Does the market price cap in the NEM provide an effective investment signal?

Energy Consumers Australia

June 2025

Contents and context of this report

Contents

Historical analysis

- Frequency and duration
- Cost of price events
- Revenue earned by technology
- Bidding behaviour
- Cost of electricity

Forward look at missing money for key technologies

Market Price Cap and policy reform

- NEM wholesale market settings review
- Price caps in other comparable markets

Context of this report

- The Market Price Cap (MPC) is an important feature of the wholesale market design in the National Electricity Market (NEM) and is one lever that is used to incentivise investment in new capacity.
- In short, the MPC is intended to reflect consumer willingness to pay for a set level of reliability. In other words, it is intended to:
  - Allow spot prices to reach high enough values in periods of scarcity that it sends clear price signals to incentivise investment and operation in the electricity wholesale market consistent with achieving the reliability standard; and
  - Limits how high spot prices can go to reflects the value of customer reliability and ensure prices remain within consumer's willingness to pay for reliability.
- Together, the MPC and the Cumulative Price Threshold are also important measures to protect electricity consumers from sustained extreme high prices.
- The MPC is set by the AEMC on an annual basis, informed by its own analysis and recommendations by the Reliability Panel. The MPC has historically been increasing over time with indexation. However, over the period FY2025 to 2028, the MPC will increase beyond indexation. The MPC will have risen from $15,500/MWh in FY23 to $17,500/MWh in FY25 to a base value of $21,500/MWh in FY28. This increase has been premised on the understanding that a higher MPC would reduce costs for consumers in the long term by incentivising investment in new capacity.
- Since the current trajectory of increasing MPC values was recommended by the Reliability Panel, the market has continued to evolve, including with state and Commonwealth programs of support for generation and storage being announced and implemented.

With these changes in mind, and with an independent review into the electricity market settings currently underway, there is reason to reconsider whether the current value of the MPC and its anticipated rise continue to be fit-for-purpose when considering investment signals.

Key messages

- Analysis of spot prices from 2019-24 demonstrates that extreme high price events occur infrequently and for limited windows of time, however these periods can still have a material impact on the total cost of delivered energy.
- Our analysis of the impact of the increased MPC found $4.7 billion in additional costs to consumers, based on the difference between the actual costs of electricity versus the costs if the MPC was held flat. Some of this cost to consumers may be offset by long-term benefits to the extent that increasing the MPC drives investment in new generation or storage which would not have come forward otherwise. However, consideration should be given to whether a more targeted approach could be used to support investment in the specific technologies or services needed rather than using the energy-only market to achieve this.
- Forward looking projections highlight significant 'missing money' persists for gas peaking units, even with the current trajectory of the MPC. This suggests that, even with a high and rising MPC, this market setting is not likely to drive the right level of investment in new peaking capacity.
- The NEM wholesale price settings review that is currently underway should consider the role of the MPC alongside the suite of measures in scope to provide more targeted price signals over operational and investment timeframes. The objective should be to deliver the right level of investment at least costs to consumers and taxpayers.

