Department of Climate Change,
Energy, the Environment and Water

Final statutory review report

NSW Peak Demand Reduction Scheme

June 2025

NSW GOVERNMENT

Acknowledgement of Country

Department of Climate Change, Energy, the Environment and Water acknowledges the traditional custodians of the land and pays respect to Elders past, present and future.

We recognise Australian Aboriginal and Torres Strait Islander peoples' unique cultural and spiritual relationships to place and their rich contribution to society.

Artist and designer Nikita Ridgeway from Aboriginal design agency – Boss Lady Creative Designs, created the People and Community symbol.

Final statutory review report NSW: Peak Demand Reduction Scheme

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1 Executive summary

This statutory review report assesses the operation of the NSW Peak Demand Reduction Scheme (PDRS) for the period 2022–2024 to determine whether the:

- PDRS is meeting its policy objectives
- policy objectives remain valid
- overall scheme design remains appropriate for securing those objectives.

The Minister for Energy and Climate Change is releasing this report to fulfil the requirement under Schedule 4A, clause 143 of the *NSW Electricity Supply Act 1995* to review the PDRS as soon as possible after 1 July 2024.

The main findings of the statutory review report are as follows.

1.1 Objective 1: create a financial incentive to reduce peak demand for electricity by encouraging activities that create peak demand reduction capacity

The PDRS is meeting this objective. Accredited Certificate Providers (ACPs) have created Peak Reduction Certificates (PRCs) and Scheme participants are purchasing and surrendering PRCs.

The objective remains valid. There are significant opportunities to reduce peak demand in NSW and market barriers limit their uptake. The PDRS provides financial incentives to help overcome these barriers.

1.2 Objective 2(a): improve the reliability of electricity supply

The objective remains valid. Electricity supply reliability risks remain in NSW as the energy system transitions and climate change increases temperatures and the frequency of extreme weather events. Reducing peak demand helps improve electricity system reliability.

1.3 Objective 2(b): reduce the cost of electricity for customers

The objective remains valid. Energy bill pressures remain for customers in NSW. Reducing peak demand helps lower electricity costs.

1.4 Objective 2(c): improve the sustainability of electricity generation

The objective remains valid. Reducing peak demand supports the uptake of renewable electricity generation and reduces the amount of emissions-intensive generation required at peak periods. This contributes to meeting NSW's legislated emissions reduction targets.

1.5 Broad scheme design remains appropriate

The statutory review finds that broad scheme design remains appropriate because the objectives remain valid. However, the statutory review has also identified that winter peak demand in NSW is forecast to grow. The government intends to consider whether a change in scheme design may be required to address reliability risks presented by winter peak demand.

2 Introduction

The Peak Demand Reduction Scheme (PDRS) is one of 3 schemes under the NSW Energy Security Safeguard. The PDRS provides financial incentives for activities that provide peak demand reduction capacity.

This statutory review report assesses the operation of the PDRS for the period 2022–2024 to determine whether the:

- Scheme is meeting its policy objectives
- policy objectives remain valid
- overall scheme design remains appropriate for securing those objectives.

The PDRS was established in 2022 and is legislated to operate until 2050 under the NSW *Electricity Supply Act 1995* (the Act).

Schedule 4A, Part 2 of the Act requires the Minister for Energy and Climate Change to review the operation of the PDRS every 5 years. The Act specifies that the first statutory review of the PDRS is to be undertaken as soon as possible after 1 July 2024. The statutory review report is due to be tabled in NSW Parliament by 30 June 2025 to align with the timeframe for the statutory review of the NSW Energy Savings Scheme (ESS).

2.1 Call for submissions

2.1.1 Discussion paper

On 9 August 2024, the NSW Department of Climate Change, Energy, the Environment and Water (the department) released a discussion paper seeking stakeholder views on:

- the proposed approach to the statutory review
- the validity of scheme objectives
- the appropriateness of scheme design for achieving those objectives
- opportunities for reform.

The consultation period closed on 6 September 2024. The department received 30 submissions.

A summary of the feedback received is available in the stakeholder feedback summary.

2.1.2 Draft statutory review report

On 21 May 2025, the department published the PDRS draft statutory review report for public consultation. The department called for submissions from all interested parties on the evidence presented in the draft statutory review report. Submissions closed on 11 June 2025. The department received 8 submissions. These public submissions are available in this summary.

Submissions received were generally in support of the findings of the draft statutory review report and did not propose any changes to the analysis or further evidence that may be relevant.

2.2 Review scope

This first review covers 2 scheme compliance periods: 2022–23 and 2023–24.

The PDRS compliance period runs from 1 November until 31 March each year. The Independent Pricing and Regulatory Tribunal (IPART), the Scheme's administrator and regulator, requires Scheme participants to lodge their annual statements by March the following year. In their annual statements, Scheme participants can elect to surrender Peak Reduction Certificates (PRCs) and/or carry forward a shortfall to meet their individual certificate targets. Scheme participants that do not meet their targets must pay a shortfall penalty. IPART prepares an annual report for the Minister for Energy on scheme performance. IPART's report covering the 2022–23 PDRS compliance period was released in July 2024.

The PDRS compliance timeframe means that 2022–23 is the most recent available compliance data to inform this statutory review report.

Compliance period	PDRS target	Statutory review
2022–2023	0.5%	2025 review
2023–2024*	1.0%	
2024–2025	3.0%	2030 review
2025–2026	5.5%	
2026–2027	7.5%	
2027–2028	8.5%	
2028–2029	9.5%	
2029–2030	10.0%	Future reviews
2030–2050	10.0%	

Table 1 Peak demand reduction targets for the Peak Demand Reduction Scheme and compliance periods covered by statutory reviews

*Incomplete scheme compliance data

2.3 Modelling to inform future reviews

The department did not undertake energy market modelling to inform this statutory review because:

- the statutory review covers just 2 scheme compliance periods, with complete data available for only one compliance period
- initial PDRS targets are relatively low (see Table 1), which means their impact on matters such as electricity prices or reliability would have been challenging to identify.

The department intends for future statutory reviews to be informed by richer quantitative analysis on scheme performance.

3 Objective 1: create a financial incentive to reduce peak demand for electricity

The principal object of Schedule 4A of the Act, otherwise referred to as Objective 1 of the Peak Demand Reduction Scheme (PDRS), is to create a financial incentive to reduce peak demand for electricity by encouraging activities that create peak demand reduction capacity.

3.1 The Peak Demand Reduction Scheme is meeting this objective

The PDRS has created a financial incentive to provide peak demand reduction capacity. This is demonstrated by:

- accredited certificate providers creating Peak Reduction Certificates (PRCs) for peak demand reduction activities
- Scheme participants purchasing and surrendering peak reduction certificates.

However, data limitations and the ability for PDRS incentives to be combined with incentives from other schemes presents challenges in being able to identify the PDRS's specific contribution to encouraging activities that create peak demand reduction capacity.

3.1.1 Accredited Certificate Providers have created peak reduction certificates for peak demand reduction activities

During the 2022–23 compliance period, Accredited Certificate Providers (ACPs) created almost 3.5 million PRCs, driven primarily by heat pump water heater and refrigeration upgrades (IPART 2024a). This is nearly 419,000 certificates (10.7%) short of the 3.9 million certificate target for the compliance period.

Figure 1 shows the share of PRCs generated by each activity for the review period 2022–2024.

