2024 Electricity Statement of Opportunities

3 September 2024

This webinar will be recorded and published online

We acknowledge the Traditional Custodians of the land, seas and waters across Australia. We honour the wisdom of Aboriginal and Torres Strait Islander Elders past and present and embrace future generations.

We acknowledge that, wherever we work, we do so on Aboriginal and Torres Strait Islander lands. We pay respect to the world's oldest continuing culture and First Nations peoples' deep and continuing connection to Country; and hope that our work can benefit both people and Country.

'Journey of unity: AEMO's Reconciliation Path' by Lani Balzan

AEMO Group is proud to have delivered its first Reconciliation Action Plan in May 2024. 'Journey of unity: AEMO's Reconciliation Path' was created by Wiradjuri artist Lani Balzan to visually narrate our ongoing journey towards reconciliation - a collaborative endeavour that honours First Nations cultures, fosters mutual understanding, and paves the way for a brighter, more inclusive future.

Read our RAP

Agenda

- Welcome
- Introduction
- **Overview** – *The ESOO highlights the opportunities for market participants, investors, governments and other jurisdictional bodies to invest in new assets and systems to maintain a reliable supply of electricity in the NEM.*
- **The Target** – *Investments in renewable generation and storage continue to increase, and the pipeline of new projects continues to expand, filling the gaps being left by the retirement of Australia's ageing coal fired power stations.*
- Q&A

How to interact today

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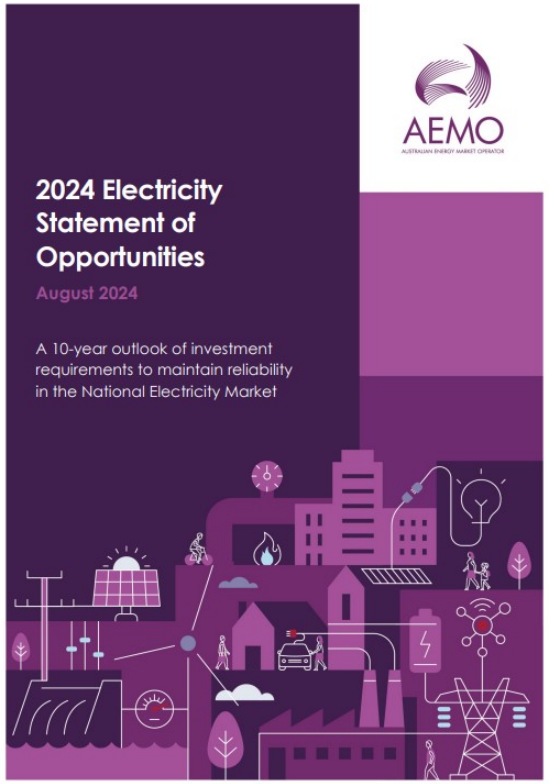
- Ask questions using Slido www.sli.do #AEMO
- Written replies may be provided through Slido if appropriate
- AEMO will not provide responses to unanswered questions

Today's objectives

Present and discuss key insights from the *2024 Electricity Statement of Opportunities* (ESOO).

After the presentation, you will have the opportunity to ask AEMO questions, using Slido.



