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EEAT Secretariat
Department of the Environment and Energy

23 September 2019

'Smart' Demand Response Capabilities for Selected Appliances

Thank you for the opportunity to comment on the initiative regarding appliance demand response capabilities.

Daikin Australia is recognized as a leading air conditioner manufacturer. As one of the regions most trusted names in air conditioning, Daikin can be found in homes, offices, hotels, and shops across Australia and around the world.

Daikin Australia has ten branches and six major service centres nationwide including a production facility in Australia. We distribute products through the trade specialist installer.

We would like to thank the Department for the work undertaken including active consultation with industry.

Daikin supports voluntary capability for air conditioners utilising modes based on rated capacity as described in the 2012 version standard.

We would like to comment further as follows.

Mandatory Demand Response

Daikin Air conditioners offer demand response capability as an option part. Mandating demand response inclusion is inefficient as it applies cost burden for all consumers to benefit only a few that activate demand response.

Air conditioner manufacturers currently offer demand response capability in most products on the market. Consequently, mandating demand response capability is unlikely to increase participation by consumers. It appears the barrier to consumer participation is not the availability of demand response air conditioners.

Daikin supports voluntary demand response as an option part to minimise burden on consumers.

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Demand Management Programs

Energy Queensland operates a successful voluntary demand management program with around 1.1 million customers participating, including households, businesses and major customers. They continually engage with stakeholders and customers and have identified:

“Stakeholders want to see demand management implemented to provide a cost effective and market driven solution.” “They expect us to collaborate with and provide incentives to customers and the supply chain to assist in demand management delivery and uptake.” Energy Queensland Demand Management Plan 2019-20, page 16-17.

It appears more could be undertaken by other energy retailers and distribution providers with support from Government.

Technical Standards

Daikin does not object to an optional digital communication pathway for demand response of electrical products.

The proposed air conditioner standards reference normal operation to limit consumption as a percentage based on conditions immediately prior to the demand response event.

An air conditioner may not be operating at the start of the event. It may be fully or partially loaded depending on outside and inside temperatures, user settings such as thermostat and fan speed, building construction and quality of installation.

This reduction is a fraction of operation at the start of the demand response event. For DRM2 at 50% reduction, air conditioners starting at 100% operation will be restricted to 50% capacity, with air conditioners starting at 50% partial operation would be restricted to 50% x 50% or 25% capacity. The percentage restriction of an air conditioner that is not operating immediately before or after the demand response signal is unclear.

Residential consumers would unfairly experience different outcomes due to the operating circumstances adjacent to an event. It is possible and very likely for consumers in an apartment building, with identical living space and air conditioners to experience considerably different outcomes simply caused by when the air conditioner was started.

An air conditioner manufacturer has no control of ambient temperatures, user settings including start/stop/thermostat/fan operations, building construction and installation quality. The requirement that an air conditioner manufacturer would manage consumption based on these items is unreasonable.

Additionally, the CSIRO Technical Report EP175701 identifies:

“The responses to DRM2 and DRM3 commands were observed in some makes ... but not in others. This observation suggests that many air conditioners implement the 2012 version of the AS/NZS 4755 standard.” page2.

Daikin **does not** support standards AS/NZS 4755.3.1:2014 and DR AS 4755.2:2019. These two standards are not consistent with the Japan Echonet specification because of normal operation reference.

The previous air conditioner standard limits the air conditioner consumption based on a percentage of rated capability same as the Echonet specification in Japan. Daikin supports AS/NZS 4755.3.1:2012 only.

We trust the above is of assistance and for further clarification please contact the writer at gknox@daikin.com.au or phone 0477 011 288.

Yours Faithfully

A handwritten signature in black ink, appearing to read 'Gary Knox', written in a cursive style.

Gary Knox
BEng (Hons) F.AIRAH
Engineering Manager
DAIKIN Australia Pty. Limited

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.

Daikin does not support mandatory demand response inclusion for air conditioners.

Demand response should be an optional part because only a small number of consumers will require this function. The optional part can be fitted to an existing air conditioner when demand response is required by the consumer. Mandatory inclusion of demand response unfairly burdens most consumers with a cost for an unused function.

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?

Yes. Energex and Ergon operate a successful incentive program rewarding consumers that participate on a voluntary basis.

GEMS Act Discussion Paper February 2018

“Voluntary compliance with AS4755 has led to consistent technology being used to control appliances on the electricity network. This has allowed significant market uptake of demand response capability in air conditioning units and will provide a good platform for electricity retailers, networks and other businesses to develop demand response programs as this market develops.”

Page 28.

The draft GEMS Act review November 2018

“The GEMS registration database also indicates that more than 65 per cent of air conditioners available on the market today are demand response capable. The issue appears not to be the availability of demand response appliances, rather the utilisation of that technology. Inclusion of this additional role to the GEMS Program would be a significant shift and is unlikely to be the most effective approach to increasing demand response initiatives within the National Energy Market.”

Page 78.

It appears more could be undertaken by energy retailers and distribution providers. Daikin recommends consideration to reform the electricity market as the preferred policy.

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?

i) Demand response labelling. Daikin does not support.

ii) Voluntary compliance. Daikin supports voluntary compliance by use of optional part as this has proved effective in Queensland.

iii) We only support AS/NZS 4755.3.1:2012 and do not support AS/NZS 4755.3.1:2014 and DR AS 4755.2:2019.