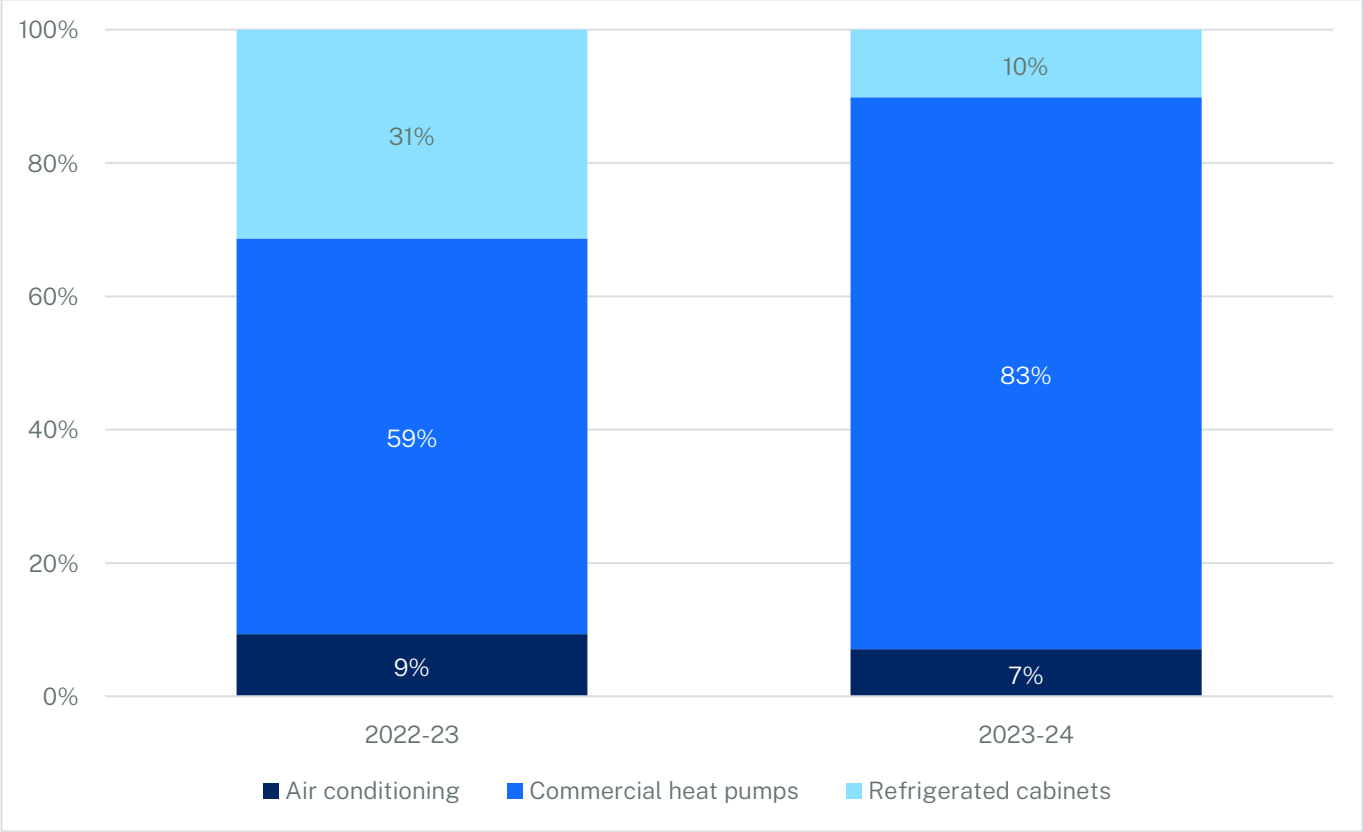

Figure 1 Share of Peak Reduction Certificates generated by each activity for the review period[1]

In the 2023–24 compliance period, PRC creation grew rapidly with an additional 26.6 million PRCs created as of 30 June 2024 (IPART, 2024a). This additional creation is enough for scheme participants to meet the 2023–24 target (7.9 million PRCs) and most of the 2024–25 target (24 million PRCs) (IPART 2024a).

3.1.2 Peak Demand Reduction Scheme participants are purchasing and surrendering peak reduction certificates

Table 2 shows PDRS participants have mostly purchased and surrendered PRCs rather than pay penalties. Preliminary 2023-24 compliance data suggests most Scheme participants have purchased and surrendered PRCs than pay penalties. IPART will publish the final report later in 2025.

[1] Department analysis of The Energy Security Safeguard Application (TESSA) portal data.

Compliance year	Total scheme obligation	Certificates surrendered to meet obligation	No. scheme participants required to pay a penalty	Total penalties in certificates	% total scheme participant obligation
2022-23	3,911,112	3,834,984	19	16,330	0.4%
2023-24	7,904,563	Not available	Not available	Not available	Not available

Table 2 Annual scheme participant compliance[2]

Scheme participants can surrender PRCs created after the end of a compliance period to meet their PRC targets for that compliance period. This means that most Scheme participants met their PRC targets despite the shortfall in certificate creation in the 2022–23 compliance period.

A total of 3.8 million PRCs were surrendered against the 3.9 million PRC target for the 2022–23 compliance period (IPART 2024a). This is a shortfall of 76,000 PRCs. Scheme participants carried forward nearly 60,000 PRCs as a shortfall to meet in future compliance periods. IPART issued penalty notices for the remaining 16,000 PRCs.[3]

This means that 98.1% of the PRC target was met by Scheme participants surrendering certificates, with around 1.5% carried forward and 0.4% met through penalties.

Scheme participants are not required to report the price they pay for PRCs. As shown in Figure 2, the PRC market indicates that the cost of purchasing PRCs was below the tax-effective penalty rate. Between 2022–23, the PRC price fluctuated between $1.05 and $2.75, remaining below the tax-effective penalty rate of $3.36 in the 2022–23 compliance period and $3.58 in the 2023–24 compliance period.

[2] As reported for 2022-23 (IPART 2024a). 2023-24 PDRS participant data pending.

[3] IPART advised that the sum of certificates carried forward or issued penalties does not align with the total shortfall due to rounding.

