CONSULTATION ON DRAFT LICENCE CONDITIONS AND TECHNICAL SPECIFICATIONS FOR SMART METERING

SCOTTISHPOWER RESPONSE

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.

We have been supportive of a late 2019 target date for completing the roll-out. However, the time being taken – for good reasons – to finalise key front end elements of the programme is putting some pressure on the timetable. While we think that the late 2019 date remains achievable if the mass roll-out is able to start on time, we do not consider it prudent to seek to accelerate this. In particular, any consideration of acceleration of the roll out timetable must be set in the context of potential delays to the approved SMETS and DCC go-live.

We have previously highlighted the risks relating to an accelerated roll out in the period between 2014 and the end of 2019. While we felt this roll out strategy may be achievable the risks associated with reducing the deployment window further would exacerbate the previously identified risks (please also reference ScottishPower's response to the Prospectus consultation – Question 9).

For clarity, our previous concerns around accelerated deployment centred on:

- The ability to accommodate an accelerated roll out in the end to end metering supply chain;
- The long term sustainability of the metering supply chain due to the creation of a "boom & bust" meter replacement cycle; and
- The scale of risk and error associated with large scale smart meter deployment during the period before the DCC is fully tested and operational.

In addition to our previous concerns, a number of new issues have arisen which we believe could make even the late 2019 timetable challenging. Our emerging concerns focus on the possibility that one or more of the following events might take place:

1) late approval of SMETS (including a HAN selection decision) which subsequently have a direct impact on the supply chain;
2) failure to procure and deliver the DCC on time; and
3) a supplier or other market participant failing to gain appropriate certification or accreditation to operate with the DCC.

Roll out completion in 2019 in our opinion is intrinsically linked to both the level of risk and volume of assets installed in an extended Foundation Phase as a result of DCC delivery being delayed. The practicalities of achieving 97% completion of roll out in a reduced mass deployment window would result in a lower probability of the Programme achieving its key objectives.

Reducing the roll out completion window at this stage seems premature and would appear not to take into account the risks around achieving pivotal milestones in 2012 and 2014. We would be unwilling to commit to an earlier delivery date for smart metering deployment until we have sufficient evidence of the following:

- customer responses/access rates;
- technical interoperability;
- practical roll out issues;
- supply chain capability; and
- successful go-live of the DCC in 2014.

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.

Subject to the challenges and issues set out in our response to Question 1, we consider that the drafting of the licence conditions designed to ensure Suppliers complete roll-out of Smart Metering Equipment by a specified date appear to be broadly sound. We also recognise the need to submit regular plan updates and take all reasonable steps to complete the installation programme.

It will be necessary in determining what are all reasonable steps, to take into account a number of factors outside the control of suppliers, including unusual / difficult installations, consumer attitudes and the effects of portfolio churn. We think that some form of guidance in this area will be essential, given the very considerable potential penalties for breach of licence conditions.

The development of appropriate guidance should consider evidence from both trial and Foundation Stage activities as well as recognise future issues including supply chain capability, availability of skilled resource to meet peak roll out volumes and other external factors such as negative media coverage which may impact the industry's ability to install meters.

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.

Whilst the licence conditions appear sufficient as a first draft, we believe that additional technical definition is required beyond the SMETS to support supplier procurement of assets and to ensure interoperability.

Paragraph 47 of the SMETS defines 'smart metering apparatus' as:

- being identified in the SMETS;
- having the functionality set out in the SMETS; and
- complying with any other requirements set out in the SMETS.

Paragraph 48 states that these conditions also build a platform for delivering interoperability; and require suppliers to install particular equipment based on an openly available set of requirements e.g. the SMETS. However, these requirements do not necessarily mean that the equipment installed is interoperable. Therefore we have proposed that in Paragraph 47, "Other Requirements", an extended definition is required to ensure interoperability is assured.

Given further work is required to guarantee interoperability between smart metering components; we believe it is currently difficult to qualify these functional requirements against the smart metering business case. As these matters are clarified, one option might be for the Smart Energy Code to reference the appropriate sections of the SMETS.

Question 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.

ScottishPower largely supports the requirement 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. However, we believe compliance should be measured from the time that smart metering equipment is procured from the supply chain.

Question 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.

Whilst we recognise that the term retrofitting may require further definition, our initial interpretation would limit this activity to the remote updating of firmware to ensure the meter

remains compliant, rather than the addition of any physical components to the meter. The responsibility for firmware updates is an area that requires further consideration, including the responsibility for keeping meters compliant with evolving security threats and other operational issues. We believe this is a complex area which requires the alignment of commercial asset ownership and manufacturing arrangements with the regulated requirements of the DCC. This could be delivered by placing obligations on meter manufacturers to continue to provide firmware development services either indirectly through commercial contracts with energy suppliers or directly as signatories to the Smart Energy Code.

The suggestion of physical retrofitting of meters to remain compliant with SMETS is of significant concern. We would propose that the replacement of initially compliant smart metering equipment before its planned 'end of life' should be regarded as a last resort and therefore any future policy changes should recognise the potential impact of asset stranding and reduced public confidence. There should be a proper due process with appropriate safeguards and appeal rights governing any power to require the replacement of already-fitted smart meters as a result of a change in specification

In addition to retrofitting meters, we recognise the potential future need to replace communications modules if a new technology is found to deliver the WAN requirements more cost effectively. The same issues about safeguards and governance would apply here.

Question 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.

The licence condition AA3-6 should effectively underpin the new and replacement policy, however ScottishPower has concerns regarding the timing of when this would come into full effect. The timing of the implementation of the licence conditions should consider the following factors:

- DCC go-live;
- supply chain readiness and the availability of meter variants (including HAN) and solutions to support non-standard installations, such as blocks of flats; and
- the possibility to phase the introduction of the licence taking into account the maturity of the DCC and cross-industry readiness to support the policy.

With regards AA-10, again we believe greater clarity is required on the application of the AA-3 and AA-4b in the context of sites where an AMR solution has been installed before 5th April 2014. The condition is unclear with regards whether a compliant smart meter should be installed where an AMR meter requires replacement (either at the end of an AMR meter's useful economic life or where the AMR meter has failed). Finally, we would recommend that additional consideration should be given to condition AA-3 and AA-4a for new installations, specifically how these conditions interact with condition BB for In Home Displays.

In summary, the introduction of a new and replacement installation policy in the first year of mass roll out could, if the associated issues have not been resolved, present significant impacts on roll out progress and place further pressures on the completion timetable.

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

We believe a 12-month notice period is appropriate provided that the supply chain for smart metering system components is fully established. Please also see our response to Question 6.

Question 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.

ScottishPower believes that ensuring interoperability between Smart Metering Equipment is best achieved through compliance with an appropriate industry code rather than licence condition. This reflects both the complexity of the issues and the risk that severe enforcement penalties might apply to a supplier for interoperability problems that were not his fault.

