



**TRANSPOWER**

*Keeping the energy flowing*

Waikoukou  
22 Boulcott Street  
PO Box 1021  
Wellington 6140  
New Zealand  
P 64 4 495 7000  
F 64 4 495 6968  
[www.transpower.co.nz](http://www.transpower.co.nz)

The Equipment Energy Efficiency Committee

Sent by email to [smartappliances2019@sa.gov.au](mailto:smartappliances2019@sa.gov.au)

## Consultation Paper: 'Smart' Demand Response Capabilities for Selected Appliances

Transpower New Zealand welcomes the opportunity provide feedback on the consultation paper "*Smart' Demand Response Capabilities for Selected Appliances, August 2019*".

We support the proposal to mandate compliance with the demand response modes in AS/NZS 4755.

Transpower New Zealand owns and operates New Zealand's national grid – the high voltage transmission network connecting areas of generation with towns and cities across New Zealand.

New Zealand's electricity system is unique. There is no other country in the world that generates its electricity from the same mix of generation sources, with the same low levels of energy storage and without a grid connection to another country's energy resources. It's against this backdrop that New Zealand will shortly find itself in the midst of a global energy transformation.

Significant new technologies are emerging, enabling households, businesses and the industry to rethink traditional notions of energy. We're investigating innovative ways to respond to electricity demand. Managing peak electricity demand is an alternative to transmission investment. There may be a situation where we forecast that the network will need new investment because electricity demand in the region is predicted to grow substantially. We could defer this investment if we use demand response at peak times, slowing down the peak load growth in a region. Less transmission infrastructure means lower electricity costs for end consumers.

It's a win-win situation where consumers are compensated for their involvement and see lower charges long term, while helping us manage demand on the grid. It is within this context that we provide our submission.

If you would like to discuss any of the points included in our submission, please contact me by phone +64 21 707114 or email [quintin.tahau@transpower.co.nz](mailto:quintin.tahau@transpower.co.nz).

Yours sincerely,

Quintin Tahau

**Manager EMS Development, Transpower New Zealand Limited**

## Responses to Questions

Question	Response
<p>1. Do you support the proposal to mandate compliance with AS/NZS 4755 for the nominated priority appliances? Please give reasons.</p>	<p>Transpower supports the proposal to mandate compliance with AS/NZS 4755 for the nominated appliances.</p> <p>Heat pumps and pool pumps are a potential distributed energy resource (DER) that, if coordinated well, provide a valuable opportunity for the power system to engage with consumers through demand response programmes.</p> <p>We support the extension of pool pump controllers for New Zealand as well as Australia.</p> <p>Coordination of these DERs would allow consumers to be rewarded for flexibility in their electricity usage to support the power system primarily during periods of high electricity demand.</p> <p>Fragmentation of technologies and communications protocols is a barrier for participation in demand response programmes. Adopting a common and open standard such as AS/NZS 4755 will reduce this barrier.</p>
<p>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?</p>	<p>a) AS/NZS 4755 is a well-defined protocol that has already been readily adopted by some appliance manufacturers. OpenADR and SEP 2.0 are other alternative options for consideration that we have experience with.</p> <p>b) Yes, we agree. Demand response capabilities on energy efficiency labelling and compliance should be linked and mandatory.</p>
<p>3. Do you support: a. permitting compliance with <i>either</i> AS/NZS 4755.3 <i>or</i> (DR) AS 4755.2? b. requiring compliance with all Demand Response Modes (DRMs)?</p>	<p>a) Yes, we support both options.</p> <p>b) Yes, we support requiring compliance with all DRMs.</p>

