

# WA Electricity Consultative Forum



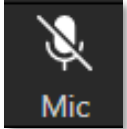
6 March 2024



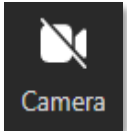
We acknowledge the Traditional Owners of country throughout Australia and recognise their continuing connection to land, waters and culture.

**We pay respect to Elders past and present.**

# Online housekeeping



- Please mute your microphone during the presentation.



- Please leave your camera off as well, but we'd love to see you during Q&A.

- We will pause regularly to give you time to comment in the chat or raise your hand to ask a question.



- We have a Q&A session at the end of today's session. Some questions may be saved for this session.



- A copy of the presentation will be published on our forum webpage: [WA Electricity Consultative Forum \(WA-ECF\)](#)

- We welcome feedback via [WAElectricityForum@aemo.com.au](mailto:WAElectricityForum@aemo.com.au)

# Agenda

Item	Time	Item	Speaker
1.	10:00am – 10:10am	Welcome, Minutes (27 November 2023) and Terms of Reference	Chair
2.	10:10am – 10:50am	Power System and Market update	Paul Elliott and Nicholas Nielsen (AEMO)
3.	10:50am – 11:10am	AEMO's Allowable Revenue Update (second in-period submission)	Kate Ryan (AEMO)
4.	11:10am – 11:20am	WA Capacity Market Investment Update	Neetika Kapani (AEMO)
5.	11:20am – 11:30am	Q&A and Other Business	Chair
6.	11:30am – 11:35am	Meeting close	Chair

\*Please note this meeting will be recorded and published on AEMO's website

# Power System and Market update

WA Operations



# Record Operational Demand

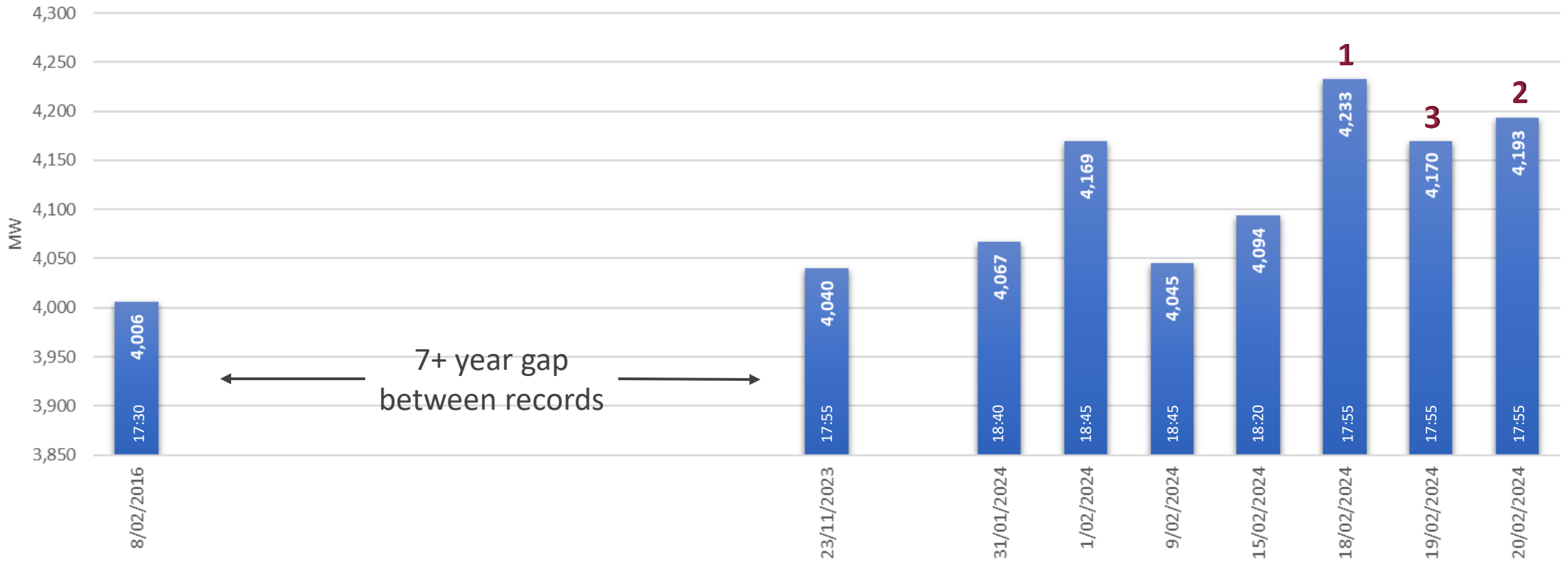
Paul Elliott

Manager, WA Real Time Operations

# Record Setting Summer

- Average Operational Demand records continued to fall over summer, with a peak demand of 4,233 MW recorded at 17:55 on 18 February 2023, which was a Sunday!
- A number of actions AEMO was require to take to manage the LOR conditions resulted in lower demand that what would have been observed, this will be discussed on the following slides.

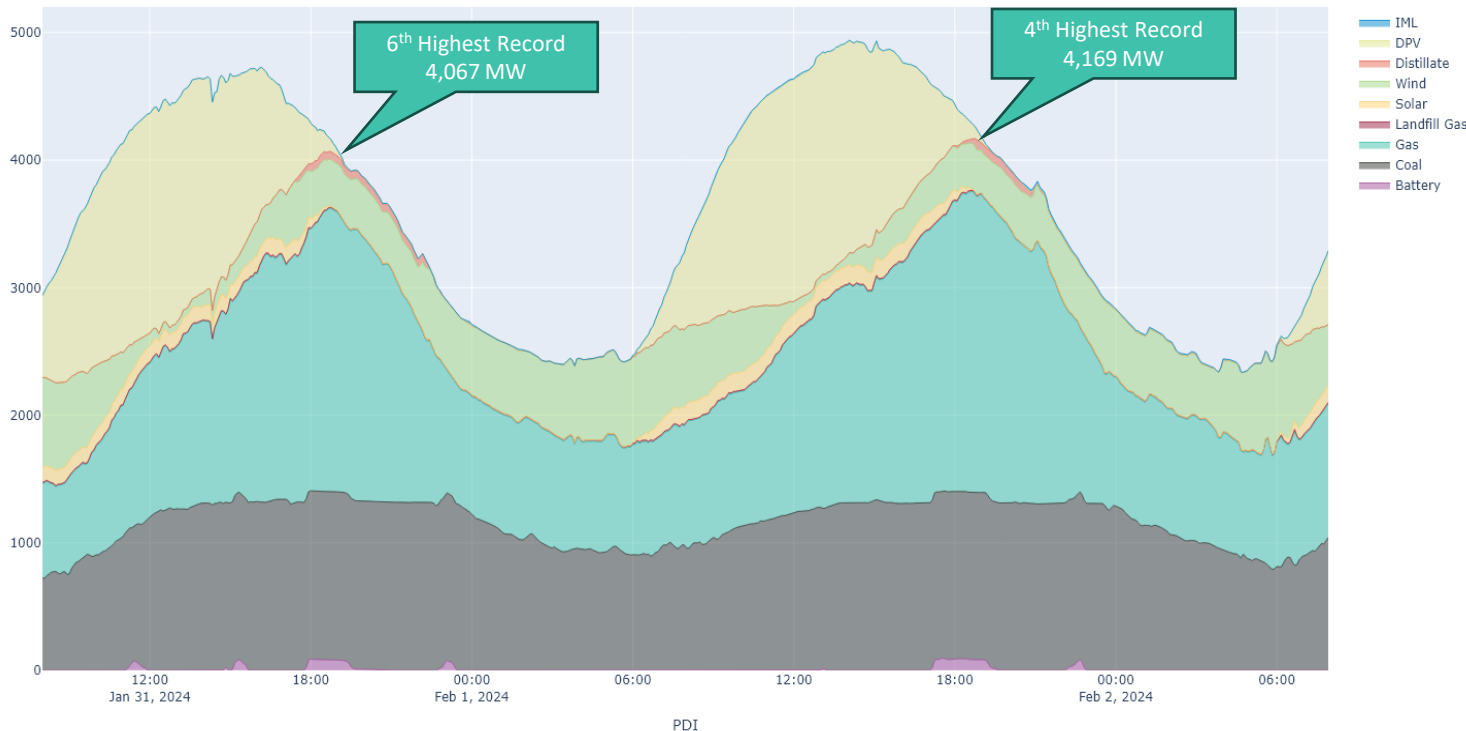
Peak Average Operational Demand



# Record Operational Demand (at the time)

Over 31 January – 1 February the WEM experienced consecutive maximum operational demand records of 4,067 MW and 4,169 MW, respectively.

