



20 February 2026

**To: NSW Department of Climate Change, Energy, the Environment and Water**  
**Re: Energy Security Safeguard rule change**

Thank you for the opportunity for the Institute for Energy Economics and Financial Analysis (IEEFA) to provide input to the Energy Security Safeguard rule change consultation.

IEEFA is an independent energy finance think tank that examines issues related to energy markets, trends and policies. The Institute's mission is to accelerate the transition to a diverse, sustainable and profitable energy economy.

A significant focus of IEEFA's work is examining the role of the demand-side in delivering a least-cost decarbonised energy system. We commend the government of New South Wales for undertaking this broad-reaching review of the Energy Security Safeguard, as this represents a significant opportunity to elevate the contribution of the demand-side to NSW's energy future.

The first part of our submission presents several key opportunities to expand the Peak Demand Reduction Scheme (PDRS) – specifically around residential hot water, pre-heating and cooling, expanding access to solar and batteries, and thermal efficiency upgrades.

The second part provides more detailed comments in response to selected consultation questions.

We have also provided a submission to the concurrent Energy Security Safeguard policy reform consultation, with some overarching comments on the overall policy framework of the scheme.

Please do not hesitate to contact us if you have any queries regarding this submission.

Kind regards,

Jay Gordon, Energy Finance Analyst – Australian Electricity

## Heat pump hot water in the PDRS

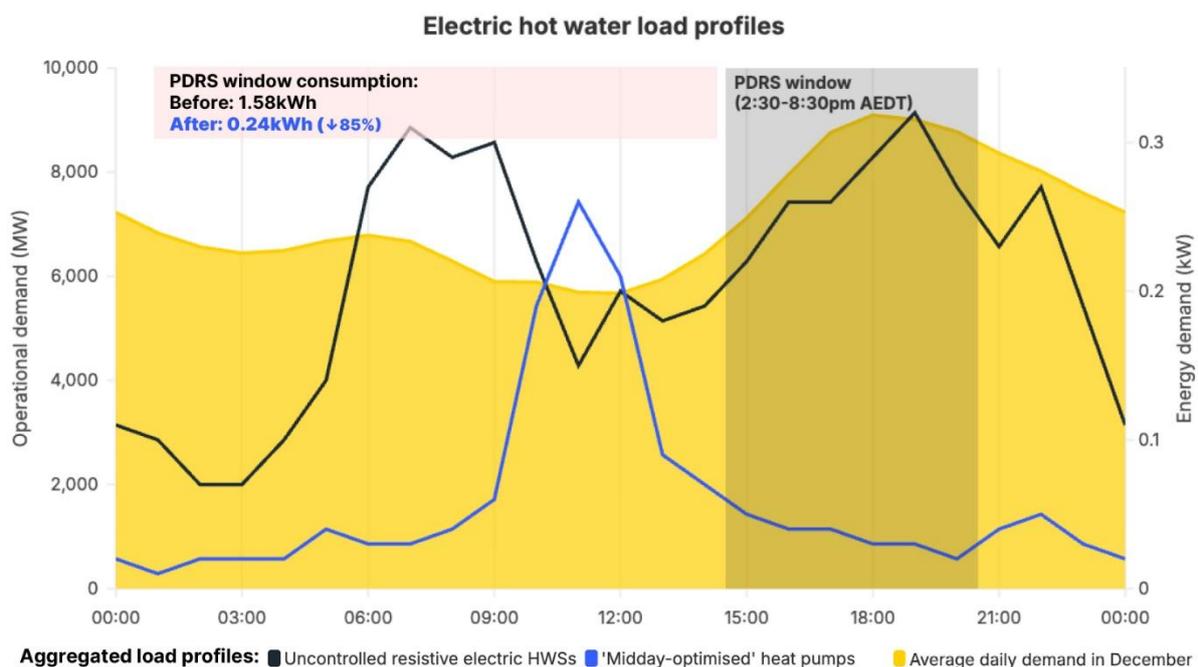
Heat pump hot water systems are far more efficient than conventional electric or gas equivalents, and this is recognised under existing ESS activities.

