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**Re: Submission – Smart Appliances.**

14/09/2019

Temperzone appreciates the opportunity to make a submission in response to the Consultation Paper "'Smart' Demand Response Capabilities for Selected Appliances".

Temperzone is an Australasian manufacturer of air-conditioning / HVAC products for the commercial and residential markets. In recent years, Temperzone has expanded its interests to include water heating systems. We understand the impact of our products on peak demands on the electricity network and the potential of Demand Response (DR) mechanisms to reduce over-investment in the electricity network and to allow for a more integrated electricity sector incorporating renewable energy sources.

Temperzone understands the global need to reduce greenhouse gas emissions which cannot be achieved via a BAU scenario. We wish to play our part in achieving that goal for the benefit of all.

Consequently, we support demand response capability being incorporated into appliances in both the residential and light commercial sectors to enable both the costs and the benefits of demand response to be shared across the community. Therefore, if following industry consultation, the E3 committee decides to recommend the mandatory implementation of AS/NZS 4755, we advocate that it is applied to all capacities of air-conditioners designed for comfort heating and cooling.

We support a flexible approach to certifying products as DR capable. AS/NZS 4755.3 is one possible approach but should not be the only acceptable one. AS 4755.2 is clearly intended to offer another path and we support that intention. However, it has some drawbacks and we do not support it being used in its Draft form.

AS 4755.2 should be flexible enough to allow for future technologies. It should allow for 2-way communication in accordance with International standards for Demand Response. We do not want to see Australasia isolated from compatibility with imported products, or conversely to make our exported products incompatible with foreign DR implementations.

Temperzone supports the implementation of mandatory DR compliance to resistance heaters in water heaters (regardless of class of water heater). We support the expansion of DR to other product classes (eg Solar PV inverters, battery storage systems, spa/pool water heaters, dishwashers etc).

Kind regards,

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# Questions for Stakeholders

Written submissions are invited on any of the material in this Consultation Paper, but particularly on the following questions.

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

Temperzone supports the mandated compliance with AS/NZS4755 for the reasons provided in the Consultation paper. However we have concerns over the detail within AS 4755.2 as expressed in our covering letter. Mandated compliance allows a level playing field across suppliers and a lowered cost of introduced technology. Most existing Temperzone products, and all new products under development already comply with AS/NZS4755.3 and are likely to comply with a protocol agnostic AS 4755.2.

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?*
   *b. Do you agree that including demand response capabilities on energy efficiency labelling and voluntary compliance with AS/NZS 4755 is not a viable alternative option?*

Temperzone supports the mandated compliance with AS/NZS4755 with provisos re AS 4755.2. We do not see the BAU case as being appropriate in the medium term due to need to provide capacity for the electrification of the transport sector over the next decade. Temperzone does not see a market led approach via energy efficiency labelling as providing a sufficiently strong incentive to purchase AS/NZS4755 compliant products.

3. *Do you support:*
   a. *permitting compliance with either AS/NZS 4755.3 or (DR) AS 4755.2?*
   *b. requiring compliance with all Demand Response Modes (DRMs)?*

Most Temperzone products currently comply with AS/NZS4755.3, however, we see the greater benefits of AS4755.2 should it be implemented with 2-way communication and in compliance with similar international standards. It is very likely that we would design to AS4755.2 in future product cycles. Temperzone supports the compliance with all appropriate DRMs for that product class where possible.

However, it may not be practical to make older units meet all DR modes applicable to a product class. DRM1 as a minimum may be a pragmatic resolution in those circumstances.

4. Do you agree with the scope of the proposal:
   a. air conditioners: up to 19 kW cooling capacity;[1]
   b. pool pump-unit controllers;
   c. electric storage water heaters (excluding solar-electric and heat pump water heaters);[2] 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?

Temperzone would support the application of AS/NZS4755 to all air-conditioners designed for human comfort, regardless of capacity. Larger capacity air-conditioners are increasingly being based on inverter technology, where the impact of implementing DR is lower than single compressor, fixed speed systems.

Temperzone supports the mandatory application of DRM1 to heat-pump, solar thermal, and solar electric water heaters where any of these products have an incorporated resistance heater. The DR should only operate on the resistance heater. Where there are multiple resistance heaters in the tank, DRM1 should operate on any / all resistance heaters in the lower 50% of the tank, by volume.

Temperzone would support the addition of other products to AS/NZS4755 over time such as dishwashers, spa / pool heaters, and space heating / cooling water heaters (including heat-pumps).

