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Energy | Sustainability | Risk

Australian Energy Markets Report
Q3 2024



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Contents

In this quarter's Report:

1. Market Wrap
 - Electricity Spot Prices
 - Q3 Market Demand
 - Electricity Futures Markets
 - Natural Gas Markets
 - Carbon and Environmental Markets
2. AEMO ESOO Update
3. Q2 and Q3 NEM Variable Renewable Energy Output
4. Government Generator Transition Support – Eraring



Electricity Spot Markets

Medium Term Spot Price Averages

Quarter 3 spot prices saw yr on yr increases based on rolling averages. Victorian in-particular has seen a strong run up in spot prices in the quarter. Spot prices in most NEM states have been adversely affected by the variability renewable output in Q2 and Q3. This is covered in more detail on page 10.

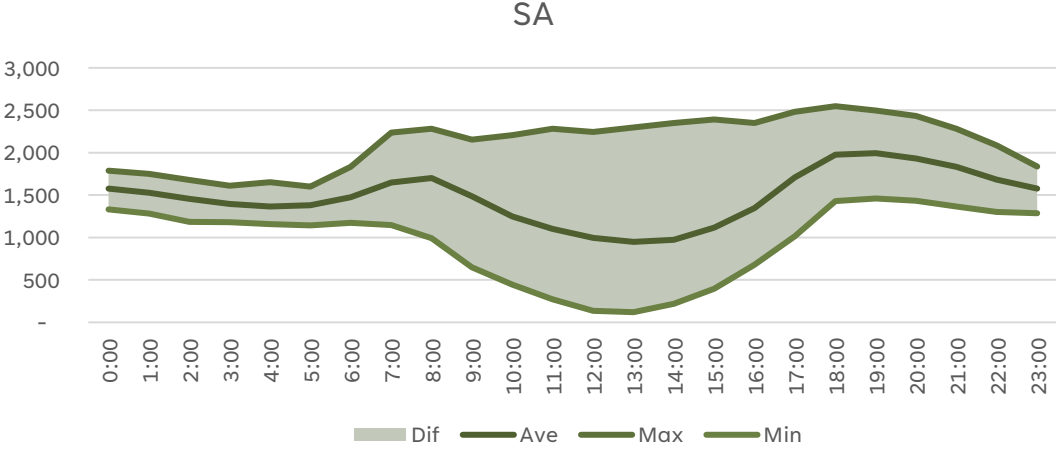
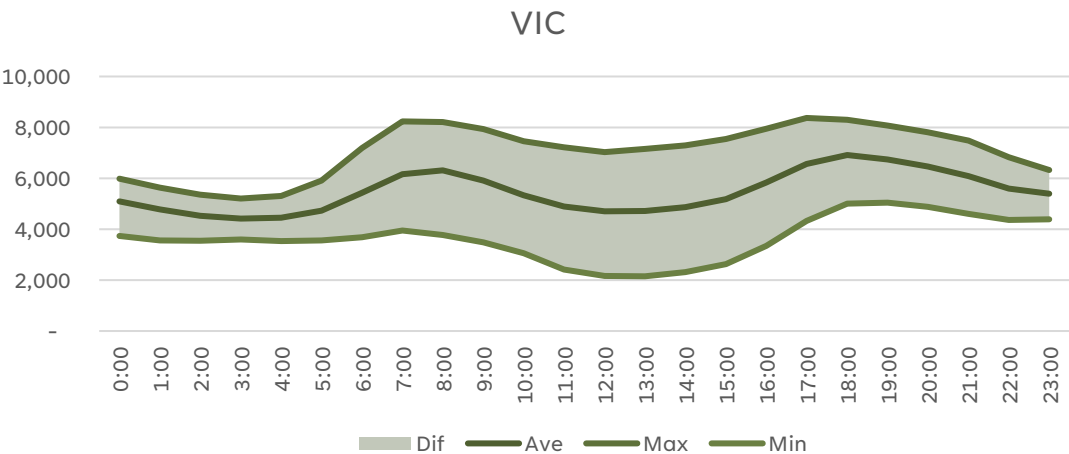
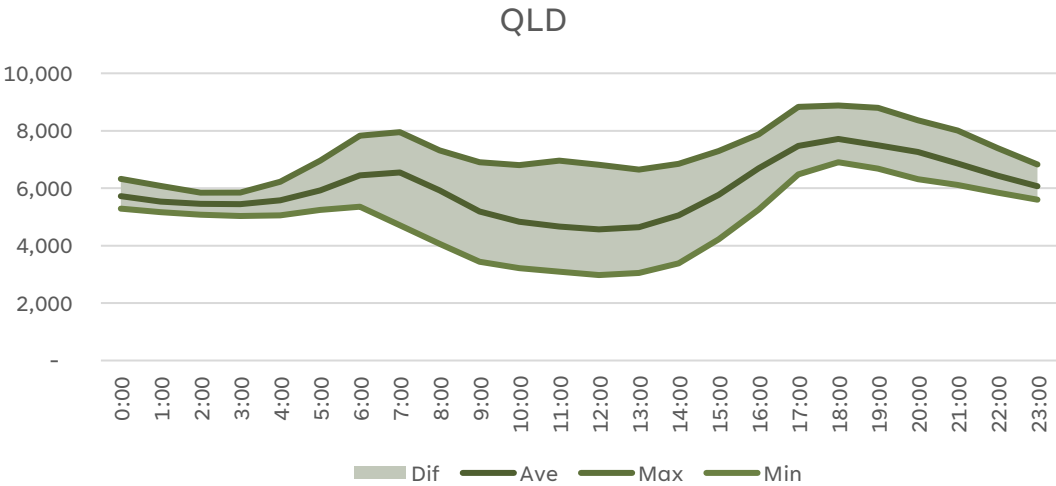
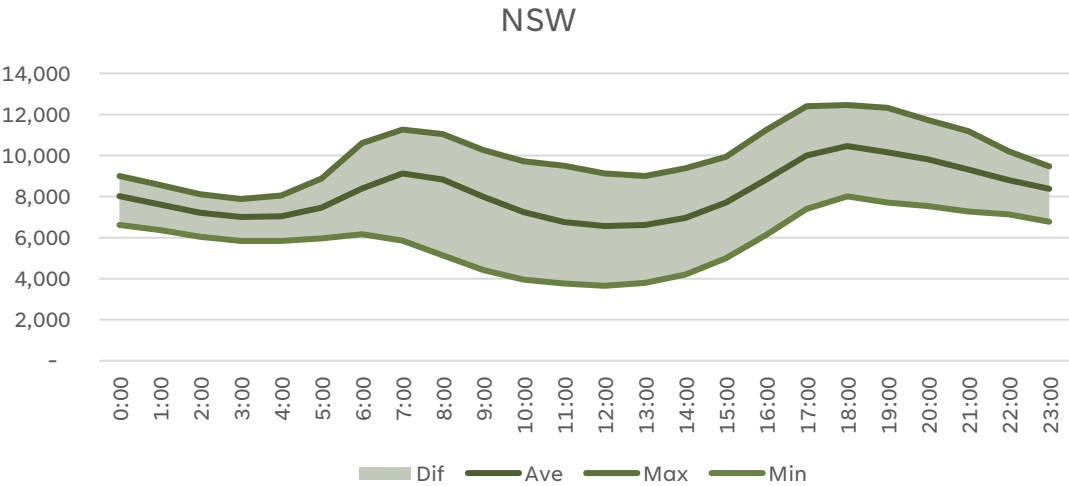
Spot Prices	Ave Prices to 30 Sept 2024			Yr on Yr		
State	3 Month Ave	6 Month Ave	12 Month Ave	3 Month Ave	6 Month Ave	12 Month Ave
NSW	\$150.80	\$130.20	\$119.22	86.54%	48.51%	9.88%
VIC	\$146.27	\$136.83	\$87.76	198.68%	98.55%	37.27%
QLD	\$124.58	\$112.61	\$102.72	90.53%	17.52%	-1.12%
SA	\$195.37	\$165.17	\$104.49	112.37%	53.08%	19.86%