Fuel Mix by Dispatch Interval



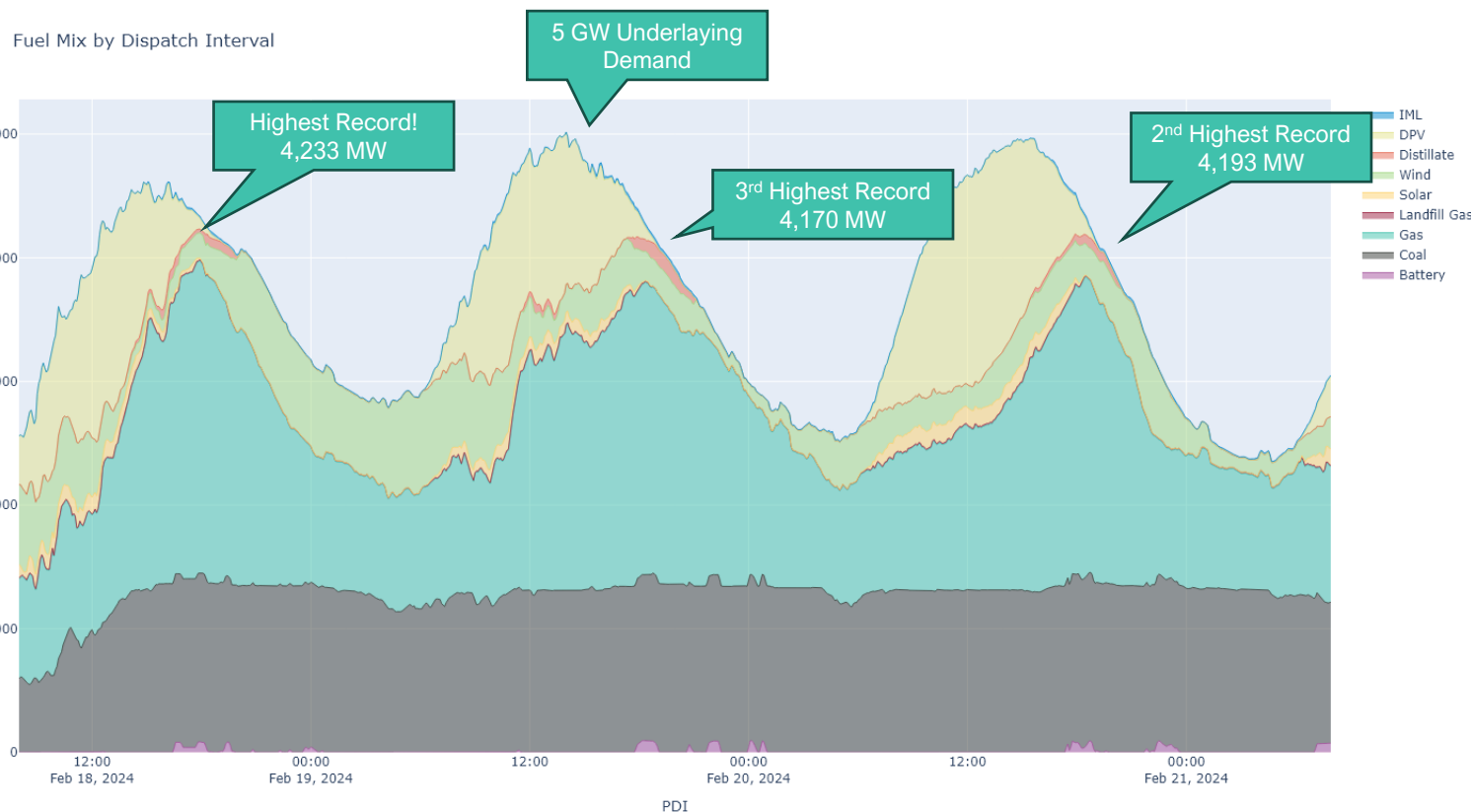
Metric	Value	Dispatch Interval
Min Average Operational Demand	2254.07MW	2024-01-31 08:30
Max Average Operational Demand	4169.03MW	2024-02-01 18:45
Min Underlying Demand	2336.96MW	2024-02-02 04:45
Max Underlying Demand	4940.22MW	2024-02-01 14:05
Min Renewable Penetration	9.24%	2024-02-01 19:25
Max Renewable Penetration	55.71%	2024-01-31 09:40
Avg Renewable Penetration	29.33%	

- This outcome was driven by extended heatwave conditions, with temperatures exceeding 40 degrees for a number of days over this period, and a maximum of 42.6 degrees on 1 February, as well as ongoing growth in underlying demand.
- AEMO was required to issue LOR2 declarations for the peak period on both days due to the high demand and low wind conditions; low wind output is common during hot days and is a key operational challenge AEMO need to manage.
- The new record of 4,169 MW was set during the 18:45 Dispatch Interval, which occurs just as DPV output starts reducing as the sun sets.
- Diesel generation was required to be dispatch to manage the peak demand period, as well as DSP and SRC capacity.



# Record Operational Demand

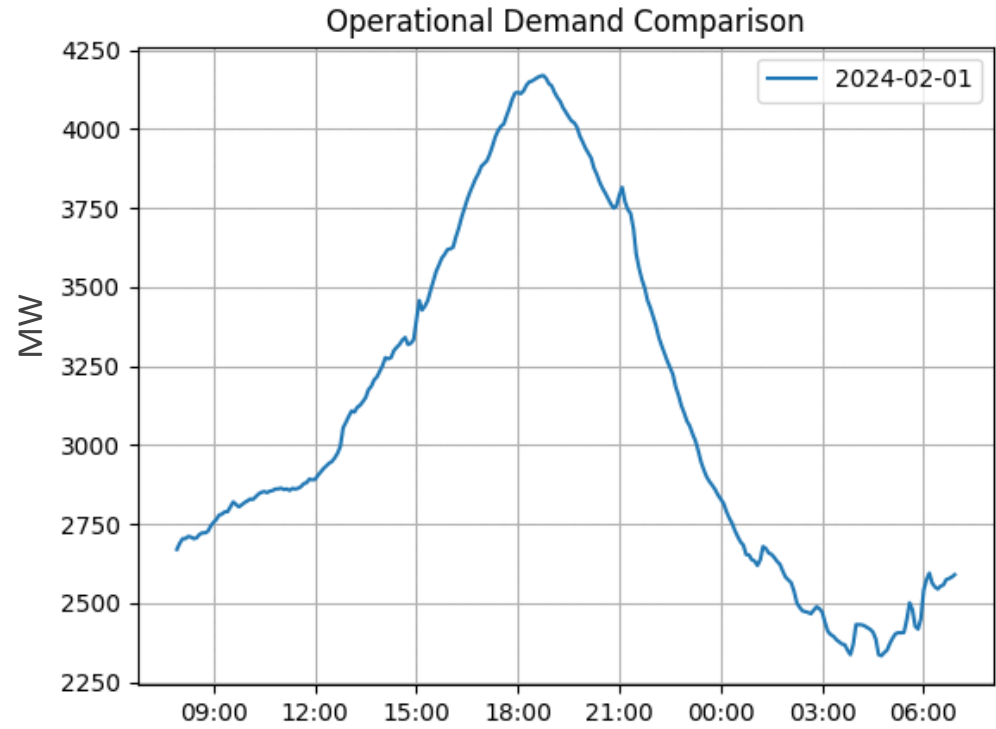
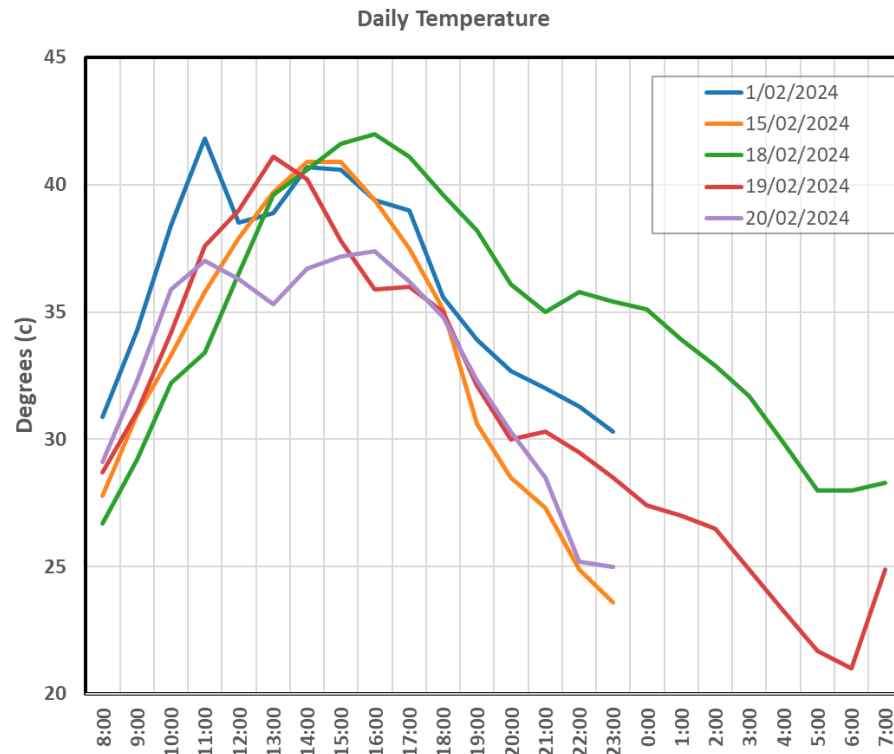
Over 18 - 20 February the WEM experienced consecutive maximum operational demand records of 4,233 MW, 4,170 MW 4,193 MW respectively.



