

# **Vodafone Response to the OFGEM Smart Metering Implementation Programme Prospectus**

**Second submission (28<sup>th</sup> October deadline)**

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## 1. Executive Summary

Vodafone strongly supports the aims of the smart metering implementation programme and therefore welcomes the opportunity to respond to the prospectus. This second volume of our response complements, and should be read together with, our previous response to the September questions.

In our first response, we made clear our strong support for programme acceleration and for the Data and Communications Company (DCC) model. We made the case for existing wireless technology, GPRS in particular, as the Wide Area Network (WAN) communications technology of choice, noting that programme acceleration makes it vital to maximise the use of existing infrastructure and that the mobile industry is well placed to support the programme's objectives.

GSM/GPRS networks are based on open, proven, global standards, used by over 1.5 billion people in 212 countries. A diverse competitive ecosystem offers substantial scale economies while minimising technical and operational deployment risks. Cellular technology is proven in smart metering applications both in the UK and internationally. Vodafone itself has operational experience of supporting national scale smart metering rollouts in New Zealand and the Netherlands. In the UK, we have already rolled out WAN services to over 250,000 devices in the metering market and to another 100,000 devices in other in-building markets requiring a similar deep coverage footprint.

We also showed in our first response how communications providers such as Vodafone can contribute to the programme's aims through innovative technical solutions providing the right regulatory framework is in place. We identified a number of critical success factors, including:

- **Early agreement on technical specification**
- **Regulatory and commercial certainty**
- **Commercial interoperability**
- **Managed transition to the DCC**
- **Flexibility and future proofing**

In this follow-up submission, having reviewed the full range of questions on which views are invited, we focus particularly on the critical elements of the Commercial Business Model and what this implies for the Regulatory and Commercial Framework. We return to many of the themes highlighted in our previous response, in particular, the need for a regulatory framework conducive to commercial investment, the need for clarity and certainty around commercial terms, and the need for a bridge from the pre-DCC world into the DCC era.

- **Novation and transition** – we recommend initial WAN communications contracts should have a minimum term of 5 years to bridge the transition into the DCC. This will require suppliers to contract for a period extending into the early phase of the DCC, with guarantees on contract novation and commercial terms. Controlled disclosure of pre-DCC contracts will enable DCC bidders to undertake due diligence.
- **DCC independence, role and remit** – we strongly endorse the principle of DCC independence both from its communications provider and data suppliers, and from its energy sector customers. Clarity over regulation and commercial terms will, however, be important in order to attract commercial candidates of the required calibre.
- **Clarity about value added services (VAS)** – we underline the importance both of *industry* VAS to support commercial interoperability, and *consumer* VAS e.g. to support third party remote energy management services consistent with the programme's objectives. To ensure the DCC

does not monopolise the market for VAS beyond the initial mandate, we propose a licence restriction on self-provision of VAS direct to consumers by the DCC. However, we believe the licence should explicitly allow the DCC to add value, drive efficiency and improve its own commercial performance by stimulating competitive provision of VAS using common infrastructure, subject always to appropriate customer consents.

Achieving all these aims will, we believe, require some refinement to the proposals contained in the prospectus, which in any event require further elaboration and development before regulatory obligations on suppliers are confirmed and the DCC franchise put out to tender. However, we believe the proposals outlined in this response sit well within the broad policy framework proposed and we look forward to working with Ofgem and other stakeholders to refine the remaining detail as the programme progresses to the next stage.

## 2. Introduction and Summary

Vodafone strongly supports the aims of the smart metering implementation programme and therefore welcomes the opportunity to respond to the prospectus. This second volume of our response complements, and should be read together, with our previous response to the September questions.

In our first response, we made clear our strong support for programme acceleration and for the DCC model, while also highlighting a number of critical success factors in the Summary and Overview chapters. We made the case for existing wireless technology, GPRS in particular, as the WAN communications technology of choice. We also showed how communications providers such as Vodafone can contribute to the programme's aims through innovative technical solutions to the challenges of technical and commercial interoperability, providing the right regulatory framework is in place.

In this follow-up submission, having reviewed the full range of questions on which views are invited, we focus specifically on the critical elements of the Commercial Business Model and what this implies for the Regulatory and Commercial Framework. We return to many of the themes highlighted in our previous response, in particular, the need for a regulatory framework conducive to commercial investment, the need for clarity and certainty around commercial terms, and the need for a bridge from the pre-DCC world into the DCC era.

Our privacy and security specialists have prepared a high level response to the Data Privacy and Security questions. We believe that our extensive experience with privacy and security in the global wireless communications services market is also highly relevant to smart metering applications.

While answering the Non-Domestic Sector questions we have also listened to the views of our clients that operate in the already fast growing market for energy management services. We support the proposal that use of the DCC be optional for this sector as this will maximise competitor engagement and innovation.

### **Communications Business Model and the Regulatory and Commercial Framework**

#### *Transition and contract novation*

Vodafone remains strongly of the view that early roll-out pre-DCC is not only possible and desirable, but also compatible with commercial interoperability, managed transition and future proofing. However, this does depend critically on providing an appropriate regulatory and commercial 'bridge' from the early roll-out phase into the DCC era, requiring novation of contracts on guaranteed terms for a transitional period. We recommend five year minimum term contracts for WAN communications. This is long enough to provide a transitional path from pre-DCC roll-out into the DCC without undermining the regulatory model proposed for the DCC. In Vodafone's view, the alternative suggestion of short initial contracts which are then replaced at a stroke when the DCC comes into being is unworkable in practice, and would defeat the objective of accelerated roll-out.

In particular, the idea that bidders for the DCC should come to the table with their own suppliers and contracts already lined up, risks becoming a massive unnecessary distraction for all stakeholders. It also threatens to re-introduce many of the 'winner takes all' monopoly risks, which the competitive procurement model of the DCC was intended to avoid. This cannot be sensible.

Contract novation is not only possible but, we believe, essential to ensure an orderly and efficient transition in the consumer interest. We recognise that DCC bidders will need controlled access to pre-DCC contracts on fair and non-discriminatory terms, in order to conduct due diligence before finalising their bids. This can be managed in much the same way as any other due diligence exercise requiring disclosure, and does not raise competition concerns providing the DCC's independence

from its suppliers and energy industry customers is guaranteed by the regulatory regime and auction rules.

#### *DCC independence, role and remit*

We agree that the DCC should be independent not only from its communications provider and data function service providers, but also from its energy industry customers to avoid any conflict of interest in delivering the key aims of the programme. We do not believe, however, that this implies that the role for the DCC should initially be completely focused on core energy industry services or over time on energy management or efficiency value added services. We believe that the DCC has an interesting and important opportunity to facilitate other parties to offer consumer value added services as soon as possible, with initial focus on energy management, but not excluding extra-industry services.

For the DCC model to work effectively to drive innovation and carbon reduction, we believe it will be necessary to attract well qualified and commercially astute candidates also from outside the energy industry. While some potential bidders may see attractions in a 'safe and steady' income stream with low but stable regulated returns, the better candidates are likely to be ones who see potential to add value by driving innovation.

#### *DCC role in value added services*

We note Ofgem's caution in relation to value added services but do not believe prohibiting the DCC from having any involvement with VAS, at least initially, is the best approach. We understand that the concern is that non-energy VAS may prove to be a distraction from the core aims of the programme, that the DCC may in practice prioritise potentially more profitable unregulated income streams over meeting the regulated core mandate, and that the DCC might monopolise value added services. These are all valid concerns. However, they can be addressed by means other than an outright ban, which we believe will be limiting and actually impede rather than further delivery of the programme's core aims.

Firstly, it is important to realise that there are various different sorts of value added services that the DCC might usefully procure and provide. Even if Ofgem regards home security management or tele-health services as being remote from the core mandate, third party energy management services provided in competition with existing energy suppliers fall squarely within the programme aims of driving energy market competition and stimulating demand-side response to meet energy security and carbon reduction goals. The DCC can act as an energy management market facilitator and catalyser by value added services to authorised parties.

Secondly, quite apart from value added services that may be provided to consumers, there is both scope and a clear need in Vodafone's view for value added services to be provided to energy suppliers and the DCC in order to meet the challenges of commercial interoperability and seamless customer switching between suppliers. Commercial interoperability was one of the key areas addressed in detail in our previous response where WAN service provider can offer such value added services to the DCC and the energy suppliers<sup>1</sup>.