Read the report and supporting material

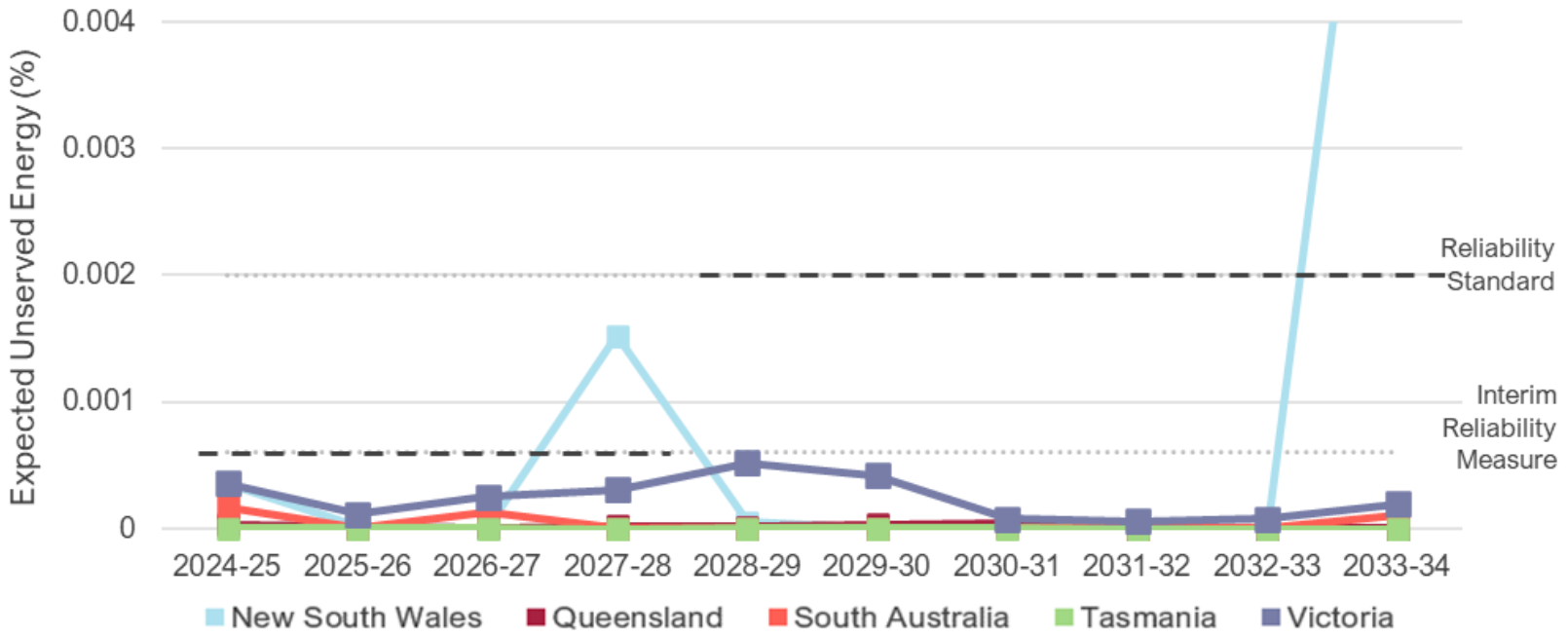
2024 ESOO highlights

Investments must be delivered on time and in full to maintain reliability

- Reliability risks are forecast within relevant standards over most of the next 10-year horizon in most market regions once federal and state government programs, actionable transmission developments, and the coordination of forecast consumer energy resources (CER) are also considered.
- 5.7 Gigawatts (GW) of new capacity has progressed sufficiently to be considered committed or anticipated since the 2023 ESOO; including:
  - **Dispatchable capacity:** 3.9 GW / 13.5 GWh of new battery and 200 MW of hydrogen developments
  - **Renewable energy:** 1.2 GW of new large scale solar and 0.4 GW of wind developments
  - This is >1 GW more than was advised in the May 2024 Update.
- Forecast reliability gaps are smaller in 2024 ESOO compared to 2023 and the May update - considering only energy supply infrastructure developments that meet AEMO's committed and anticipated commitment criteria.
- While the outlook has improved, reliability gaps are forecast in New South Wales, South Australia and Victoria in 2024-25. Opportunity for Interim Reliability Reserves (IRR) to be contracted.
  - 2023 ESOO: **55 MW in total**, being 55 MW (VIC)
  - May 2024 ESOO Update: **515 MW in total**, 270 MW (NSW), 245 MW (VIC)
  - 2024 ESOO: **475 MW in total**, 265 MW (NSW), 10 MW (VIC), 200 MW (SA)

  } 2024-25 reliability gaps only
- Sufficient security and stability services are also required to ensure that the power system remains stable and resilient alongside investments that provide energy and capacity to support power system reliability.

Federal and state government programs, supported by transmission and coordinated CER have the potential to meet the reliability standards over most of the horizon



- On time and in full delivery of these programs will be essential for the reliability of the NEM
- Only the initial SA-Vic stages of the CIS is considered, however further stages of CIS, NSW, VIC SEC or offshore wind tenders have the potential to resolve further gaps if delivered consistent with requirements.