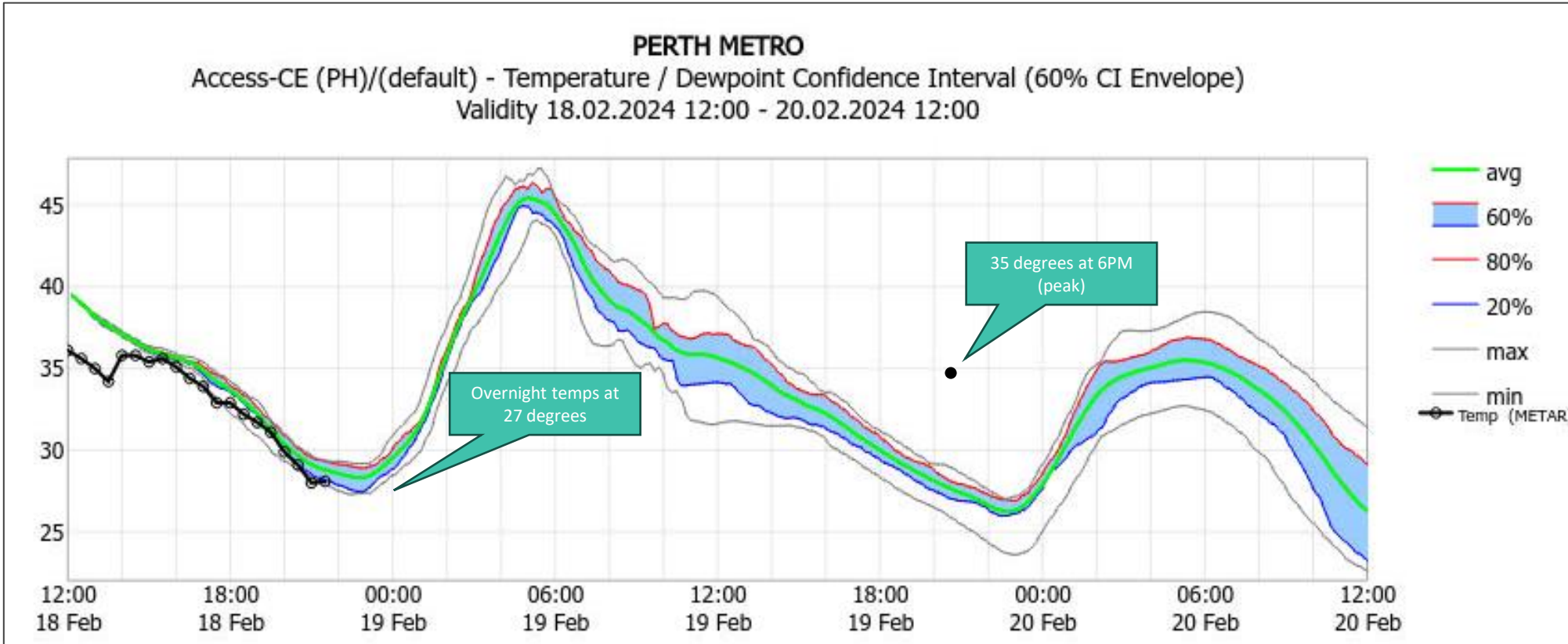
Metric	Value	Dispatch Interval
Min Average Operational Demand	2024.33MW	2024-02-18 08:55
Max Average Operational Demand	4232.94MW	2024-02-18 17:55
Min Underlying Demand	2352.96MW	2024-02-21 04:45
Max Underlying Demand	5016.46MW	2024-02-19 14:00
Min Renewable Penetration	3.47%	2024-02-19 23:50
Max Renewable Penetration	53.3%	2024-02-18 09:40
Avg Renewable Penetration	23.13%	

- Driven by extended heatwave conditions, with temperatures exceeding 40 degrees for a number of days over this period, and overnight minimums of ~27 degrees.
- AEMO was required to issue LOR2 declarations for the peak period on 18<sup>th</sup> and 20<sup>th</sup>, and issued a forecast LOR3 declaration (i.e. manual load shedding may be required) on the 19<sup>th</sup> due to high demand and low wind.
- The new record of 4,233 MW was set during the 17:55 Dispatch Interval on the 18<sup>th</sup>, which occurs just as DPV output starts reducing as the sun sets.
- Diesel generation was required to be dispatch to manage the peak demand on each day, and DSP, SRC and other provisions were activated on both days, delivering an ~235 MW reduction.

# Heatwave Conditions Drive High Demand

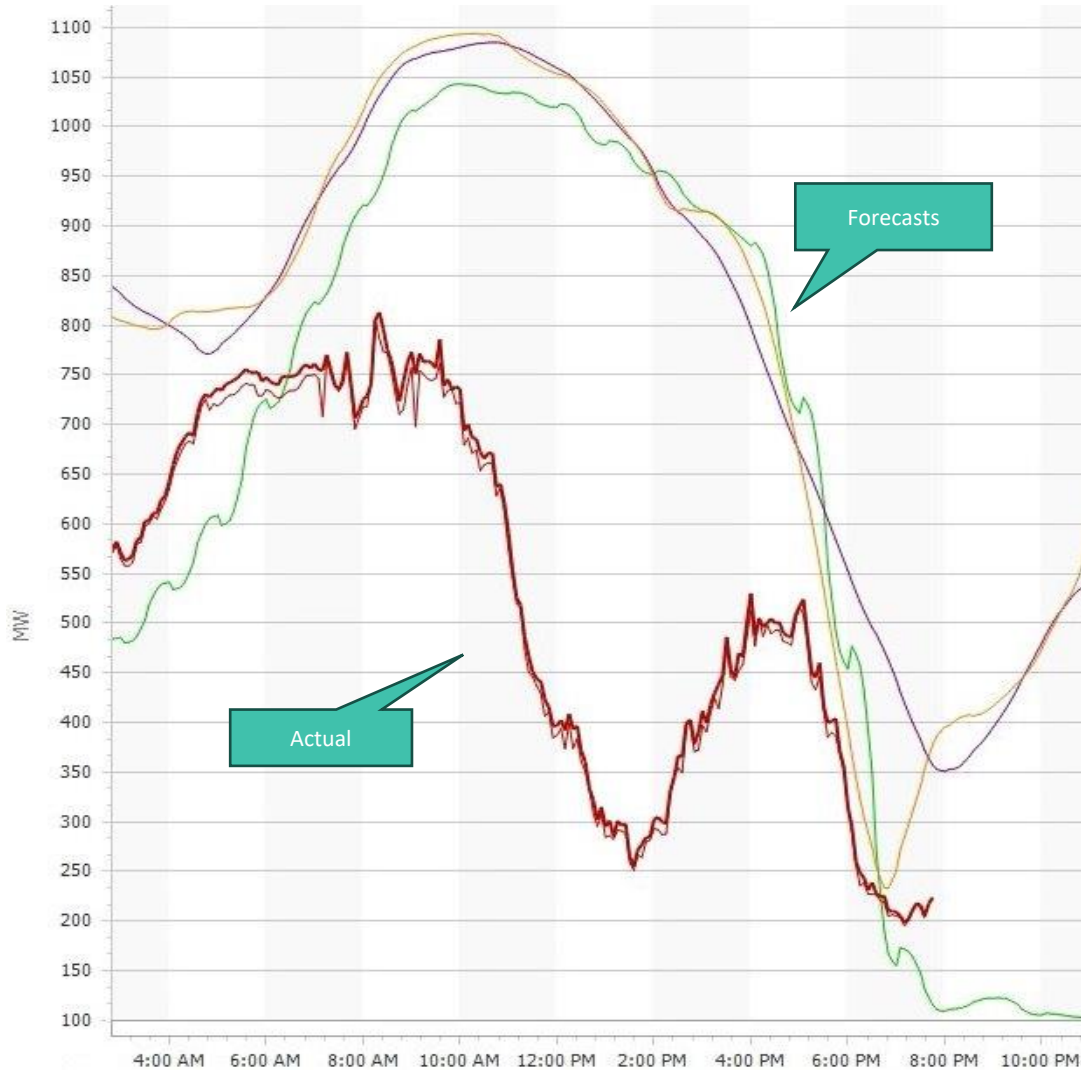


# Explanation of tight conditions



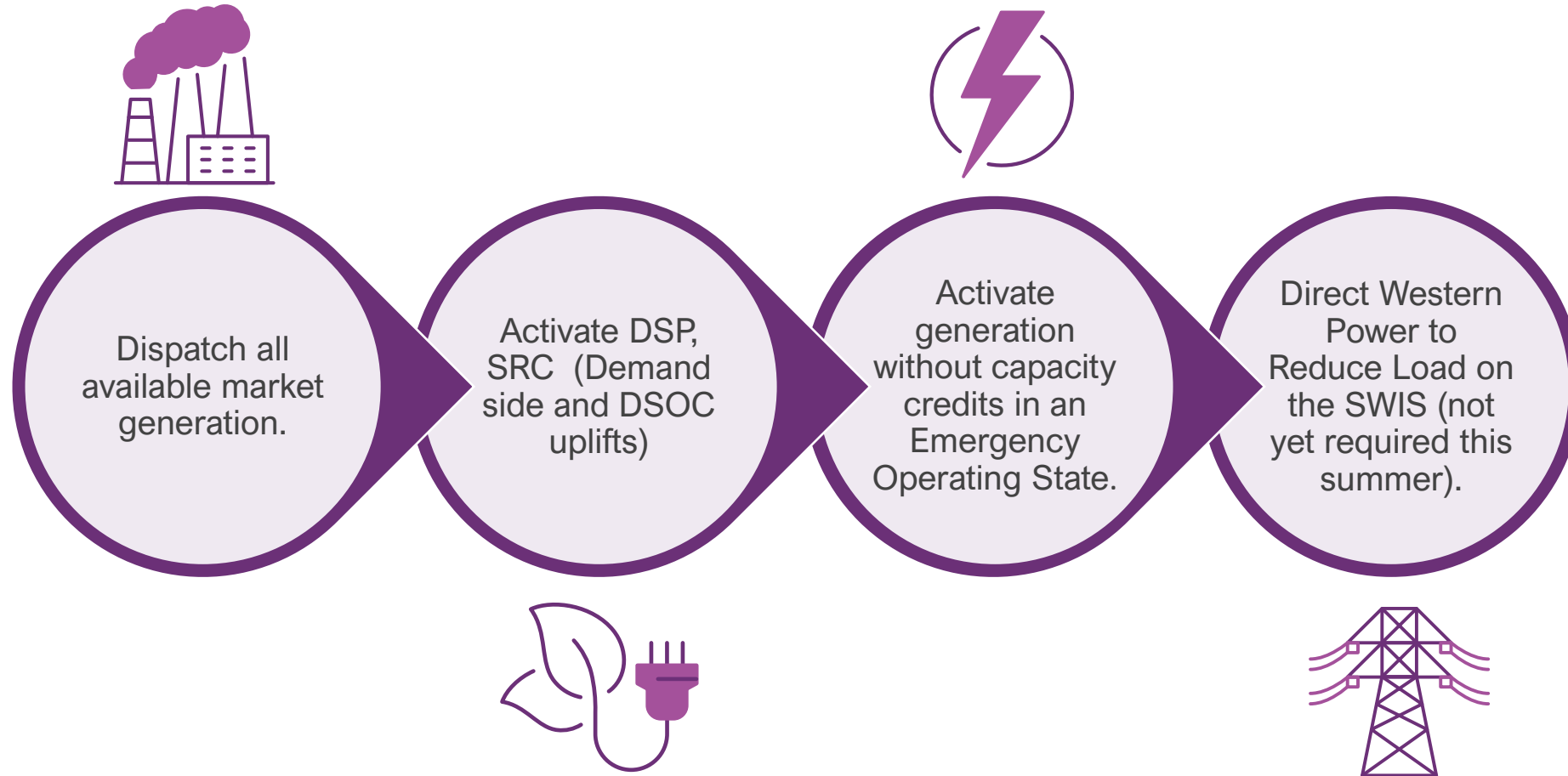
- High overnight temperatures have a large contribution to the following days load forecasts and actuals.
- This effect is referred to as heat banking as households do not get a chance to cool down without the use of air-conditioning, exacerbating the demand for the following day