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<sup>1</sup>To support day to day operation of the WAN module Vodafone believes that WAN Services Providers are best positioned to provide a number of value added services, for instance:

- Device and Configuration management,
- Identity and Access Management,
- Security and Key Management ('trust centre'),
- Communications Event and Fault Management, Remote 2nd line Problem Handling.

Thirdly, concerns about distraction or monopolisation can most appropriately be dealt with not by a complete ban on DCC involvement with value added services but through careful framing of the terms of the DCC licence. The regulatory framework in which the DCC operates should provide incentives and penalties to ensure appropriate priority to core mandate, but also reward beneficial innovation by allowing the DCC to share in the financial upside of the nascent market for value added services. To ensure that the DCC is incentivised to foster but not monopolise the market for VAS beyond the initial mandate, the programme should impose a licence restriction on self-provision of VAS direct to consumers by the DCC. At the same time, the licence should explicitly allow the DCC to add value, drive efficiency and improve its own commercial performance by stimulating competitive provision of VAS using common infrastructure, subject always to appropriate customer consents.

Achieving all these aims will, we believe, require some refinement to the proposals contained in the prospectus, which in any event require further elaboration and development before regulatory obligations on suppliers are confirmed and the DCC franchise put out to tender. However, we believe the proposals outlined in this response sit well within the broad policy framework proposed and we look forward to working with Ofgem and other stakeholders to refine the remaining detail as the programme progresses to the next stage.

### **Data Privacy and Security**

Vodafone believes that the approach to data privacy is appropriate, although we have three main suggestions for improvement, concerning the treatment of aggregated or anonymised data, the 'right to be forgotten' and public interest in protecting the privacy of all citizens. Vodafone supports the development of a privacy charter and believe that in particular it should address the issue of function creep (i.e. incremental changes in the uses or disclosure of data collected through smart metering).

In our response to the Data Security questions, from our extensive experience as an operator of many millions of end-user devices, Vodafone wants to share considerations regarding: Application layer security; Security of the WAN and HAN; Authentication, access control and audit functions; Balance between 'design to cost' and 'level of security'; Device/configuration management, security and interoperability; and Operational security.

### **Non-Domestic Sector**

Vodafone strongly supports the key proposal that use of the DCC be optional for the non-domestic sector. We agree that interoperability will be a key challenge and have made a series of recommendations and suggestions to materially contribute to overcoming this. We agree with the proposal on exceptions and believe that in regard to communications in particular, we can credibly assist in a goal of providing a suitable WAN connection to every non-domestic customer premise in GB, in line with the approach outlined in the appendix to our previous response ('Vodafone's view on how to get a smart metering into every GB home'). Finally, we support the proposal that minimum requirements on access to data should be put in place.

### **Consumer Protection**

Vodafone sees ensuring adequate consumer protection as paramount to ensuring positive engagement and supports the approach to unwelcome sales activities. We believe that the installation sales visit should be used to provide relevant, tailored information and education to customers. We also believe that a form of opt in/out is essential to maximise the value of the IHD and ensure messages sent via it are appropriate and wanted. Finally, we agree that consumption information should be provided free of charge, and propose that it could also be made available through mobile phone applications, potentially enhancing energy management awareness and engagement.

### **In-Home Display**

Vodafone believes that in order to avoid a variety of customer, call centre and billing issues, the IHD may approximate power usage but should be mandated to accurately reflect the bill charged. We understand the motivation for displaying carbon dioxide emissions information but highlight two key challenges (calculation and data flow) which may outweigh the benefits. Finally, we agree that the minimum functional requirements provide an excellent basis for design.

### **Structure of the response**

The remainder of this response is structured as follows:

- Chapter 3: Responses to Communications Business Model Questions
- Chapter 4: Responses to Regulatory and Commercial Framework Questions
- Chapter 5: Responses to Data Privacy and Security Questions
- Chapter 6: Responses to Consumer Protection Questions
- Chapter 7: Responses to In-Home Display Questions
- Chapter 8: Responses to Non-Domestic Sector Questions

Since the relevant content is provided in response to questions in the supporting documents, we have not on this occasion repeated these answers in a separate chapter on the remaining questions from the main prospectus. Instead we have noted in the thematic chapters where our answers also relate to questions in the prospectus.

We have focused on those questions where we have particular expertise or views to contribute and have sought to provide suggestions and recommendations which support the aims of the programme. For brevity, where we believe that other stakeholders are better positioned to respond to specific questions in the first instance, we have not provided extensive comments of our own at this stage. We look forward to reviewing others' comments with interest, however, and may wish to respond to these at a later stage if appropriate.



### 3. Responses to Communications Business Model Questions

#### 3.1 The Scope of DCC

Please note that our responses to the questions in this section are also relevant to prospectus question 9.

**Question 1: 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?**

Vodafone agrees that these services are necessary elements of the initial scope of services in order to realise the benefits of commercial interoperability and authorised access to data on change of supply.

However, we do not wholly agree with the proposal to exclude certain types of value added service (VAS) from the allowable scope of DCC activity. We consider that Ofgem's concerns about distraction from core functions and abuse of the DCC's exclusive position can be addressed through appropriate licence terms, preventing the DCC from monopolising VAS provision to consumers and incentivising it to stimulate a competitive market for such provision in the consumer interest. Secure remote energy management in particular is a value added service of real benefit to consumers that is wholly consistent with the programme's overall aims, and should therefore be encouraged.

**Question 2: Do you agree that meter registration should be included within DCC's scope and, if so, when?**

Vodafone believes that the DCC will need access to a database of all relevant meter registration points, whether or not it owns and controls this database directly itself.

We agree with Ofgem's provisional assessment that ultimately meter registration should be included within the DCC's scope but that requiring the DCC to take on this role immediately could delay its establishment. We look forward to reviewing the further evidence that Ofgem intends to gather on costs and benefits in due course.

**Question 3: Should data processing, aggregation and storage be included in DCC's scope and, if so, when?**

Vodafone expects that the DCC will have to do some level of processing, aggregation and storage in order to deliver requests from suppliers or energy network operators that will involve data collection from a substantial part of the installed smart meter base. We therefore assume that this question concerns data processing, aggregation and storage tasks that go beyond this basic role.

In line with our response to question 2 above, we see potential benefits in a central repository of information to which the DCC can manage appropriately authorised access. We note the proposal to exclude these functions from the initial scope but to consider including them at a later stage subject to further analysis and a cost/benefit case.

Without wishing to pre-judge such further analysis, Vodafone notes that provision for subsequent expansion of the DCC's functions will require careful consideration when it comes to tender the initial DCC franchise. In particular, clarity will be required on the decision making process and any further consultation necessary before any revised scope is confirmed.

**Question 4: 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?**

Vodafone considers that early roll-out pre-DCC is not only possible and desirable, but also compatible with commercial interoperability, managed transition and future proofing. However, this does depend critically on providing an appropriate regulatory and commercial 'bridge' from the early roll-out phase into the DCC era, requiring novation of contracts on guaranteed terms for a transitional period.

In Vodafone's view, the alternative suggestion of short initial contracts which are then replaced at a stroke when the DCC comes into being is unworkable in practice and inconsistent with the objective of accelerated roll-out. In particular, the idea that bidders for the DCC should come to the table with their own suppliers and contracts already lined up risks becoming a massive unnecessary distraction for all stakeholders, while also re-introducing many of the 'winner takes all' monopoly risks the competitive procurement model of DCC was intended to avoid.

Contract novation is not only possible but, we believe, essential to ensure an orderly and efficient transition in the consumer interest. We recognise that DCC bidders will need controlled access to pre-DCC contracts on fair and non-discriminatory terms in order to conduct due diligence before finalising their bids. This can be managed in much the same way as any other due diligence exercise requiring disclosure, and does not raise undue competition concerns providing the DCC's independence from its suppliers and energy industry customers is guaranteed by the regulatory regime and auction rules.

## **3.2 The Structure and Realisation of DCC**

Please note that our responses to the questions in this section also relate to prospectus questions 10 and 11.

**Question 5: 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?**

Vodafone agrees that the procurement and contract management model proposed for the DCC is superior to any of the other alternatives considered, i.e. full service provider, separate data and communications monopolies, or a national data monopoly and regional communications monopolies. In particular, it is critical that the DCC should be independent of its data and communications provider suppliers in order to preserve the integrity and the benefits of the competitive procurement model.