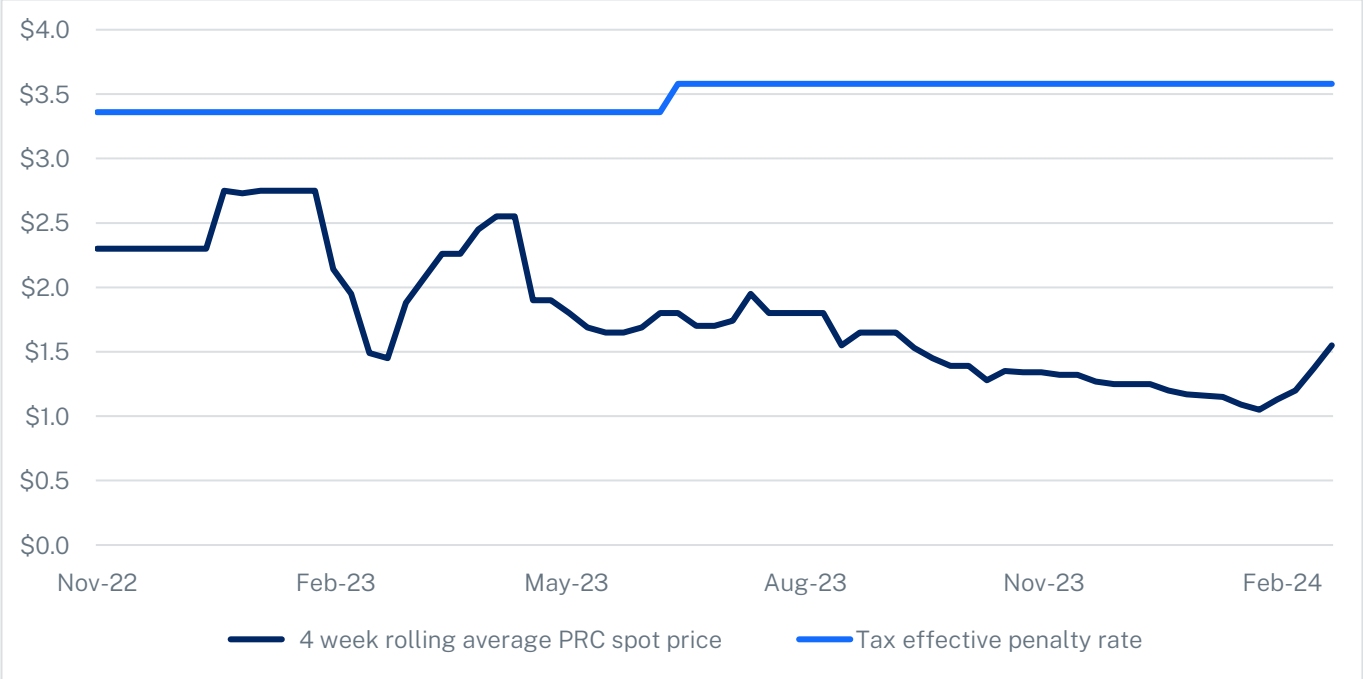

Figure 2 Tax-effective penalty rate and Peak Reduction Certificate price[4]

3.1.3 Incentive stacking presents challenges to identifying Peak Demand Reduction Scheme impact

PDRS activities were eligible to access combined incentives from up to 3 schemes in some cases.[5] Some activities that could generate Energy Savings Certificates (ESCs) and PRCs were updated in the ESS before the PDRS commenced. This makes it challenging to identify the PDRS's specific contribution to encouraging the uptake of peak demand reduction activities.

However, data suggests that the combined impact of ESCs and PRCs encouraged significant uptake of commercial heat pump water heaters in NSW. Commercial heat pumps accounted for 80% of PRCs created over the review period, and some models could quality for incentives from the Australian Government's Small-scale Renewable Energy Scheme (SRES), PDRS, and ESS. Between 2020 and 2022, before heat pumps were eligible to create PRCs and ESCs, heat pumps in NSW that received SRES Small-scale Technology Certificates (STCs) accounted for 7% of the national STC uptake under the SRES. After commercial heat pumps were eligible for PRCs and ESCs, heat pumps in NSW that received STCs accounted for 42% of the national STC uptake over the review period.[6] STC data indicates that the combined impact of the ESS and PDRS encouraged significant uptake of heat pumps in NSW.[7]

Air conditioning and refrigeration activities accounted for the remaining 20% of PRCs created during the review period and were eligible for both ESCs and PRCs. However, the ESS Rule was

[4] PRC price sourced from CORE Markets and averaged over the preceding four weeks. The tax-effective penalty rate is the base penalty rate adjusted for CPI and grossed up by the corporate tax rate of 30%.

[5] For the review period all PDRS activities had a corresponding ESS activity, and some heat pump upgrades could also qualify for incentives under the Australian Government's SRES.

[6] Department analysis of STC uptake data.

[7] The PDRS and ESS incentivised commercial heat pumps. However, STC data does not differentiate between residential and commercial heat pumps.

changed for both activities just before the PDRS commenced. This means there is no consistent baseline to assess impact against.[8]

3.1.4 Insufficient data to assess level of financial incentive available from Peak Reduction Certificates

The amount of financial incentive available from PRCs is partly determined by the cost of creating certificates. When certificate prices exceed certificate costs, the difference is available for ACPs to pass through to customers as a financial incentive. For example, as an upfront discount on the cost of purchasing and installing equipment.

The department has not researched the cost of creating PRCs during the review period. Therefore, this statutory review cannot determine the amount of incentive available to be passed through to customers. The department intends for future statutory reviews to be informed by research on the cost of creating PRCs.

3.2 The objective remains valid

The objective to provide a financial incentive to encourage activities that reduce peak demand for electricity remains valid because:

- significant peak demand reduction opportunities remain in NSW
- financial incentives can overcome market barriers and encourage their uptake.

3.2.1 Significant peak demand reduction opportunities remain

Research commissioned by the department identified a range of potential peak demand reduction opportunities for the PDRS (Common Capital 2024). Opportunities range from those already in the PDRS, including solar batteries, to potential new activities, such as smart electric vehicle charging and demand-response enabled appliances.

Battery energy storage systems exemplify the scale of remaining opportunity. The NSW Consumer Energy Strategy indicates that just over 5% of households with rooftop solar systems have batteries installed that can reduce peak demand by charging from solar and discharging at peak periods (NSW DCCEEW 2024a).

3.2.2 There are market barriers to delivering peak demand reduction capacity

Market barriers prevent the uptake of peak demand reduction opportunities.

High upfront costs and long payback periods remain a fundamental barrier to the adoption of energy efficiency upgrades that can also provide peak demand reduction (CCA 2024). Demand response and shifting faces barriers to uptake including a lack of financial reward for participation and a lack of awareness or trust in opportunities (Brinsmead, et al. 2021). Research suggests that financial barriers prevent the uptake of demand shifting activities like battery installations in

[8] The PDRS commenced in November 2022, but ACPs could claim PRCs for upgrades delivered from 1 April 2022 for all eligible activities.

Australia, and that government subsidies for battery installs would drive uptake (Alipour et al., 2022; Solar Citizens, 2022).

The PDRS provides financial incentives that help overcome financial barriers to the uptake of peak demand reduction capacity.

3.3 Outcome of consultation

3.3.1 Discussion paper consultation

Most respondents agreed the objective remains valid and market-based certificate schemes effectively encourage uptake.

However, 2 respondents suggested the primary objective should be to enhance the flexible use of energy. Respondents also proposed that the principal objective should be revised to remove reference to providing a financial incentive and instead focus on the outcome of reducing peak demand for electricity.

The department will consider these suggestions alongside broader Scheme reforms in 2025.

3.4 Finding

The statutory review finds that the PDRS is meeting this objective and it remains valid.

4 Objective 2(a): improve the reliability of electricity supply

Objective 2(a) of the Peak Demand Reduction Scheme (PDRS) is to improve the reliability of electricity supply.

4.1 The objective remains valid

As set out in sections 2.2 and 2.3, complete data is available for only one compliance period. Additionally, relatively low PDRS targets mean the Scheme's impact is too small to gain any reliable findings on whether it improved reliability. The next statutory review will be supported by data covering 5 years of scheme performance against increasing the Scheme's targets.

The objective to improve the reliability of electricity supply remains valid because:

- the transitioning energy system and climate change continue to pose reliability risks
- reducing peak demand improves electricity system reliability
- significant opportunities remain to reduce peak demand.