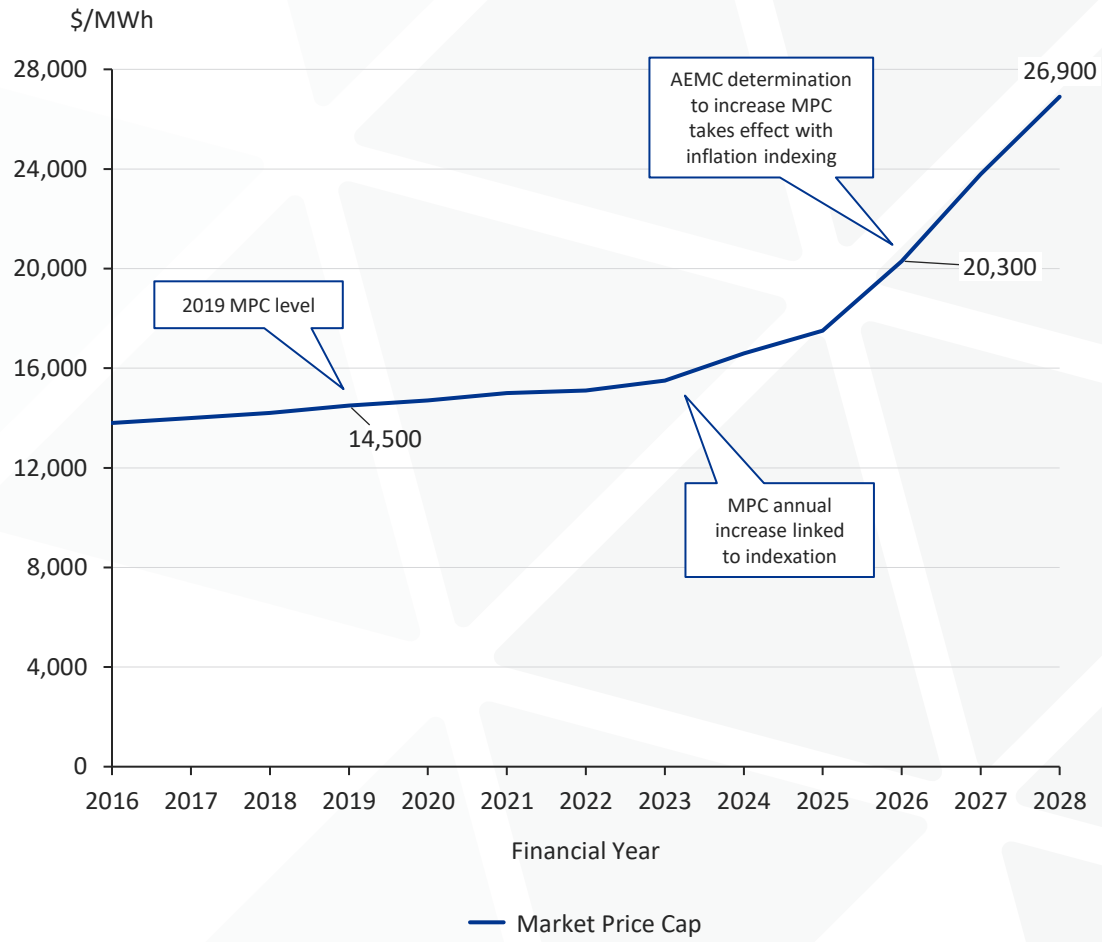
Historical Analysis

This analysis is based on historical dispatch data from the National Electricity Market

The introduction of new government mechanisms to drive investment brings into question whether the high and rising MPC is also necessary to achieve this outcome

- The AEMC released its final rule change decision on market price settings in December 2023. This document outlined the increases to the market price cap, cumulative price cap and administered price cap from July 2025 onwards.
- Under this final determination the base value of the MPC will progressively increase from $18,600/MWh on 1 July 2025 to $22,800/MWh on 1 July 2027. This base level is in 2022 dollars and will be increased in the respective year to real dollars in line with inflation.
- The change to the market price cap was said to be necessary due to the current level being too low to support adequate generation being available during times of system stress. The determination highlights that by increasing the price cap, new investment is expected to increase to a level which reduces future prices and saves consumers money in the long term
- The AEMC's determination was informed by Reliability Panel recommendations which were made ahead of major policy announcements which directly impact market investment in dispatchable technologies. In particular, the Capacity Investment Scheme has since been announced to bring forward significant volumes of new generation and storage across Australia.
- Other government mechanisms which have since been announced include South Australia's Firm Energy Reliability Mechanism and the extension of the long duration storage target in NSW, both intended to drive investment in technologies which are required for reliability, but which may not be developed in the absence of support.
- The introduction of these government mechanisms to drive investment brings into question whether a high and rising MPC is necessary to effectively deliver new investment, and whether the government support would underpin these investment decisions irrespective of whether the MPC was reduced.

Market Price Cap, inflation adjusted*



*Future vase values have been adjusted using RBA inflation forecasts

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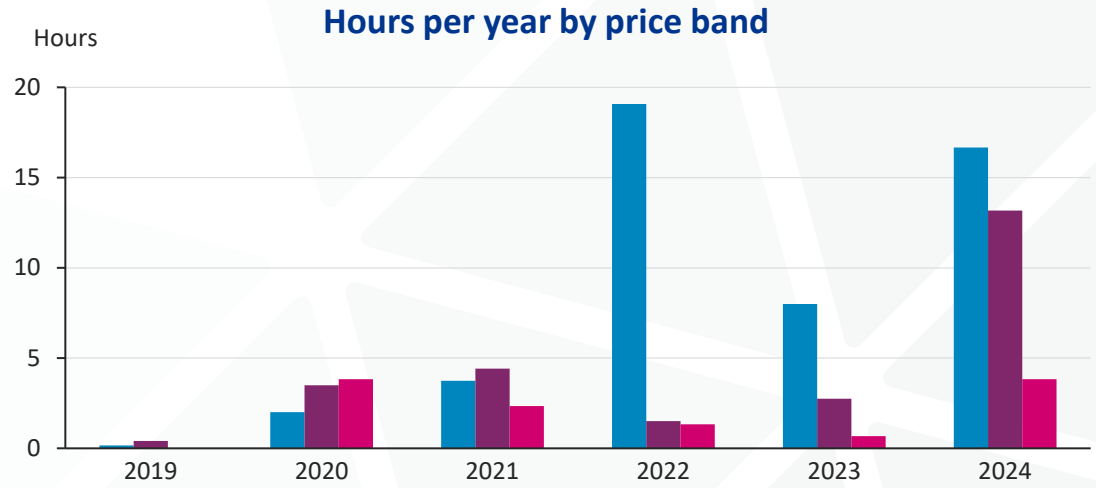
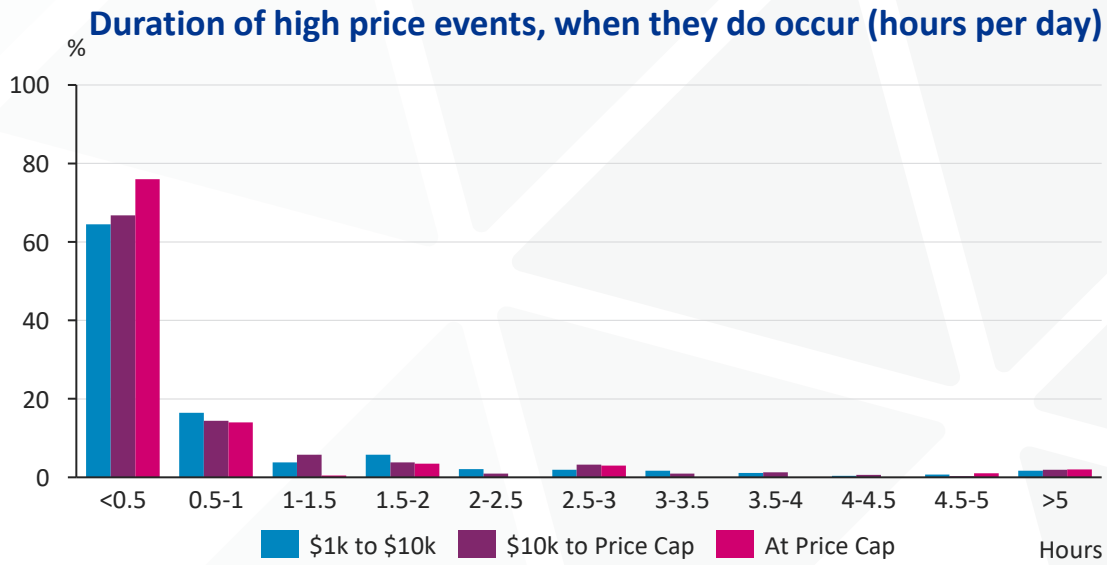
High price periods, and especially prices close to the MPC, occur very infrequently and for short durations in the NEM

