Smart Metering Implementation Programme
Roll-Out Team

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OnStream's response to: 2546 Smart Metering Implementation Programme – Consultation on draft license conditions and technical specification for the rollout of gas and electricity smart metering equipment.

Please find below OnStream's response to your consultation on draft supply licence conditions and technical specifications for the Smart Metering Implementation Programme.

The Programme is gathering pace and the latest consultations and the publishing of the IDTS are important steps in bringing the consultation phase of the Programme to conclusion. OnStream welcomes the progress of the IDTS and commends DECC and the Hothouse participants for producing so much output in very demanding timescales.

It is clear however that much work is still required to deliver a final specification to bring this part of the Programme to a conclusion and allow the Foundation Phase to proceed with some certainty. The three key issues which need addressing are:

- The initial SMETS must be a 'thin' version of the IDTS focussed on core functionality and must be delivered by early 2012. Designing and building smart metering equipment with the detailed functionality of the IDTS will delay the Foundation Phase, increase unit costs, overwhelm consumers and increase mass rollout workforce costs by steepening the rollout profile
- The separate Communications Hub should not be mandated. The industry must be allowed and encouraged to develop innovative and cost efficient communications solutions. The separate Communications Hub will increase unit costs, approvals costs, replacement costs and installation costs and complexity
- DECC must establish a dedicated SM-HAN transport layer, this would allow manufacturers to build smart metering equipment with components that can handle a range of HAN technologies on a common transport layer. Failure to standardise this layer will discourage Foundation Phase installations, cause asset stranding and incur additional costs due to revisits to exchange HAN technology

OnStream would welcome the opportunity to discuss the content of this response with DECC and in addition offer continued support to DECC to ensure the Programme's timelines and objectives are met.

Please treat this response as non-confidential.

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OnStream would welcome the opportunity to discuss the content of this response with DECC and in addition offer continued support to DECC to ensure the Programme's timelines and objectives are met. If you have any queries regarding our response please contact:

Executive Summary

1.1. OnStream have responded directly to the questions posed by DECC in Appendix B of this document.

1.2. Our responses particularly highlight the importance of a fully matured Foundation Phase and how this will impact all industry participants' ability to deploy smart metering systems during this and the subsequent Mass Rollout Phase if this is not completed appropriately within the documented timescales. In relation to this point, the resulting negative consumer perception from a poorly executed Foundation Phase could materially affect the Programme benefits set out in the Impact Assessment and prohibit peak installation volumes being met during the rollout.

1.3. OnStream agree with DECC that a Foundation Phase before the mass rollout of smart meters across Great Britain is essential in a number of areas including:

- Increasing consumer awareness
- Developing technical specifications
- Establishing the DCC
- Producing/approving compliant meters
- Developing the regulatory environment
- Mobilising of the smart workforce
- End-to-end trialling of market infrastructure
- Preparing for the migration to the DCC

1.4. OnStream believe that in order for mass installation to start from Q2 2014; Smart metering systems must be installed in significant volume from around Q2 2013 and therefore smaller (but still material) trials to test functionality and particularly HAN technology must take place during 2012.

1.5. OnStream believe the following factors need to be addressed for the Foundation Phase to be a success which will enable and encourage the industry to achieve the target date for mass rollout commencement and importantly the target for mass rollout completion in 2019:

Allow industry to use a range of Communications Hub architectures	Clarify where functionality resides; in the meter or the Hub	Define the properties of an 'intimate' and a 'separate' Hub	Establish a dedicated SM-HAN transport layer
Focus the initial version of the SMETS on core functionality	Establish the application data layer protocol	Clarify the adoption criteria for the DCC	Decouple mass rollout commencement from DCC go-live
Establish the basis for technical and commercial interoperability	Ensure the SMETS minimises installation duration, cost, and complexity	Ensure Programme decisions take into account the impact on the consumer	Provide visibility of the overall Programme plan

1.6. These key issues and how to address them are explored in Appendix A.

1.7. Addressing the above points will ensure that when the Mass Rollout Phase begins, smart metering is 'business as usual' and financially viable for all parties involved. Failure in satisfactorily completing the Foundation Phase will mean the duration for the Mass Rollout Phase will be eroded by trials and further capability building, ultimately placing the 2019 completion target at high risk if not making it impossible to achieve.

1.8. The Impact Assessment for the Programme cites total benefits of circa £15 billion. Consumer benefits account for £4.64 billion of this total, of which the vast majority (£4.60 billion) is achieved through "reduced energy

consumption." Approximately 50% of the supplier benefits (circa £4.5 billion) are delivered through activities directly related to consumers ("avoided site visits" and "reduced enquiries and customer overheads").

1.9. This puts the consumer right at the centre of almost two thirds of the total benefits of the Programme. Any key Programme decisions must take into account the affect on the consumer; their ability to understand and engage with smart metering and the potential savings they can make in the future.