Background

Relevant reports

1. **August 2023:** *2023 NEM Electricity Statement of Opportunities (ESOO)*
2. **May 2024:** *Update to the 2023 NEM Electricity Statement of Opportunities (ESOO)*
3. **August 2024:** *2024 NEM Electricity Statement of Opportunities (ESOO)*

Key modelling sensitivities in the 2024 NEM ESOO

1. **Committed and Anticipated Investments** – applying the standard modelling methodology to prepare the reliability forecast – committed and anticipated projects are modelled assuming a delay to advised dates based on observed historical commissioning.
    - This is the "Reliability Forecast" under the NER that triggers the procurement of interim reserves, and places obligations on electricity retailers to contract for appropriate capacity.
2. **On time Delivery** = committed and anticipated projects without any modelled delay to generation, storage and transmission projects' commissioning
3. **Actionable Transmission and Coordinated CER** = 'On time' sensitivity + [additional Virtual Power Plant, Vehicle to Grid and Demand Side Participation] + [Actionable and other transmission developments]
4. **Federal and State Schemes** = Actionable Transmission sensitivity + [Federal schemes] + [State schemes]

Compared to the 2023 ESOO, the reliability outlook has improved

Positive changes (reducing reliability risks)	Negative changes (increasing reliability risks)
Lower forecast of maximum demand and energy consumption	
Increased demand flexibility in some regions	
Eraring Power Station advised closure from 2025 to 2027	
AEMO now considers HumeLink *anticipated*	
Newly committed and anticipated generation and storage projects	Delays to some committed and anticipated generation and storage projects. Earlier mothballing of SA gas generation.
Improved transfer capability from some existing transmission corridors (Latrobe Valley to Melbourne)	Delayed commissioning of some transmission projects (Project EnergyConnect)

Key:

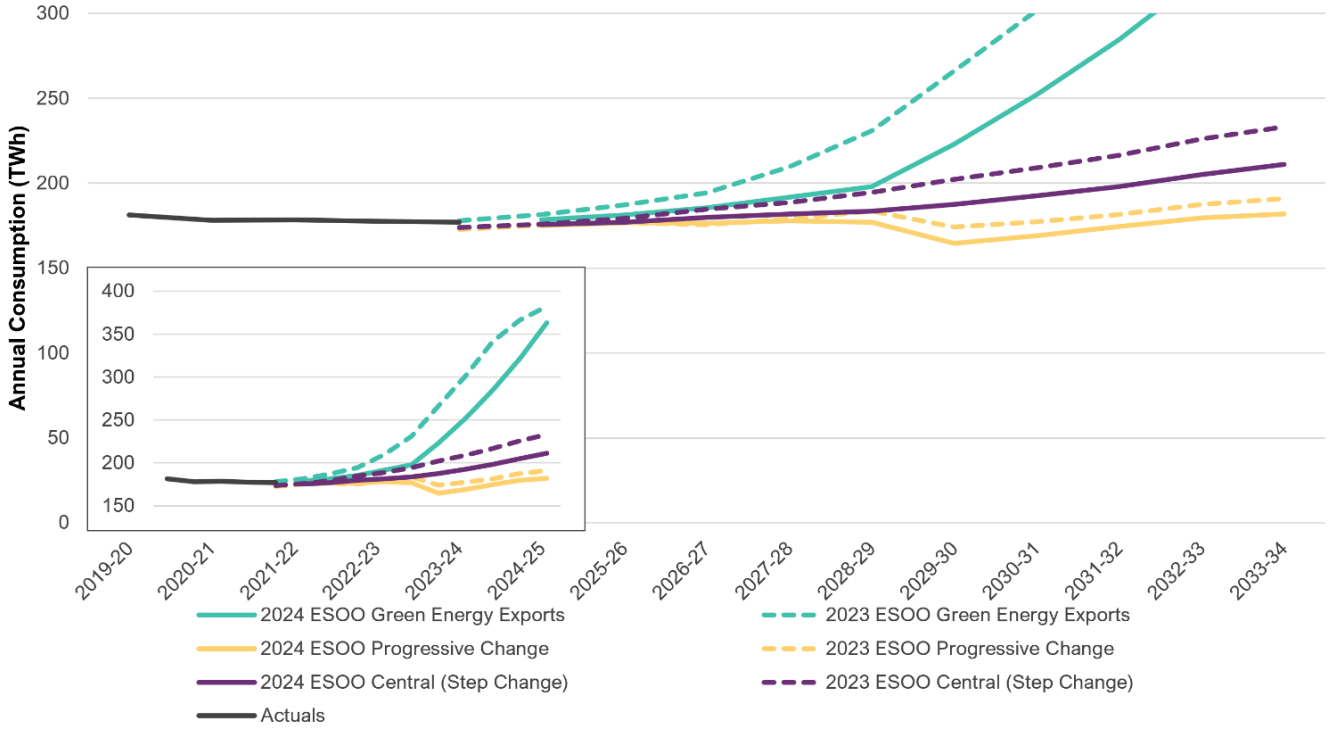
- Included in the May 2024 Update to the 2023 ESOO
- New Information since the May 2024 Update to the 2023 ESOO