Suitable interoperability rules are required to ensure that individual organisations do not deliberately or accidentally create technological barriers to the functioning of the competitive Retail market. The selection of a HAN technology to facilitate interoperability is a pre-requisite of this process operating effectively.

In addition, there are a number of key areas which require further exploration to provide confidence that interoperability rules would be effective once implemented:

- Guidance for dealing with IHD's provided to consumers which have complex functionality well beyond that required by the SMETs and how these are required to function after a Change of Supplier event.

- Effective governance, assurance and testing regime that is required to ensure that devices can be easily tested to ensure interoperability on an ongoing basis and to provide dispute resolution services where devices are found to not be interoperable. The dispute resolution process should be able to evaluate relevant interoperability test data to assign responsibility for interoperability failure to the relevant party and enforce any financial responsibilities associated with that failure.

Question 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?

We believe that the policy intention to ensure Smart Metering Equipment is interoperable should be delivered under the Smart Energy Code.

We would note that should the licence condition define too much with regards to interoperable equipment there is a risk of introducing a level of uncertainty when referencing the licence and the code.

Please also see our response to Question 8.

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

We believe that a dispute resolution mechanism is necessary to ensure that interoperability issues are appropriately addressed, in terms of both resolution and associated timescales. We believe this is best served through the Smart Energy Code.

We would recommend that a dispute mechanism will require the following features:

- It should be available to all parties who require interaction with smart metering systems to deliver a service to consumers;
- It should be a 'last resort' where it has not been possible for parties to resolve an issue;
- It should be efficient to operate with clear rules of operation including the approach to decision making and supported by an appropriate body with suitable technical expertise;
- Interoperability issues managed through the dispute mechanism should result in either issue of further clarifications or changes to the SMETS through an appropriate governance process;

- An appropriate cost recovery process ensuring the party who is responsible for the failure to deliver interoperability pays the costs associated with the dispute.

Question 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.

ScottishPower agrees that where CT metering is required suppliers should only be required to install AMR equipment rather than meters that comply with the SMETs. This is largely due to the presence of contactor switches in the smart meter which would be impractical and unsafe to deploy where CT metering is required.

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

ScottishPower would agree that the draft licence conditions effectively underpin the policy intention for Current Transformer meters.

Question 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.

It is our understanding that DECC is proposing that a gas supplier, under the terms of a new and replacement policy should have the option of waiting for a smart electricity meter to be installed.

This is a complex area where suppliers have natural commercial incentives to deploy meters efficiently and avoid re-work and repeat visits to properties. As such, we believe that gas suppliers will have a natural incentive not to install "dumb" gas assets wherever possible. However, it is possible to envisage certain circumstances where it is not practical to install a fully operational smart gas meter and IHD prior to the installation of the smart electricity meter. This could arise, for example, where gas meter replacement is needed but where:

- the gas installer is not qualified or able to install a mains powered communications module; or

- a complex communications solution is required at a property (e.g. a block of flats).

In all of the potential circumstances it is our opinion that suppliers should be obliged to install a meter compliant with the SMETS but that consideration should be given to the possibility of installing the meter in a smart ready mode and not necessarily commissioned with the DCC. This would avoid potential asset stranding and may facilitate remote enablement of smart functionality without the need for a repeat visit.

This approach could be advantageous for new connections where a gas meter installer may be on-site to install meters before the electricity supply is connected or metered at the same property.

Finally, it is important to note the implications of a gas first meter installation using a powered communications module. This approach would lead to modular communications units being installed in series with the meter rather than as a removable component of the electricity meter. Having the communications module located in this manner would result in the module being unmetered and also introducing new potential points of illegal electricity abstraction/theft.

Question 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.

We believe the current form of DCUSA would present a barrier and would require revision. In the interests of safety, it currently prevents any party, other than the electricity MOP/MAP, from working on an electricity installation. This is a barrier if a gas MAM needs to pull a fuse in order to install a communications hub which is powered on the supply side. The gas MAM would also need to be able to manage other issues around the electrical installation such as asbestos meter back-boards, operation of metal clad cut-outs, and renewal of meter tails,

We also believe that gas only installations require further clarity be established on:

- the final architecture of the SMS and in particular how the communications module is configured to operate within the SMS;
- the solutions to deal with communications architectures in blocks of flats and hard to reach meter locations (or ones which require relocation); and
- permission for gas only installers to interrupt the electricity supply to a property to fit a mains powered communications module where they are not the registered Supplier.

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.

ScottishPower believes that third party installations should not be undertaken without the involvement of the registered supplier. We see a number of implications of extending the new and replacement obligations to parties other than suppliers for the installation of meters in new properties, which include consumer engagement issues where significant complexity is introduced with regards the provision of IHD's and the delivery of appropriate consumer engagement messaging.

In many cases a site of new build properties will start with a preferred supplier arrangement and as such it is the responsibility of the supplier to discharge their obligations as part of the new connections process. For individual new connections it should remain the requirement for the consumer to contact or gain appropriate agreement from their Supplier to arrange for suitable metering equipment to be installed.

It is clear that application of the IHD conditions (BB) will require further thought in relation to the installation of meters at new properties where the end consumer is not yet present.

We would also wish to further understand the current practices undertaken by iGTs where metering installation may be undertaken as part of the establishment of a new gas network and the smart metering components installed.

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.

ScottishPower believes that the roll out of smart metering provides a unique opportunity to standardise processes across Great Britain for gas and electricity emergency meter works.

In a smart metering context it will become highly challenging for GDN's and DNO's to practically manage meter faults. This is primarily because it is unclear how these parties would successfully access the supply chain for meters as it is unlikely to be cost effective for them to do so for small volumes of compliant meters. In addition the ancillary equipment

(hand held technology) and security requirements required for smart meter installations in low volume may make it cost prohibitive to install the meters.

It is likely that outage calls from consumers will still go to DNO's / GDN's out of hours as consumers will fail to differentiate between networks related outages and meter faults. With this in mind we would propose that where a Distributor received an outage notification from a single consumers (i.e. not from the meter) and no immediate safety concerns were identified then the Distributor may wish to conduct meter diagnostics via the DCC to determine if the outage is a meter/communications fault and then decide whether to attend the site, provide advice to the consumer (if the fault is downstream of the meter) or pass to the supplier (or their appointed agent) as appropriate. As part of this process we would anticipate the Distributor checking for multiple outage notifications from the meter (via the DCC) which would indicate the presence of a network fault.

Maximising the opportunity for suppliers to resolve these issues will ensure that meters remain smart and issues are resolved in the most effective manner possible.

However, we also recognise that exceptional circumstances will arise where a Distributor, when attending a consumer's property, identifies a meter or communications fault. Further consideration is needed as to the circumstances where it would be appropriate for the Distributor to ensure that the installation was made safe (and the Supplier was contacted as soon as possible to arrange for a meter replacement to be conducted) and where there would be a need for the Distributor to take action which leaves the customer with a supply of gas and/or electricity. Where supply is to be maintained, it should be considered whether this should be undertaken by the installation of a non-smart meter, through the installation of a smart ready meter which meets the SMETS or as a last resort establishing an unmetered supply for a limited period. Each of these solutions presents its own challenges and we would welcome further discussion on a consistent approach across the industry.