However, we do not believe that this necessarily implies a very limited role for the DCC. As the supporting document on this subject notes at paragraph 3.1:

*"DCC will have a pivotal role at the heart of the smart energy market. It is vital that it delivers a cost efficient and resilient service. It must be flexible to adapt to developments in the industry. It will offer exclusive services and hence must be incentivised to drive the best*

*value for money in delivering these services, and governance and management structures must be put in place to ensure it delivers on its commitments.”*

**Question 6: 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?**

We agree that the DCC should be independent not only from its data and communications service providers but also from its energy industry customers to avoid any conflict of interest in delivering the key aims of the programme.

For the DCC model to work effectively to drive innovation and carbon reduction, we believe it will be necessary to attract well qualified and commercially astute candidates from outside the energy industry. While some potential bidders may see attractions in a 'safe and steady' income stream with low but stable regulated returns, the better candidates are likely to be ones who see potential to add value by driving innovation.

We note that independence of the DCC from its service providers is defined in the following terms: "Any party controlling the prospective licensee or controlled by it would be ineligible to bid to provide services to the DCC". Similarly, the relationship between the DCC and its energy sector stakeholders is essentially a customer/supplier relationship in the other direction. If energy sector customers of the DCC are also its shareholders, we see potential problems for energy market competition. Similarly, if the DCC is a shareholder in the businesses of its customers its independence may be called into question.

The corollary of these important independence provisions, however, is that they potentially limit the field of candidates who would be eligible to bid for the DCC franchise. It will nevertheless be important to attract the right calibre of candidate for this key role. We comment further on this in relation to question 8 below.

**Question 7: 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 note, but do not entirely agree with the sequential steps envisaged at paragraph 3.27, namely: preparation for procurement, procurement, development and contract management, testing and trialling, and reporting.

While the DCC will doubtless need to engage in all these activities over its life cycle, the sequential picture presented seems to envisage a 'year zero' approach to smart metering roll out that overlooks the critical impact of the policy decision to accelerate programme delivery through mandated pre-DCC roll-out. This substantially changes the nature of the exercise because in order to provide a seamless transition from the pre- to the post-DCC world, in the short term the DCC will inherit the contracts and infrastructure put in place prior to its establishment.

As discussed in answer to question 4 above, novation of pre-DCC contracts is critical to programme acceleration and smooth transition. Therefore we believe the suggestion that shortlisted bidders for the DCC franchise should be "invited to bring a portfolio of potential contracts with service providers to the last stage of the process" is misconceived. The better approach is to allow all shortlisted bidders to conduct due diligence on the contracts they would inherit on fair, equal and non-discriminatory terms. Candidates may of course enter into exploratory discussions with potential service providers about future terms as initial contracts come up for review or retender but this should not be an express requirement as part of the bidding process.

**Question 8: Do you have any comments on the proposed approach to cost recovery and incentivisation for DCC?**

We agree that as a statutory monopoly the DCC will need to be subject to a charge control regime that provides appropriate incentives for cost efficiency and innovation while also protecting the interests of customers. However, we do not believe that the proposed method of setting explicit margin and cost targets is the most appropriate way to achieve these ends.

It is common in regulated industries, particularly in communications, for regulators to set multi-annual *charge* controls rather than *cost* controls. The logic is that if charges are capped, the regulated business has every incentive to contain costs. The alternative model currently proposed in the prospectus seems to be a modified form of rate of return regulation, albeit with the return in this case based on operating costs as opposed to capital employed due to the outsource nature of the commercial model.

In this particular case, there are two further critical added elements to consider, namely competitive procurement of WAN communications by suppliers pre-DCC and the DCC franchise auction itself.

As discussed above, we recommend that initial WAN communications contracts should have a minimum term of 5 years to bridge the transition into the DCC. This will require suppliers to contract for a period extending into the early phase of the DCC, with guarantees on contract novation and commercial terms.

The precise formulation of initial obligations on suppliers is yet to be determined. However, as noted elsewhere in the prospectus, energy suppliers operate in a competitive market and have incentives to procure best value terms since the contracts they enter into will form part of their cost base. This is the case both pre-DCC and post-DCC, since once the DCC is up and running the charges it makes to energy suppliers will be conditioned to a large extent by the contractual cost-base it inherits until such time as initial contract terms come up for review. As a result, we would expect initial communications contracts with suppliers to be subject to competitive tender, enabling the market to discover best value terms.

As noted above, because in the short term the DCC will inherit pre-DCC contracts that it has not itself negotiated, its ability to manage its own cost base will come into play more fully as initial contract terms come up for review. Providing all shortlisted bidders have equal access to existing contracts to enable due diligence, all will be on the same footing in terms of the judgements they make about their ability to manage costs over the whole term of the franchise.

While the auction process and rules have not yet been developed in detail, one option would be to select the successful candidate based, among other things, on the level of regulated charges they propose to set for all or part of the franchise term. Adopting this approach could potentially limit the burden on Ofgem to scrutinise costs and set specific charges on an on-going basis, as seems to be proposed. The disclosure process will give both bidders and Ofgem a high degree of certainty over the initial level of the competitively determined cost base, while enabling bidders to take their own informed view on achievable levels of efficiently incurred cost that meets the programme's functionality requirements over the whole franchise term. If the initial DCC franchise term is assumed to be ten years, it may be appropriate to allow for a mid-term review of DCC charges by Ofgem.

Consideration will also need to be given to how best to provide the right incentives for the initial DCC franchise holder when the franchise itself comes up for re-tender. Providing the incumbent DCC is eligible to re-tender for subsequent franchise terms, the initial DCC should have the correct incentives to procure cost-effectively (which in any case will be a regulatory obligation enforceable by Ofgem) so avoiding the risk of 'poison pill' terms for any successor. As with the initial DCC franchise auction, managed disclosure of existing contracts with the incumbent DCC will be necessary to enable competitors bidding for the new DCC franchise to do due diligence.

In relation to value added services, we propose that concerns about distraction from core aims or monopolisation can most appropriately be dealt with not by a complete ban on DCC involvement with value added services but through careful framing of the terms of the DCC licence. The regulatory framework in which the DCC operates should provide incentives and penalties to ensure appropriate priority to core mandate, but also reward beneficial innovation by allowing the DCC to share in the financial upside of the nascent market for value added services.

More specifically, to ensure that the DCC is incentivised to foster but not monopolise the market for value added services beyond the initial mandate, the programme should impose a licence restriction on self-provision of value added services direct to consumers by the DCC. At the same time, the licence should explicitly allow the DCC to add value, drive efficiency and improve its own commercial performance by stimulating competitive provision of value added services using common infrastructure, subject always to appropriate customer consents.

## 4. Responses to Regulatory and Commercial Framework Questions

### 4.1 Smart Metering Regulatory Regime

<b>Question 1: Have we identified all of the key elements that you would expect to see as part of the Smart Metering Regulatory Regime?</b>
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Paragraph 2.13 summarises the key elements of the proposed regime in formal terms. Vodafone cannot comment definitively on comprehensiveness as some energy sector specifics are outside Vodafone's experience. Vodafone would, however, highlight the importance of some key areas that non-energy sector participants will need to understand.

#### **DCC licence**

As a potential supplier of WAN communications to the DCC we will need early visibility of the licence and surrounding regulatory framework to understand e.g. the DCC's roll-out, value for money obligations, and obligations for novating pre-DCC contracts with Energy Suppliers. We will also need to understand how, and how closely the DCC's pricing and scope of activity will be regulated e.g. the scope, if any, to earn additional non-regulated revenue through provision of value added services beyond its core statutory remit.

As a statutory monopoly, we consider the DCC will need to be subject to some kind of regulatory charge control for core mandated services, but the detailed mechanics of any such control are currently unclear. This is something any organisation that might wish to tender to become the DCC will need to understand, but is equally important for their potential customers and suppliers.

It will also be important to clarify the allowable scope and charging model for value added services going beyond the core statutory remit. We believe the most appropriate model is one that allows the DCC to enable and foster the market for third party value added services to customers, e.g. remote home energy management. This needs to be allowed for within initial licence terms, while ensuring that the DCC has appropriate incentives to support value added services in the consumer interest without monopolising them.

Vodafone has previously highlighted the key importance of contract novation in relation to communications contracts entered into by suppliers before the DCC comes into being. This aspect of the DCC's cost-base will reflect the terms of pre-DCC contracts that were competitively awarded. The DCC will thus inherit a high degree of cost-certainty, at least for the initial period covered by novation. While regulatory charge control should enable the DCC to recover its efficiently incurred costs, the relatively low risk, low value-added nature of this contract management function should be reflected in the DCC's charge control regime.

