Committed to Australia's ICT, electronics and electrical manufacturing industries

Consultation Paper on National Minimum Functionality for Smart Meters

Energy Market Reform Bulletin No. 103 on Smart Meters

Cost Benefit Analysis

Phase 1 - National Minimum Functionality

COMMENTS BY AUSTRALIAN ELECTRICAL AND ELECTRONIC MANUFACTURERS' ASSOCIATION (AEEMA)

Introduction

The Australian Electrical and Electronic Manufacturers' Association Ltd (AEEMA) is the peak national, industry body in Australia representing some 400+ infrastructure providers for Australia's ICT, electronics and electrical manufacturing industries. AEEMA is organised in three principal divisions (electrical, electronics and 'ICT Australia®'). On 30 October 2007, AEEMA members voted to consolidate AEEMA's members into the much larger Australian Industry Group (Ai Group), which will be effective from 1 January 2008.

AEEMA's policy platform is based on adherence to competitive market principles, removal of trade barriers including non-tariff barriers, reduced red tape, regulation only where required, equitable tax treatment for business and the removal of impediments to Australian manufacturing that harm its international competitiveness.

AEEMA supports the concept of smart meters and their use to limit demand and / or improve energy efficiency of air conditioners, and emphasises the need for manufacturers to be included in the consultation process.

It is also essential that the processes for implementation of any smart meter program be based on accepted international standards. In this regard, it is important that the consultation process includes close cooperation with Standards Australia EL-054

committee (Remote Demand Management of Electrical Products). This committee recently published AS4755, which is the framework document for demand response of electrical products and is currently defining demand response enabling devices for air conditioners as a follow up document.

Comments on the Overview

The overview report refers to the possibility of using 'smart Thermostats' for direct load control (DLC), and in particular, the assumption that this technology would be capable of interacting with new and existing air conditioners (9.3, page 92). AEEMA cautions against such assumptions. While ducted systems would lend themselves to such intervention, smaller systems such as splits often have limited access to their control systems, which can be quite complex. In many cases, manufacturers would consider intervention a breach of warranty, even if the control was a totally external IR system. Unless sophisticated systems were incorporated, DLC from such a control could conceivably be over ridden or made ineffective by the consumer.

Comments on the Stream 4 Report

In the work stream 4 report, (2.3, page 15), there is an assumption that DLC of air conditioners can be made "....whilst minimising the impact on the cooling capacity..." It is important to note that the best way of achieving this goal is to avoid prescriptive requirements. For example, a DLC specification for an air conditioner should not prescribe such methods as a change in thermostat setting, or limit to compressor on-time. Specifications should prescribe outcomes such as "limiting demand to X% of full load over a period of Y minutes", leaving manufacturers with the freedom to design the load control algorithm to maximise consumer comfort within the constraints demanded during the DLC period.

While air conditioners manufactured from 2009 are considered capable of being directly controlled, (stream 4, 4.1.3, page 34) the realities of manufacturing lead times, the relatively small Australian market size and logistics of dealing with overseas suppliers will limit the impact in this time frame; 2009 is only 13 months away. Typically, a minimum two-year period is required to introduce such changes after they are mandated.

Possible functionality of smart meters

Functionality 14 calls for load management and this functionality is appropriate for the minimum smart meter requirements. If this were the case, then it would seem logical that being able to communicate to a third party device (be it an 'in-home display', or an air conditioner) is also required. This is true for two reasons:

1. there is little *additional* peak demand benefit in load control over what already exists (See NERA Economic Consulting report, *Cost Benefit Analysis ….Phase 1 Overview report,* page 89, lines 2 and 3) so it makes sense to be able to control more than just the hot water heater; and

2. the current minimum requirement does not allow real time communication with the customer so the retailer is left with *only* a direct load control possibility. Thus, functionalities 15 and 16 should be included and, in fact, these two functionalities could be one in the same if access to the home area network (HAN) was possible. If additional loads are not controllable, then functionality 14 becomes a very limited functionality to help with peak load demand; it does not make the meter 'Smart'. Smart encompasses the ability to control many more loads and communicate with the customer.

If a meter is called smart, it needs to have two-way communication for remote readings. Most electronic meters can detect ripple signals to switch loads, therefore a smart meter could have all this 'smartness' of communication but still use the already existing ripple control signals to switch loads. This further supports the claim that functionality 14 on its own does not necessarily make the meter smart - functions 15 and 16 need also to be included.

Functionality 17 allows for the provision of an in-home display (the provision of an *interface* for an in-home display is part of functionality 16). Following on from the above argument, if access is provided to the HAN, then it is not necessary to specify this functionality as product and industry innovation time will provide the possibilities. It is sufficient to only require functionalities 15 and 16.

