energy savings
Industry Association

ESIA Submission:

NSW Government
Energy Security Safeguard
Peak Demand Reduction Scheme
Part 2: ESS Annual Rule Change 2023-24

15 November 2023 (extended to 20 November)

Submitted to Terry Niemeier, Director – Program and Market Development – Safeguard | Energy, Climate and Sustainability | Office of Energy and Climate Change, New South Wales Government

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1. Introduction

The Energy Savings Industry Association (ESIA) welcomes the opportunity to provide this submission to the New South Wales Government for the NSW Energy Security Safeguard Rule Change Part 2: PDRS Consultation which commenced on 19 October 2023. This consultation is being managed by the Office of Energy and Climate Change (OECC).

The ESIA has referred to: https://www.energy.nsw.gov.au/sites/default/files/2023-10/Peak_Demand_Reduction_Scheme_Consultation_Paper_Rule_Change_2.pdf including documents that form this consultation, and attended a public forum on 1 November.

About ESIA

The Energy Savings Industry Association (ESIA) is the peak national, independent association representing and self-regulating businesses that are accredited to create and trade in energy efficiency certificates in market-based energy savings schemes in Australia. These activities underpin the energy savings schemes which facilitate the installation of energy efficient products and services to households and businesses. Members represent most of the energy efficiency certificate creation market in Australia. Schemes are established in Vic, NSW, SA and ACT. Members also include product and service suppliers to accredited providers under the schemes. As well, the ESIA represents member interests in national and state initiatives that include energy efficiency and demand reduction, such as the Federal Government's Carbon Farming Initiative energy efficiency methods and the NSW Peak Demand Reduction Scheme.

Further engagement

We welcome the opportunity to discuss this submission further, please contact the ESIA Executive Officer at comns@esia.asn.au.

This submission can be made public.

2. Responses to consultation questions

1. Do you agree with the update to the equation, adjustment factors and lifetime for SYS2?

Yes and No.

We agree with the proposed amendments to the equation and adjustment factors levering the GEMS data (PAEC and DRT) to build a more robust calculation metric that removes the need to measure total pool volume.

We disagree with the proposed lifetime value of SYS2 as this appears to significantly undervalue the lifespan of energy efficient *variable speed* pool pumps currently available.

We note that the proposed lifetime of 7.25 years is based on an old study from 2016 with a small sample size that had some limitations:

> "Based on the Woolcott survey, among respondents in Australia who were replacing their pool pumps, 20 per cent were replacing pumps 0-5 years old, 42 per cent were replacing pool pumps 5-10 years old, 23 per cent were replacing pool pumps that were more than 10 years old. The remaining 15 per cent did not know the age of the pump they were replacing". E3 Decision Regulation Impact Statement: Swimming pool pumps (p. 60).

The shortcomings of the survey were:

- it was based on a customer survey of replacement rates, rather than any equipment test reports;
- a very small sample size of 131 respondents in Australia;
- and the survey was undertaken in 2016 when *single speed* pumps were prevalent, and these have a lower lifespan due to their continuous high-speed operation. Sales data for the previous five years to 2016 showed an average of 80% sales rate of single speed pool pumps.

ESIA considers a minimum lifetime of 10 years to be reasonable. This aligns with:

- current Australian Tax Office (ATO) Depreciation Rates Table;
- current expectations from pool pump manufacturers and installers as a typical pump has a typical lifespan of 60 months with use primarily in summer (i.e. six months of operation per year.

Note there are no GEMS-registered single speed pool pumps that exceed a start rating of 2, which is well below the ESS and PDRS benchmark of 4.

2. Is the pool pump industry able to meet a requirement that pool pumps have demand response capability and what would the cost impact of this be?

Don't know. The ESIA supports exclusion of DR capability initially.

ESIA member conversations with some pool pump stakeholders suggests that while industry may be able to meet a DR capability responsibility in the future, now it is likely to increase supply and installation costs to the consumer.

3. Do you agree with adding a capacity factor to WH1?

Yes.

ESIA supports adding a capacity factor to WH1 to appropriately apportion peak demand reduction capacity and avoid installation of units that are not fit-for purpose and/or oversized simply to take advantage of a higher incentive.

