

Smart Metering Implementation Programme Prospectus

Ofgem and the Department of Energy and Climate
Change, July 2010

IBM Response to Consultation Questions

October 2010

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1 Introduction

IBM United Kingdom Ltd is pleased to respond to the questions raised in the 'Smart Metering Implementation Programme Prospectus' issued jointly by DECC and Ofgem in July 2010.

IBM is a leader in the Smart Metering and Smart Grid market, being involved in more Smart Metering projects, in more roles, in more countries, than any other consulting and technology company. In this regard we have:

- Played a lead role in the majority of the announced second-generation Smart Metering deployments in the world;
- Worked on some of the world's most advanced Smart Grid projects, such as those for DONG Energy in Denmark and CenterPoint in the US, and currently hold the Chair of the GridWise Alliance in the US;
- Managed the implementation and operation of centralised Smart Metering operations, analogous to the proposed central communications model operating within a DCC; and
- Been working on Smart Metering and Smart Grid projects in the UK and Ireland for over four years, including leading roles supporting Energy Suppliers and Network Operators.

We are pleased to continue with our contribution to the development of Smart Metering in Great Britain, drawing upon our global experience to inform our views in response to the key aspects of the consultation, covering the proposals on the:

- functional requirements catalogue and the approach for developing technical specifications for smart metering equipment;
- strategy for roll out including the consumer experience, proposals for a code of practice on installation, the use of installation targets and potential future obligations on local coordination; and
- implementation strategy, including the proposed staged approach to implementation, the timeline for agreement of the technical specifications and options to bring the rollout forward.

1.1 *The need for Smart Metering*

We fully support the introduction of Smart Metering in Great Britain, and believe it will make a significant contribution in helping to improve energy management.

The provision of energy in Great Britain is facing an unprecedented set of interrelated challenges which impact right across the energy value chain, from generation, through transmission, to consumption.

Demand is ever increasing, as are consumer expectations for security of supply and service, yet, the power stations and network infrastructure which provides that energy are aging and in need of major investment. At the same time, the provision of energy is hugely reliant on finite resources, and produces a large amount of damaging emissions –

79% of UK electricity comes from fossil-fuel generation¹, and 25% of the worlds CO2 emissions are from power production².

To help meet these challenges and ensure a sustainable long-term supply of energy for Britain a number of key needs emerge. Firstly, our energy must come from a more diverse range of sources, including an increased role for renewable generation, new nuclear power stations, and investments in technologies to clean-up fossil-fuel generation.

Secondly, our energy transmission infrastructure requires investment to enable the increased use of distributed and renewable generation and to maintain network resilience. We need increased storage capabilities and sophisticated control systems to be able to utilise the intermittent supply associated with renewable energy.

Finally, energy must be used in a smarter way – we need to find new innovative ways to reduce our overall consumption, and to interact with consumers in a way which allows the proactive management of the energy available, and the increased use of distributed and renewable generation.

We believe that Smart Metering is a key component in meeting these challenges. Smart Metering is a means of providing instrumented, interconnected, and intelligent capabilities through which the energy industry and consumers will be able to address challenges around reducing energy consumption, proactively managing usage to reduce the need for infrastructure investment, improving inefficient industry processes such as customer billing, and as a fundamental element of a Smart Grid transformation which would enable the intelligent distribution of energy.

Through our work on Smart Metering projects throughout the world we have seen the benefits which Smart Metering can provide, and are pleased to contribute to the consultation process helping Great Britain achieve similar benefits.

¹ BERR Energy Markets Outlook, December 2008

² The Climate Group and McKinsey & Co, "Smart 2020 Report"

2 Responses to Consultation Questions

2.1 Main Prospectus

Q1: Do you have any comments on the proposed minimum functional requirements and arrangements for provision of the in-home display device?

We support most of the proposed minimum data set including presentation of near real-time, historic and comparative consumption information in unit, monetary and ambient form, and account credit and debt information for prepayment customers. Broadly we do not support the mandated introduction of IHDs, rather we believe a mandate to provide a defined set of information would better enable supplier freedom to engage consumers and deliver the desired benefits in a more economic manner. However, if IHDs are mandated we believe these data items are appropriate.

We are unconvinced as to whether the incremental benefits from providing account balance information for credit customers on IHDs will outweigh the marginal costs, and as such we do not support this. We believe providing this information will be potentially challenging from a data and systems integration perspective, in particular we would highlight the challenges associated with applying conditional discounts, anniversary discounts and such like which will be necessary to allow consumers to reconcile their IHD account data with actual billing data. We are also unconvinced as to how effective this information would be helping credit customer understand and change their energy use.

We do not believe displaying the local time on the display is necessary to achieve the stated objectives, and as such do not believe this should be part of the minimum data set.

Q2: Do you have any comments on our overall approach to data privacy?

“Privacy by design” is a good principle to follow. While existing legislation is the default position for all personal data, it is recommended that a clear set of use cases for the consumer are defined so that this can be designed in as early as possible. These use cases can also be used to increase consumer confidence in the area of smart metering. Failure to include these use cases at an earliest opportunity will inevitable result in compromise positions being reached that could result in privacy/security risks not being fully addressed.

Q4: Have we identified the full range of consumer protection issues associated with the capability to conduct remote disconnection or switching from credit to prepayment terms? If not, please identify any additional such issues

We support many of the controls put forward but believe that Ofgem should not attempt to retrofit existing guidelines, rather a new set of guidelines should be defined for both remote disconnection and switching to prepayment. Such controls will need to reflect the differing circumstances of suppliers initiating disconnection or switch to prepayment without customer consent (e.g. due to non-payment of a bill) versus being pre-agreed with the customer (e.g. as part of a tariff change or agreement)

An example of this would be to define measures governing the required contact prior to and the actual time that a mode switch or disconnect can occur (e.g. within contact centre hours) to ensure a customer is aware of the change and can regain/maintain supply as quickly as possible.

In addition we believe that consideration should be made for the time of day a disconnection or switch to prepayment should take place. In the case of disconnection we believe this should fall within contact centre operating hours to enable customers to regain supply as soon as possible. In the case of a switch to prepayment we believe this should either be restricted to contact centre operating hours or for it to be a requirement that the switch to prepayment is made with an opening credit balance.