# Wind Forecasts vs Actuals (19/01/2024)



- When preparing for tight conditions a conservative approach to the forecast wind is considered when calculating the amount of available generation available to meet demand.
- As can be seen, wind forecast spreads vs the actual wind generation vary dramatically in their correlation.

# Operational Actions



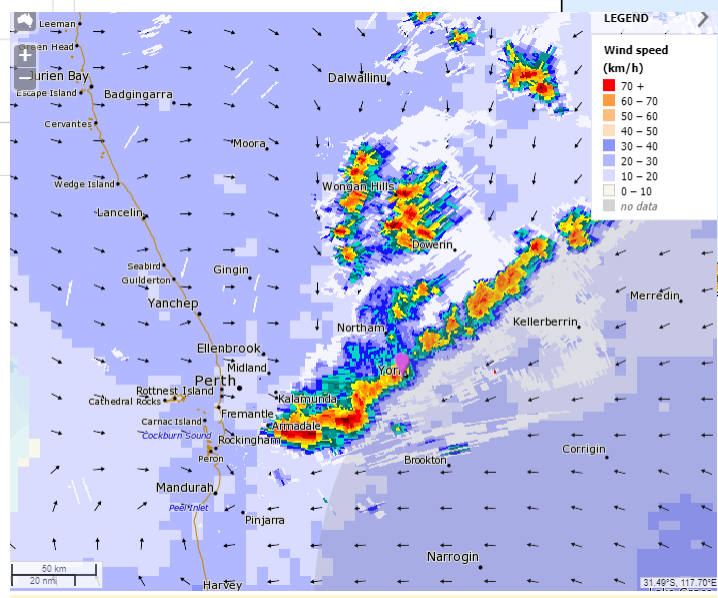
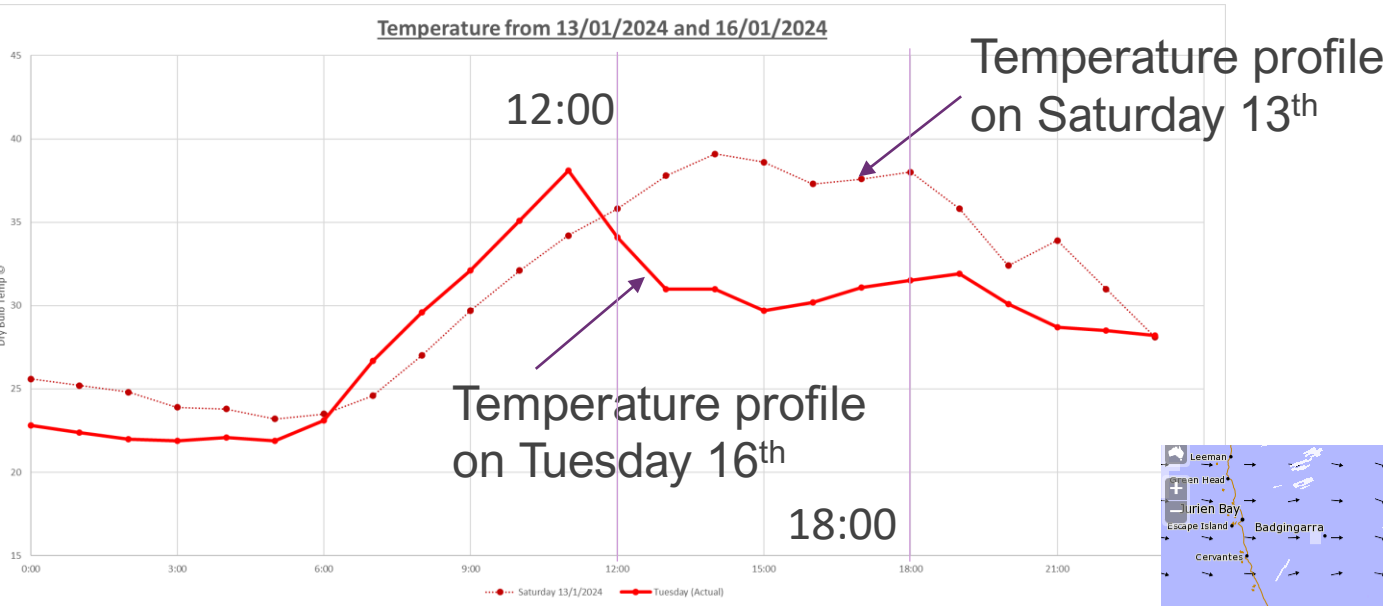
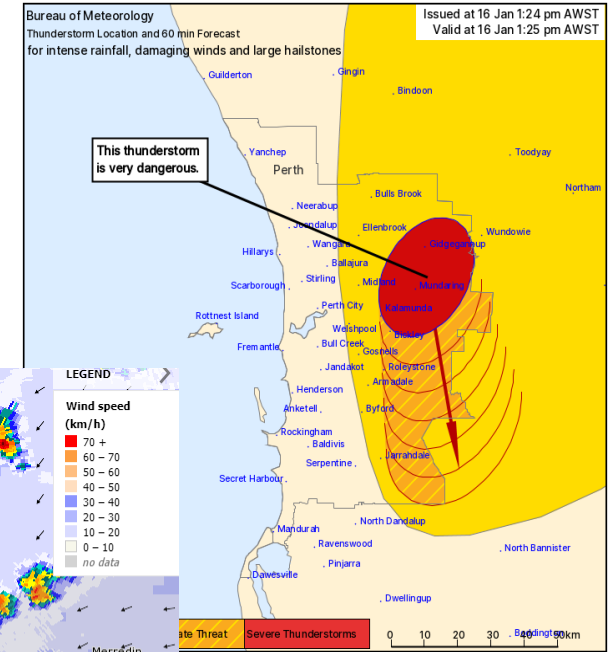
# Eastern Goldfields Islanding

Paul Elliott

Manager, WA Real Time Operations

# Tuesday, 16<sup>th</sup>: Thunderstorm

**Severe Thunderstorm Warning - Greater Perth**  
 for INTENSE RAINFALL, DAMAGING WINDS and LARGE HAIL STONES  
 For people in parts of Greater Perth area.  
 Issued at 1:24 pm Tuesday, 16 January 2024.  
 A VERY DANGEROUS STORM IS OCCURRING NEAR MUNDARING.