However, the capacity factor should be aligned across the ESS and PDRS to avoid unnecessary complexity for the market.

This requirement is already well understood by industry as it has been in effect since the inception of F16 activities, so will be straightforward to implement and communicate with the market with minimal disruption.

We cannot comment on the effectiveness of a differing approach without further information regarding the specific calculation method for a WH1 Capacity Factor (using the baseline input power which is determined by the *ComPkLoad* (peak daily (winter) load in megajoules)).

Notably, as the *ComPkLoad* is recorded in the accepted product list for each HP Zone and does not account for the specific electric hot water system currently installed at the premises, an approach using this value may not adequately meet the specified goal of limiting savings to new equipment with a rated capacity less than the original equipment.

4. What evidence should be required under WH1 to ensure that customers aren't being taken off controlled load?

Some members question why customers can't be taken off controlled load as this will erode a significant pool of market opportunities for this activity.

Minimal evidence is likely a reasonable approach given this activity is targeting commercial sites which are generally on a continual tariff and not controlled load.

Possible evidence:

- a copy of the electricity bill before the installation to verify controlled load status which will be a separate line item on the bill, and this is important because controlled load is not during the peak period.
- a copy of the electricity bill after the installation if the customer was on a controlled load before the installation, noting that:
    - this will be a burdensome requirement as it will be challenging to get a copy of the bill after installation, however,
    - it may be justified as a customer is not eligible for PRCs if they were on a controlled load and have been taken off it.
- Date-stamped and geotagged photograph of the switchboard, meter box, NMI etc demonstrating that there is no controlled load meter at the premises.

Any required evidence could be included in a guide published by the scheme administrator with the objective of avoiding being prescriptive and onerous.

A significant scenario suggested is that a large percentage of twin element electric

water heaters are used in commercial applications. These heaters typically have an off -peak control load at the bottom and a continuous rate element at the top. They use a combination of off peak and continuous power. As a result, such HWHPs are providing savings of 70-80%, so even coming off controlled load should result in considerable savings based on off peak (controlled load) tariffs as they are around half the rate of peak rates. This is before solar PV benefits are considered if part of the site, where savings may increase by a further 50-60%.

5. **Is the new air conditioner requirement (equipment requirement 3), as written in the rule, going to be effective to enable consumers to participate in demand response programs using their new air conditioner?**

   In principle, ESIA supports including requirements to support demand response capability in air conditioning units, especially the proposed wording to address current restrictions relating to AS4755.

   However, more clarity is needed to define 'internet connectivity' and what acceptable evidence is needed, noting that simply having internet connectivity does not guarantee compatibility with a demand response aggregator.

   For example, each manufacturer designs their own wi-fi chip and protocols, and having a wi-fi chip in an HVAC system is not sufficient to connect to a demand response program.

   There are concerns that manufacturers could use third-party wi-fi chips simply to meet minimum requirements to obtain PRDS without the capability or intention to integrate with demand response programs.

   What is likely needed is an open API or a manufacturer-developed demand response system and requirements to demonstrate this capability. Note that if this is not the case, then installers will be required to install an external smart thermostat to ensure the newly installed product is eligible for HVAC3. The latter approach seems less attractive in the longer term.

   Finally, further clarity is needed on how IPART will manage product applications and approvals, especially given the GEMS register does not stipulate wi-fi capabilities.

6. **Do you need a transitional period to prepare for the new demand response requirements?**

   Yes, but don't delay the introduction of this activity. Provide a transition period of 6-9 months once clarity on requirements has been provided.

7. **Do you agree with the requirement to verify demand response capacity through dispatch data?**

   Yes

8. **Do you agree with the proposal to leverage data from the Wholesale Demand Response Mechanism to validate PDRS capacity?**

   Yes, in principle but subject to ESIA concerns about additionality and other issues

raised in paper.

9. **Do you agree with the exclusion of RERT and LTESA loads from the PDRS?**

   Yes, and exclude retailer demand response.

10. **Are the implementation requirements sufficient to drive best practice installation of batteries?**

    Probably.

