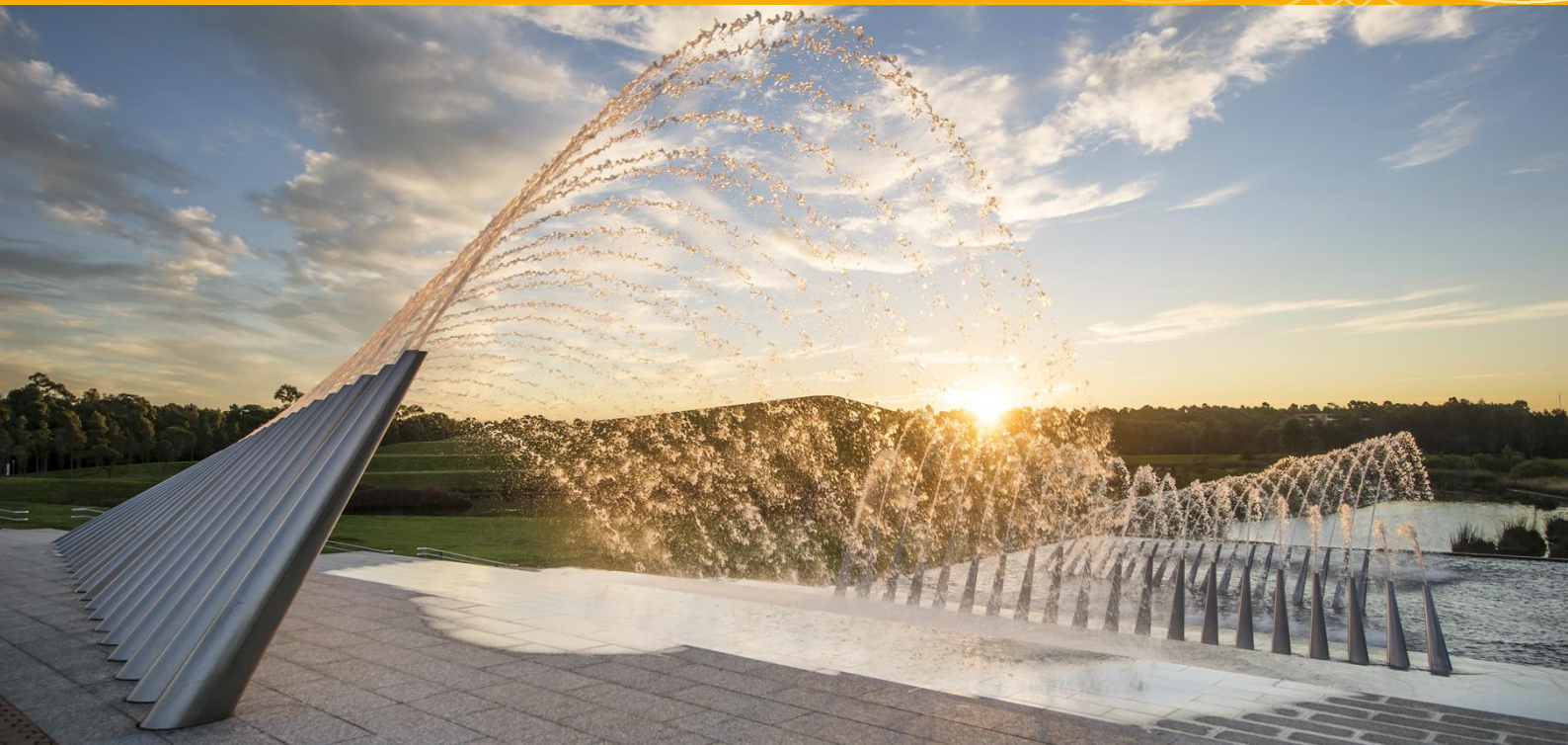


Office of Energy & Climate Change

Peak Demand Reduction Scheme



Rule 1 position paper

September 2022



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Published by Office of Energy and Climate Change, NSW Treasury

energy.nsw.gov.au

Title [Peak Demand Reduction Scheme Rule 1 position paper]

