range of options for the presentation of account balance on their IHD, including the option of not displaying a balance.

Government position:
The Government is minded to include requirements in the SMETS to support the calculation and/or display of account balances for credit customers. The Government is also seeking views and supporting evidence on the costs and benefits of requiring suppliers to provide this service.

Consultation Questions	
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?**
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?**

iv. Real-time gas demand

202. An issue identified for further consideration in the Response, was whether the IHD should provide a real-time display of gas consumption. The conclusion of the working group was that it was impractical to include this requirement for the IHD and it should not be included in the SMETS. This is because it would require the continual sending of messages from the gas meter to the IHD which would put a substantial drain on the life of the battery in the gas meter. Installing a meter with this functionality which could meet the requirement to have a normal operating life of fifteen years was considered uneconomic. Instead, the industry working group has recommended that the IHD should display gas usage updated on a half hourly basis. The Government is minded to agree with this recommendation.

v. Consumption and cost in latest bill period

203. The working group has proposed to withdraw the requirement set out in the Response for the IHD to display the cumulative consumption built up over the current bill period. It was felt that this may add an unnecessary level of confusion, in particular as it could duplicate other display requirements such as the requirement to display cumulative consumption over the day, week and month.

204. The group identified further complicating factors with showing cumulative data for a bill period and that any cost displayed could only be indicative. These included the range of billing options (routinely billed, monthly direct debit to pre-paid arrangements), discounts and standing charges which would complicate calculations. The group also felt that comparing consumption in a bill period to any previous bill period has little relevance because of variations in seasonal consumption. The Government is minded to agree with these recommendations.

vi. "Next-tariff" rate

205. "Next-tariff" functionality is the ability of the IHD to display information to customers on time-of-use tariffs on the unit price will be in the next tariff period, as opposed to the real-time price. The rationale for potentially including this functionality is to help consumers better manage their demand by avoiding using energy at times of peak prices.

206. The industry working group concluded that there was insufficient evidence of the benefits of providing this information on all IHDs. In particular, the case was unclear given such information is more relevant to dynamic time-of-use tariffs, rather than those with fixed prices and tariff periods, and that the wide-scale adoption of those tariffs is unlikely to take place in the near future. As such the Government is minded not to include this functionality in the SMETS.

(i) Enduring prepayment interface

207. Under the current regulatory framework, suppliers are subject to a licence obligation to install/ switch a consumer to a prepayment meter in certain circumstances, but only where it is safe and reasonably practicable to do so. As a significant number of meters are situated in inaccessible locations, a sizeable group of customers are currently unable to have a prepayment meter without having to have their meter moved.

208. In the Response, the Government stated its intention to further consider the costs and benefits of different options for providing an enduring prepayment interface to provide consumers with prepayment functionality even where meters are inaccessible to consumers. Such an interface would be needed to provide for scenarios where communications via the WAN between the premises and the supplier were unavailable.

209. The two options considered were:

- A device wired to the meter; and
- A wireless device – effectively an enhanced in-home display (IHD).

210. Having considered the options, the Government proposes to work with industry to further develop a wireless solution, as a variant to the requirement in the SMETS. However, this does not mean that implementation of a wireless solution will be mandated in all cases. The Government expects that suppliers will be able to use existing measures (for example, move the meter) where this is a more appropriate solution to enable prepayment services to be offered. However, the availability of a standard wireless solution should means that suppliers will be able to offer prepayment services in a wider set of circumstances, giving more customers the option of moving to a prepayment tariff, and avoiding the need for disconnection where a customer is in debt. It will also ensure that these solutions will continue to work on change of supplier. The Government will monitor whether implementation of a wireless solution is functioning as expected and satisfies the End-to-end Smart Metering System security requirements.

(j) Update from the Prospectus Response

211. The Government made a commitment in the Prospectus Response to give further consideration to a number of issues that were raised but not resolved during the consultation process. Table 6 lists these issues and describes the current Government position as appropriate (in some instances the issues are covered in other sections of this consultation).

