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Smart Metering Implementation Programme – Roll-Out Team
Department of Energy and Climate Change
3 Whitehall Place
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13 October 2011

Dear Sir

Smart Metering Implementation Programme: consultation on draft licence conditions and technical specifications for the rollout of gas and electricity smart metering equipment (August 2011) (consultation reference: URN 11D/836)

UK Power Networks is pleased to respond to the above consultation and provide views on the draft licence conditions and technical specifications for the rollout of gas and electricity smart metering equipment. Whilst we have responded to all questions posed by the consultation we would draw particular attention to the points below.

In terms of the draft licence conditions, UK Power Networks believes that it is important that an appropriate licence framework is developed for a successful implementation of the smart metering programme. This framework needs to provide sufficient incentives to all industry parties to ensure that customers can benefit from smart meter technology whilst minimising their disruption.

The rollout of smart meters nationwide will require a significant investment of private capital (estimated at £11.7 billion by DECC). This capital will need to come from the retail suppliers who are obligated to deliver the rollout, from other private investors who the suppliers may subcontract to deliver their obligations, and from the loan markets and debt capital markets. In our view, it is critical to the success of attracting capital that prospective providers of capital can forecast the meter rental rates they will receive on their investments. This means that there must be clear and binding obligations on new suppliers to maintain contracted meter rental payment levels when a customer switches to a new supplier. This could be achieved via regulation, or via binding industry-wide contractual agreements. We believe that DECC and Ofgem have an important role to play in facilitating this outcome.

In terms of the draft technical specifications, UK Power Networks believes that all of the 'network operator requirements' which DECC has made subject to consultation under section 3.3(d) of the consultation have been adequately justified by network operators through the SMIP working groups engaged in the development of the IDTS, and should therefore be included in the SMETS. Our reasoning is fully explained in our answers to questions 43–45.

Given the inclusion of the functionality under 3.3(d), UK Power Networks believes that the overall technical specification for smart meters would then be sufficient to support distributors in continuing to meet their statutory and licence obligation to develop, maintain and operate an efficient, coordinated and economical system for the distribution of electricity.

Going forward, it will be important for DECC to build on responses received to this consultation in resolving a number of currently outstanding technical issues: in particular issues surrounding the communications hub and standards for the HAN. Delays in finalising positions in these areas could critically delay progress during the Foundation Stage of the programme and ultimately put at risk the desired completion date for the programme.

We hope that you will find our detailed answers in the Appendix useful and confirm that we have no objection to this letter being published on DECC's website.

If you have any questions about our response, please do not hesitate to contact me.

Yours faithfully

Appendix

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.

UK Power Networks considers that it is appropriate to specify a completion date that is as early as reasonably practicable in 2019 consistent with:

a. an economic level of resourcing of meter installation staff such that unit costs of installation are not adversely impacted by market conditions;
b. adequate attention being given to training and accreditation of meter installers; and
c. adequate attention to quality control and assurance throughout the installation programme.

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.

Licence conditions AA1–2 are clear as to which premises – domestic and designated – will be subject to the requirement on suppliers to take all reasonable steps to ensure that smart metering equipment is installed by the specified date. Licence conditions AA3–6 provide the necessary clarification as to suppliers' duties in respect of both new and replacement meters while licence conditions AA10–12 clarify the exceptions.

The term 'all reasonable steps' will require a common understanding as to suppliers' duties in respect of consumers who are reluctant to/ refuse to accept, smart metering equipment. Compliance with the Smart Metering Installation Code of Practice (SMICoP) (currently in draft) should help minimise installation refusals. Adoption of 'opt-out' as opposed to 'opt-in' provisions would also increase consumer acceptance; nevertheless, there will be practical limitations as to the steps that suppliers can take to encourage acceptance.

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.