First Published September 2022

ISBN 978-1-76058-634-8

Cover image [A water feature at sunset. Credit: Paul Robbins]

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Contents

Overview	4
Purpose of this paper	4
PDRS activities	5
Demand response capability	5
Changes to HVAC baseline efficiency metric	6
Additionality of the refrigerated cabinets activity	7
Electric water heaters on continuous tariffs	8
New GEMS pool pump MEPS from 1 October 2022	10
Clarity around certificate rounding and vintage	10
Digital delivery	12
What we've developed	12
What we're continuing to develop	13
Future of the PDRS	15
Areas of interest for future activities	15
Appendix	18
Appendix A: Acronyms	18

Overview

The Peak Demand Reduction Scheme is a new certificate scheme to reduce peak electricity demand in NSW, starting in the summer of 2022-23.

The primary objective of the PDRS is to create a financial incentive to reduce peak electricity demand by encouraging activities that will reduce capacity during hours of peak demand.

With the release of the first scheme rule, the PDRS is open for business. This rule has been shaped by extensive feedback and public consultation. This took place between 11 April – 13 May 2022. It culminated in a consultation forum on 27 April 2022, attended virtually by over 130 stakeholders with over 50 questions received during the Q&A session. Feedback was received via 28 submissions from a range of stakeholders including Accredited Certificate Providers (ACPs), Demand Response Service Providers (DRSPs), electricity retailers, industry associations and manufacturers.

Purpose of this paper

This paper is designed as a companion piece to the PDRS consultation paper.¹ It summarises stakeholder views and highlights changes to initial proposals. There are 3 key areas covered in this paper, which focus on:

- summarising and addressing the main issues raised during consultation on the PDRS rule, particularly the activity definitions
- outlining plans for digital delivery of the Safeguard rules, including what is available now and what will be coming soon
- providing a snapshot of the direction the PDRS is heading.

Each section of this paper includes a summary of the policy position. This is followed by analysis of the issue and a summary of stakeholder feedback.

A table at the bottom of each section summarises stakeholder feedback.

¹ [PDRS consultation paper](#)

PDRS activities

Demand response capability

Summary of position

The requirement for air conditioners to have demand response capability in accordance with any chosen standard has been removed. No demand response capability requirements have been added to any other PDRS activity definitions.

This change has the following effect:

- ensures consumers can access a wide range of high efficiency models under the PDRS
- leaves the door open for innovative approaches or alternative standards
- recognises all demand savings and maximises Peak Reduction Certificate (PRC) creation.

Issue analysis

Demand response capability is important for the future of the PDRS. Ensuring consumers have the tools needed to participate in demand response and shifting programs is crucial to maximising peak demand reduction capacity.

Draft PDRS activity definitions HVAC 1 and HVAC 2 proposed requirements for air conditioners to have demand response capability in line with AS4755.3.1 or IEEE2030.5.

AS4755 is the demand response standard developed by Standards Australia. It has limitations such as a lack of interoperability, inability to verify results and no post-event return to normal operating conditions.²

IEEE2030.5 is an interoperable demand response standard with wide uptake internationally, particularly in California. In addition, the OpenADR protocol is increasing in popularity around the world. Stakeholders made little comment on standards or protocols other than AS4755.

We will continue to monitor options in the demand response capability space to ensure any solution through the PDRS, as an activity requirement or new standalone activity, allows consumers to override control as needed and any response can be measured and verified.

