



**UK Department of Energy and Climate Change  
CURRENT Group, LLC Response to  
Consultation on Smart Metering for Electricity and Gas July 2010**

Contact: [REDACTED]

**1. Summary**

The deployment of gas and electric smart meters is an extremely complicated task and DECC and Ofgem (collectively, the "Government") should be commended for the considerable time and effort that has been put forth in analyzing the task and in developing potential solutions to the address potential issues. As the noted in the Regulatory and Commercial Framework Document:

*"DECC's updated impact assessment identifies that just under half of the benefits of the smart metering programme are expected to come from consumers using the information they will gain from smart meters to take action to reduce their energy consumption. It will be critical, therefore, that the process of installation and on-going maintenance of smart meters and related equipment in customer premises is a positive experience."*

In other words, the success of the programme may well depend on mitigating the risk associated with the consumer's response to Smart Meters. In reviewing the consultation and the attached documents, CURRENT has focused on three primary areas where actions can be taken to mitigate risk or potential alternative solutions provided to improve the likelihood of a positive outcome. These areas involve:

- Increasing the reliability and customer experience of In-Home Display (IHD) through use of integration of an upgradable HAN and WAN "gateway" which can be remotely managed by DCC or its communication providers.
- Increase focus in metering plan on high value Smart Grid solutions that can provide load and carbon savings to offset risk associated with consumer participation. For example a number of U.S. utilities are looking to combine grid focused voltage optimization with their meter rollout to assure they achieve the desired load and carbon savings.
- Structure Supplier's accelerated rollouts in 2012 and 2013 as large trial projects (similar to structure of Low Carbon Network Fund) to assure they test various potential technology solutions and provide feedback that can be incorporated into the metering rollout plans.

This document provides more details around these proposals and also provides specific answers to the detailed questions.

**Integrated WAN and HAN Gateway** – As noted numerous times in the consultation documents, the Government believes the IHD is critical to the success of the program. The heart of the Smart Meter program will be successfully linking communications of energy usage to the customer and to the supplier, network operator and other interested parties. We support the position that the Government has taken the step of separating out the WAN communications solution to assure long term upgradability. We believe that a similar approach should be taken for the HAN.

While not specifically addressed, it appears the present plan includes the following assumptions: a) the electric meter is the gateway for the HAN; b) one HAN technology will work for all types of deployment; and c) HAN technology is more mature and doesn't need to be upgraded or remotely managed.<sup>ii</sup> This does not appear to reflect the current state of the market. For example a recent article on HAN technology provided a good history of the various computer LAN technologies and listed ten different emerging HAN technologies and within one, Zigbee, pointed out four or five changes in the standard in last six years, none of which were backwards compatible.<sup>iii</sup>

We believe a more flexible approach would be to treat the WAN module as the equivalent of a router or a gateway in an internet solution. This gateway would also contain a HAN interface to the electric and gas meter as well as a HAN interface to the IHD. Initially, in many cases, this could be the same HAN technology, although it is highly unlikely one HAN technology will work for all of the UK. For example, in the case of multi tenant buildings or hard to reach locations, the connection to the IHD could require a different more robust technology (i.e., power line, Wi-Fi) than the low power wireless technology used to connect to the gas meter. In addition, by adding additional memory and processing capability to this gateway, it could act as upgradable storage capability and act as one gateway to enable one IHD for both gas and electricity. Any additional cost of this device would likely be paid for by reducing the cost of the meter which would be required to provide less functionality - this is especially true in multi tenant situations where one gateway could communicate to multiple meters.

The benefits of this approach would easily facilitate adding new capabilities like water metering and provide an upgraded communications option as IHD innovation occurs without needing to change the meter. This structure would also facilitate the remote network management, security and troubleshooting of the HAN technology which would appear to be highly desirable given the critical nature of the HAN.

The present plan also assumes that the individual Suppliers should acquire the WAN module based on specifications prepared by two expert groups.<sup>iv</sup> Given that it is likely there will be at least two different WAN communications technologies (wireless and power line) and at least two different HAN technologies (wireless and power line), with at least six major suppliers, it would be possible to end up with 24 different WAN modules for the DCC to integrate with and to be responsible for the security of. History has shown that despite best intentions, different manufacturers working to newly developed specifications often face challenges in achieving interoperability. We believe a better approach would be for the DCC to be

responsible for the WAN module initially to limit the potential difficulties in achieving interoperability, similar to how the telecom vendors in rolling out DSL chose one or two modem manufacturers.