- This analysis focuses on the frequency and duration of high price events across the NEM for the period Jan 2019 to Dec 2024.
- Key observations include:
  - Overall, high price periods are rare. The price has been above $1000/MWh on average for less than 15 hours per year since 2019. This is less than 0.2% of time across a year.
  - Prices above $10,000/MWh or at the price cap* are even less common, occurring for 4 hours and 2 hours on average in a year since 2019 (less than 0.05% of the time).
  - During the 2022 global gas crisis, the NEM saw a large spike in prices above $1,000/MWh. However, prices above $10,000/MWh occurred less than the previous two years during this window.
  - Analysis of the duration of high price events identifies how many hours in the day have been at high prices, based on those days in which high prices have occurred. This analysis, presented to the right, finds that the vast majority of days in which high prices occur see these prices for less than 30 minutes across the entire day, and this proportion increases as the price band increases. Around 76% of days which had a price at the price cap had this price for under 30 minutes, these were not sustained for long stretches of time.
- This analysis highlights that price cap events are rare and very short lived. This is important pretext to understand how impactful it may be for investment decisions in the NEM and the level of risk involved in relying on these events to earn adequate returns.

**For the purposes of this analysis, we consider prices to be 'at the price cap' when they are within $100 of the MPC.*





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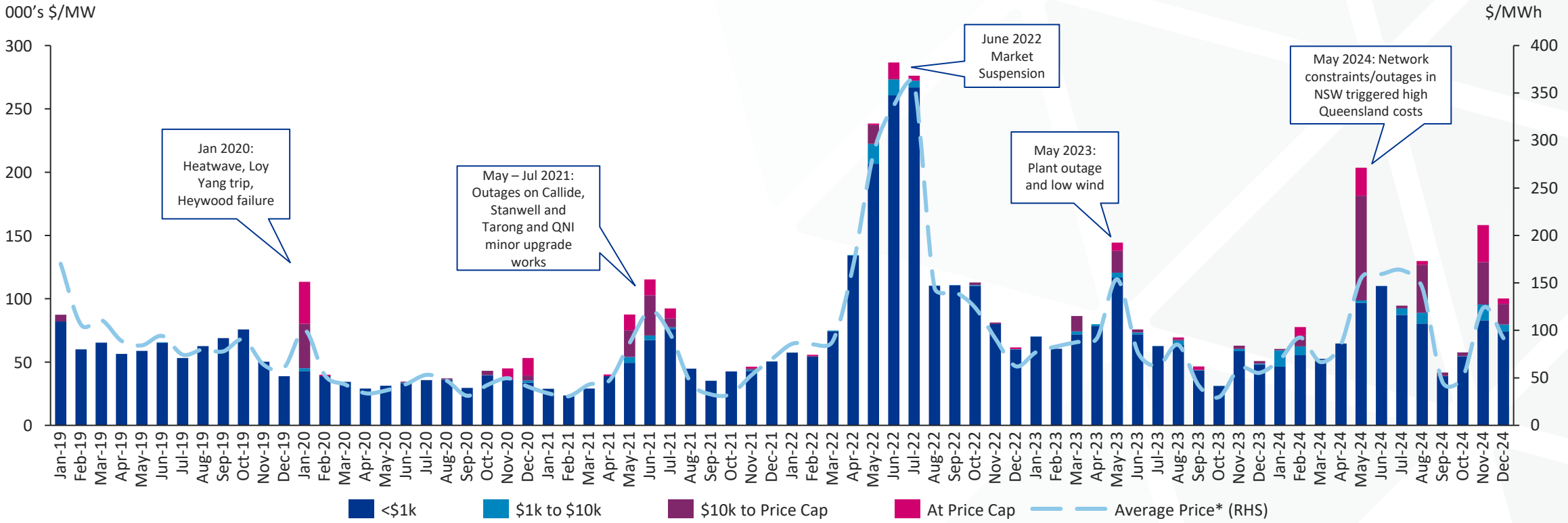
While lower priced periods contribute most to overall costs, high price events can increase costs in the NEM significantly during unexpected system stress events

- Over the last six years, there are occasional months in which costs have risen significantly due to very high price periods. The magnitude of these high prices means a relatively small number of periods will translate to a large increase in overall costs. This can be seen in, for example, in January 2020 and May 2024 in the chart below. From 2019-2024, prices above $10,000/MWh have contributed to 10% of the total cost of electricity supply even though these high priced intervals occur infrequently and for limited durations.
- The most significant increase in prices in the NEM since 2019, which occurred in May-July 2022, were actually driven by price periods below $1,000/MWh rather than high prices. This reflects, in part, cost-reflective bidding in the context of higher costs. Market restrictions also limited bidding for a period of time during this window.

