

Ember response to Ofgem 27/9/2010

1. Smart Metering Implementation Programme: Implementation Strategy

Overall

This document contains some detail that is not within our area of expertise, so we have not answered all of the questions posed, rather we have included only those questions that we can reasonably form an opinion on.

We welcome any opportunity to assist in expert groups, in particular the Smart Meter Design group, to provide expert input on ZigBee networking and ZigBee Smart Energy for the smart metering home area network (HAN). Ember is a leading technology company within the ZigBee Alliance and can provide broad and deep technical expertise relating to current and future ZigBee features and capabilities.

Based on discourse up to now, we expect it is unlikely that the DCC will consider the use of ZigBee for communications outside of the home, in the WAN infrastructure, so to speak. Nonetheless, there are examples in smart metering where ZigBee has been used in this way, such as the implementation of meter reading for 270,000 electric meters in Goteborg, Sweden. If the Data and Communications group would like to discuss any of our experience with such implementations, we would be more than happy to assist, however for now we assume that the primary interest in ZigBee is for the communications between a gateway, electric meter, gas meter, in-home display and other future devices in the home area network (HAN).

We welcome the stated Government wish to accelerate the rollout, and the proposed staged approach to implementation. ZigBee Smart Energy is already available for use in the smart metering HAN, and with the leadership of UK-based meter manufacturers in particular, the ZigBee Alliance is updating the standard to ensure that it includes all of the features required by the suppliers and this prospectus.

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

Answer:

It is not clear how you plan to select 'expert external stakeholder resource' or 'relevant experts from industry'. We are only concerned that accurate and complete technical advice is available to the team, in particular in relation to ZigBee networking and ZigBee Smart Energy profile; including details about such issues as security, availability of certain features or capabilities, roadmap/schedule etc. We recommend that the names of proposed experts in each technical area be discussed with the ZigBee Alliance, so as to identify any gaps in knowledge and experience that may need to be filled by other experts. For example, a good technical metering expert may have experience of implementing ZigBee Smart Energy, but may not be fully aware of certain technical details of how security is implemented or what is being discussed on the roadmap.

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

Answer:

We recommend that ‘Interoperability’ should be a cross-cutting activity, not only how to provide interoperability between different HAN systems provided by different suppliers, especially when the consumer changes suppliers, but also interoperability between the WAN communications and HAN communications networks.

A second cross-cutting activity might be ‘support for future services’ – how can the roll-out support future services such as demand response, electric vehicles, microgeneration, non-energy related home services (e.g. home security).

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

Answer: Yes.

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

Answer:

It is our understanding (which may be flawed) that the technical specification for HAN communications will NOT ultimately specify a particular technology or technical standard to be used by suppliers. This would seem to imply that the issue of future interoperability of networks and devices is no more at risk with suppliers implementing ahead of the official roll-out than it will be later when an official roll-out has begun. Not specifying a particular technology/standard may lead to non-interoperable networks and devices, or at least an increased cost of deployment because of a need for more expensive modular communications strategies either in the meters, displays and/or home gateways and possibly some devices having to support multiple communications technologies.

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

Answer:

We recommend a pragmatic approach to the choice of communications for the rollout, that technologies and standards that have already been designed for and used in smart metering deployments should be chosen. A minimum of re-specification of standards or technologies should be allowed, and any modifications should be primarily incremental and primarily at an application level (for example, the addition of new fields to a ZigBee Smart Energy command). Of course we believe choosing ZigBee Smart Energy for the HAN would bring forward the rollout and de-risk it because of the proven nature of ZigBee Smart Energy, the existing expertise of UK metering companies and the capability for expansion into other services in the home.

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

Answer:

Much of the focus is on DCC and from a communications point of view, the WAN. While the WAN is arguably a far greater challenge, it would be good to see more focus on the HAN also. In the future this HAN should be for much more than (just) in home displays.

If a number of suppliers have, by the time of the official start of rollout, already deployed significant numbers of smart meters in the field, and if their initial assumptions about communications technologies are correct (or even close), it could be argued that the time to ramp to production may be shorter than anticipated.

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

There is no mention (especially in 5.48, where it might be expected) of any testing or certification process for meters or metering systems to ensure that they comply with any interoperability requirements and meet the necessary standards from a networking or communications point of view. This may be as simple as 'HAN devices shall be certified by a test house approved by the ZigBee Alliance to be ZigBee Smart Energy 1.1 compliant', or it may be that some specific tests and certification are developed and applied to those devices.