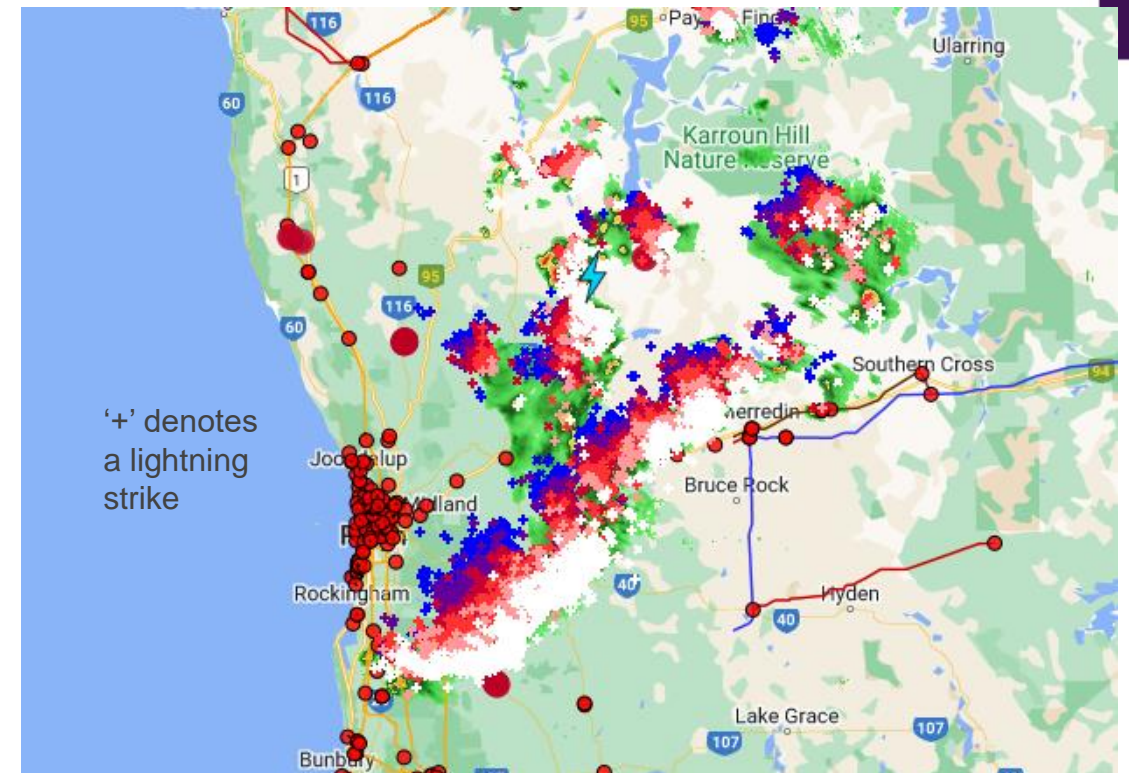
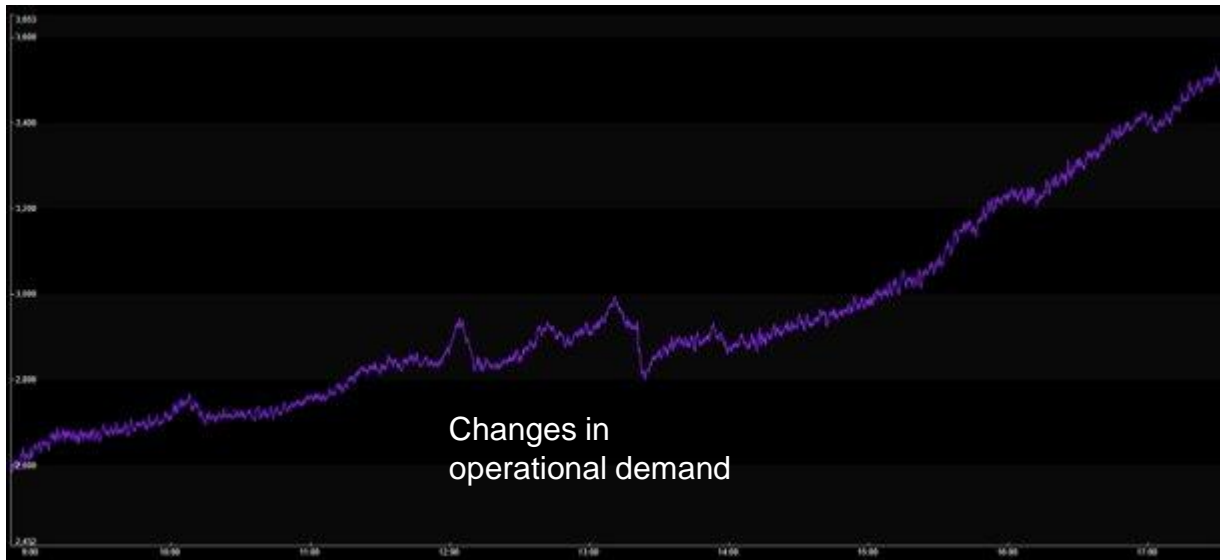


- Temperatures started dropping around noon
- Severe thunderstorm warning was released ~13:30



# Tuesday, 16<sup>th</sup>: Thunderstorm

This resulted in damage to distribution infrastructure and the loss of power of ~15k customers in a short period of time, resulting in volatility in system demand.





# Wednesday, 17<sup>th</sup>: Thunderstorms

- 5 of the 220kV Towers were destroyed by localised weather events which tripped the Eastern Goldfields off. The West Kal backup generators were started, under the NCESS contract, and tripped a short time later and were unable to be restarted until late afternoon the following day.
- All residential customers were reconnected to supply after ~33hrs.



# Thursday 18<sup>th</sup> – Saturday 27<sup>th</sup>: Island Operation

Whilst Western Power worked to restore the 220kV network, AEMO operated the Eastern Goldfields island to meet the load in the island and manage frequency of the island dispatching;

- WKT GT 2 in ISOC for frequency control
- WKT GT 3
- PKS to manage changes
- Western Power also managed network loading to maintain customer reliability
- Western Power worked 24/7 to build new structures. The 220 kV line was re-energised on the 27th of Jan

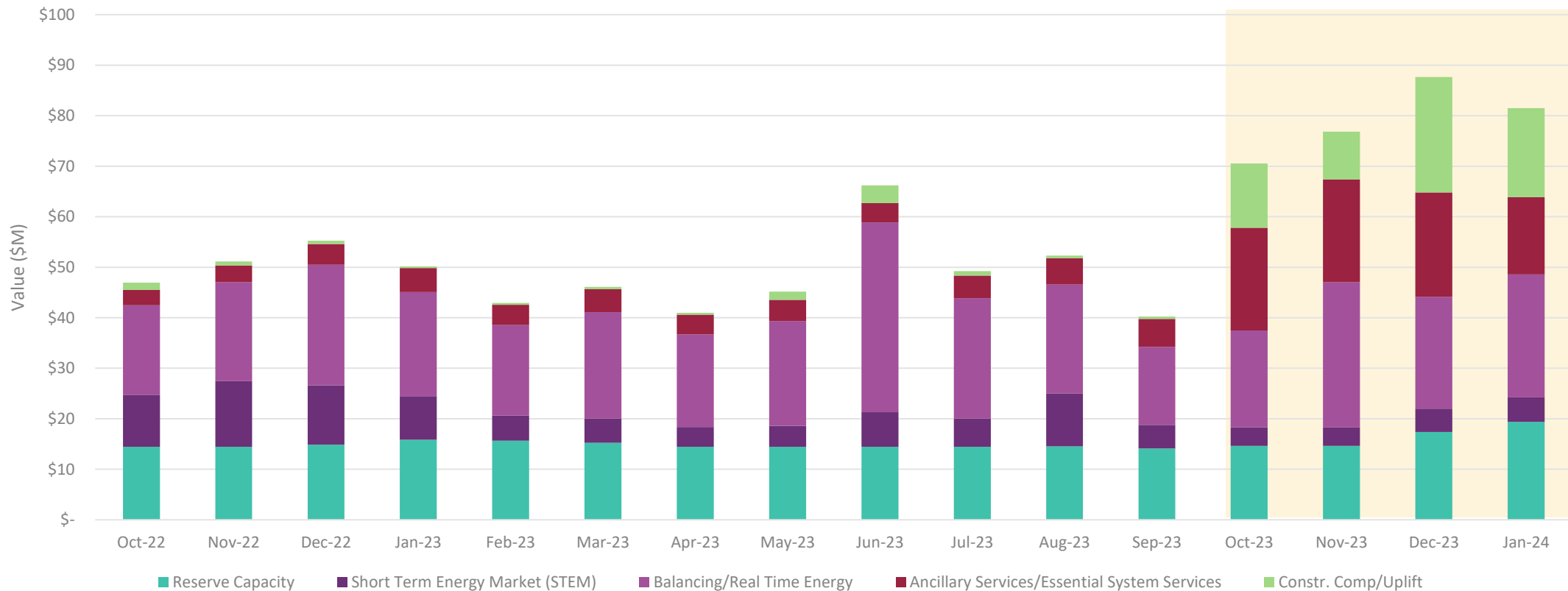


# Settlement Outcomes

Nicholas Nielsen

Manager, WA Prudentials & Settlements

# Market Segment Settlement Values



- This compares the monthly settled value Real-Time Market (Energy and ESS) vs the old Balancing market and Ancillary Services, plus Capacity.
- Bilaterally (off-market) traded Energy and Capacity is excluded.

# Balancing and Real Time Energy Prices

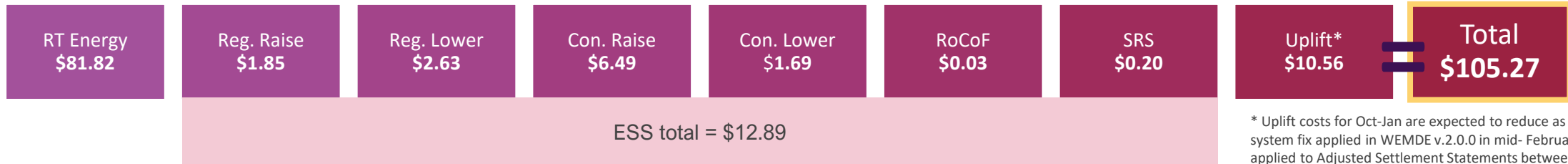


- The Balancing Price peaked around June 2023, with an average of \$129.68/MWh, driven by tight conditions in the system as a result of high outages and higher than normal winter demand.
- The average Final Reference Trading Price remained similar to the Balancing Price over the previous year, averaging \$81.82/MWh.
- Average monthly load has remained similar across both markets at just over 2,000 MW, however maximum demand hit a new record in November 2023 (4,040 MW), and again in January 2024 (4,067 MW).

# Old vs New Market Comparison

On a \$/MWh of Energy basis

## New Market (Oct 2023 to Jan 2024)



\* Uplift costs for Oct-Jan are expected to reduce as a system fix applied in WEMDE v.2.0.0 in mid- February are applied to Adjusted Settlement Statements between February and July.