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.

A successful roll out of smart metering in great Britain will include the suppliers' ability to access an established supply chain of interoperable, compliant smart metering system components, which includes IHDs.

We would highlight that given the SMETS is not yet published, with a number of outstanding issues around the definition of interoperable smart metering equipment still remaining, it is

currently difficult to estimate the notice period required prior to the obligation to provide IHDs coming in to effect. Please also see our response to Question 7.

Question 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.

ScottishPower would highlight that during the Change of Supplier process there will be potential challenges in determining the level of IHD functionality which can continue to be supported in cases where the installed IHD functionality exceeds the basic SMETS. As a result, during the sales engagement process careful management of consumer expectations will be required whilst determining the future smart metering system functionality that will be available and the possible circumstances where previously established smart services cannot be maintained following Change of Supplier.

We believe that further consideration needs to be given to the following:

- validity of warranties following Change of Supplier;
- the level of data items stored / not stored; and
- the level of redundant functionality.

We would recommend that it is ensured that business process design and the SMETS are aligned to minimise Change of Supplier issues.

Question 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.

ScottishPower would agree that the draft licence conditions appear to cover the requirements stated in the consultation document, although tracking of IHD installations may be complex. We would recommend that clarification of IHD provision and lead times for compliant smart metering equipment need to be established before introducing licence conditions.

We would however note that the requirements of the "Relevant Period" pertain to the installation date of the Smart Metering Equipment rather than the IHD itself, which may be installed at a later date. This may cause some confusion with regards to responsibility for IHD faults; although it is likely suppliers will rely on warranty arrangements if the IHD is less than 12 months old.

Question 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.

The proposed licence changes give powers to the Secretary of State which could be exercisable in relation to licence conditions which do not relate to smart metering. We think that DECC should assure themselves that they have the vires to make such changes or else limit the changes to matters connected with the smart metering licence conditions. Subject to this technical point, we are in general agreement with the proposed consequential changes to Standard Licence Conditions However, we would highlight that the proposed change to 'Designated Premises' definition may require future change in the event of reforms in the electricity settlements arrangements currently under consideration.

It is necessary to clarify supplier obligations around IHD provision in the following scenarios:

- new build installations where initially no consumer is present; or
- non-domestic customers who have previously opted out of DCC smart services.

Question 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.

We believe that there is still work to be undertaken by the Programme in this area and will continue to input into the Programme including the work of the DCCG Working Group 1 and the identification of consequential changes to existing codes, legislation and other industry codes and agreements. A key item will be the necessary price control mechanisms to fund work by DNOs in this area as DPCR5 did not fund activities by DNOs to support/facilitate accelerated or incremental roll out activities.

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.

We are continuing to review this question. It would be advisable for Energy Services Companies to be obliged to accede to the Smart Energy Code, but we think that that result can probably be achieved without legislative change.

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.

We believe there will be a need for consequential changes to existing industry codes and agreements in order to make the proposed roll out obligations operate correctly and will continue to support the DCCG Working Group 1 in its work to identify necessary changes.

Question 24: Do you think that there are other requirements that the Government should adopt into SMETs? Please explain your reasoning.

We are generally happy with the functional requirements set out in the IDTS and that these should form the basis of the SMETS. However, we believe there are a number of key areas which require further consideration by the Programme, with input from industry experts, ahead of the SMETS being submitted to the EU – reference the summary brief issued on 22nd September 2011 entitled "Completion of the SMETS Project". Table 1 summarises the areas we believe require further consideration and proposed next steps.

Subject	Comments
Standardisation of data and power connections between communications hub and smart meters	Ensure simplified interchange ability of SMS components to ensure supply chain competition between multiple third parties. BEAMA has indicated that attempts to standardise connections may not be delivered in time for roll out. ScottishPower believe further work should be undertaken with immediate effect, but do not consider it a showstopper for mass rollout.
One Wallet	In a predominantly dual fuel market ScottishPower recognise the potential benefits to the consumer of a 'one wallet' approach to pre-payment. Commercial judgement and scope for innovation could be enhanced with an architecture option that includes adoption of a 'thicker hub'. This option could help to strengthen delivery of an optimal technical solution with reduced / simplified HAN data traffic. We believe a full cost benefit analysis should be undertaken to enable an informed evaluation.
Bridging Devices	Further consideration of how SMS components and other devices will be securely connected to the SMHAN including the scenarios where the HAN bridging device will become the secure join between the SMHAN and the consumer's own HAN.
Data Privacy	The overall security requirements and controls need to be defined to a lower level of detail including the way in which consumers access their data. Careful consideration needs to be given to the way a robust yet cost effective PIN service can be delivered which does not introduce further complexity to either the smart metering architecture or consumer.

Subject	Comments
Range Extenders	For some difficult property types it is anticipated that there will be a requirement for some form of range extender (repeater or booster) whatever WAN and / or HAN solution(s) is selected. More work is required to determine practical options in respect to how these additional devices will be powered together in addition to an agreement on responsibilities for ownership, installation and maintenance.
Data Push / Pull	The DECC Security Team has stated a requirement that where data is being retrieved it should be pulled from the SMS components, yet there is no reference made to this in the IDTS. This requirement needs to be explicitly stated as a push (e.g. for tampers and alerts) and / or pull schema has significant impact on WAN and HAN traffic volumes and associated message coordination.
Optical Port	Smart meter products, including the latest releases from SSWG manufacturers, all incorporate an optical port yet this is not part of the specification as outlined in IDTS. ScottishPower believes an optical port supports on-site diagnostics and would recommend that concerns over security weakness could be overcome e.g. remote control on/off of the optical output.
Firmware Upgrade	Detailed definition of governance, testing, operational process, roles and responsibilities with regard firmware upgrades to SMS components is still outstanding. Detailed analysis is required to determine levels of security severity, the approach to fix on fail and enhancements whilst maintaining continuity of service and full interoperable compliance.

Table 1: Recommended additional SMETS requirements

ScottishPower has previously passed review comments back to the Programme detailing areas in the IDTS where levels of definition are inconsistent leading to unintended ambiguity and the potential for mis-interpretation. We believe that further work is required on the IDTS ahead of the anticipated legal and regulatory review in order to shape the SMETS for EU submission.

In addition to the areas outlined in Table 1 above, we are also keen to see detailed definition with regard the use of hand held terminal devices (HHTs) during the installation and commissioning process. We believe that there is an insufficient level of detail / lack of reference in the following areas:

- Security requirements required for individual HHT units; and
- Authentication routines to enable HHT devices to become temporary attributes of individual smart metering HANs

ScottishPower also has certain reservations associated with the use of HHTs in respect to the governance and control of its software and the prospect that there could be a prevalence of proprietary or bespoke software. Whilst security and authentication is vital, productivity associated with the installation and commissioning activity should remain a critical consideration for the Programme. We believe that the Programme should consider options associated with on-site commissioning routines to protect confidentiality, authenticity and

integrity of data and the use of cryptography solutions e.g. the deployment of self-describing devices utilising trusted certification certificates and public key encryption.