Rolling Average Spot Prices
Source: AEMO





Market Demand – Q3 Ave Daily Demand Profiles





Electricity Futures Markets

Outcomes in electricity forward markets have been mixed through Q3 2024. Whilst the forward price outlook is generally flat with some backwardation in VIC and QLD, prices are still elevated on a historical basis.

Some uncertainty remains in the forward outlook from the impact of government revenue support for retiring baseload generators. More on this on page 16.

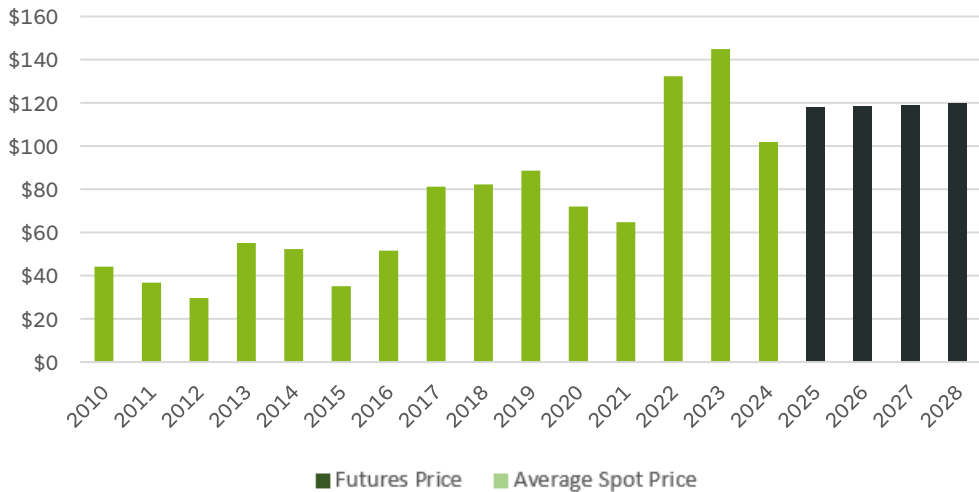
State	FY 25	FY 26	FY 27	FY 28	Yr on Yr FY 25	Yr on Yr FY 26	Yr on Yr FY 27
NSW	\$117.30	\$117.40	\$118.00	\$119.34	-5%	-7%	-7%
VIC	\$77.70	\$70.60	\$67.20	\$68.11	4%	-3%	-10%
QLD	\$105.20	\$99.10	\$94.40	\$92.05	2%	3%	2%
SA	\$114.60	\$103.00	\$101.04	\$96.83	-1%	-10%	-12%

Baseload Strip Futures Contract Prices @ 30 September 2024
Source: ASX Energy

VIC



NSW





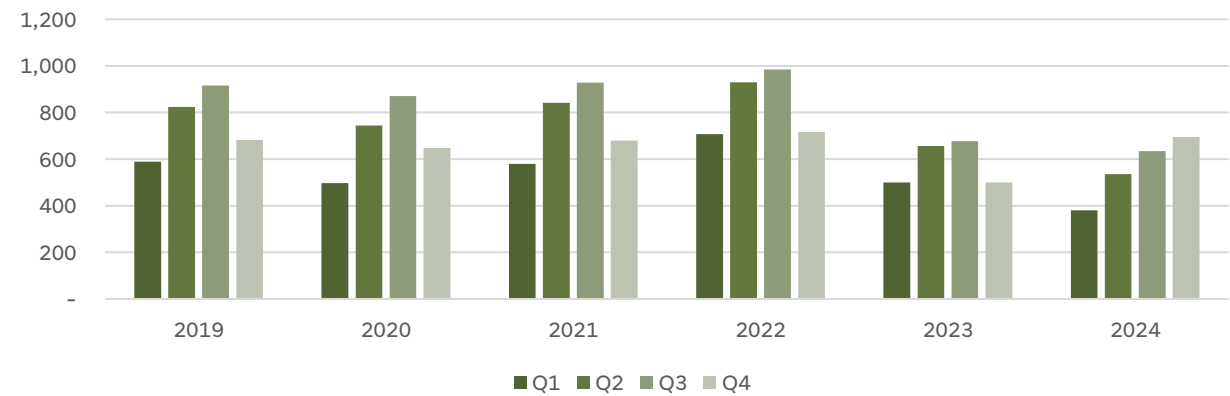
Domestic Natural Gas Markets

The ACCC Gas Inquiry September 2024 Interim Report (available [here](#)) highlights the tightening of the supply and demand balance in domestic gas markets. The report forecast a Q1 2025 surplus of 12-27 PJ across east coast states which is down on the June 2024 outlook from 26-35 PJ. These forecasts are subject to potential outcomes with uncontract gas being supplied to the export LNG market.