Overall we believe that disconnection should be a last resort and that suppliers should consider the use of trickle disconnection or switch to prepayment first.

Q5: Do you have any comments on the proposed approach to smaller non-domestic consumers (in particular on exceptions and access to data)?

We believe that there is a significantly large subset of non-domestic customers that have attributes more similar to domestic customers than to large non-domestic customers.

We believe that definition of smaller non-domestic customers as set out in the prospectus document 94i/10 is appropriate; and that this group of customer would benefit from the same level of access to data as domestic customers. We believe that information on the benefits of smart metering for small non-domestic customers should be made available and that smaller non-domestic customers should have the option to have access to the same level of service and information that will be provided to domestic customers. We do not foresee any issues for the DCC to incorporate the small non-domestic customers into its service. There are exceptional circumstances which may exclude smaller non-domestic customers from implementing smart metering. In some cases there may be some technical issues related to the customer's site or the type of metrology needed which may make it unfeasible to implement smart metering.

Q8: Do you have any comments on the proposals that energy suppliers should be responsible for purchasing, installing and, where appropriate, maintaining all customer premises equipment?

We support the supplier(s) being responsible for procuring, installing, and maintaining meters, HAN modules and display devices, due to the consistency this should provide to the customer experience and avoiding the potential for more parties than necessary visiting the customer. We believe consideration should be given to additional requirements to support and maintain display devices (and hence the HAN as well) beyond the present one year limit in circumstances where the customer requests this. We believe such an approach would better engage customers in energy management and maximise energy saving benefits for the consumer and society.

We support the supplier being responsible for installing and maintaining the WAN hub as this provides a simplified customer experience, and reduces the potential for multiple site visits.

However, we believe it is more appropriate for the DCC to be responsible for procuring and owning the WAN device so as to:

- provide the DCC with end-to-end accountability for communications to the home;
- give suitable incentive for the DCC to define the most cost effective communications system to deliver the requirements;
- reduce complexities associated with a customer changing supplier; and
- provide a more straight-forward basis for sharing of costs between separate electricity and gas suppliers at the same customer site.

With regard to variations in responsibilities where the customer has gas and electricity from different suppliers, we support the proposal for a 'lead supplier' as outlined. Although this will present potentially significant complexity to implement, we believe that within a market where consumers have the option to have gas and electricity from separate suppliers, and where the supplier-led metering model is chosen, it represents the most pragmatic solution to a complex problem. Under this option, to enable suppliers to be able to effectively plan their deployment for single fuel customers, it is desirable that a supplier should be able to establish what work they need to undertake on site and what work has already been undertaken. As such we believe that it should be possible for a supplier to query if WAN and HAN communications and a display device have already been enabled at a customer site by another supplier without undertaking a site visit. Similarly, post installation we believe that suppliers / MOPs / MAMs will need to be able to obtain details of the managers for specific assets to help in resolving issues with infrastructure which is used by multiple parties. We believe such functions would be best provided by the DCC.

Q9: Do you have any comments on the proposal that the scope of activities of the central data and communications function should be limited initially to those functions that are essential for the effective transfer of smart metering data, such as data access and scheduled data retrieval?

Subject to further analysis on meter registration, which is addressed in our response to Q2 in the Communications Business Model, we believe that the initial scope of the DCC should be limited to the effective transfer of data both to and from the meter, including scheduled data retrieval, alert processing and command processing. We also believe that there will necessarily be some validation and data storage activities associated with these transfers.

Q10: Do you have any comments on the proposal to establish DCC as a procurement and contract management entity that will procure communications and data services competitively?

We believe that separating the contracting and procurement of the service from the service providers that will provide the service is an essential measure in promoting flexibility in requirements, implementation and the adoption of new technologies, and in enabling the service to remain competitive as requirements change into the future. However, whilst agreeing that this is the right strategy, there is a risk that this approach will delay implementation of the DCC service. A clear roadmap with key milestones needs to be managed rigorously to ensure timely delivery.

We strongly believe that given the programme scale, complexity and timescales the DCC should procure a service provider with specific responsibility for the overall integration of the multiple comms and data service providers. For the DCC to either retain such responsibilities itself, or attempt to achieve effective integration via some form of co-operation / collaboration between the various service providers would significantly increase delivery risk.

We also believe that various funding mechanisms should be explored for the DCC to avoid energy suppliers having to shoulder the full burden of the initial setup and operating costs of the DCC. Consideration should be given to a model where the DCC service providers provide the initial investment requirements, thereby minimising the cash calls on the energy suppliers. By adopting such an approach, supported by a mandated programme of meter installations, it may be possible for the DCC to become largely self-funded.

Q11: Do you have any comments on the proposed approach for establishing DCC (through a licence awarded through a competitive licence application process with DCC then subject also to the new Smart Energy Code)?

We agree that the DCC should be awarded through a competitive licence application. We consider that experience of providing metering and registration agent services to the energy industry is an important factor in managing the DCC service.

Q12: Does the proposal that suppliers of smaller non-domestic customers should not be obliged to use DCC services but may elect to use them cause any substantive problems?

In the initial implementation we do not see substantive problems, but it will be necessary to manage the longer term implications for smart grid applications and also for DCC should it be determined that the DCC should take on wider registration and data aggregation responsibilities. Also, additional costs may arise where the DCC is obliged to take on smart or advanced meters that do not comply with technical specifications and, whilst we note the proposal that these costs would fall on the Supplier, there may be isolated low-volume, niche/redundant technologies where such costs could become prohibitive.

Q13: Do you agree with the proposal for a Smart Energy Code to govern the operation of smart metering?

Yes, we agree that the most practical approach is to bring both gas and electricity smart metering governance together into a single unified Smart Energy Code.

Q14: Have we identified all the wider impacts of smart metering on the energy sector?

Broadly we agree that the key impacts have been identified, for example the linkage to smart grids, reducing the need for network and generation reinforcement, the need for customer engagement and alike. Whilst these have not all been exhaustively developed, they are sufficiently developed and their impacts considered for today's needs to enable the smart metering programme to continue without delay.

One area we would highlight is the potential for a 'feast-and-famine' for MOPs and MAMs as a consequence of the smart metering deployment, especially in light of the desire to accelerate deployment which will only act to exacerbate this situation. Consideration should be given as to how this will be minimised, and whether there is a need for any regulatory or Government intervention in this area.