AppendixA–Thekeyissuesandhowtoaddressthem

Allow industry to use a range of **Communications Hub architectures**	• The architecture recommended by DECC 'A separate Communications Hub without a modular WAN will increase unit costs, approvals costs, replacement costs and installation costs and complexity • Manufacturers and suppliers should be permitted to choose from a range of Hub architectures to find the solution which best suits a particular consumer property and on commercial terms which suit their organisation
Clarify where **functionality** resides; in the meter or the Hub	• It is unclear which part of the SMS provides which functionality (for example pre-payment tariffs and outage management). The Hub and the smart meters will require some degree of processing power but how much is unclear • Should the Communications Hub concept (whether 'intimate' or 'separate') be included in the SMETS, DECC must provide clarity on where functionality resides so that manufacturers can design and build SMETS compliant equipment
Define the properties of an **'intimate'** and a **'separate'** Hub	• Interoperability from a technical perspective can only be achieved with some degree of standardisation of SMS equipment so that assets from different manufacturers can work together in the home • Suppliers should be permitted to choose a range of Hub architectures, however the industry should agree the standard power and data interfaces and the physical characteristics of both a 'separate' and 'intimate' Hub
Establish a dedicated **SM-HAN** transport layer	• Without a standard SM-HAN transport layer (I.e. a dedicated wireless frequency for the SMS) then technical interoperability cannot be achieved. Lack of a standard SM-HAN will increase programme costs due to stranding and revisits • The Government must establish a dedicated wireless frequency for the SM-HAN to allow manufacturers to design and build smart metering equipment with the appropriate hardware to operate on that dedicated frequency
Focus the initial version of the SMETS on **core functionality**	• The functional requirements of the IDTS are very detailed. Developing smart metering equipment that encompasses all the functionality of the IDTS will take a considerable amount of time, increase unit costs and prevent Foundation activity • The initial version of the SMETS should be 'thin' and focussed on hardware definitions (i.e. where the smart functionality resides in the SMS) and the core functionality required to deliver essential smart services
Establish the **application data layer** protocol	• Developing application layer languages in the past for similar sized programmes has taken several years (ANSI C12/C19/C20). This length of delay will essentially end the chances of interoperability • The initial version of the SMETS should be 'thin' and then evolve as more advanced functionality is added. The DLMS language and registers should start equally as 'thin' and then evolve in parallel with the SMETS
Clarify the **adoption criteria** for the DCC	• The lack of clarity on 'adoption' of smart meters into the DCC creates a risk of stranding. This discourages installation of smart meters during the Foundation Phase • Clarity must be given on what amounts to 'compliant' with the SMETS and who approves compliance as well as the criteria for the novation of communications contracts to the DCC

Decouple mass rollout commencement from **DCC go-live**	• The DCC is an ambitious aspect of the Programme. Given the scale of the project and its nature it is possible that the timescales established for the implementation of the DCC will slip • Any DCC timescale slip must not delay the start of mass rollout. The process of migrating the installed portfolio of smart meters into the DCC can be undertaken once new installations are communicating with the DCC without any issues
Establish the basis for technical and commercial **interoperability**	• A key concern for suppliers and their agents is the risk of stranding smart meters. In the event that a smart meter is installed in a property and the consumer subsequently changes supplier • A phased approach to CoS obligations in line with a 'thin' initial SMETS will ensure that suppliers are required to support essential smart services only, therefore minimising system investment and still providing certainty
Ensure the SMETS **minimises installation duration, cost, and complexity**	• The biggest challenges of the Programme are changing consumer behaviour and the practicalities of installing circa 50 million meters in 29 million homes • A simple and efficient installation process is critical to both these challenges as it maximises successful installation visits and minimises consumer disruption. The SMETS must support a simple and efficient installation but should focus on functional requirements and not technical solutions
Ensure Programme decisions **take into account the impact on the consumer**	• Consumer benefits account for £4.64 billion of the Programme total, the vast majority (£4.60 billion) is achieved through "reduced consumption." 50% of the supplier benefits (circa £4.50 billion) are directly consumer related • The consumer is right at the centre of almost two thirds of the total benefits of the Programme. Any key Programme decisions must take into account the effect on the consumer and their ability to understand and engage with smart metering
Provide visibility of the **overall Programme plan**	• DECC have successfully coordinated a huge amount of industry consultation and debate. As this consultation begins to draw to a close, it would be beneficial to the industry for DECC to provide visibility of the next key steps in the Programme • It is particularly important for the industry to have a clear roadmap for how uncertainty will be taken out of the Programme's key areas and a progression plan which has an integrated view of taks accross different workstreams

AppendixB–OnStream'sresponsestothequestionsposedbyDECC.

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 Programme is an ambitious combination of technology development, industry reform, asset management and field service delivery all at a time of challenging economic conditions and general uncertainty in the energy industry.

   The functionally rich nature of the smart meter technical specifications combined with the creation and implementation of the DCC will mean the foundation phase must deliver a huge amount of activity and progress; So much so that the rollout is unlikely to begin in significant volume until 2014. This leaves less than 6 years for the installation of circa 50 million domestic smart meters.

   For this reason, a completion target of the end of 2019 is already ambitious. OnStream believe it would be unwise to set a completion target in the "earlier part" of 2019, indeed should the Foundation Phase not mature as planned then the pressure would be on to maintain the current 'end of 2019' target.

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.

   Although OnStream recognises that these conditions are essential to the success of the Programme, we have little expertise to advise on the legal drafting of the conditions.

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.

   Although OnStream recognises that these conditions are essential to the success of the Programme, we have little expertise to advise on the legal drafting of the conditions.

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.

   OnStream are concerned that the version of SMETS against which Smart Metering Equipment must be compliant is fixed at the point of installation. This is impractical for equipment which is held in stock for a long period of time as a new version of SMETS may be issued whilst the equipment is 'on the shelf.'

   The requirement should be for Smart Metering Equipment to be compliant with the current version of SMETS at the point of manufacture.

   It will be an important part of the development of the SMETS to minimise or avoid completely any backward compatibility issues with older versions of the SMETS.

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.

   The business case for the Programme will be undermined if this happens regularly. Obviously if a smart meter or meter type has a safety defect then it is absolutely correct for suppliers to visit those meters which are affected to

repair or remove them. For absolutely critical security reasons which cannot be remedied through remote methods then the same obligation should apply.

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.

   Although OnStream recognises that these conditions are essential to the success of the Programme, we have little expertise to advise on the legal drafting of the conditions.

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

   In our response to questions 24 and 25 we advocate a layered approach to developing the SMETS:

   "By focussing the initial version of the SMETS on hardware definitions (i.e. where the smart functionality resides in the SMS) and the core functionality required to deliver the high level aims of smart metering; the market can grow with the Programme and this could promote early deployment."

   This approach means that as the smart metering market matures, additional functionality could be introduced into to this 'thin' initial version of SMETS and where applicable added to the installed portfolio remotely.