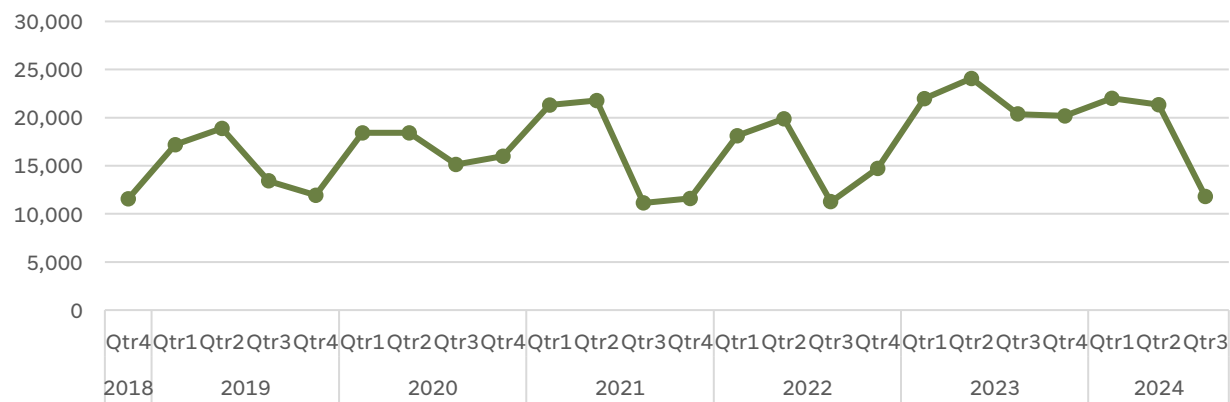
The dynamics of domestic gas markets have dramatically changed over the last decade. The previously abundant sources for natural gas to the southern states via the bass straight offshore gas reserves are drawing to a limit. The southern states are now increasingly reliant on storage refilling through the summer seasons surpluses to be able to meet higher winter demand. As can be seen across, storage levels at the Iona storage facility in Victoria have been significantly drawn down through winter 2024 compared to 2023.

Output from the Longford gas plant has also been down on historical levels. More recently, this has been driven by scheduled maintenance, however any delays beyond the scheduled completion Q1 2025 pose as a risk to supply/demand balance into winter 2025.

Longford Average Daily Output (TJ)



Iona Gas Storage Levels (TJ)





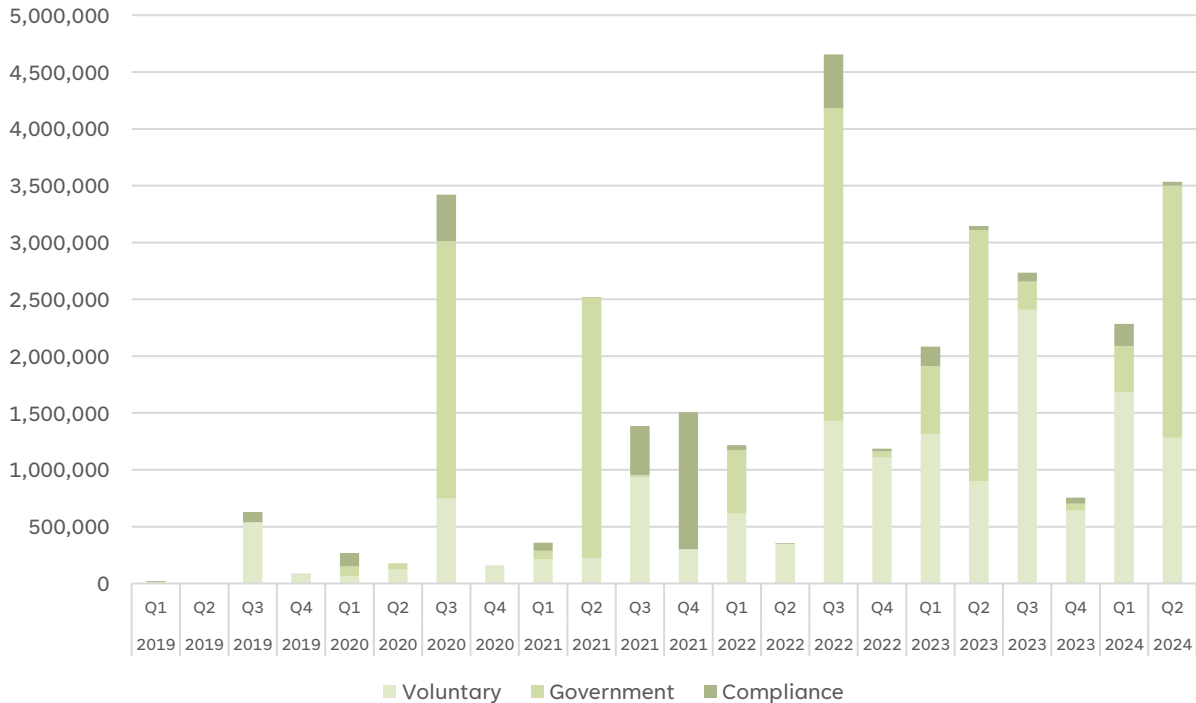
Carbon & Environmental Markets

The market for spot and forward LGCS continues to be supported by non-RET demand. Non-RET retirement of LGCS continues to grown significantly as corporates and government agencies look to offset their electricity consumption to support active carbon neutral strategies. Spot prices for LGCS have reduced slightly over the last 12 months to currently sit at sub \$45/LGC levels.

Forward prices for Cal 26 LGCS at \$26 is higher than the sub \$10 forward prices seen 2-3 years ago. Out beyond the retirement of the RET in 2030, we look toward the instatement of the Guarantee of Origin Scheme.

Certificate	Spot Price	Cal 2023	Cal 2024	Cal 2025	Cal 2026
LGC	\$43.75	\$44.20	\$43.75	\$34.55	\$29.00
STC	\$39.90	\$40.00	\$40.00	\$40.00	\$40.00
ESC	\$13.50	\$14.82			
VEEC	\$108	\$108	\$108		
ACCU	\$38.20				
As at:	30/09/2024				

Voluntary LGC Surrenders



Increasing Demand from Voluntary Surrender
Source: CER Qtrly Carbon Report (Sept 2024)



AEMO Electricity Statement Of Opportunities “ESOO”