Q15: Is there anything further we need to be doing in terms of our ensuring the security of the smart metering system?

The development of the "privacy and security compliance framework" should be seen as a priority as it will have a large influence on the design of the DCC and IHD's. Furthermore responsibilities for compliance should be clearly defined. For example, should a vulnerability in an IHD be exploited that impacted on the DCC, clear lines of liability will be required given the multi-vendor environment in the end-to-end environment.

2.2 *Communications Business Model*

Q1: Do you agree that access control to secure centrally-coordinated communications, translation services and scheduled data retrieval are essential as part of the initial scope of DCC?

Yes, these services are essential as part of the initial scope of the DCC. Centralised access control is the most secure solution and there are significant efficiencies to be derived from centralised translation services. With these services in place it makes sense for all meter communications to be routed through the DCC.

Q2: Do you agree that meter registration should be included within DCC's scope and, if so, when?

We have looked closely at this issue and conducted our own analysis. We believe that within the initial scope of the DCC that meter registration activities should be restricted to maintenance of a smart meter register and the enablement of fast customer transfers including read provision and support to aligned dual fuel transfers. The smart meter register will need to be aligned with the current gas and electricity registration services to share appropriate meter and registration data.

We believe that at this early stage it would be premature to bring further registration processes, such as objection process, change of agent processing and, in electricity, settlement data processing, within the scope of the DCC due both to the complexity of these processes and the fact that the current processes whilst, though not ideal, do work. Furthermore, we consider that the developments and testing that all parties would require to undertake could put at risk the early implementation of the DCC. Therefore we consider that in the initial implementation legacy registration agents will retain some responsibilities in the change of supplier, agent and settlement data processes.

We consider that separating registration processing across the legacy registration agents (for legacy meters) and the DCC (for smart meters) has the potential to cause confusion in the market and this must be carefully managed so as not to adversely impact on customers.

Q3: Should data processing, aggregation and storage be included in DCC's scope and, if so, when?

The situations for gas and electricity are not the same. For electricity, we believe that industry processes will be simplified by a transfer of data processing and aggregation activities to the DCC. However, in order to accommodate the necessary developments and testing by all parties and to avoid delays to the initial implementation of DCC services, this should not take place until a critical mass of meters are installed. For gas, however we believe that aggregation should remain under the current arrangement with the DCC responsibility limited to data validation and the calculation of AQ/SOQ. To support these activities, data storage would be required.

However, we believe that in any case some data storage is required in the initial DCC implementation because the Supplier and Network Operator timeline requirements for data are not aligned and because allowing the DCC to maintain some level of data storage provides data security in the event of meter failure or failure of Supplier systems and interfaces.

Q4: Do any measures need to be put in place to facilitate rollout in the period before DCC service availability and the transition to provision of services by DCC, for example requiring DCC to take on communications contracts meeting certain pre-defined criteria?

Yes, the early agreement of a smart metering technical specification is important including the specifications for communication with the metering system including the WAN communications module. This would allow suppliers to commence their mandated roll-out planning and execution with certainty. It will also allow prospective DCC service providers to plan and design with a similar degree of certainty.

Q5: Do you agree that the licensable activity for DCC should cover procurement and management of contracts for the provision of central services for the communication and management of smart metering data?

Yes we agree the DCC should cover these activities but do not have a view on whether this is managed by licence or by alternative contractual arrangements.

Q6: Do you consider that DCC should be an independent company from energy suppliers and/or other users of its services and, if so, how should this be defined?

Yes, we consider that the DCC should be a regulated body that is independent from suppliers, from network operators and from any other body that takes services from the DCC. The DCC should also, for procurement transparency, be independent from providers of communications, IT and other services to the DCC.

Q7: Do you have any comments on the steps DCC would need to take to be in a position to provide its services and the likely timescales involved?

We do not have any comments on the steps that the DCC would need to take. However, the timescale from granting the DCC licence in autumn 2012 to the appointment of service providers by spring 2013 and to operational service by autumn 2013 is very challenging, particularly given the desirability of robust testing. As a result it is important that both the meter and communications technical specifications and the design of the DCC services and its interactions with other parties in the industry are completed well in advance of the granting of the licence.

Q8: Do you have any comments on the proposed approach to cost recovery and incentivisation for DCC?

It is important that the approach to cost recovery and incentivisation for the DCC is one that it can be flowed down to key service providers to the DCC. We do not have any concerns in this regard.

2.3 *Regulatory and Commercial Framework*

Q2: Do you agree with the proposal to establish a Smart Energy Code?

Yes - we agree with the proposal to establish a Smart Energy Code.

Q3: Do you have any comments on the indicative table of contents for the Smart Energy Code as set out in Appendix 3?

Section 8 should also address the residual responsibilities of the current registration agents if it is decided that the DCC should acquire meter point registration responsibilities. Section 15 should also address, in addition to meter operation, the responsibilities of networks where there are complex installations that may require re-location. We also suggest that there should be a section to address conflicts of interest arising from commercial and business relationships between the DCC, other signatories to the Code and service providers and which addresses the independence of service providers with whom the DCC may contract.

Q5: Do you agree with the proposals concerning the roles and obligations of suppliers in relation to the WAN communications module?

We support the supplier being responsible for installing and maintaining the WAN hub as this provides a simplified customer experience, and reduces the potential for multiple site visits. However, we believe it would be more appropriate for the DCC to be responsible for procuring and owning the WAN device so as to:

- provide the DCC with end-to-end accountability for communications to the home;
- give suitable incentive for the DCC to define the most cost effective communications system to deliver the requirements;
- reduce complexities associated with a customer changing supplier; and
- provide a more straight-forward basis for sharing of costs between separate electricity and gas suppliers at the same customer site.

Q7: Do you agree with the proposal that the WAN and the HAN in customer premises should be shared infrastructure, with the installing supplier retaining responsibility for ongoing maintenance? If not, would you prefer to have an arrangement by which if the gas supplier is the first to install, responsibilities for the common equipment is transferred to the electricity supplier when the electricity smart meter is installed?