We would also highlight an outstanding lack of clarity around load limiting functionality and would like to see further detail surrounding instantaneous power thresholds (in kW) and demand thresholds (in kW) taken as an average over time.

Whilst ScottishPower is supportive of DECC's intention to conduct a revised Impact Assessment based on the full and final SMETS we would highlight the urgent need for a plan to mobilise sufficient resources to address outstanding areas in the IDTS, as detailed above - any delays to SMETS having a direct impact on overall Programme delivery as reflected elsewhere in our Programme responses.

We also believe that the Programme must continue to exercise careful control over the scope of the SMETS, the direct impact on the Impact Assessment and the ability to realise stated benefits where associated costs have increased.

Question 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.

ScottishPower believes that the security requirements at a high level are appropriate and reflective of the needs of the Smart Metering System and the end-to-end processes. However, we believe that further detailed work is required to ensure consistent application across the Programme.

We would recommend that further consideration is given to a 'thicker' communication hub which may lend itself to promoting a more secure architecture with security (i.e. device roles, encryption and key management) controlled centrally at the point of entry / exit to the national infrastructure.

A 'thicker hub' containing the smart software, in conjunction with MID compliant smart meters, would reduce the number of 'attack points' to affect the operation of the smart metering system. As a result, there would be only one major interface to be protected i.e. the WAN, with SMHAN components still requiring a level of security, but this to a potentially lesser extent.

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

ScottishPower believes that whilst the IDTS contains a considerable amount of information, there is still a significant amount of work to be undertaken to address gaps and issues to enable transition in to the SMETS. We would propose that further industry involvement is required to address these issues in a timely manner.

We would urge that the Programme gives more attention to the association between uses cases and business processes, the latter of which are still under development.

We believe that achieving a fully interoperable smart metering architecture presents significant delivery challenges and as a result the Programme should be minded that robust testing and associated governance is essential to the success of initial roll out and enduring smart metering operation throughout Great Britain.

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 on-going governance of the SMETs? Please explain your reasoning.

ScottishPower believes that the governance of the SMETS should be part of the arrangements under the Smart Energy Code and that there is a need to get governance in place as early as possible.

We believe the promotion of gas and electricity alignment, through the amalgamation of supporting governance in the Smart Energy Code, is a major step forward in assisting future streamlining of the industry.

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 provide any other comments .

It is difficult to make such projections with much assurance. On the one hand, the cost of electronic devices can be assumed to fall in real terms as has been demonstrated in many markets for many years. On the other, significant elements of smart meters involve mechanical elements and commodities such as copper whose prices are likely to be much more resilient. A high proportion of the initial SMS asset unit cost is associated with front

loaded payback for the manufacturer on their embedded proprietary firmware and software development. Once the SMS is in mass production this aspect of the cost component could reduce. However, it is anticipated that individual component firmware will be subject to further development and upgrade over the lifetime of the component (excluding that associated with general support and maintenance for fixes and/or security resolutions) to deliver innovative enhancements beyond delivery of the mandated requirements.

As detailed in the Impact Assessment, we would support a model where there is a reduction in unit price in the second or third year of mass deployment (assuming that any teething problems are addressed during the Foundation Stage). At this stage, we would however be cautious, taking account of commodity and firmware costs as set out above, in going beyond the 13% reduction in equipment costs over the next twenty years set out in the Government's Impact Assessment.

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

ScottishPower agrees that the scope of the SMETS should include the Communications Hub, given that it provides an appropriate platform for interoperability and innovation.

We would recommend that the Programme gives further consideration to an architecture incorporating a 'thicker' Communications Hub. Table 2, below, outlines the potential benefits the adoption of a 'thicker' communications hub could potentially deliver:

Benefit	Reasoning
Simplified architecture	Smart meters would become sensors on the energy network only sending consumption data that falls under the MID. There are no complex tariff related data items or prepay credits to transfer as these are never required outside the Hub.
Enhanced security	The thick communications hub would control data privacy and confidentiality, authentication, access rights and authority and logic integrity with connected SMS devices acting principally as slaves.
Interoperability	Accepting that the metrology firmware in the meter is understandably proprietary, having proprietary / bespoke software however operating in each of the meter components may add considerable overhead to compliance testing in order to achieving consistent and interoperable functions. If the software driving the smart functionality is operated on a common platform, capable of running third party 'non-proprietary' software, then interchangability and interoperability may be more easily achieved and sustained.

Benefit	Reasoning
Testing and assurance	Reduction of interoperability testing with smart meters already in existence that can provide simple consumption data and communications systems which can transport it. Development would therefore be restricted to the design of an interoperable communications hub with controlled and secure non-proprietary software running on an open operating platform.
Lower cost Smart Metering System	By combining all the smart functionality in one solution the costs of power supply and data processing can be shared where more than one smart meter is installed. Within certain architectures there would be no need for a HAN radio in both electricity meter and hub.
No firmware upgrades over the HAN	By restricting the functionality of the meters to that of being sensors that provide MID data there will be no need to upgrade the firmware in them. This reduces the memory requirements in the meters and hub and frees up bandwidth on the HAN. It removes a point of attack for potential hackers as the meters cannot be modified.
Minimal data requirements over the HAN	By restricting the meters to only providing metering data, the messages required via the HAN are reduced. A reduction in the number of data items that are required for interoperability will result in a simpler specification reducing testing overheads and overall timescales for deployment.
13 month data stored in one place	13 months of consumption data could be stored for both fuel types in the communications hub - a requirement for gas in any system architecture. The extra cost of the memory requirements for storing both fuel types rather than just one would be minimal. A thicker hub may also provide an option to become the gateway to the consumer HAN.
ZigBee V1.1 may be suitable without extensions	Current HAN solutions will work with the dual hub as there are no complex data items to transport over the HAN. There would be no requirement to update ZigBee for the HAN, however it is accepted there would still be a requirement for extra data items for the WAN.
Wired IHD solution capability	A remotely wired dual communications hub could provide the functionality of the wired IHD if necessary. It could be fitted with a display and user interface for prepay.
Simpler delivery of innovation	The dual fuel thicker hub approach allows for maximum flexibility and innovation both at the design stage and for future in-the-field upgrades. With the meters providing basic information, the communications hub could be made to perform a variety of functions using the data ranging from a simple credit based bill estimation to complex pay as you go with multiple debt type collection and forward bill projection. Updates to the system functionality delivered via the WAN with no subsequent requirement for HAN firmware upgrade.
Multi-Utility / Multi-Facet Accounts	Staging of all data to a common point supporting the 'one wallet', approach to managing consumer accounts e.g. micro-generation meter(s) would simply join at the hub and provide the opportunity for the information on gross generation to be reflected appropriately into the consumer's energy account with their Supplier; or consumers being offered multi-service discounts integrated with their pre-pay arrangement (e.g. dual fuel discount).
Future Flexibility	It is envisaged that many smart components may be added to the smart home in the future. The communications hub could be at the heart of enabling the integration of other metered services such as water and heat keeping the smart software, intelligence and processing out of individual measurement instruments reducing the number of firmware upgrades required over the HAN. This may address some of the concerns with regard meter attacks in the 'thinner' communications hub option.