The licence conditions focus on technical interoperability issues but do not address the issue of commercial interoperability, i.e. the question of capital recovery for the supplier installing the smart meter given that customers will churn. The rollout of smart meters nationwide will require a significant investment of private capital (estimated at £11.7 billion by DECC). This capital will need to come from the retail suppliers who are obligated to deliver the rollout, from other private investors who the suppliers may subcontract to deliver their obligations, and from the loan markets and debt capital markets. In our view, it is critical to the success of attracting capital that prospective providers of capital can forecast the meter rental rates they will receive on their investments. This means that there must be clear and binding obligations on new suppliers to maintain contracted meter rental payment levels when a customer switches to a new supplier. This could be achieved via regulation, or via binding industry-wide contractual agreements. We believe that DECC and Ofgem have an important role to play in facilitating this outcome.

Licence conditions AA7–8 provide a limited definition of interoperability which, while consistent with the business case in terms of providing for a customer to change supplier and/or for a supplier to replace part of the equipment without adversely affecting the capacity of the equipment to operate as smart metering equipment, does not explicitly state the requirement for the equipment to be fully interoperable in respect of (two-way) communications through both the HAN and WAN.

It is essential that all smart metering equipment is able to interoperate such that access to the full range of functionality incorporated in the smart meter (as defined by the SMETS) is available to authorised parties irrespective of the type or model of compliant meter installed, and without the need for modification to their systems in the event that a smart meter is replaced.

However, with reference to our answer to question 54, in order to further underpin the policy it will be important to establish an assurance framework to ensure that the smart metering equipment, and indeed the end-to-end smart metering system, will deliver the required overall functionality.

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.

Compliance with the SMETS is an essential pre-requisite for realising the full business benefits of smart metering, including those determined by network companies subsequent to the original impact analysis and in support of which additional functionality is now reflected in the SMETS. These benefits will ultimately be passed through to consumers in terms of lower overall costs of electricity and gas production and delivery. Smart metering equipment must therefore be capable of compliance with the SMETS extant at the time of installation throughout its operational life. An exception to this requirement would apply in the event that the SMETS are modified (through an appropriate governance body) subsequent to installation, and in the event that the installed smart metering equipment is able to meet the modified requirement either without modification or where such modification is economically and practically feasible.

If modifications to the SMETS are agreed (through an appropriate governance body) during or after completion of the initial rollout programme (concluding in 2019), then it will be necessary to provide for a reasonable period of grace to enable existing compliant smart metering equipment stocks to be deployed and for existing contracts for compliant smart metering equipment to be honoured. The underlying requirement is to avoid smart metering equipment asset stranding whilst enabling suppliers to place forward contracts for smart metering equipment in volumes that maximise scale efficiency.

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.

In order to prepare for volume rollout to commence from 2014, with sufficient prior trials having been undertaken to provide for resolution of 'teething problems' (especially where these might create inconvenience to, or loss of confidence in the programme by consumers), it will be important for suppliers to have undertaken significant numbers of installations during the Foundation Stage of the programme.

Depending on progress in agreeing the final SMETS and securing EU confirmation, it may be necessary for a limited number of installations to take place prior to finalisation and confirmation (indeed some installations have already been undertaken). As to whether suppliers should be required to replace such smart metering equipment where it is not compliant in all respects with the final SMETS: any decision in that respect must balance the cost and consumer inconvenience of retrofitting with the practical consequences of any unavailable functionality. Only where the latter outweighs the former should retrofitting be a requirement and key tests here will be to ensure that the existing meter fully supports commercial interoperability and that the consumer beneficial experience is not compromised. If those tests cannot be satisfied then all reasonable steps should be taken to replace the meter by the installation programme completion date.

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.

Please refer to our answer to question 2.

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

UK Power Networks believes that the new and replacement obligation should be subject to a period of notice consistent with the need to avoid unnecessary meter asset stranding in respect of existing conventional meter stocks and/or stocks of smart metering equipment which, while procured in good faith and in the spirit of the Foundation Stage objectives, may not be compliant in all respects with the final SMETS.

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.

Please also refer to our answer to question 3. The interoperability licence condition obligation must extend to ensuring that interoperability applies to all aspects of the smart metering equipment, including functionality that is required by network operators to ensure they are able to continue to develop economical, efficient and coordinated systems of electricity and gas distribution. In particular, it will be important that functionality included in the SMETS to provide for the development of more efficient and 'smart' networks that will be required to support an economical transition to a low carbon economy is not compromised by any lack of interoperability in respect of those functions.

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?

Please refer to our answer to question 3.