   If this approach is adopted by DECC then the notice period for the new and replacement obligation can be linked to the date the EU approved SMETS is published. A notice period of circa 6 months from the publication date of the SMETS (assuming that the initial SMETS is 'thin') may be appropriate however this would need to be reviewed to ensure that the notice period allows for adequate time to source and test 'thin' SMETS compliant smart metering equipment.

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.

   The provisions in draft condition AA 7-8 are essential to the success of the Programme and the same is true in relation to IHDs in draft condition BB 6-7. It is clear however that technical interoperability must be supported by commercial interoperability to ensure stranding and other costs are minimised.

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?

   Although OnStream recognises that these conditions are essential to the success of the Programme, we have little expertise to advise on the legal drafting of the conditions.

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

    The key feature of a dispute resolution should be to restore or establish full smart metering services to the consumer quickly. To this end, we believe any mechanism should be able to quickly mediate between two parties to stop (for example) protracted supplier interoperability disputes causing poor end consumer experience or frustration.

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 advanced rather than Smart Metering Equipment? Please explain your reasoning.

    Where this fits the end consumer's needs, this seems appropriate.

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

    Although OnStream recognises that these conditions are essential to the success of the Programme, we have little expertise to advise on the legal drafting of the conditions.

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.

    Balancing the implications of waiting until the smart electricity meter is in place against installing the smart gas meter first (a more costly and less efficient installation, please see our response to question 35) is a commercial decision to be made by the gas supplier. For this reason OnStream supports the suggestion that gas suppliers be given the option to wait for the electricity installation but recognises that industry processes (in relation to notification of a gas supplier by the installing electricity supplier) do not currently exist to allow this to take place.

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.

    The technical complexities regarding the Communications Hub in a gas first installation (please see our response to question 35) will cause the installation visit to be less efficient than an electricity first or dual fuel installation. This has negative cost implications for the supplier and causes increased disruption for the consumer. Further, OnStream believe that innovation should be permitted and encouraged to provide alternative gas first installations configurations such as stand alone smart gas meters, the use of which should be the choice of the supplier.

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.

    The installation of a smart metering system must be undertaken by an approved meter installer who complies with the smart installation code of practice. New developments will be no exception. It is logical, given that there will have been no supplier appointed to the new build property that the DNO is responsible for installing or arranging for the installation of a smart meter in these circumstances. Given that they will need to do so in a PEMS situation the capacity to do so will be required anyway.

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.

    It is logical, given that the DNO will be on site following an emergency that they are responsible for installing or arranging for the installation of a smart meter in these circumstances.

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.

    It is logical to align the notice period for IHDs with the new and replacement obligation as the IHD forms part of the Smart Metering System.

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.

    This may cause issues in relation to draft condition BB 5. If a consumer refuses an IHD on installation, changes supplier and then requests an IHD within the Relevant Period; does the responsibility to provide an IHD fall to the supplier who installed the smart metering equipment or the new supplier?

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.

    Although OnStream recognises that these conditions are essential to the success of the Programme, we have little expertise to advise on the legal drafting of the conditions.

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.

    Although OnStream recognises that these conditions are essential to the success of the Programme, we have little expertise to advise on the legal drafting of the conditions.

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.

    Although OnStream recognises that these conditions are essential to the success of the Programme, we have little expertise to advise on the legal drafting of the conditions.

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.

    Although OnStream recognises that these conditions are essential to the success of the Programme, we have little expertise to advise on changes to legislation.

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.

    Although OnStream recognises that these conditions are essential to the success of the Programme, we have little expertise to advise on changes to industry codes.

24. Do you think that there are other requirements that the Government should adopt in the SMETS? Please explain your reasoning.

The functional requirements of the IDTS are very detailed with further information in some areas still to be provided. Developing smart metering equipment that encompasses all of the functionality of the IDTS may cause some problems and certainly take a considerable amount of time for design and testing:

- The complexity and cost of incorporating all the IDTS functionality will mean a delay to the point at which SMETS compliant meters are available in mass volumes therefore delaying the Foundation Phase installations
- The complexity is likely to cause confusion to consumers who may be overwhelmed by functionality rather than being gradually introduced to smart. Consumer confusion is the opposite of what the Foundation Phase is in place to deliver
- The complexity will inevitably increase the cost of the SMS units which will have a knock on effect on business case and cost to consumers

Any delays will affect the Foundation Phase, making volume installations unlikely.

By focussing the initial version of the SMETS on hardware definitions (i.e. where the smart functionality resides in the SMS) and the core functionality required to deliver the high level aims of smart metering; the market can grow with the Programme and this could promote early deployment.

As the smart metering market matures, additional functionality could be introduced into to this 'thin' initial version of SMETS and where applicable added to the installed portfolio remotely.

Another requirement to be taken into account is the Application Data Layer; if the initial version of the SMETS is focussed on core functionality and gradually evolves over time as the smart market matures; the approach taken toward the application data layer protocol would logically be the same. The DLMS registers and language required for the 'thin' functionality could be developed alongside the initial 'thin' version of SMETS.

As functionality is added to SMETS, the DLMS language evolves in parallel with this.

In relation to the Foundation Phase; the approach outlined above would allow the industry to produce SMETS compliant meters in time to install significant volumes of smart meters during the Foundation Phase and achieve the stated aims for this part of the Programme.

Keyquestion

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.

As mentioned above; the functional requirements of the IDTS are very detailed. Developing smart metering equipment that encompasses all of the functionality of the IDTS may cause several problems and certainly take a considerable amount of time for design and testing:

- The complexity and cost of incorporating all the IDTS functionality will mean a delay to the point at which SMETS compliant meters are available in mass volumes therefore delaying Foundation Phase installations
- The complexity is likely to cause confusion to consumers who may be overwhelmed by functionality rather than being gradually introduced to smart. Consumer confusion is the opposite of what the Foundation Phase is in place to deliver
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Any delays will affect the Foundation Phase, making volume installations unlikely.