<p>4. Do you agree with the scope of the proposal:</p> <ul style="list-style-type: none"> <li>a. air conditioners: up to 19 kW cooling capacity;<sup>1</sup></li> <li>b. pool pump-unit controllers;</li> <li>c. electric storage water heaters (excluding solar-electric and heat pump water heaters);<sup>2</sup> and</li> <li>d. charge/discharge controllers for electric vehicles (SAE Level 2 or IEC Mode 3).</li> <li>e. If not, what products (or capacity limits) would you propose be included or excluded, and why?</li> </ul>	<p>We partly agree.</p> <p>Transpower propose to extend the scope to include 4755.3.5 (electrical energy storage (EES) systems) as part of the scope of the proposal.</p> <p>With the current uptake of storage devices across Australia and New Zealand, the same potential for market fragmentation identified by E3 may occur again. This could also be addressed by adopting a common and open standard such as 4755.3.5 and signalling this to market early.</p> <p>We agree with all other points.</p>
<p>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).</p> <p>b. Would adoption of proprietary “smart home” systems undermine the benefits of peak demand reduction into the future?</p> <p>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?</p> <p>d. Is there a risk that a mandatory AS/NZS 4755 standard</p>	<p>a) Yes, Transpower operates a Demand Response Management System that communicates with many smart home devices such as batteries, Ambi Climate heat pump controllers and Futurepoint DREDS (AS/NZ 4755) devices. We are willing to share information about our platform and how we operate with these smart devices.</p> <p>b) Transpower’s experience is that the more demand side capability there is in the industry the more successful Demand Response Programmes are at meeting peak demand and achieving benefits. Proprietary smart home systems do not undermine the benefits of peak demand potential.</p> <p>c) Since starting our DR programme in 2012, smart devices and DER have become fast growing global markets. The number of devices with the ability to connect to demand response programmes is difficult to estimate however the range is diverse and the number vast. Transpower’s current demand response programme and platform intergrates with directly with Ambi Climate, Futurepoint DREDS and is an OpenADR 2.0b certified virtual top node (VTN) to name a few, there are many more. The provision of DREDS and OpenADR interfaces through our platform enables an endless array of potential new device types.</p> <p>d) Yes, the evolution of smart home appliances is fast moving, so standards such as DREDS must keep pace to maintain relevance. We have seen the evolution of OpenADR with good</p>

<p>may become obsolete as new technologies/innovative products achieve the same objectives without using AS/NZS 4755?</p>	<p>governance through the OpenADR alliance. AS/NZ 4755 could develop something similar to manage the risk of obsolescence.</p>
<p>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?</p>	<p>While this question is better answered by device manufacturers we estimate the cost to be relatively low if the device can be updated remotely assuming no hardware changes are required.</p>
<p>7. Are the data and assumptions used in the cost-benefit estimates reasonable? Do you have information or data that can improve these estimates?</p>	<p>The data and assumptions for New Zealand are somewhat opaque in the consultation paper so it is difficult to assess. For example, an assumption is made on page 34 that 380MW is available in New Zealand for routine curtailment without any addition information. If peak demand across New Zealand is roughly 6,500MW then 380MW is a conservative estimate as it equates to approximately 20% of all households with a heat pump. Note that a 2009 BRANZ survey suggested that 21% of dwellings had heat pumps and given the projected growth it should be assumed that a higher (not lower) percentage of dwellings will have heat pumps.</p>
<p>8. Do you think the estimates of activation rates and costs are reasonable? Do you have information or data that can improve these estimates?</p>	<p>No comment.</p>
<p>9. Do you think the estimates of annual participant costs are reasonable? Do you have information or data that can improve these estimates?</p>	<p>Transpower's demand response programme was designed to develop demand response as a transmission alternative and has been running since 2012. Through the course of the programme we have developed a good understanding of the likely costs for different consumer groups across a range of scenarios on the power system.</p> <p>Our programme uses a price responsive structure (\$/MWh) with a reverse auction for most consumers, however participants can select a pre-determined price point (\$/MWh) at which they will respond to demand response events automatically. Each participant is paid at the price agreed at the end of the Event Offer Window.</p> <p>We are unable to provide individual price points for our participants, however the average for our FY2018/19 programme was \$976/MWh across all events.</p> <p>It must be stressed that this pricing sits outside the New Zealand wholesale electricity market as it is designed to signal transmission needs, typically during times of peak demand in areas where constraints on the network are forecast. Most participants in the programme are not</p>

	exposed to the wholesale electricity price so they are unlikely to respond to an elevated wholesale price during peak demand periods.
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?	Yes, we agree that the lack of demand response capable products is a barrier to entry. Mandating demand response capability for these products will enable activation but will not lead to consumer enrolment without proper consumer engagement.
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?	Yes, we agree if existing infrastructure is used.
12. What implications (positive or negative) would the proposals have for your industry, in terms of activity, profitability and employment?	The primary implication is that a number of connected devices will increase and therefore the potential demand response participation will grow.
13. What can appliance suppliers, installers and energy utilities do to facilitate customer enrolment in direct load control or demand response programs?	Transpower, as a demand response programme operator, would facilitate customer enrolment by establishing programmes that incentivise consumers/aggregators. Appliance suppliers and installers would be channels for consumers to enrol in those programmes.
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)?	No comment.
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?	No comment.

