

# ‘Smart’ Demand Response Capabilities for Selected Appliances

Joint response to the South  
Australian Government

30 September 2019



Part of the Energy Queensland Group



## **ABOUT ERGON ENERGY**

Ergon Energy Corporation Limited (Ergon Energy) is part of the Ergon Energy and Energex Group and manages an electricity distribution network which supplies electricity to more than 740,000 customers. Our vast operating area covers over one million square kilometres – around 97% of the state of Queensland – from the expanding coastal and rural population centres to the remote communities of outback Queensland and the Torres Strait.

Our electricity network consists of approximately 160,000 kilometres of powerlines and one million power poles, along with associated infrastructure such as major substations and power transformers.

We also own and operate 33 stand-alone power stations that provide supply to isolated communities across Queensland which are not connected to the main electricity grid.

## **ABOUT ENERGEX**

Energex Limited (Energex) is part of the Ergon Energy and Energex Group and manages an electricity distribution network delivering world-class energy products and services to one of Australia's fastest growing communities – the South-East Queensland region.

We have been supplying electricity to Queenslanders for more than 100 years and today provide distribution services to almost 1.4 million domestic and business connections, delivering electricity to a population base of around 3.4 million people via 52,000km of overhead and underground network.



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## 1 INTRODUCTION

Ergon Energy Corporation Limited (Ergon Energy) and Energex Limited (Energex) welcome the opportunity to provide comment to the South Australian Government on consultation paper 'Smart Demand Response Capabilities for Selected Appliances'.

This submission, which is available for publication, is provided by Ergon Energy and Energex as distribution network service providers (DNSPs) operating in Queensland.

Ergon Energy and Energex are committed to providing:

- safe, reliable and affordable electricity supply;
- a great customer service experience;
- customers greater control over their energy consumption;
- efficient and sustainable energy solutions; and
- access to the next wave of energy linked innovative technologies and renewables.

In December 2018, the Council of Australian Governments (COAG) Energy Council agreed to draft a Regulatory Impact Statement for certain appliances to be demand response capable with the South Australian Government as the lead under the Energy Equipment Efficiency (E3) Program.

The consultation paper explored some options for to facilitate the creation of a market for demand response services. The primary proposal is to mandate compliance with relevant parts of AS/NZS4755 for 4 types of electrical products:

- Air-conditioners
- Electric Hot Water Systems
- Pool Pumps
- Electric Vehicle Charge Controllers

The South Australian government has requested that interested parties make submissions on the issues paper by 23 September 2019 however Ergon Energy and Energex has sought an extension until 27 September 2019.

Ergon Energy and Energex's comments in response to the issues paper are provided in sections 2 and 3 of this submission. We are available to discuss this submission or provide further detail regarding the issues raised.

## 2 KEY MESSAGES

Ergon Energy and Energex broadly support the efforts of the South Australian Government and the Council of Australian Governments (COAG) to facilitate the creation of a market for demand response services. Ergon Energy and Energex remain supportive of promoting greater levels of demand side participation in the market to lower customers' electricity costs and increase system reliability and security in the NEM and is also generally supportive of the AEMC's longer-term view that the electricity market should move towards becoming a two-sided market in which both the supply and demand side actively participate in dispatch and price setting.

Ergon Energy and Energex recognise and support the role that Australian Standards play in gathering input from key stakeholders and developing standards which are valued and provide greater economic efficiency. In particular, Ergon Energy and Energex recognise the value provided by AS/NZS 4755 in the development of our *PeakSmart* Demand Response Program which now has over 100,000 units from voluntary customer participation and choice of compliant products. The use of this minimum performance standard has allowed:

- Networks to provide a signal to participating customers when network support is required
- Networks to provide a simple signal to participating customers on the level (high, medium or low) of support that is required
- Allow a set & forget approach for participating customers to respond
- Allowed a simple and efficient mechanism for allowing Ergon Energy and Energex to quantify the size (kW) of the demand response to justify the financial reward

We recognise that Australia is a relatively small market and there are risks associated with enforcing a local, as opposed to an International, standard. We believe that this risk can be mitigated by ensuring that AS/NZS 4755 is compatible with other standards, particularly with respect to AS/NZS 4755.2 and AS/NZS 4755.3.4, which are still in draft. In the absence of this compatibility, we support the intent of mandating AS4755 in order to ensure faster uptake and higher penetration of demand response capable appliances. We believe that costs will not be prohibitive, having seen manufacturers voluntarily develop compliant air-conditioner products based on the recognised value of network services alone. *PeakSmart* has shown that without a mandated standard a market can be generated but at additional effort and cost.