#### **Pre-DCC obligations on energy suppliers**

As well as understanding the proposed framework for regulating the DCC, it will be equally important for all market participants to understand the proposed regime for roll-out obligations on Energy Suppliers pre-DCC. We consider that this will need to provide for an obligation to procure services for a contract term that will extend into the post-DCC era to provide the necessary market certainty for 3<sup>rd</sup> party WAN communications and data suppliers to invest.

We propose a minimum initial contract term of five years. This is long enough to provide continuity on transition, while short enough to leave the DCC in control of its cost-base for the majority of its franchise. Importantly, if there is no certainty over contract term length and other associated

commercial terms, the unit costs of any initial pre-DCC deployment are likely to be inflated due to compressed cost-recovery. If communications providers and other commercial parties face a 'cliff edge' with no certainty of commercial terms post-DCC they cannot be obliged to continue their activities faced with a DCC monopoly. Yet premature change of supplier very early in the DCC's operational life will also tend to inflate overall costs, which is unlikely to be efficient from an overall programme point of view.

Efficient accelerated roll-out is best supported by continuity from the pre-to post-DCC era. Regulatory certainty in this respect will assist efficient programme delivery while avoiding an unnecessary risk premium.

### **Smart energy code**

The proposed code will be a key part of the new regime, containing much of the specific detail affecting all market participants, not just licensees. Please see our further comments in relation to questions 2, 3 and 4 below.

## **4.2 Smart Energy Code**

Please note that our responses to the questions in this section are also relevant to prospectus question 13.

<b>Question 2: Do you agree with the proposal to establish a Smart Energy Code?</b>
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Vodafone agrees in principle with the proposal to establish a new Smart Energy Code rather than attempt to modify existing industry codes for gas and electricity respectively.

We note, however, that since the Code is intended to be one of the main legal instruments by which responsibilities are delineated it will be important for all market participants to understand the contents of the code (and the governance process for any subsequent amendments).

Given its potential importance and impact on third parties who may not be formally subject to the Code directly, we believe it is essential that the draft Code itself should be subject to public consultation and therefore welcome the commitment at paragraph 3.8 to this effect.

<b>Question 3: Do you have any comments on the indicative table of contents for the Smart Energy Code as set out in Appendix 3?</b>
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The indicative table of contents is clearly broad ranging and conveys some idea of scope but does not, as yet, enable stakeholders to understand the intended substance under each heading. This is of concern because while formal responsibility for adhering to the Code may fall to licensees, either directly under the terms of their licence or indirectly via the proposed framework agreement, in practice the provisions of the Code will have knock-on implications for other parties including communications providers and other suppliers to the DCC.

We also note that the indicative table of contents seems to envisage a world where the DCC is already in being. However, it seems to us that at least some of the same subject matter will need to be agreed or prescribed by regulation for the pre-DCC roll-out phase of the programme. For instance, sections 6 and 7 dealing with technical and commercial interoperability are clearly important matters where clarity will be needed before the DCC comes into being.



Section 7 of the indicative table of contents refers specifically to new suppliers taking over smart meters and other equipment. We agree that provision will need to be made for this. However, as noted in our first submission in response to interoperability questions, this will in practice also require a value added service offered by communications providers to reroute data streams successfully to another party. We also see clear advantages in rationalising the number of parties who need to be directly connected to one another by allowing third parties to provide a 'hub' role pre-DCC, with potential to novate this activity to the DCC once established. In order to make this possible it may be necessary to recognise the role of such parties within any pre-DCC version of the Code.

**Question 4: Do you have any comments on the most appropriate governance arrangements for the Smart Energy Code?**

Vodafone believes is difficult to offer detailed comments at this stage without visibility of the eventual content of the Code. However, while governance arrangements may be of most direct concern to the licensed entities that will be directly subject to it, the practical ramifications go wider as illustrated above. For this reason, we believe a transparent consultation will be required on both the substance of the Code and its governance arrangements before these are confirmed.

### **4.3 Roles and Responsibilities at Customer Premises**

**Question 5: Do you agree with the proposals concerning the roles and obligations of suppliers in relation to the WAN communications module?**

Vodafone does not entirely agree with the proposals as set out at paragraphs 4.6 to 4.10.

Specifically, we agree that installation of the WAN module sits best with installation of other related customer premises equipment so see supplier responsibility for installation as a corollary of supplier-led roll out generally.

However, paragraph 4.8 envisages that the DCC will provide the specification for the WAN module<sup>2</sup>, which will clearly not be possible before the DCC has been appointed. It is necessary, therefore, to distinguish between roles and responsibilities before and after the DCC is established.

In the pre-DCC stage, formal responsibility for the WAN module will have to sit with energy suppliers. However, once the DCC has been established, we think there is a strong case for transferring formal responsibility to the DCC.

Once formal responsibility has been established the details of operational responsibility for various aspects can be agreed and assigned contractually. Vodafone considers that on-site installation, maintenance and replacement will need to be conducted by appropriately qualified and authorised electrical engineers. Installation will in most cases require access to the non-metered side of the electricity supply. From a customer experience perspective, it is clearly preferable if installation and provisioning can be completed and confirmed in a single visit. Communications providers can,

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<sup>2</sup>Vodafone believes that WAN service provider should have a strong influence on the development of the functional and technical specifications of the WAN module. WAN service providers are best positioned to take responsibility for some to the day to day operations of the WAN module, like device management, security management, and alert management. They also will need to be involved in the installation process in order to optimise WAN connectivity. This implies that WAN service providers should also become responsible for the design those elements of the WAN module design that support installation and day to day operations.



however, provide operational support and diagnostics remotely for operations not requiring a site visit.

Finally, formal regulatory responsibility need not be synonymous with 'ownership'. As the prospectus notes, in practice the responsible party could choose to have an asset provider finance and own the module, as occurs at present in the competitive metering market. The main point from a communications provider perspective is that the WAN module that is procured needs to be selected in conjunction with the communications provider appointed to provide the WAN service. This is important in order to ensure that it has all the functionality needed to support the services contracted for. Providing this is the case, formal 'ownership' of the WAN module can be reassigned as necessary when WAN communications contracts are novated.

**Question 6: We welcome views as to which other additional data items should be included in the mandated HAN data set beyond the list for the IHD.**

We believe that one additional capability for IHDs that should be considered is the ability to display a message from the energy supplier to inform the consumer of events and hence reduce call centre requirements and costs, e.g. "Sorry, due to a fault we will need to interrupt your supply at 21:00 for approximately 20 minutes". This could constitute an additional data item in the mandated HAN data set. Restrictions to prevent abuse, e.g. advertising, should be imposed at the head-end, perhaps by regulation, and not restrict the content of any message downloaded to and displayed by the IHD.

**Question 7: 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?**

Please note that our response to this question also relates to Prospectus question 8.

In general Vodafone agrees with the proposals that energy suppliers should be responsible for purchasing, installing and, where appropriate, maintaining all customer premises equipment. As suppliers manage the relationship with customers, Vodafone's opinion would be that they are best positioned to align activities that directly involve customers.

However, we believe that formal responsibility for the WAN module sits better with the DCC once established, given that it rather than the suppliers will be responsible for procuring communications. Building on our recommendation to separate the WAN module from the meter, this will enable suppliers in the pre-DCC period and the DCC once established to assign operation and maintenance responsibilities to subcontractors, e.g. allowing communications providers to also look after the WAN module, harnessing their experience in optimising and maintaining end user equipment (e.g. broadband modems, mobile phones, Machine-to-Machine equipment).

Enabling communications providers to take responsibility for both the WAN module (including HAN technology) and WAN communications is also attractive from the perspective of providing continuity on novation of contracts from suppliers to the DCC and/or on change of supplier pre-DCC.

Vodafone plans to work closely with manufacturers to develop WAN modules that are secure, interoperable and easy for energy suppliers to install, and additionally to provide sufficient functionality to ensure secure HAN/WAN interworking.