² [IEEFA, Mandating AS4755 Ignores Households and Widely Supported International Solutions](#)

Stakeholder feedback

Table 1 Stakeholder feedback summary on demand response capability requirements

Stakeholder group	Feedback summary
ACPs	<p>The key message from ACPs was that demand response capability would present a barrier for PRC creation especially in the first few years.</p> <p>Also, that the focus of demand savings activities should be on the permanent reduction in peak demand, rather than any additional capability to provide temporary demand response or shifting.</p>
Industry associations	<p>Energy Savings Industry Association (ESIA) supported a best practice aim of demand response capability for the PDRS. However, making such a requirement mandatory may be more of a barrier than benefit, especially given the issues around AS4755 and the flexibility of standards with broader international recognition.</p> <p>They suggested that further consumer information was needed to explain the concept.</p>
Manufacturers	<p>Manufacturers were mostly supportive of demand response capability but highlighted root issues with AS4755.</p> <p>Emerald Planet echoed the message from ACPs that demand savings activities should focus on permanent demand reduction.</p>
Retailers	<p>Flow Power highlighted that putting limits on the tools needed for demand response may limit innovation.</p>

Changes to HVAC baseline efficiency metric

Summary of position

The minimum requirement tables and baseline efficiency requirement tables in HVAC 1 and HVAC 2 have been changed. They are now based on the Annualised Energy Efficiency Ratio (AEER), instead of the Energy Efficiency Ratio (EER). This change will bring simplicity to HVAC activities and ensure alignment with the equivalent ESS activities.

Issue analysis

The initial prototype HVAC activity definitions used AEER for baseline efficiency requirements. This simple approach aligned with the ESS and could be evidenced through product data on the GEMS Registry.

In targeted consultation, air conditioning manufacturers suggested updating the baseline efficiency requirement to use EER. The benefit is that EER is more representative of air conditioner performance during peak demand times.

Following feedback on the draft PDRS rule, the baseline efficiency requirement is back to using AEER. Using AEER in HVAC 1 and 2 results in a calculation can be slightly less accurate. However, the greater benefit that comes with ESS alignment and a reduction in complexity outweighs the loss in accuracy.

Stakeholder feedback

Table 2 Stakeholder feedback summary on changes to HVAC baseline efficiency metric

Stakeholder group	Feedback summary
ACPs	Most ACPs thought that using a different cooling metric for the same activities between the ESS and PDRS created unnecessary complexity without adding a great deal of value. They saw it also creating an issue where some models exceeded the baseline and are eligible but don't create any PRCs.
Manufacturers	Emerald Planet suggested aligning with the ESS where practically possible to create less barriers for entry.

Additionality of the refrigerated cabinets activity

Summary of position

PDRS activity definition RF2 has been updated to be a replacement only activity.

Energy Efficiency Baselines have been reduced to reflect the reductions that occurred with the latest ESS rule change.

The ESS and PDRS already contain clauses requiring decommissioning of existing refrigerated cabinets in accordance with legislation.

Issue analysis

Unlike air conditioning, pool pumps or water heaters, refrigerated cabinets are an always on appliance. This means as soon as they are installed, they will have a significant impact on electricity consumption and demand for consumers, which when aggregated may pose a significant peak demand issue. Limiting this activity to only replacement of refrigerated cabinets ensures that peak demand savings will occur and reduces the risk of incentivising implementations that are not fit for purpose.

The Energy Efficiency Baselines in the PDRS have been reduced to be in line with the changes to the ESS refrigerated cabinets activity that commenced on 1 August 2022. The full details of the latest ESS rule change are outlined in the [refrigerated cabinets position paper](#).

Several stakeholders called for a new clause to be added to the PDRS rule (also the ESS rule) requiring decommissioning of existing refrigerated cabinets. It should be noted that clause 5.3A in the ESS rule and 5.3 in the PDRS rule already requires any replaced or removed refrigerated cabinet to be disposed of in accordance with legal requirements. ACPs need to obtain evidence of disposal or recycling for refrigerants in accordance with the [Ozone Protection and Synthetic Greenhouse Gas Management Act 1989](#).