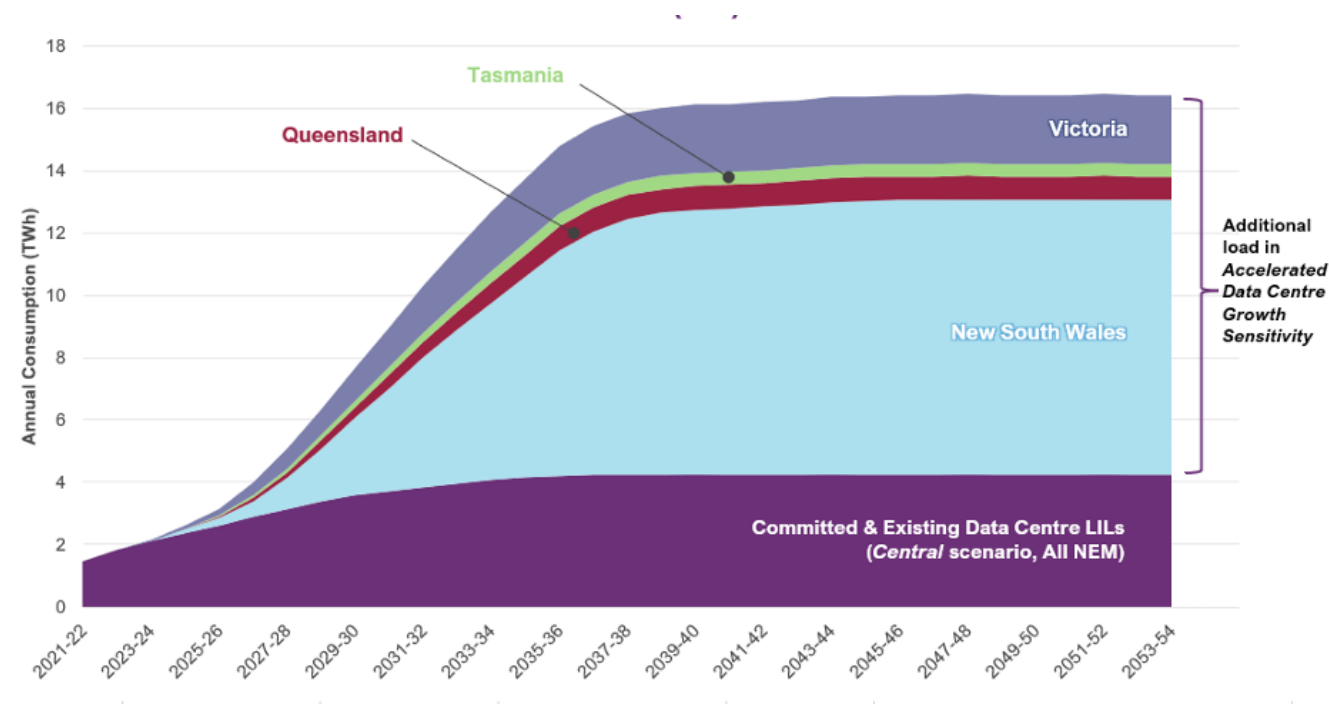
The ESOO was published in August 2024 (available [here](#)). The ESOO represents a 10-year forward projection for the reliability of the NEM. In recent years, ESOO reports have shown deteriorating reliably outlook as baseload generation facilities are scheduled to retire and consumer demand grows.

The 2024 ESOO showed a slightly improved picture driven by:

- Extension of the retirement of Eraring in NSW (see page 16)
- Higher than anticipated output from rooftop distributed solar
- Changes to previous assumptions around demand growth related to EV adoption and business demand.

The last point highlights the fact that the ESOO is a forecast and subject to changing assumptions developed by AEMO. The ESOO remains and important guide to our view of the future state of the market and AEMO’s assumptions are increasingly important part of that guidance.

This raises the question, if AEMO has overestimated EV uptake in previous years, are they underestimating growth in electricity intensive areas of the new economy into the future (i.e. the growth in data centre loads)?



Accelerated Data Centre Growth Sensitivity Analysis – is it enough?

Source: AEMO ESOO (2024) – Page 36 – Figure 12



Renewable Generation Performance Through Q2 & Q3

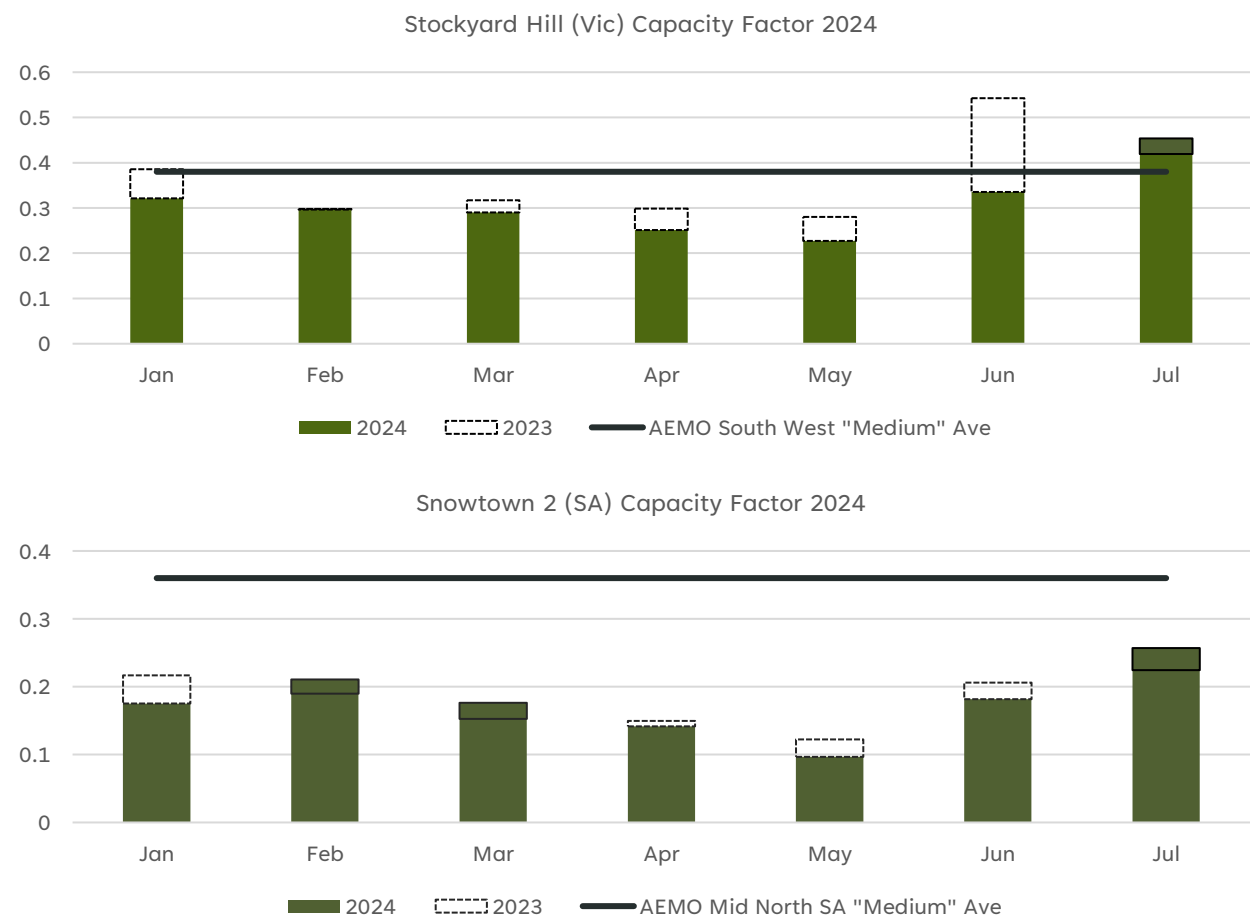
Q2 – The Famine – The NEM Wind Drought

Through Q2 2024, there has been notably low wind generation output. This was acute in Victoria and South Australia through several days in May, when wind farms produced quite low generation.

In QLD, a market with a lower proportion of wind generation, the performance was relatively stronger with Coopers Gap Wind Farm recording relatively higher capacity factors in this period. This demonstrates the value of geographic diversity in the market for renewables as the proportion of variable renewable generators increases in the future.

In many cases, the reduction in wind output was primarily infilled by increase in gas fired electricity generation. With natural gas fuel prices remaining historically elevated, this drove increases in spot electricity prices through this period.