Ergon Energy and Energex recognise the challenge of the current situation, where most existing tariffs do not provide signals to customers about the price of delivering energy over time and prohibit rewarding and/or penalising respective behaviours. We recognise the important role that tariff reform plays filling this gap and how demand response capable appliances and associated programs can both complement appropriate tariffs or provide an alternate mechanism for direct incentives.

Given the complexity and range of change in the energy industry we believe that this proposal requires further consultation and careful consideration to ensure the right outcome and are happy to provide further input into this process.

## 3 TABLE OF DETAILED COMMENTS

Consultation Paper Feedback Question	Ergon Energy and Energex 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>Ergon Energy and Energex recognises the challenge of the current situation where the absence of cost reflective tariffs restricts ability to pass on the signals to customers about the price of delivering energy at particular point in time and also prohibits rewarding/penalising respective behaviours.</p> <p>Ergon Energy and Energex remains supportive of promoting greater levels of demand side participation in the market to lower customers' electricity costs and increase system reliability and security in the NEM and is also generally supportive of the AEMC's longer-term view that the electricity market should move towards becoming a two-sided market in which both the supply and demand side actively participate in dispatch and price setting.</p> <p>Demand Response (DR) Standards, such as those proposed, are key enablers to assist customers to partake in demand side participation. Ergon Energy and Energex supports standardising DR capability in the nominated appliances in absence of cost reflective tariffs. However, in order to support mandating this Standard (AS/NZS 4755) over others, Ergon Energy and Energex would recommend further information is provided to stakeholders on:</p> <ul style="list-style-type: none"> <li>• compatibility of the proposed Standard with widely adopted international Standards; and</li> <li>• materiality of restrictions that this proposal would place on nominated appliances to comply with future international Standards.</li> </ul> <p>This would allow stakeholders to provide a more considered response to this consultation paper. This is particularly, relevant to AS/NZS 4755.3.4, as this Standard is still a draft.</p> <p>Ergon Energy and Energex also notes that Electric Vehicles (EV) charge/discharge controllers should be a high priority appliance and considers that the current 'infant' stage of the industry is the perfect</p>

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Consultation Paper Feedback Question	Ergon Energy and Energex response
	time to embed DR capability. However, as iterated above, Ergon Energy and Energex would like to further understand the materiality of restrictions that this proposal would place on EV chargers to comply with future international Standards.
<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) We believe that a successful market for demand response services will require a suite of solutions including tariff reform (reflected in retail tariffs) and baseline demand response standards. However effectiveness of cost reflective tariffs in meeting the objectives of the proposal is not known. In the absence of above tariffs and a competitive DR market place, mandating a minimum compliance is considered necessary to achieve the penetration of DR responsive appliances in a timely fashion, or where market failure exists.</p> <p>(b) No, It can be viable where incentive programs are in place to encourage buyers to voluntarily purchase products with specific DR capabilities</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 – as this provides flexibility for manufacturers and AS/NSZ 4755.2 should significantly reduce communication and hardware costs.</p> <p>(b) Yes – as this provide flexibility for Remote Agents.</p>
<p>4. Do you agree with the scope of the proposal: a. air conditioners: up to 19 kW cooling capacity;<sup>70</sup> b. pool pump-unit controllers; c. electric storage water heaters (excluding solar-electric and heat pump water heaters);<sup>71</sup> 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?</p>	<p>Yes to a, b and c</p> <p>(d) Support mandating DR capability in EVs. Ergon Energy and Energex also notes that EV charge/discharge controllers should be a high priority appliance and considers that the current ‘infant’ stage of the industry is the perfect time to embed DR capability. As outlined in Q1, AS/NZS 4755.3.4 is still a draft. Ergon Energy and Energex would like to further understand the materiality of restrictions that this proposal would place on EV chargers to comply with future international Standards.</p>