Table 6: Update from the Prospectus Response		
Issue	**Description**	**Proposal**
Standard meter interface language or languages	See section 3.3	See section 3.3
Assurance and Governance arrangements	See section 3.4	See section 3.4
Accessibility and inclusivity of IHD design	See section 3.3	See section 3.3
IHD – minimum display requirements	See section 3.3	See section 3.3
IHD Update frequency	The Government confirmed its intention to seek clarification from the industry working group as to the extent to which the requirement for a five second update could be achieved without affecting cost and power constraints.	Subject to the review processes outlined in section 3.3, the Government is minded to accept the recommendation to retain this requirement because it is felt to be compatible with the overall requirements for the gas meter battery life.
Consumer access to consumption data	See section 3.3	See section 3.3
Outage detection	See section 3.3	See section 3.3
Electricity Isolation Switch	See section 3.3	See section 3.3
Smart Metering Equipment Data Items	The Government concluded that a minimum Smart Metering Equipment data item set should be further considered. An industry working group was established to consider the issue in detail and to present recommendations to Government.	The industry working group has developed a draft smart metering data catalogue. Subject to the review processes outlined in section 3.3.b. Government is minded to accept the draft data catalogue. This will be developed, as necessary, during specification of the end-to-end data systems, drawing on the smart metering business processes and application layer data model. This work is due for completion in conjunction with the SMETs.
Smaller non-domestic (and large domestic) meters	The Government asked the industry working group to consider whether variants should be produced of the technical specifications for smaller non-domestic and larger domestic consumers.	The Government has decided that CT meters in the non-domestic sector should be granted a derogation for AMR. The governance process for dealing with smaller non-domestic Advanced Meter exceptions to the technical specifications and the approach for upgrading domestic installations to smart meters will be considered in the next phase of the Smart Metering Implementation Programme.
EMS	The Government required that where wireless technologies are used, they will have to comply with relevant regulations, best practice and international standards as set out by the International Commission on Non-Ionising Radiation Protection.	The Government will continue to engage with the Department of Health and its full range of stakeholders on all relevant practical issues as work progresses on communications for smart metering.
WAN solution	See section 3.3	See section 3.3

Consultation Questions	
53.	**Do you agree with or have any comments on the Government's proposals for the outstanding issues from the Response? Please explain your reasoning.**

3.4. Assurance and interoperability

212. The Government recognises that an assurance framework may be required for the End-to-end Smart Metering System to give the confidence needed that the new arrangements will operate as intended before the enduring metering arrangements take effect (that is, at the point of DCC "go-live"). Such an assurance framework needs to take into account not just legal obligations, but any possible testing requirements, certification, accreditation and enforcement. Aspects of this assurance framework will need to be developed over the course of the Smart Metering Implementation Programme and will need to be considered on an ongoing basis.

What is an assurance framework for smart metering?

A smart metering assurance framework would be a method for managing the risks associated with aspects of Smart Metering Equipment and the End-to-end Smart Metering System. This can be supported by a number of mechanisms which help ensure that equipment or practices are acceptable and meet a required standard. A framework could include some of the mechanisms below:

- **regulatory legal obligations** with which suppliers and other parties have to comply under legislation, licence conditions and associated codes of practice. Enforcement for non-compliance would fall to Ofgem using their standard powers;
- **contractual obligations,** which in the case of smart meters could be a contractual obligation to deliver, for example, goods or services that meet a required specification. Enforcement for non-compliance would fall to the parties of the contract on a commercial basis;
- **testing requirements** in the form of an outline or plan of tests to demonstrate whether a product or system complies against a set of requirements or specifications. Testing can be used to demonstrate compliance on a proactive basis, or could be used to gather evidence of non-compliance on a reactive basis (for example to help enforce legal or contractual obligations;
- **a certification or accreditation scheme** against which products or systems could be certified that they follow a certain standard and/or accredited that they demonstrate a particular competence. This can be underpinned by a range of tools such as self-certification, or accreditation by an external panel or body; and
- **monitoring and enforcement mechanisms**, such as audit procedures, which could be used as part of an assurance framework to ensure that it operates effectively.

213. As proposed in chapter two, suppliers will be required to take all reasonable steps to install Smart Metering Equipment[32] which complies with the SMETS. The Government is also considering whether these conditions will be sufficient to deliver all the requirements and benefits of the system. In particular, the Government is seeking views on the role that an assurance framework could play in giving confidence that Smart Metering Equipment is:

[32] This condition does not include IHDs – please see 2.7 for further details on IHD licence conditions

- **capable of delivering the required functionality** set out in the SMETS.

- **interoperable** – for example assuring that:

  - o suppliers can win or lose customers without being concerned as to the specific type of Smart Metering Equipment that was originally installed by a previous supplier;

  - o other parties (network operators and authorised third parties) can access data from the Smart Metering Equipment, again without being concerned as to the specific type of smart meter at the specified metering point; and

  - o a second supplier can connect devices to apparatus installed by a first supplier, for example the Communications Hub, and that the new equipment will be compatible. Equally, consumers should be able to interface easily with the Smart Metering Equipment in their premises, for example to download consumption data or receive data for the operation of smart appliances.

- **secure** – this means that appropriate controls have been implemented to meet the security requirements included in the SMETS.