2024 NEM ESOO results

Energy consumption forecast

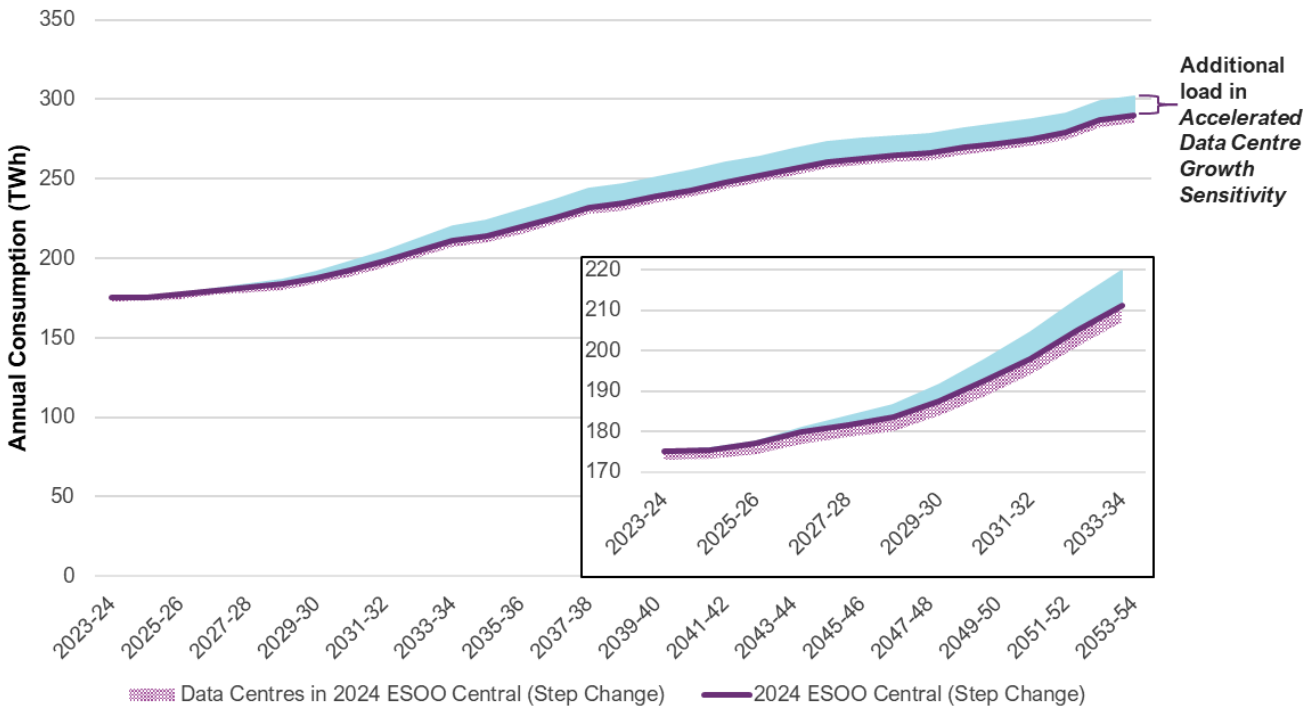
Step Change scenario

- AEMO considers the *Step Change* scenario to be the most likely
  - It is applied as the ESOO Central scenario for all reliability analysis.
- Relative to the 2023 forecast, 2024 forecasts project lower energy consumption, driven by:
  - Large PV systems
  - A weaker economic outlook
  - Slower EV uptake