The mass rollout phase is being squeezed from both ends; at the start through the DCC and HAN protocols not being available until late 2014 and at the end through an ambition to complete the rollout in the "earlier part" of 2019 (as referred to in question 1).

By focussing the initial version of the SMETS on hardware definitions (i.e. where the smart functionality resides in the SMS) and the core functionality required to deliver the high level aims of smart metering; the market can grow with the Programme and this could promote early deployment.

OnStream are additionally concerned at the amount of functionality the IDTS assigns to the Hand Held Terminal. Suppliers and their agents will have to replace current HHTs with ones which can provide all the functionality referred to in the IDTS and integrate with back office systems. OnStream has practical experience of this and we know that it is a lengthy and complicated process. OnStream believes that the initial version of SMETS should omit references to the HHT and a separate cost benefit analysis be carried out. If this analysis produces a positive case for the functionality referred to in the IDTS being a part of any HHT then a later version of SMETS can introduce this functionality.

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.

Although OnStream recognises that these the security requirements are essential to the success of the Programme, we have little expertise to advise in this area.

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

OnStream believes the process outlined by DECC will mean the Foundation Phase will not mature, if the high complexity of the IDTS is retained and required to be delivered all at once. Furthermore the outstanding decisions and detailed requirements must be established now.

As mentioned above; the functional requirements of the IDTS are very detailed. Developing smart metering equipment that encompasses all of the functionality of the IDTS may cause several problems and certainly take a considerable amount of time for design and testing:

- The complexity and cost of incorporating all the IDTS functionality will mean a delay to the point at which SMETS compliant meters are available in mass volumes therefore delaying Foundation Phase installations
- The complexity is likely to cause confusion to consumers who may be overwhelmed by functionality rather than being gradually introduced to smart. Consumer confusion is the opposite of what the Foundation Phase is in place to deliver
- The complexity will inevitable increase the cost of the SMS units which will have a knock on effect on business case and cost to consumers

Any delays will affect the Foundation Phase, making volume installations unlikely.

The mass rollout phase is being squeezed from both ends; at the start through the DCC and HAN protocols not being available until late 2014 and at the end through an ambition to complete the rollout in the "earlier part" of 2019 (as referred to in question 1).

By focussing the initial version of the SMETS on hardware definitions (i.e. where the smart functionality resides in the SMS) and the core functionality required to deliver the high level aims of smart metering; the market can grow with the Programme.

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.

    OnStream have no preference in terms of which forum should govern the SMETS. It does however seem reasonable that participants affected by the changes to SMETS (i.e. meter manufactures, suppliers, , MAPs, MAMs etc) should have input into this process.

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.

    Smart Metering is a world wide market, as such electronic component manufacturers will see this as a good opportunity to produce components directly targeted at this sector. In this competitive arena, costs will decline. A 5% reduction year on year in costs would not be unrealistic in this environment. This does however depend upon design certainty regarding functionality and architecture.

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

OnStream believe that a Communications Hub is one way of achieving IDTS requirement IM.3 – "The Smart Metering System shall support in situ exchange of WAN communication technology (without removal of meter)." However, due to the current lack of technical interoperability and the need to standardise the nature of the Hub (including the data and power connections and the physical dimensions) we do not believe it is a solution which is viable during the Foundation Phase.

Failure in satisfactorily completing the Foundation Phase will mean the duration for the Mass Rollout Phase will be eroded by trials and further capability building, ultimately placing the 2019 completion target at high risk.

OnStream's 5 terminal smart electricity meter (pictured) includes two removal modules containing WAN and HAN. We believe this solution, available today, also

meets the requirements of IM.3 without the need for a Communications Hub.

OnStream believe that it is important that smart meters support requirement IM.3. However we don't believe that a Communications Hub is necessarily the best solution to do this in the short term (i.e. the Foundation Phase). Please see our response to question 35 for more detail on Communications Hub issues.

OnStream would also advocate that DECC continue to support market led solutions and innovation. This could mean that as the smart meter market matures non-modular meters (which may be significantly more cost effective to produce) could be utilised where a Supplier wishes to accept the commercial terms of this configuration.

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.

    OnStream believe this should not be a part of the initial SMETS so as to allow more investigation into the costs and benefits for outage detection in every household. Adding outage management into every meter will increase unit costs.

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

    This is a logical approach however; it is essential to the Foundation phase of the Programme that smart meters are installed and systems trialled. The DCC service providers are not due to be appointed until Q4 2012, it is unlikely that they will be in a position straight away to state their requirements for outage detection.

    DECC have recognised in the consultation that if the DCC service providers specify requirements for outage detection; smart meters installed before the DCC service providers establish these requirements are unlikely to be able to provide outage management. This must be accepted and any smart meters installed during the Foundation Phase which do not include outage management must not be deemed non-compliant due to the absence of this functionality.

    In addition to the impact on the Foundation Phase discussed above, OnStream believes that the DCC service providers alone may not be best placed to specify the requirements for outage detection. DNOs and suppliers could contribute their knowledge to establish these requirements with the DCC service Providers best placed to define how the SMS then signals an outage to the DCC.

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.

    This seems a logical approach; however suppliers and the DNOs are best placed to give advice in this area. The Programme must take into account the strain this may put on the WAN network and the affect on meter unit cost.

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.

    OnStream would advocate that DECC continue to support market led solutions and innovation. This could mean that as the smart meter market matures non-modular meters (which may be significantly more cost effective to produce) could be utilised where a Supplier wishes to accept the commercial terms of this configuration. Please see our response to question 35 for a full discussion of Communications Hub architectures.

Keyquestion

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?

    Please explain your reasoning.

OnStream agree with option B - The Smart Metering Implementation Programme objectives would be better met by: Giving suppliers flexibility over options for configuration of the Communications Hub.