“Capacity Factor” is the ratio of generation energy (MWh) output to maximum possible hourly power output (MW).

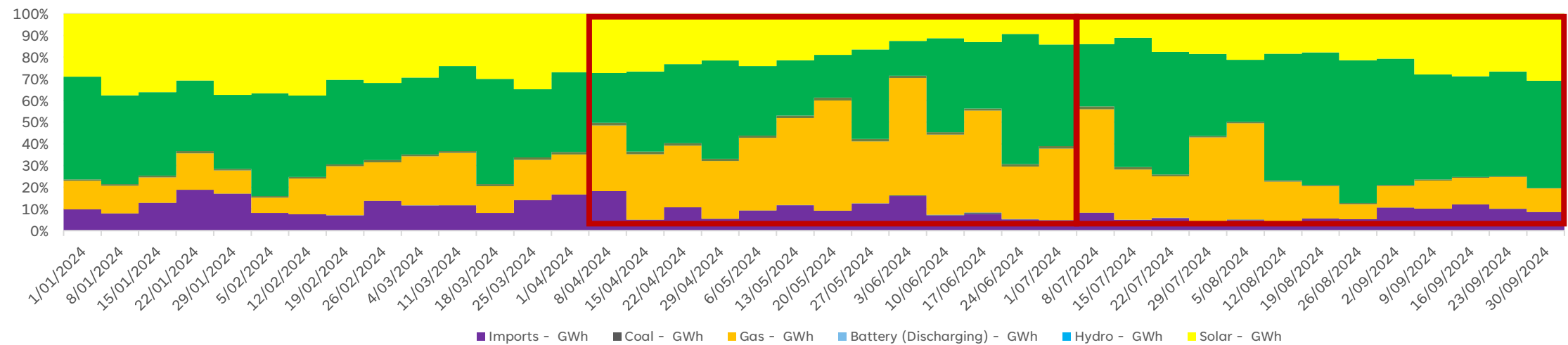


Stockyard Hill and Snowtown Capacity Factors through Q2
Source: AEMO Market Data

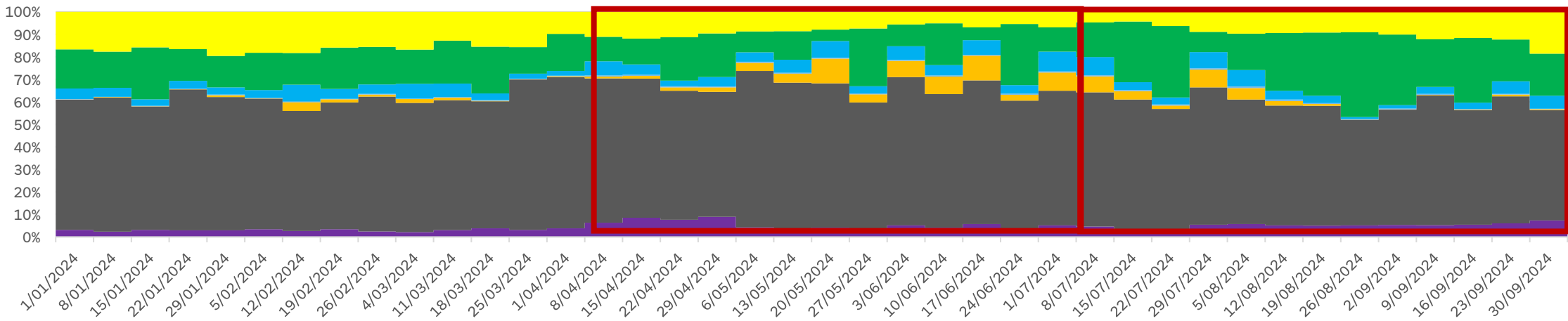


Renewable Generation Performance Through Q2 & Q3

South Australia Share of Generation



Victoria Share of Generation



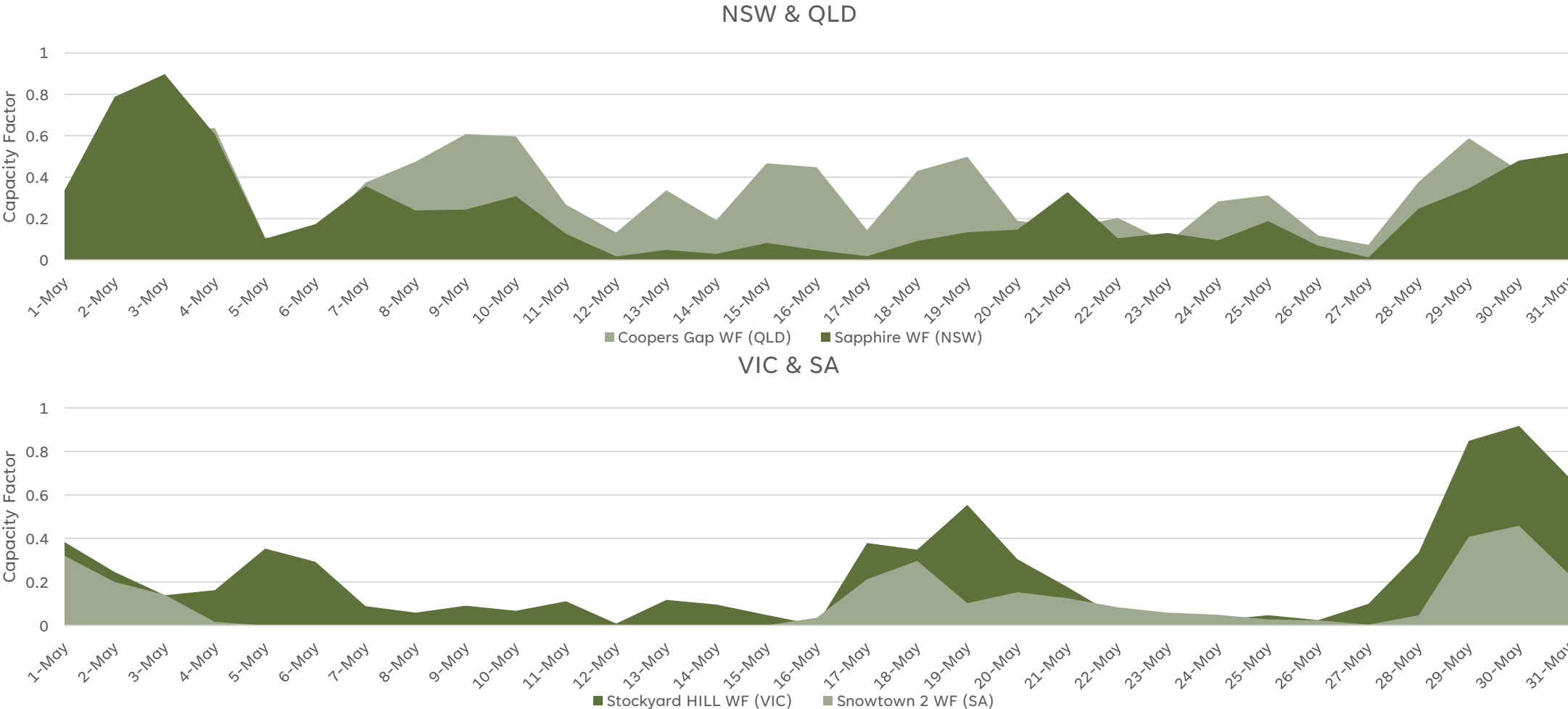
Quarter 3 2024

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Source: <https://openelectricity.org.au/>