## Old Market (12-month Ave to Sep 2023)



- This compares the cost of the Real-Time Market (Energy and ESS) vs the old Balancing market and Ancillary Services, normalised by energy consumed. Capacity costs are excluded.
- To calculate a dollar per MWh of energy consumed, AEMO divided the total segment cost by total gross consumption in the WEM, calculated as:
  - For the new market: the sum of CCQ\_P\_I
  - For the old market: the sum of (MSNDL\_P\_I - ABSLOAD\_P\_I)/2 + min(MS\_F\_I of Registered Facilities, 0)

# AEMO's Allowable Revenue Second In Period Submission update

Kate Ryan, Executive General Manager - Western Australia & Strategy

# Second in-period submission

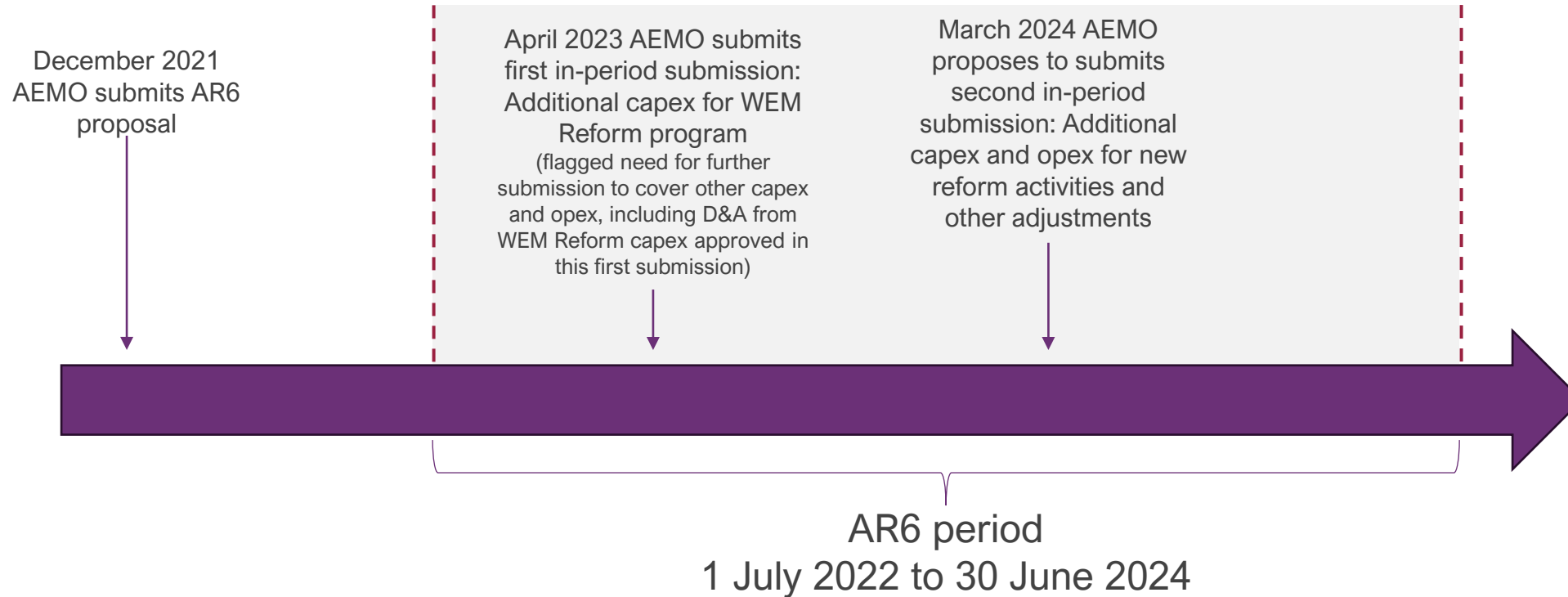
AEMO is focused on its core role of operating the power system and market, and enabling the energy transition for the benefit of WA consumers.

Energy sector reform will continue at pace into the foreseeable future, with AEMO continuing to play a central role in the WA Government's Energy Transformation Strategy and related energy sector reforms.

- AEMO is preparing to submit a second in-period submission to the Economic Regulation Authority in March 2024, to enable a decision before the start of the 2024-25 financial year.
- The energy transformation requires market reforms, as well as further investment in energy generation and storage technologies, network and power system design and operation, and in cyber security and IT systems
  - This is a challenge faced by power system operators across the globe, including AEMO in the WEM and NEM. AEMO WA's cost pressures are similar to those faced by international peers.
  - AEMO is investing in its systems, re-organising its resources, and leveraging the benefits of a national organisation to better respond to the challenges associated with transformation.
- AEMO is committed to facilitating the best consumer outcomes throughout the energy transformation by:
  - Striving for efficiency in our work to facilitate the decarbonisation of the SWIS, modernising market arrangements, integrating new technologies, and enabling new modes of consumer engagement with the system while 'keeping the lights on'.
  - Undertaking prudent investments in cyber security and systems to maintain the integrity of critical infrastructure and the efficient operation of the market.
  - Engaging with its stakeholders as part of providing transparency on its activities and decisions.



# The AR6 period – timeline



- A lot has changed since the original AR6 submission was prepared in 2021 – in the SWIS and the broader economy.
- The pace of change and speed required to implement the reform agenda provides significant challenges for funding under the current regulatory process.
- AEMO is keen to explore alternatives that provide effective transparency and accountability of AEMO’s costs and activities, but are better able to accommodate the pace of change and provide market participants with a more realistic estimate of future fees.

# Overview of second in-period submission



## Cost adjustment drivers

### First in-period submission



Changes in depreciation and borrowing opex allowance resulting from the Sep 2023 in-period adjustment, the conclusion of WEM Reform projects, and minor adjustments to the accounting treatment of some project-related capex.

REVENUE (OPEX)

**\$13.2 million**

### Cost pressures



External factors that have varied from the original AR6 forecast, such as inflation, labour cost escalation and interest rates.

REVENUE (OPEX)

**\$7.6 million**

AEMO is seeking to minimise these cost pressures, such as through recent AEMO bond issue

### Additional internal requirements



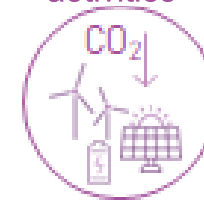
Changes to support ongoing operational needs including upgrades to critical cyber security and enterprise systems.

REVENUE (OPEX)

**\$4.9 million**

WA share of these necessary activities is lower than stand-alone cost would be

### New reform and energy transformation activities



The ongoing need to fully resource and facilitate energy transformation projects and support the WA Government's energy policy agenda.

Related activities by AEMO to enable the energy transition

REVENUE (OPEX)

**\$33.5 million**

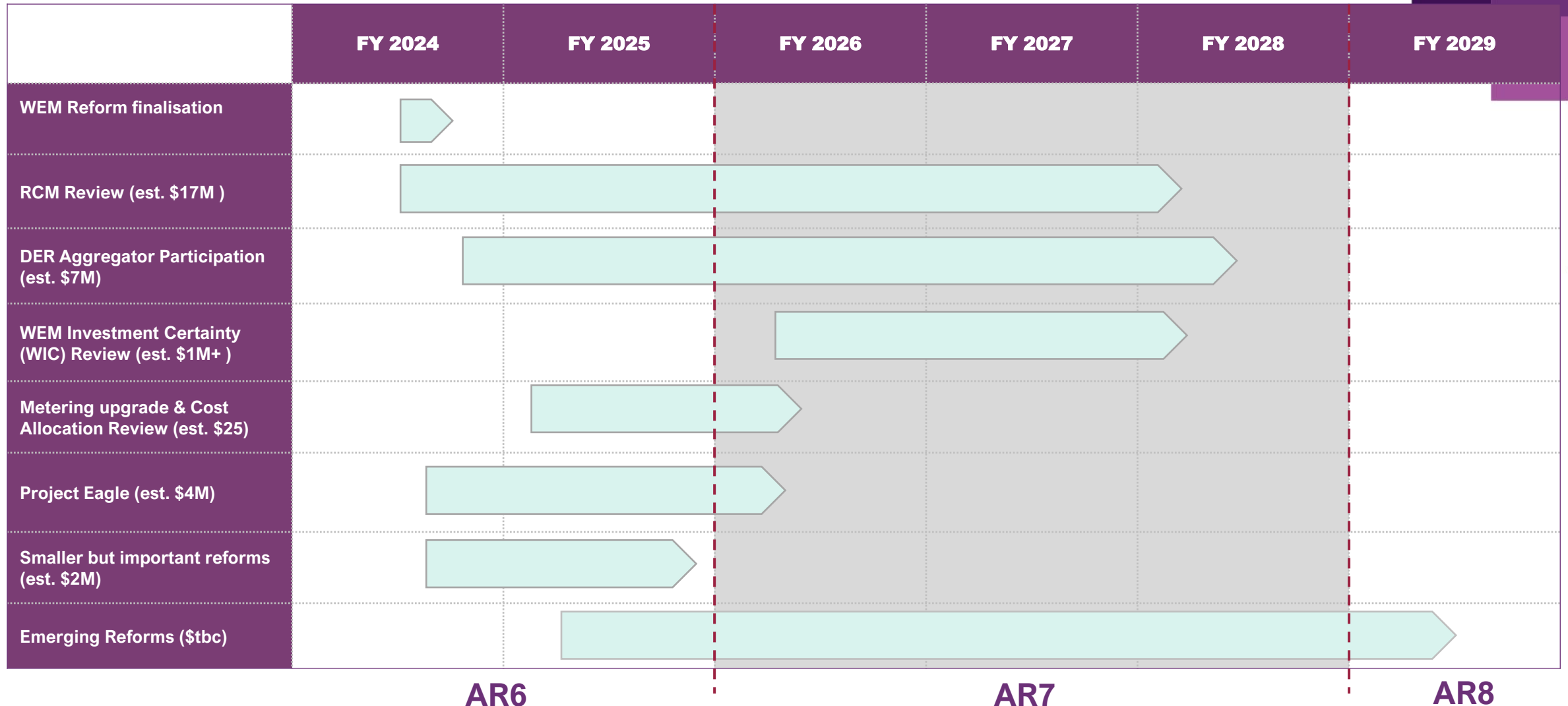
CAPEX

**\$39.0 million**

Largest contributor is new **reform** activities as part of WA Government's ongoing Energy Transformation Strategy

Original AR6 submission also contemplated a reduction in AEMO staffing levels post-WEM Reform, however **operational activities have expanded** and this also contributes to requested opex to maintain staffing at levels similar to 2022-23 to 2023-24.