We agree with the proposal to adopt Option 2 (sharing of assets), and agree that responsibility for WAN and HAN module maintenance should sit with the installing supplier until a change of supplier occurs. We believe that Option 1 (separate systems for each fuel) can be discounted due to the high additional cost for minimal additional benefit, and that adopting Option 3 (electricity owned assets to be installed before gas) would be a constraint on supplier freedom in a competitive market.

Under Option 2, to enable suppliers to be able to effectively plan their deployment for single fuel customers, it is desirable that a supplier should be able to establish what work they need to undertake on site and what work has already been undertaken. As such we believe that it should be possible for a supplier to query if WAN and HAN communications have already been enabled at a customer site by another supplier without undertaking a site visit. Similarly, post installation we believe that suppliers / MOPs / MAMs will need to be able to obtain details of the managers for specific assets to help in resolving issues with infrastructure which is used by multiple parties. We believe such functions would be best provided by the DCC.

Q8: Are there additional measures that should be put in place to reduce the risks to the programme generated by early movers?

Our main concern relates to the risk that suppliers' interim data and communications arrangements are so different as to cause interoperability issues and problems with subsequent novation/migration to the DCC. To mitigate these risks, IBM suggests that the government examines ways in which:

- To accelerate development of meter specifications, communications protocols and service levels agreements in order to reduce interoperability issues
- accelerate development of supply licence changes and the DCC licence application process in order to allow more time for procurement and testing of metering systems and processes
- To allow any interim arrangements to be novated to the DCC at a later date, such as by 2015/16.

Q9: What is needed to help ensure commercial interoperability?

We believe that commercial meter interoperability is a vital enabler for an open, fair and competitive energy retail market. To achieve this there should be pre-agreed commercial arrangements for the use of any MAP's assets by any supplier at common rates with common terms and conditions. To ensure barriers to customer switching are not introduced, and to encourage supply competition, a MAP should not be permitted to offer preferential rates to any one supplier.

Q10: Can current arrangements for delivering technical assurance be developed to gain cost effective technical assurance for the smart metering system? If so, how would these procedures be developed and governed?

We do not have any comments on technical assurance of the smart metering system. However, technical assurance of the communications specification is also a matter that should come under the purview of the SMDG. The Intellect group is represented on the SMDG and others can be invited to bring data and communications technical expertise. Data communications are critical to the success of the DCC and a similar focus is required in this area as is given to the metering system itself. To strengthen technical assurance we would suggest a separate expert group under the SMDG to develop data and communications technical proposals with an independent technical review of the proposals and specifications.

Q11: Are there any other regulatory and commercial issues that the programme should be addressing?

We believe that organisations that are members of the DCG should not be eligible to become the DCC as this could compromise the independence both of the findings of the DCG and of the DCC procurement processes that would follow. This would not preclude the DCG from taking expert advice from parties that might in future offer a DCC service.

Q12: What evolution do you expect in the development of innovative time-of-use tariffs? Are there any barriers to their introduction that need to be addressed?

The key barrier to introduction and acceptance of Time Of Use (TOU) tariffs is tariff confusion. Whilst some customers have experience of such tariffs in other industries (e.g. Telco), for many this will be a new concept (except of course E7 customers). We believe that suppliers should start with simple TOU products and over time, as customers become used to managing their energy and monitoring their behaviour (through more advanced tools provided by suppliers and third parties), more complex TOU products should be targeted at specific customer segments prior to being rolled out more widely. The introduction of these tariffs will need to be supported by suitable campaigns and guidance for customers to see the benefit of these tariffs and to drive transparency.

IBM has observed some key lessons learned from its work within the Telco industry:

- Simplicity of these tariffs will be important in the early stages of deployment. Customer Service Agent's understanding is as important to ensure they can clearly explain the product to the customer
- Education during the sales process is important to ensure customers understand why the tariff is best for them
- The product structures need to be clearly reconcilable on the customer's bill and display devices (e.g. the IHD and web) to drive understanding and behaviour change
- Dedicated first bill support provided to drive understanding in the early stages
- Conduct focus group work to test customer understanding of the product, especially in interpreting information on the bill
- Pilot more complex time of use products with customers most receptive to change (i.e. customers who have successfully changed their behaviour)
- Avoid proliferation of tariffs

In regards to the evolution of tariffs, there are also learning that can be taken from the Telco industry:

- Recognition that over time on and off peak periods will be different for different products, targeted based on different customer segments
- The introduction of incentives to drive behaviour change (e.g. tiered discounts and green bonuses linked to behaviour change or volume of usage in particular periods)
- Utilising data to design and match products to different customer types

Q13: Are there changes to settlement arrangements in the electricity or gas sectors that are needed to realise the benefits of smart metering?

For electricity we believe that the settlements process should be adapted to use actual half-hourly interval data, rather than relying on profiling, and settlement timescales should be reduced from months to days. Such changes should reduce processing, risk and credit cover costs for industry agents, suppliers and hence customers. Furthermore, without this change we believe there is a disincentive on suppliers to offer the time of use tariffs which the smart metering benefits case is partially predicated on.

For gas we believe that the settlements process should be adapted to use actual daily data, and like electricity settlement, timescales should be significantly reduced. We do not believe that there is benefit at this time in using half hourly interval data in gas settlement.

We also believe that there would be benefit in the DCC taking on additional data roles, such as those of the data collector and data aggregator.

The timing of all of these changes should be carefully considered as it is likely value may only be achieved once a non-trivial volume of meters are deployed. Accordingly we do not think changes to settlements should be in scope for the change programme now, but should be included in a later phase of work.

Q15: Are there any other industry processes that will be affected by smart metering and which the programme needs to take into account?

Section six of the Regulatory and Commercial Framework supporting document addresses the consideration that will be given to change of supplier process, Time of Use tariffs, aggregation and settlement and the processes of independent network operators.

In addition to these we suggest consideration be given to the residual role of the data collector and to smart prepayment processes taking into account new opportunities for payment and top-up. Furthermore we believe there are major opportunities to be considered in smart grid management including load switching and balancing.

2.4 Consumer Protection

Q2: Do you agree with our proposed approach for addressing unwelcome sales activities during visits for meter installation?

We support the restriction of unwanted sales activity in the code of practice, however a clear definition of “unwanted” sales activity is needed to avoid confusion for suppliers and consumers. We also support the provision of additional information or a helpline for vulnerable customers.