**Increase focus in metering plan on high value Smart Grid solutions that can provide load and carbon savings to offset risk associated with**

**consumer participation** – The FDS Consumers' views of Smart Metering Report noted "The vast majority of respondents did not care enough about the smart meter and display to worry as to whether they would be among the first or last to have a smart meter installed. . . With many expressing concerns about the cost of implementing the scheme, there will be considerable disappointment if the scheme is not proven to help people reduce their energy bills.<sup>v</sup> The impact assessment highlighted the risk "There remains a great deal of uncertainty about the likely response of consumers to the full roll out of smart meters. A number of international studies exist, the most recent a review of 57 feedback studies in nine different countries by the American Council for an Energy-Efficient Economy which finds that on average feedback [to the customer] reduces energy consumption between 4-12%."<sup>vi</sup> It is important to note the same study, in analyzing potential aggregate savings from a voluntary program, estimated only a 3 to 8% participant ratio, which resulted in overall average residential load savings of only 0.4%.<sup>vii</sup> Thus, depending on participation rates, this suggests a significant potential shortfall to the 2.8% assumed in the Ofgem Impact Assessment.

CURRENT is presently working with several U.S. utilities who are concerned about the potential shortfall in achieving desired or mandated energy efficiency targets, due to a lack of consumer participation, and who are turning to Smart Grid to make up any shortfalls. Using real-time data from the distribution grid, CURRENT is able to implement a dynamic voltage optimization that improves power factor and reduces voltage requirements. It is estimated that optimization of the distribution grid alone (operated by the DNOs) can reduce electric generation requirements and related CO2 emissions by 3 to 5% without impacting on, or requiring any change in, customer behaviour. Such a Smart Grid results in lower costs to the national grid, the DNO, the supplier and the customer along with more reliable power and reduced carbon emissions. Such a solution could assure the success of the meter program as the results would be equal to or greater than the 2.8% consumer savings estimated in the meter programme. This solution can be implemented with sensors in the grid and the availability to the DNO's of meter reads on a one to five minute basis for a portion of the meters and on an hourly basis for the remainder. While this can be done using wireless, a more cost effective solution can be implemented with minor changes to the metering program as listed below:

- The supplier/retailer would install the meters, as previously envisaged (keeping the current industry structure intact), using the EC funded "Open" or "Prime" Metering system that utilizes an open standards power line technology. Such a technology is presently being deployed in Europe and could be tested in the UK as part of the accelerated rollout. The meter could still be at the supplier's choice but would

contain an PRIME meter module as opposed to a GPRS chip. The main objective of the PRIME meter project is to specify a comprehensive set of open and public standards for AMI, supporting electricity, gas, water and heat metering. The OPEN project, part of the EC 7th Framework Program includes many of the largest utilities in Europe including Iberdrola, EDF, Endesa, ENEL, Iberdrola, Netbeher Nederland and RWE and most of the major meter manufacturers.<sup>viii</sup>

- At the same time, the equipment needed to gather and collect the data from the meters would be installed at the distribution transformer by the DNO, including sensing devices to provide intelligence needed for Smart Grid operations. The DCC would install a high speed connection to the same transformer using GPRS or other Internet Protocol (IP) based high speed communications technologies (fibre, cable, DSL, WiMax, etc).
- Under the present proposal the annual backhaul cost for once a day meter reading is £4.8 per meter per year (annuitised) for the WAN devices. Thus for the approximate average of 125 homes served by a transformer, the cost per transformer would be £600 a year (125 x £4.8). If the OPEN system were used to collect the meter data from each of the 125 meters, instead of GPRS, this cost would be eliminated and replaced by a real-time broadband WAN at the transformer. Based on a review of individual consumer rates, the monthly charge for an unlimited data mobile broadband charge for a 24 month contract is £10 a month or £120 a year.<sup>ix</sup> The result is an annual saving of 80% (£120/£600) before negotiating any discounts. The OPEN meter and module are expected to be comparable in cost to the current proposed cost and it is likely that the sensing equipment could easily be paid for with several years of the savings, allowing for a full Smart Grid to be deployed for less than the cost of the proposed system with only the GPRS Smart Meters.
- Adding analytic software would allow the DNOs and TOs to have real-time data that would be used to:
  - Implement system optimization and reduce electricity losses during distribution;
  - Manage two way power flow created from widely distributed generation, distributed renewables and PHEV's;
  - Improve reliability through real-time knowledge of grid status and proactive identification of potential outages;
  - Instantaneous outage detection including location and probable cause;
  - Better load forecasting, increased asset management and reduced capital requirements;
  - Reduce emissions;
  - Reduce operating cost.