Monthly cost of supply, per price band



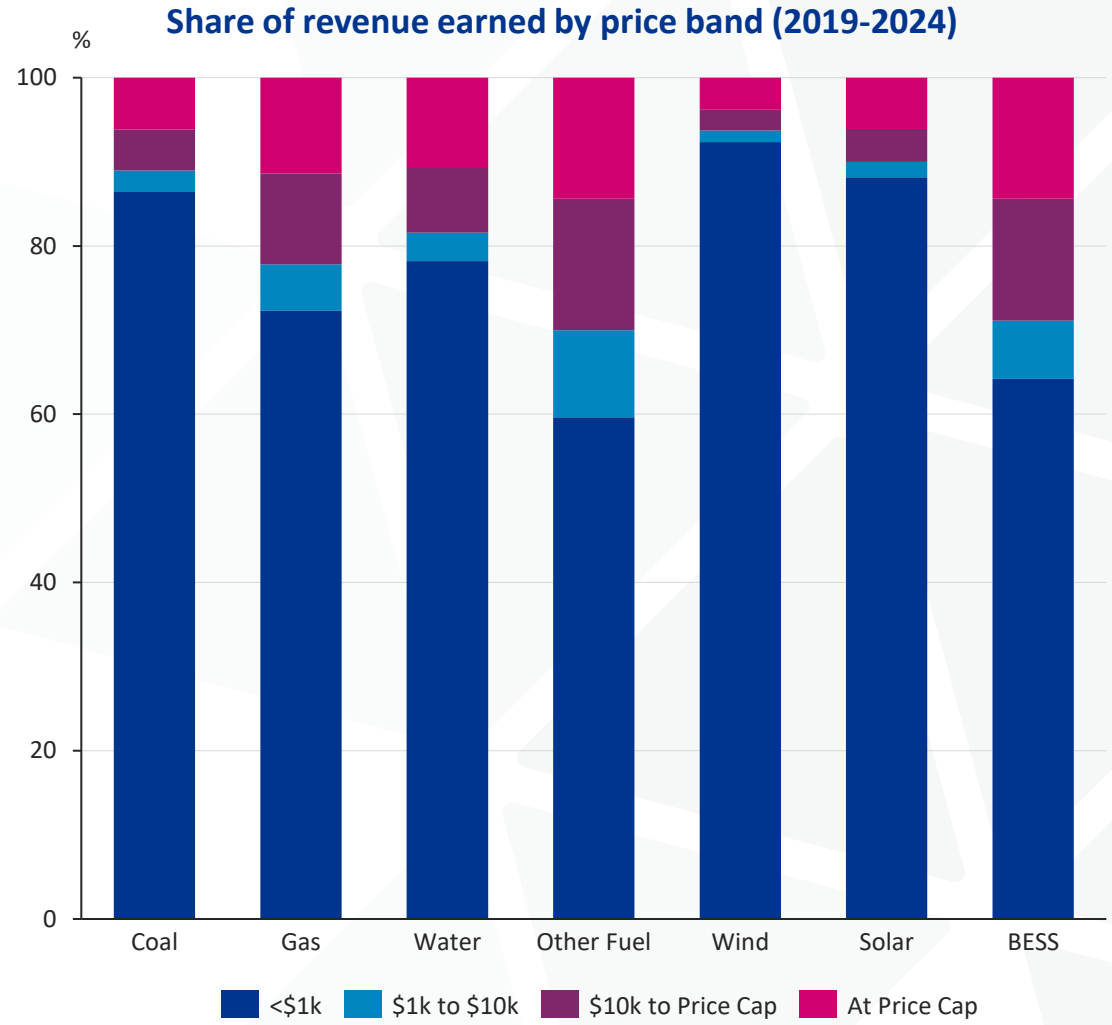
*NEM-wide average price, unweighted

While high prices provide a significant share of revenue to peaking units, the revenue from high price periods is earned by all other generation too

- Each technology type earns different proportions of revenue from high price periods. This is a result of a combination of factors.
  1. Generation profile:
     - Most renewable generation is not dispatchable, and periods of high renewable generation are negatively correlated with high prices.
     - Coal plants will provide baseload power consistently across price bands.
     - Gas and BESS and other fuel* are dispatchable and respond to the needs of the system and to prices.
  2. Bidding behaviour – this will generally reflect the generation profile, but an asset can change its bid to take advantage of either too much or too little supply and the market price.

- Dispatchable units such as Gas and BESS earn the highest proportion of revenue from periods above $10,000/MWh reflecting their ability to respond to prices. Gas historically has earned 22% of Revenues while BESS earns 28% from prices from periods above $10,000/MWh.

- This proportion is lower for coal (11%), which will usually generate during as many periods as possible and lowest for renewables (8%) which will generate when available and are usually less correlated with high price periods.