Renewable Generation Performance Through Q2 & Q3 – May Performance



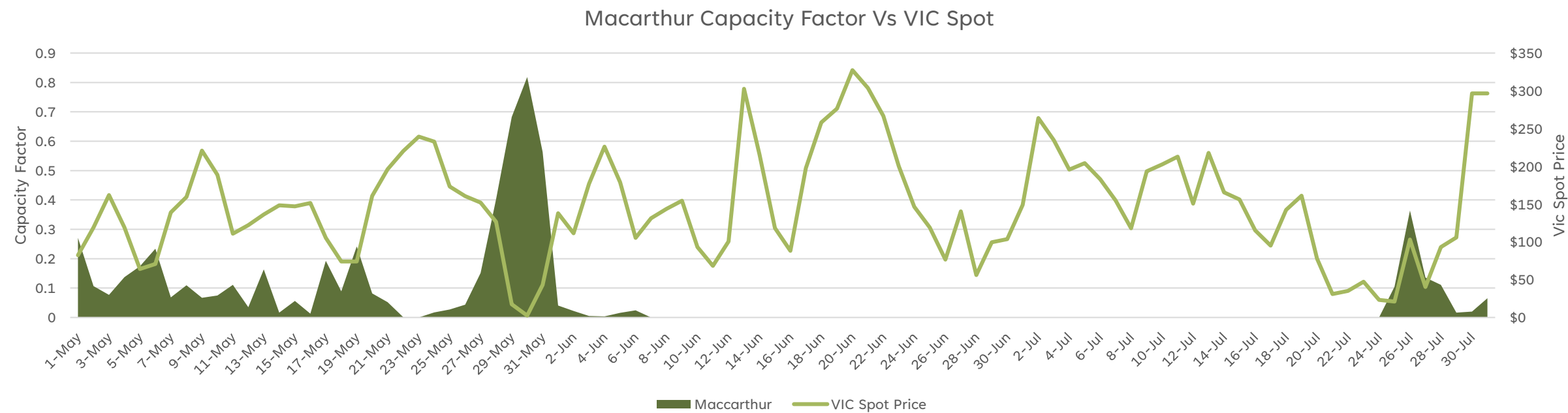


Renewable Generation Performance Through Q2 & Q3

Q2 – The Famine – Trouble down on old Macarthur’s Farm

The poor wind harvest through Q2 and early Q3 was exacerbated by outages at AGL’s Macarthur Wind Farm – Victoria’s biggest in terms of capacity. The outage was triggered by a transformer fault and kept the windfarm off-line through most of June and July.

Macarthur has generally been an underperformer through its life in the NEM. This incident highlights that there are several risks in the energy transition beyond simply investment for new generation. A coordinated, sustained investment in reliable distribution and transmission infrastructure will be arguably more important and challenging as we move to the next stages of the transition.

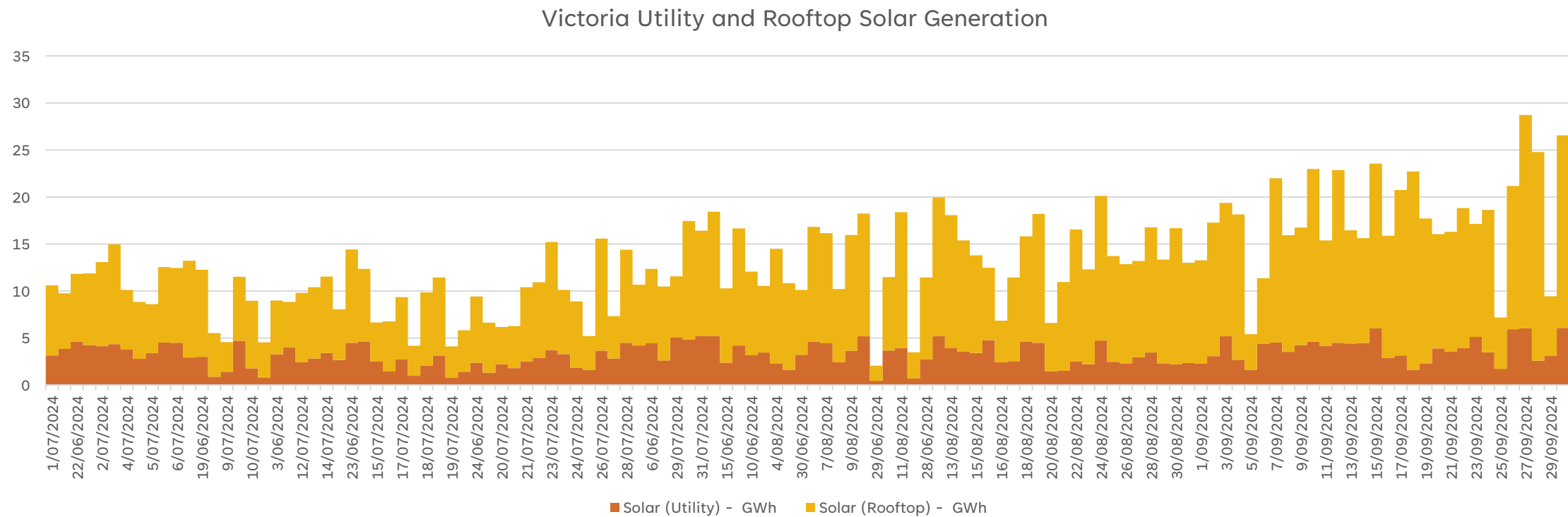




Renewable Generation Performance Through Q2 & Q3

Q3 – The Feast – Here comes the sun

Moving through to into Q3 and the tides started to turn on variable renewable energy output in the NEM. Favourable wind and solar conditions, coinciding with seasonally low market demand, led to curtailment in utility solar generators through several days in September. Utility solar is further challenged as it competes with coincidental output from distributed rooftop solar generation.