In relation to the WAN and the HAN being shared infrastructure, with the installing supplier retaining responsibility for ongoing maintenance:

- This question largely falls away post-DCC if Vodafone's alternative proposal for transfer of formal responsibility to the DCC is adopted. The DCC would then be able to subcontract most operational management that can be carried out remotely to the WAN communications provider.
- In rare cases where a home site visit may be necessary, the DCC could in principle subcontract this activity to any suitably qualified supplier on a commercial basis. It is not clear that on-going maintenance should fall permanently to the energy supplier that originally installed the WAN module as a matter of regulatory obligation, and this may be inappropriate where the customer has in the meantime switched supplier and/or has separate suppliers for energy and gas.
- In the case of dual supply pre-DCC it may be appropriate for costs associated with the WAN module and associated communications contracts to be shared between suppliers. While it is possible that this could be achieved on a purely commercial basis, it may be that cost-sharing principles in such circumstances need to be established on an industry-wider basis, perhaps as part of the Smart Metering Code.

#### **4.4 Other Regulatory and Commercial Issues**

<b>Question 8: Are there additional measures that should be put in place to reduce the risks to the programme generated by early movers?</b>
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Vodafone commented extensively in its first submission on the need for early agreement on technical specification and those comments apply equally here.

In particular, we recommend that HAN and WAN technology should be based on existing open and non-proprietary standards to drive scale economies, competition and innovation and allow specialisation in manufacture.

Risks for early movers will be most effectively reduced by using existing WAN technology that has proven itself, is future proof, is cost-effective, does not require high upfront investments and has the flexibility to immediately support a nationwide dispersed rollout. Vodafone believes that cellular technology and in particular GPRS meets these requirements.

Vodafone also believes that clear rules for novation of communications contracts to the DCC need to be established as early as possible. In order to provide the right incentives to support programme acceleration via early roll-out pre-DCC, all deployments that meet the programme's functional requirements should qualify for novation to avoid wasteful duplication.

Vodafone believes that Ofgem should consider arrangements for a form accreditation of equipment in the pre-DCC phase to reduce risks for early movers and accelerate the programme. Referring to paragraph 2.58 of the Communications Business Model supporting document, we understand that this will be a service of the DCC in a later phase; however we believe consideration should also be given to this issue in the pre-DCC period.

<b>Question 9: What is needed to help ensure commercial interoperability?</b>
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Vodafone recognises the vital importance of ensuring commercial interoperability to achieve a seamless customer experience on switching energy supplier. Vodafone's proposals for achieving this were discussed in detail in our first submission. In short, they involve provision of value added services by communications providers to suppliers and the DCC, rationalisation of connectivity through the

use of a small number of third party data 'hubs' pre-DCC to which all relevant industry stakeholders would be connected, and guaranteed contract novation for a transitional period.

**Question 10: 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?**

Vodafone recommends the delivery of test procedures and tools to verify technical interoperability in association with the technical specification. These results can then be used by manufacturers and suppliers to verify interoperability of their smart metering equipment. In addition Ofgem and, later on, DCC could provide an accreditation service based on these procedures and tools.

**Question 11: Are there any other regulatory and commercial issues that the programme should be addressing?**

For the DCC model to work effectively to drive innovation and carbon reduction, we believe it will be necessary to attract well qualified and commercially astute candidates from outside the energy industry.

We agree that the DCC should be independent not only from its communications provider and data function suppliers but also from its energy industry customers to avoid any conflict of interest in delivering the key aims of the programme. We do not believe, however, that this implies a very limited role for the DCC.

While some potential bidders may see attractions in a 'safe and steady' income stream with low but stable regulated returns, the better candidates are likely to be ones who see potential to add value by driving innovation.

We note Ofgem's caution in relation to value added services but do not believe prohibiting the DCC from having any involvement with value added services, at least initially, is the most appropriate response.

Firstly, it is important to realise that there are various different sorts of value added services that the DCC might usefully procure and provide. Even if Ofgem regards home security management or tele-health services as being remote from the core mandate, third party energy management services provided in competition with existing energy suppliers fall squarely within the programme aims of driving energy market competition and stimulating demand-side response to meet energy security and carbon reduction goals.

Secondly, quite apart from value added services that may be provided to consumers, there is both scope and a clear need in Vodafone's view for value added services to be provided to energy suppliers and the DCC in order to meet the challenges of commercial interoperability and seamless customer switching between suppliers. Commercial interoperability was one of the key areas addressed in detail in our previous response.

Thirdly, concerns about distraction or monopolisation can most appropriately be dealt with not by a complete ban on DCC involvement with value added services but through careful framing of the terms of the DCC licence. The regulatory framework in which the DCC operates should provide incentives and penalties to ensure appropriate priority to core mandate, but also reward beneficial innovation by allowing the DCC to share in the financial upside of the nascent market for value added services.

To ensure that the DCC is incentivised to foster but not monopolise the market for value added services beyond the initial mandate, the programme should impose a licence restriction on self-

provision of value added services direct to consumers by the DCC. At the same time, the licence should explicitly allow the DCC to add value, drive efficiency and improve its own commercial performance by stimulating competitive provision of value added services using common infrastructure, subject always to appropriate customer consents.

Achieving all these aims will, we believe, require some refinement to the proposals contained in the prospectus. However, we believe the proposals outlined in this response sit well within the broad policy framework proposed and we look forward to working with Ofgem and other stakeholders to refine the remaining detail as the programme progresses.

## **4.5 Impact on Wider Industry Processes**

**Question 12: 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?**

Vodafone is not well placed to comment directly on likely developments in time-of-use tariffs. However, in terms of barriers we note that half-hourly settlement poses considerable challenges for the domestic sector. We understand that privacy concerns are being separately addressed.

**Question 14: What arrangements would need to be put in place to ensure that customers located on independent networks have access to the same benefits of smart metering as all other customers?**

Vodafone believes that by making suppliers responsible for rollout of smart metering equipment, independent networks will inevitably become participants in the smart metering developments as use of smart meters is mandatory for all end users.

**Question 15: Are there any other industry processes that will be affected by smart metering and which the programme needs to take into account?**

In relation to energy industry process, Vodafone believes that other industry participants are better positioned to comment on this question.

However, in relation to communications industry processes, Vodafone emphasises that smart metering will affect device management (configuration management, software upgrades, communication management), alert management, security management, fault handling, changed customer problem handling, etc. These processes are particularly relevant for technical and commercial interoperability. Vodafone recommends the programme to further elaborate on the changes in these processes that result from smart metering.

## 5. Responses to Data Privacy and Security Questions

### 5.1 Data Privacy

Vodafone regards data privacy as a legitimate key concern for customers with regard to smart metering and believes that overall the programme's approach to data privacy is appropriate, however we have three main suggestions for improvement, concerning the treatment of aggregated or anonymised data, the 'right to be forgotten' and public interest in protecting the privacy of all citizens. Furthermore, we support the development of a privacy charter and believe that in particular it should address the issue of function creep with regard to smart metering data collection (i.e. incremental changes in the uses or disclosure of data collected through smart metering).

#### **Question 1: Do you have any comments on our overall approach to data privacy?**

Please note that our responses to this question also relates to prospectus question 2.

Vodafone believes the approach to data privacy is appropriate; however we have three main suggestions for improvement.

Firstly, with regard to limiting secondary uses of data unless the user consents, we believe a clear distinction is needed between secondary uses of aggregate or anonymised data (which does not have any privacy implications) and secondary uses of individual or household-specific data. This does not seem to be explicit and suggests a blanket limit on all secondary use which is not necessary from a privacy perspective. We believe the concept of limiting use of identifiable data to only what is necessary for regulatory requirements is sound and should be captured in the Charter to prevent function creep.

Secondly, the concept of 'the right to be forgotten' is gaining momentum in privacy circles. In the context of smart metering, this means the right for customers to have their records deleted once no longer needed. We note that the In Home Display will store 12 months of data. The right to be forgotten suggests that when a home owner or resident changes, the previous 12 months of data should not necessarily be available to the new resident and recommend that this protection should be ensured.

Thirdly, the principle of "balancing the individual's right to privacy with the public interest" is referred to. When considering privacy rights, we believe the balance should not be between an individual right to privacy and a public interest but rather between two competing public interests i.e. it is a public interest to protect the privacy of our citizens.

#### **Question 3: Do you support the proposal to develop a privacy charter?**

Vodafone supports the proposal to develop a privacy charter as this should generate consumer confidence in the rollout and facilitate transparency and openness about what is trying to be achieved.

**Question 4: What issues should be covered in a privacy charter?**

Vodafone believes that preventing function creep in particular with regard to customer data is important. By this we mean that the issue of incremental changes in the uses or disclosure of data collected through smart metering should be addressed specifically in the charter.