4.1.1 Reliability risks remain

4.1.1.1 Energy transition

The NSW energy system is in transition and more variable renewable generation is entering the system. Figure 3 shows the department's internal capacity mix projections over the next 10 years, demonstrating increased renewable generation capacity and battery storage, and reduced capacity from the planned retirement of coal power plants.

The energy transition presents reliability challenges. The 2024 Energy Security Target Monitor (ESTM) Report forecasts an Energy Security Target (EST) breach in NSW in 2027–28[9] (AEMO 2024b). This is primarily due to the announced retirement of Eraring Power Station in August 2027, but before commissioning of new transmission projects that increase transfer capacity into the Sydney Newcastle Wollongong (SNW) subregion.

Although new generation, storage and transmission capacity projects continue to increase, delays in project development and commissioning can impact system reliability. A second breach of the EST is expected in 2033–34, due to the planned retirements of both Vales Point and Bayswater power stations (AEMO 2024b).

[9] The Energy Security Target is defined as the electricity generation capacity required to meet forecast NSW maximum consumer demand in summer, plus a reserve to account for the unexpected loss of the 2 largest generating units in the state.

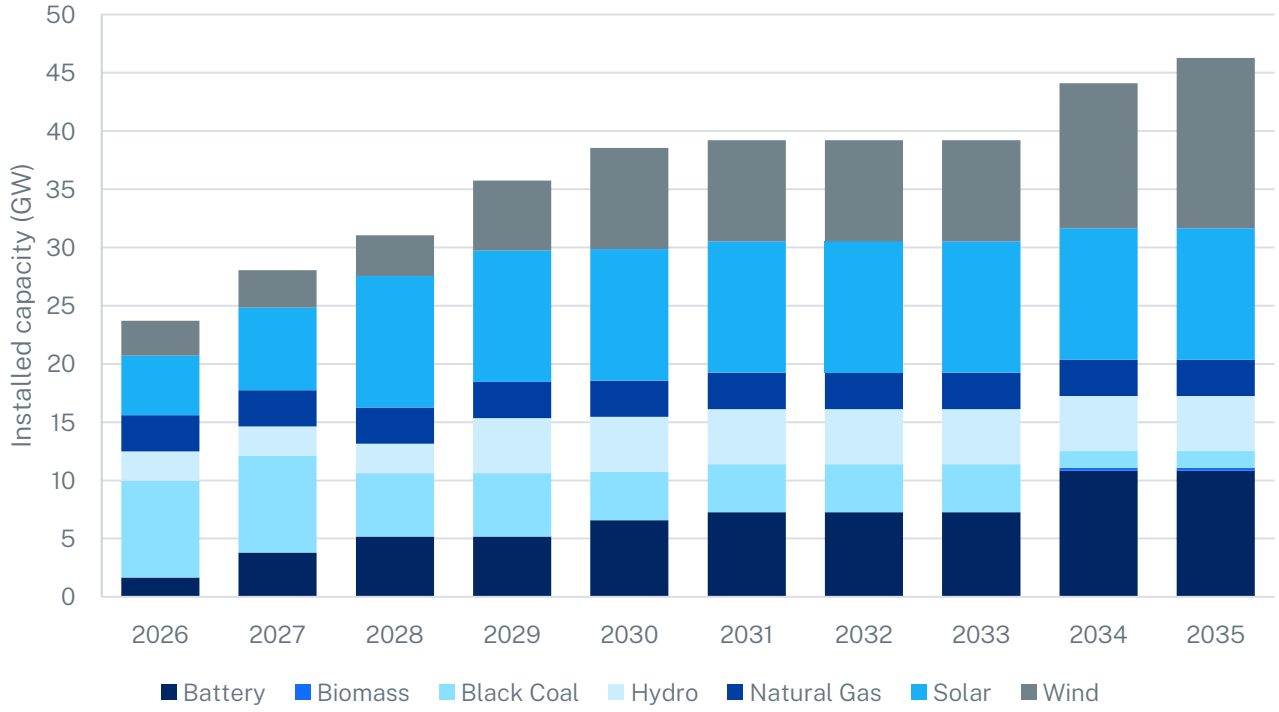

Figure 3 NSW projected installed capacity by financial year[10]

4.1.1.2 Climate change increases reliability risk

NSW and Australian Regional Climate Modelling (NARCliM) 2.0 data suggests that average temperatures, as well as the frequency of days of extreme heat and cold, are forecast to increase under both low and high emissions scenarios (DPE 2024).

Temperature change and extreme weather events can put additional pressure on the electricity system. The Australian Energy Market Operator (AEMO) found that temperature can contribute up to 50% of electricity demand in cases of extreme heat or cold (AEMO 2024c). Additionally, scheduled, and semi-scheduled electricity generation availability is lower in peak temperatures, typically when it is 37°C or greater, compared to typical summer and winter periods (AEMO 2024c). This is because some electricity generators have high temperature cut-offs. Wind generators can have up to 100% derating (or decrease in generator capacity) during extreme heat events. Extreme weather events and temperature changes therefore add to electricity reliability challenges on the demand and supply-side.

4.1.2 Peak demand reduction improves electricity system reliability

When the PDRS was designed, the reliability of the electricity system was challenged during times of peak demand because it was when a shortfall in firm capacity was most likely to occur (DPIE 2021). AEMO data between 2022 and 2024 suggests that most actual loss of reserve (LOR) events

[10] Department internal modelling.

occur during times of peak demand [11,12] (AEMO 2025). The magnitude of peak demand, along with demand flexibility, plays a role in determining grid reliability (AEMO 2024c).

Reducing peak demand improves reliability by reducing the amount of electricity generation required. It also helps mitigate temperature-sensitive demand spikes caused by weather events. Battery storage and flexible demand are key solutions to balance supply and demand during these periods. The NSW Consumer Energy Strategy highlights peak demand savings, shifting, and response as key strategies for improving grid reliability (NSW DCCEEW 2024a).The firm capacity from the PDRS has been included in the 2024 ESTM Report under the Demand Side Participation (DSP) forecast (AEMO 2024b).

4.2 Outcome of consultation

4.2.1 Discussion paper consultation

Respondents generally supported the PDRS objective to improve the reliability of electricity supply. Respondents highlighted its increasing importance in the context of the transition to renewable energy, and the increasing pressure on electricity generation from the uptake of electric appliances and vehicles.

4.3 Finding

The statutory review finds that the PDRS objective to improve the reliability of electricity supply remains valid. The next statutory review will seek to assess the extent to which the PDRS has contributed to meeting this objective.

[11] Department analysis of AEMO LOR data between 1 January 2022 and 31 December 2024.

[12] There is greater variability in timing of forecast LOR 1, 2, and 3 declarations that are cancelled (i.e., forecasts that do not lead to actual LOR events). Some actual LOR events also spill outside the peak demand window the PDRS targets.

Affordability

5 Objective 2(b): reduce the cost of electricity for customers

Objective 2(b) of the Peak Demand Reduction Scheme (PDRS) is to reduce the cost of electricity for customers.

5.1 The objective remains valid

As set out in sections 2.2 and 2.3, complete data is available only for one compliance period. Additionally, relatively low PDRS targets mean the Scheme's impact is too small to gain any reliable findings on whether it improved affordability. The next statutory review will be supported by data covering 5 years of Scheme performance against increasing Scheme targets.

The objective to reduce the cost of electricity for customers remains valid because:

- energy bill pressures remain for many NSW customers
- significant opportunities remain to reduce peak demand and lower electricity costs.