Consultation Questions	
54.	**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.**

(a) Accreditation, Certification and Testing

214. Notwithstanding views on the above question, the Government anticipates that Smart Metering Equipment installed by suppliers will be subject to some form of testing regime. Examples of the kind of testing undertaken could include:

- **overall security** – to determine whether overall security requirements are met and interoperate on an end-to-end basis;

- **smart metering functionality and interoperability tests** – to determine whether devices deliver the required functions and are compatible with each other. For example, tests whether devices communicating across the HAN can establish reliable connections in accordance with performance standards; and

- **message handling tests** – to determine whether devices respond to commands and requests from the DCC and deliver the data, acknowledgements and error messages in line with the specifications.

215. The Government is exploring what such a regime should look like and whether there is an argument to develop a testing regime underpinned by regulatory obligations. Possible options for a future regime include:

- **a market-led approach**: this would rely on participants' own testing arrangements, commercial incentives and enforcement of contractual obligations to ensure that the required technical specifications standards were met alongside delivery of interoperability and security requirements. This would be faster to deliver, potentially less expensive, less onerous and would have less of a regulatory burden. However, it might have the disadvantage of favouring larger participants and offer a less certain outcome;

- **a mandatory industry code and body to deliver and govern a testing regime**: this would be broadly in line with other industry practices. This could be governed independently of any other mechanisms or it could be delivered as part of the Smart Energy Code. It provides a high level of assurance and shares costs. However, a disproportionate regime could lead to undue burdens and governance overheads. It should be noted that a similar approach was developed to deal with similar assurance issues for the digital television sector. An entity was established by interested parties to deal with development and maintenance of necessary technical specifications, testing requirements/plans and laboratory conformance testing; and

- **a certification or accreditation scheme**: where products and systems demonstrate compliance with a set of requirements, they are certified or accredited with a "stamp of approval" by approved bodies or test houses. Such a scheme should give consumers and suppliers confidence that equipment has the required functionalities and performs as expected. As with an industry code approach, proportionality is important.

Consultation Questions	
55.	**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**
56.	**What are your views on the options outlined for a testing regime? Are there other options that should be considered?**

216. The Government also is also undertaking further work to consider the role of an assurance framework in the Foundation phase and whether a different approach is needed to the enduring phases of the Smart Metering Implementation Programme.

Consultation Questions	
57.	**Do you think that a different approach to assurance is necessary for the Foundation and enduring phases? Please explain your answer.**

(b) Next Steps

217. It is possible that any assurance framework, and in particular testing and accreditation requirements, may need to be notified to the European Commission under the Technical Services Directive (98/34/EC). This will be considered as the Government develops proposals on an end-to-end framework.

3.5. Security Trust Model

218. Further to the Response, it is recognised that the security of the End-to-end Smart Metering System is critical to its successful operation and to ensuring that operational and consumer data is protected. To this end, the Government has identified the security risks it faces and is developing security requirements proportionate to these risks. The security requirements are currently being embedded into the design of the End-to-end Smart Metering System.

219. To support the security activity, the Government has established and now facilitates the Security Technical Experts Group (STEG), membership of which includes:

- security representatives from industry – including energy suppliers, meter manufacturers, system integrators, etc.; and

- Government representatives – including the Centre for the Protection of National Infrastructure (CPNI) and The National Technical Authority for Information Assurance (CESG).

220. The Smart Metering Implementation Programme's security approach is consistent with the Cabinet Office's Security Policy Framework risk assessment standards and incorporates best practice from commercial information assurance guidance and international standards

221. The SMETS will contain a security section that will focus on the technical security requirements that are applicable to Smart Metering Equipment installed in consumer premises. Technical security requirements cover the controls and processes used to protect the confidentiality, integrity and availability of Smart Metering Equipment data and systems. The IDTS includes a number of recommended security requirements that cover areas such as data encryption, access control, device security roles, network security and tamper monitoring.

222. However, the security risk assessment conducted by the Smart Metering Implementation Programme has identified security risks associated with the End-to-end Smart Metering System, not just the Smart Metering Equipment at the consumer premises. The security of the End-to-end Smart Metering System is dependent on a combination of technical controls, process and governance arrangements. Furthermore, these security requirements are not limited to technical security areas (for example, message integrity checks and network access controls), but also include organisational security areas, such as personnel security and security incident management. The remainder of this section of the chapter presents the options that are available to address certain aspects of the security risks associated with the End-to-end Smart Metering System, that will need to be considered in more detail throughout the Smart Metering Implementation Programme.

Cryptographic functionality

223. The security requirements identified by the STEG suggest that cryptographic functionality may be needed to protect against unauthorised modification and disclosure of sensitive data and critical commands (for example, remote disablement, firmware upgrades, etc).