## 5.2 Smart Metering System Security

Please note that our responses to the questions in this section are also relevant to prospectus question 15.

**Question 5: Do you agree with our approach for ensuring the end-to-end smart metering system is appropriately secure?**

Vodafone generally agrees with the end-to-end security approach that the programme is proposing. We especially agree with the view that security of the smart metering solution is paramount to ensuring consumer confidence. The best way to approach security is by making it an integral element of the system design from the very beginning.

In this response Vodafone wants to share a number security considerations that we find relevant for the programme. We would welcome the opportunity to participate in the Privacy and Security Advisory Group, should it be expanded to include external stakeholders.

### Application layer security

Elaborating on the risk analysis and identified mitigation measures and high level security requirements, Vodafone recommends full application layer security between the meter and DCC applications as a starting point for the security design. This should ensure authenticity, integrity and confidentiality on an end-to-end basis.<sup>3</sup>

### Security of the GSM/GPRS WAN and HAN<sup>4</sup>

Further to Vodafone's recommendation to use cellular technology, and in particular GPRS, as the primary solution for the smart metering WAN services, we note that GSM and GPRS user data is protected over the radio interface by encryption, using an algorithm called A5. This generates a unique key for each session or call based upon the authentication credentials contained in the SIM. The GSM standards understand that no system can remain secure forever, so is designed to accommodate changes as technology advances. The existing A5 algorithm is called A5/1, and although more than 20 years old no credible attack has yet been demonstrated. Nonetheless, a much tougher algorithm A5/3 is already defined to supersede A5/1 in due course. Thus GPRS offers a very secure mechanism for the most vulnerable part of the data path: the WAN.

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<sup>3</sup> This application layer security starting point has also been adopted in The Netherlands. See: "Beveiligingsmaatregelen Slimme Meter Keten", issued by Netbeheer Nederland, 2009.

<sup>4</sup> To deal with situations where meters and IHDs are far separated or WAN services are difficult to establish, Vodafone recommends considering the use of HAN technology across several homes: inter HAN solutions. This will lead to new security requirements, which we believe can well be resolved by the combined security capabilities of GPRS based WAN and Zigbee based HAN technologies.

Considering Zigbee, a relevant candidate for HAN technology that Vodafone mentioned earlier, security is based on AES encryption of wireless data transmission. However, some concerns are raised about the cost consequences of this and alternatives are being considered that align security measures with identified risks. Vodafone trusts that this issue will be resolved and expects that Zigbee will provide sufficient security for smart metering or home energy management purposes.

It is relevant to note that the HAN will require a trust centre that stores keys for the network, uses security services to configure a device with its key(s) and authorise it. It seems practical to assign this trust centre role to the WAN module, where a SIM module could appear very helpful in implementing further security functions.

### **Authentication, access control and audit functions**

Authentication, access control and audit functions play a vital role in the delivery of end-to-end security.

1. **Reliable authentication** of devices, and the code within them, underpins the security of any solution. Metering devices, and the DCC (or its predecessor) need to be mutually authenticated; the DCC needs to know that the metering device has not been altered in any way that impacts the quality of the service or data it delivers; the device needs to know the origin of the source of commands and OTA<sup>5</sup> code upgrades sent to it.

The GSM/GPRS mobile industry depends upon simple, fast and reliable registration mechanisms as part of SIM-based device deployment. The strength of authentication established by these procedures and their use of SIM-based keys is such that it is being used increasingly by the banking industry to secure financial transactions.

2. **Access control** is needed at both physical and logical layers to ensure the reliability of the service and the data it provides. Motivation to interfere with meters for fraudulent purposes has to be recognised, as are the imaginative approaches by which these attacks are perpetrated, such as irradiation techniques. It is essential therefore to be able to differentiate authorised transactions from tampering.

Service engineers registering service access to on-line devices via a mobile phone or equipment with a registered SIM, is already well established and helps differentiate quickly between authorised access and tampering.

3. **Audit** serves a vital role in answering questions about what happened and how it happened in the event of a problem. The log of transactions at the meter endpoint, and any log that is consolidated at the head end, must be reliable.

Cryptographic functions, such as those of the SIM card, can play a useful role in determining its authenticity. In the management plane, the audit logs identify the source of any change to the configuration or offered service.

### **Balance between 'design to cost' and 'level of security'**

While the requirement for security is of key importance to building and retaining customer and community trust in the smart metering programme, an optimum balance needs to be found between the level of protection and the cost of it. Where protection measures represent a relatively small part of the unit cost, for instance at a central application server, the best available should be used. Where security measures put a relatively high burden on the cost per unit, a pragmatic approach may need

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<sup>5</sup> Over The Air.



to be adopted. Looking at low cost devices as the IHD or WAN module, the cost of encryption may add significantly to the build cost, in requirement for RAM or FLASH storage, or the need for a hardware encryption engine in the CPU to get the required performance. These additional per unit cost should be balanced against the risks. Equipment vendors should be consulted on the security/cost implication to both the meter and the HAN.

### **Device/configuration management, security and interoperability**

Vodafone's significant experience in operating a network of millions of remote devices has allowed it to fully understand and appreciate the benefits of OTA device/configuration management. Such remote management can make use of the inherent high security that can be achieved in centrally controlled processes and enables potentially less secure local device/configuration management interfaces to be minimised if not totally removed.

As a result of Vodafone operating a network of both wireless and wireline products and services, Vodafone has extensive operational experience of both the Open Mobile Alliance (OMA) Device Management standards as well as those of the Broadband Forum. In addition to these public standards, a number of proprietary device/configuration management protocols exist and the use of these in pre-DCC deployments could cause potential consolidation issues when these deployments are migrated to DCC.

### **Operational security**

Security needs to consider more than the protection of the data: a reliable and robust system is vital to ensure timely collection of meter readings without disruption. One threat is the risk of end device compromise, widely practiced in the desktop PC market and called a Distributed Denial of Service attack (DDoS), using large numbers of hijacked PC; colloquially, a bot-net. The motive may be extortion, vandalism or political. The mobile phone industry has a good record of protecting its network against such end device compromise.

In a Machine-to-Machine environment, other threats occur: the innocent and simple actions of one device may, when repeated in huge numbers of identical devices, lead to unexpected 'emergent behaviour' which can present unintended but serious threats: the 'thundering herd' threat. An obvious example is a simplistic 'last gasp' message to report a power cut. A wide-area power failure might then cause an avalanche of reports, with serious congestion impact. Other instances might be 'on the hour' reporting schedules. In both cases, it is simple to design in dispersion and backoff mechanisms, provided the potential risk is identified in the design.

For this reason it is important that the WAN module design is closely coordinated to the WAN provider to ensure that these emergent behaviours are correctly handled and do not risk either the smart metering system or any other user of the infrastructure.

### **Reuse of GSM/GPRS security experience for smart metering**

The GSM/GPRS mobile industry has wide experience of a very large data network carrying flows of significant value, from many millions of low cost terminals in widescale usage. We thus have experience of securing that data and the corresponding revenue against attacks on any part of the chain.

The parallel with smart metering is clear: again there will be many millions of end terminals in widescale usage, so that security by obscurity or lack of access to the devices is not a defence. Again, a very large geographic network will carry high value data, presenting the same needs for authenticating end points, protecting the data in transit and ensuring it is not substituted.

The GSM/GPRS mobile industry is well placed to apply its experience and technology to the smart metering application.



## 6. Responses to Consumer Protection Questions

Vodafone sees ensuring positive consumer engagement as paramount for the success of the smart metering rollout and the realisation of benefits and therefore believes that adequate customer protection is essential. To that end, we support the approach to unwelcome sales activities and believe that the installation sales visit should be used to provide relevant, tailored information and education to customers. Furthermore, we believe that a form of opt in/out is essential to maximise the value of the IHD and ensure messages sent via it are appropriate and wanted. Finally, we agree that consumption information should be provided free of charge, and propose that it could also be made available through mobile phone applications, which could potentially enhance customer energy management awareness and engagement.

With regard to the questions contained in the chapters on 'Prepayment and Remote Disconnection' and 'Vulnerable Customers and Fuel Poverty', Vodafone emphasises that while it regards these as highly important issues, we believe that other industry participants are better positioned to comment on these questions.

Please note that our responses to the questions in this section are also relevant to prospectus question 5.