5.1.1 Energy bill pressures remain

In the June 2024 Energy Consumer Sentiment Survey, NSW households reported the expense they are most concerned about paying is their electricity bill (ECA 2024).

According to data collected by the Australian Competition and Consumer Commission (ACCC), between 1 August 2022 and 1 August 2023, the weighted average electricity bill in NSW increased by 35% for residential customers and 29% for small business customers (ACCC 2023). Typical electricity prices in regional areas are, on average, 23% higher for households and small businesses than in metropolitan areas (IPART 2024b).

The proportion of NSW households on hardship programs for electricity has steadily grown to over 2% in 2023–24 (AER 2024). 4.1% of small business customers in NSW have energy bill debt (AER 2024).

In recognition of the opportunities and challenges related to energy costs, one of the Consumer Energy Strategy's objectives is to keep energy bills as low as possible. This includes strategies to overcome challenges like the high upfront costs of energy upgrades, which some households and small businesses cannot afford (NSW DCCEEW 2024a).

5.1.2 Reducing peak demand lowers electricity costs

In NSW, electricity use is highest in the evening. This demand requires an increase in supply. Electricity generation is usually deployed from cheapest to most expensive, which means the cost of meeting peak electricity demand can be high.

Reducing peak demand will be particularly important over the coming decade because it helps reduce the amount of new generating capacity needed to replace retiring coal fired plants (NSW

DCCEEW 2024c). Between 2024–2050, the cheapest peaking gas technology is significantly more expensive than all forms of renewable variable generation[13] (CSIRO 2025). Reducing peak demand therefore avoids developing expensive electricity generation, like peaking gas plants.

The average cost of a Peak Reduction Certificate (PRC) was around $1.90 in the 2022-23 period.[14] The department has not conducted research on the cost of PRC creation. However, based on the $1.90 PRC price, the cost of creating a PRC could be 5.4 times higher than the current PRC price and would still be a more cost-effective means of providing peak demand reduction capacity compared to building a new peaking gas plant.[15]

During critical peak demand periods when generation resources cannot meet the demand, AEMO may also deploy mechanisms such as the Reliability and Emergency Reserve Trader (RERT). RERT allows AEMO to contract for emergency reserves, such as generation or demand response, that are not otherwise available in the market. AEMO compensates eligible participants for these interventions (AEMO 2024d). Costs of such interventions to reduce demand are reflected in electricity bills for households and businesses.

While the department has not modelled the impact of the PDRS for this statutory review, modelling for the 2025 ESS statutory review found that between 2019 and 2023, the ESS reduced enough peak demand to defer the need for additional gas peaking plants as well as other network investment (NSW DCCEEW 2025). Because the PDRS targets peak demand reduction, the department expects the PDRS also reduces the need for gas peaking generation and new network investment.

The PDRS provides incentives for activities that provide peak demand reduction capacity in summer afternoons and evenings. However, PDRS activities can also reduce electricity costs outside this window. For example, demand shifting or response from batteries can also provide capacity to help meet winter peaks, minimum demand or respond to other electricity system events.

5.2 Outcome of consultation

5.2.1 Discussion paper consultation

Respondents generally agreed that the objective remains valid. Stakeholders cited cost of living pressures for households and the PDRS's potential to reduce energy costs.

[13] Based on levelised cost of electricity analysis

[14] PRC price sourced from CORE Markets and averaged over the preceding 4 weeks. The tax-effective penalty rate is the base penalty rate adjusted for CPI and grossed up by the corporate tax rate of 30%.

[15] The analysis compares the construction cost $/kW of a new large-scale Open Cycle Gas Turbine (OCGT) with its fixed operating and maintenance costs over its lifetime to the cost of providing peak demand reduction capacity through the PDRS. The OCGT capital, fixed and lifetime were sourced from CSIOR GenCost. No transmission or distribution loss factors were applied. The total OCGT costs were annualised and estimated at $90.70 per kW, with a fixed operating expense and maintenance cost of approximately $14.10 per kW per year. The PRC cost was estimated a $1.90 per PRC which translates to ~$19 per kW of peak demand reduction capacity. We note that this comparison focuses only on the peak demand attribute of a OCGT and does not account for the full benefits of OCGT such as FCAS, system strength and reliability.

5.3 Finding

This statutory review finds that the PDRS objective to reduce the cost of electricity for customers remains valid. The next statutory review will seek to assess the extent to which the PDRS has contributed to meeting this objective.

6 Objective 2(c): improve the sustainability of electricity generation

Objective 2(c) of the Peak Demand Reduction Scheme (PDRS) is to improve the sustainability of electricity generation.

6.1 The objective remains valid

As set out in sections 2.2 and 2.3, complete data for the PDRS is available only for one compliance period. Additionally, relatively low PDRS targets mean the Scheme's impact is too small to gain any reliable findings on whether the Scheme improved sustainability. The next statutory review will be supported by data covering 5 years of Scheme performance against increasing targets.

The objective to improve the sustainability of electricity generation remains valid because:

- NSW has legislated emissions reductions targets
- significant opportunities remain to reduce peak demand to support emissions reduction.

6.1.1 NSW has legislated emissions reductions targets under the *Climate Change (Net Zero Future) Act 2023*

The NSW Government is committed to effective action on climate change. The *Climate Change (Net Zero Future) Act 2023* legislates emissions reduction targets for NSW:

- 50% reduction on 2005 levels by 2030
- 70% reduction on 2005 levels by 2035
- net zero by 2050 (NSW Government 2023)

The Net Zero Future Act also mandates the setting of future interim targets to reduce net greenhouse gas emissions in NSW for 2040 and 2045, which must be greater than the previously set target.

NSW must reduce emissions in all sectors (including electricity) to achieve these targets (NSW NZC 2024). Figure 4 shows there is a risk that NSW is not on track to achieve the 2030 and 2035 targets under current policy settings (NSW DCCEEW 2024b).