- For the wider use of the data, this system would also be able to collect the meter data on a rolling basis and communicate it back to the DCC in 15 minute intervals every 15 minutes (as opposed to the once a day, day after data collection presently proposed). This would allow the data to be accessible on the Internet (with proper security), leveraging tools like those developed by Google and Microsoft and eliminating the need for a separate Real Time Display for anyone having Internet access at home or on a mobile device – another potential saving for the customer.
- The use of a PLC system specifically designed to read electric and gas meters in Europe would eliminate many of the hard to reach meters under the proposed plan. For example, Vodafone recently estimated GPRS already covers 98% of all UK households ‘to the door’. However, only 70% of UK households have coverage to their meter cupboard.<sup>x</sup>
- The system would leverage a European standard in OPEN as well as an IP based network. This would greatly increase security and the availability of 15 minute meter data on the Internet would likely allow the development of a variety of innovative home energy management products.

**Structure Supplier’s accelerated rollouts in 2012 and 2013 as large trial projects (similar to structure of Low Carbon Network Fund) to assure they test various potential technology solutions and provide feedback that can be incorporated into the wider metering rollout plans.**

While we believe that there are valuable lessons to be learned and the capability to fine tune the entire process by allowing the suppliers to accelerate rollouts into 2012 and 2013, we believe that any such rollouts should be structured so that they test a wide variety of issues such as suitability of various communications technologies, IHD and installation practices. In reviewing the comments and reports from the existing 18,000 home meter trial, it is clear that there are significant potential learnings that could be achieved by an early rollout, structured to create that learning. Examples include the need for multiple communications technologies, difficulties in implementing the HAN, various difficulties in physical installation of equipment and, critically, customer feedback. These projects could be structured similar to the Low Carbon Network Fund and could be designed to test the implementation of, say, 1 million or more meters. Trials of this size and in this time frame would clearly be seen as expediting the meter roll-out from the approximate 18,000 installed to the target of over 50 million gas and electric meters.

There are potential risks to allowing suppliers to implement the meters in any structure they desire. As noted in the Rollout Strategy: “However, there is no guarantee that suppliers would naturally choose the rollout profile that delivers the most benefits for the programme.”<sup>xi</sup> For example, focusing

on just replacement meters may mean that there is a wide spread deployment of meters using wireless technology which may limit the use of what may be a better and cheaper power line technology, for example, if the deployment was being done on a geographic basis.

Specifically, we would propose that any supplier wishing to accelerate their deployment be required to:

- Test multiple WAN communications technologies including wireless and power line;
- Test IHD and HAN technology;
- Test in defined geographical areas and customer selected/replacement deployments;
- Test consumer participation across various customer classes.

Allowing suppliers to independently choose their own technologies and implementation plans at this stage, may result in the implementation of a “low hanging fruit” solution, thinly spread over a wide geography that, while allowing some meter rollout, limits the technology and program choices of future players like the DCC.

### **Smart Metering Implementation Programme: Prospectus**

*Question 3\*: Do you have any comments on the proposed approach to ensuring customers have a positive experience of the smart meter rollout (including the required code of practice on installation and preventing unwelcome sales activity and upfront charging)?*

We generally support your approach in this area.

*Question 6\*: Do you have any comments on the functional requirements for the smart metering system we have set out in the Functional Requirements Catalogue?*

See Summary Response above and Specific Response to Functional Requirements Catalogue below.

*Question 7\*: Do you see any issues with the proposed approach to developing technical specifications for the smart metering system?*

See Summary Response above. We also are concerned how an expert group will be able to develop WAN specifications without having formal bids from Communications providers of the cost of various WAN technologies.

*Question 16\*: Do you have any comments on the proposals for requiring suppliers to deliver the rollout of smart meters (including the use of targets and potential future obligations on local coordination)?*

See Summary Response above. We also believe that to effectively use certain cost effective technologies such as power line, and to maximize the impact on the Smart Grid, it is important to provide for geographically focused deployments in the earlier years.