Stakeholder feedback

Table 3 Stakeholder feedback summary on the additionality of the refrigerated cabinets activity

Stakeholder group	Feedback summary
ACPs	ACPs believe that a replacement-only approach to RF2 would minimise the risk of installations that aren't fit for purpose and increase peak demand.
Industry associations	ESIA suggested that a decommissioning requirement be added, incentives for new installations be reviewed and that a co-payment requirement be added, as required under the ESS Home Energy Efficiency Retrofits method.

Electric water heaters on continuous tariffs

Summary of position

No residential water heater activity has been included in the first PDRS rule. We will continue to work with Distribution Network Service Providers (DNSPs) to pursue pricing structure opportunities that are beneficial to the grid, as well as energy service providers and manufacturers to ensure the technology approach provides the best outcome for consumers.

Issue analysis

Stakeholder views on this issue were vastly different depending on their role in the energy industry. This is expected as water heaters are a technology where energy efficiency, thermal storage capacity and consumption of renewable energy all need to be considered.

Some stakeholders suggested that an incentive could be provided to upgrade non-controlled electric resistance water heaters with heat pump water heaters or smart electric resistance water heaters. The evidence requirements suggested were an electricity bill showing that consumers are on a continuous tariff. There is a potential issue with implementing such a requirement. It could result in perverse outcomes where customers switch off their controlled load tariffs until they become eligible to access incentives. The result of this, if widespread, would be a significant overall increase to peak demand.

Given the size and complexity of the opportunity in this space, we need to consider not just the technology options. We will continue to engage with DNSPs regarding tariffs that seek to

make the most of the thermal storage capabilities of water heaters and address localised minimum demand issues. In particular, some DNSPs are conducting trials into shifting controlled load tariffs from the middle of the night to the middle of the day which could provide benefit by helping address minimum demand issues and increasing consumption of excess solar.

Stakeholder feedback

Table 4 Stakeholder feedback summary on electric water heaters on continuous tariffs

Stakeholder group	Feedback summary
ACPs	ACPs provided broad support for an activity that replaces electric water heaters on continuous load tariffs. The suggestions for evidence requirements focused on electricity bills that demonstrate the consumer was on a controlled load tariff.
Industry associations	ESIA highlighted that around 80 % of electric water heaters are on controlled load tariffs, leaving 20 % or 500,000 units on continuous tariffs. The suggestion was that an electricity bill could be used as evidence.
Manufacturers	<p>Manufacturers emphasised the ability of controlled electric resistance water heaters to shift demand into the middle of the day to maximise solar consumption.</p> <p>Also, heat pump water heaters were described as problematic without controls as they may lead to increases in peak demand when compared to controlled electric resistance water heaters.</p>
Retailers and DNSPs	<p>One retailer suggested that the NSW Government work closely with DNSPs to implement “solar sponge” network tariffs, noting the work from SA Power Networks to implement such a tariff in South Australia.</p> <p>Ausgrid mentioned trials they are running to move controlled load tariff timing from 10pm – 7am to the middle of the day to make the most of excess solar being exported and reduce minimum demand.</p>

New GEMS pool pump MEPS from 1 October 2022

Summary of position

The equipment requirements under SYS2 have been updated to reflect the 1 October 2022 commencement of the Greenhouse and Energy Minimum Standards (Swimming Pool Pump-units) Determination 2021.

This requirement will also be proposed for the ESS rule during consultation later this year with retrospective application of the requirement.

Issue analysis

The new GEMS (Swimming Pool Pump-units) Determination commences in October 2022 and will be adopted in the PDRS.

The ESS rule will still refer to the Voluntary Energy Rating Labelling Program for Swimming Pool Pumps until the next rule change comes into effect in early 2023. This may pause ESS pool pump activity until the new rule is updated.

We will commit to allowing retrospective application of the new Determination as a requirement in the ESS. This means that products registered under the new Determination but not the Voluntary Energy Rating Labelling Program won't miss out on eligibility for creating Energy Savings Certificates (ESCs) while waiting for the new requirement to be added to the rule.