As stated in our response to question 30; OnStream believe that a Communications Hub is one way of achieving IDTS requirement IM.3 – "The Smart Metering System shall support in situ exchange of WAN communication technology (without removal of meter)." However, due to the current lack of technical interoperability and the need to standardise the nature of the Hub (including the data and power connections and the physical dimensions) we do not believe it is a solution which is viable during the Foundation Phase.

Failure in satisfactorily completing the Foundation Phase will mean the duration for the Mass Rollout Phase will be eroded by trials and further capability building, ultimately placing the 2019 completion target at high risk.

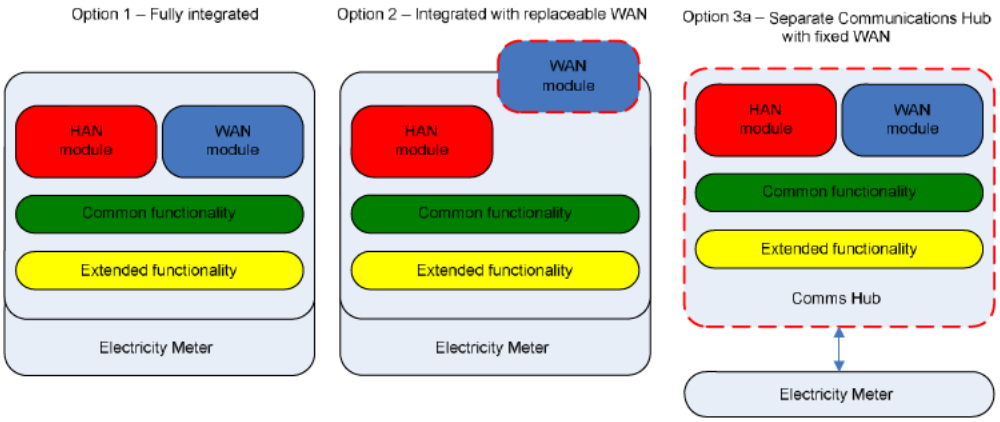
OnStream's 5 terminal smart electricity meter (pictured) includes two removal modules containing WAN and HAN. We believe this solution, available today, also meets the requirements of IM.3 without the need for a Communications Hub.

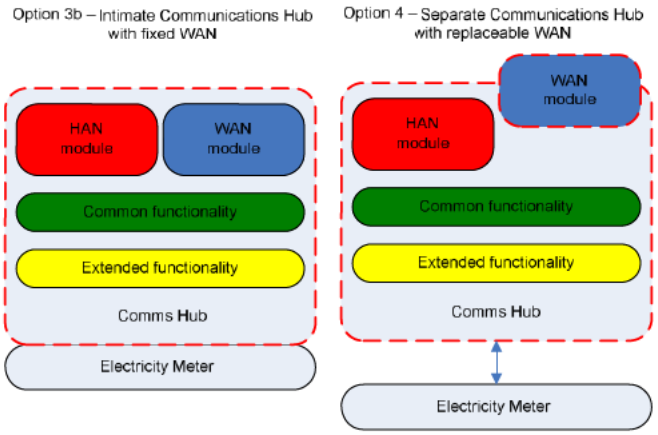
OnStream believe that it is important that smart meters support requirement IM.3. However we don't believe that a Communications Hub is necessarily the best solution to do this. In addition OnStream do not believe that in the long term a 'separate Communications Hub with a fixed WAN transceiver' will be the optimal solution.

The key benefits cited by DECC of the Communications Hub concept are:

- Preservation of gas battery life
- To support gas first installations
- To provide flexibility to decouple WAN and HAN application layers

Throughout the Programme various working groups have been considering several different options for communications architecture that may be used for the SMS in the home:





DECC is seeking views on whether to mandate a single architecture; a separate Communications Hub without a modular WAN (option 3a above). OnStream believe that the key benefits of the Communications Hub concept are not specific to option 3a:

- Preservationofgasbatterylife – The consultation document correctly states that housing data storage in the Communications Hub as opposed to the gas meter will preserve battery life. However the Communications Hub need not be separate to the electricity meter for this to be the case therefore this benefit applies equally to option 3a, 3b and 4.
- Tosupportgasfirstinstallations – A separate Communications Hub in option 3a as opposed to an intimate hub in option 3b does allow a gas smart meter to be installed before the electricity smart meter. However, balancing the implications of waiting until the electricity meter is in place against installing the smart gas meter first (a more costly and less efficient installation due to the reasons explained below) is a commercial decision to be made by the gas supplier.
- ToprovideflexibilitytodecoupleWANandHANapplicationlayers – As in relation to battery life, there is no need for the Communications Hub to be separate from the smart electricity meter to allow the flexibility to decouple WAN and HAN application layers therefore this benefit applies equally to option 3a, 3b and 4.

OnStream also believe that other architectures present further benefits particularly in relation to unit costs for the SMS, overcoming practical issues at the point of install and simplifying the installation process (which reduces costs and disruption to consumers). The table below shows OnStream's analysis of option 3a and other architectures against the same criteria used by DECC in the Impact Assessment:

Area of concern	Option 3a – Separate Communications Hub with fixed WAN	Alternative Communications Hub options or installation solutions
Cost What are the day one installation costs for each of the options?	• DECC state a unit cost of £25.60 for option 3a. OnStream believe this cost is unrealistic: ○ This cost is simply a list of component prices ○ Some of the components are underpriced particularly the casing ○ The cost of manufacturing the hub is omitted ○ The cost of testing and approvals is omitted • The approval process will be excessive as a separate Hub will be classified as a consumer product (and therefore be subject to more rigorous testing than	• DECC states a cost of £23.10 for option 3b, the 'intimate' Hub • The £2.50 saving against the DECC estimated cost of option 3a is entirely down to the removal of the HAN from the Hub • If the intimate Hub was included inside the meter casing then the cost of the casing (DECC cost £1.10, although likely more costly) is not required and the £4.00 power supply is likely to be cheaper • The casing integrity and approvals requirements are lower which lowers unit cost against option 3a • Despite these savings against option