*Question 17\*: Do you have any comments on our implementation strategy? In particular, do you have any comments on the staged approach, with rollout starting before DCC services are available?*

See Summary Response above. We believe it is important that any accelerated rollout be used as a larger scale trial testing multiple technologies and rollout approaches.

*Question 18\*: Do you have any other suggestions on how the rollout could be brought forward? If so, do you have any evidence on how such measures would impact on the time, cost and risk associated with the programme?*

See Summary Response above. If the objective of the programme is to complete a nationwide meter rollout, but one that is effective, is an integral part of a wider Smart Grid, good value for money and welcomed by customers, the expression “more haste, less speed” comes to mind. We believe accelerated rollouts in 2012 and 2013, as large trial projects, would significantly de-risk the overall programme, but would nevertheless demonstrate urgent action.

*Question 19\*: The proposed timeline set out for agreement of the technical specifications is very dependent on industry expertise. Do you think that the technical specifications can be agreed more quickly than the plan currently assumes and, if so, how?*

While preliminary technical specifications may be possible, it would be difficult to finalize such specifications.

*Question 20\*: Do you have any comments on our proposed governance and management principles or on how they can best be delivered in the context of this programme?*

We believe it important that there be an annual check process to assure the deployment is achieving the desired results, potentially by an independent commission. We have seen many examples, in other metering rollouts, where various circumstances have changed and new technology developments have occurred, which would result in a better overall result if evaluated and deployed.

### **Smart Metering Implementation Programme:** **Statement of Design Requirements**

## **CHAPTER 3**

*Question 1: Should the HAN hardware be exchangeable without the need to exchange the meter?*

Yes, as explained in the Summary, there are approximately ten different HAN technologies competing for acceptance and various versions

of the technology are often not backwards compatible. In addition, experience in computer networking shows that LAN technology changed over time and the early popular technologies were not what emerged as the ultimate standard. We also believe the HAN technology should be based in the WAN module (similar to a router or gateway) versus being based in the meter. See the Summary for more details.

*Question 2: Are suitable HAN technologies available that meet the functional requirements?*

See answer to Question 1 and the Summary. While there may be technologies that meet the requirements, they are often immature, subject to change, not a clear standard and it will not be a case of one size fits all. Thus, we believe the HAN should be part of the WAN and upgradable. In addition, our experience has also shown that many of the IHD require more bandwidth than shown in your tables for upgrades and often require a broadband connection.

*Question 3: How can the costs of switching between different mobile networks be minimised particularly in relation to the use of SIM cards and avoiding the need change out SIMs?*

This issue is best addressed with the wireless carriers. We believe it would be best to avoid field replacement of SIM cards.

*Question 4: Do you believe that the Catalogue is complete and at the required level of detail to develop the technical specification?*

The Catalogue is a good starting point for the technical specifications. It is likely that modifications and additional requirements will emerge as the technical specifications are developed. It is important to recognize that the Smart Meter and Smart Grid industry is one that is rapidly developing and changing and that new and different requirements will likely emerge throughout the rollout. There will need to be a process in place to take advantage of such changes and the specifications will need to be continually modified.

*Question 5: Do you agree that the additional functionalities beyond the high-level list of functional requirements are justified on a cost benefit basis?*

While in general, that makes sense, we believe that required Smart Grid capabilities and the requirements of the DNOs have not been sufficiently included as they have yet to be subject to the level of analysis that the metering business case has been. As described in the Summary, the result is that potential large benefits like Dynamic Voltage Optimization which could be implemented as part of the metering program are not being considered. We believe the Government needs to incorporate emerging results of the Low Carbon Network Fund as well as best practices in Smart Grid from around the world. For example, the U.S. FCC recently studied the bandwidth requirements of a Smart Grid "The amount of data moving across Smart Grid



networks is modest today but is expected to grow significantly because the number of devices, frequency of communications and complexity of data transferred are all expected to increase. Various parties have attempted to estimate bandwidth requirements; none expect existing narrowband communications will be sufficient.”<sup>xii</sup> Thus we believe the data requirements for Smart Grid are likely to be understated.