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?*

Temperzone considers that for DR to be effective, it needs to be independent of consumer selected technologies within the home due to the likelihood of connected devices becoming disconnected over time as consumer technologies evolve over time.

If structured appropriately AS 4755.2 would seem to offer this prospect.

[1] The 2013 Consultation RIS proposed a limit of 30 kW cooling capacity, but this was revised to 19kW following the previous consultations.
[2] The 2013 Consultation RIS proposed that solar-electric and heat pump water heaters should also comply, but this was revised following the previous consultations.

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?*

Temperzone sees minimal marginal cost of compliance to the other DRM modes for air-conditioners if the power consumption limits of 50% and 75% are upper limits rather than precise expectations ± e.g. 5%, particularly where compliant with AS4755.2

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

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

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

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

Temperzone sees the increased uptake of TOU electricity pricing in the residential sector as evidence that a sizeable proportion of the population is willing to actively 'take control' of their electricity costs. Adding DR programs where they provide a cost benefit to the individual is likely to further increase the proportion of the population willing to manage / have managed the energy consumption of their appliances. The more installed compliant devices there are available, the greater the effectiveness / lower the cost of these programs.

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?*

Temperzone sees the cost of communications continuing to reduce over time. We are sceptical of the use of WiFi as a stable platform for the long-term connection of a DR enabled device. We would greatly prefer products connected via AS4755.2, with 2-way communication allowing confirmation that the unit was both operational, and that the DRM has been activated.

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

We feel the proposals would only help enhance the reputation of the HVAC sector as being willing and able to take its part in addressing national energy demands and consequential emission reduction targets. We do not see the proposals having a negative impact on profitability and employment of our industry provided they are enforced even-handedly across each product class, be they imported or produced locally.

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

Temperzone could incorporated DRM information in the promotional material for our products, and explain the benefits of the technology through printed material, industry forums and case-studies.

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)?*

Temperzone does not expect the proposal to increase our product prices. Most of our products are already compliant to AS/NZS4755.3

15. *If the measure is implemented, what is the earliest feasible date by which products could comply? How much lead time should there be after publication of the final requirements?*

Temperzone would very likely have a product range fully compliant with AS/NZS4755.3 by the end of 2021. It is likely that many products would be compliant with AS4755.2 (if finalised) within a further year (2022).

16. *Do you consider that there are any major technical or functional issues related to the proposal? If so, how should these be addressed?*

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?*

Appliances which are connected via a 2-way communication protocol would allow for the operational state at the time of the DR event to be polled. This would allow the benefits of DR to be targeted to sites actually impacted by the DR event, thus improving the economic efficiency of the financial incentives offered.

18. *How will the proposal impact on electricity prices and energy network costs and investment requirements?*

This proposal is likely to result in an underinvestment in the electricity network over time, leading to the increasing use of DR across the network.

19. *Do you think that the effectiveness of the proposal depends on the implementation of more cost-reflective pricing, e.g. time-of-use (TOU) tariffs?*

TOU tariffs are effectively a price signal of the operational and/or the environmental cost of electricity consumption at that time. DR allows a further mechanism to reward not using electricity at critical times. It should allow greater effectiveness of TOU pricing. It is anticipated that the prevalence of DR events will increase over time, and therefore there will become a greater link between TOU and DR.

20. *In regard to the regional aspects of the proposal do you consider that it would provide significantly more benefits in certain regions? If so which ones? Will any regions be largely unaffected? If so which ones? What causes these differences in impacts between regions?*

Temperzone considers the electrification of the transport sector as increasingly exposing capacity constraints on the electricity network over the coming decade. Regions which currently are not capacity constrained are likely to become constrained over time. The market will respond regionally as this occurs through the emergence of DRSPs.

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?*

Temperzone considers that the proportion of households/ light commercial sites agreeing to DR will increase as DR is successful in reducing the investment otherwise required in the electricity network. This deferred / negated investment will lead to an ever-increasing need for DR, and the financial incentives to participate.

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?*

It should be incumbent upon Electricity retailers to explain to anyone making a new electricity supply connection, the cost saving benefits of opting in to a Demand Management scheme and to explain to them how to select appliances which are capable of reaping those benefits for them.

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?*

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)?*

Temperzone estimates that 90% of our products comply with AS/NZS4755 at all capacities for DRM1,2 and 3, although depending on the unit configuration options chosen on individual sites, it may not be possible to activate all DRMs. In other words only a sub-set of the DRM may be available. In terms of air-conditioners < 19kW, then all products comply with DRM1,2,3.

No products currently comply with AS4755.2

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