However, they also offer a significant peak demand reduction benefit when they are replacing resistive electric hot water systems. This benefit is not recognised under the PDRS. It is strongest where:

- The resistive electric hot water system was previously operated on an “uncontrolled” basis,<sup>1</sup> and/or;
- The heat pump hot water system is configured (or dynamically controlled) to avoid the peak demand window.

Analysis from IEEFA’s household energy modelling shows that a typical Sydney home switching from uncontrolled resistive electric hot water to a “midday-optimised” heat pump hot water system could reduce their hot water electricity consumption by 85% during the PDRS peak window on an average December day (Figure 1). This could be higher if the heat pump were configured to entirely avoid the peak window.

**Figure 1: Uncontrolled resistive electric vs ‘midday-optimised’ heat pump hot water load profiles**



Source: NSW December average daily load profile from [AEMO](#). Uncontrolled profiles derived from [Mohseni et al. 2023](#). 'Midday-optimised' profile derived from analysis of data from [Solar Analytics Pty Ltd](#). Adapted to NSW context via method discussed in [IEEFA 2025](#). Load profile shapes are aggregated – it may be possible to reshape 'midday-optimised' profiles to entirely avoid the PDRS peak window.

<sup>1</sup> IEEFA estimates 48% of electric hot water systems in NSW are not controlled loads (based on NSW distributor data in UTS Institute for Sustainable Futures. [Domestic Hot Water and Flexibility](#). 2016. Page 27; and accounting for [17.5% of controlled loads](#) being inactive).



Based on this, IEEFA recommends the NSW government introduce a new PDRS activity for upgrading residential resistive electric hot water systems to heat pumps. This activity should ideally require heat pumps be configured to draw the bulk of their energy during off-peak times.

Appliances could easily be programmed to avoid the PDRS peak window via passive controls. However, IEEFA analysis has observed that dynamic management of hot water systems would deliver the greatest benefits, and most heat pump hot water systems available to the Australian market are equipped with the underlying technology to make this possible.<sup>2</sup>

Similar opportunities likely exist in the commercial and small industrial sectors. We therefore encourage the NSW government to proceed with its intention to develop new methods that would enable commercial water heating activities (previously covered by the WH1 activity) to be reintroduced.

## Pre-heating and cooling in the PDRS

IEEFA's analysis has found that residential pre-heating and pre-cooling may be an under-represented peak demand reduction activity.<sup>3</sup> One key benefit of pre-heating and pre-cooling is its low upfront cost to implement – as it can often be enabled via passive or active controls that are already built into air conditioners. Alternatively, it can be activated using relatively inexpensive external controllers.

However, the financial reward for engaging in pre-heating and pre-cooling is weak, and it is unlikely meaningful uptake can be expected in the absence of further incentives.<sup>4</sup>

The NSW government should consider introducing pre-heating and pre-cooling activities in the PDRS. This could be enabled in several ways – providing external controllers, configuring built-in device settings, or by enabling dynamic controls.

While only pre-cooling may be necessary to reduce peak demand under the existing summer-focused PDRS window – as noted in our submission to the department's concurrent policy change submission – there is significant merit in considering PDRS opportunities that could target both summer and winter peaks.

The effectiveness of pre-heating and pre-cooling is highly dependent on a home's thermal efficiency properties, and this measure will be most effective if combined with broader thermal upgrades.<sup>5</sup>

## Expanding access to distributed solar and batteries

The federal government's Cheaper Home Batteries Program (CHBP) has driven a dramatic increase in the uptake of residential batteries. However, not all consumers are able to take advantage of the program. The split incentive problem inhibits uptake of solar and batteries for

<sup>2</sup> IEEFA. [Australia needs more efficient, smarter home hot water systems](#). 21 August 2024. Pages 9, 6.