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

UK Power Networks believes that a governance framework should be in place that will include a procedure for disputes resolution. The governance body must include appropriate representation from all industry stakeholders in the SMETS, including network operators who will be dependent on aspects of the SMETS for the continued development of economical, efficient and coordinated systems of electricity and gas distribution. Please also refer to our answer to question 3.

11. For the smaller non-domestic sector do you agree that where there is a Current Transformer meter then suppliers should be required to install an advanced rather than Smart Metering Equipment? Please explain your reasoning.

Provided that the installation and power requirement of the premises concerned justify the continuation of CT metering, then the licence conditions would seem to underpin the intention However, where the installation and power requirement would be suitable for smart metering equipment then, unless an advanced meter is required, smart metering equipment should be installed.

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

Yes – with the proviso mentioned under 11 above. The licence conditions should require that if the existing meter is a CT meter (but not an advanced meter) and the maximum demand required by the premise precludes smart metering equipment being installed, then an advanced meter should be installed. Otherwise, smart metering equipment should be installed.

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.

UK Power Networks has no view on this other than that it will be important that the installation programme is executed as efficiently as possible with the minimum inconvenience to consumers, and that the consumer experience is not compromised by perceptions of poor coordination.

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.

None identified.

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.

It is in consumers' interests to have available (with effect from the date of the mandate on suppliers to install smart metering equipment for new and replacement meters) smart metering equipment from the date of taking occupancy of new domestic dwellings. When requested to provide a temporary supply by a developer, the supplier should therefore install smart metering equipment and an IHD and responsibility for the maintenance of these assets will then transfer to the supplier that has been selected by the householder. This arrangement would overcome potential shortcomings associated with network operators (including independent network operators) having an obligation to install temporary metering equipment.

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.

Under the current market framework, distributors are no longer responsible for the replacement of meters, though a number of them still provide this service. In the event that smart metering equipment will in future require replacement, it will be important to ascertain the extent to which suppliers would wish to continue this arrangement (either directly or through an appointed meter operator). Provided that the interoperability objective is achieved, it should not be necessary for network operators to hold emergency stocks of different manufacturers or models of smart metering equipment; rather, it should be possible to hold a standard set of smart metering equipment. If that is the case then it would be feasible, with appropriate commercial arrangements in place, for network operators to replace defective equipment with smart metering equipment rather than revert to a traditional meter as a temporary measure. This would clearly have benefits for consumers.

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.

The obligation to install IHDs must take account of progress in developing a technical solution for the HAN in 'problematic' buildings. For example, there is currently no proven solution for HAN communications in multi-occupancy buildings where meters are accommodated in a communal position. With that proviso, the period of notice should be consistent with the obligation to install smart metering equipment so that, as far as reasonably practicable, consumers have access to information from an IHD at the time of installation of smart metering equipment.

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.

The requirement for interoperability should extend to HAN communications systems and IHDs such that a change of supplier should not require the IHD to be replaced in order to maintain functionality, even in the unlikely event that the smart metering equipment is changed. Should the new supplier wish to offer a new IHD, which the consumer accepts, then the previous supplier's obligation to maintain the IHD over the warranty period should transfer to 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.

Licence condition BB would appear to effectively underpin the policy as laid out in the consultation document.

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 change to Condition 2 of the standard licence conditions appears appropriate

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.

None identified.

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.

None identified.

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 have not identified any consequential changes, however the consultation proposal that the Government will work with code administrators and other interested parties to determine any necessary consequential changes is sensible.

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

The IDTS are key to ensuring that the smart metering equipment is interoperable in all important respects, and to ensuring that consumers are able to benefit fully from the prescribed functionality. This includes the longer term benefits of enhanced efficiency of the overall electricity and gas supply chain due to information made available to network operators, suppliers and other relevant parties through the smart metering equipment and the services of the DCC.

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.