Area of concern	Option 3a – Separate Communications Hub with fixed WAN	Alternative Communications Hub options or installation solutions
	a meter) • OnStream believe that option 3a will cost significantly more than the DECC estimate due to the reasons stated above • In addition to the cost of the unit DECC assumes an installation cost on £29 for each architecture. Option 3a involves the installation of an additional device in the home and will without doubt increase installation complexity, duration and cost	3a OnStream believe that DECC's base cost for option 3b will be higher than the estimate
Impact for gas first installs How easily can gas-first installations be supported and what are the cost and other impacts on the programme?	• Option 3a allows for gas first installations however the cost of the installation will be higher due to the additional time on site of installing the separate Hub • In addition the gas workforce will require additional training to be authorised to work on the DNO cables in the home • Installing the Hub so it is powered by the DNO cables creates several practical issues including skills, safety, having to disconnect the customer of a competitor, finding enough space to install the Hub and the suitability of the DNO cut out to support the Hub without remedial work by the DNO • The in situ electricity meter is likely to be in the place where a separate Hub would ideally be installed. A gas supplier would not be permitted to move this meter, nor would the consumer likely be happy with this further disruption • OnStream believe that although in theory option 3a supports gas first installations there are many practicality and cost implications, the extra time spent on site will increase the overall install cost and cause additional disruption to the consumer	• A standalone smart gas meter with its own battery powered 'intimate' Hub will allow gas first installations • This will mean 2 hubs in the home however the additional unit, installation and training costs are avoided. Alternatively the gas meter Hub could operate on a temporary basis until the smart electricity meter is installed • OnStream believe that balancing the implications of waiting until the electricity meter is in place against installing the smart gas meter first is a commercial decision to be made by the gas supplier and that suppliers are best placed to choose what architecture works best for each property
Impactforviabilityof FoundationPhase What is the impact on the incentives for suppliers to roll-out meters in the foundation phase, and what are the implications for the DCC when it goes	• DECC state that equipment to the specification for option 3a is "readily available." OnStream dispute this claim given that it is not clear what functionality resides in the Hub and the issue of how to power the Hub from the DNO cables is not resolved – This equipment is not available today • OnStream do not deny that in the Foundation Phase a separate Hub	• DECC state that the delay caused the process of standardising the physical properties, data and power connections of the intimate Hub would negatively affect the Foundation Phase. This may be true which is why suppliers may prefer a separate Hub in the Foundation Phase. In the long term though option 3b may well be the most economical

Area of concern	Option 3a – Separate Communications Hub with fixed WAN	Alternative Communications Hub options or installation solutions
live?	may be a good choice, we do not however believe it to be the best solution in the long term and are therefore against this architecture being mandated • Similarly OnStream believe that a fixed HAN module may be a good long term solution but in the Foundation Phase, a Hub with a modular HAN may be a worthwhile solution. Mandating option 3a would prevent this	and practical solution. Mandating 3a would stop suppliers and manufacturers from innovating and finding these cost and efficiency savings
<u>Procurementimpact</u> What is the impact on the procurement of equipment (by suppliers and DCC)? Does it add complexity (and cost)?	• DECC state that 3a removes the need for standardisation of the meters • OnStream believe that this is a short term benefit which is outweighed by the longer term implications of mandating 3a (i.e. preventing future innovation and potentially more cost effective architectures) • In addition; the power connection of the Hub will need to be standardised • Overall the SMS will require more materials in option 3a than in 3b	• In the Foundation Phase 3b may cause procurement issues due the requirement to standardise components of the SMS however in the long term once data and power connections and physical properties of the Hub are defined procurement complexity will reduce • Overall the SMS will require less materials in option 3b than in 3a
<u>FutureFlexibility</u> How easily and cost effectively can the equipment be upgraded/replaced?	• During the Foundation Phase 3a may well be the best option for suppliers however - DECC's cost comparison in the consultation show that 3b has replacement costs which are £36 million lower than 3a • In the long term therefore 3a is not the best approach as suppliers would have to replace a costly unit in order to exchange HAN or WAN communications hardware • The optimal solution is to allow the industry to choose the best architecture for a particular property	• DECC's cost comparison in the consultation document shows that option 3b provides a £117 million higher NPV and a £36 million lower replacement cost than the preferred option 3a. Option 2 also has a higher NPV and significantly lower replacement cost than the preferred option 3b • Once the industry has established the standard power and data connections and the physical properties of the 'intimate' Hub 3b may well be the most cost effective architecture as well as providing the most straight forward and efficient installation visit and least disruption to the consumer • In addition manufacturers should have the option of 'modularising' elements of the Hub (i.e. the HAN or WAN modules) and allow suppliers to make the commercial decision to have this option within the Hub

Although OnStream disagree some of DECC's stated benefits of option 3a – There certainly are some benefits to this architecture particularly during the Foundation Phase.

We believe however that mandating option 3a is the wrong approach as this would prevent other potentially more suitable and more economical solutions being developed and utilised in the mass rollout.

SummaryofconcernswiththeseparateCommunicationsHub

- The unit cost of the separate Hub will be high
- The approvals cost of the separate Hub will be high
- The installation complexity will increase time on site and therefore installation cost
- There will be instances where there is simply not enough space for a separate Hub
- There will be instances where the existing DNO set up in the house will not support a separate Hub
- The entire Hub would need to be replaced in a WAN or HAN technology change was required, this is costly and wasteful
- Mandating any approach prevents the development of innovative and potentially cost saving solutions

Difficultinstallations

In addition to our assessment above, there will be instances where the newly installed smart gas meter is simply unable to connect to the Communications Hub via the SM-HAN due to connection failure (e.g. due to the separation distance between the gas meter and the Hub). In these cases an alternative architecture to 3a will be required such as a second Hub either intimate to or alongside the gas meter.