Table 2 – Proposed benefits of a thicker Communications Hub

Pre-payment gas meter operation:

ScottishPower believes that further consideration should be given to the operation of pre-payment gas meters and the potential for 'over the air' communications failure (or forced failure through interference by the occupier) leaving the gas supply in an uncontrolled state. We believe that further consideration should be given to the possibility of the communications hub managing a 'cut-off' value and a parameterised 'time-out' arrangements, incorporated in the 'ack' and 'nak' communications transactions.

Question 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.

ScottishPower believes that further clarification of the costs (including DNO costs in managing and utilising the data) and benefits associated with outage detection is required.

In principle, we agree with the Government's proposal that the Communications Hub is the rightful location to incorporate outage detection technology. However, we would recommend that the SMETS definition of requirements for Outage Detection would need to build in a suitable solution to avoid bombardment of messages in the event of intermittency.

However, we have reservations in respect to the benefits realisation associated with outage detection, given the level of associated industry process and system development and subsequent testing. We would also note that the use of outage detection data may not be used until sometime after mass roll has commenced due to initial smart metering density - a factor which is not currently present in the Government's business case.

We would propose that further work needs to be undertaken by the Programme, in conjunction with the industry, to set appropriate consumer expectations. As it stands, the process from the point of notification to restoration of supply will remain unchanged and therefore there will be no reduction in the time for resolution, apart from a potentially quicker response time to initiate the restoration work. Until the density of smart meters installed reaches a sufficient level the, Network Operator will need to continue to rely on current practices.

ScottishPower does not believe that all the process implications for outage detection and notification have been fully considered to date. We would recommend that further work is required in the following areas:

- detailed definition of data handling and message filtering via the DCC in terms of traffic volume and processing implications;
- MPAN to network feeder; and
- the approach to differentiating a communications network failure from a supply network failure e.g. in circumstance where a supply network failure may bring down the WAN tower.

Question 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.

ScottishPower does not agree that the DCC Communications Service Providers should be responsible for specifying the functional and performance requirements for outage detection. It is of prime importance that these requirements are agreed upon by Government in collaboration with the Energy Network organisations. In doing so advice should be taken from WAN experts with regard to the potential implications that such service requirements could have on the capacity and bandwidth of the communications infrastructure and feasibility of WAN technology solutions.

Question 33: Do you think that the Communications Hub should also have the rollout obligations functionality to send a communication to the DCC when power is restored? Please explain your reasoning.

If Outage Detection is to be catered for in the Smart Metering System, DCC services and end-to-end business processes, then ScottishPower considers it appropriate that the process should include notification of supply restoration. We believe further work is required with regard associated roles and responsibilities and consumer engagement during this process.

Please see ScottishPower's responses to Questions 32 and 34.

Question 34: Do you agree with the Govenment's proposal that fully integrated electricity meters and Communications Hubs will not comply with the SMETs? Please explain your reasoning.

ScottishPower agrees with the Government's proposal that a fully integrated electricity meter and communications hub will not satisfy the requirements currently set out in the SMETS.

Maintaining a separate communications hub and electricity smart meter reflects the intended ownership and competition in manufacture of each smart metering system component, however, we would highlight the need to establish an agreed common standard for both the power and data transport connections to ensure delivery of an optimal solution. Whilst we acknowledge BEAMA's commitment to standardisation of safe and practical power, protection and communications provision to a separate Communications Hub, we would still expect that associated standards will require approval from network operators and the EU.

A key concern, particularly for network operators, will be the extension of potential weak points which could be prone to illegal power extraction. This would be most applicable where the communication hub's power is sourced from the cut-out and is therefore unmetered and unsecured. The risk of energy theft could be mitigated by powering the communications hub using a direct wired connection from the electricity smart meter (i.e. umbilical cord). However, this approach would not address gas first installations where a battery would be required to power the WAN. On this basis, we have reservations with regard gas first installations and the communications solutions which will be deployed with regard on-going capabilities following a smart electricity meter being subsequently installed at the site.

It will also be necessary to resolve the issue of how the energy consumed by the Communications Hub will be dealt with from a settlement perspective and to take steps to avoid any unintended penalties that might accrue to DNOs through their network losses incentive mechanisms.

We would recommend that further detailed work is required by the Programme and industry with regard to site activities, roles and responsibilities and the necessary authorisations required by field operatives in order to ensure the safe and secure power up of a separate Communications Hub, with power being provided from the supply side of the electricity meter.

Question 35: Do you think that 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.

ScottishPower believes that the objectives of the SMIP are best met by Option (a)-a separate Communications Hub with a fixed WAN transceiver.

We believe Option (b) could result in more variant products, resulting in logistical issues with regard to field support and maintenance activities.

Question 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.

The HAN selection process is an accepted issue within the Programme, with selection of the wrong technology potentially resulting in the future stranding of assets. We believe that HAN selection should be concluded as soon as possible given it is a key enabler for the Foundation Stage and achieving final sign off of the SMETS with the European Union. Technical interoperability continues to be a primary objective of the Programme. ScottishPower believes that this can only be achieved with unified agreement on as few standard protocols as possible recognising that there may be some call for variations to the mainstream to meet the needs of difficult property types. Any need for protocol variation may be more prevalent at the physical layer, but network and application layer consistency will help to simplify security and data handling. Aiming for a successful roll out of smart metering in Great Britain, complexity and the level of translation across the end to end design must be kept to a minimum.

We believe that considerable work is still required to define areas such as message payloads and the order of data objects and items in support of the functionality that will be defined in SMETS to operate smart metering in Great Britain. We would also refer to our response to Question 30 and the consideration of benefits associated with a 'thicker' communications hub.

In order to agree the most appropriate HAN technology/technologies, we would propose that the following activities need to be undertaken:

- Agree a two-stage EU notification process with a first notification as early as possible with HAN requirements defined in SMETS against which HAN technologies are evaluated;
- Second notification to the EU with final HAN technology selection;
- DECC to make a decision within the next 6-months within the scope of programme governance to ensure that interoperability and investment certainty can be delivered as quickly as possible.

Question 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.

ScottishPower recognises the reasons for establishing communications standards which are appropriate for the roll out of smart metering across Great Britain; however we seek further clarity as to how the EU may influence the final standards adopted. EU approval for the SMETS will have an impact on how soon SMS components can be classified as being fully compliant.