<p>16. Do you consider that there are any major technical or functional issues related to the proposal? If so, how should these be addressed?</p>	<p>One consideration should be given to post-installation activation. How will a consumer activate the DREDS functionality after the device is installed? This is particularly important for a consumer who has purchased a property with pre-installed devices that have not been activated.</p> <p>An extension to this is a scenario where a consumer purchases a property with an activated device but chooses to not participate in demand response. What is the workflow to de-activate a device?</p>
<p>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?</p>	<p>The measurement, verification and payment of DR performed by devices should be determined by the DR programmes themselves.</p> <p>Recommended notional baselines would be well received by Transpower and would be useful during programme designs. There are however times where a mandatory baseline method would not be preferred, such as a ‘Firm Service Level’ (FSL) DR programme, where a signal may be sent to control demand of devices at a certain kW level (or DRM) as opposed to measuring a typical demand reduction.</p>
<p>18. How will the proposal impact on electricity prices and energy network costs and investment requirements?</p>	<p>Reducing barriers to entry for residential consumers to join demand response programmes through the adoption of AS/NZ 4755 will enable DR capability to grow.</p> <p>Through Transpower’s Regulatory Control period 2 (RCP2), the intent has been to evolve DR into a standard transmission alternative (TA) option within our investment analysis tools when transmission projects are evaluated. Based on the planned investments which could utilise DR as an alternative out to 2040, the value of a typical two-year transmission deferral is estimated to be \$36 million. The financial benefit to Transpower of a deferral is approximately the value of the deferred investment times the regulated WACC</p>
<p>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?</p>	<p>No, we do not believe that the effectiveness of the proposal depends on the implementation of cost-reflective pricing.</p>
<p>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?</p>	<p>Yes, from an electricity transmission perspective the location of devices is extremely important given that peak demand issues are not often a nationwide problem. At a distribution level, those issues become even more focussed given the electricity demand profile and network augmentation differences.</p>

<p>21. (To electricity network service providers, electricity retail companies and DR aggregators specifically).</p> <p>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?</p> <p>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?</p> <p>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?</p> <p>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?</p>	<p>a) Transpower offers payment to participate in demand response programs. Transpower as the transmission owner does not set residential tariff rates and therefore could not offer those to consumers.</p> <p>b) If AS/NZ 4755 was adopted, then Transpower would likely shift our programme design requirements to accept devices that meet that standard and discontinue other non-standardised protocols. The aim of which would be to avoid market fragmentation and having to integrate with many different devices types/manufacturers that increases operational programme costs.</p> <p>c) No comment</p> <p>d) Transpower's DR programmes work in aggregation of each other and residential consumer DR capability would be stacked with other DR providers. The more capability there is in a DR programme the more downward pressure there is on the cost to run a DR programme and the more deferral value there is.</p>
<p>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?</p>	<p>No comment.</p>
<p>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?</p>	<p>n/a</p>

<p>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?</p>	<p>n/a</p>
<p>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?</p>	<p>The New Zealand Electricity Industry Participation Code 2010 does not prohibit DNSPs or TNSPs from investing in demand response programmes and it is not clear if there is direct interaction with the proposal.</p>
<p>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?</p>	<p>Not applicable for New Zealand.</p>
<p>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?</p>	<p>No comment.</p>
<p>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:</p>	<p>n/a</p>

<p>a. Meet the minimum requirements of the relevant part of AS/NZS 4755;</p> <p>b. Meet additional requirements (e.g. additional DRMs); and</p> <p>c. Comply with other published DR standards (please state which)?</p>	
--	--