11. **What additional steps can we take to mitigate fire and other safety risks from batteries supported through the scheme?**

    As above, and what the Clean Energy Regulator (CER) and Australian Energy market Operator (AEMO) are doing.

12. **Will there be any challenges meeting the requirement for batteries to be registered on AEMO's DER register?**

    In principle, no. It should be easy enough to do. Notably, the AEMO DER register doesn't include all batteries, so inclusion would give AEMO confidence.

13. **Are there additional requirements you recommend we add to ensure consumers get the best outcomes?**

    Not at this stage: maintain the CER and AEMO requirements.

14. **Do you support the dataset used, data assumptions and proposed calculation method for certificates for activity BESS 1?**

    No. The proposed approach by OECC will not recognise and value the real demand reduction benefits that could be delivered by BESS (batteries).

    Some ESIA members have explored the possibilities in detail and ESIA request further targeted consultation to explore the possibilities further.

15. **Do you agree with the way we've considered round trip losses in the factor of 10%?**

    Yes, in principle.

16. **Do you support the data assumptions and proposed calculation method for certificates for activity BESS2?**

    We disagree. ESIA suggests there are three key issues.

    a) Reconsider the approach to account for a longer lifetime for batteries. The OECC has proposed a limited battery life of eight years. However, batteries last significantly longer and deliver more capacity over more years. (Other ESIA member submissions provide further discussion.) A deemed lifetime of significantly more than the proposed eight years is reasonable especially considering manufacturers routinely warrant batteries to 10 years at up to

70% of capacity. We note the ATO determines asset lifetime of batteries for depreciation at 15 years.

b) It may be fairer to consider batteries over a three-hour period at least, not a six-hour period (the peak period). (Refer to member analysis in other submissions.)

c) Consider how smaller battery sizes would play out e.g. 3-5kW. For example, based on a reasonable scenario now of an 18-23kWh average household daily usage and an 8-10kW battery absorbing that usage), what if smaller battery sizes of 3-5kW prove to be effective, e.g. cycling three times through the peak period of six hours? They may not necessarily wear out three times as fast as battery degradation may be based on overall age of the product rather than the cycle. Consider the current common scenario of a 6kW solar PV system and a 10-15kW battery.

The ESIA understands that the PDRS does not have the remit for a solar activity, and so suggested this be considered at some point such as the 2025 Statutory Review of the NSW Safeguard (including the ESS and PDRS).

17. Are there additional requirements you recommend we add to BESS2 to ensure consumers get the best outcomes?

No.

18. Can you provide evidence of what proportion of a battery's capacity is available for demand response under orchestration contracts?

No, not at this stage. It varies.

19. Can you see any potential issues with the 12-month cadence of certificate creation for each NMI?

Don't know.

20. Do you support the data assumptions and proposed calculation method for certificates for activity HVAC3?

No, it has been proposed to be capped at two hours, and ESIA proposes it should be six hours. i.e., HVAC can be cycled three times in the six-hour peak period and so should be rewarded with three times the PRCs.

Only two hours will likely stagnate HVAC3 activities.

Inclusion of external controllers will provide more PRCs.

Look at the requirements established in the REPS South Australian energy efficiency scheme. If similar requirements were to be adopted, a minimum six-month transition time would be needed. The requirements need to be very clear to avoid the regulator IPART having a different interpretation to the intention of the Rule, e.g., terms such as 'internet connectivity and 'DR capable' are not clear.

Other ESIA member submissions explore possible options for consideration in detail. A combination of all these points could significantly increase PRC eligibility and increase commercially viable rollout at scale:

- **increase maximum set point for temperature** e.g., model at 26 degrees Celsius.

  For example, if an energy customer has their temperature set at 20 degrees and the demand response aggregator raises the system by 6 to 26 degrees, then the PRCs eligibility would rise from eight to twelve PRCs.

  This temperature increase seems reasonable when considering that Queensland's Energex Peaksmart program has been turning compressors down to 50% capability via the DRM2 activity. In that scenario, energy customers have been accepting that on an ambient 35-degree day, their unit will run at mid-20 degrees rather than 19 degrees. Refer to https://www.energex.com.au/manage-your-energy/cashback-rewards-program/peaksmart-air-conditioning.