<sup>3</sup> IEEFA. [A focus on homes, not power plants, could halve energy bills](#). 9 July 2025. Page 25.

<sup>4</sup> Ibid. Page 32.

<sup>5</sup> RACE for 2030. [H1 Opportunity Assessment: Residential solar pre-cooling and pre-heating](#). November 2021. Page 8.



renters, while low income households and apartment dwellers are still likely to face financial and physical barriers.

Increasing access to distributed solar and batteries would align to the goals of the Energy Security Safeguard. Modelling by IEEFA has found that rooftop solar could reduce energy bills for an efficient electric household in Sydney by 61%, with a battery reducing it by a further 81%.<sup>6</sup>

Critically, residential batteries were one of the most effective peak demand reduction methods identified in our modelling. We found that a typical Sydney household with efficient electric appliances, an average-sized solar system and a 10kWh battery may not need to draw at all from the grid at peak times on an average day throughout the year.<sup>7</sup>

In practice, most consumers are installing batteries much larger than 10kWh, many of which could have a significant potential to export energy to the grid during peak times.<sup>8</sup>

Allowing priority consumer groups to stack the BESS1 PDRS rebate with the CHBP rebate could be an effective way to increase access to small-scale batteries. We agree with the NSW government's proposal to allow stacking of the BESS1 activity for rental properties, public and Aboriginal Housing Office managed homes, and those receiving Energy Accounts Payment Assistance. We also note that some low-income households may not be captured in the Energy Accounts Payment Assistance program; the department should consider broader options to capture these households.

Given the significant peak demand reduction potential available from small-scale batteries, IEEFA also agrees there may be merit in allowing government facilities to stack BESS1 and CHBP rebates. The NSW government should consider whether it may be appropriate to expand this to a broader range of facilities where there is a demonstrable shared benefit to installing a battery, and where uptake is limited. Examples could include community sporting facilities, aged care facilities, healthcare services and community halls.

## Thermal efficiency upgrades in the ESS and PDRS

IEEFA supports the NSW government's intention to explore reactivating insulation activities in the ESS.

In addition to overall energy savings, our analysis has found that thermal upgrades can provide significant peak demand benefits. We found a seven-star NatHERS equivalent home in NSW with efficient electric appliances could have 40% lower peak demand than a two-star equivalent home on a typical summer day (this could be considerably greater on peak demand days).<sup>9</sup>

Thermally efficient homes can also unlock secondary peak demand reduction opportunities. As discussed above, thermally efficient homes have a greater ability to engage in pre-heating and pre-cooling. IEEFA's analysis has found that a combination of high electric heating loads and reduced winter rooftop solar output may limit some households' ability to fully charge their battery. Thermal efficiency upgrades could therefore enable those households to unlock more

<sup>6</sup> IEEFA. [A focus on homes, not power plants, could halve energy bills](#). 9 July 2025. Page 12.

<sup>7</sup> Ibid. Page 19.

<sup>8</sup> As of October 2025, the average size of a new small battery system has exceeded 20kWh ([RenewEconomy](#)).

<sup>9</sup> IEEFA. [A focus on homes, not power plants, could halve energy bills](#). 9 July 2025. Page 22.



storage potential in winter, which should be considered as a co-benefit alongside summer peak reduction.<sup>10</sup>

In parallel to the ESS updates, IEEFA therefore recommends the NSW government consider introducing new thermal upgrade activities to the PDRS. This should include insulation, but should also include a fuller range of thermal upgrade activities, such as updating window coverings, draught-proofing and gap sealing.

Ideally, households should be encouraged to undertake multiple thermal efficiency upgrades where it makes sense to do so. The NSW government should consider introducing a broader activity definition that would allow for bundled thermal upgrades.

## Response to consultation questions

Table 1 contains further detailed responses to selected consultation questions.