Renewable Generation Performance Through Q2 & Q3

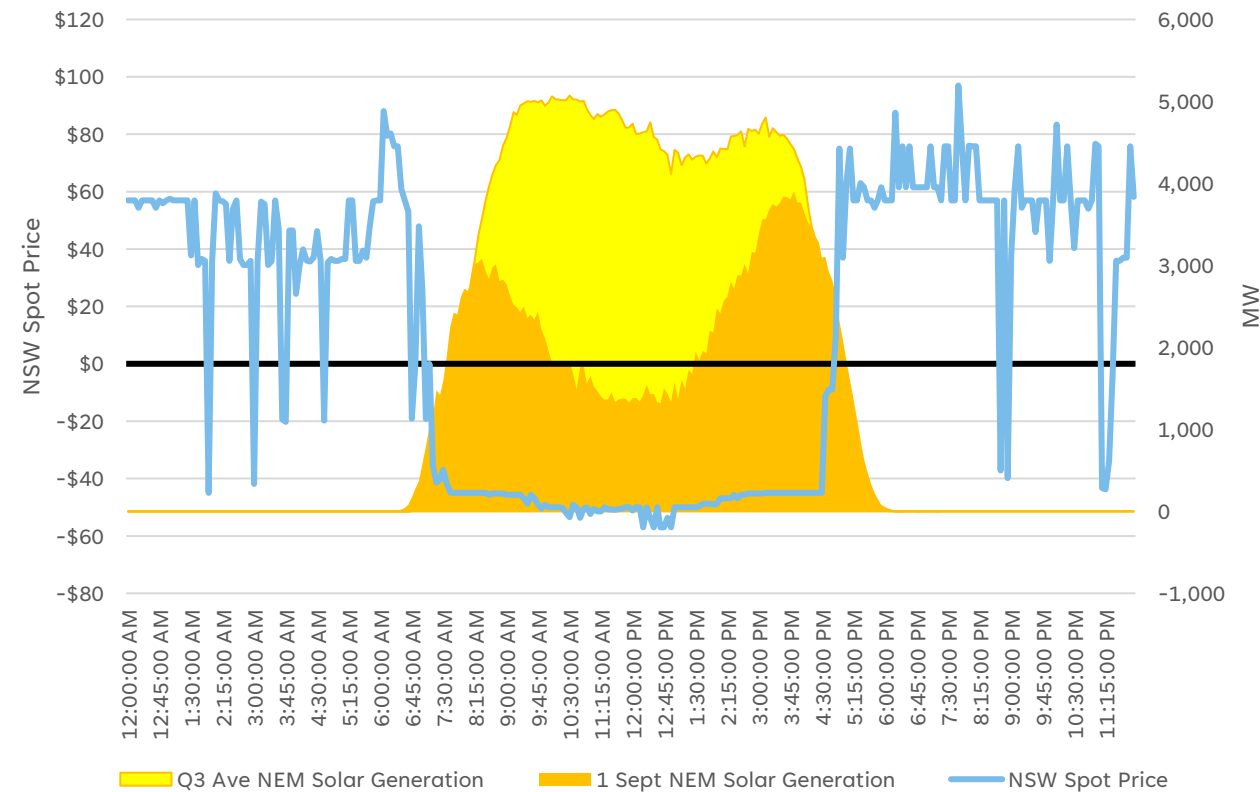
Q3 – The Feast – Here comes the sun

Through September, there was a strong turn around and increase in both wind and solar generation across the NEM. This manifest in many days recording significant periods of negative spot prices. Mid-day prices were commonly recorded around the -\$45 per MWh mark (the break-even price for a renewable generator assuming a \$45 spot price per LGC).

Through several days in September, many utility scale solar farms had curtailed output. There may be as number of reasons for a variable generator to curtail their output, but in this case, curtailment is likely to be driven by economic factors as utility solar generators look to avoid significantly negative mid-day spot prices. The challenge for utility solar generators is compounded as they’re competing in the same time bands as behind the meter rooftop systems that have less opportunity to curtail their loads.

In the chart across, we show total NEM solar output on the 1st of September against the Q3 NEM solar output average and the NSW spot price.

Further utility solar curtailment continued through the later weeks of September in concert with negative mid-day spot prices.



Total NEM Solar output on 1 September 2024
Source: AEMO Market Data



Baseload Generator Government Support

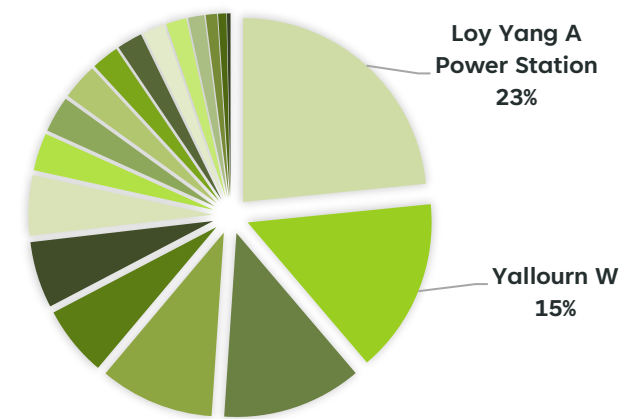
On 22 May 2024, the NSW government confirmed the much-anticipated announcement on an agreement with Origin Energy for a support agreement to extend the operating timeline for Eraring generator to 2027. Eraring is NSW’s largest baseload electricity generator and Origin had previously planned to close it in 2025.

Combined with additional transition agreements struck between the Victorian government and Energy Australia at Yallourn and AGL at Loy Yang A, state governments are now providing transition agreements to 38% and 22% of baseload electricity generation in Victoria and NSW respectively.

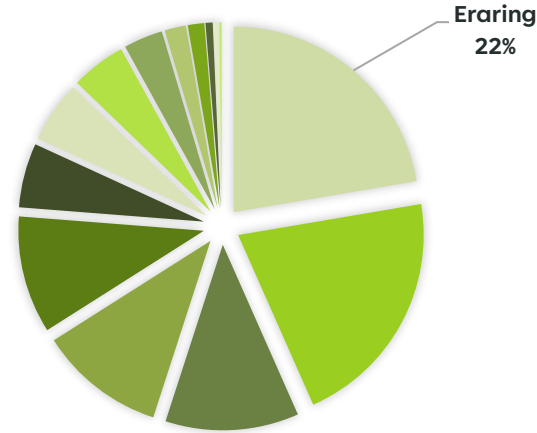
The outlook for all three of these generators are retirement dates is as follows:

- Eraring – 2027 – Extended from 2025
- Yallourn – 2028 – Brought forward from 2032
- Loy Yang A – 2035 – Brought forward from 2040/45