Alongside energy advice, we would support the provision of information and offer of a call back to be made by the supplier, to the customer for further information (and hence speak to someone with the appropriate skill set). This would speed up the installation time and avoid the customer coming under pressure to listen and make a decision during the visit.

On the suggestion of gaining advanced consent for sales activity, clear guidance is required on what "advance consent" means (i.e. would this cover people who have already agreed to receive sales activity/ information and offers through various channels). There is a risk that if suppliers start asking permission in advance that this could prove to be a barrier to entry.

Q4: Do you agree with our proposed approach to ensuring that the IHD is not used to transmit unwelcome marketing messages?

We agree with the proposal, however clear guidelines on what "unwelcome marketing messages" means is required to protect consumers and enable suppliers to avoid breaching guidelines. International experience tells us that the majority of behavioural learning from IHDs are made in the first 1-2 months. After this period, customers will make less use of the device and therefore unwelcome marketing will only increase the likelihood that customer will discard the device or put them in place where no further benefit will be realised (A questions of the environmental impact of Issuing 30+ million of these devices should be raised given the fact that one of the key drivers of smart metering is the green agenda).

We believe that suppliers should have to request a customer to opt-in to receive marketing information or other types of notifications/alerts (e.g. travel news, weather). This will protect those customers who don't wish to receive messages but allow others to receive such messages.

Q6: Do you consider that existing protections in the licence are sufficient to ensure that consumers are not remotely switched to prepayment mode inappropriately?

We believe that a review of these conditions is required to take into consideration the new capabilities and flexibility offered by smart metering (e.g. new potentially 24hour top-up options). Further consideration needs to be given to:

1. The time the switch from credit to PP occurs e.g:
 - a. During contact centre hours to ensure customers can contact the supplier for support and top-up;
 - b. During times that vend channels are available to the customer
2. Consideration for a starting balance, with the option for the customer to top-up in advance of the change. Another possibility would be for the supplier to pre-load a credit balance that can be recovered over a period of time
3. Inclusion of a pre-switch checklist that is subject to audit by the regulator, to check the suitability of prepayment as a product for a customer (e.g. vulnerability checks).

Q8: What notification should suppliers be required to provide before switching a customer to prepayment mode?

We agree with the existing guidelines in place, however to protect consumers we think suppliers should have to take all reasonable steps to make contact with the customer first. Where no contact is possible (e.g. vacant site), we believe the switch should be allowed to go ahead provided facilities such as emergency credit, are available at the point of mode change to enable a customer to get on supply.

Q9: Do you believe that suppliers should be required to provide emergency credit and 'friendly credit' periods to prepayment customers or whether, as now, this can be left to suppliers?

Since many suppliers already offer this we don't see the need for regulating this off the back of smart metering (except in specific circumstances e.g. meter mode change). Smart metering will offer more flexibility for vend options and vend hours than today and as such current rules should suffice.

Q10: Do you consider that an obligation similar to Prepayment Meter Infrastructure Provision (PPMIP) may be required?

With smart metering there are options to reform the prepayment market and provide consumers with freedom to choose their supplier each time they vend. Smart prepayment meters must have functionality to enable top-up when the WAN is unavailable. We agree that prepayment customers must have local cash payment options and believe that suppliers should be obliged to support this. When the WAN is available all commands including payment can be delivered through the DCC. We do not therefore believe that further obligations similar to PPMIP are required.

Q11: Is the obligation which Ofgem is proposing to introduce on suppliers to take all reasonable steps to check whether the customer is vulnerable ahead of disconnection sufficient? If not, what else is needed?

We support the need for suppliers to take all reasonable steps to identify if a customer is vulnerable. However suppliers should not be forced to make a site visit where they are able to make contact with the customer and perform a pre-disconnection survey remotely as it will erode many of the benefits of "remote" disconnection. During this pre-disconnection contact the supplier will be able to assess vulnerability status. Where no contact can be made remotely a site visit will still be required or alternatives to disconnection be considered (i.e. switch to prepayment or trickle disconnection).

We believe that further clarification should be made to the recent supply licence amendment to ensure it is clear what Ofgem means by "all reasonable steps". In reading the changes to the licence condition it leaves the condition open to interpretation which poses a risk for both consumers and suppliers.

Q12: What notification should suppliers be required to provide before disconnecting a customer?

We believe that alongside the advance notification (i.e. white mail) that a customer receives, suppliers should be required to contact the customer on disconnection by either phone or SMS. This removes the dependency of a device on the supply at the site for notification. This also drives the likelihood that the customer will have received the message and provides the opportunity to provide information on how to rectify the issue and avoid unwanted calls to DNOs and GTs.

Q14: Do you agree with our approach for addressing issues related to remote disconnection and switching to prepayment?

We support the approach to addressing the issues related to remote disconnection and switching to prepayment. We would however suggest that suppliers should consider using prepayment and trickle disconnection as a first choice rather than remote disconnection.

Q15: Have we identified the full range of consumer protection issues related to remote disconnection and switching to prepayment?

We support many of the controls put forward but believe that Ofgem should not attempt to retrofit existing guidelines, rather a new set of guidelines should be defined for both remote disconnection and switching to prepayment. Such controls will need to reflect the differing circumstances of suppliers initiating disconnection or switch to prepayment without customer consent (e.g. due to non-payment of a bill) versus being pre-agreed with the customer (e.g. as part of a tariff change or agreement)

An example of this would be to define measures governing the required contact prior to and the actual time that a mode switch or disconnect can occur (e.g. within contact centre hours) to ensure a customer is aware of the change and can regain/maintain supply as quickly as possible.

In addition we believe that consideration should be made for the time of day a disconnection or switch to prepayment should take place. In the case of disconnection we believe this should fall within contact centre operating hours to enable customers to regain supply as soon as possible. In the case of a switch to prepayment we believe this should either be restricted to contact centre operating hours or for it to be a requirement that the switch to prepayment is made with an opening credit balance.

Overall we believe that disconnection should be a last resort and that suppliers should consider the use of trickle disconnection or switch to prepayment first.

Q17: Do you have any comments on our proposals to prevent upfront charging for the basic model of smart meters and IHDs? (IH)

We support the proposal to prevent upfront charging for the basic model of a smart meter and IHD. However, should a customer choose a higher spec meter or IHD, suppliers should be able to apply an upfront or incremental charge for the devices. In our view, whilst the IHD may be owned by the customer we believe that the meter, WAN and HAN module should always be owned by the MAP.