### 6.1 Developing Services for Consumers

**Question 2: Do you agree with our proposed approach for addressing unwelcome sales activities during visits for meter installation?**

Vodafone supports the proposed approach as we believe it is sensible and a positive customer experience is essential to drive acceptance and benefits of smart metering.

**Question 3: What do you consider as acceptable and unacceptable uses of the installation visit and why?**

Vodafone believes that acceptable uses of the installation visit should include checking that the customer is comfortable with the use of the IHD and offering additional training or support as required. The installation visit should also be able to be used to provide relevant, tailored information to a customer about the services that they use and consume.

We believe unacceptable uses include for example, using the visit to pressure a customer into signing contracts to switch energy supplier.

**Question 4: Do you agree with our proposed approach to ensuring that the IHD is not used to transmit unwelcome marketing messages?**

Vodafone highlights the IHD as a valuable resource in engaging the customer about a wide range of topics linked to energy production, consumption and efficiency.

Clearly different messages will be more or less relevant and more or less desirable to customers. It is our view that nuisance or spam messages must not be permitted. For other marketing messages that might be desirable, a form of online, or mobile text messaging based opt in/opt out process should

therefore be used to ensure that these messages are wanted and appropriate for the customer. Desired messages could include:

1. Potential promotional offers for users that might be interested in alternative energy sources based on their location.
2. Hints and tips on how to manage usage patterns.
3. Special offers on low energy use appliances, light bulbs or services to improve the energy efficiency of their homes.

**Question 5: Do you agree that consumers should be able to obtain consumption information free of charge at a useful level of detail and format? How could this be achieved in practice?**

Vodafone agrees that consumption information should be provided free of charge, and proposes that consumption information could also be made available through mobile phone applications to provide customers the ability to better measure and manage their energy efficiency. We believe this could have potential to enhance customer awareness and engagement.

## 7. Responses to In-Home Display Questions

Vodafone believes that in order to avoid a variety of customer, call centre and billing issues, the IHD may approximate power usage but should be mandated to accurately reflect the bill charged. We understand the motivation for displaying carbon dioxide emissions information but highlight two key challenges (calculation and data flow) which may outweigh the benefits. Finally, we agree that the minimum functional requirements provide an excellent basis but make one suggestion for consideration – adding the ability to display messages from suppliers about events such as power outages to reduce call centre costs.

### 7.1 Functional Requirements of the IHD

Please note that our responses to the questions in this section are also relevant to prospecting question 1.

**Question 1: 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.**

The types of display a customer would expect can be assessed from existing market products that measure consumption alongside the utility meter (with many variants, from the "Wattson" which displays information in watts or pounds in a clock like design, to Alert Me's more graphical Smart Energy monitor).

Most useful for monitoring energy waste is the current consumption indicator. This displays the numeric consumption in watts and a light colour or graphical variation depending on the comparison with internal low and high thresholds. The display is updated frequently (e.g. every 10 seconds), giving a usable feedback of turning on/off lights or an appliance. Customers therefore immediately see the significance of high consumption devices such as heaters, showers, cookers, kettles, irons and washing machines. Since this figure is continuously changing, and does not directly match anything in the bill, a margin for inaccuracy is tolerable.

Most useful for overall economy is the accumulated spend to date in £. However, with third party equipment, this is neither linked to the tariff, nor to the bill cycle, nor is it particularly accurate. None of these limitations would apply to a smart meter IHD, making this a real boon for the consumer. However, that will be true only so long as the displayed figures accurately reflect the bill. Indeed, to reduce costs, the supplier could use the IHD to replace paper bills, at least for some of the quarters in a year. If the suppliers billing system can compute discounts and adjustments, it would be hard for a consumer to understand why these could not be communicated to the meter and reflected in the running total displayed. This issue should be given consideration as one can envisage a variety of challenges where consumers are misled by displayed figures which did not accurately reflect the underlying bill leading to bill revocation and an increase in call centre costs.

To enhance competition, the actual history of usage could be re-rated against a competitor's tariff and the contrast in total bills between that charged by the incumbent and that offered by the bidder could be easily and clearly shown to the consumer. This would take much of the guesswork out of shopping around, but would require regulatory support to allow the bidder's proposed tariff to be downloaded to the IHD as a comparison model, without disrupting the actual bill computation.

The ability to extract data to software stored on a PC or online is also interesting for many customers. In a wide-scale smart meter environment one can envisage a market for third party suppliers authorised by the consumer to fetch the historic data and perform analysis upon it: either to recommend an alternative supplier or to propose energy saving methods etc. It is therefore essential that IHD data matches the real bill.

In summary, Vodafone therefore believe the display may approximate the power usage but should be mandated to accurately match the bill charged.

**Question 2: 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.**

Vodafone understands the motivation for displaying carbon dioxide emissions information but believes that the challenges associated with calculating and transmitting accurate information to all customers are likely to outweigh the benefits.

Firstly, Vodafone highlights the difficulties in computing accurate information. As identified in the In Home Display supporting document, the relative contributions of electricity source varies during the day, reflecting the variability of some sources, the slow response times of others and the relative, and fluctuating, economics of each individual generator type and instance. Where power is imported from other countries' grids, the same issue arises as to the relative carbon footprint of each instance of imported power. For stored power (e.g. pumped reservoir) one would have to know the relevant figure for the accumulated stored power, scaled to reflect the storage inefficiencies.

Given these complications, defining an agreed set of requirements that is at once accurate and reliable is likely to prove both challenging and contentious. While we understand that contributing to national and international commitments on reducing carbon dioxide emissions is a key programme aim, the competing claims made for different electricity generation technologies, for example, and how these may change over time is fraught with difficulty.

For electricity in particular there is a very real risk that periodic changes to the way in which carbon intensity (or indeed other environmental impacts) is calculated, audited and presented would render any technical design solution unstable, with adverse implications for overall programme costs. Alternatively, assuming fixed and immutable percentages that abstract from such difficulties e.g. based on average grid mix would be misleading, and call into question the whole basis for 'green' or 'low carbon' tariffs, causing consumer confusion rather than adding value.

Secondly, even if a set of agreed and applicable percentages could be generated which in some way reflected a 'true' and 'fair' picture of the energy being consumed, how would these figures, once computed, be disseminated to each IHD at a rate where it could inform the consumer on an effective basis? This suggests a frequency and volume of data flow far in excess of the meter readings. The cost of supporting that data flow would dominate the WAN design, causing Vodafone to question the justification for such investment and ongoing cost.

Thirdly, Vodafone believes that price information will be the most effective indicator in encouraging widespread behaviour change amongst consumers in general. We note the research results referred to at paragraph 2.13. These strongly suggest that consumers prefer information to be presented in local currency, and that energy units are not well understood. This being the case, measures of carbon intensity with detailed caveats and qualifications are likely to be even more difficult to communicate effectively.

We therefore agree with Ofgem's provisional conclusion that given the lack of evidence on the consumer benefits to be derived from providing information on carbon dioxide on the IHD, it should not be included as part of the minimum information set.

**Question 3: We welcome views on the issues with establishing the settings for ambient feedback.**

Households differ greatly in what represents an 'average' usage, reflecting such aspects as the size and age of the property, the number of individuals living there, whether the house is occupied continuously or empty during the day, whether there are elderly people resident, use of alternate fuels etc. Thus any ambient feedback thresholds need to be tuned to suit each installation, and little value would be gained by applying a fixed level regardless of circumstance.

We propose that the householder should set initial thresholds by a few simple questions: number of bedrooms, detached/semi, exposed/suburban setting and so on. Over time, the IHD will build a history of usage and can then adapt the thresholds to suit the individual profile to display when power usage is high or low, relative to that household's pattern.

In addition, the householder could specify a budgeted figure for the bill, e.g. for the next quarter, and the ambient feedback could indicate if the usage pattern is on target to exceed or satisfy that budgeting figure.

**Question 4: 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?**

Vodafone agrees that this is an important consideration but believes that other industry participants are better positioned to comment on this question.

**Question 5: We welcome evidence on whether portability of IHDs has a significant impact on consumer behavioural change.**

Vodafone believes that the use of the IHD as a portable item need not be predicated upon an internal battery supply as one could also move the mains power adapter, e.g. when experimenting with equipment in a specific room. Adding batteries as standard seems an excessive cost burden for the majority of usage which will be static. For those specific users to which unconfined portability is valuable, there would be an opportunity for open market IHD to satisfy this. In a situation where continuous usage in many rooms would be of value to the consumer, they should be able to source additional IHD and use as many as they wish.