224. To ensure interoperability of any cryptographic functionality, the Government is considering whether there is a need to specify that, in addition to the relevant technical security requirements, the following activities should be performed:

- development of the end-to-end trust hierarchy and cryptographic key management design. This would enable the management of cryptographic keys across Smart Metering Equipment, DCC and DCC users in a consistent and coordinated manner; and

- determining how the cryptographic functionality specified in the security requirements can be implemented within Smart Metering Equipment. This would enable common cryptographic interfaces that will support the delivery of interoperable Smart Metering Equipment.

Consultation Questions	
58.	**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?**
59.	**Do you agree that cryptographic/ key management is necessary to secure the End-to-end Smart Metering System? Please explain your reasoning**

225. The Government is considering the following options for the trust hierarchy and cryptographic key management:

- use of **asymmetric** cryptography – a type of cryptography that uses a key pair for performing cryptographic operations. One key must remain secret and the other can be made public. A Public Key Infrastructure (PKI) and digital certificates are required to bind the key pair to an identity;

- use of **symmetric** cryptography – a type of cryptography that uses the same secret key for performing cryptographic operations between sender and receiver; and

- use of **hybrid** cryptography – a combination of both symmetric and asymmetric keys (e.g. asymmetric keys are used for encrypting a symmetric key which is securely shared and used for encrypting data).

Table 7 below outlines the Government's assessment of the advantages and disadvantages of each option.

Table 7: Advantages and disadvantages of cryptographic solutions

Option	Advantages	Disadvantages
Asymmetric (PKI)	• No shared keys used, therefore no need to transmit secrets over unsecure networks. • Digital certificates can be used to bind the public key to a device (for example, smart meter) or component (for example, DCC systems). This can protect against repudiation of commands.	• Specific functionality would be required to be built into the Smart Metering Equipment to perform asymmetric operations – this could increase design and manufacturing costs. • Significantly more processing power required for executing asymmetric key operations on every transaction requiring protection – this could affect system performance. • A Certification Authority (CA) hierarchy would need to be established to securely support issuance and management of digital certificates – this could increase running costs.
Symmetric	• Less processing power required for symmetric operations – potential to reduce costs and enhance performance.	• Considerable complexity involved in sharing secret keys over unsecure networks
Hybrid	• No shared keys need to be transmitted over unsecured networks as these can be encrypted using asymmetric keys. • Digital certificates can be used to bind the public key to a device (or component . This can protect against repudiation of commands.	• Specific functionality would be required to be built into the Smart Metering Equipment to perform asymmetric operations – this could increase design and manufacturing costs. • A Certification Authority (CA) hierarchy would need to be established to securely support issuance and management of digital certificates – this could increase running costs.

Consultation Questions	
60.	**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**
61.	**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.**
62.	**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.**

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.

Balancing and Settlement Code (BSC)
The BSC contains the rules and governance for electricity balancing and settlement in Great Britain. All licensed electricity suppliers must be party to it.

Communications Hub
A device or set of devices located at the consumer's premises which will have the capability to communicate and transfer data between Smart Metering Equipment and the WAN.

Credit mode
Mode of operation whereby consumers are billed for their energy retrospectively.

Current Transformer Meters
An electricity meter which uses a current transformer as part of the mechanism for measuring electricity consumption.

Data 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.

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, network operators and authorised third-party service providers.

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

Gas Mirror
A separate data storage device for maintaining information from the gas Smart Meter while the meter is not actively transmitting or receiving information.

Home Area Network (HAN)
The Home Area Network is the means by which communication between Smart Meters, IHDs and other Authorised Devices in premises is effected.

In-home Display (IHD)
An In-home Display is an electronic device, linked to the HAN, which provides information on a customer’s energy consumption.

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

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 (a condition in which the voltage at the supply terminal is lower than the statutory voltage limits, for a period in excess of 3 minutes) to be identified and communicated to the WAN.

Prepayment mode
The mode of operation whereby customers have to pay for their energy before using it.

Smart Energy Code
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 Meter
A meter which, in addition to traditional metering functionality (measuring and registering the amount of energy which passes through it), is capable of providing additional functionality; for example, two-way communication allowing it to transmit meter readings and receive data remotely.

Smart Metering Equipment
The Smart Meters, IHD, Communications Hub and any other devices needed to deliver the smart metering requirements described in the SMETS.

Smart Metering Equipment Technical Specifications (SMETS)
The document, designated by the Secretary of State, that describes the requirements of the Smart Metering Equipment that suppliers must take all reasonable steps to install in consumer premises in 2019.

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

WAN Module
The equipment that enables the exchange of information between the Smart Metering Equipment and the WAN.