*Other fuel is representative of generation using Diesel, Coal seam methane, Oil or Kerosene

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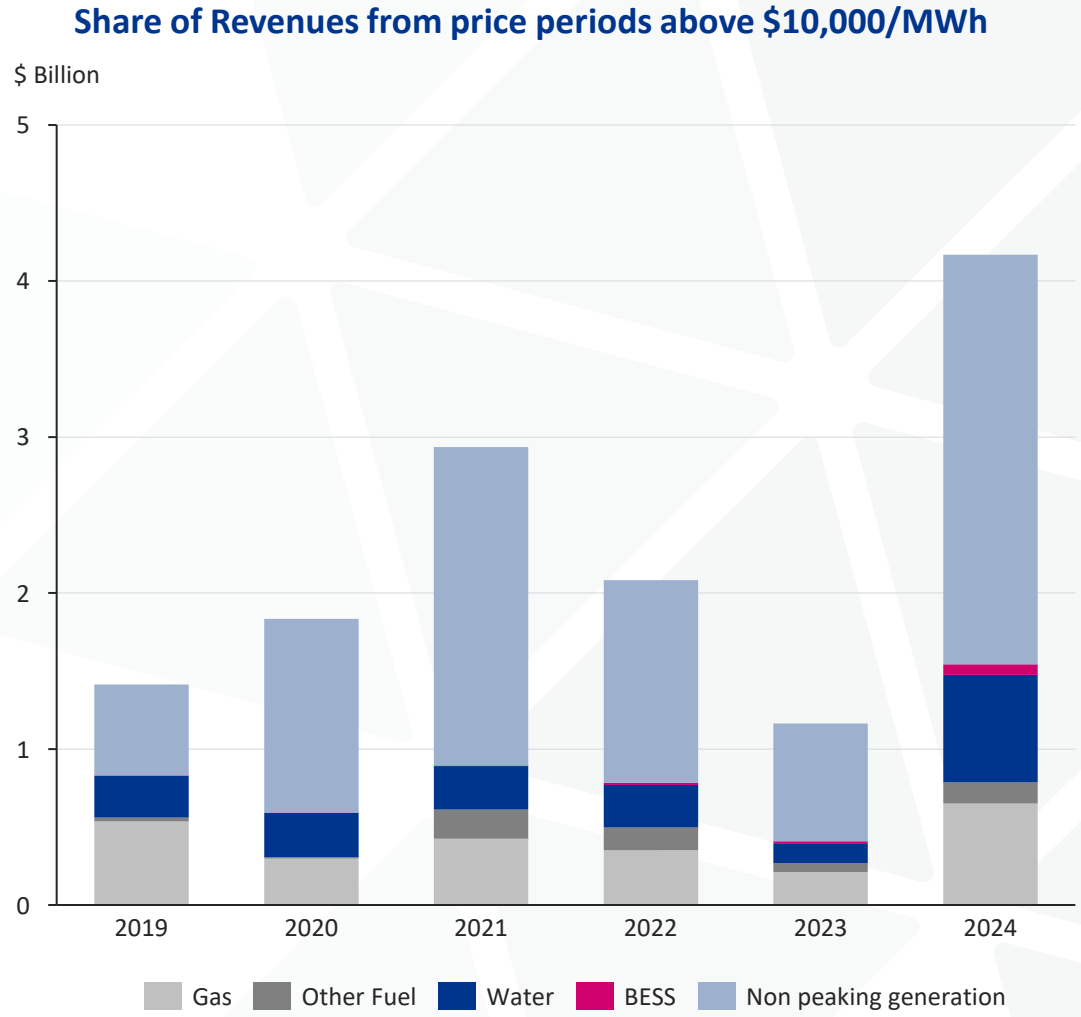
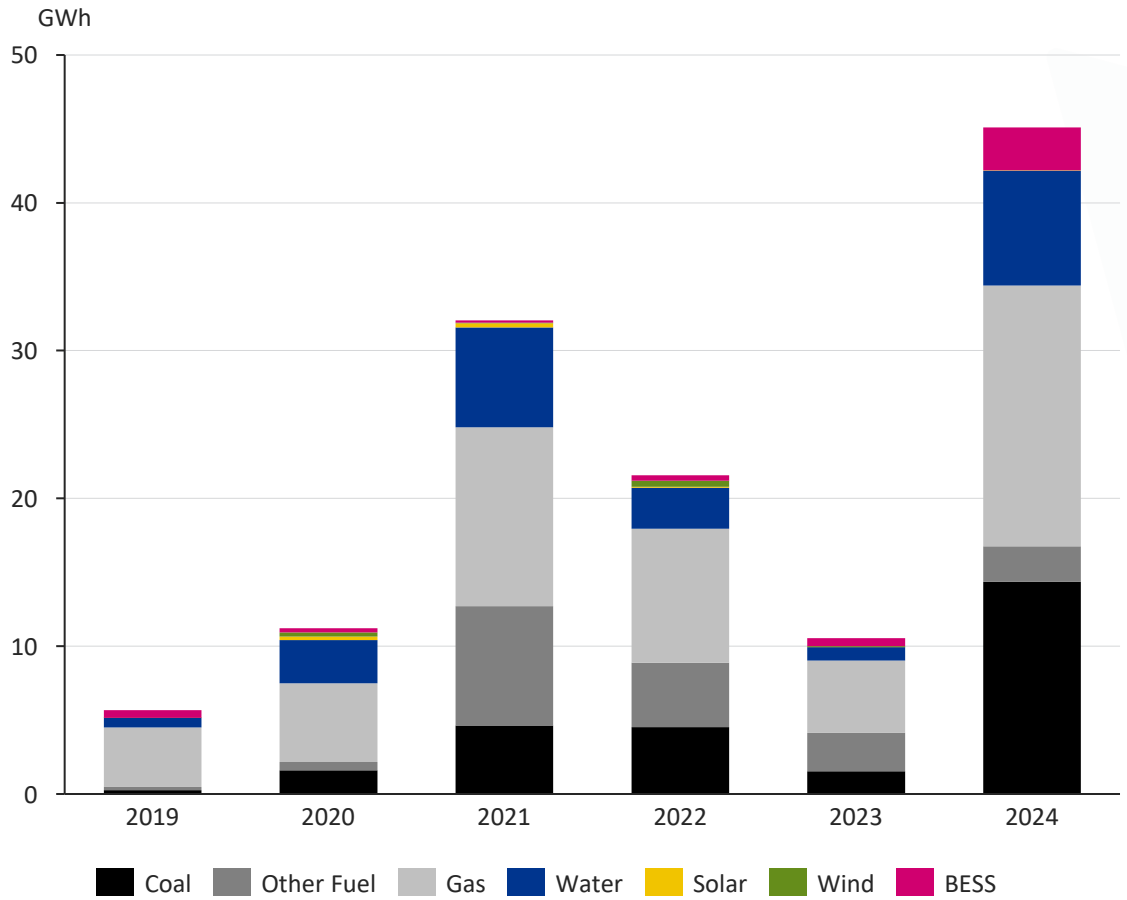
Revenue from the rising MPC is available to all plant generating in high price periods, rather than targeted specifically at the dispatchable peaking plant that we need

