EV CHARGING INFRASTRUCTURE

‘Smart’ demand Response Capabilities for Selected Appliances Response to Consultation Paper

ABB Australia welcomes the opportunity to provide comment on the consultation paper: “Smart” Demand Response Capabilities for Selected Appliances. ABB is involved in the electric vehicle sector and our submission reflects this involvement. We have not commented on the air-conditioning, pool pump controller and electric hot water systems as it is out of scope for our business.

AS/NZS 4755

We currently support a voluntary or an incentivized voluntary adoption process for AS/NZS 4755. In line with Australian Government policy on standardization we believe Australia should pursue the adoption of IEC standards. The appropriate channel for standards development is via Standards Australia’s involvement with the Technical Committees of the IEC which ensures Australia is in line with global best practice. We note that currently AS/NZS 4077.3 Part 4 (Electric Vehicles) does not exist.

National recognition

There are many instances where the various jurisdictions have adopted state specific requirements which can affect costs to consumers (recent case of RCBO Prohibition by ESV). It is essential that the Demand Response approach is truly national.

GEMS

The GEMS Act does not have a bearing on the Demand Response discussion as it relates to energy improvements on products whereas DR relates to a process.

Questions for Stakeholders

1. Do you support the proposal to mandate compliance with AS/NZS 4755 for the nominated priority appliances?

Currently the appropriate volume for electric vehicles (AS/NZS 4755.3.4) does not exist. For this to be mandated will require a project proposal to be initiated within Standards Australia and then a new draft to be developed, verified by the electric vehicle manufacturers, presented for public comment and if successful, published. This process would generally take 2-3 years before a standard is available for industry to comply with. In addition to this time frame could be the product development requirements of the manufacturers required for compliance, especially if the requirements are out of step with IEC requirements.

Having Australian requirements differing from IEC can have the effect of restricting choice and increasing costs to consumers.

EV charging modelling indicates that most charging sessions will take place via 'plug on the wall' chargers providing overnight trickle charging.

EV charging infrastructure does not belong in the same discussion as air conditioning, pool pumps and electric hot water systems. The EV charging process is inherently linked to the requirements of the vehicle where the vehicle is in control of the charge cycle.

Technology is also moving towards utilizing the vehicle as a battery storage capacity using vehicle to grid technology. This is being developed at the global level and an Australian specific standard is likely to jeopardise the implementation of this technology and increase costs to consumers.

2. a. Is there any viable alternative options for meeting the objectives of the proposal, apart from the BAU case or mandating compliance with AS/NZS 4755?

Origin Energy has initiated a Summer Saver program which incentivized consumers to manage their demand requirements without the need for additional hardware. An analysis of this program has not been included in the Consultation Paper.

The EV industry already have a standardized communication protocol called OCPP (Open Charge Point Protocol) which is globally accepted by the automotive industry and charger infrastructure providers. This also reinforces the view that Australia should be engaging with IEC committees to ensure a holistic view.

Australia recently adopted the international standard for home and building automation as a Technical Specification (SA/SNZ TS IEC/ISO 14543.3 Parts 1 to 6) and systems compliant with this standard could meet the objectives of this proposal.

3. Do you support: a. permitting compliance with either AS/NZS 4755.3 or (DR) AS 4755.2?

We agree with compliance to AS/NZS 4755.3 however compliance of EV charging equipment should not be mandatory. As AS/NZS 4755.3.4 (EV) has not been developed the possible implications of deviations from current IEC product standards is not known so we do not support mandatory compliance.

b. requiring compliance with all Demand Response Modes (DRMs)?

We do not support compliance with all DRM's for EV chargers. Until such time as it is decided to develop AS/NZS 4755.3.4 or for Australia to appropriate IEC standards it is not possible for the EV sector to support compliance to the DRM's.

4. Do you agree with the scope of the proposal: a. air conditioners: up to 19 kW cooling capacity;70 b. pool pump-unit controllers; c. electric storage water heaters (excluding solar-electric and heat pump water heaters);71 and d. charge/discharge controllers for electric vehicles (SAE Level 2 or IEC Mode 3). e. If not, what products (or capacity limits) would you propose be included or excluded, and why?

At this stage we believe electric vehicle chargers should be excluded from the scope of the proposal.

Significant development costs will be imposed on the local stakeholders in the EV sector if the proposal requirements fall out of step with global IEC standards. These costs will be passed onto consumers which will reduce uptake and work against the desired outcome of the proposal.

Having unique Australian requirements could also force some suppliers to withdraw from the Australian market which will lower competition and increase costs to consumers.

We note that current global standards in the EV sector offer the capability to comply with the intention of AS 4755 as well as additional capability that would benefit the electricity market.