**Question 6: Do you agree with the proposed minimum functional requirements for the IHD?**

Vodafone believes that the minimum functional requirements are an excellent basis.

One additional capability that should be considered is the ability to display a message from the energy supplier to inform the consumer of events and hence reduce call centre requirements and costs, e.g. "Sorry, due to a fault we will need to interrupt your supply at 21:00 for approximately 20 minutes".

The display of free format messages would have an obvious risk of misuse for advertising and spam, so the usage would have to be strictly limited and controlled if the IHD is to be retained by the consumer.

## **7.2 Nature of the Mandate on Suppliers in Relation to the IHD**

**Question 7: Do you have any views or evidence relating to whether innovation could be hampered by requiring all displays to be capable of displaying the minimum information set for both fuels?**

Vodafone believes that allowing a display that is not capable of supporting one fuel supply would seem to invite barriers to competition and the threat of multiple IHDs being necessary to receive the minimum set of information. However, there would be a problem for an electricity only supplier in sourcing and validating the performance of the gas information in a potential IHD (and vice versa), so regulation could assist in this task.

**Question 8: Do you agree with the proposals covering the roles of and obligations on suppliers in relation to the IHD?**

Vodafone agrees with the proposals covering the roles and obligations of suppliers in relation to the IHD. We further recommend that the programme's IHD strategy should also consider and align its aims with developments in the market for additional mobile IHDs, such as those provided by smart phones and other tablet devices as these rapidly gain penetration.

## **8. Responses to Non-Domestic Sector Questions**

Vodafone strongly supports the key proposal that use of the DCC be optional for the non-domestic sector. We agree that interoperability will be a key challenge and have made a series of recommendations and suggestions to materially contribute to overcoming this.

We agree with the proposal on exceptions and believe that in regard to communications in particular, we can credibly assist in a goal of providing a suitable WAN connection to every non-domestic customer premise in GB, in line with the approach outlined in the appendix to our previous response ('Vodafone's view on how to get a smart metering into every GB home').

Finally, we support the proposal that minimum requirements on access to data should be put in place.

With regard to a number of specific questions in this chapter which we have not responded to, we believe that other industry participants are better positioned to comment on these questions.

Please note that our responses to the questions in this section are also relevant to prospectus question 12.

### **8.1 Flexibility for Installations of Advanced and Smart Meters**

**Question 2: Do you agree with our proposed approach to exceptions in the smaller non-domestic sector?**

Vodafone agrees with the proposed approach to exceptions in the smaller non-domestic sector.

We believe that in line with the approach outlined in Appendix I of our previously submitted response to the questions with 28<sup>th</sup> September deadline ('Vodafone's view on how to get a smart meter into every GB home'), in relation to difficulties related to getting communications signals in remote or underground premises, it will be possible to overcome these using a combination of WAN technologies and technical solutions.

### **8.2 Use of DCC to Communicate with Meters in the Smaller Non-domestic Sector**

**Question 4: Do you agree with the proposed approach that use of DCC should be optional for non-domestic participants in the sector?**

Vodafone strongly supports the proposal that use of DCC should be optional for non-domestic customers as this will maximise competitor engagement and innovation, in both the pre- and post-DCC periods. The non-domestic AMR and smart metering market is already experiencing strong growth and we therefore support the proposal as it should act to stimulate this growth rather than stifle it.

Vodafone also recognises the concerns raised around interoperability, smart grids and maintaining separate industry processes. Please refer to our answer to Non-Domestic Sector Question 8 below for further detail on how we believe the interoperability challenge can be addressed.

**Question 5: 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?**

Vodafone recognises the issues raised by DCC's exclusive position in the domestic market but believes that other market participants which are directly impacted are better positioned to comment on this question.

**Question 8: How can interoperability best be secured in the smaller non-domestic sector?**

Possibilities for both technical and commercial interoperability depend largely on the actual case involved. Three broad cases can be distinguished:

1. Specific advanced meter installed and WAN and data services arranged by supplier or agent.
2. Smart meter installed and WAN and data services arranged by supplier or agent.
3. Smart meter installed and WAN and data services arranged by DCC; supplier or agent use services of DCC.

In the first case, assuming that the specific advanced meter requires a specialised head-end, a new supplier or agent would have to replace the meter, unless the 'old' supplier or agent provides a standardised interface service over which the new supplier or agent can get its metering data. This approach to commercial interoperability is also described in our answer to Smart Metering Statement of Design Requirements question 3 (approach 1) in our 28<sup>th</sup> September response.

In the second case it will also be possible that WAN service providers switch the WAN communications to the new supplier or agent. WAN service providers can offer this as a value added service, including a set of Application Programming Interfaces (APIs). This option has also been described in our answer to Smart Metering Statement of Design Requirements question 3 (approach 2) in our 28<sup>th</sup> September response.

The third case has been optimised for supplier switching and commercial operability, as this is one of the key tasks of the DCC; in that case the DCC just has to change the supplier or agent relationship for this non-domestic customer. In case the new supplier or agent does not want to use the services of the DCC, that same approach as described under the second case above can be used, assuming that the WAN service provider that is contracted by the DCC provided the required value added service.

Concerning this question about securing technical and commercial interoperability in the non-domestic market from a more general point of view, we believe that most of the responses we provided on this subject in our 28<sup>th</sup> September response are also valid for this market segment:

- In Prospectus Question 3 and elsewhere we recommend that the installation procedure should cover interoperability testing and that interoperability should be guaranteed by suppliers so this never becomes a customer issue.
- In Prospectus Question 6, we recommend that a standardised interface be required between the data function and suppliers or between suppliers themselves.
- In Prospectus Question 17, we suggest the programme considers allowing third party aggregators to take on a central 'hub' role pre-DCC with a view to continuing to provide this function at least on a transitional basis as a supplier to the DCC.
- In Statement of Design Requirements Questions 3 we outline a number of suggestions on how commercial interoperability and switching between different mobile networks can be facilitated.
- In Statement of Design Requirements Question 7 we call for closer involvement of WAN communications providers in developing technical interoperability solutions.



- In Rollout Strategy Question 1 we emphasise that 'operational rollout workarounds' can sometimes reduce the scale of interoperability issues.
- In Implementation Strategy Questions 4 and 8, we recommend developing interoperability testing and tools as outputs for Phase 2 of the Programme, and emphasise the advantages in terms of interoperability of market participants using GPRS as an open standards, existing technology.

Furthermore, Vodafone already has experience supporting AMR switching in the non-domestic sector on a large base of deployed assets and looks forward to supporting the non-domestic market in this regard as the rollout proceeds. We believe that despite greater initial complexity, the market will standardise over time due to incentives and we highlight the fact that there is a stronger business case than in the domestic sector for investment to support this.

### **8.3 Other Issues Related to Non-Domestic Customers**

**Question 9: What steps are needed to ensure that customers can access their data, and should the level of data provision and the means through which it is provided to individual customers or premises be a matter for contract between the customer and the supplier or should minimum requirements be put in place?**

Vodafone believes that minimum requirements should be put in place as non-domestic customers also require strong protection and rights with regard to access to their data. Having a set of common requirements would maximise consumer trust, competition and innovation in the marketplace.

**Question 10: Do you agree with our approach to data privacy and security for non-domestic customers?**

Vodafone believes that the approach to data privacy for non-domestic customers is appropriate as it facilitates commercial confidentiality and thereby encourages acceptance of smart metering. We believe that provided the data collected on non-domestic customers is aggregated so as not to single-out any one business, then there is no reason that this data should not be shared and made available (in aggregated form) for a range of secondary purposes including energy efficiency initiatives and experiments.

Vodafone agrees with the Programme's end-to-end approach to security and with the development of technical specifications that will reflect detailed security requirements. In section 4.3 of this document ('Smart Metering System Security'), our response details the high standard and quality of security provided by our WAN communications services. We provide security on a non-discriminatory basis to all customer types and have a long track record of delivery and trust in the non-domestic sector in both AMR and across other high security data applications (including credit card information and critical infrastructure).

**Question 11: 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?**

Vodafone agrees that the proposed approach to rollout is appropriate for the non-domestic sector, as the supplier owns the customer relationship and the use of challenging but achievable targets should accelerate deployment and enhance benefits.



We further recommend that the installation code of practice consider both different domestic and non-domestic installation opportunities and challenges and explicitly incorporate a best practice installation procedure to optimise coverage and minimise the number of site visits required.