The IDTS have been developed under a robust programme of work resourced through industry specialists and where appropriate and feasible have been cost-benefit tested. The IDTS include functionality not envisaged by the original impact analysis but which has subsequently been demonstrated through the Electricity Network Association's (ENA) Smart Metering System Use Cases and High-Level Smart Metering Cost-Benefit Analysis[1] to provide substantial benefits to consumers in terms of improved quality and ultimately lower cost of service provision. This applies particularly to additional functionality promoted by network operators (especially electricity network operators) through the ENA. In addition, a number of specific aspects of functionality are currently the subject of further investigation, summarised in the consultation as 'outstanding technical issues'. We comment on the requirement for these aspects of functionality in our responses to specific questions below.

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.

The security arrangements proposed appear reasonable.

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

The IDTS next steps outlined in the consultation appear broadly reasonable. However, while UK Power Networks recognises the need for 'legally robust and precise' drafting, this must not be at the expense of any loss of relevant technical detail. This would run the risk of unintended loss of functionality (and potentially interoperability), with a consequential loss of benefit and to the detriment of the overall consumer experience. We would therefore recommend that the IDTS continue to be developed by industry experts, but with the necessary legal overview and through making reference within the legal drafting to the IDTS. The industry has relevant experience in this area, as demonstrated for example by the Grid and Distribution Codes.

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.

UK Power Networks believes that, subject to appropriate representation by all relevant stakeholders, the Smart Energy Code could be a means of achieving the required governance. Key to robust governance will be that proposed changes to the SMETS are fully assessed in terms of technical functionality and interoperability.

[1] http://2010.energynetworks.org/smart-meters/

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.

While we are unable at this stage to comment quantitatively on the potential economies of scale associated with a large scale rollout of smart metering equipment, we would anticipate similar levels of savings over time to those experienced by other large scale adoptions of new technology. Pointers could include the price movements in domestic digital appliances. Experiences of adoption of smart metering in other countries could also provide pointers to cost movements. Notwithstanding the potential benefits of economies of scale, a further driver of costs will be that of supply and demand, especially as other countries look to roll out smart metering within a similar timescale to the UK.

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

The requirement for a communications hub, incorporating both a WAN and HAN transceiver, has been identified by the industry working group. It would be difficult to ensure interoperability without specifying this component in the SMETS. UK Power Networks supports this recommendation for the reasons summarised in the consultation document.

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.

UK Power Networks supports the requirement for distributors to be able to interrogate smart metering equipment to assess energisation status. This will provide substantial benefits to customers at minimal marginal cost (other than the costs incurred by distributors in upgrading their network management systems) in terms of verifying supply restorations following post-fault switching or repairs. This functionality will be particularly beneficial during severe storms where multiple 'nested' LV network faults may go undetected due to geographical correlation between LV and HV network faults.

The case for providing positive outage detection (so-called 'last gasp' capability) is less clear in cost-benefit terms. Such functionality will be helpful in identifying localised LV faults (distributors are currently reliant on customer calls to bring these to their attention). Particularly if faults occur during sleeping hours, there can be significant delays between fault occurrence and detection.

Given the increasing dependence on electricity implied by low carbon transition, more rapid detection of such faults will become important (for example, in order to ensure that a supply failure affecting a consumer's ability to recharge an electric vehicle overnight is rectified in sufficient time).

UK Power Networks also believes that the ability for the smart metering equipment to signal a loss of supply to the distributor would be an expectation that consumers would have of such equipment, and a benefit that consumers would readily identify.

A secondary benefit would therefore be that such functionality might help convince consumers of the benefits of accepting a smart meter.

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

For the reasons stated in our response to question 31, we agree that DCC Communication Service Providers should specify the requirements for outage detection in specifying the WAN technology. In specifying the requirement, DCC Communication Service Providers must ensure that the technology will identify supply failures at each individual smart metering equipment location. However, the functionality would need to be carefully specified in order to avoid unnecessary outage detection messages following HV or other major faults affecting large numbers of customers.

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.

Provided that the incremental cost implications are minimal, the functionality to send a communication to the DCC when the power is restored would be an added benefit in terms of positively identifying to a distributor that all affected supplies had been restored. This would be a more reliable basis for determining full restoration of supplies through interrogation. However, as with outage detection, the functionality would need to be carefully specified in order to avoid unnecessary confirmation messages following restorations of HV or other major faults affecting large numbers of customers.

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.