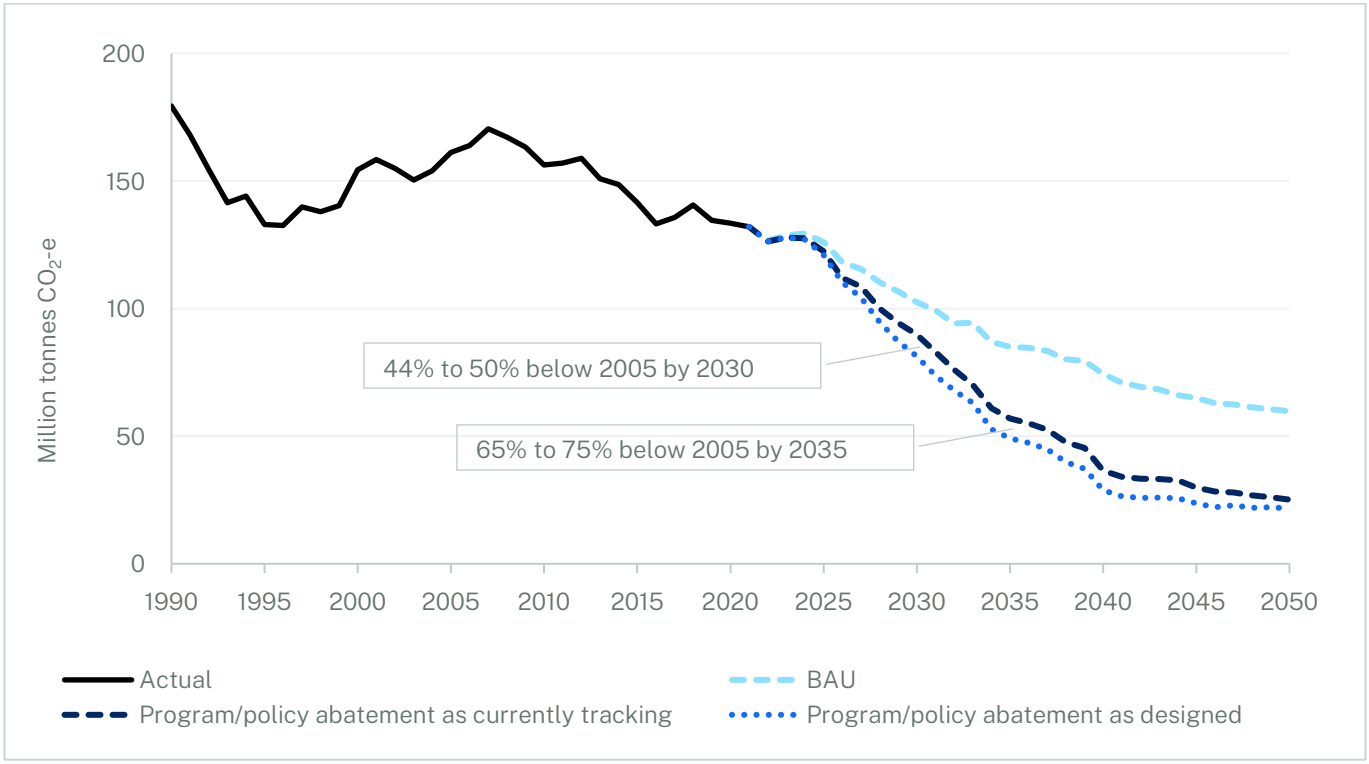

Figure 4 Projected total NSW emissions to 2050 for business as usual and current policy scenarios

6.1.2 Reducing peak demand supports emissions reductions

The electricity and energy sector is the largest source of emissions in NSW, accounting for 40% of emissions (NSW NZC 2024). Coal and gas fuelled electricity generation is emissions intensive. In 2023–24, 64% of electricity was generated by coal, 2% by gas, and 34% by renewables (NSW NZC 2024).

Figure 5 shows the average generation mix in NSW for the top ten peak demand days in summer between November 2022 and June 2024. Coal, gas and hydro use are the highest during times of peak demand. In times of peak demand and decreased solar output, generation includes a higher proportion of coal power and gas peaking plants (NSW NZC 2024). The contribution of large-scale batteries during peak demand is insignificant for the period from November 2022 until June 2024 as the installed capacity of batteries in NSW at the end of that period was only 210 MW with duration of less than 2 hours (AEMO 2024e).[16]

NSW and Australia are investing in renewable energy to meet legislated emissions reduction targets and replace the capacity of steadily retiring coal power stations (AEMO 2024c). Reducing peak demand will reduce the need for gas peaking plants and utility scale storage, which will decrease emissions and enable the transition to renewables while maintaining reliability and affordability (NERA 2022).

Deployment of renewable energy depends on load flexibility and demand management. Total electricity consumption and the timing of use in buildings will significantly impact both the cost and pace of decarbonising the electricity and energy sector (NSW NZC 2024).

[16] Department calculations using AEMO July 2024 generation information.

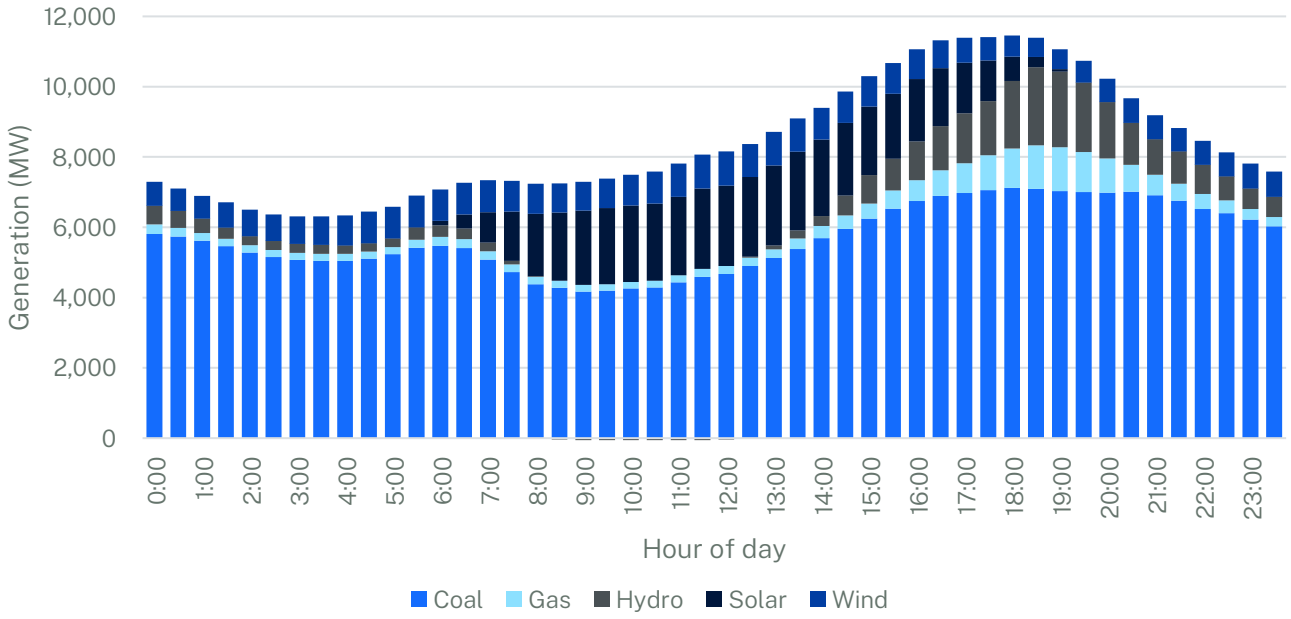

Figure 5 NSW average generation fuel mix during top peak demand days in summer 2022-23 and 2023-24

Reducing peak demand will help reduce electricity sector emissions and, along with other actions, will support an orderly transition to a largely decarbonised electricity grid.

6.2 Outcome of consultation

6.2.1 Discussion paper consultation

Respondents generally agreed the objective remains valid and highlighted the importance of peak demand reduction and energy flexibility in the transition to renewable energy.

6.3 Finding

The statutory review finds that the PDRS objective to improve the sustainability of electricity generation remains valid. The next statutory review will seek to assess the extent to which the Scheme has contributed to meeting this objective.

7 Broad scheme design remains appropriate

7.1 Finding

This statutory review finds that the Peak Demand Reduction Scheme (PDRS)'s objectives remain valid. Therefore, the broad design as a market-based certificate scheme remains appropriate, despite limited evidence to assess its performance.

However, the statutory review has identified that winter peaks are forecast to grow. The department will consider whether the PDRS should be expanded to address winter peaks and, if so, whether changes to the scheme are required.

The NSW Government has also committed to investigating options to enhance the PDRS to help deliver the NSW Consumer Energy Strategy targets and objectives (NSW DCCEEW 2024a). The department will consider these options alongside broader Scheme reforms in 2025.