2.5 Privacy and Data Security

Q2: We seek views from stakeholders on what level of data aggregation and frequency of access to smart metering data is necessary in order for industry to fulfil regulated duties.

Whilst it is possible for suppliers and other industry participants to perform their regulated duties using a limited dataset obtained infrequently (as now), we believe access to up-to-date customer level half-hourly interval data will both enable regulatory duties to be discharged in the most optimal manner and facilitate a range of additional benefits.

For example, it is possible for an energy supplier to service the needs of a customer on a single rate electricity tariff by obtaining one register read only when a bill is to be produced. However, access to and use of more granular data by suppliers would enable numerous supplier and customer benefits, e.g.:

- More personalised tariff and energy saving recommendations;
- Much quicker visibility of changes in consumption, leading to more accurate forecasted consumption and future bills, in turn resulting in more accurate collections and reduced potential for shock bills and debt accumulation; and
- More accurate demand forecasts enabling more optimal energy procurement and hedging, reducing market volume and price exposure.

Q3: Do you support the proposal to develop a privacy charter?

Yes we support the development of a privacy charter. There will inevitably be consumer concerns about how their data is processed and disclosed as smart metering is rolled out. Addressing these concerns will be a critical success factor.

Q4: What issues should be covered in a privacy charter?

While we welcome the opportunity to contribute to the privacy charter ultimately this needs to reflect the needs of the consumer and we assume appropriate stakeholders will be engaged. We believe our involvement will be confirming the privacy charter can be enforced through a combination of education, appropriate operational procedures, and technology.

Q5: Do you agree with our approach for ensuring the end-to-end smart metering system is appropriately secure?

In principle, yes. An end-to-end approach to security is key to the success of smart metering. On going risk assessment coupled with the adoption of industry based standards such as ISO27001 provides a clear statement of intent to all parties involved in smart metering.

2.6 *In-home Display*

Q1: We welcome views on the level of accuracy which can be achieved and which customers would expect, in particular in relation to consumption in pounds and pence.

There are particular challenges in presenting accurate costs in the home. For example, we would highlight the challenges associated with calculating block tariffs, conditional discounts, anniversary discounts, product bundling, and retrospective application of gas calorific values. We would expect many customers to still desire to retain their present tariffs, and as such do not expect these challenges to reduce.

To gain acceptance of the values presented via the IHD it will be necessary to allow consumers to reconcile their IHD account data with actual billing data. If customers are not able to do this then there is the potential for an increase in customer contact and billing disputes. Accordingly, we are unconvinced as to whether the incremental benefits from providing account balance information for credit customers on IHDs will outweigh the marginal costs, and as such we do not support this.

To manage customer expectations we believe the presentation of any financial data to the customer on their IHD should be on a 'worst case' basis so that their actual bill is not greater than the values on their IHD.

Q2: We welcome evidence on whether information on carbon dioxide emissions is a useful indicator in encouraging behaviour change, and if so, how it might be best represented to consumers.

CO2 emission information would be of interest to many consumers, although the incremental benefit of providing this information is limited as most environmentally motivated consumers are also financial motivated, and hence would already have been influenced by the provision of information in monetary terms. As such, we do not believe the provision of CO2 information should be a requirement.

Our own consumer survey in the UK shows that 50% of consumers say they would change their consumption behaviour in response to concerns about environmental impact, but of these only 1 in 7 is not also motivated by cash or other incentives. The subsequent incremental benefit in providing environmental information and incentive is therefore small, reaching out to only any additional 7% of the population.

We believe there are challenges in providing meaningful CO2 emissions information due to there being no real-time measurement of this in the market. Whilst it is possible to calculate emissions based on grid averages, or even hypothecation of emissions to specific energy suppliers or consumers, such as those on green tariffs, it is not representative of the marginal environmental impact of the customer changing their behaviour. We believe the most effective and reality-reflective means to incentivise environmentally conscious people would be to provide the short run marginal carbon emissions at a given point in time. This would be more representative of the environmental impact of marginal energy usage abatement, but would be a very challenging system to implement.

Q4: Do you think that there is a case for a supply licence obligation around the need for appropriately designed IHDs to be provided to customers with special requirements, and/or for best practice to be identified and shared once suppliers start to roll out IHDs?

Broadly we do not support the mandated introduction of IHDs, rather we believe a mandate to provide a defined set of information would better enable supplier freedom to engage consumers and deliver the desired benefits in a more economic manner.

It is important that all customers have access to such a minimum set of information, but we believe that mandating bespoke IHD solutions for all domestic customers is not necessarily the most economically suitable approach. For example, providing a disabled customer with energy advice through a visit from a local support group rather than developing and installing a bespoke IHD may reduce costs and increase customer engagement.

Where a customer has requested an IHD and a standard IHD is not considered appropriate (e.g. due to customer disabilities) we believe suppliers should be permitted to provide energy information and advice through alternative means.

Q5: We welcome evidence on whether portability of IHDs (i.e. ability to move from room to room) has a significant impact on consumer behavioural change.

Evidence from implementations and research IBM has done in the US has highlighted that the IHD as a key tool in driving change in customer consumption behaviour. This was highlighted in a survey done for prepayment customers where the IHD was a key tool in driving a 9-11% reduction in consumption. This programme also saw the IHD drive a greater adoption/ request of prepayment tariffs for fuel poor customers. As the industry moves to embrace capabilities such as TOU pricing and Critical Peak Pricing options, the IHD will be an important tool to guide customers.

For the IHD to be effective it needs to be in a useful place that provides a clear view to the customer so they can react in real time to the audio and visual alerts of the IHD. This position won't always be near a power socket and as such portability is a key capability for the IHD (although fulfilling this through conventional single use batteries is not supported).

Q6: Do you agree with the proposed minimum functional requirements for the IHD?

We support most of the proposed minimum data set including presentation of near real-time, historic and comparative consumption information in unit, monetary and ambient form, and account credit and debt information for prepayment customers. Broadly we do not support the mandated introduction of IHDs, rather we believe a mandate to provide a defined set of information would better enable supplier freedom to engage consumers and deliver the desired benefits in a more economic manner. However, if IHDs are mandated we believe these data items are appropriate.