There is clear benefit in having a communications hub that is de-coupled from the metering equipment. The communications technologies have a less mature profile than the metering technologies, which are mostly already well understood. Separate communication hubs are better able to cope with the full range of multiple meter scenarios.

Given that a number of WAN (possibly LAN) and HAN technologies are likely to be required across the UK to ensure reliable performance, and especially given that, at this stage, the technologies that will prove most effective in specific environments are yet to be confirmed, UK Power Networks agrees that fully integrated meters and communications hubs are unlikely to prove practical or cost effective.

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.

Of utmost importance under either option is ensuring commercial as well as technical interoperability. Provided that standard specifications are agreed and full technical interoperability is assured (including the ability to exchange components from different manufacturers), then option b would seem to preserve the benefits of innovation and competition. However, UK Power Networks would caution that the challenge of ensuring full interoperability should not be underestimated.

If option a is adopted whereby the SMETS provides for standardised communication technologies for both WAN (and LAN where appropriate) and HAN requirements, then the standardised technologies must be sufficiently comprehensive to ensure that all conceivable communications challenges that may present themselves for any given installation can be met through at least one of the specified technologies.

SMETS should address this issue in sufficient depth now to ensure interoperability, whilst allowing a suitable range of options. Please see our response to question 34 for our reasoning as to why a separate communications hub has benefits.

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.

For the reasons outlined in our response to question 35, we agree that there should be no restrictions on HAN technologies – at least during the foundation period – provided they are compliant with European or international standards.

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.

Following testing during the Foundation Stage, UK Power Networks believes that there should be a consolidation of standards by 31 December 2014 – or ideally earlier, at the time the mandate comes into effect. Given sufficient attention to testing during the Foundation Stage over a wide spectrum of locations and building types (including, for example, multi-occupancy buildings in urban environments with communal metering positions in basements), it should be possible by then to identify a discrete number of technologies that can be regarded as standard solutions.

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.

UK Power Networks believes that there are sufficient incentives for suppliers to ensure the delivery of an effective HAN testing regime during the Foundation Stage without recourse to regulatory intervention. The position can, of course, be kept under review to ensure that there is clear evidence of an appropriate level of engagement and coordination between suppliers over the Foundation Stage resulting in satisfactory progress towards a sustainable suite of HAN standards.

39. Do you agree with industry's recommendation that DLMS should be adopted as the application layer for communications with the DCC? Do you believe there are any consumer, economic or technical issues with this solution which could be circumvented by an alternative approach? Do you have any economic, technical or consumer evidence to assist Government in evaluating industry's proposal?

Industry has assessed that the end-to-end requirements of the smart metering system are best served through a mixture of two application layers. Their analysis is founded on industry's judgments that:

1. the inherent complexity of having two application layers rather than one is more than offset by the benefits of applying each application layer to the devices, communications environment and functions to which it is most suited; and
2. the need to translate or bridge between the application layers at specific points is not a barrier to delivering the requirements of the smart metering system; does not pose interoperability risks; and does not place unnecessary restrictions on future development.

UK Power Networks believes from the information provided that these judgments are correct. Given that the DCC communicates mainly, and in more detail, with the electricity smart meter rather than other devices in the HAN, it follows that the application layer most heavily developed for meter communication by industry and the manufacturers may be used – in this case DLMS (device language message specification). The DLMS standard appears compatible with WAN communications.

While we support industry's stance on balance, we note that this is not a clear-cut decision and the possible use of SEP 1.x for the DCC communications, instead of or in addition to DLMS, is still under review. Whatever the final determination, UK Power Networks believes that it is important for Government to have a clear view as to the longer term roadmap. This may eventually result in a single application layer.

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?

Building on our response to question 39, we believe that industry is seeking to combine two applications layers so that each can be applied to the scenarios for which it is most suited. The design philosophy of SEP 1.x and related Zigbee profiles is towards a large range of devices optimised for HAN interaction, extending well beyond the direct realm of metering. This makes SEP 1.x a good choice for the HAN environment. Since industry has judged that there is benefit in utilising DLMS for electricity meter communication in spite of the general applicability of SEP 1.x to other device types, then it follows that both profiles will be supported on the HAN.

UK Power Networks supports this approach provided that the profile translation aspects can be readily catered for at a practical level without detriment to the end-to-end operation of the SMS.