- The chart to the right shows total revenues from price periods above $10,000/MWh, split by technology.
- Total revenues earned by technology type is highly skewed due to the quantity of energy provided during these high price periods. However, this revenue also reflects a cost to consumers which is impacted directly by the MPC.
- Peaking capacity such as gas, hydro and increasingly BESS have collectively earned on average less than 40% of the total market revenues from price periods above $10,000/MWh. The majority of total revenues are earned by non-peaking plant that also generate during these high-priced periods.
- High prices are intended to provide investment signals that additional capacity is needed to meet demand on the system, particularly for peaking capacity that relies most on these periods of scarcity. However, this analysis illustrates how an increasing MPC would not be exclusively targeted at these peaking plant, and is instead spread across all plant generating during these periods.



Fossil fuel generation and hydro have historically offered their energy for high prices when the system is tight, with BESS increasingly doing so as more projects are built

Energy bid above $10,000, during price periods above $10,000



- This analysis shows the amount of energy by year which was offered into the NEM for above $10,000/MWh, in periods where the market clearing price was above $10,000/MWh. Market bidding of each technology can highlight the underlying behaviour which is contributing to high prices in the NEM.
- Coal, gas, diesel and hydro are the technologies which have contributed the most to energy bids at prices above $10,000. Then in 2024, energy offered by BESS at this price increased significantly, in line with the expanded capacity in the NEM.*
- Bidding at this value is not reflective of short-run marginal costs for any of these technologies, but rather is more associated with real-time capacity tightness ('system scarcity'). For peaking plant that have low capacity factors (i.e. not running very often), bidding high in these periods is important for the recovery of long-run marginal costs, however this is unlikely a driver for baseload plant such as coal.
- It is also important to note all other energy bid below $10,000/MWh will also earn the market clearing price set by these bids.

**Note that the volume of energy bid in these price bands is very small in comparison to the total market volumes on the NEM, which was approximately 190TWh in FY2024.*

Note, this does not include cross state bidding, meaning bids within a state are only counted if a state's price is above 10k, regardless of other states

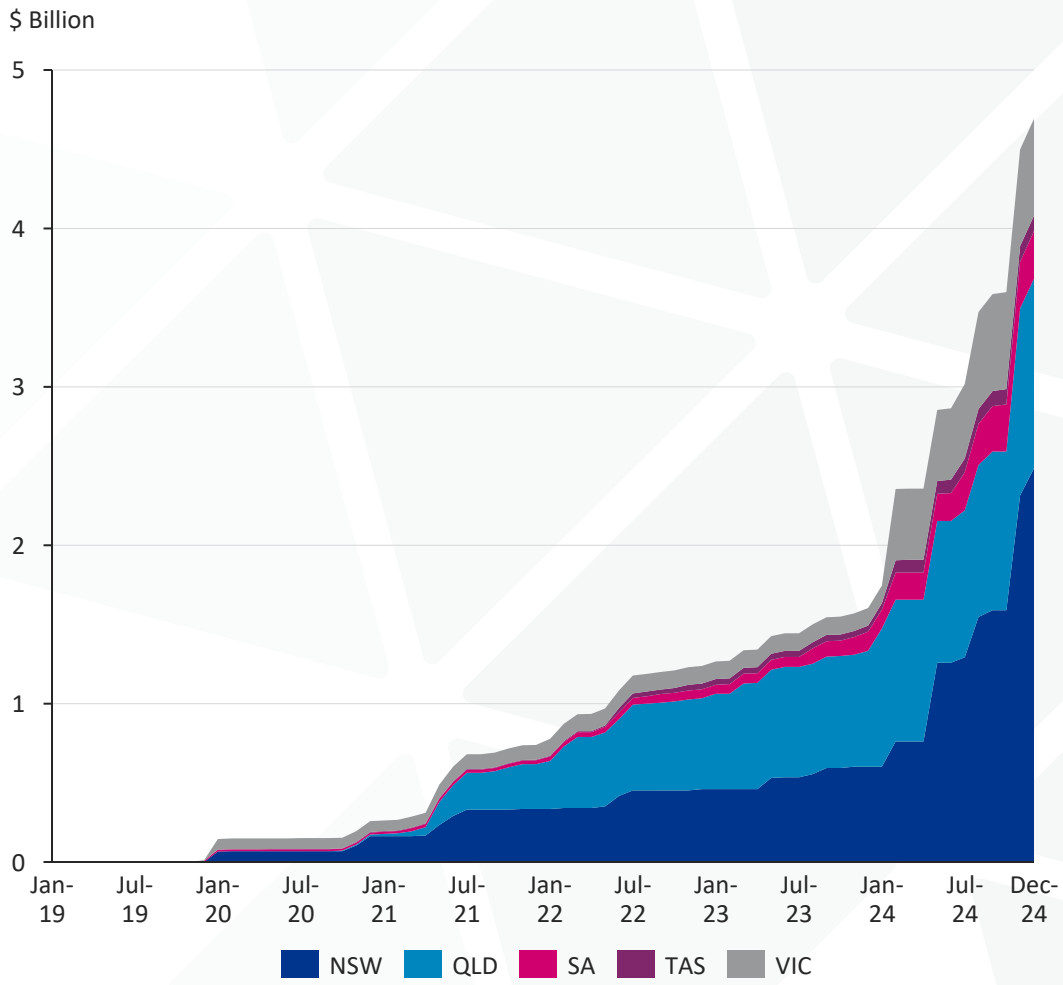
We estimate that raising the price cap has increased the total cost of electricity in the NEM by around $4.7 billion since 2019, with over $3 billion in costs occurring in 2024

