To: CER

Comments from: Echelon Corporation

Regarding: CER's National Smart Metering Programme Consultation

Submitted: January 2014

Echelon appreciates the opportunity to provide comments and believes that they will assist CER with improving the direction and goals associated with smart metering. Therefore, we respectively submit the following comments regarding the documents associated with CER's National Smart Metering Programme Documents and Proposed Decision Paper Consultation, dated 17th December 2013.

Smart Metering Programme Functionality

We believe that while the functionality is well defined and advanced, it is missing some key aspects and benefits that can be derived from smart meters and an AMI solution that offers smart grid functionality. The minimum functional requirements appear to be too focused on the needs associated with billing and monitoring usage and do not address some potential benefits associated with grid management as well as some advanced benefits for suppliers. We believe it is extremely important to ensure all of the requirements of the DNO are taken into account. Currently, we see a very limited set of requirements supporting advanced grid management and optimization, including detection of non-technical losses, local generation, and distribution network problems. DNOs need to be able to offer services beyond billing, for example ensuring a reliable distribution network and energy supply. The current direction is too focused on billing and usage requirements and applications needed to support suppliers and third parties.

The Smart Metering Programme should include smart grid functionality and DNO benefits. To take advantage of a smart metering system infrastructure, the requirements should be increased to a higher level and scope. The ability to implement functional requirements depends to some extent on infrastructure. The selected architecture should be based on a neighbourhood (substation centric) approach for both the architecture and installation process. This type of architecture can provide topology information that enables the ability to manage the grid better based on information received from the devices within a given area.

Some AMI architectures that use the power line for communications offer distinct advantages over other types of communications. By analyzing the communication statistics (i.e. signal strength, communication phase, and alternate paths), the system maximizes grid intelligence while minimizing operating costs by embedding communications and monitoring directly into the electricity grid. For example, some AMI solutions provide low voltage grid mapping (LVGM) of the distribution grid which can be used to determine transformer loads, isolate outages, proactively identify problems, automatically update GIS information and speed up repair times for the operations team. By using the unique characteristics of a proven power line technology, an intelligent concentrator node can determine the topology and identify connection of actual phase in its portion of the LV grid. An intelligent concentrator node tracks the linked associations of meters, segments and feeders with its transformer creating a map that is updated as grid topology changes. In addition, this data is made available at an intelligent concentrator node for use in distributed applications and at the head-end where it can be utilized for GIS integrations, OMS, detailed load analysis, phase balancing and other grid modernization applications.

Also, some of these types of AMI solutions are self-configuring. PLC devices can utilize an automatic topology management (ATM) feature, so intelligent control nodes automatically discover those meters and other devices with which they can communicate and report this list to the collection system software and utility applications. With these services, there is no need for the installer to associate meters with data concentrators or to verify operation of the communications network.

In addition, it would also be beneficial to incorporate advanced power quality data into the solution. Some smart meters not only provide power quality alarms, as are mentioned in section 3.3.4 of the Appendix A – Core Design document, but also can provide extensive power quality measurement functionality as well. This can be captured in configurable load profile registers or as instantaneous values. It would be beneficial if the smart metering programme requires smart meters that are able to measure and report additional power quality load profile data for items such as voltage, current, frequency, and total harmonic distortion.

The type of AMI architecture and communications model mentioned above not only has a significant impact on the ability to manage the grid but it has a positive impact on the overall business model. In addition, the detailed power quality data helps DNOs with Grid Optimization. The smart metering programme cost-benefit analysis should take into consideration the various grid management benefits associated with smart grid functionality and power quality data in order to help justify the national smart metering programme.

Also, there is an issue that we would like to mention related to gas meters. In section 5.3.2 of the Appendix A – Core Design document, it states that gas consumption data is limited by the “wake-up” data transmit and receipt period determined by the GSM battery performance requirements. We understand the desire to conserve battery use and the associate battery life. Therefore it would be good to explore other communication solutions for the gas meters. Rather than wireless, wired M-Bus communications could be used between gas meters and electric meters. While this might not be practical for all gas meter installations due to their location and proximity to electric meters, it would be beneficial where practical. Using wired M-Bus would allow the gas meter to communicate locally with the electric meter without the concern for battery life.

Besides those comments already mentioned, there are other additional benefits associated with this type of AMI architecture. For example, in section 5.3.5 of the Appendix A – Core Design document, a concern is mentioned about having incomplete smart meter coverage due to multi-dwelling units (MDUs) where the meters are likely to be located in the basements. The AMI architecture mentioned above is able to reach all meters regardless of their location since the communications are accomplished via the power line. So unlike RF mesh networks or even cellular networks, power line is able to successfully reach meters located in basements and other hard out of sight locations.

<u>Summary</u>

While, we are very encouraged and pleased by the report and objectives associated with rolling out smart metering, we believe there are still some adjustments that should be made to ensure that the best and most cost effective architecture for smart meters is implemented. We agree that the interests of consumers must be central to decisions at every stage and at every level of the Smart Metering Programme. Consumers must see and feel real benefits from the smart meter roll out if it is to be successful and their benefits can only be optimized and maximized if smart metering is based on an AMI architecture that can be integrated with building an end-to-end smart grid. We believe that implementing an AMI architecture and communications model as described above is the proper direction for smart metering in order to ensure a cost effective and truly smart grid that benefits consumers and all stakeholders in the future.