*Question 6: Is there additional or new evidence that should cause those functional requirements that have been included or omitted to be further considered?*

See answer to Question 5. We believe, for example that the communications specs in E.S. 10, and 1.79 and 1.83 are understated. We have done extensive work around Smart Grid data requirements which we would be happy to share.

## CHAPTER 5

*Question 7: Do you agree that the proposed approach to developing technical specifications will deliver the necessary technical certainty and interoperability?*

We agree with the goal of interoperability. As discussed in the Summary, we are concerned that the process of implementing new technical specifications is often more difficult due to different interpretations of the specifications. The present plan also assumes that the individual Suppliers should acquire the WAN module based on specifications prepared by two expert groups.<sup>xiii</sup> Given that it is likely there will be at least two different WAN communications technologies (wireless and power line) and at least two different HAN technologies (wireless and power line), with at least six major suppliers, it would be possible to end up with 24 different WAN modules for the DCC to integrate with and to be responsible for the security of. History has shown that despite best intentions, different manufacturers working to newly developed specifications often face challenges in achieving interoperability. We believe a better approach would be for the DCC to be responsible for the WAN module initially to limit the potential difficulties in achieving interoperability, similar to how the telecom vendors when rolling out DSL chose one or two modem manufacturers. We are also concerned that the expert panel will develop specifications based on the assumed means of communication that the DCC will utilize, not based on the actual bid cost of the various solutions. This may limit a more expensive module, for example, producing a lower operating cost which could more than pay for the additional up front cost.

*Question 8: Do you agree it is necessary for the programme to facilitate and provide leadership through the specification development process? Is there a need for an obligation on suppliers to co-operate with this process?*

Yes and Yes. See Answer to Question 7 for some of the risks associated with not doing this.

*Question 9: Are there any particular technical issues (e.g. associated with the HAN) that could add delay to the timescales?*

As explained in the Summary and Question 1, we believe there are risks associated with the HAN. We suggest the HAN be upgradable to reduce these risks.

*Question 10: Are there steps that could be taken which would enable the functional requirements and technical specifications to be agreed more quickly than the plan currently assumes?*

This may be difficult. We believe our approach described in the Summary of large scale trials would provide critical information around the functional requirements, leading to the right specifications for the wider national roll-out.

### **Smart Metering Implementation Programme: Implementation Strategy (September 28<sup>th</sup> Responses)**

#### **CHAPTER 2**

*Question 1: Do you have any comments on our proposed governance and management principles or on how they can best be delivered in the context of this programme?*

See Summary. We believe the next best step would be structured large scale trials. We also believe there needs to be an ongoing review and assessment process as you have proposed, throughout the project.

#### **CHAPTER 3**

*Question 2: Are there other cross-cutting activities that the programme should undertake and, if so, why?*

Possibly an international advisory committee of individuals working on other Smart Meter/Smart Grid projects around the world that would feed in directly lessons already learnt and being learnt in other countries.

#### **CHAPTER 5**

*Question 3: Do you agree with our proposal for a staged approach to implementation, with the mandated rollout of smart meters starting before the mandated use of DCC for the domestic sector?*

See Summary on proposal for structured large scale trials similar to Low Carbon Network Fund, which could reduce the risks of a staged approach to acceptable levels.

*Question 4: Do you have any comments on the risks we have identified for staged implementation and our proposals on how these could best be managed?*

Without a structured approach, we believe that there is substantial risk of a patchwork of various technologies that can not be intergrated, do not accomplish the wider objectives or which misinform the process, because they only deal with the most profitable or easiest to install customers.

*Question 5: Do you have any other suggestions as to how the rollout could be brought forward, including the work to define technical specifications, which relies on industry input?*

See Summary.

*Question 6: Do you agree with our planning assumption that a period of six months will be needed between the date when supply licence obligations mandating rollout are implemented and the date when they take effect?*

See Summary and Answers above regarding a structured large scale trial.

*Question 7: Do you have any comments on the activities, assumptions, timings and dependencies presented in the high-level implementation plan?*

See Summary and Answers above regarding a structured large scale trial.

*Question 8: Do you have any comments on the outputs identified for each of the phases of the programme?*

See Summary and Answers above regarding a structured large scale trial.