Accelerated Data Centre Growth sensitivity

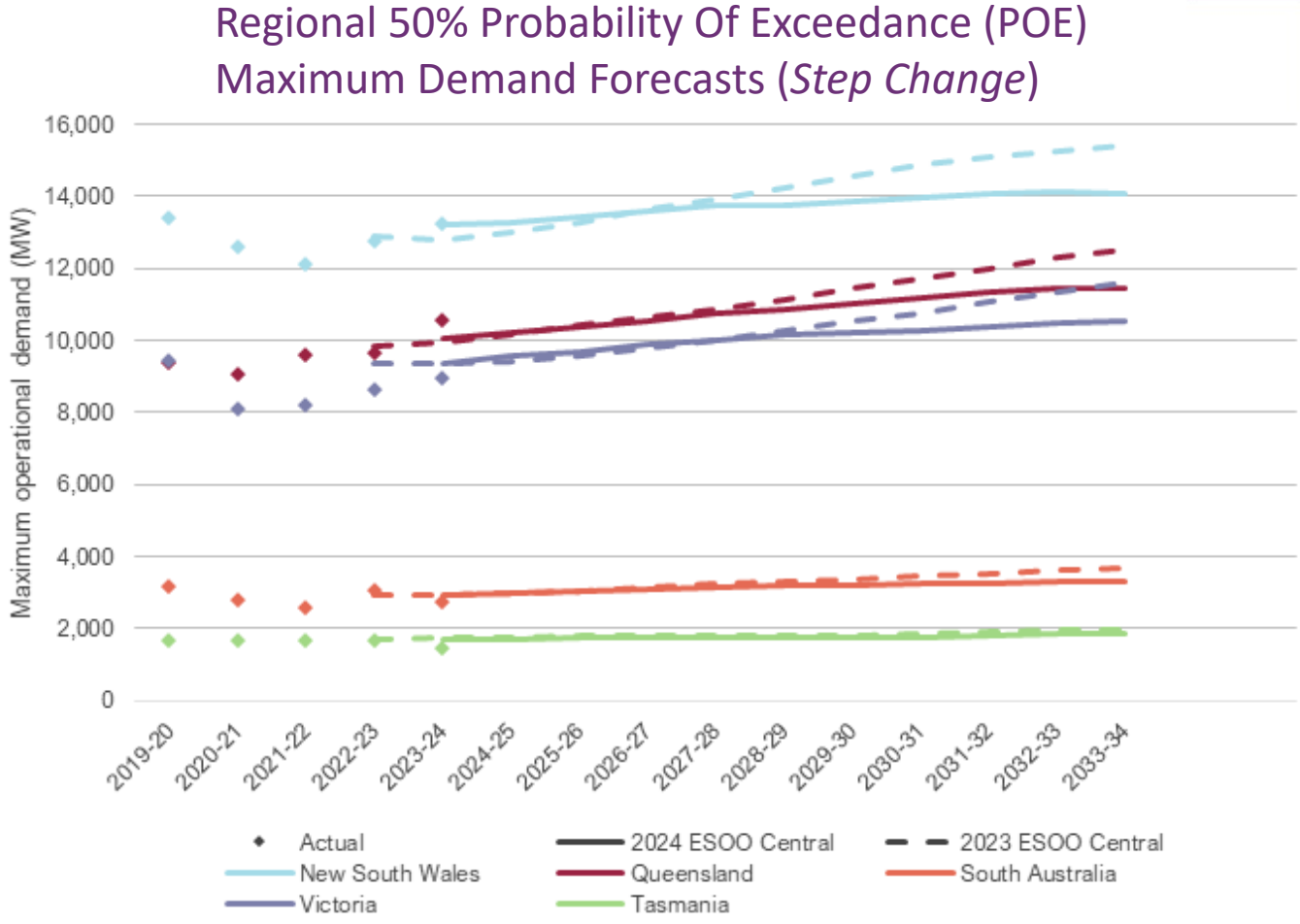
- The ESOO Central scenario forecasts around 5 TWh of data centre load by 2033-34, from existing and committed projects
- The *Accelerated Data Centre Growth* sensitivity forecasts nearly 15 TWh of **total data centre** load per year by 2033-34, which is assumed to continue rising over the next 30 years. Based on this trajectory, data centres are estimated to make up nearly 15% of LIL consumption and around 5% of total NEM operational consumption by 2033-34
- Around two-thirds of the consumption is forecasted to be located in New South Wales, particularly in the Western Sydney area. In addition, one fifth is assumed in Victoria, and the remainder in Queensland and Tasmania.



