

Dr. Raniero Guarnieri
Technical Manager

STIEBEL ELTRON (Aust) Pty Ltd.
25 Montpelier Road
Bowen Hills QLD 4006
Mobile: 0400 722 871
Email: raniero@stiebel.com.au

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Equipment Energy Efficiency E3
Department of Environment and Energy
Commonwealth of Australia

Consultation Paper: 'Smart' Demand Response Capabilities for Selected Appliances - Feedback submission -

Dear E3 committee

We welcome the opportunity to provide a submission to this consultation process.

STIEBEL ELTRON is an internationally recognised manufacturer of quality thermal comfort systems.

For more than 95 years we have been developing innovative products to improve the overall comfort of our customers' homes and have evolved into one of the leading manufacturers in the fields of "hot water", "heating" and "renewable energy" in the world.

We are aligned with various national and international associations and companies with the purpose of facilitating the exchange of ideas, information and progress involving sustainability and innovation, including smart energy management.

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

Absolutely not.

We strongly disagree with mandatory demand response compliance of the nominated appliances. We will support, in principle, a **voluntary program that can be adequately supported by incentives from energy retailers, regional/local/state/federal jurisdictions and others.**

These would be financial incentives that recognised the benefits of the products' DRM capabilities in whichever networks they were used.

This would provide incentives for manufacturers to incorporate such functionality into their products and for end-users to seek out these products.

In regards to appliances targeted as priority, we agree with those nominated, with some changes as indicated in our reply to **Q3e**.

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?

We believe there are 2 alternatives:

- The proposal mentioned before: A national voluntary program with the right incentives would likely produce better outcomes and would also give manufacturers the freedom to choose how and when to participate, plus which products would be better suited for DRM tasks.
- Energy networks and providers adapting and working in partnership with the already established technological trend of smart energy control at the home level. This will be able to do much more than simple unidirectional 'blind' control of appliances, where a true whole-of-house dynamic energy management process can be had and modified in real-time, in response to household energy consumption behaviour, energy network changes and climate conditions. The incentives here are again financial and end-users would seek control products and services that would ultimately minimise purchased energy and associated costs. There would be no regulatory requirements, but financial incentives could still be used to accelerate the uptake of technologies that will do this.

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?

We do not agree.

On its own it's not a viable alternative, however, a voluntary system supported with incentive programs as mentioned before would be.

3. Do you support:

a. permitting compliance with either AS/NZS 4755.3 or (DR) AS 4755.2?

Yes

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

No, as the only scheme we would be willing to consider is a voluntary scheme with incentives.

Incentives would target those products and applications (air conditioners, pool pumps, electric storage water heaters), which would ultimately meet the objectives of the proposal and so these would be the ones that would naturally have DRM capabilities added to them.

4. Do you agree with the scope of the proposal:

a. air conditioners: up to 19 kW cooling capacity

In principle we do, however we leave this to the A/C industry to determine what is best.

b. pool pump-unit controllers;

As above, we agree in principle and it is up to those manufacturers and stake holders to indicate what they consider best.

c. electric storage water heaters (excluding solar-electric and heat pump water heaters); and

Agree with the exclusion of solar-electric and heat pump water heaters, plus any other low-energy consumption devices incorporating renewable technologies.

Do not fully agree with electric storage as is proposed (see answer to e).

d. charge/discharge controllers for electric vehicles (SAE Level 2 or IEC Mode 3).

In principle we don't agree with this, but once again, as with **a** and **b**, we will support the proposal of the experts in this field.

e. If not, what products (or capacity limits) would you propose be included or excluded, and why?

We will agree with the scope as mentioned above, but only with the following additional considerations:

- 1) If the volume range for electric storage water heaters is changed to above 50 L up to 710 L, as we believe that would reasonably contribute to the overall objective of the proposal and not unduly impact applications of relatively low hot water demand, and
- 2) If these electric storage water heaters are stand-alone units and not used as components of larger heating packages, where the primary heating source for the latter is non-resistive (eg. solar and heat pump hot water systems).

1) Water heaters 50 L and below are used in quasi-instantaneous applications most of the time for low volume deliveries, then relying on relatively quick recoveries, anywhere from a few minutes to about an hour.

These are for short term, hot water draw-off events, for points of use such as office kitchenettes, laundries, powder room basins, etc.

Limiting or reducing the heating, even for a short time, would be to the discomfort and detriment of those relying on the quick, ongoing availability of hot water, defeating the purpose of use of the low volume/high recovery applications.

Also, small volume water heaters like these are used on occasions for maintenance and reheating of ring main recirculation loops, meaning they need to be on when required.

Modifying operation by temporarily reducing or shutting down the heating would also greatly affect the outcome, in this case it would be mainly long waiting times for hot water to points of use in buildings with centralised hot water plant rooms. There could also be a rise of pathogens (eg. legionella bacteria) if strict heating regimes are not adhered to.