# Indicative schedule of reforms AR6/AR7



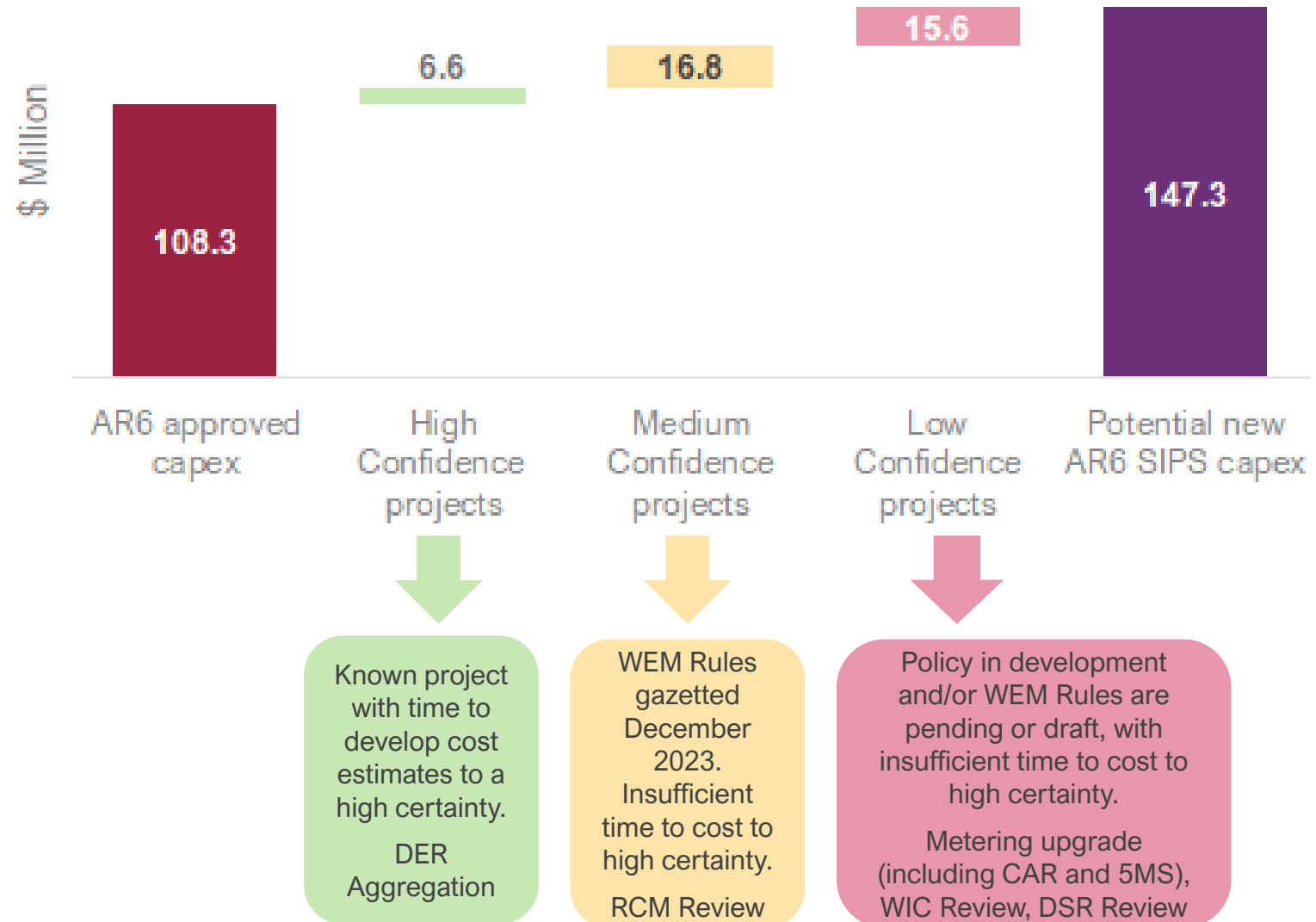
- We're working to sequence delivery of reforms to deliver value for consumers, while making change in a sustainable way.
- The reform program provides benefits for consumers, including by improving the effectiveness of market signals for much-needed investment, unlocking greater participation by the demand-side, and providing for more effective management of system security and reliability.

# Second in-period submission – Capex

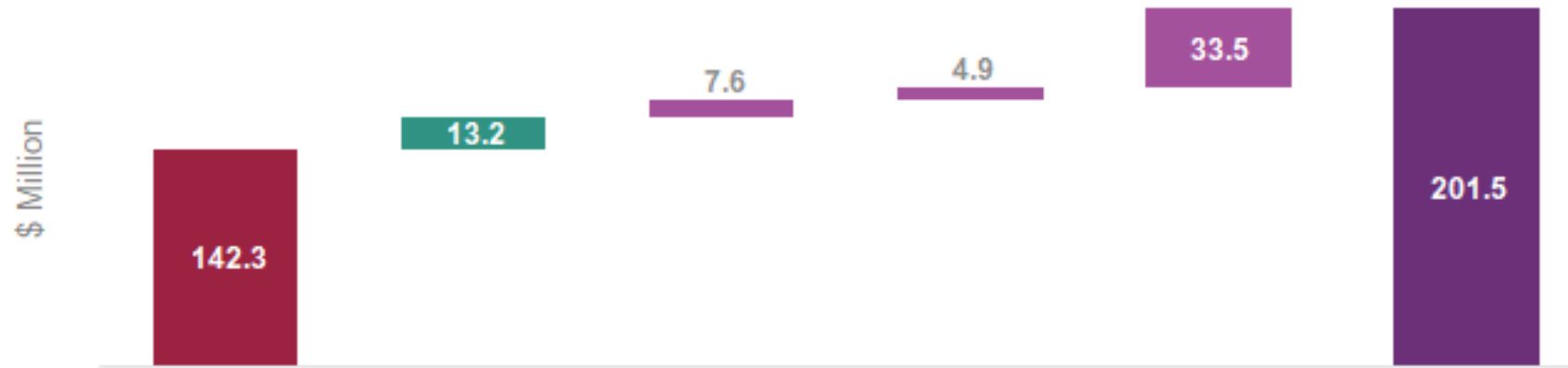
## Energy Reform

Reforms are at varying stages, meaning AEMO’s cost estimates have varying levels of confidence, and it hasn’t been possible to fully satisfy the ERA’s guidelines in all cases.

AEMO welcomes feedback on how to best manage this uncertainty to provide useful information on costs but not delay reform delivery by waiting to seek funding approval in a later process.



# Second in-period submission – Opex



AR6 Allowance

2023 In-Period Adj. Capex: Depreciation + Financing

External Cost Pressures: Inflation + Interest rates

Additional Internal requirements: Cyber + ERP

New Activities: Support + Deliver Govt Reform

Total AR6 requirement

Depreciation and financial flows for the cost recovery of WEM Reform costs under AEMO's first in-period submission.

External external cost pressures, include interest rate increases, inflation, and labour cost escalation.

Costs of internal requirements including operational support activities i.e., cyber security and the finance system uplift.

New activities including direct and indirect facilitation of energy reform initiatives.

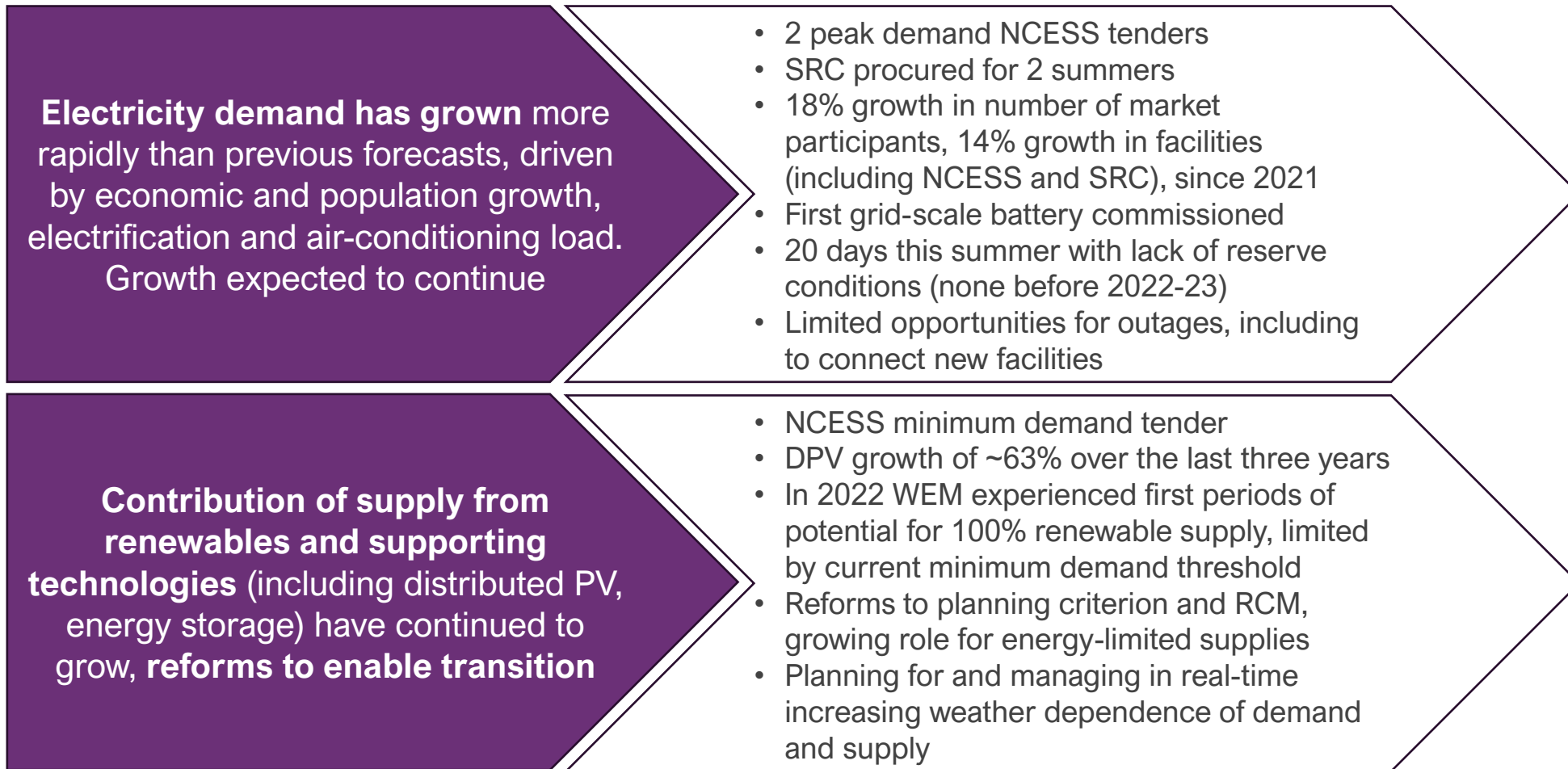
AEMO is required under clause 2.1A(IA) and 2.1A(Ii) of the WEM Rules to support EPWA in developing and implementing reform, and as the market and power system operator is required to have fit for purpose tools and procedures as the energy sector transforms.