7.2 Peak demand is highest in afternoons and forecast to grow in winter

7.2.1 Winter peaks present reliability challenges

The PDRS defines the peak demand period as 2:30 pm and 8:30 pm AEST from 1 November to 31 March (the AEMO-defined summer period). Table 3 shows electricity demand data between 1 July 2022 and 30 June 2024.[17] 6 out of the top 10, and 10 out of the top 20 daily peak electricity demand intervals occurred in summer (AEMO 2024a).[18] The rest occurred in winter, mostly concentrated June.

Date	Time of peak operational demand (AEST)	Total operational demand (MW)	Season
29 February 2024	16:35	13,764	Summer
6 March 2023	17:45	13,119	Summer
14 December 2023	17:55	13,053	Summer
20 June 2023	18:50	12,589	Winter
21 January 2024	18:10	12,495	Summer

[17] While the review period for this report is 1 November 2022 to 31 June 2024, this analysis uses 1 July 2022 to 31 June 2024 to compare 2 full summers and winters.

[18] Department analysis of AEMO demand data.

23 February 2024	16:00	12,423	Summer
19 July 2022	18:00	12,415	Winter
21 June 2023	18:25	12,384	Winter
22 June 2023	18:00	12,349	Winter
9 December 2023	17:35	12,333	Summer

Table 3 20 highest operational demand days between 1 July 2022 and 31 June 2024

As shown in Table 4, the summer demand forecast is higher than winter in 2024–25 for the 10% Probability of Exceedance (POE) case. However, the gap between summer and winter demand decreases steadily over the medium to long term (AEMO 2024c).[19] Additionally, the forecast EST breaches in 2027–28 are all in summer. These forecasts indicate that summer peaks currently pose a greater reliability risk, but the gap with winter peaks is narrowing. As a result, winter peaks may present a significantly higher reliability risk in the next decade. The department will consider the target season as part of broader reforms and continue to monitor peak demand trends.

[19] Additionally, the 50% POE forecast is only slightly higher in summer than winter in 2025-25 and is higher in winter than summer in 2039-40 and 2049-50.

Financial year	Summer Demand (MW) 10% POE	Calendar year	Winter Demand (MW) 10% POE
2024–25	14,064	2025	12,893
2029–30	14,851	2030	13,833
2039–40	15,704	2040	15,112
2049–50	16,175	2050	16,065

Table 4 NSW summer and winter 10% POE maximum operational (sent-out) demand forecast, Step Change scenario

7.2.2 Evidence suggests that summer afternoon peaks remain high

As seen in Table 3, peak demand during both summer and winter occurred between the PDRS peak demand period of 2:30–8:30 pm AEST (AEMO 2024a). Figure 6 and Figure 7 show the top 10% of peak demand events on the four highest-demand summer days during the two compliance periods covered in this statutory review.[20] In both compliance periods, highest demand took place between 2:30 pm and 8:30 pm AEST, which suggests that the target time and duration remains broadly appropriate.

However, the 50% POE summer maximum demand distribution is expected to shift later into evenings between 2022–23 and 2031–32 (AEMO 2024b). AEMO also notes that shifts in consumer demand and behaviour, including increasing use of consumer energy resources, make future peak timing uncertain (AEMO 2024b). NSW electricity distributors, like Ausgrid, have indicated they may change peak windows to later in the day in mid-2027 (Ausgrid 2023).[21] The department will investigate the suitability of the target peak demand reduction period as part of broader reforms.

[20] Department analysis of AEMO demand data (AEMO 2024a)

[21] This change will be trigged if a network system peak demand occurs after 9 pm on any day before 1 March 2027 (Ausgrid 2023).

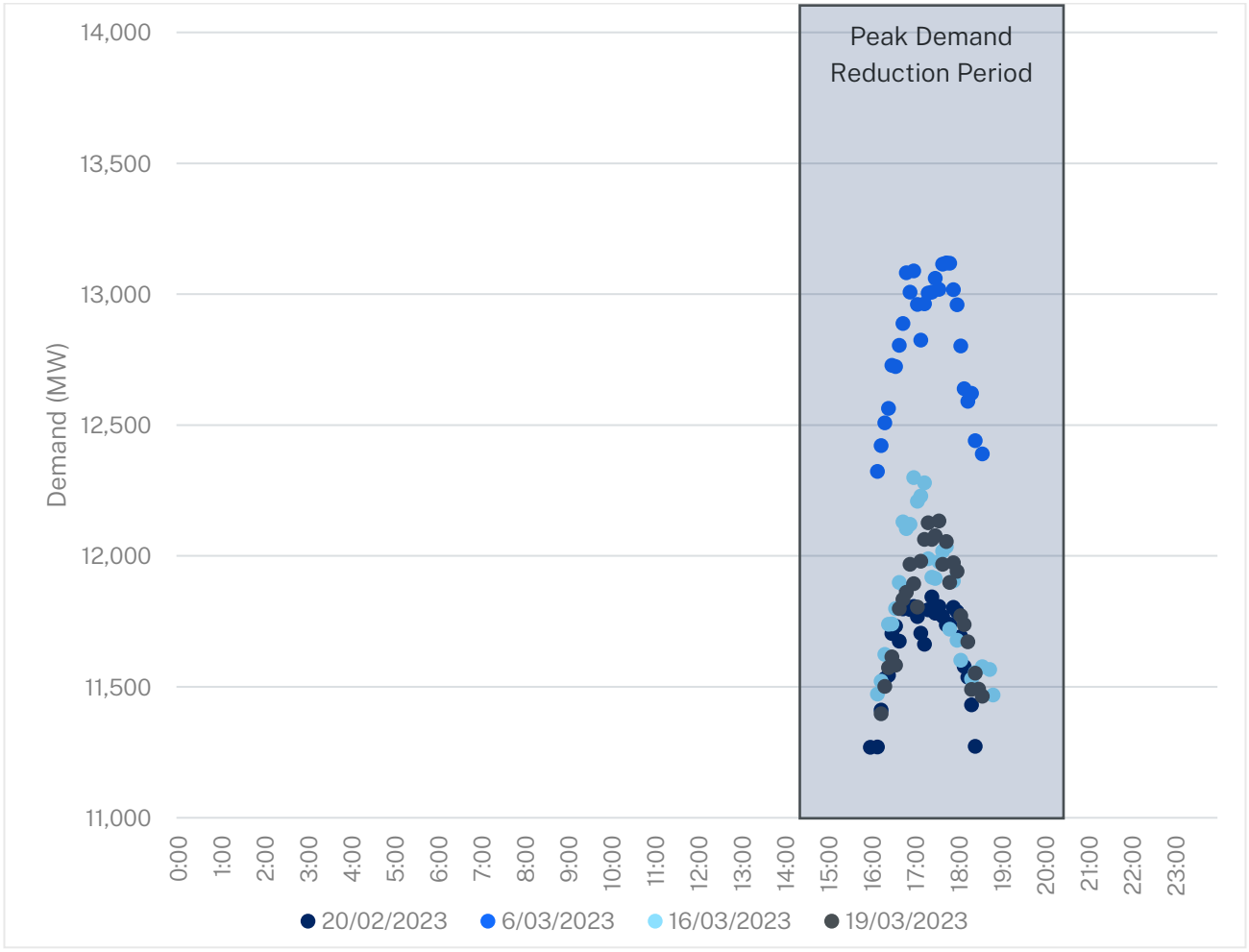

Figure 6 Top 10% of demand in 4 highest summer demand days between 1 November 2022 and 31 March 2023