Stakeholder feedback

Table 5 Stakeholder feedback summary on new GEMS pool pump MEPS from 1 October 2022

Stakeholder group	Feedback summary
Industry associations	The Swimming Pool & Spa Association of Australia (SPASA) highlighted the need to align with the new GEMS Swimming Pool Pump Units Determination 2021.

Clarity around certificate rounding and vintage

Summary of position

Clause 6.3 and 6.4 have been updated to implement a fixed approach to certificate rounding based on an application to register certificates for one or more implementations of an activity of the same type.

Clause 7.2 has been updated to clarify that certificates are created and assigned a vintage based on the year that the capacity is available.

Issue analysis

Certificate rounding has been written in the PDRS rule to maximise the amount of capacity that is converted into PRCs. Certificates are rounded at the application to register the creation of certificates and may be totalled over one or more implementations of the same activity. For example, when applying to register the creation of certificates from multiple implementations of SYS1, rounding will occur based on the capacity totalled across all implementations of SYS1 in that application.

Certificate vintages are aligned with the year when the capacity is available. In the example shown below, an implementation creates 89 PRCs from an activity that results in 8.9 kW of peak demand reduction capacity being made available across the lifetime of the activity. 12 PRCs are created in the first vintage year, while 11 are created each subsequent year.

Table 6 Vintage year, capacity, and certificate creation.

Year	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
Capacity (kW)	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
PRCs	12	11	11	11	11	11	11	11

Table 7 Stakeholder feedback summary on certificate rounding and vintage

Stakeholder group	Feedback summary
ACPs	Green Energy Trading shared concerns about rounding of PRCs and requested more certainty, while seeking clarification about certificate vintages.

Digital delivery

What we've developed

Summary of position

A Microsoft Word version of the PDRS rule is available on the PDRS website, in addition to the usual pdf document, to allow easier copying of data tables into stakeholder systems.

Issue analysis

A key focus is to provide digital solutions that help make the Safeguard schemes more accessible.

The inclusion of a Microsoft Word version of the PDRS rule is in response to calls from stakeholders for easier access to data tables. It will remain available as an interim measure until the publication of Application Programming Interfaces (APIs) which allow data transmission between one software product and another.

Stakeholder feedback

Table 8 Stakeholder feedback summary on publicly available PDRS calculators and data tables

Stakeholder group	Feedback summary
ACPs	Publishing data tables in spreadsheet form or similar was thought to be helpful for ACPs to integrate changes into their systems.
Industry associations	There was support for improvements to processes in general.

What we're continuing to develop

Summary of position

An online estimator will be publicly available on our website in the coming months. The estimator will cover all 7 activity definitions of the PDRS, and the equivalent ESS methods. Users will be able to input a single set of information and understand:

- their eligibility for the ESS and PDRS, and
- how many ESCs and PRCs they can create from this information, in a single transaction.

We are continuing to develop a rule API that will provide full calculation functionality for the 7 activities detailed in the first version of the PDRS rule, as well as their equivalent ESS methods.

We also plan on delivering the calculation tables for the PDRS rule through a calculation API and in YAML format.

Issue analysis

The first project in development is a certificate estimator to support stakeholder understanding of how the ESS and PDRS rules interact with each other. The estimator will validate the number of ESCs and PRCs generated from an activity – for a given set of eligibility and activity specific requirements.

A coded version of the PDRS rule is also in development. This will allow stakeholders to access the most up-to-date version of the rule (through an API) as rule changes are made.

The Safeguard API will be delivered via www.api.nsw.gov.au, and will include technical documentation as well as an opportunity to provide feedback and suggested improvements.

We understand the need to build a governance process to consult on changes made to the API. One option for consultation is on a dedicated platform, like the Github repository maintained by the Commonwealth's Consumer Data Standards team.³

We also understand the need to provide clarity on where responsibility for the accuracy of the API sits. We will work with stakeholders to provide this clarity before any API is published.