5. a. Do you have information that demonstrates the ability of so-called "smart home" devices and systems to achieve automated demand response for the appliances within the scope of this proposal? Is so, please provide this information and specify which particular "smart" devices? (Please be specific with regard to the capabilities you envisage for such devices or systems, and whether you would expect them to conform to any particular standards).

b. Would adoption of proprietary "smart home" systems undermine the benefits of peak demand reduction into the future?

c. How many products currently on the market have the ability to connect to demand response programs? If so, which or what type of programs?

d. Is there a risk that a mandatory AS/NZS 4755 standard may become obsolete as new technologies/innovative products achieve the same objectives without using AS/NZS 4755?

Smart home solutions compliant to the existing Australian Technical Specification SA/SNZ TS ISO/IEC 14543.3 have the capacity to manage the EV charging load in coordination with the demand of the building. This Technical Specification utilizes a globally accepted open protocol that covers all applications in building automation and control. While EV is not specifically covered in this standard it allows the system integrator to provide the managed solution utilising currently available compliant products.

The charge requirements of an electric vehicle charge session are defined by the vehicle as per the globally accepted protocol developed by the electric vehicle manufacturers. The building automation system has the capability of assessing the available supply (grid and renewable) together with the existing building load (lighting, air conditioning and other services) and managing this to within the available demand. This process has been completed on many projects both in Australia and overseas.

A mandated AS/NZS 4755 could easily become obsolete in the near future due to the out of step nature with global trends as already discussed and the availability of IEC standards providing a wider range of competitive solutions.

6. What is your estimate of how much complying with the requirement will increase the price of each product? If a product complies with DRM 1, are there any additional costs incurred for a product to comply with the other DRM modes?

In the EV sector we believe the cost impact will be a minimum $500 per device. This matches the current price difference between a standard residential EV charger without communications capability and one with cellular connection. Depending upon the product, the cost could be higher.

The leading country for EV acceptance is Norway where they are estimated at least 12 years ahead of Australia. In the Norwegian market over 60% of EV drivers charge their vehicle using a standard power outlet with a simple and uncontrollable charger. Imposing higher costs on chargers with special compliance requirements will likely push this usage of 'simple' charger higher.

7. Are the data and assumptions used in the cost-benefit estimates reasonable? Do you have information or data that can improve these estimates?

As per Question 6.

There are a number of assumptions used in the cost benefit estimates which are not transparent. Table 9 asserts a projection of medium uptake of DLC where

637MWe of maximum demand reduction is achieved. The footnote states this figure is 50% of participating DR capable products in 2035.

The calculation of 637MWe DLC reduction available in 2035 is unqualified and the methods of calculation are not known. With EV's the demand will depend upon the size and range of the EV, the state of charge and the type of charger (trickle charge, DC charge, rapid charge).

8. Do you think the estimates of activation rates and costs are reasonable? Do you have information or data that can improve these estimates?

The calculation method and assumptions are not known so the activation rates do not seem reasonable.

9. Do you think the estimates of annual participant costs are reasonable? Do you have information or data that can improve these estimates?

The activation cost figures projected are significantly understated.

Current market prices for solutions that will permit this style of control for EV charging using existing techniques (not AS/NZS4755, but the globally accepted OCPP protocol), over existing cellular networks, run approximately $400 per charger per year. This is approximately 20 times the cost suggested on page 32 of the paper.

10. Is lack of demand response capable products a barrier to the introduction of demand response programs for small consumers?

Alternate demand response programs such as Origin Energy's Summer Saver program provide DR outcomes in the small consumer market using existing smart phones or smart meters.

As noted earlier the use of existing systems compliant with the Home and Building Automation technical specification SA/SNZ TS IEC/ISO 14543.3 already provide the capacity to incorporate demand response for small consumers.

Do you think that mandating demand response capability for these products will lead to their activation and to consumer enrolment in DR programs?

Cost conscious consumers have the ability to take active steps to saving energy costs by choosing their charging times for EV's and utilizing ToU tariffs. Charging vehicles from rooftop solar systems during surplus generation periods or using private battery storage derived from renewables can be accessed without mandated demand response.

11. It is assumed that the cost of communications platforms to support demand response and direct load control services will be low (e.g. through the use of existing electricity supply infrastructure such as ripple controls or smart meters, or general infrastructure such as WiFi or 3G/4G/5G). Do you agree? If not, can you provide estimates of the platform set-up costs?

Currently a solution that will permit control of EV charging using industry standard OCPP and cellular networks will cost about $400 per charger. It is anticipated a AS/NZS 4755.3.4 compliant system would be a higher cost than this which is far greater than the activation costs projected in Figure 6.

Ripple control would not be considered as a viable solution as it is restricted to defined regions and can have implications on other elements of the supply network.

Smarter technologies such as smart home systems will allow for better control, and the possibility that a geographically concentrated group of EVs do not all start charging at once. Smart home systems will also allow for amortisation of the cost of direct load control across a total home automation system.