- To quantify the impact of the increased price caps on cost of energy, we can compare historical market prices to a counterfactual scenario where price caps do not increase. Total cost is the price ($/MWh) in each interval by the generation in that interval, summed across time.
- Our counterfactual assumes that the price cap was held constant after 2019 at $14,500/MWh. We have not undertaken market modelling with the revised price cap but have assumed all energy dispatched at prices above this threshold were instead settled at the $14,500/MWh price.
- The total delta between historical costs and our counterfactual by the end of 2024 is $4.7 Billion across the NEM.
  - NSW and QLD make up the majority of this delta, making up 53% and 26%, respectively.
  - 2024 also sees a significant step up in costs, driven by the price cap increase in July 24. Over $3 Billion of the total costs have occurred in 2024.

Bidding Strategies

- It is likely that, with a reduced price cap, assets would re-adjust their bid strategies to reflect the change in price cap level.
- Under this assumption, the market clearing price during historical high price periods would have been reduced, as the bid from the marginal unit would be lower than under the higher price cap.
- Therefore, capping prices at $14,500/MWh may actually underestimate the cost savings.

Delta in total wholesale cost



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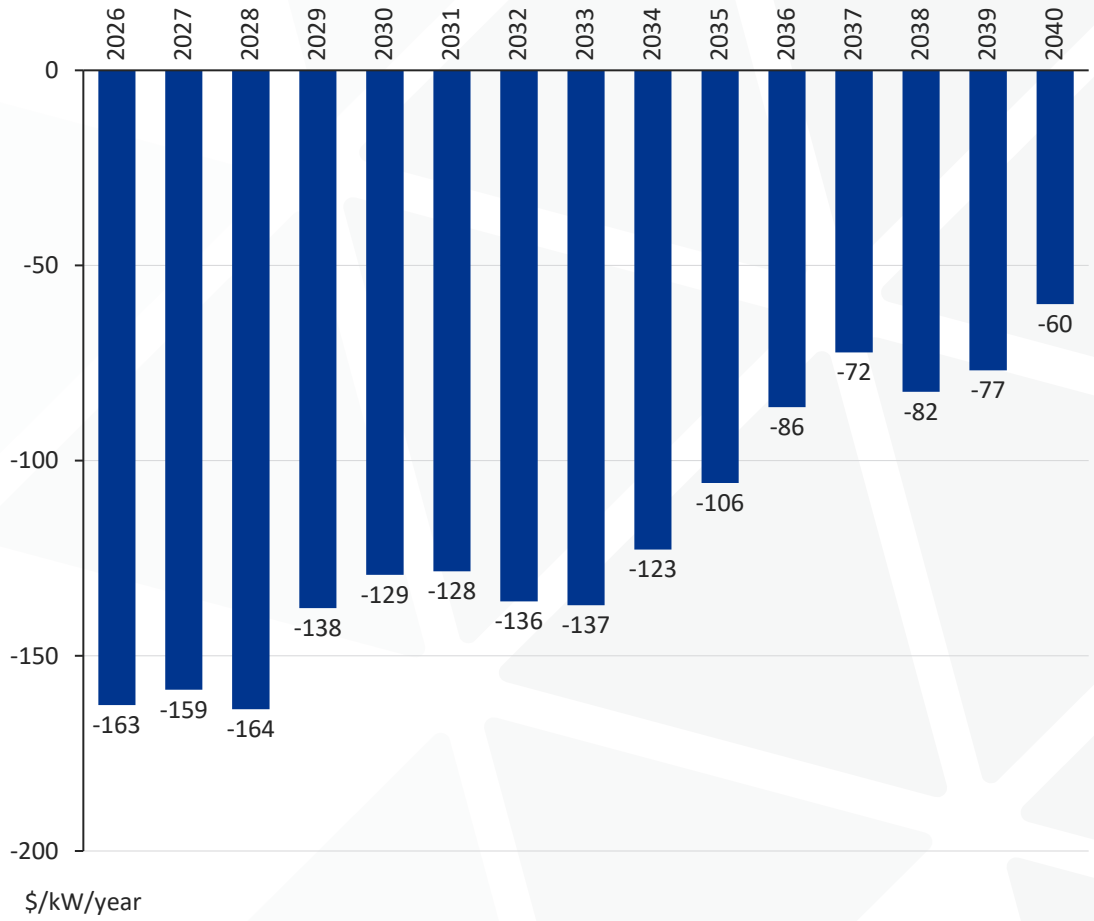
Forward look at missing money for key technologies