We anticipate that a number of different communications technologies will be required to support HAN and WAN interfaces, with the potential requirement for protocols to be modified / enhanced to meet future compliance measures. Risk of obsolescence and/or asset stranding must be managed to a reasonable level during the Foundation Stage in the lead up to full scale roll out. However, it will be essential to test a selected mix of communication technologies in respect of their performance and connectivity to Smart Metering System components. This will assist in setting end to end process expectations against technical interoperability criteria to be detailed within the SMETS. Ideally any protocol which is tested in an operational environment should be subject to an independent assurance test regime whilst recognising that during the Foundation Stage protocols may be in the field that have not fully reached the point of standards approval and as such have undergone the desired level of independent assurance.

Question 38: Do you think regulatory obligations are needed to underpin a systematic approach to testing of HAN standards during the Foundation Phase? Please explain your reasoning.

ScottishPower would regard regulation in this context to be at odds with the proposed approach to installations in the Foundation Stage, unless it is used to drive some form of standard approach to evidence collection.

Individual suppliers can only be expected to roll out meters in line with their own commercial strategies, perhaps targeting customers according to demographic or geographic criteria, resulting in a potentially limited mix of the HAN technologies being deployed. This would make a systematic approach to HAN testing very difficult to achieve without insisting that at least some of these meters are rolled out according to a plan prescribed by DECC or Ofgem.

Suppliers could submit anonymous statistical results from their foundation activities and these be accumulated in a database for detailed analysis. While this will still be based on an uncontrolled mix of HAN technologies, the results could be weighted accordingly.

We would also wish to seek further clarification with regard the arrangements for metering equipment installed with HAN solution technology which does not meet the final specified standard with a subsequent potential impact on both suppliers and consumers.

Question 39: Do you agree with the 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 asssist Government in evaluating industry's proposal?

ScottishPower supports the recommendation to adopt DLMS as the standard for communications with the DCC from / to the SMS installed in the domestic and small commercial premises across Great Britain.

There is a considerable amount of work still to be done to enhance the standard in order to gain approval by the DLMS User Association in respect to security requirements (e.g. it does not, as yet, include the capability to administer public key exchange) and ensure support of the full functional range of SMS to be defined in SMETS – particularly pre-payment and smart grid related requirements. However, DLMS is a protocol that does not dictate the physical and transport layer solution and would therefore assist in the Programme's aim for consistency in the Application Layer., Work on enhancing DLMS and COSEM to set out a specification that defines the transport and application layer requirements, is already

underway. It has already been concluded in the SMDG Working Group that DLMS was a closer fit (e.g. less of a gap) to GB requirements than ANCI C.19 or SML. Whilst ANCI is an established standard adopted in North America and SML is being developed in Germany, DLMS has been acknowledged as a European Standard as used by most of the smart metering implementations across Europe to date and is central to the M4441 activities of the Commission.

ScottishPower still has reservations in respect to setting the core standard for the HAN as Zigbee SEP 1.x without extensive evidence to support its suitability in the context of smart metering roll out in Great Britain. Although widely adopted in the United States, there are reports of installations where this has been at the higher power rate than the standard Zigbee power rating of 1mW (i.e. up to 100mW EIRP) which entails the incorporation of a power amplifier as an add-on to the standard Zigbee module. Although this has overcome potential issues with line of sight propagation and penetration through barriers or obstacles, it is noted that in Europe the maximum power amplification may only allow up to 32mW (i.e. 15dBm), and therefore a lower propagation capability than has been required in the US.

Power amplification:

Whilst power amplification has the added advantage of reducing transmission error rates due to multipath fading (i.e. where a radio signal is reflected by terrestrial objects causing copies of the signal to reach its destination by multiple paths), the higher power option would however add more than £5 to each Zigbee module deployed and reduce gas battery life. We understand that it is possible to mix low and higher powered Zigbee modules depending on the site specific needs, but this would in itself introduce variants in the integrated HAN module within the SMS component. We would also note a high number of RF exposure complaints currently being experienced in the United States in association with Zigbee operating at a 2.4GHz frequency. Whilst Zigbee 2.4 GHz offers up to 16 channels of choice, to enable the frequency setting to optimise the performance of the communications on site, the sub GHz Zigbee option is set to a fixed frequency in the free spectrum space, and may therefore be more susceptible to noise and interference from other over the air communications in the HAN environment. This gives rise to concerns related to reliability and robustness of the solution and therefore the Government might wish to consider dedicating a thin band of low frequency spectrum for smart home use to the Utility sector.

HAN selection criteria:

Whilst the HAN Working Group has set out the criteria for selecting viable HAN solutions matching GB requirements, ZigBee as a protocol has evolved to support simple sensors on

a network connected to the WAN via an Energy Services Interface (ESI). Conventional design utilising Zigbee over the HAN has tended to have the intelligence contained within the ESI and the meters' extra capabilities minimised. It has taken the ZigBee Alliance over 6 months to reach agreements on interoperability requirements for version 1.0 with only the very limited / basic mandatory features, and with many of the extended optional features still not being certified four years later. If in Great Britain, the meters were to be specified with simplified interfaces, i.e. with the smart functionality located in the communications hub, then interoperability over the HAN could be achieved more readily, meters would be lower cost and gas meter battery life could be extended.

Independent testing:

ScottishPower would support rigorous independent testing of potential HAN options to minimise the risk of selecting sub-optimal solution(s). We currently have reservations over the Government proposal to allow flexibility in HAN standards, leaving suppliers with the expectation that they will be required to sample test a range of options during the Foundation Stage to sufficiently address concerns. At present some standards are more advanced in meeting smart metering requirements in Great Britain than others, and as such the solution may be selected by functional capability rather than overall performance applicability.

ScottishPower continues to hold an opinion that a low band PLC solution (e.g. Lonworks or Zigbee V2)for the HAN may indeed offer considerable benefit in respect to difficult property types and could, if the protocol is invested in, be developed to be a viable solution for more than just the difficult to reach meter, hub and display locations. Again the option of a thicker hub, could reduce the protocol development gap in having the smart applications based in the hub and connecting devices used in their simplest form as sensors or switches etc.

Question 41: Do you think the Smart 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.

A single network layer technology would be preferred by ScottishPower as we believe this would mitigate some of the risks associated with achieving the fundamental objective of technical and commercial interoperability.

In the short-term, ScottishPower would not see any immediate need to move to an IPv6 network layer platform. It is understood that there are potential security implications with the on-set of IPv6 that have yet to be fully understood (recent publications by SOCA pointing

towards IPv6 becoming very complicated due to the almost limitless numbers of IP addresses). However, given developments in new in-home gadgets, appliances and advancements in demand side management equipment in the medium to long term, manufacturers are likely to favour an IPv6 platform to maximise future interconnectivity potential. Therefore, we would urge the Government to listen to expert advice and opinion from the telecommunications and IT market. Rolling out solutions on IPv4 offers less risk in the short term, but could become a constraint in the future.