Wide Area Network (WAN)
The network that is used for two way communication between the Smart Metering Equipment and the Data and Communications Company

Annex 1: Digest of consultation questions

1.	The Government is seeking new evidence and views on the impacts of specifying a completion date that is in the earlier part of 2019.
2.	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 necessary? Please explain your reasoning.
3.	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.
4.	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.
5.	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.
6.	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.
7.	What period of notice do you think would be appropriate before the new and replacement obligation comes into effect? Please explain your reasoning.
8.	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.
9.	Do you think the licence conditions as drafted effectively underpin the policy intention to ensure Smart Metering Equipment is interoperable? Please explain your reasoning?
10.	What role could a dispute resolution mechanism have a role in ensuring interoperability? What key features should such a mechanism have?

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.**
12.	**Do you think that the licence conditions as drafted effectively underpin the policy intention for Current Transformer meters? Please explain your reasoning.**
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.**
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.**
15.	**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.**
16.	**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.**
17.	**What period of notice do you think would be appropriate before the obligation to provide an IHD comes into effect? Please explain your reasoning.**
18.	**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.**
19.	**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.**
20.	**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.**
21.	**Do you think there are any other consequential changes to existing licence conditions needed in order to make the proposed roll-out**

	obligations work as intended? Please explain your reasoning.
22.	**Do you think there are any consequential changes to existing legislation needed in order to make the proposed roll-out obligations work correctly? Please explain your reasoning.**
23.	**Do you think there are any consequential changes to existing codes needed in order to make the proposed roll-out obligations work correctly? Please explain your reasoning.**
24.	**Do you think that there are other requirements that the Government should adopt in the SMETS? Please explain your reasoning.**
25.	**Do you agree that all the requirements recommended in the IDTS should be adopted by the Government in the SMETS? Please explain your reasoning.**
26.	**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.**
27.	**Do you agree that the process outlined above is a suitable way forward to develop the SMETS? Please explain your reasoning.**
28.	**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.**
29.	**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.**
30.	**Do you agree that the Government should include a requirement for a Communications Hub in the SMETS? Please explain your reasoning.**
31.	**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.**
32.	**Do you agree that the DCC Communication Service Providers should specify the requirements for outage detection as part of their general role in specifying the WAN technology? Please explain your reasoning**
33.	**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.
34.	**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.**
35.	**Do you think the Smart Metering Implementation Programme objectives would be better met by:** **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 Hub33?** **Please explain your reasoning.**
36.	**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.**
37.	**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 recommendation? Please explain your reasoning.**
38.	**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.**
39.	**Do you agree with industry's recommendation that DLMS should be adopted as the application layer for communications with the DCC? Do you believe 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?**
40.	**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?**

[33] This would be subject to standard specifications being agreed where components are exchangeable between different manufacturers products and excluding the option of a fully integrated electricity meter and Communications Hub.

41.	**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.**
42.	**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?**
43.	**Do you think that maximum and minimum demand functionality should be included in the SMETS? Please provide supporting evidence for your response**
44.	**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).**
45.	**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.**
46.	**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.**
47.	**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.**
48.	**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**
49.	**Where do you believe that translation is best managed:** **a) At the Communications Hub; Or** **b) At the DCC?** **Do you have any economic, technical or consumer evidence to assist Government in evaluating the options?**
50.	**Do you agree that the IHD should only be required to display ambient feedback based on energy usage? Please explain your answer.**

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?**
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?**
53.	**Do you agree with or have any comments on the Government's proposals for the outstanding issues from the Response? Please explain your reasoning.**
54.	**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.**
55.	**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**
56.	**What are your views on the options outlined for a testing regime? Are there other options that should be considered?**
57.	**Do you think that a different approach to assurance is necessary for the Foundation and enduring phases? Please explain your answer.**
58.	**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?**
59.	**Do you agree that cryptographic/ key management is necessary to secure the End-to-end Smart Metering System? Please explain your reasoning**
60.	**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**
61.	**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.**

62.	**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.**

Annex 2: Electricity draft licence modifications

Amendments to Condition 1. Definitions for standard conditions

The following definitions to be included in 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*];**
Gas Supply Licence	means a gas supply licence granted or treated as granted under section 7A(1) of the Gas Act 1986;
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 Smart Metering Equipment 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 of that title which 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 Equipment	means equipment installed at premises for the purposes of the supply of electricity to those premises which, on the

date on which it is installed, as a minimum:

(a) consists of the apparatus identified in;

(b) has the functional capability specified by; and

(c) complies with the other requirements of,

the SME Technical Specification applicable at that date;

Smart Metering Equipment (or SME) Technical Specification means the document of that title which 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;

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

The roll-out duty

1 The licensee must take all reasonable steps to ensure that Smart Metering Equipment is installed on or before ***[xx/xx/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 10 and 11.