12. What implications (positive or negative) would the proposals have for your industry, in terms of activity, profitability and employment?

This proposal would create needless cost and uncertainty for the emergent electric vehicle industry. The negative impact is to the end user/consumer as any additional costs would have to be passed on. We believe alternative solutions such as OCPP and smart homes provide a more viable approach.

13. What can appliance suppliers, installers and energy utilities do to facilitate customer enrolment in direct load control or demand response programs?

Installing contractors are face to face with consumers and provide information/advice of options. An incentive program to installers would assist in the uptake of the systems on behalf of the DRSP, government, or energy utility provider.

Utilities have demonstrated that they can run programs of this nature (Peaksmart by Ergon/Energex), and similar programs designed to achieve the same outcome (Summer Saver by Origin).

14. Do you think the proposal would reduce competition among product suppliers, reduce consumer choice or lead to an increase in product prices (beyond what is expected to occur)?

The proposal has the threat of increasing product prices due to required hardware changes and the possibility that some manufacturers will see the Australian market as not worthwhile for the development of Australian specific compliance products. This will reduce competition and push up pricing.

17. How should the changes in demand or energy during DR events involving AS/NZS 4755-compliant products be measured? What would should be the notional "baselines?" Is the estimation of baselines more or less reliable than for other DR approaches?

Will any regions be largely unaffected? If so which ones? What causes these differences in impacts between regions?

Regions currently deploying time of use tariffs will be unlikely to benefit from DRSP.

21. (To electricity network service providers, electricity retail companies and DR aggregators specifically). a. Is it your company's intention to offer tariff or other incentives for customers to have demand response capabilities on the appliances in question activated and to participate in demand response programs? Are there any specific barriers (or lack of incentives) that would prevent your company from offering and promoting such programs? b. Would you offer tariff or other incentives to customers to participate in demand response programs using "smart home" device functionality? (if so, please specify the type of functionality/ies). Are there any specific barriers (or lack of incentives) that would prevent your company from offering and promoting such programs? c. In your opinion, what proportion of householders with appliances with the above type of "smart home" device functionality/ies will participate in demand response programs? Do you have survey or other evidence to support your view? d. What would be the total MW of appliance demand response capability (or number of participating appliances) required to defer the need for network investment to manage peak demand in your area/s of operation?

22. In your opinion, what proportion of householders with AS/NZS 4755-compliant appliances will have the demand response capabilities activated and will participate in demand response programs? Do you have survey or other evidence to support your view?

We believe the proportion will be low due to the cost to consumers for the hardware. Consumers will be more likely to pursue off peak tariffs and utilize renewable energy with battery storage.

23. (To consumer and welfare organisations). In your opinion, what measures should be taken to ensure that consumers are adequately informed of the potential costs, as well as the benefits, of entering contracts that enable the demand response capabilities on their appliances to be activated?

24. (To electricity market regulators). Do you consider that the regulatory arrangements provide utilities and potential DR aggregators with sufficient incentive to offer (or commission) small-consumer demand response as a means of reducing investment in supply-side infrastructure?

25. How do existing electricity market rules which enable and encourage DNSPs and TNSPs to invest in demand response programs impact on, or interact with the proposal?

26. a. How would changes to electricity market rules (the Retailer Reliability Obligation and the wholesale market demand response mechanism draft determination announced by the AEMC) impact on or interact with the proposal?

b. Would a new class of DR aggregators make use of AS/NZS 4755 DR platform? If so, why. If not, why not?

c. Would the potential AEMC wholesale demand response mechanism be material to the benefits of mandating AS/NZS 4755 for the four selected appliances? Why or why not? d. Would the benefits of deferring investment in network capacity from the wholesale demand response mechanism changes announced by AEMC also reduce the network investment benefits attributable to mandating AS/NZS 4755?

27. Could an option for Government to require utilities or independent DR service providers to offer incentives, or have the Government fund these incentives, achieve the same benefits as the mandatory standard but at a lower overall cost to the community?

The incentive approach could achieve the desired outcomes of the DR Program and without the need for compulsory hardware modifications.

28. (To manufacturers and distributors of the products in the scope of this proposal). What percentage of the products you sold in Australia and in New Zealand in the last year: a. Meet the minimum requirements of the relevant part of AS/NZS 4755; b. Meet additional requirements (e.g. additional DRMs); and c. Comply with other published DR standards (please state which)?

There is no product currently on the market compliant with AS/NZS 4755.3.4 as the standard has not been developed.

The closest solution is EV charging equipment with built in ethernet and cellular connectivity, operating with a cloud based service using the global standard OCPP protocol.

Approximately 90% of EV charging equipment sold by ABB have been specified with OCPP connectivity

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