**Table 1: Response to specific consultation questions**

Question	Response
1 Are there any sectors that we have not identified that also have a genuine financial need and could be supported by an Exempt Energy Program?	IEEFA supports the application of Exempt Energy Programs to the sectors identified by the NSW government. However, there may be a need for a broader definition to capture low-income households that are not part of payment assistance programs.
2-4	<i>No response</i>
5 What are your views on allowing battery installations incentives for government-owned and operated facilities, and Exempt Energy Programs?	We agree with this approach. Public facilities often have a large and underutilised rooftop solar potential; providing additional incentives for batteries could unlock more of this potential while reducing operational expenditure for taxpayers, and potentially providing consumer benefits.  The NSW government should consider whether this group can be expanded to other community facilities under different ownership structures, where there is both limited uptake of batteries and a demonstrable shared community benefit.  <i>(See Expanding access to distributed solar and batteries above)</i>
6 Please provide your feedback on the current Rule and options being considered [in relation to BESS2].	The low uptake of BESS2 activities appears misaligned with current estimates of VPP uptake, including AEMO projections. <sup>11</sup> We therefore support and encourage efforts to reduce administrative barriers to uptake of the activity.

<sup>10</sup> IEEFA. [A focus on homes, not power plants, could halve energy bills](#). 9 July 2025. Page 23.

<sup>11</sup> AEMO assumes a VPP participation rate of 16% in NSW, rising to 50% by 2050 in the *Step Change* scenario. ([Draft 2026 Forecasting Assumptions Update](#)).



		<p>IEEFA believes that typical installed battery sizes exceeding 20kWh<sup>12</sup> are larger than many households need to meet their day-to-day energy demand. Therefore, there is a significant benefit in enabling more batteries to export energy to the grid at peak times, including via VPPs.</p> <p>Given this point, we agree with the NSW government’s proposal to expand eligibility of the BESS2 activity to larger batteries.</p> <p>We also agree that expanding the eligibility of BESS2 to sites without solar makes sense, especially in the context of the federal government’s newly proposed Solar Sharer Offer (SSO).<sup>13</sup> There may be some consumers – for example, in multi-unit or high-density dwellings – who may face physical constraints to installing rooftop solar, but could still benefit from installing a battery.</p>
<b>7</b>	<p>What are your views on the proposed changes to air conditioning activities?</p>	<p>IEEFA agrees with aligning ESS and PDRS products with the GEMS register. Multi-split air conditioners should be eligible for ESS and PDRS incentives, as these are often the most practical option for certain dwelling types.</p> <p>We agree with the inclusion of large air conditioners in the ESS and PDRS, which would unlock more opportunities for businesses and large facilities.</p>
<b>8</b>	<p>What are your views on the proposed option to calculate Energy Savings Scheme and Peak Demand Reduction Scheme incentives? How can we ensure savings for multi-split systems are representative and installations are fit for purpose?</p>	<p>We broadly agree with the approach suggested by the NSW government. This appears to align with the Victorian Energy Upgrades program, which includes multi-split air conditioners.</p> <p>The second proposed option to define the capacity of multi-split systems appears most robust (the lesser of the registered capacity of the outdoor unit, or the sum of the rated capacities of the indoor units).</p>
<b>9</b>	<p>What are the potential risks from excluding certain product classes from Energy Savings Scheme and Peak Demand Reduction Scheme incentives?</p>	<p>IEEFA considers the risks of excluding the classes of air conditioner as noted by the NSW government are relatively low. We broadly agree with these exclusions.</p>
<b>10-15</b>		<i>No response</i>
<b>16</b>	<p>What are your views on the proposed changes to the emissions factors of eligible fuel types within the Energy Savings Scheme Rule?</p>	<p>We agree with the NSW government’s proposal to remove Table A28 from the ESS.</p> <p>Fixed emissions factors for electricity are inappropriate for a rapidly decarbonising energy system, such as in NSW, as they are likely to become quickly outdated.</p>

<sup>12</sup> RenewEconomy. [Australians install 100,000 home battery systems in 17 weeks, and they are getting bigger](#). 24 October 2025.