The duty when installing new or replacement meters

3 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, any new or replacement Electricity Meter installed at that premises forms part of an installation of Smart Metering Equipment.

4 For the purposes of paragraph 3:

(a) a 'new meter' is an Electricity Meter that is being installed for the first time at the premises; and

(b) a 'replacement meter' is an Electricity Meter that replaces another Electricity Meter previously 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 10 and 11.

The duties on and after installation

7 The licensee must, in conjunction and co-operation with all other gas and electricity suppliers, 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 Smart Metering Equipment is being or has previously been installed, that equipment is interoperable.

8 For the purposes of paragraph 7, Smart Metering Equipment is taken to be 'interoperable' if it is designed and operates so that:

(a) the customer at the premises in which it is installed is able to change his Electricity Supplier without any requirement for the equipment (or any part of it):

(i) to be replaced; or

(ii) except to the extent that it can be done by means of remote communication, to be modified or reconfigured;

(b) any part of the equipment is capable of being replaced by an Electricity Supplier with another part designed to fulfil the same function, without that replacement adversely affecting the capacity of the equipment to operate as Smart Metering Equipment; and

(c) the equipment can operate in conjunction with 'Smart Metering Equipment' as defined in standard condition 1 of a Gas Supply Licence.

9 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 Smart Metering Equipment has been installed:

(a) subject to sub-paragraph (b), the Smart Metering Equipment continues to satisfy the requirements of the SME Technical Specification that was applicable at 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 Smart Metering Equipment (or any part of it) installed prior to the date specified in the direction, the Smart Metering Equipment (or the relevant part of it) is replaced, modified or reconfigured so as to comply with the amended requirements of the SME Technical Specification.

The exceptions – Designated Premises

10 The licensee is not required to install Smart Metering Equipment at any Designated Premises in respect of which:

(a) a contract for the installation of an Advanced Meter has been entered into on or before 5 April 2014; and

(b) the contractual obligation to install the Advanced Meter at the premises has been satisfied, or is required to be satisfied, on or before ***[xx/xx/ 2019]***.

11 The licensee is not required to install Smart Metering Equipment at any Designated Premises at which the existing Electricity Meter is a Current Transformer Electricity Meter.

Definition

12 For the purposes of this Condition:

Advanced Meter	means a meter which satisfies the definition of advanced meter in standard condition 12 but which does not constitute or form part of Smart Metering Equipment.

Condition BB: Provision of an In-Home Display

The IHD Direction

1 This Condition BB applies with effect from the date specified by the Secretary of State in a direction issued to the licensee (the **IHD Direction**).

The general duty

2 Where the licensee installs or arranges for the installation of Smart Metering Equipment at any Domestic Premises on or after the date specified in the IHD Direction, it must ensure that it:

(a) provides to that Domestic Customer clear and accurate information concerning the availability and benefits of an In-Home Display;

(b) offers the Domestic Customer the opportunity to have an In-Home Display provided at the premises at the same time; and

(c) where the Domestic Customer accepts the offer, provides the In-Home Display at the premises.

3 The requirement in paragraph 2 is subject to paragraph 4.

Exception to the general duty

4 The licensee is not required to comply with paragraph 2 if, on the date on which the Smart Metering Equipment is installed at the Domestic Premises, an In-Home Display has already been provided at those premises.

The duty on request of Domestic Customers

5 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.

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

6 The licensee must, in conjunction and co-operation with all other gas and electricity suppliers, 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 is being or has previously been provided, that In-Home Display is and remains interoperable until the end of the Relevant Period.

7 For the purposes of paragraph 6, an In-Home Display is taken to be 'interoperable' if it is designed and operates so that:

(a) the customer at the premises at which it is provided is able to change his Electricity Supplier without any requirement for the In-Home Display:

(i) to be replaced; or

(ii) except to the extent that it can be done by means of remote communication, to be modified or reconfigured; and

(b) it can operate in conjunction both with Smart Metering Equipment and with 'Smart Metering Equipment' as defined in standard condition 1 of a Gas Supply Licence.

8 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 installed 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.

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 not functioning as intended;

(c) the Smart Metering Equipment at the Domestic Premises was installed no more than 12 months prior to the date of the notification; and

(d) the licensee is satisfied that the fault in the In-Home Display is not due to a failure by the Domestic Customer 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.

Definition

10 For the purposes of this Condition:

Relevant Period means a period which commences on the date on which Smart Metering Equipment is installed at Domestic Premises and ends:

(a) where the installation took place prior to the date specified in the IHD Direction, 12 months after the date specified in that direction; or

(b) where the installation took place on or after the date specified in the IHD Direction, 12 months after the date of the installation.