3. Do you support:

CSIRO Technical Report EP175701 identifies: "The responses to DRM2 and DRM3 commands were observed in some makes ... but not in others. This observation suggests that many air conditioners implement the 2012 version of the AS/NZS 4755 standard." Page2.

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

Daikin does not object to an optional digital communication pathway for demand response modes to electrical products.

We only support AS/NZS 4755.3.1:2012 and do not support AS/NZS 4755.3.1:2014 and DR AS 4755.2:2019.

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

Daikin supports partial operation DRM modes relative to rated capacity and does not support modes relative to normal operation.

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

a. air conditioners: up to 19 kW cooling capacity;

Daikin currently provides demand response support by optional part for air conditioners in this scope.

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).

Daikin has no comment.

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

Daikin has no comment.

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?

Air conditioner manufacturers provide high levels of support for demand response according to the draft review of GEMS Act November 2018.

"The GEMS registration database also indicates that more than 65 per cent of air conditioners available on the market today are demand response capable." Page 78.

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?

Daikin has no comment.

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?

Daikin offers no estimate as there is insufficient opportunity to study the proposed new standard DR AS 4755.2:2019 to determine the preferred pathway.

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

AEMO Electricity Statement of Opportunities – August 2019

“Maximum demand over the next five years is forecast to:

- Remain relatively flat in New South Wales and South Australia, and to decline in Victoria, as growth in underlying residential and business load is offset by increasing energy efficiency.
- Continue growing in Queensland, due to growth in the business sector and large industrial loads.
- Grow in Tasmania in the initial years to 2021, driven by large industrial loads, and then to stay flat.” Page 9. Data on page 62.

The current AEMO forecast has been significantly revised down compared to last years forecast.

Daikin recommends revaluating the cost-benefit estimates to the current AEMO forecasts.

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

See above Question 7.

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

See above Question 7.

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?

The draft GEMS Act review November 2018 comments:

“The GEMS registration database also indicates that more than 65 per cent of air conditioners available on the market today are demand response capable. The issue appears not to be the availability of demand response appliances, rather the utilisation of that technology. Inclusion of this additional role to the GEMS Program would be a significant shift and is unlikely to be the most effective approach to increasing demand response initiatives within the National Energy Market.” Page 78.

Daikin believes there is no product barrier to residential programs and consequently mandating demand response capability will not lead to increased participation.

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?

Daikin has no comment.

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

Daikin has no comment.

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

Daikin has no comment.

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)?

Daikin has 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?

Daikin does not comply with AS/NZS 4755.3.1:2014 and DR AS 4755.2:2019 and there is considerable doubt that these standards could be applied. To change from AS/NZS 4755.3.1:2012 would require three years from date of regulation at considerable cost to redevelop all product.

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

CSIRO Technical Report EP175701 identifies: "The responses to DRM2 and DRM3 commands were observed in some makes ... but not in others. This observation suggests that many air conditioners implement the 2012 version of the AS/NZS 4755 standard." Page 2.

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?

Daikin has no comment.

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

Daikin has no comment.

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?

The draft GEMS Act review November 2018 comments:

“The GEMS registration database also indicates that more than 65 per cent of air conditioners available on the market today are demand response capable. The issue appears not to be the availability of demand response appliances, rather the utilisation of that technology. Inclusion of this additional role to the GEMS Program would be a significant shift and is unlikely to be the most effective approach to increasing demand response initiatives within the National Energy Market.”
Page 78.

Daikin recommends consideration to reform the electricity market as the preferred policy.

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?

Daikin has no comment.

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?

Daikin has no comment.

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?

Daikin has no comment.

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?

Daikin has no comment.

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?

Daikin has no comment.

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?

Daikin has no comment.

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?

Daikin has no comment.

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?

Daikin has no comment.

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?

Daikin has no comment.

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?

Daikin has no comment.

b. Would a new class of DR aggregators make use of AS/NZS 4755 DR platform? If so, why. If Consultation Paper: 'Smart' Demand Response Capabilities for Selected Appliances not, why not?

Daikin has no comment.

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?

Daikin has no comment.

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?

Daikin has no comment.

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?

Daikin has no comment.

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;

Daikin currently provides demand response support by optional part for air conditioners in the proposed scope to AS/NZS 4755.3.1:2012

b. Meet additional requirements (e.g. additional DRMs); and

The optional part supports DRM1, 2 & 3.

c. Comply with other published DR standards (please state which)

Daikin only supports AS/NZS 4755.3.1:2012 and do not support AS/NZS 4755.3.1:2014 and DR AS 4755.2:2019.

References:

GEMS Act Discussion Paper February 2018

<https://www.energy.gov.au/publications/gems-act-review-discussion-paper>

The draft GEMS Act review November 2018

<https://www.energy.gov.au/publications/greenhouse-and-energy-minimum-standards-gems-act-review-draft-report>

CSIRO Technical Report EP175701

<https://publications.csiro.au/rpr/pub?pid=csiro:EP175701>

Energy Queensland Group (Energex and Ergon) – Demand Management Plan 2019-20

<https://www.energex.com.au/home/control-your-energy/managing-electricity-demand/demand-management-plan-and-initiatives>

AEMO Electricity Statement of Opportunities – August 2019

<https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Planning-and-forecasting/NEM-Electricity-Statement-of-Opportunities>