Conclusion

OnStream believes that mandating any particular architecture will restrict innovation and potential cost saving technical solutions from being developed. DECC are best placed to define what functionality the SMS should provide, industry is best placed to develop the technology solutions which meet those functional requirements and selecting the solution which works best in a particular property.

OnStream agree with option B - The Smart Metering Implementation Programme objectives would be better met by: Giving suppliers flexibility over options for configuration of the Communications Hub. This is because in the long term once there is more certainty on enduring WAN and HAN solutions; manufacturers will be able to produce cheaper smart meters using the 'intimate' Communications Hub architecture or solutions which meet requirement IM.3 without the need for a Communications Hub, as well as producing solutions for difficult installations. This does not prevent the separate Communications Hub being used for the Foundation Phase or throughout the rollout if suppliers choose to do so.

This approach will also allow gas suppliers to balance the commercial implications of installing their meter in the property first or waiting until the electricity supplier has first visited the premises.

Keyquestion

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.

Standardising the HAN is essential for all stakeholders in the Programme:

- IHD and meter manufacturers – A HAN standard will give manufacturers some certainty to invest in developing products for the Foundation Phase without risking stranding
- Suppliers – A HAN standard will reduce the likelihood of having to re-visit consumers to exchange the Communications Hub
- Networks – A HAN standard will allow the development in plans for in home demand response to assist in balancing the network
- Consumers – A HAN standard will simplify the process of adding smart appliances or advanced IHDs to the household

In relation to the Foundation Phase; the risk of asset stranding associated with the HAN will discourage Foundation Phase installations (assuming non-modularity is not acceptable under the initial SMETS). DECC is understandably reluctant to select a HAN technology. OnStream believes that if a dedicated transport layer for the HAN was established, this would allow manufacturers to build smart metering equipment with components that can handle a range on HAN technologies confident that should the HAN technology they initially deploy not become the enduring industry solution, the HAN on metering systems already installed could be remotely upgraded to another solution.

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.

Standardising the HAN is essential for all stakeholders in the Programme:

- IHD and meter manufacturers – A HAN standard will give manufacturers some certainty to invest in developing products for the Foundation Phase without risking stranding
- Suppliers – A HAN standard will reduce the likelihood of having to re-visit consumers to exchange the Communications Hub or the IHD
- Networks – If the HAN will be used for demand response to assist in balancing the network, then a standard will be required in order to develop the associated equipment
- Consumers – A HAN standard will simplify the process of adding smart appliances or advanced IHDs to the household

In relation to the Foundation Phase; the risk of asset stranding associated with the HAN will discourage Foundation Phase installations.

Until a standard is chosen and ratified, most likely as a BS-EN directive, then equipment manufacturers cannot implement a final solution. If the enduring HAN standard is not established until the end of 2014 this discourages smart meter installation during the Foundation Phase as these meters may need to be revisited and the Communications Hub exchanged.

DECC is understandably reluctant to select a HAN technology. OnStream believes that if a dedicated transport layer for the HAN was established, this would allow manufacturers to build smart metering equipment with components that can handle a range on HAN technologies confident that should the HAN technology they initially deploy not become the enduring industry solution, the HAN on metering systems already installed could be remotely upgraded to another solution.

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.

    The testing of the HAN will be very important to protect investment in the meter and/or any Communications Hub. OnStream believe that there should be governance to prove the technology before roll out and trials with defined success criteria would be a means of doing this. Success in this area will also protect the consumer experience which is clearly to everyone's benefit and as such OnStream consider an obligation is appropriate to conclude this activity satisfactorily.

Keyquestion

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 is 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?

The application layer is key to ensure interoperability between products from different parties.

If the initial version of the SMETS is focussed on core functionality (see response to question 24) and gradually evolves over time as the smart market matures; the approach taken toward the application data layer protocol would logically be the same. The DLMS registers and language required for the 'thin' functionality could be developed alongside the initial 'thin' version of SMETS.

As functionality is added to SMETS, the DLMS language evolves in parallel. A DLMS/COSEM interface could be provided to the DCC. This way the application layer is not enforcing any restrictions on the transport layer.

In relation to the Foundation Phase; the approach outlined would allow the industry to produce SMETS compliant meters in time to install significant volumes of smart meters during the Foundation Phase and achieve the stated aims for this part of the Programme.

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?

OnStream believe that there is no existing standard which meets the requirements of Smart Metering. DLMS/OBIS/COSEM is an established European wide protocol which is well accepted. Modified and enhanced to meet Smart requirements, this standard will be a good choice. How this is communicated (i.e. transported) to the various SMS components is open to debate, where SEP 1.x is a possible solution however other choices such as the other European accepted standard Wireless MBUS are also available.

OnStream believes an early adoption of an acceptable standard is paramount to early deployment; therefore solution 'simplicity' should overrule solutions which are 'comprehensive.'

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.

Any international, proven and open standard would be a sensible approach. If the DCC was to communicate with a head end then the network addressing for each type of comms can be abstracted from the DCC. For example, if DLMS/COSEM was used as transport and IP was used as a network layer then the DCC would just need to route to the Hub's IP address. This could be on any one of a number of head ends. Each head end then manages the network addressing for the Hubs on its networks. It would provide address translation as required.

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?

A single network address per Hub is all that is required. If multiple meters/customers are available then this would be addressed at the application layer. This could be handled by DLMS if that is the chosen application protocol. Existing deployed techniques have adopted this approach.

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

    We believe this can be done at minimal cost. The SMETS should specify max and min demand periods as this could potentially impact implementation costs such as additional memory requirements.

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).

    OnStream supports the need to hold network information but would like to understand this requirement in further detail before concluding comment. Further, it could be considered that this type of requirement is not essential for day one and could form part of a later version of SMETS

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.

    In instances where such a fault condition can lead to excessive voltages, such as a multiphase system, we strongly recommend using a contactor switch for safety. In a correctly designed meter the costs should be minimal.