Annex 3: Gas draft licence modifications

Amendments to Condition 1. Definitions for standard conditions

The following definitions to be included in Condition 1:

Designated Premises	means Non-Domestic Premises at which the measured annual consumption of gas is less than 732,000 kWh**;**
Electricity Supply Licence	means an electricity supply licence which is granted or treated as granted under section 6(1)(d) of the Electricity Act 1989;
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 Smart Metering Equipment is installed at the premises), as a minimum: (d) is a device of a type identified in; (e) has the functional capability specified by; and (f) complies with the other requirements of, the IHD Technical Specification applicable at that date;
In-Home Display (or IHD) Technical Specification	means the document of that title which 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 Equipment	means equipment installed at premises for the purposes of the supply of gas to those premises which, on the date on which it is installed, as a minimum: (d) consists of the apparatus identified in;

(e) has the functional capability specified by; and

(f) complies with the other requirements of,

the SME Technical Specification applicable at that date;

Smart Metering Equipment (or SME) Technical Specification	means the document of that title which 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;

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

The roll-out duty

1 The licensee must take all reasonable steps to ensure that Smart Metering Equipment is installed on or before ***[xx/xx/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 paragraph 10.

The duty when installing new or replacement meters

3 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, any new or replacement Gas Meter installed at that premises forms part of an installation of Smart Metering Equipment.

4 For the purposes of paragraph 3:

(a) a 'new meter' is a Gas Meter that is being installed for the first time at the premises; and

(b) a 'replacement meter' is a Gas Meter that replaces another Gas Meter previously 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 paragraph 10.

The duties on and after installation

7 The licensee must, in conjunction and co-operation with all other gas and electricity suppliers, 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 Smart Metering Equipment is being or has previously been installed, that equipment is interoperable.

8 For the purposes of paragraph 7, Smart Metering Equipment is taken to be 'interoperable' if it is designed and operates so that:

(a) the customer at the premises in which it is installed is able to change his Gas Supplier without any requirement for the equipment (or any part of it):

(i) to be replaced; or

(ii) except to the extent that it can be done by means of remote communication, to be modified or reconfigured;

(b) any part of the equipment is capable of being replaced by a Gas Supplier with another part designed to fulfil the same function, without that replacement adversely affecting the capacity of the equipment to operate as Smart Metering Equipment; and

(c) the equipment can operate in conjunction with 'Smart Metering Equipment' as defined in standard condition 1 of an Electricity Supply Licence.

9 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 Smart Metering Equipment has been installed:

(a) subject to sub-paragraph (b), the Smart Metering Equipment continues to satisfy the requirements of the SME Technical Specification that was applicable at 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 Smart Metering Equipment (or any part of it) installed prior to the date specified in the direction, the Smart Metering Equipment (or the relevant part of it) is replaced, modified or reconfigured so as to comply with the amended requirements of the SME Technical Specification.

The exception – Designated Premises

10 The licensee is not required to install Smart Metering Equipment at any Designated Premises in respect of which:

(a) a contract for the installation of an Advanced Meter has been entered into on or before 5 April 2014; and

(b) the contractual obligation to install the Advanced Meter at the premises has been satisfied, or is required to be satisfied, on or before ***[xx/xx/ 2019]***.

Definition

11 For the purposes of this Condition:

Advanced Meter	means a meter which satisfies the definition of advanced meter in standard condition 12 but which does not constitute or form part of Smart Metering Equipment.

Condition BB: Provision of an In-Home Display

The IHD Direction

1 This Condition BB applies with effect from the date specified by the Secretary of State in a direction issued to the licensee (the **IHD Direction**).

The general duty

2 Where the licensee installs or arranges for the installation of Smart Metering Equipment at any Domestic Premises on or after the date specified in the IHD Direction, it must ensure that it:

(a) provides to that Domestic Customer clear and accurate information concerning the availability and benefits of an In-Home Display;

(b) offers the Domestic Customer the opportunity to have an In-Home Display provided at the premises at the same time; and

(c) where the Domestic Customer accepts the offer, provides the In-Home Display at the premises.

3 The requirement in paragraph 2 is subject to paragraph 4.

Exception to the general duty

4 The licensee is not required to comply with paragraph 2 if, on the date on which the Smart Metering Equipment is installed at the Domestic Premises, an In-Home Display has already been provided at those premises.

The duty on request of Domestic Customers

5 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.

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

6 The licensee must, in conjunction and co-operation with all other gas and electricity suppliers, 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 is being or has previously been provided, that In-Home Display is and remains interoperable until the end of the Relevant Period.