VICTORIA - BASELOAD GENERATION



NSW - BASELOAD GENERATION

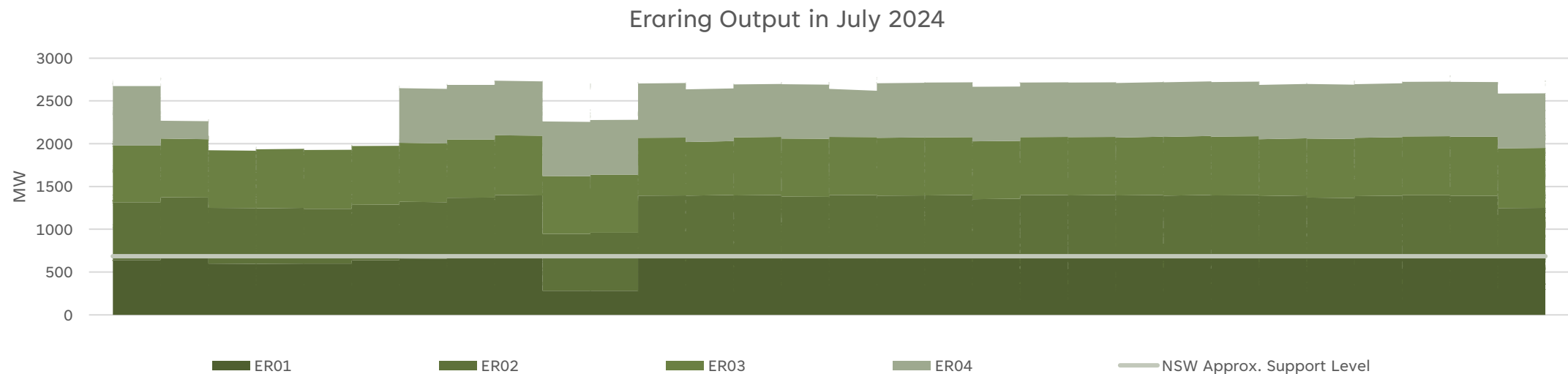




NSW Transition Agreement – Earing

Whilst the detailed commercial terms of the NSW agreement with Origin are not public, there has been some highlights provided:

- 1. Over the term of the agreement to 2027, Earing must produce a minimum of 6 TWh of energy per annum. **Which is approximately equivalent to output from 1 of the 4 currently generating units.**
- 2. The NSW government will provide support for fixed and variable costs up to the equivalent of 6 TWh of energy production per annum.
- 3. The NSW government will underwrite revenue for the generator at a 1.15 multiple of the 3-year average baseload futures price before the start of the year.
- 4. In an opt-in year, net payments to Origin (where they make a loss) will be capped at \$225m per year
- 5. In an opt-in year, if Origin makes a profit, they will make payment to the Government of 20% of those profits up to a cap of \$40m.





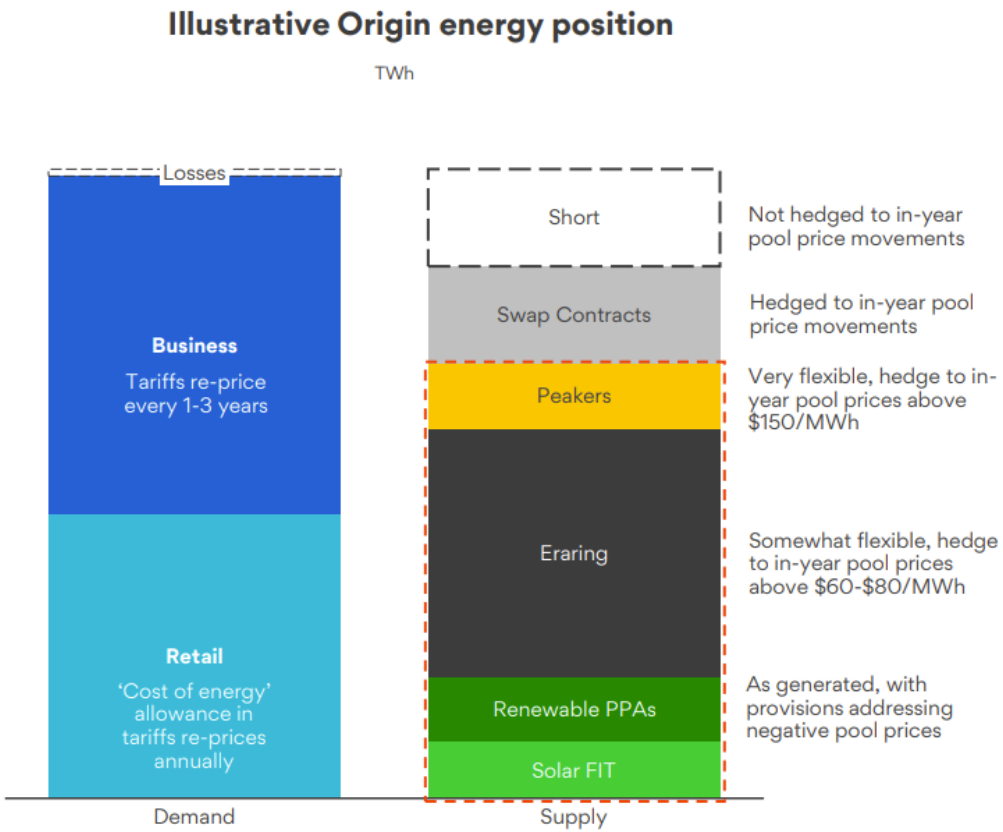
Origin Energy – A Future Without Eraring

The impending closure of Eraring in 2027 poses an interesting question for Origin’s future energy supply balance. For some time, the ownership of this baseload generator has operated as a natural hedge to Origin’s retail book. Even under that arrangement, Origin takes a small exposure to pool prices.

Origin propose to replace the Eraring generation with a combination of additional renewable PPA’s (or ownership positions) and large utility battery off-take agreements (or ownership positions).

Some of the projects Origin is currently looking to develop include:

- Yanco Delta Wind Farm – 1.5GW generation with 800MWh battery
- Salisbury Solar Farm and Ruby Hills Wind Farm – Circa 1.3GW
- Warrane Wind Farm - 500MW
- Mortlake Battery – 300 MW/650MWh
- Eraring Battery – Stage 1 – 460MW/920MWh
- Eraring Battery – Stage 2 – 240MW/960MWh



Origin’s Supply/Demand Energy Balances
Source: Origin FY24 Results Presentation and Analysis P55



Summary Discussion and Highlights

Difficulty managing price volatility in a market dominated by VRE

The performance of VRE generators through Q2 and Q3 2024 has demonstrated the challenge of managing intermittency risk in an energy only market.

Challenging outlook for gas supply in southern states

We take the view that there is a timing mismatch on the long-term ambition to electrify and to reduce the use of domestic natural gas in southern states (particularly Victoria) and the short/medium term outlook for gas supply. This, combined with increase in demand for gas for electricity generation to support renewable intermittency, will continue to support higher prices for natural gas in the medium term.

Upward pressure on wholesale electricity prices

Spot market price outcomes through Q3 2024 have shown significant intra-day volatility. In a market subsidising existing coal generators to stay online, there is a challenge in balancing price signals for the mid-day solar generation where baseload generators continue to dispatch. The market outcomes resulting from renewable intermittency continues to highlight the importance of flexible firming generation. Combining this with current market conditions for natural gas as a potential firming fuel, there is likely to be continued elevated wholesale energy price outcomes through the next stage of the transition.



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20