We are unconvinced as to whether the incremental benefits from providing account balance information for credit customers on IHDs will outweigh the marginal costs, and as such we do not support this. We believe providing this information will be potentially challenging from a data and systems integration perspective, in particular we would highlight the challenges associated with applying conditional discounts, anniversary discounts and such like which will be necessary to allow consumers to reconcile their IHD account data with actual billing data. We are also unconvinced as to how effective this information would be helping credit customer understand and change their energy use.

We do not believe displaying the local time on the display is necessary to achieve the stated objectives, and as such do not believe this should be part of the minimum data set.

Q8: Do you agree with the proposals covering the roles of and obligations on suppliers in relation to the IHD?

We support the supplier(s) being responsible for procuring, installing, and maintaining meters, HAN modules and display devices, due to the consistency this should provide to the customer experience and avoiding the potential for more parties than necessary visiting the customer. We believe consideration should be given to additional requirements to support and maintain display devices (and hence the HAN as well) beyond the present one year limit in circumstances where the customer requests this. We believe such an approach would better engage customers in energy management and maximise energy saving benefits for the consumer and society.

With regard to variations in responsibilities where the customer has gas and electricity from different suppliers, we support the proposal for a 'lead supplier' as outlined. Although this will present potentially significant complexity to implement, we believe that within a market where consumers have the option to have gas and electricity from separate suppliers, and where the supplier-led metering model is chosen, it represents the most pragmatic solution to a complex problem. Under this option, to enable suppliers to be able to effectively plan their deployment for single fuel customers, it is desirable that a supplier should be able to establish what work they need to undertake on site and what work has already been undertaken. As such we believe that it should be possible for a supplier to query if WAN and HAN communications and a display device have already been enabled at a customer site by another supplier without undertaking a site visit. Similarly, post installation we believe that suppliers / MOPs / MAMs will need to be able to obtain details of the managers for specific assets to help in resolving issues with infrastructure which is used by multiple parties. We believe such functions would be best provided by the DCC.

2.7 Non-domestic Sector

Q2: Do you agree with our proposed approach to exceptions in the smaller non-domestic sector?

Yes we agree with the exceptions in the smaller non-domestic sector.

Q4: Do you agree with the proposed approach that use of DCC should be optional for non-domestic participants in the sector?

The non-domestic sector is significant with around 4 million meters and for many non-domestic premises the requirements are similar to domestic. It is therefore important that interoperability is promoted by adherence to the smart metering and WAN technical specifications.

Provided that is in place, we do not see significant issues in making use of the DCC optional, excepting the need to manage the implications for the future provision of centralised registration and aggregation processes and for achieving the full benefit of smart grid applications, which are dealt with further under our response to question 6 below.

Where use of the DCC remains optional it will be more complex for the DCC to provide registration and, in the future, other data services such as aggregation. Therefore in the event that the DCC is required to provide registration and aggregation services across all smart meters we believe that use of the DCC should become mandatory at this point.

Q5: If use of DCC is not mandated for non-domestic customers, do you agree with the proposed approach as to how it offers its services and the controls around such offers?

The DCC should not be able to use its domestic position to subsidise the services it offers in the non-domestic market, but it is important that it is allowed to offer the same services in the non-domestic market.

The DCC would be in a position to offer energy management services that would benefit a wide range of customers and also provide wider economic benefits and it should not be precluded from doing so. However, where the DCC manages smart metering data transfers it should not be allowed to use that position to preclude other companies from offering energy management and similar services and it is important that data is available through the DCC, with customer consent, to these other companies.

Q6: To what extent does our proposed approach to the use of DCC for non-domestic customers present any significant potential limitations for smart grids?

We do not believe the proposed approach to the DCC has significant adverse implications for operational planning provided that the conditions for providing data to network operators, addressed in question 7 below, are robust.

There are implications within the approach for active data management, and particularly the requirements for load management and switching where network companies will face additional complexities through having to interface with a potentially wide range of communications providers.

Q7: Is a specific licence condition required to ensure that metering data for non-domestic customers can be provided to network operators or DCC, and should any provision be made for charging network operators for the costs of delivering such data?

Yes, it will be important that metering data for non-domestic customers is made available as reasonably required by network operators and licence conditions on both the DCC and on suppliers not using the DCC can be used to ensure this. The provision of this data should be governed by an industry agreed specification for basic data content, granularity and timeliness.

For electricity a basic specification could be, for example, half-hourly data on active, reactive and voltage measures to be delivered monthly plus exceptions delivered immediately.

The DCC should be able to charge for managing data for network operators on a similar basis to the data it would manage for suppliers, with data delivered within the agreed basic data specification covered by a standard charge and additional charges for delivering data that is required outside of this basic data specification. Suppliers not using the DCC could also be governed by these charges.

Q8: How can interoperability best be secured in the smaller non-domestic sector?

Where possible, smaller non-domestic customers should be provided with the same technical solution as domestic customers. Where the in-home technology is different between the two sectors then the interfaces to DCC should be compatible

As discussed in section 4 we believe the road to inter-operability is promoted by adherence to the smart metering and WAN technical specifications.

Where possible, smaller non-domestic customers should be provided with the same technical solution as domestic customers. Where the in-home technology is different between the two sectors then the interfaces to DCC should be compatible.

Q10: Do you agree with our approach to data privacy and security for non-domestic customers?

In principle, yes. The “privacy and security framework” will need to recognise that non-domestic customers will require a different identity and access model to domestic customers. i.e. non-domestic customers will have multiple people who may require access to data within the DCC at different levels. Non-domestic customers also have their own internal compliance regimes therefore the privacy and security framework should recognise common requirements in this area such as individual accountability and the timely provisioning and removal of user access.

Q11: Is the proposed approach to rollout (for example in terms of targets and a requirement for an installation code of practice) appropriate for the non-domestic sector?

For the smaller non-domestic sector (as defined in prospectus document 94i/10) we believe that it is appropriate that they be treated in exactly the same way as the domestic customers, with exceptions as set out in the same document.