2. Smart Metering Implementation Programme: Rollout Strategy

Overall

This document contains some detail that is not within our area of expertise, so we have not answered all of the questions posed, rather we have included only those questions that we can reasonably form an opinion on.

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

Answer:

We believe that interim targets are important for many of the reasons stated, not least the temptation to leave the majority of deployments until the latter part of the rollout. We do not have a strong opinion on frequency, but suspect that any targets for less than 1 year may be difficult to monitor.

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

Answer:

It would seem to make sense that a supplier's target should be to achieve some percentage (of their current customer base) of installations per year, so for instance, if rollout starts in Summer 2012, this leaves 8 full years for rollout, and allowing for some ramp, it might be reasonable to expect a very small percentage of the suppliers base to be installed in the second half of 2012, perhaps 1%, to rise to e.g. 5% (6% cumulative) in 2013, 10% (16% cumulative) in 2014, 14% (30% cumulative) in 2015, perhaps leveling off at 15% (45% cumulative) in 2016, leaving 55% to be installed over the remaining 4 years.

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

Answer:

We agree with the proposed approach and think that suppliers should report annually during the rollout.

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

Answer:

We agree, and in particular with the suggestion that suppliers should coordinate in blocks of flats with respect to WAN and HAN network communications. This will only be possible however, if all suppliers choose the same WAN or HAN communications technology and standards, otherwise interoperability would be an issue.

3. Smart Metering Implementation Programme: Statement of Design Requirements

Overall

This document contains some detail that is not within our area of expertise, so we have not answered all of the questions posed, rather we have included only those questions that we can reasonably form an opinion on.

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

Answer:

In some ways this is simply a matter of cost, although I believe there may also be issues of security of service (i.e. that the customer may be able to disable the service if a communications module can be exchanged). Fully integrated communications in a meter is normally more cost effective than modular communications, although there may be an argument that total cost of ownership is lower for modular meters if you assume that the communications will change within the lifetime of the meter. We are not experts in the economics of this issue.

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

Answer:

Yes. ZigBee Smart Energy is available, is being used in other smart metering HAN deployments around the World including USA and Australia and it meets the functional requirements. ZigBee has been used in smart metering around the World, including 270,000 electric meters in Goteborg, Sweden, and millions of electric meters in the USA (40 million meters contracted to use ZigBee so far). Additional features at an application level can be added easily as they arise through this specification process in GB.

The implication of 4.9 and 4.10 would seem to be that only European standards may be used for the smart metering HAN, or even that only European standards can be seen as open standards for this purpose. We disagree with this. We agree that it is desirable to use open standards to promote competition and innovation. It could be argued that ZigBee is already an open standard, as it is maintained by a not-for-profit organization, with an open decision-making process, publishes its standards and makes them freely available online and does not impose royalties for the use of the standard. In addition, there are currently 11 different companies with interoperable ZigBee PRO certified platforms, based on chips from 6 different vendors, providing choice to the market.

ZigBee Smart Energy is the only standard considered for GB smart metering HAN that supports electric meters, gas meters, in-home displays, future features such as demand response, and has significant reach into home automation and home healthcare. ZigBee Smart Energy also embraces other protocols such as DLMS (which can be tunneled over ZigBee) and other technologies such as HomePlug and WiFi. It could also be argued that none of the existing European Standards are

suitable for use in GB smart metering.

Nonetheless, we accept that definitions of ‘open standard’ are varied and divisive, and that it is at least desirable that GB smart metering should use European Standards. To that end, the ZigBee Alliance is in the process of proposing a new work item to be managed by CEN TC 294, and led by the BSi mirror group, PEL/894, to publish ZigBee Smart Energy, ZigBee Cluster Library and ZigBee 2007 networking specification (including ZigBee PRO) as European Standards. We feel that this shows that not only is ZigBee the most suitable standard for GB smart metering HAN, but that the ZigBee Alliance and platform vendors such as Ember are willing to work with Ofgem to deliver a solution for GB.

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

Answer:

It is not clear if there is an intention to specify a single communications standard for the HAN. If that is the case, it will be difficult to achieve technical interoperability of HANs in the timescale.

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

Answer:

This depends on the choice of HAN technology. If ZigBee Smart Energy is used in the HAN we believe there should not be any delay to the timescales.

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

Answer:

In terms of HAN communications, the choice of ZigBee Smart Energy would facilitate earlier rollout, because this is a complete standard with most of the major features required (and with the rest already in hand). This would also provide ready-made certification processes etc. for the specification.