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.

UK Power Networks believes that the approach for delivering SMS must be practical and focused on achieving programme benefits. The case for network-based approaches such as IPv6 has yet to be made and is driven primarily by a technological vision of an extended internet that may or may not have benefit in the future, and has often been championed by technology vendors that are not specific to the industry. There are several areas of technical concern with the extension of IP to the HAN, including the inherently non-optimised use of finite HAN bandwidth.

UK Power Networks supports the approach put forward by industry as being the most suitable solution at the current time. However, in line with our response to question 39, we believe that Government should have a clear view of the longer term roadmap and potential upgrade paths.

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?

UK Power Networks believes that the use of the Communications Hub as a gateway to the HAN is sufficient to support current and foreseeable benefits for the SMS, and that a single network addressing architecture is not required. In fact, there is some logic in having the HAN and WAN as separate realms for certain aspects of security.

It should be possible to achieve efficient solutions for multi-occupancy buildings using shared Communications Hubs as gateways to multiple, secure HANs. Such scenarios provide good test cases for the approach put forward by industry and should be developed.

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

Maximum demand (MD), rather than electricity consumption per se, is of particular importance to distributors as it is the quantum of MD that networks and their components need to be designed for and which ultimately gives rise to network reinforcement. While it would be possible to determine maximum (and minimum) demand from half-hourly consumption data, this would require considerable processing effort. The ability to access MD data directly from individual meters would provide the basis of an efficient 'first pass' methodology for identifying networks potentially under stress (due, for example, to increasing volumes of electric vehicles and/or heat pumps). More complex analyses of half-hourly data could then be undertaken on a selective basis.

Given that distributors will typically have hundreds of thousands of individual LV networks, it should be apparent that a 'first pass' monitoring capability would be of considerable benefit in determining the need for more detailed studies and would make a significant contribution towards their continued development of a secure, safe and economic electricity distribution system.

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).

UK Power Networks believes there is a strong case for separate network registers. The consultation notes some of the benefits of separation of supplier and distributor information in terms of optimisation of data flows and storage requirements.

It will also be important for distributors to be able to develop effective distribution use of system (DUoS) time-of-use tariffs, and information provided through separate network registers would be key to facilitating that objective.

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.

Distributors, through the ENA, have proposed that the smart metering equipment would send an alarm in the event that abnormally high or low voltages appear at consumers' premises. Though a rare occurrence, there are certain conditions that can lead to so-called 'floating neutrals' which can give rise to abnormally high or low voltages and which in turn can cause significant damage to consumers' electrical appliances and electrical wiring, and indeed to electricity meters. While distributors will always respond promptly to such events, putting in hand necessary repairs and replacements, the impact of such events can be extremely stressful for consumers.

UK Power Networks holds records of such events and the costs of rectification. Since 2003/04, UK Power Networks and its predecessor EDF Energy Networks have incurred costs of some £9.7m in meeting claims and/or financing rectification work on consumers' premises. Moreover, an increase in copper theft is giving rise to an increase in such incidents.

Given that the SMETS and the draft IDTS stipulate the inclusion within the smart metering equipment of a load disconnection switch, UK Power Networks believes that the switch should be configured to automatically disconnect the supply to the premises in the event of an abnormally high or low voltage condition. This could provide effective protection against damage to consumers' appliances and wiring and, importantly, automatically remove a potentially dangerous condition.

The relevant functionality within the IDTS is as follows:

- ES.10 – the smart metering system shall support measurement of other power quality data including: RMS voltage, over/under voltage, sag/swell;
- DI.1 – the smart metering system shall support logging of meter events such as faults, tampers, thresholds associated with extreme levels etc. This will include but is not limited to the time and date stamping and recording of the originating device for the event;
- ES.12 – the smart metering system shall allow the load switch to be configurable to be open or closed for a range of events.

UK Power Networks is aware that meter manufacturers, while supporting the proposal in principle, have cast doubts over the capability of the current prepayment meter contactor to successfully interrupt load under a high voltage condition. However, UK Power Networks' view is that the contactor would have been designed with an appropriate factor of safety to deal with credible abnormal voltages such as those arising from a floating neutral condition and that if any doubt exists it should be a straightforward matter to subject meters to laboratory tests to ascertain their capability. Given that the electricity meter is itself likely to suffer irreparable damage in the event of an abnormally high voltage condition, self isolation would obviously be desirable.