3 Appendix - IBM Smart Metering and Smart Grid experience and credentials

3.1 *IBM's Smarter Planet strategy*

The world is facing a series of interrelated complex challenges, the impacts of which are being felt across all facets of our lives – from food shortages to transport inefficiencies, from managing pandemics to coping with energy shortages. These challenges are all occurring at a time when new interconnected technologies are emerging and maturing. These technologies both exacerbate the impact of these challenges, but also make new smarter solutions achievable.

Building a smarter planet is IBM's point of view on how interconnected technologies are changing the way the world works. Opportunities for change are being driven by the world becoming:

- Instrumented – taking advantage of the opportunity to measure, sense and see the exact condition of everything, and to do so in real-time or near real-time;
- Interconnected – enabling people, systems and objects to communicate and interact with each other in entirely new ways; and
- Intelligent – responding to changes quickly and accurately, learning from patterns of behaviour and activity, and getting better results by predicting and optimising for future events.
- Our vision of a smarter planet has at its heart a digital infrastructure which exists in parallel to, and fundamentally interconnected with, our physical infrastructure. The information sensed by this digital infrastructure drives analysis, insight and improvement.

Either through automatic actuation or by embedding visualisation and decision making into business processes, the digital infrastructure is able to make the physical infrastructure dynamic, so that it rapidly and effectively responds to changing circumstances.

One of our key focus areas within our Smarter Planet strategy, both globally and in the UK, is Smarter Energy. We are already working on many of the emerging areas where instrumentation, interconnection and intelligence can be employed to help address many of the challenges being faced in the energy industry, including: advanced modelling and simulation of nuclear power stations, optimising electric vehicle charging to best interact with a Smart Grid, and the deployment of Smart Meters to help influence and control energy consumption.

3.2 *IBM's global Smart Metering and Smart Grid qualifications*

In formulating our response we have drawn upon our experience in the global Smart Metering and Smart Grid market. There are five aspects of our work which are particularly relevant to this consultation:

1. Network-led Smart Metering deployments;
2. Supplier-led Smart Metering deployments;
3. Central Smart Metering service provision;
4. Smart energy pilots with consumers; and
5. Smart Grid development.

Nearly all Smart Metering deployments in the world have been led by network businesses, and these large deployments present several learning points for Great Britain. IBM is currently the lead consulting organisation on Smart Metering projects with eight major networks businesses in North America, who collectively serve more than 34 million customers. Our roles on these engagements include business case development, project planning and management, vendor selection and management, systems integration and deployment management.

IBM has also had a lead role in one of the few supplier-led Smart Metering deployments, with Oxxio, in the Netherlands. In September 2005 Oxxio announced a five-year agreement with IBM to provide Oxxio customers with new Smart Meters for both electricity and gas. We have been working with Oxxio since their initial preparations and deployment, and have been actively involved in the market model discussions in the Netherlands.

In global Smart Metering deployments to date there are a few examples of central Smart Metering service provision, equivalent to the Central Communications Market Model proposed for Great Britain. IBM is managing the implementation and operation of two:

- In Ontario, IBM was selected to design, build, and manage the provincial Meter Data Management Repository (MDM/R). The MDM/R system is designed to collect and validate hourly interval data from 4.5 million meters every day, then frame this into Time of Use bill determinants for use by over 90 local distributors and competitive Energy Suppliers.
- In Texas, IBM is building a Common Advanced Metering Web Portal and Data Repository that consolidates customer usage and meter data from five different network operators to provide to Energy Suppliers, end consumers, and other authorised parties via a web portal. The system will store four years of 15-minute interval data from 7 million meters, together with monthly billed usage data, and maintain current and historical views of meter attributes, premise and service point information.

Throughout the world we have been involved in a number of Smart energy pilots with consumers, evaluating how consumer behaviour changes in response to information and incentives, and considering how better to engage consumers in the management of energy:

- As part of the U.S. Department of Energy's GridWise Programme, the Pacific Northwest National Laboratory and IBM designed the Olympic Peninsula Smart Grid demonstration project to help consumers participate in the operation of the power grid in a way that benefited them and the network. In this trial, smart appliances, meters, and sensors adjust consumption dynamically based on real time pricing signals at five minute intervals.

This delivered results that included: 10% lower electricity bills; a 15% reduction in peak loads over a 12 month period; and a 50% reduction in short-term peak loads.

- In Ontario, IBM completed an innovative pilot of Time of Use and Critical Peak Pricing tariffs with the Ontario Energy Board. Our analysis of the results included focus groups, participant surveys and statistical evaluation of demand response and conservation effects. The results formed an important part of the Ontario's policy to introduce mandatory Time of Use rates across Ontario.

Across both mature and emerging markets, IBM is working on nearly 50 Smart Grid engagements, these include:

- As part of the Smart Grid programme at DONG Energy in Denmark, where network operations were programmed to respond to outages faster resulting in significant operational benefits. These included a 52% improvement in Customer Minutes Lost through immediate identification and isolation of faults; faster response time to faults leading to a 35% reduction in restoration times; up to 80% reduction in Network Reinforcement; improved Customer Service and Outage Management; and better identification of Power Quality issues.
- As part of the EDISON project in Denmark (Electric Vehicles in a Distributed and Integrated Market using Sustainable Energy and Open Networks) which involves IBM, the energy industry, academia, and others, working together to establish how electric vehicles could be used together with Smart Grids to increase the share of renewable energy in SMIP Prospectus - IBM Response to Prospectus Consultation overall consumption. Researchers from IBM are developing smart technologies that synchronise the charging of the electric vehicles with the availability of wind in the grid to ensure that electric vehicles are recharged from renewable non-carbon sources. IBM is also working with the Technical University of Denmark to undertake large-scale, real-time, simulations of the energy system and the impact of electric vehicles.

3.3 IBM's UK Smart Metering and Smart Grid qualifications

In the UK and Ireland we have been working on Smart Metering and Smart Grid projects for over three years, including:

- Working with many of the Energy Suppliers, including helping them understand Smart Metering, develop their business strategies, design and run pilots, and plan for the business transformation Smart Metering will enable;
- Helping ESB Networks in Ireland plan and manage their far-reaching Smart Metering customer behaviour trials and technology pilots;
- Working with electricity Network Operators to conduct Smart Grid pilots and understand the possible benefits which Smart Grids could provide to them; and
- Chairing the Energy & Utilities forum at Intellect, and being members of The Application Home Initiative (TAHI) where we hold a Board level position.