In our view, concentration on the communication path to the home through the communications hub has the greatest prospect of ensuring a secure, reliable and protected data path is enabled from Host to smart meter. Having individual IP addresses for each individual component on the SMHAN may not be necessary and could add an extra complexity to the operation of the smart metering system.

Question 42: Is the provision of a single network-layer address for each Communications Hub a reasonable and sufficient functional requriement for the Smart Meter WAN? Will this requirement limit potential future capability or present challenges, for example, in multi-occupancy buildings?

ScottishPower believes that establishing a single network-layer address for the communications hub will be sufficient and may contribute to maintaining overall security of the smart metering system installation.

Whilst it is recognised that other devices such as boiler time switches, electronic thermostats, smart demand side contactors etc. may be joined to a home network through the consumers own choosing, any action that can be instructed or instigated by the utility host (i.e. supplier or network operator) should be through the Communications Hub. Please also see our response to Question 41.

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

ScottishPower believes that further work is required to understand in detail the requirements around maximum and minimum demand and the associated cost benefit model. Like all other requirements, we believe this process is necessary ahead of inclusion in the SMETS.

Question 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).

ScottishPower does not believe a requirement for network registers should be included in the SMETS.

The inclusion of network registers in the SMETs would appear at this stage of the Programme to be premature. This position may change when second or third generation of smart metering firmware becomes available, however in the short to medium-term (up to the next 10 years) we believe this requirement is unnecessary.

Half-hourly consumption data will be recorded and stored for 13 months at the meter and should be accessible to network operators via the DCC. There is currently no evidence that network tariffs, which may be fixed geographically at high medium and low annual rates, would dynamically alter the price being paid by the consumer for their energy use. The consumer's energy tariff would be in accordance with the tariff agreed with their supplier of choice with DUOS charges amounting to only a small proportion of the consumer's overall electricity bill.

Considerable investment would be required in end to end processes and supporting systems to support network tariffs at the meter point. We would recommend that a detailed cost benefit analysis be undertaken, recognising that a fundamental change to the supplier hub model will be required. It is also noted that there would be a requirement for firmware in the electricity meter to record consumption to concurrently active supply and network registers on the meter, noting that switching times and number of rates may not be fully aligned.

Question 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.

Theft of copper from distribution systems is a serious and growing problem and it is therefore appropriate that consideration is given to whether the prepayment contactor switch could offer protection from floating neutral network faults. The considerations which we consider to be relevant to this question are as follows:

(a) *Performance*. It is recognised that the switch is unlikely to operate in sufficient time to prevent electronic equipment in the consumer's home from being damaged;

however it could have the capability to reduce the time for which the excessive voltage is sustained, thus reducing the risk of further damage such as fires. In order to prevent false cut-offs, the meter would need to be able to differentiate between electrical surges and prolonged periods of excessive voltage.

(b) *Cost.* Protection against a 'floating neutral' fault would require the load switch within SMS to be rated higher than that currently specified in the IDTS, involving a larger gap between contacts and more copper. A cost assessment undertaken by BEAMA has indicated a £15 to £20 additional cost to the meter. It is noted that early drafts of IEC 62052-31 would suggest that the EU may require meters to withstand over-voltage of up to two and a half times the current nominal voltage. If this comes about, this could reinforce the case for providing this functionality, but it would not be reasonable to require the retrofitting of meters already installed.

(c) *Other options.* The IDTS already incorporates diagnostic requirements for event notification for voltage thresholds and sags and swells. This will offer network operators greater opportunity for improved network management that may help prevent some instances of voltage extremes from occurring or allow necessary repairs to be more quickly effected. The Programme should also give further consideration (in conjunction with appropriate advice from meter manufacturers) to the incorporation of thermal protection for the electronic components within the smart meter and communications hub. This may mitigate potential asset damage and may lessen the prospect of a fire hazard at the meter point. We believe this can be achieved with a minimal incremental cost.

We would like to see consideration of this issue continue, taking account of the above points. Mandatory provision of the capability to switch off on detecting a floating neutral fault should only be pursued if it can be demonstrated that it is cost effective and sufficiently reliable,

Question 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 expalin your reasoning.

ScottishPower agrees with the proposed approach for customers to access and transfer their data via the HAN, however we continue to have concerns over how devices will be securely added to the smart metering HAN.

Question 47: Do you have any views on the options presented to ensure that electrcical contractors can work safely and efficiently between the electrcity meter and the consumer unit/fuse box? Please provide evidence to support your reasoning.

ScottishPower operates a policy wherever feasible to install a double-pole isolation switch for new connections. The cost of adding this isolation point is included within Meter Operator charges. The customer / electrical contractor / landlord / council are responsible for ensuring that any installation on the consumer's side is approved and tested in accordance with the current edition of the IEE wiring regulations. The cost of a surface mount sealable double pole isolating switch would be in the region of £10 when purchased in bulk quantities and the added cost of installation is thought to double this cost if a switch were deployed external to the meter to constitute a full smart metering installation.

Without an isolation switch on the load side of the meter there is no mechanism to safely isolate the supply to a premise without an authorised party pulling the main supply fuse. For obvious reasons of safety and control on the network, non-supply industry operatives would not be given authorisation to withdraw the main supply fuse. Occasionally there can be difficulties in liaison between electricians and network or supply company representatives and main fuse seals have been removed illegally.

To date we are unaware of any cost benefit analysis to determine the number of times an isolation switch is required, resulting in savings in resource time and effort - including the avoidance of industry operative site visits. Analysis would also have to take in to account the implications of existing meter locations, determining whether an integral isolation switch is incorporated within the meter itself (increasing its size) or a separate isolation device is installed.

Until the Programme has undertaken a cost benefit analysis, which demonstrates a positive benefits case, ScottishPower does not believe a final decision on the mandating of a double pole isolation switch and subsequent inclusion in the SMETS can be made.

Question 48: Do you agree with the 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?

If protocol standards are sufficiently detailed to cover all of the core functions without the need (or minimal need) for tunnelling of interface messages to / from SMHAN devices and

the standards are applied by all component manufacturers as independently assured in a fully compliant and consistent manner then the call for translation will be minimal. Whilst the message payload should remain the same in the application layer, the WAN to HAN protocol conversion and *vice versa* would be defined by the standards adopted.

Question 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?

ScottishPower believes that if communications standards are universally adopted, translation at the DCC head end for the WAN communications should not be required.

The 'plug and play' aspiration associated with a truly interoperable Smart Metering System, with interchangeable components potentially developed by different manufacturers, will be achievable where the WAN to HAN translation takes place within the Communications Hub. At present manufacturers have tended towards bespoke message interfaces to/from their devices which has required Head Ends to have the requisite translation capabilities (i.e. access to external or embedded device drivers) to enable effective communication to take place.