Stakeholder feedback

Table 9 Stakeholder feedback summary on rule calculation APIs

Stakeholder group	Feedback summary
ACPs	ACPs pointed to the online VEEC calculator provided by the VEU as an excellent resource for information purposes. They found it especially helps consumers and serves as a debugging tool for ACPs in the early part of a scheme.

³ [Consumer Data Right Standards github repository](#)

	<p>ACPs feel that online calculators would result in better decision making, especially at the time of introducing new activities. It would also allow for a better understanding of the associated certificates for new activities and allow for more informed business decisions.</p> <p>ACPs were generally supportive of integrating rule APIs into their systems but request further clarity and information on how these APIs will be delivered.</p> <p>A particular area of concern was the legality and responsibility related to an API. If responsibility for the API's accuracy lies with the ACP, they have indicated they will only use this for verification purposes. Currently the responsibility for accuracy of the calculations sits with ACPs, and there is no supporting tool to assist with accuracy.</p> <p>ACPs suggested that failed APIs can be a major source of disruption and suggest a robust process for advising of changes, with at least 3 months' notice for major changes to the API.</p> <p>ACPs asked whether the API would allow for a streamlined audit process and requested further information on how errors in the API will be treated at audit.</p> <p>If done correctly, a rule API could save dozens of man hours spent manually re-typing calculation factors, tables and other requirements into calculation tools.</p> <p>They suggested this would also reduce errors in factors, and therefore reduce risks of improper ESC and PDRC calculations.</p>
<p>Industry associations</p>	<p>ESIA saw APIs as an important feature to make it easier for stakeholders to assess the viability of changes and to enable control of peak consumption. Specifically, publicly available calculators would be very useful and should be available as soon as possible.</p>
<p>Manufacturers</p>	<p>Manufacturers welcome digital systems as they increase ability to integrate rules and legislation into applications. They were also thought to help with the understanding of requirements but changes to digital systems need to be rolled out as the rule is updated to be effective.</p> <p>Manufacturers were receptive to a rule API and saw benefit from allowing real-time updates and changes into software applications.</p> <p>Providing monitoring and a reliable data feed would make it easier to produce reliable figures for measuring input power values and could potentially replace the existing calculation methods detailed in the draft rule.</p>

Future of the PDRS

Areas of interest for future activities

Summary of position

While we can't provide a guaranteed list of what will be in the next PDRS rule change, we can provide the following key snapshots:

- a range of demand response and shifting activities will be included
- a mix of residential and business opportunities will be available
- where possible, we will try to avoid cherry picking technologies and opt for a technology neutral approach that is underpinned by the ability to verify capacity.

Issue analysis

We received stakeholder submissions from a wide range of sectors and the demand reduction opportunities put forward were broad and vast.

The ESS Project Impact Assessment with Measurement and Verification (PIAM&V) method received a lot of support for future inclusion in the PDRS. We can confirm that robust measurement and verification (M&V) methods will be included in the PDRS in the coming years. The exact methods and timing remain to be seen and will be informed by further work on measured methods in the ESS as well as consultation on PDRS specific measured methods.

Storage of energy will play a key part in shifting demand from peak periods to the middle of the day when renewable generation is abundant, and demand is low. We see batteries (both stationary and mobile), water heaters and space cooling as key technologies.

Technologies that allow consumers to receive signals to reduce demand as well as control systems that allow remote demand reduction will be crucial to creating demand response capacity. We will work to ensure consumers maintain overriding choice over their power consumption, as we see this as crucial to maintaining consumer safety and important to the long-term success of demand reduction programs.

As the PDRS is providing incentives for activities that reduce peak demand, our focus will be on ensuring capacity is available when needed. Testing and verification of systems-ready capability will be involved, as will measurement of the amount and duration of demand reduction available. We will explore options to leverage existing sources of testing data where it is fit for purpose.

The PDRS needs to be flexible and fast-moving, best achieved by keeping a technology neutral approach. This will ensure the scheme does not need to chase emerging technologies and reduces the development workload for new PDRS activities.