- **increase demand response duration;**

  For example, increase the duration from 1 x 2-hour period to 3 x 2-hour period throughout the year, then the PRCs eligibility would rise by 300% and would align with the capacity hours of other activities under the PDRS to 6 hours.

  This duration increase seems reasonable when considering that Queensland's Energex Peaksmart program has four events in 2022 including 1 x 4-hour event, and in 2018 there were 6 x 2-hour events.

  i.e. consumers opting into a demand response program would like accept >3 event between 1 November and 1 March, so capacity would be available if required.

  North America demonstrated an even higher tolerance with a study demonstrating consumers opted in to accept up to 15 events per year. Refer to a 2016 study of the potential impact of smart thermostats on residential energy efficiency and demand response in North America https://dspace.mit.edu/handle/1721.1/104303, p72.

  There could be some protection against the potential health and safety risks.

- **consider system degradation over time**;

  If this is considered when calculating the yearly PRC incentive, then ACPS could be required to demonstrate the year the existing product was manufactured prior to replacement.

  A 2018 paper as part of ACEEE summer study on efficiency in buildings explored: Evaluation of air conditioning performance degradation: opportunities from diagnostic methods. Refer to https://publications.energyresearch.ucf.edu/wp-content/uploads/2018/09/FSEC-PF-474-18.pdf. That paper suggested that AC

systems degrade over time by an average of 5% per annum and up to 10% without appropriate coils maintenance.

For example, an HVAC system with a Baseline Input Power of 1.59kW which is five years old would have degraded by 5 x 5% = 25%, bringing the Baseline Input Power to 1.98kW. This equates to an additional 20% in PRCs, or 5% per annum increase in incentive.

Evidence of product age could be photographic evidence of the specifications plate or the manufacturer serial code. If evidence cannot be provided, then no degradation calculation would be applied.

- **increase energy savings per one-degree Celsius increase**;

ESIA notes that OECC applied the energy savings percentage of 7.5% per degree of set-point temperature change, based on Sunardi et al. (17 July 2020) research article on the 'Effect of room temperature set points on energy consumption in a residential air conditioning'.

An ESIA member has noted Figure 6 in that report details the percentage decrease in energy consumption at each degree of increased room set point from 20 to 21 °C to 23 to 24 °C. The report found an average energy savings percentage of 11.78% within this set point range, which is indicative of the climate and set point change expected to occur in NSW. Therefore, we propose that the calculation methodology for Input Power (kW) be amended. OECC could explore:

  - For a 4°C maximum set point: Baseline Input Power × 0.53 (assuming 47% reduction based on relationship between 11.78% per degree of temperature set point increase and a 4°C set point increase).
  - For a 6°C maximum set point: Baseline Input Power × 0.29 (assuming 71% reduction based on relationship between 11.78% per degree of temperature set point increase and a 6°C set point increase).

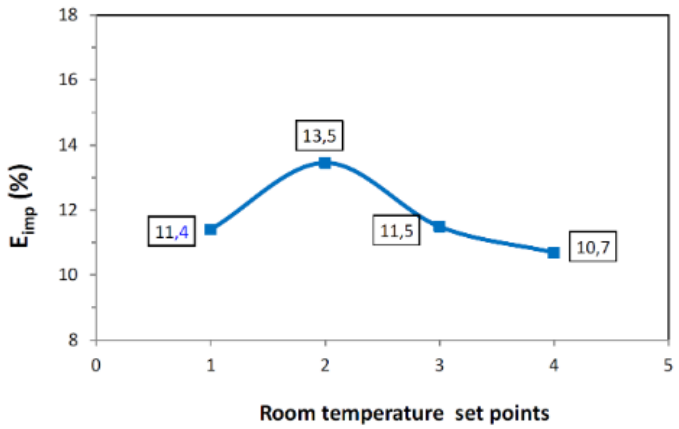

FIGURE 6. The energy consumption improvement of A/C system due to increment in room temperature set points.