7 For the purposes of paragraph 6, an In-Home Display is taken to be 'interoperable' if it is designed and operates so that:

(a) the customer at the premises at which it is provided is able to change his Gas Supplier without any requirement for the In-Home Display:

(i) to be replaced; or

(ii) except to the extent that it can be done by means of remote communication, to be modified or reconfigured; and

(b) it can operate in conjunction both with Smart Metering Equipment and with 'Smart Metering Equipment' as defined in standard condition 1 of an Electricity Supply Licence.

8 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 installed 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.

The duty to deal with IHD faults

9 Where:

(e) 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;

(f) the consequence of the fault is that the In-Home Display is not functioning as intended;

(g) the Smart Metering Equipment at the Domestic Premises was installed no more than 12 months prior to the date of the notification; and

(h) the licensee is satisfied that the fault in the In-Home Display is not due to a failure by the Domestic Customer 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.

Definition

10 For the purposes of this Condition:

Relevant Period means a period which commences on the date on which Smart Metering Equipment is installed at Domestic Premises and ends:

(c) where the installation took place prior to the date specified in the IHD Direction, 12 months after the date specified in that direction; or

(d) where the installation took place on or after the date specified in the IHD Direction, 12 months after the date of the installation.

Annex 4: Standard Licence Condition 12 modifications

Condition 12 Amendments

Advanced Meters for Relevant Premises

12.17 This paragraph has effect on and after 6 April 2009 and applies where the licensee installs or arranges for the installation of an Electricity Meter at Relevant Premises.

12.18 If paragraph 12.17 applies, the Electricity Meter installed at the Relevant Premises must be an advanced meter.

12.19 As from 6 April 2014, the licensee must not supply electricity to any Relevant Premises other than through an advanced meter.

Advanced Meters for Designated Premises

12.20 This paragraph has effect on and after [6 April 2014] and applies where the licensee installs or arranges for the installation of an Electricity Meter at Designated Premises at which:

(a) the existing Electricity Meter is a Current Transformer Electricity Meter; or

(b) if the installation had taken place before [6 April 2014], a Current Transformer Electricity Meter would have been installed.

12.21 If paragraph 12.20 applies, the Electricity Meter installed at the Designated Premises shall be an advanced meter.

12.22 As from [***xx/xx/2019***], the licensee must not supply electricity to any Designated Premises through a Current Transformer Electricity Meter which is not also an advanced meter.

Customer Access to Data

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

Exceptions

12.24 The prohibitions imposed by paragraphs 12.19 and 12.22 do not apply where the licensee is unable to install or arrange for the installation of an advanced meter at the Relevant Premises or the Designated Premises in question despite taking all reasonable steps to do so.

Definitions

12.25 For the purposes of this condition:

advanced meter means an Electricity Meter that, either on its own or with an ancillary device, and in compliance with the requirements of any relevant Industry Code:

(i) provides measured electricity consumption data for multiple time periods, and is able to provide such data for at least half-hourly time periods; and

(ii) is able to provide the licensee with remote access to such data.

Relevant Premises means Non-Domestic Premises where the metering point falls within profile class 5, 6, 7 or 8 as defined in the Balancing and Settlement Code on 6 April 2009.

Annex 5: SMDG working groups and objectives

Working Group	Objective
Home Area Network	Define the HAN selection procedure and make recommendations as appropriate
Tariffs	Define the minimum tariff structure to be supported by the smart metering system
Pre-Payment Metering	Define the minimum data items associated with PPM
Application Layer	Define the data items and undertake gap analysis of proposed solutions (e.g. DLMS)
Installation & Maintenance	Define the minimum data items associated with installation and maintenance
Gas Meter Variants	Define the meter variants required for non standard installations such as Radio Tele-Switch, CT, large gas, non domestic
Electricity Meter Variants	Define a meter envelope (includes semi concealed)
Microgeneration	Define the minimum data items associated with Microgeneration, and the procedure for micro-generation on self disconnect
Difficult Property types/ Positions	To understand what would make a property difficult for a smart meter to be installed and to understand the number of these properties that might be expected.
In-Home Display	To define the functionality of the minimum specification IHD
Interoperability testing	To identify options for testing and trialling the components of the smart metering system.
Access to Data	To define how consumers and their authorised parties will be able to access consumption data
Data Modelling	To produce a catalogue of data items that the meter will be able to record or transmit.
Gas Meter Battery Life	To understand the operations that will have an impact on the expected life of a gas meter battery. To define what a typical use profile would be and confirm that a 15 year lifespan is achievable
Extended Statement of Design Requirements	Ensure that technical specifications meet needs of the Smart Metering Implementation Programme, consumers and other stakeholders
Normative References	To identify and catalogue the standards and benchmarks for which adherence to will form part of the functional specification

Working Group	Objective
Architectures	Defining the options for the architectures of the smart metering system.

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