<sup>13</sup> Chris Bowen MP. [More Australian homes to get access to solar power](#). 4 November 2025.



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		IEEFA's analysis generally finds most residential electrification activities result in an immediate reduction in annual emissions. <sup>14</sup> This reduction is stronger for homes with rooftop solar, and is expected to accelerate as the grid continues to decarbonise. Therefore assessing the specific emissions factor for additional electricity demand under the ESS holds limited value.
<b>17-20</b>		<i>No response</i>
<b>21</b>	What are your thoughts on the proposed battery capacity thresholds for commercial and industrial (C&I) and multi-dwelling residential incentives?	The proposed C&I capacity threshold would leave a gap between batteries between 100–200kWh, which would not be eligible for federal or state incentives. Given the diverse nature of the C&I sector, it is likely this capacity range may represent a suitable size for certain businesses. We recommend the NSW government consider a lower capacity threshold of 100kWh for C&I sectors.
<b>22</b>	What data or evidence could help inform a more robust and effective incentive structure for commercial and industrial (C&I) and multi-dwelling residential batteries?	<p>Actual load data for applicable commercial sites and multi-dwelling residential properties would be useful to inform this analysis. Engagement with facilities themselves could support this, as would access to appropriately aggregated smart meter data for multi-dwelling sites.</p> <p>Numerous approaches to implementing batteries in multi-unit dwellings could lead to different peak demand and energy outcomes. For example, batteries could be used to supply electricity to common properties, or to individual lots. There are varying ways in which batteries might participate in the wholesale market and distribute this revenue to owners and/or occupants.</p> <p>The department should carefully consider the implementation model this incentive would target.</p>
<b>23</b>		<i>No response</i>
<b>24</b>	What do you think is stopping customers from using smart charging and vehicle-to-grid (V2G) technology today?	<p>Many electric vehicles sold in Australia have the technical capacity to support V2G.<sup>15</sup> However, options for consumers to engage in V2G are limited due to:</p> <ul style="list-style-type: none"><li>• Limited support of V2G by distribution networks</li><li>• Cost and availability of bidirectional chargers</li><li>• Poor interoperability standards</li><li>• Reluctance to engage in V2G where this may void some manufacturers' warranty conditions.</li></ul>

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<sup>14</sup> For example, this holds true in Victoria, which has a more emissions-intensive electricity grid than NSW. (IEEFA. [Managing the transition to all-electric homes](#). 2 November 2023. Page 13.)

<sup>15</sup> IEEFA. [Submission to New Vehicle Efficiency Standards consultation](#). 12 March 2024. Page 3.



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<b>25</b>	Given the broader functionality of vehicle-to-grid (V2G), should smart charging be included in the Peak Demand Reduction Scheme (PDRS) as a separate activity? How can we confidently measure the impact of smart charging, and ensure that incentives are driving new behaviour and not just rewarding what's already happening?	Smart charging should be included as a separate activity in the PDRS. AEMO forecasts EVs to be one of the largest sources of long-term demand growth. <sup>16</sup> As noted by the NSW government, there is considerable evidence suggesting many EV owners already avoid the peak period when charging. <sup>17</sup> Nonetheless, the risk that EV uptake could result in additional peak demand is material enough to warrant mitigation through appropriate PDRS measures. Some distribution networks have observed that EV charging could be impacting load growth and voltage across their networks. <sup>18</sup>
<b>26-28</b>	<i>No response</i>	

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<sup>16</sup> AEMO. [2025 Inputs, Assumptions and Scenarios Report](#). August 2025. Page 65.

<sup>17</sup> For example, AGL. [AGL Electric Vehicle Orchestration Trial: Final Lessons Learnt Report](#). May 2023. Page 5; Origin. [Origin EV Smart Charging Trial: Lessons Learnt Report](#). May 2022. Page 9.

<sup>18</sup> AER. [Export services network performance report 2025](#). December 2025. Pages 18-19.