### **Smart Metering Implementation Programme: Rollout Strategy** **(September 28th Responses)**

#### **CHAPTER 2**

*Question 1: Do you believe that the proposed approach provides the right balance between supplier certainty and flexibility to ensure the successful rollout of smart meters? If not, how should this balance be addressed?*

See Summary regarding large scale structured trials similar to Low Carbon Network Fund.

*Question 2: Would the same approach be appropriate for the non-domestic sector as for the domestic sector?*

See Summary regarding large scale structured trials similar to Low Carbon Network Fund. We also believe for the purposes of Smart Grid that it is important the non domestic sector use the DCC. This will assure the DNOs access to needed information comes from one place rather than attempting to interface with multiple suppliers or their vendors.

*Question 3: Is there a case for special arrangements for smaller suppliers?*

We do not have an opinion on this.

#### **CHAPTER 3**

*Question 4: What is the best way to promote consumer engagement in smart metering? As part of broader efforts, do you believe that a national awareness campaign should be established for smart metering? If so, what do you believe should be its scope and what would be the best way to deliver it?*

Consumer engagement will be critical to the success of the project. We believe it is important to conduct large scale trials to determine the best approach including in a geographic area which will facilitate meaningful customer communication at an individual and community level. As discussed in the Summary, we also believe it is important to have an alternative Smart Grid based plan that can be executed simultaneously - dynamic voltage optimization, for example - which will ensure the desired overall results are achieved. This is an emerging best practice in other countries.

*Question 5: How should a code of practice on providing customer information and support be developed and what mechanisms should be in place for updating it over time?*

We do not have an opinion on this.

#### CHAPTER 4

*Question 6: Do you agree with the proposed obligation on suppliers to take all reasonable steps to install smart meters for their customers? How should a completed installation be defined?*

If a national rollout is the goal, then there should be this requirement. The large scale trials we proposed in the Summary will help to assess the definition and the difficulties in achieving a complete installation.

*Question 7: Do you think that there is a need for interim targets and, if so, at what frequency should they be set?*

We believe that periodic reviews of best practices and accomplishment to date should be required. Based on this process, adjustments should be made in the programme as required.

*Question 8: Do you have any views on the form these targets should take and whether they should apply to all suppliers?*

The large scale trials we propose in the Summary will help to assess these targets.

*Question 9: What rate of installation of smart meters is achievable and what implications would this have?*

The large scale trials we proposed in the Summary will help to assess the these targets.

#### CHAPTER 5

*Question 10: Do you have any evidence to show that there are benefits or challenges in prioritising particular consumer groups or meter types?*

The large scale trials we proposed in the Summary will help to assess the these issues.

#### CHAPTER 6

*Question 11: Do you agree with our proposed approach to requiring suppliers to report on progress with the smart meter rollout? What information should suppliers be obliged to report and how frequently?*

Yes. We believe that periodic reviews of best practices and accomplishment to date should be required. Based on this process, adjustments should be made in the programme as required.

## CHAPTER 7

*Question 12: Do you agree that there is already adequate protection in place dealing with onsite security or are there specific aspects that are not adequately addressed?*

We do not have an opinion on this.

*Question 13: Do you agree with our proposal to require suppliers to develop a code of practice around the installation process? Are there any other aspects that should be included in this code of practice?*

Yes.

### **Smart Metering Implementation Programme - Rollout information request**

CURRENT does not provide meters but does manufacturer communications modules, sensors and data collectors. As discussed in the Summary, CURRENT believes that it makes sense for an accelerated rollout by Suppliers to be used as a trial period for the new technology and that the full rollout technology and processes be finalized as a result of the learning from those trials.

## **ANNEX 2: QUESTIONS FOR METER MANUFACTURERS**

*Question 1: What is your planned maximum production capacity during rollout?*

CURRENT does not disclose this information but works with a number of large contract manufacturing companies who have substantial manufacturing capabilities.

### *Impact of accelerated rollout*

*Question 2: In terms of the unit costs of metering and communications assets (including the IHD where relevant), we welcome feedback on the impact of accelerating the rollout on:*

- a) *the magnitude, timing and probability of any increased costs and risks; and*

See Summary Response above. We believe it is important that any accelerated rollout be used as a larger scale trial testing multiple technologies and rollout approaches. We believe that there is significant benefit from a broader scale trial prior to a full scale rollout from a risk reduction standpoint. It is important to note such a trial or series of trials could easily be 1 million meters or more in a specific geography.