With the quickening pace of energy reform, AEMO's role in supporting market evolution has grown significantly and we expect it to continue long-term.

AEMO also needs to evolve its planning and operational frameworks, methodologies and tools to enable the energy transition and achieve the WEM Objectives.

# Second in-period submission

## Other new and expanded activities driven by reforms and the energy transition



Additional market management and external comms activities

Additional modelling and planning tools activities and capabilities

Urgent need to design for high renewables system - SWIS [Engineering] Roadmap to Renewables

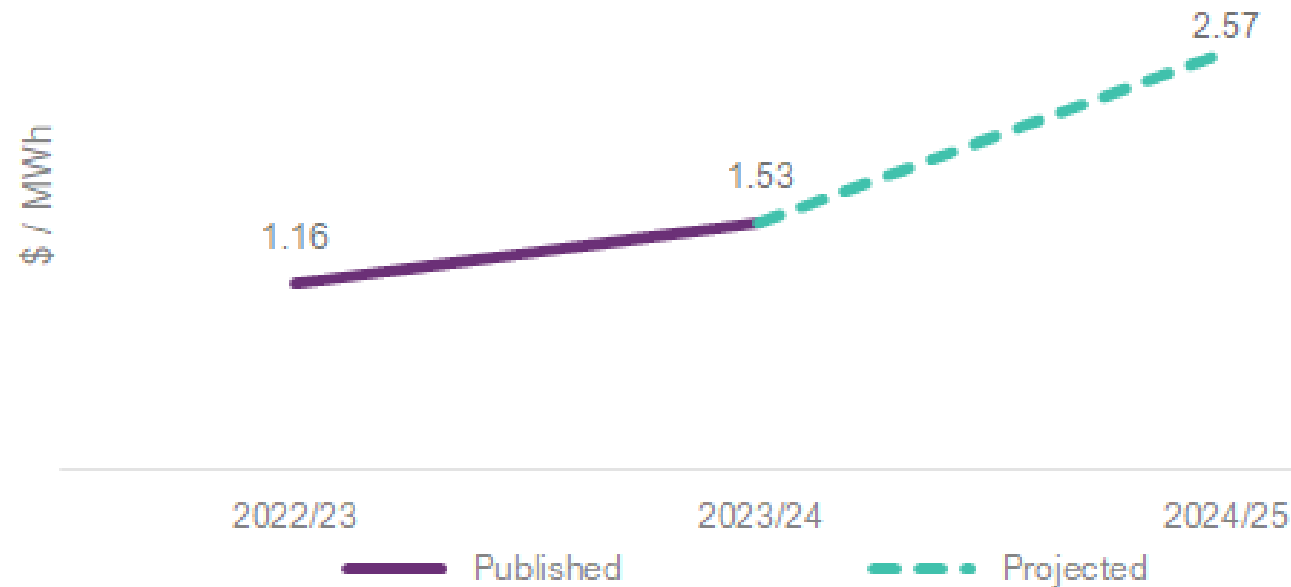
Operating model optimised to accommodate new activities with minimal change in headcount.

# Projected effect on Market Fees

FY25 market fee increase \$1.04 of which approx. \$0.65 consists outcomes of the first in-period adjustment and the original AR6 price path.

Subject to the ERA's determination on this in-period submission, AEMO proposes to incorporate the adjustments in this submission in the market fee increase from 1 July 2024.

As there is no proposed adjustment to GSI allowable revenue or capex.



- AEMO acknowledges the increase in market fees is significant.
- Future changes in fees are not expected to be as significant:
  - A significant step change is reflected in the increases from 2022-23 to 2023-24, driven by the scale and pace of reform, acceleration of the energy transition in the SWIS, and significant changes in the external economic environment.
  - AEMO has sought to re-organise and optimise its operating model to meet the needs of the current and expected environment, including to deliver a scale of reform at proposed 2025-26 levels ongoing over the medium to long term.

# WA Capacity Market Investment Update (WACMI)



Neetika Kapani, Manager - WACMI





# Status of Procurement Processes

## 2023-24 Supplementary Reserve Capacity (SRC) process

- AEMO procured 160 MW of the 326 MW of SRC requirement for the 2023-24 Hot Season (1 December 2023- 1 April 2024).
  - SRC has been activated 13 times this summer (to date).
- In response to the Amending Rules, AEMO released an updated SRC WEM Procedure for consultation on 19 February.
  - Formal consultation window closes on **19 March** with the aim for this WEM Procedure to be effective 1 April 2024.

Supplier	Contract commenced	MW signed
Enel X Australia	1 Dec 2023	60
Water Corporation	1 Dec 2023	50
Synergy DER	1 Dec 2023	1.8
Shell Energy	11 Dec 2023	10
Starling Energy	11 Dec 2023	1.5
AER Retail	14 Dec 2023	3
NewGen Neerabup	20 Dec 2023	11.4
Synergy KWGT2	20 Dec 2023	7.5
Synergy KWGT3	21 Dec 2023	7.8
Cockburn Cement - Kwinana	21 Dec 2023	2
Cockburn Cement - Munster & Woodman Pt.	16 Jan 2023	5

# Status of Procurement Processes – continued

## 2025-27 Non Co-Optimised Essential System Services (NCESS) for Reliability

- Submissions for this NCESS for up to 436 MW of peak demand services for either a 1-year or 2-year contract closed on 24 January.
- AEMO is in the final stages of assessing the submissions, with the aim to inform successful respondents by **8 March**.

## 2026-27 Certified Reserve Capacity (CRC) process

- The Request for EOI's for new capacity for 2026-27 closed on **1 March**.
- AEMO will publish the 2026-27 EOI summary report by **2 April**.
- While the EOI process is non-mandatory to be eligible for CRC, Participants who are intending to provide new capacity for 2026-27 are required to apply to AEMO for an indicative Facility Class (IFC) and an indicative Facility Technology Type (IFTT) assessment prior to submitting a CRC application for 2026-27.
- For Facilities who did not submit an EOI, the closing date for IFC and IFTT assessment submissions is **17 May**.
- The CRC application window opens on **15 April** and closes on 24 June.

## 2026-27 CRC process – important timelines for related activities

EOI submitted	Market Participant registration (20 Business Days)	Facility Creation form (10 Business Days)	Deadline for registration applications
Yes	Not registered	Not created	Market Participant registration applications must be lodged prior to 28 February
Yes	Registered	Not created	Facility Creation applications must be lodged prior to <b>28 March</b> .
No	Not registered	Not created	Market Participant registration applications must be lodged prior to <b>4 April</b> (clause 4.8A.4(b)).
No	Registered	Not created	Facility Creation applications must be lodged prior to <b>3 May</b> (clause 4.8A.4(b)).

# Other WACMI processes underway

- Reserve Capacity Security exchanges
- Engagement with stakeholders around the upcoming 2024 CRC process
- Re-accreditation of Independent Experts to assess Relevant Level for the CRC determinations
- 2023-24 summer Reserve Capacity (RC) Testing process
  - The 'self-test' period ended on 31 January 2024.
  - Facilities that did not pass by observation by 31 January 2024 are being subjected to a formal RC Test.
  - This is the first RC testing period since New WEM commencement and AEMO is updating its procedures to clarify the change in the notification process to Participants when conducting formal tests.



# Q&A and Other business

Contact us: [waelectricityforum@aemo.com.au](mailto:waelectricityforum@aemo.com.au)

# Upcoming forums and publications

## Calendar

AEMO Procedure Change Working Group	6 March 2024
WEM Electricity Statement of Opportunities, Forecasting Reference Group	12 March 2024
Certified Reserve Capacity workshop	April 2024
Network Access Quantity workshop	April 2024
WA 2024 Electricity Statement of Opportunities	June 2024



For more information visit

[aemo.com.au](http://aemo.com.au)