- **consider firmness factor** based on data available that shows actual opt out rates on a demand response event, as the OECC proposed 20% seems high.

  For example, an Ausgrid demand management initiative 'CoolSaver' gave participants the option of overriding a dispatch event, however, only 4.3% of selected this option during the 2015/16 summer period. During Phase 3 of this trial program (the latest publicly available dataset covering summer peak events), there was only one recorded override across a total of 74 participants during six demand response events in Maitland, representing an opt-out percentage of 1.35% (see table below).

  Table 7 – Coolsaver Maitland dispatch events: source Ausgrid Demand Management Coolsaver Interim Report, Feb 2017, p21. Refer to https://www.ausgrid.com.au/-/media/Documents/Demand-Mgmt/DMIA-research/Ausgrid-CoolSaver-Interim-Report-2017_Final.pdf

Date	Day of week	Start Time	Finish Time	Mode	Max. Daily Temp (°C)	Participants	No of Overrides
14/01/2016	Thursday	2:00pm	6:00pm	DRM2	38.5	3	0
15/02/2016	Monday	2:00pm	6:00pm	DRM2	33.2	12	0
25/02/2016	Thursday	3:00pm	7:00pm	DRM2	39.5	13	0
3/03/2016	Thursday	3:00pm	7:00pm	DRM2	33.4	16	0
9/03/2016	Wednesday	3:00pm	7:00pm	DRM2	34.8	18	1
10/03/2016	Thursday	3:00pm	7:00pm	DRM2	34.8	12	0

  Therefore, a firmness factor of at least 0.97 may be reasonable.

- **consider a smart thermostat activity in the ESS which** would provide a stepping stone to consumers to consider engaging in demand response activities.

21. Are there additional requirements you recommend we add to HVAC3 ensure consumers get the best outcomes?

Not sure at this stage. Clarity on consumer choice to opt out at any time during a peak event or of a demand response contract in its entirety would be insightful.

22. Can you provide evidence on the approximate duration of events where an air conditioner is controlled by a third party? In addition, can you provide evidence that customer comfort is not noticeably impacted?

Not from the ESIA directly, however OECC could further explore programs such as those mentioned above to ascertain customer engagement, retention and termination experiences:

- Queensland's Energex PeakSmart Program;
- North America study; and
- Other retailers in Australia such as Origin Energy Origin Spike program. Refer

to https://www.originenergy.com.au/spike/.

23. Can you provide evidence of opt out rates for third party control of air conditioners?

OECC could consider Ausgrid Demand Management CoolSaver Interim Report (February 2017) figures on opt out rates annually. In phase two of that initiative, 109 households selected to participate in the program in the Central Coast and Lake Macquarie area, with Ausgrid receiving consistently positive survey feedback from participating households. From this initial population, 'a total of 90 participating households (84%) extended their participation in the trial to a third summer period in 2015/16; and in 2016, 79 households (88%) extended their participation through to the end of summer 2016/17. Of the 10 customers who have declined to continue with the trial, 70% were due to residents having moved out of their property and 30% did not wish to continue'.

24. Can you see any potential issues with the 12-month cadence of certificate creation for each NMI?

Not at this stage.

25. Can you provide information on baseline demand/discharge, demand response or shifting, and other key operational characteristics that the NSW Government could use to develop rules for any of the activities we are continuing to look at?

Yes.

The NSW government needs to develop rules for more commercial and industrial activities including for M&V and batteries.

3. Other suggestions from the ESIA

1. Incentive more environmentally friendly global warming refrigerants, possibly in the Statutory Review 2025 if not possible sooner.

2. Consider an OPT out option for customers to have, instead of having the customers to sign a nomination form annually.

3. Include a Sandbox activity in the Rule change for innovative ideas to get traction.

4. Enable an independent DRSP to participate in WARM &/or BESS2.

5. Which date would a nomination from need to be executed by for the WARM method, given that the asset needs to be already in place and WDRM registered?

6. It's probably a bit early but nonetheless important: where does EV - V2 grid fit in?

For more information regarding this submission, please email ESIA Executive Officer, comns@esia.asn.au