    In addition OnStream would like to highlight a DNO licence issue which should be addressed; in the event where voltage tolerance on the DNO network is exceeded and meter faults or damage is caused. This is particularly an issue given the potential introduction of a Communications Hub.

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.

    No, OnStream does not believe that all consumers will be interested in this, and that many will prefer to access their data via the IHD, online or on a paper bill. In addition; how would a bridging or gateway device (or any other device for that matter) get connected to a separate Communications Hub (option 3a)? The separate Communications Hub would need to be constantly searching for devices to pair with, receive a WAN message to prompt it to start searching or have a button or keyboard to instruct it to search for devices.

    The cost of a bridging device would be born by the consumer. OnStream believe this is unreasonable and will erode any savings made from reduced energy use.

    For these reasons a bridging or gateway device should be given no special attention by the Programme and instead the industry should be left to build these devices in a way which meets the Programme security requirements and speaks the correct HAN language (once established). These devices can then be sold as smart devices which could be added to the SM-HAN by the consumer.

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.

The safety issue when working between the meter and the consumer fuse box is not specifically related to the Programme but the ENA and others have suggested that smart metering is an opportunity to mandate that a smart electricity meter has an isolation switch in order to allow work to be safely carried out between the meter and the consumer fuse box (e.g. replacing the consumer fuse box) without having to remove the main DNO fuse for the property.

This adds cost to the Programme and to the unit cost of a smart metering system for something that will rarely be used. A more pragmatic solution would be option 4 provided by the ESC; the introduction of a system for the authorisation of competent non-supply industry personnel to withdraw cut-out fuses. This will avoid the addition of unnecessary cost into the programme.

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

OnStream agree with this principle. We do however believe that there are some technical issues to be resolved before this configuration can be adopted.

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?

Any translation or added functionality would be better added at the DCC rather than the Hub. This reduces the software requirements of the Hub. Further technical discussions (as per question 48) would however be required to establish the feasibility of this solution.

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

Although OnStream recognises that the IHD will be an important part of the SMS, we believe the relative effectiveness of information displayed has yet to be fully researched through trials. The Foundation Phase is an opportunity to undertake this process through engagement with consumers.

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?

OnStream have no particular opinion in this respect other than again to reiterate that there is a definite opportunity to phase in some requirements to later SMETS and this would appear to be an example of this.

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?

OnStream have no particular opinion in this respect other that again to reiterate that there is a definite opportunity to phase in some requirements to later SMETS and this would appear to be an example of this.

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.

    OnStream agree that the outstanding issues need to be addressed and would further comment that this needs to be concluded as soon as possible to allow the foundation phase to take place via increased certainty and reduced stranding risks.

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.

    The SMETS, Smart Energy Code, SMICoP and licence obligations would seem to suffice in this space. Formalising the ongoing roles and members of these groups may help check the validity in terms of a suitable level of overall assurance.

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

    OnStream believe that this is very important element to ensure success of the roll out and protect the consumer experience. The lack of a testing regime could result in an unacceptable level of rework / visits where technology fails. This could be particularly important where manufacturers and suppliers are working to tight timescales after the final SMETS is known creating a tension between testing timescales and the need for roll out to commence with compliant meters.

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

    The options outlined all have merit although OnStream believe that option b) a mandatory industry code and body to deliver and govern a testing regime) would be the best option to ensure a consistent, robust approach.

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

    As per question 57, option b) is particularly applicable to the foundation phase as it will ensure robust and consistent application in this new field.

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?

    The activities specified are the development of a trust hierarchy and key management design. From an overall system point of view this will be essential as there will be several levels of authorised party from the consumer upwards. However the system design should set goals for keeping the overall structure relatively flat. That is - limiting the levels of hierarchy to a minimum.

    Interoperability is a quality of two or more nodes being able to inter-work using the same protocols and service interfaces or a given node being able to translate to and from heterogeneous protocols and services. The development activity should establish which nodes use same procedures and which nodes may translate on behalf of others. Where possible all protocols and services should be chosen from existing internet security standards.

The design should assume that the security specification will be made public. This publication should not compromise the integrity and security of the system.

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

A robust, scalable Key management system which provides for key establishment/distribution both at system installation time and operation (session key) is essential to secure operations of the system. Given the scale (millions of keys and millions of key management operations), the key management system must be distributable and as such, respect the trust hierarchy. However the Key management must be implementable at the nodes with the lowest processing power. And provide the same key security as more powerful nodes.

The key management system must allow for system nodes, such as smart meters to be manufactured in an insecure environment where key information may leak. In addition the key management distribution system should secure against loss of any single key providing access more than one system node.
The management system should allow recovery from loss of key synchronisation at a given node, and indeed loss/leak of the cryptographic key data of the entire system.

The key management system should be based firmly on existing key distribution systems already standardised by internet RFCs.

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

We agree in general. A hybrid asymmetric PKI (such as RSA) for key distribution and block ciphers, for meter data protection is ideal, and we believe can be achieved cost effectively. Other large enterprises (internet) routinely use asymmetric PKI for efficient key management and security, and avoid the issue of key distribution.

Key exchange using RSA or ECC is now well established with low power electronic components readily available to perform this function. These low power devices are suitable for battery powered devices, and as such lend themselves to Smart Metering, and other mediums such as internet and mobile phone technologies.

A purely symmetric system, with complex key establishment processes is, in our opinion, logistically impractical.

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.

The DCC should be a part of the hierarchy but should delegate and grant authority for the distribution and management of cryptographic key data. Implemented correctly this provides for no single point of failure, robust from DOS attack etc. The system should operate in a similar manner as existing key distribution systems working today in the Internet.

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.

All smart metering systems which are deployed in Great Britain (whether opted out or not) should be compliant with the smart metering security procedures. It is very likely that domestic and I&C equipment will use common data retrieval services at some time. This being the case, security is paramount to all connected equipment, as low security devices would provide a back door to compromising the entire GB system.