2) Many electric storage water heaters are used in centralised solar and heat pump hot water systems for large scale applications, where the use of electric elements is not intended for ongoing heating, rather short-term boosting at specific times in order to assist with load demand and other requirements. Contribution to decreased peak loads via DRM would be very low in these situations as the vast majority of heating would have been provided anyway by the primary heat source (again, solar or heat pump). However, the impact of not allowing operation at the crucial times would be significant and potentially render a product non-compliant with standards requirements and regulations, particularly hygienic protection.

It is important to continue to exclude low energy consumption products such as electric-boosted solar and heat pump water heaters. The reason is the same given in previous consultation in regards to the low impact that demand response control would have for high energy during peaks, but also, the low energy off-loading that they could provide for excess grid power at times when there is renewable energy surplus. This is particularly the case for low heating capacity heat pumps (0.4 kW – 0.8 kW).

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? If 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).

Smart homes, the internet of things (IoT), energy efficiency, connectivity and remote management and optimised load-control based on intelligent systems that provide whole-of-house management, optimising PV energy self-consumption/export, is the way in which energy is being increasingly used and manipulated and many are already trying and doing this to varying degrees of success.

We are aware of companies that offer smart energy monitoring and limited management, geared towards different outcomes, usually by optimising on-site PV production (with and without batteries) and purchased grid energy, in different ways:

- optimising on-site consumption
- optimising on-site export
- maximising appliance usage and storing energy from grid electricity at times when purchased value is very low, or even negative
- optimising appliance usage from on-site energy production with no purchased electricity at times when grid energy is expensive

The more advanced energy management systems (EMS) implement complex and elaborate feedback control schemes, using solar predictive analytics for forecasting and are capable of learning the energy consumption habits of the house, even to the level of single monitored devices, to provide the best optimisation for PV home use; energy and cost savings.

This goal generally is the best utilisation of energy via smart application of distributed energy resources (DER), with homes having many DER, such as those priority appliances targeted in this consultation process.

Several companies provide the above in some way, some more than others (Intelligent Automation, Reposit Power, Redback Technologies, SMA, to name a few).

Intelligent Automation has a smart control product named the **GSwitch**, which together with their proprietary software control is capable of doing all of the above and more, as it can integrate with those priority appliances such as pool pumps, water heaters, air conditioners, plus others, to make them DRM-enabled. We understand the **GSwitch** is AS/NZS 4755.2 compliant already.

Link to the product: <http://gswitch.com.au/>

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

On the contrary, as they will all have the same end-result and that will mean less energy ‘peaks’ and ‘troughs’ in the grid.

In fact, we would welcome as many different systems as possible and it is expected that the best overall will remain, as it tends to happen with competing technologies in free markets.

Eventually, the control outcomes outlined above would take care of the problems trying to be curtailed by the proposal of DRM capabilities of this study: stress on electricity networks due to unmatched energy demand at times of energy scarcity or energy surplus.

We believe this would happen as it would be in the best interest of end-users to manage their energy to take advantage of the most economically favourable times to use it.

It would appear to us that this will be the natural evolution of smart control and integration of products with centralised and decentralised energy provision and usage, so it would, in fact, render DRM proposals such as these obsolete as they provide much more and much smarter functionality and better outcomes.

A whole-of-house energy management and control, with interdependence between all components, appliances and energy production and usage, is the best approach to satisfying the objectives of the DRM proposal, rather than mandating the implementation of restrictive and limited DRM capabilities in appliances.

In the not so distant future we see the smart use of DER working together to provide these outcomes.

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?

Besides air conditioners as mentioned in the consultation paper (and used for several years with demand response control under the 'Peak smart' program in QLD), we are not aware of any other appliances incorporating this ability. As mentioned above, we are aware of the *GSwitch* control device that can connect and control those priority appliances and make them DRM-capable.

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?

Absolutely, as mentioned in **b)**. We believe this will be the reality, to the point where a voluntary DRM scheme will actually be ignored by manufacturers in pursuit of smarter DER control systems.

For many years, Stiebel Eltron has provided a smart EMS, whole-of-house, option for our ventilation and heat pump products, using the SMA control and management platform.

Currently, our company is engaged in this type of work with several other companies to extend this to other platforms, giving end-users a wider choice to suit their overall needs and preferences.

Resource investment in this type of work is much more reasonable, with the expectation of much more versatile and fruitful control management outcomes, than attempting to modify our products to satisfy the limited DRM requirements.

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

For a mandated scheme these would be negative as in added costs to manufacturers and end-users with the only ones directly benefitting apparently being the network distributors.

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

Financial incentives.

As mentioned before, we believe the best option moving forward is to embrace existing and evolving DER management technologies and processes, where appliance manufacturers, installers and energy utilities dedicate resources to this, rather than to the implementation of DRM schemes as proposed in the consultation.

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)?

The answer to all three is **0%**.

Please contact me for any questions or observations in regards to this submission.

We would be grateful for any news and information of continued developments on this matter and as stakeholders would welcome further participation in any additional work that may be eventuate.

Thank you.

Yours faithfully,

Dr. Raniero Guarnieri
Technical Manager