Stakeholder feedback

Table 10 Stakeholder feedback summary on future PDRS opportunities

Stakeholder group	Feedback summary
<p>ACPs</p>	<p>Several ACPs wanted to see existing M&V methods in the ESS applied in the PDRS. Batteries charged from solar PV were also a common suggestion for future inclusion in the PDRS, as were smart controls and automation.</p> <p>ACPs supported regular consultation forums as they provide a great opportunity to pose questions and learn more regarding the intention behind aspects of the PDRS.</p> <p>Questions around additionality and ensuring incentives are resulting in genuine peak demand reduction capacity were raised.</p>
<p>DRSPs</p>	<p>Enel X proposed leveraging AEMO's assets register for the Wholesale Demand Response Mechanism and batteries, as well as pursuing opportunities to incentivise smart charging and vehicle to grid technology for electric vehicles.</p>
<p>Energy management firms</p>	<p>City FM suggested Power Factor Correction units and Building Management Systems as market opportunities that can contribute to reducing peak demand.</p>
<p>Individuals</p>	<p>Les wanted to see the PDRS encouraging the application of new technologies rather than sticking to existing mature technologies. Matt suggested including control systems and electric vehicle recharging stations, given their great potential for peak demand shifting.</p>
<p>Industry associations</p>	<p>ESIA saw value in adding M&V based methods to the PDRS by changing measurement units from daily to hourly.</p> <p>Another association representing a group of Local Councils in Sydney saw value, both from an end-user perspective via the coordination of council facilities to provide peak demand reduction and from a support role by using councils help to promote awareness to ratepayers.</p>
<p>Manufacturers</p>	<p>On water heaters, responses were varied with some manufacturers believing electric storage water heaters with smart controls or those on controlled load tariffs are the best option to shift peak demand with heat pump water heaters already receiving enough incentives. Another suggested that heat pump water heaters are the best option to reduce peak demand.</p> <p>One suggestion was to look at opportunities for peak demand reduction in the distribution network, namely through voltage regulation technologies. Another suggested the installation of</p>

	<p>variable speed drives on single-speed pool pumps could have a significant impact on energy consumption across NSW.</p> <p>There was support for M&V, control systems and innovative tariff structures. There was also acknowledgement that the Internet of Things (IoT) provides opportunities for both local and remote control of devices and therefore loads.</p>
Retailer	<p>Retailers saw a broad range of opportunities in all sectors.</p> <p>At the residential scale, retailers suggested pursuing solar batteries, hot water systems and behavioural demand response that retains customer choice. Virtual Power Plants (VPP) were seen as a mechanism for wide scale coordination of capacity available from residential solar batteries.</p> <p>At the commercial and industrial scale, the focus from retailers was on demand flexibility and M&V.</p>

Appendix

Appendix A: Acronyms

Acronym	Full Term
ACP	Accredited Certificate Provider
AEER	Annualised Energy Efficiency Ratio
API	Application Programming Interface
DRSP	Demand Response Service Provider
EER	Energy Efficiency Ratio
ESIA	Energy Savings Industry Association
ESS	Energy Savings Scheme
GEMS	Greenhouse and Minimum Energy Standards
HEAB	High Efficiency Appliances for Businesses
HEER	Home Energy Efficiency Retrofit
HVAC	Heating, Ventilation and Air Cooling
IoT	Internet of Things
IPART	Independent Pricing and Regulatory Tribunal
M&V	Measurement and Verification
MEPS	Minimum Energy Performance Standards
NSW	New South Wales
PDRS	Peak Demand Reduction Scheme
PIAM&V	Project Impact Assessment with Measurement and Verification
PRC	Peak Reduction Certificate
The Safeguard	Energy Security Safeguard
VPP	Virtual Power Plant

Net Zero Plan



For more information

To learn more about the Peak Demand Reduction Scheme or the Energy Security Safeguard, please visit or contact:

www.energy.nsw.gov.au | sustainability@environment.nsw.gov.au