In view of the reservations expressed by some meter manufacturers, the ENA has commissioned a short study with the objective of:

- reviewing the current prepayment meter standards e.g. IEC62055;
- reviewing typical meter contactor (load switch) specifications used in prepayment meters; and
- reviewing a sample of current prepayment meter specifications.

The intention of the review is to establish the present requirements and current practice relating to the capability of prepayment meters to switch successfully under circumstances where the supply voltage could rise to levels theoretically possible under floating neutral conditions.

In summary, given the opportunity to provide effective protection to consumers by quickly removing dangerous over-voltages and damaging under-voltages through the automatic operation of the isolating switch, any necessary testing of the capability of the isolating switch should be put in hand to certify its capability to operate correctly under such conditions.

Moreover, given the possibility of the isolating switch in any case operating while an abnormally high voltage condition is present (for example, in its capacity as a prepayment meter), then it would seem important to ensure that it is able to do so safely.

A summary of the settlement costs incurred by UK Power Networks and its predecessor EDF Energy Networks in respect of damage to consumers' appliances and installations due to abnormally high or low voltage is included below.

Year		EPN		LPN		SPN		Total	
		No.	Cost	No.	Cost	No.	Cost	No.	Cost
2003/04		110	£337,661	35	£233,627	61	£369,147	**206**	**£940,531**
2004/05		128	£1,415,354	34	£127,321	56	£237,748	**218**	**£1,780,513**
2005/06		124	£445,312	31	£175,240	43	£573,448	**198**	**£1,194,074**
2006/07		140	£556,616	38	£128,169	64	£406,330	**242**	**£1,091,217**
2007/08		157	£650,786	27	£306,179	80	£589,005	**264**	**£1,546,077**
2008/09		91	£295,187	21	£214,775	45	£375,943	**157**	**£885,971**
2009/10		81	£408,336	17	£59,067	48	£287,368	**146**	**£754,836**
2010/11		85	£663,069	25	£189,699	53	£656,913	**163**	**£1,509,759**
Total		**916**	**£4,772,321**	**228**	**£1,434,077**	**450**	**£3,495,902**	**1,594**	**£9,702,978**

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.

UK Power Networks agrees with the Government's minded to position to provide for consumers to download their consumption data by means of a wireless secure connection enabled through a bridging device. This would seem to be the most practical solution for reducing risk of obsolescence, of additional costs and/or delays to the design of smart metering equipment, and of compromising the security of the overall smart metering system.

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.

UK Power Networks, while recognising the issues raised by the ESC, does not believe this is an appropriate issue for consideration under the Smart Metering Programme. Options 1 and 2 would both be likely to incur significant costs and delays to the design of the smart metering equipment and option 3 would give rise to additional costs of both equipment and installation. Each of these options, but particularly option 3, would result in a larger overall 'footprint' for the smart metering equipment/isolator which might lead to physical accommodation issues and hence further increase costs or delays to the programme

Moreover, while each of options 1, 2 and 3 would give rise to significant costs (in that some 27 million installations would be impacted by the proposal), UK Power Networks questions how many of the 27 million installations would, during the lifetime of the smart metering equipment, benefit from the provision of the isolation facility. In other words, how many of the 27 million isolators would ever be operated by an electrical installer needing to isolate the supply to a consumer unit?

We note that BEAMA has provided a high level assessment of the relative costs and benefits of the options put forward but suggest that before any of options 1, 2 and 3 are considered further, an assessment should be made from historic information as to the likely future usage of the isolation facility and the likely overall cost of providing such a facility relative to the cost savings that would accrue from the suppliers' meter operator no longer having to remove and replace the main fuse.