*b) the likelihood of any supply chain, or other, constraints arising.*

We do not foresee supply chain constraints but do see potential problems with interoperability unless the final specifications are tested in a broader scale trial prior to full scale deployment.

*Pre-rollout preparation*

*Question 3: Our current planning assumption is that GB smart meter technical specifications will be confirmed by winter 2011. Please outline the processes and timescales required to go from confirmation of the technical specification to delivery of the smart metering components. Please specify whether these timescales differ for the following components:*

*Smart electricity meter*

*Smart gas meter*

*In-home display*

*WAN communications module*

*HAN communications chip*

*Any other components*

CURRENT makes WAN modules, sensors and data collectors. The present plan assumes that the individual Suppliers should acquire the WAN module based on specifications prepared by two expert groups.<sup>xiv</sup> Given that it is likely there will be at least two different WAN communications technologies (Wireless and power line) and at least two different HAN technologies (Wireless and power line), with at least six major suppliers, it would be possible to end up with 24 different WAN modules for the DCC to integrate with and to be responsible for security for. History has shown that despite best intentions, different manufacturers working to newly developed specifications often face challenges in achieving interoperability. We believe a better approach would be for the DCC to be responsible for the WAN module initially to limit the potential difficulties in achieving interoperability, similar to how the telecom vendors in rolling out DSL chose one or two modem manufacturers.

*Rollout strategy*

*Question 4: How do you plan to organise your production capacity in order to minimise supply chain constraints?*

CURRENT does not disclose this information but works with a number of large contract manufacturing companies who have substantially manufacturing capabilities.

**END NOTES**

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- <sup>i</sup> Ofgem, 'Smart Metering Implementation Programme: Regulatory and Commercial Framework', July 2010 pg 20.
- <sup>ii</sup> For example the Statement of Design Requirements states "The WAN hardware carries a greater obsolescence risk than the HAN because it is dependent on an external infrastructure that is also evolving, for example from cellular 2G to 3G. . .The HAN hardware carries less obsolescence risk in that it has no dependence on other infrastructure becoming obsolete." (Ofgem, Smart Metering Implementation Programme:Statement of Design Requirements, July 2010 pg. 34)
- <sup>iii</sup> Haaser, Bary, 'Industry Dilemma: Modular vs. Embedded Communications', September 2010, available at <http://smart-grid.tmcnet.com/topics/smart-grid-fa/articles/101260-industry-dilemma-modular-vs-embedded-communications.htm>
- <sup>iv</sup> "The specification for the WAN communications module will initially be developed by the programme, through the two Expert Groups, to enable the roll out of smart meters prior to DCC commencing its operation under the staged implementation approach." (Ofgem, Smart Metering Implementation Programme: Communications Business Model, July 2010 at 20)
- <sup>v</sup> At v and viii
- <sup>vi</sup> GB-wide smart meter roll out for the domestic sector Impact Assessment, July 2010 at 27,28
- <sup>vii</sup> Erhardt-Martinez, Donnelly, Laitner, Advanced Metering Initiatives and Residential Feedback Programs: A Meta-Review for Household Electricity-Saving Opportunities, June 2010 at 76-81
- <sup>viii</sup> See <http://www.openmeter.com/> for additional information. The Open Meter project is the result of an initial project led by Iberdrola called PRIME. Meters utilizing this standard are presently being deployed in Spain.
- <sup>ix</sup> Data from Orange's website used as an example.
- <sup>x</sup> Vodafone and Accenture, "Carbon Connections: Quantifying mobile's role in tackling climate change" July 2009 at 16
- <sup>xi</sup> Smart Metering Implementation Programme: Rollout Strategy at 25
- <sup>xii</sup> U.S. Federal Communications Commission, National Broadband Plan, March 2010 at 251
- <sup>xiii</sup> "The specification for the WAN communications module will initially be developed by the programme, through the two Expert Groups, to enable the roll out of smart meters prior to DCC commencing its operation under the staged implementation approach." (Ofgem, Smart Metering Implementation Programme: Communications Business Model, July 2010 at 20)
- <sup>xiv</sup> "The specification for the WAN communications module will initially be developed by the programme, through the two Expert Groups, to enable the roll out of smart meters prior to DCC commencing its operation under the staged implementation approach." (Ofgem, Smart Metering Implementation Programme: Communications Business Model, July 2010 at 20)