Functionalities 23 and 24 relate to interoperability between meters and between other devices. This is, understandably, a very difficult problem to solve. At present there seems to be two technologies that will facilitate smart meter rollout - these are mesh radio and power line communication systems. Each system requires a concentrator to communicate with the individual meters and then itself communicate back to a Network

Management System (NMS). The connection between the concentrator and the NMS is currently achieved via several methods (i.e. the physical layer is not always the same). It is envisaged that the application layer of this communication from the concentrator to the NMS should be standardised to ensure interoperability back to the NMS. In other words, the NMS should be able to communicate in a single application layer protocol format to the concentrators. The communication between the meters and the concentrator can then be vendor-specific.

Open standards currently exist that allow this sort of control, such as ModBus, DNP3 and DeviceNet. ModBusIP also appears to be a good option. The HAN side of the meter interface also needs to be specified to the application layer level to ensure interoperability. Without these interoperability issues addressed it is unlikely that smart meters will become pervasive. The delay in the Victorian Government's implementation of Interval Meter Roll Out (IMRO) was largely caused by the lack of definition of what an interval meter was and the need to level the playing field to ensure competition. In Bulletin 103 under consideration here, the failure to specify interoperability effectively will cause a stalled roll out.

Regulatory Impact Statement

AEEMA understands that one of the objectives of deregulation was to introduce competition into the market and hence, hopefully, create a market environment that tends to innovate and reduce costs to the customer. If this assumption is correct, then AEEMA is of the view that the playing field needs to be levelled and an umpire installed to ensure 'fair play' (figuratively speaking). If this argument follows, then some sort of minimum standard is needed to maintain the level playing field.

AEEMA believes that either maintaining the status quote, or allowing the market to dictate smart meter functionality have the potential to create a high risk profile for businesses, which will in turn discourage businesses from readily investing in innovation.

Therefore, AEEMA recommends that Option C ("National minimum functionality and performance levels") be mandated from the outset. Mandating performance levels will enable businesses to phase out the humble electrical meter – a unique product with a longevity of up to thirty years. Unlike the mobile industry, for instance, the swap-out or stranded costs are highly significant.

Requested comment on pg 102 (functionality 16)

As discussed above, AEEMA considers it vitally important to include a HAN capability to be able to call it a smart meter. Victorian authorities have already completed a good deal of this ground work on this issue, to the point where they have specified Zigbee as their physical layer. Once the HAN interface is present, then it is our option that DLC via this medium will follow. Innovation and imagination will then form the backbone of acceptance for third party vendors. Adoption of this technology by third party vendors can either be mandated or encouraged via structured energy packages from retailers.

Requested comments on pg 118 (DLMS-COSEM)

AEEMA believes an open international standard is most desirable, while a national proprietary protocol is least favoured.

The problem, as it is currently understood, is that there is no open international standard that provides all the core functionality that Australia is looking for. The other problem is that it would take a long time to influence and finally deliver these standards through international channels.

It is therefore AEEMA's considered opinion that the middle road is a preferred option, (i.e. to take the best or closest international standard and with permission 'Australianise' it). This practice is already adopted prolifically with IEC standards. It is suggested that this approach will deliver the best of both world. As to the question of whether this will reduce the number of competitors, AEEMA members argue that there are currently standards and idiosyncrasies that limit favour certain vendors and leads to market dominance in some areas. AEEMA argues that creating such a standard in fact levels the playing field and conversely increases competition, as everyone is playing to the same rule book.

Requested comment on pg 119 (contractual approach)

It is believed that a contractual approach to interoperability will have limited success. It has a short-term affect, in that two or three vendors introduce co-operation and effectively shut out other competitors. This could therefore lead to long-term competition degradation. An open, level playing field is preferred.

AEEMA members believe there is clear benefit to competition if interoperability is pervasive. The fundamental desire to reduce competition prevents vendors from freely distributing their already existing proprietary protocols.

Requested comment on pg 121 (Hardware component interoperability)

It may not be necessary to specify down to the hardware component level if the interfaces can be identified and specified. For example, if the Zigbee standards is specified, it is not necessary to further specify the physical and MAC layers and possible in the security socket. The interface then becomes the application layer and socket. It is important then to specify this socket to achieve interoperability. Therefore the hardware is not important, but the interface is.

AEEMA further suggests that the concentrator become the next interface to be standardised. This leaves the hardware and communication link between the concentrator and meter to be vendor specific. This preferred position prevents 'cross finger-pointing' between vendors when a newly fitted meter suddenly doesn't work. The 'last mile' should be vendor-specific to prevent blame shifting.