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Consultation Paper Feedback Question	Ergon Energy and Energex response
<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? 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?</p>	<p>(a) Smart home devices in the market today are already capable of managing downstream AS/NZS 4755 compliant appliances.</p> <p>(b) No, devices compatible with AS/NZS 4755, can be controlled by a local smart home device, as well as a remote agent (e.g. DNSP).</p> <p>(c) Given the time constraints of the consultation, we are unable to give a comment at this time. We welcome opportunity to discuss further.</p> <p>(d) Given the time constraints of the consultation, we are unable to give a comment at this time. We welcome opportunity to discuss further.</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>Ergon Energy and Energex anticipates that AS/NSZ 4755.2 should significantly reduce communication and hardware costs, compared to AS/NSZ 4755.1.</p> <p>Cost estimates for compliance contained in the document appear to be reasonable for air-conditioners, pools and hot water systems.</p>

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	<p>Compliance with additional modes, would add some cost, but would also enable greater DR benefits and customer value to be realised. Importantly DRM 4, could assist with low voltage network management.</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>Given the time constraints of the consultation, we are unable to give a comment at this time. We welcome opportunity to discuss further.</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>The discussion paper states that: <i>“benefit/cost ratio of exactly 1.0 (at a 7% discount rate) ... To achieve cost-effectiveness in Australia, at least 2% of the total AC stock needs to be activated by 2035, 6% of the pool pump controller stock, 11% of the water heater stock and 3% of the EV charge controller stock. For New Zealand, the minimum cost-effective activation rates are higher.”</i></p> <p>Based on our experience with the PeakSmart air conditioning program, activation rates of around 10% have been achieved, however noting that there is an incentive on offer. Ergon Energy and Energex therefore considers that the activation rates for air conditioning appear to be reasonable.</p> <p>In Queensland, around 60% of hot water heaters are electric storage systems, of which around half are on load control tariffs. Load control tariffs are a form of Direct Load Control. Once again, there is an incentive in place in the form of discounted energy price.</p> <p>Based on our experience, activation rates depend on incentive amount; ease of activation and participation; perceived loss of amenity; and appliance/installer and customer education.</p>

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Consultation Paper Feedback Question	Ergon Energy and Energex response
<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>Given the time constraints of the consultation, we are unable to give a comment at this time. We welcome opportunity to discuss further. We welcome opportunity to discuss further.</p>
<p>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?</p>	<p>Yes, however it is not the only barrier. Energex and Ergon Energy has a DR program where the appliance (e.g. Water Heater and Pool Pumps) does not have built in DR capability but it requires additional technology (e.g. upstream relay) and additional tariff charges. This approach (i.e. on/off) is not suitable for all kind of appliances (e.g. air conditioners).</p> <p>Ergon Energy and Energex supports standardising DR capability in the nominated appliances as a key enabler to increasing demand side participation of small customers. In addition to standardising DR capability, adequate activation rates will require the right combination of incentive amount; perceived loss of customer amenity; ease of activation and participation; and appliance/installer and customer education.</p>
<p>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?</p>	<p>This requires further investigation and heavily depends on the scale and requirements of the system. For example, market supplied IOT platforms which supports multiple functions (&amp; value streams) could represent a low-cost scenario however dedicated platforms could be considerably more expensive.</p> <p>For Ergon Energy and Energex, the cost is low due to having existing communication infrastructure combined with the application of a Performance Based Standard (such as AS/NZS 4755). This has allowed us to overcome the limitations of the existing communication system (i.e. lack of two-way communications) and removed the additional cost required for measurement and verification of individual appliance performance.</p> <p>We envisage that alternate communication platforms will be required to enable DR applications where granular level of control and two-way communication is required in conjunction with AS/NZS 4755.2. If</p>

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	these are also existing, then costs can be low however we expect the costs of establishing new dedicated communication platforms to be high.
12. What implications (positive or negative) would the proposals have for your industry, in terms of activity, profitability and employment?	Given the time constraints of the consultation, we are unable to give a comment at this time. We welcome opportunity to discuss further.
13. What can appliance suppliers, installers and energy utilities do to facilitate customer enrolment in direct load control or demand response programs?	In addition to standardising DR capability, adequate activation rates will require the right combination of incentive amount, ease of activation and participation and appliance/installer and customer education.
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)?	Considered unlikely but possible as typically Australia is a “technology taker”. Some manufacturers/suppliers could withdraw from competing in the Australian market, particularly in light of current lack of regulatory support, limited vehicle choice and lack of incentives.
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?	Given the time constraints of the consultation, we are unable to give a comment at this time. We welcome opportunity to discuss further.