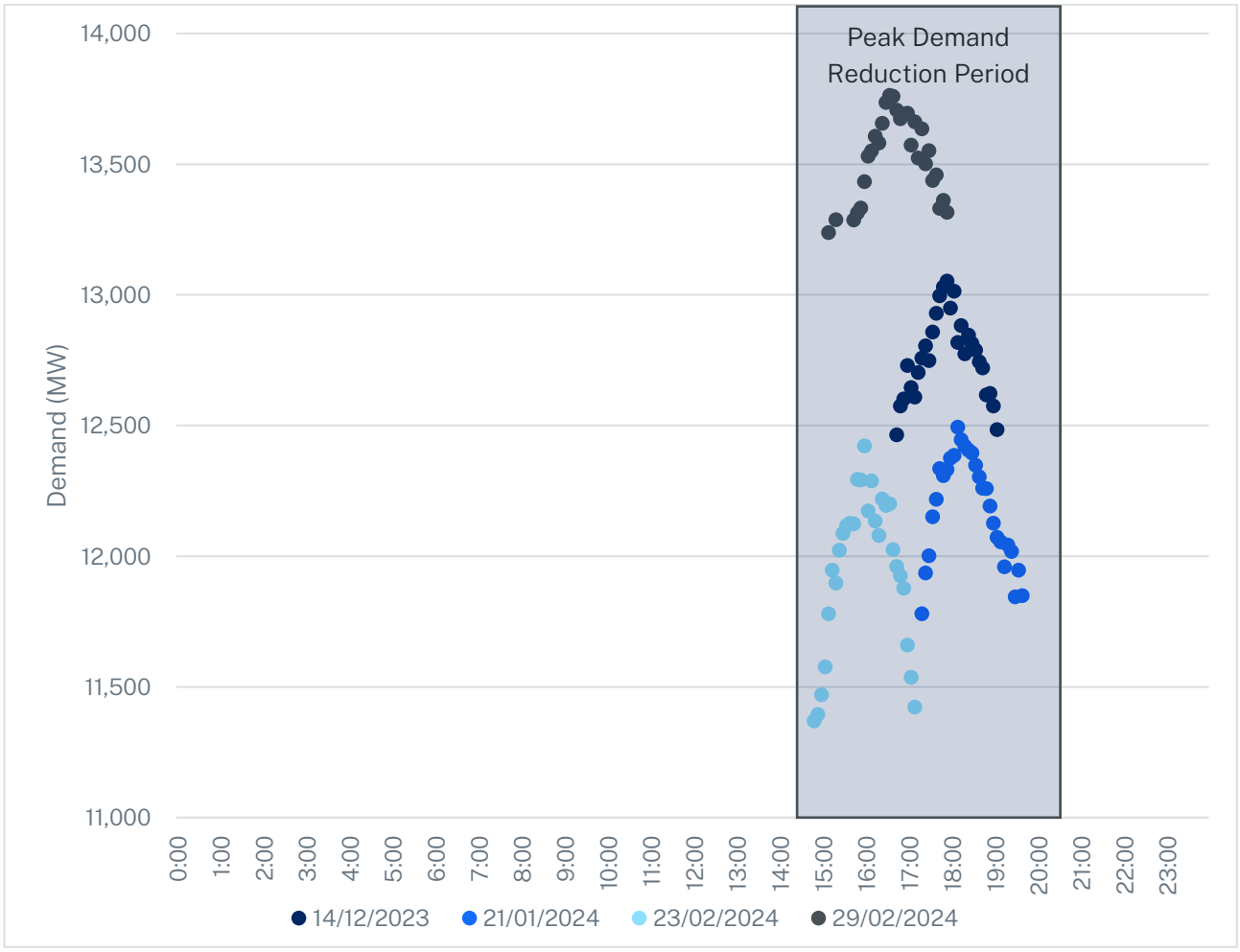

Figure 7 Top 10% of demand in 4 highest summer demand days between 1 November 2023 and 31 March 2024

7.3 Commitment to consider the Energy Security Board's Post-2025 Electricity Market Design

The 2021 Safeguard position paper committed to considering the Energy Security Board's (ESB) Post-2025 Electricity Market Design in statutory reviews and rule development (DPIE 2021). The ESB delivered the final design in late 2021.

Elements of the Post-2025 Electricity Market Design project were completed or transferred to other relevant bodies, including to AEMO, the Australian Energy Regulator (AER), the Australian Energy Market Commission (AEMC), and Working Groups under the Energy and Climate Change Ministerial Council (ECMC). The department reviewed project outcomes and found they do not materially impact the validity of PDRS objectives or the appropriateness of overall PDRS design.

In November 2024, the Australian Government announced that an independent panel will evaluate wholesale market settings (WMS) within the National Electricity Market (NEM) to determine how the NEM can be shaped to ensure it promotes investment in firmed, renewable generation and storage capacity following the conclusion of the Australian Government's Capacity Investment Scheme. This WMS Review will consider, in part, how the NEM can harness a large cohort of consumer energy resources to enhance competition and whether there is a role for certificate-based schemes to promote investment in both grid and distributed firmed, renewable generation and storage. The

department will continue to monitor, and contribute to, the WMS Review as well as other relevant developments in the sector and how they relate to the design of the PDRS.

7.4 Discussion paper consultation

Most respondents agreed the PDRS's design is appropriate. Some stakeholders commented that:

- the Scheme is in its early implementation stage, and it is therefore challenging to assess its design based on early performance
- Scheme design presents challenges for some customers to access incentives, particularly in regional areas or for low-income households
- the peak demand period could be adjusted to account for winter peaks and summer peaks after 8:30 pm AEST
- the Scheme should also seek to encourage shifting demand to the middle of the day when the emissions intensity of electricity generation is lower and minimum demand challenges exist[22]
- the Scheme should expand to include activities for commercial and industrial demand response.

The department will consider these suggestions alongside broader Scheme reforms in 2025.

[22] The 2021 Energy Security Safeguard position paper (DPIE 2021) stated that the NSW Government would consider giving minimum demand greater priority in future statutory reviews. While this statutory review finds that the PDRS's objectives and design remain valid, the NSW Government intends to consider whether and how the Scheme could help address minimum demand issues.

8 Glossary

Acronym	Term
ACCC	Australian Competition and Consumer Commission
ACP	Accredited certificate provider A business who is accredited to create PRCs under the PDRS
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
ECMC	Energy and Climate Change Ministerial Council
ESC	Energy savings certificate
ESS	Energy Savings Scheme
ESB	Energy Security Board
EST	Energy Security Target
ESTM	Energy Security Target Monitor
GWh	Gigawatt hours
IPART	Independent Pricing and Regulatory Tribunal
LOR	Lack of reserve
MW	Megawatt
NARCliM	NSW and Australian Regional Climate Modelling
NEM	National Electricity Market
PDRS	Peak Demand Reduction Scheme
PRC	Peak Reduction Certificate
RERT	Reliability and Emergency Reserve Trader
Scheme participant	Typically, an electricity retailer, who is required by legislation to participate in the PDRS and meet an individual certificate target each year
SRES	Small-scale Renewable Energy Scheme

STC	Small-scale Technology Certificate
TESSA	The Energy Security Safeguard Application
WMS	Wholesale market settings

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