Notwithstanding all of the above, none of these options would facilitate the execution of the Smart Metering Programme since isolation of the main supply fuse will in any case be necessary to allow the existing meter to be replaced with smart metering equipment. We would expect meter operators undertaking the replacements to be authorised to remove, replace, and finally reseal the main supply fuse. We also agree that option 4 is not a matter for consideration under 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

We are supportive of industry's approach, as laid out in our responses to questions 39 to 42. The question of translation needs to be further investigated to confirm that it does not impede benefits, incur interoperability issues, or unnecessarily limit future flexibility. Based on the published literature this does not seem to be the case.

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?

Based on the IDTS as it stands, option 'a' would be favoured due to the co-existence of DLMS and SEP 1.x devices on the HAN. The DCC can interact fully with the electricity smart meter due to the Zigbee/SEP support for tunnelling DLMS communication between the Communications Hub and the meter. Translation would be required for the communications that span the two application profiles – for example, between the IHD and the electricity meter or between the DCC and the gas meter. Provided that it can be demonstrated that translation is a simple and robust process, then it should be suitable for being encapsulated in the Communications Hub. Local translation may also allow for some electricity meters to be implemented to the SEP 1.x standard in future without the DCC having to cater for these details.

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

UK Power Networks does not agree that the IHD should display only ambient feedback on energy usage. While it is true that consumers cannot directly influence current tariff rate, they can make informed decisions about managing energy consumption according to variable tariff rates.

Going forward, UK Power Networks anticipates the early development of more flexible and cost reflective tariffs that would, for example, enable consumers to save on their energy bills by switching flexible consumption to cheaper periods, reflecting lower electricity production costs and/or lower marginal costs of network reinforcement.

This will become particularly relevant in future where, due to day-on-day (or within-day) variations in available wind energy production, electricity market prices will become more dynamic. The ability to signal through the IHD both current and forecast (e.g. day-ahead) tariff prices would be a source of particularly valuable information for consumers.

An example of how such information can be used to provide day-ahead tariff price information for consumers is the 'Tempo' tariff introduced by EDF in France. Simple price signals using a three colour system (not dissimilar to a 'red/amber/green' status referred to in the consultation) has been effective in shifting demand from relatively high cost to low cost days.

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?

UK Power Networks sees merit in the smart metering equipment being designed to support the calculation and/or display of account balances.

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?

UK Power Networks has no particular view as to the costs and benefits of mandating suppliers to display account balance for credit customers on their IHD, although, as per our answer to question 51, we do see merit in such information being provided to credit customers.

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.

Other than as qualified in our responses to specific questions in this consultation (for example, questions 11 and 12 as they relate to CT meters) UK Power Networks agrees with the Government's approach.

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.

UK Power Networks believes that it is important for both industry and consumer confidence to ensure that smart metering equipment meets in full the requirements of the SMETS, both in terms of functionality and especially interoperability.

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

UK Power Networks agrees that an appropriate testing regime is an essential component of the required assurance framework.

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

UK Power Networks sees merit in each of the options put forward but believes that a combination of two of these options, namely a market-led approach underpinned by a certification and accreditation scheme, offers the most effective and pragmatic solution.

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

UK Power Networks believes that a different approach is required for the Foundation Stage insofar as this will be a formative stage in developing an appropriate testing regime ensuring evolution of shared best practice in testing procedures against an initially draft certification and accreditation scheme, which should be continuously refined and finalised in time for the commencement of the mandated rollout.

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?

UK Power Networks believes the advice offered by the STEG is well informed and hence the case for undertaking the activities considered by this part of the consultation would seem well founded.

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

Based on the advice of the STEG, UK Power Networks believes it is vital that all practically reasonable steps are taken to ensure the security of the end-to-end smart metering system. Any breaches of security could have severe economic consequences and could destroy industry and consumer confidence.

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

UK Power Networks agrees that the Government's assessment of advantages and disadvantages appears reasonable. UK Power Networks is not aware of any viable options to cryptographic solutions.

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.

Given the potential implications for national security that could arise from serious security breaches, UK Power Networks considers that an appropriate government department, or possibly a suitably qualified body reporting to the Government (such as CPNI), should be responsible for cryptographic key management.

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.

UK Power Networks believes that existing approaches to security in respect of consumers with advanced meters should be reviewed in light of the work undertaken by the STEG and, where necessary, recommendations made for enhancing existing security systems.

UK Power Networks
13 October 2011