Given the probable capability of the Communications Hub microcontroller, it is anticipated that there should be few issues in providing translation services in the hub. If the Communications Hub were to provide most of the 'smart functionality', then the amount of translation would be reduced with less traffic across the HAN. The translation in this context should be limited to be the standard protocol carrier / overhead and not translation of the message payload itself as this should be compliant with the GB companion specification.

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

ScottishPower agrees that the minimum specification IHD should only be required to display ambient feedback based on instantaneous electricity power level. There is currently no evidence to suggest that consumers would prefer ambient feedback based on any other

measures, the risk being further measurement options will result in consumers becoming confused.

We are satisfied that the inclusion of this feature may help to positively influence consumer behaviour, particularly where there is discretionary choice and the consumer is given near real-time indication of their energy consumption e.g. turning on or off electrical appliances. However, ambient feedback of this type is relevant for electricity usage but not as appropriate in the context of gas as this tends to be 'on burn' or 'off burn'.

We acknowledge that there is significant scope for innovation beyond the basic IHD specification; however incorporation of extra functionality should be subject to commercial judgement based on customer demand associated with specific product offerings.

Question 51: Do you agree that the 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?

ScottishPower believes a detailed cost benefit analysis is required to understand the full impact of supporting the calculation and/or display of account balances.

Whilst we recognise that there is the necessary functionality within the Smart Metering System and in the minimum specification IHD, the impact on supplier systems and the end to end delivery of account balance information is significant. Complex financial controls, including alignment and reconciliation, will be required to ensure that account balances displayed in the consumer's home align with their current billing profile. This could also be regarded as a barrier for new entrants into the market.

We are in agreement with the Government that the display of account balance when operating in credit mode should not be mandated. In our view it has the potential to cause unnecessary customer confusion e.g. where a customer pays by fixed direct debit payments with no billed amount outstanding, yet the IHD could display a level of debt on their account balance if displayed in real-time via their IHD.

As the acceptance of smart metering increases, we recognise that consumer requirements may change and that account balance may become a future requirement. However, we believe account balance provision should be an area of innovation based on individual commercial judgements and specific product offerings.

Question 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?

ScottishPower believes a detailed cost benefit analysis needs to be undertaken by the Programme in order to determine the benefits associated with displaying an account balance on credit customer IHDs. Such an assessment must take in to account complex requirements within the end to end solution (supplier systems to IHD) to deliver account balance information to the smart metering system.

Any services offered to consumers in this area should be based on individual commercial decisions. The Foundation Stage offers the opportunity to gain further insight into the level of potential customer take-up.

Please also see our response to Question 51.

Question 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.

We believe that there are a significant number of outstanding issues still to be addressed by the Programme. In addition to the issues we have outlined in response to the roll out consultation, we would also highlight the following areas requiring further consideration:

Issue	Comments
HAN / Communications	Significant effort still required to determine appropriate HAN communications technology. Additional trialling and testing required during the Foundation Stage ahead of final selection and mass roll out.
Accessibility and inclusivity of IHD design	Need to ensure that the design is in alignment with customer expectations – further trialling and testing required during the Foundation Stage.
IHD update frequency	A 5 second update in the context of electricity information is appropriate. However we are in agreement with the IHD working group recommendations, not driven by gas battery life considerations, that there is no need or relevance for updates any more frequent than at 30 minute intervals for gas.
Smart metering equipment data items	Significant effort is still required to define end to end data requirements in addition to the alignment between the data catalogue and the functional requirements outlined in the SMETs.
Smaller Non-Domestic (and large domestic) meters	ScottishPower are in agreement with Government proposals for the granting of derogation for CT metered premises.
EMS	Non-ionising radiation issues are of significant concern to some stakeholders and as such we agree with Government that an extensive group of stakeholders should be kept in the loop throughout with respect to work in progress and practical issues arising related to communications solutions being considered and then rolled out.

Table 3: Outstanding issues

Question 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.

ScottishPower believes there is no need for the Government to specify its own interoperability assurance framework and enduring certification authority in respect to the rollout of the SMS components to cover data interfaces and security safeguards and controls. We believe introducing any additional testing regime will only introduce further complexity.

Provided appropriate European or International standards are specified by SMETS then the protocol body itself will most likely operate the requisite independent assurance framework certification regimes e.g. for DLMS through the DLMS User Group, and Zigbee through the Zigbee Alliance.

Question 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, interoprability and security? Please explain your reasoning.

ScottishPower believes the development and maintenance of a trusted test regime to deliver a secure and interoperable SMS is a critical part of providing a consistent level of operational assurance. It is ScottishPower's view that the test regime should be governed within an industry code and the board of governance of the code would be accountable for establishing and maintaining the test regime baseline.

Please also see our response to Question 54.

Question 56: What are your views on the options outlined for a testing regime?

ScottishPower would recommend that DECC should select an existing communications standard(s) which already include an appropriate level of independent robust testing and certification framework.

Please also see our response to Question 54.

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

ScottishPower would propose that the same assurances should be sought for Foundation and enduring phases in order that sufficient confidence in the framework can be gained prior to mass roll out commencing.

Question 58: Do you think that the activities outlined above are a suitable way for achieving interoperability across Smart Metering Equipment cyryptographic functionality? How else could this be achieved?

ScottishPower agrees that cryptographic functionality is required in order to secure the end to end Smart Metering System and protect it from the risks identified in the security risk impact assessment. It is essential that this functionality is implemented in a manner which supports inter-operability of Smart Metering Equipment. An end to end trust hierarchy with appropriate industry participants acting as Certification Authorities (CA) is the most appropriate model to ensure a robust and secure system. The favoured option is for the DCC to act as the root of trust and for Industry Participants to act as subordinate CAs.

Question 59: Do you agree cryptographic/key management is necessary to secure the end-to-end Smart Metering System? What other options should the Government consider? Please explain your reasoning?

Please see our response to Question 58.

Question 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 would wish to bring DECC's attention to the description of 'Hybrid' in Table 7. Whilst keys are established through the certificate based key exchange, the keys generated are then used for symmetric encryption. Although the CA will be required as stated with a slight increase in costs, however there is no reference to IPR issues surrounding asymmetric algorithms.

Question 61: Do you think 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.

ScottishPower supports the view that a centralised agency should be responsible for cryptographic key management. The DCC is the most appropriate agency to perform this role within the Smart Metering System architecture.

An end to end trust hierarchy with appropriate industry participants acting as Certification Authorities (CA) is the most appropriate model to ensure a robust and secure system. The favoured option is for the DCC to act as the root of trust and for Industry Participants to act as subordinate CAs. This will ensure a single, robust and centralised process is established with clear lines of responsibility.

Commercial arrangements must be put in place to ensure that the DCC delivers this service to Industry Participants efficiently and effectively.

Question 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.

ScottishPower believes a single security standard should be applied across the industry. This will alleviate any issues where consumers subsequently wish to opt back in to the DCC services.

ScottishPower
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