Gas peaking plant revenues in the wholesale market are projected to be insufficient to cover costs, and a sufficiently high MPC would have significant costs to consumers

- Missing money refers to the shortfall in revenue that a generator can earn on the energy market in order to recover its fixed and variable costs fully (including a required rate of return).
- Projected revenues earned by a peaking gas plant through participation exclusively in the NEM wholesale market each year are significantly lower than the required return to make a new investment economic.
- The missing money gap decreases over the projected horizon from $163/kW/year in FY26 to a minimum of $72/kW/year in FY2036. This is due to an increase in revenues earned over time.
  - Revenue for peaking plant are driven up by increased variable generation and coal plant retiring from the system.
- These peaking gas plant are projected to have a capacity factor of <5% on average over the horizon, relying on a small number of high-priced periods (reflecting historical revenue earnings).
- **The market price cap would need to be increased significantly above the current trajectory to close this missing money gap for gas peaking plant. However, this increase would also come at a very significant costs to consumers.**

- Missing money projections for OCGT peaking gas plant using:
  - Capex assumptions from CSIRO GenCost 2023/24 data
  - Fixed O&M cost assumptions from CSIRO GenCost 2023/24 data
  - Variable costs from Baringa's Reference Case projections
  - Revenue from Baringa's Reference Case projections
- We have also assumed an 8% hurdle rate and a 20-year payback period.

NEM average missing money for OCGT peaking plant ($/kW/year)



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Policy Analysis

The ongoing NEM market review, which is likely to recommend a long-term contracting mechanism, must consider the magnitude of the MPC against investment needs

Wholesale market settings review

- The NEM wholesale price settings review, initiated by the Australian Government in November 2024, was established to recommend market settings to promote investment in firmed renewable generation and dispatchable capacity, after the Capacity Investment Scheme concludes in 2027.
- The consultation Terms of Release Package states ***"The existing 'energy-only' spot market is very efficient at delivering pricing signals for real-time operation. However, it was never intended on its own to be a pricing signal for investment in long-lived firmed renewable generation and storage."***
- Public updates on the progress of the review, in May 2025, outlined the potential to introduce a new mechanism which could utilise forward contracts to provide investment certainty for new investments over longer timeframes than retailers are typically willing to contract for. These contracts are proposed to be awarded for the provision of bulk energy services, shaping services and firming services.
- The independent expert panel appears to have focused their strategy for long-term investment signals on filling this "tenor gap", which is the mismatch between long-term certainty needed to invest and the willingness of retailers and other offtakers to contract into the future.
- While the review has not reached its final recommendations, the panel has indicated that the magnitude of the MPC is likely to remain a key driver of investment decisions in the NEM into the future.

Revising the market price cap

- As the NEM wholesale market settings review progresses and as the Reliability Panel undertakes its next Reliability Price Setting Review, the wider policy context and the practical role of the MPC in incentivising new investment, vis-a-vis other mechanisms, should be front of mind.
- While the MPC should remain sufficiently high to provide efficient price signals for operation and investment, it must be set at a level which makes sense in the context of other market mechanisms and reforms. Overall, the suite of market mechanisms in place (including the MPC) should provide the right investment signals while balancing with the need to protect consumers from unnecessarily high costs.
- Further, consideration should be given to whether closing the 'missing money' gap for key technologies and bringing forward this investment could be more effectively targeted at these technologies through means other than very high prices in the wholesale market.
- **If the MPC is positioned as a complementary market setting to provide investment signals to the market *alongside* other mechanisms such as central underwriting of long-term contracts, it may be that the magnitude of the MPC would need to be revised.**

There are limited examples of energy only markets globally, but price caps in comparative markets are significantly lower, despite some high gas penetration

Comparison of other energy only markets

Jurisdiction	Price Cap* ($/MWh)	Additional	Capacity Mix Overview
NEM	$17,500/MWh	This price cap is projected to increase to a base value of $21,500/MWh	Coal baseload in most states, renewable generation has grown to around 40% of total
ERCOT	$7,250/MWh	This price cap was **decreased** by 44% in 2021 after extreme weather events.	Reliant on Gas but high growth in BESS. High renewables penetration.
New Zealand	N/A	There is no explicit price cap. Energy and reserves are co-optimised and prices during scarcity are set in relation to the Value of Lost Load of the demand which is not being met.	Dominated by hydroelectric (60%) and geothermal power (17%).
Singapore	$5,400/MWh	Singapore also has a temporary price cap which is based off actual gas prices at the time	94% Gas generation due to very limited space
Philippines	$890/MWh	The Secondary price cap is $175/MWh	>80% of installed capacity is met by fossil fuels (including coal and Gas) or hydro.

*Converted to approximate AUD$/MWh

Commentary

- Energy markets globally are transitioning to high renewable systems with peaking plants of broadly consistent technology types. These are predominantly OCGT gas, BESS or pumped hydro.
- Energy-only markets like the NEM, which rely primarily only on real time dispatch prices to incentivise investment in new generation and storage, are increasingly rare. Of those with energy-only markets, the market price caps tend to be much lower than in the NEM. These markets continue to attract new investment, with other mechanisms supporting this new investment when required.
- Many global markets use capacity mechanisms to ensure they have sufficient capacity of dispatchable units to meet demand in all periods. Capacity markets have been introduced in a number of countries in the last decade as they transition away from a relatively small number of large dispatchable units. Consistent with the NEM, many markets also have a number of ancillary service markets and other contracting mechanisms to bring forward new investment in technologies capable of providing particular services.