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<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>	<ul style="list-style-type: none"> <li>• Coordination of DR remains an issue of concern for Ergon Energy and Energex. DR at the local level is used by distribution network service providers (DNSPs) to respond to local network issues that will be different to broader market demand issues. As such in response to the AEMC’s Wholesale DR Mechanism Ergon Energy and Energex stated that <i>“Ergon Energy and Energex also recommends that further consideration is given as to whether DNSPs and other impacted participants should be provided with advance notice when a large-user is intending to enter into an agreement with a DRSP and when they will be participating in the wholesale demand response mechanism, including when they will be dispatched.”</i> The same recommendation would apply here, but rather than a large user, it would relate to a large aggregate of customers in a localised area.</li> <li>• However in order to support mandating this particular Standard (AS/NZS 4755) over others, Ergon Energy and Energex would recommend further information is provided to stakeholders on:             <ul style="list-style-type: none"> <li>• compatibility of the proposed Standard with widely adopted international Standards; and</li> </ul> </li> </ul> <p>materiality of restrictions that this proposal would place on nominated appliances to comply with future international Standards.</p> <p>This would allow stakeholders to provide a more considered response to this consultation paper. This is particularly, relevant to AS/NZS 4755.3.4, as this Standard is still a draft.</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>Ergon Energy and Energex supports the AS/NZS 4755 framework as it provides a simple effective means of measuring and baselining DR.</p> <p>Measurement and verification approaches should be developed. Estimation of baselines may not give accurate reflection of changes in DR events.</p>
<p>18. How will the proposal impact on electricity prices and energy network costs and investment requirements?</p>	<p>A competitive and functional DR market has the potential to reduce network augmentation and reduce energy network costs in the mid to longer term.</p>

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<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>Both DR compatible appliances and cost reflective tariffs are required (complimentary initiatives) to reduce network augmentation and reduce energy network costs in the mid to longer term.</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>Urban areas likely to yield higher activation rates of appliances, however regional areas could yield higher benefits with lower penetrations (e.g. end of SWER lines). As outlined above, activation rates depends on incentive amount; perceived loss of amenity; ease of activation and participation; and appliance/installer and customer education.</p>
<p>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</p>	<p>(a) Energex and Ergon Energy are seeking to procure DR from the market during 2020-25 to complement our existing DR programs. We have also submitted a Tariff Structure Statement which complements our proposed DR programs over the period.</p> <p>(b) Yes. In the future we will looking to procure DR either from the market or directly from customers. Energex and Ergon Energy has just commenced a trial to procure DR from the market.</p> <p>(c) As outlined above, activation rates depend on incentive amount; perceived loss of amenity; ease of activation and participation; and appliance/installer and customer education.</p> <p>(d) In residential areas of network constraint, around 0.5 MVA/year is required to offset growth driven augmentation.</p>

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Consultation Paper Feedback Question	Ergon Energy and Energex response
<p>“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?</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>Currently Energex and Ergon Energy have around 10% of air-conditioners sold in Queensland are participating in PeakSmart initiative and around half of those homes with electric storage hot water systems are connected to a load control tariff.</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>Given the time constraints of the consultation, we are unable to give a comment at this time. We welcome opportunity to discuss further.</p>

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Consultation Paper Feedback Question	Ergon Energy and Energex response
<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>Given the time constraints of the consultation, we are unable to give a comment at this time. We welcome opportunity to discuss further.</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>Existing electricity market rules are supportive as they are looking to increase demand side participation thus it would be complementary with the proposal in terms of increasing appliances that have capability to participate.</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</p>	<p>Given the time constraints of the consultation, we are unable to give a comment at this time. We welcome opportunity to discuss further.</p>

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<p>wholesale demand response mechanism changes announced by AEMC also reduce the network investment benefits attributable to mandating AS/NZS 4755?</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>Possibly, but this is expected to incur higher cost in short to medium term.</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: 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)?</p>	<p>Given the time constraints of the consultation, we are unable to give a comment at this time. We welcome opportunity to discuss further.</p>