Maximum demand forecast

Step Change scenario

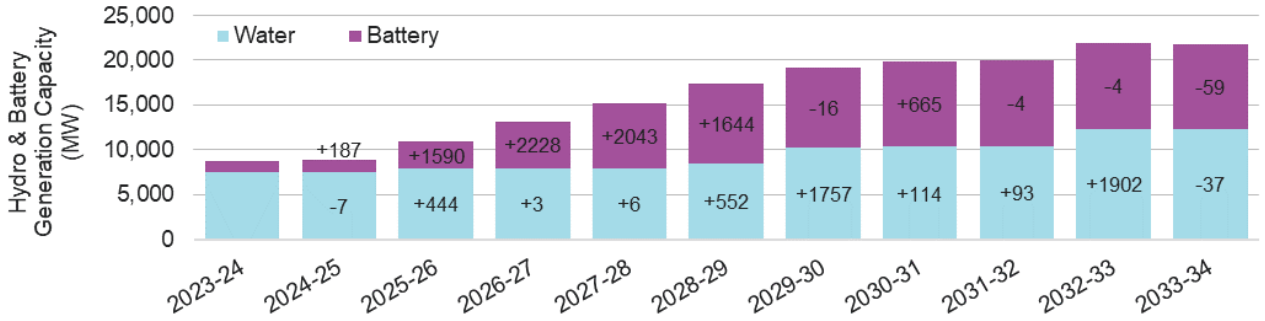
- Maximum demand forecast remain similar to those used in 2023 in the near term.
- Maximum demand forecasts have been revised downwards in the longer term, following energy consumption drivers.



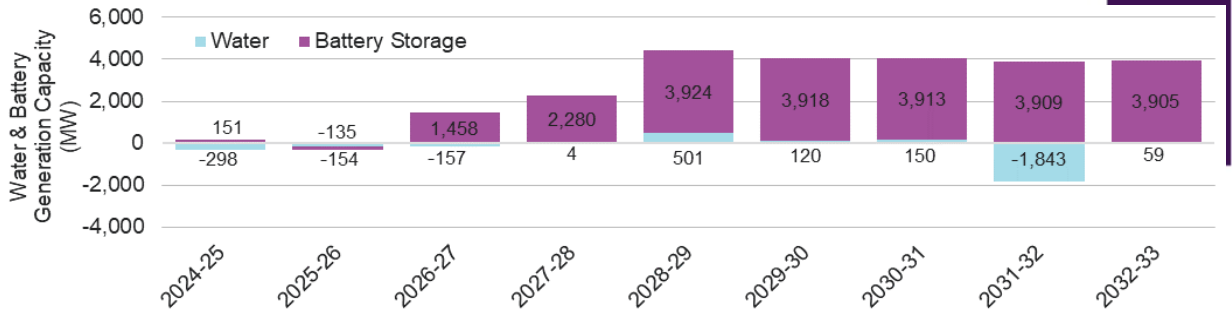
NEM capacity changes

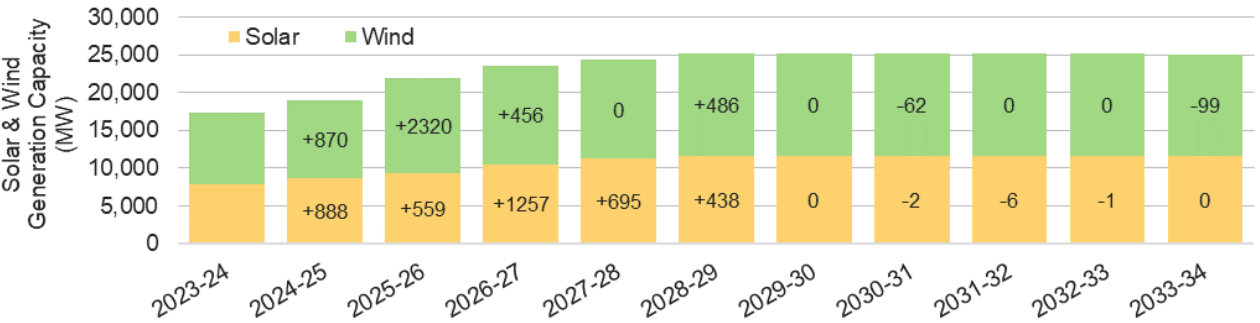
Committed and Anticipated Investments sensitivity

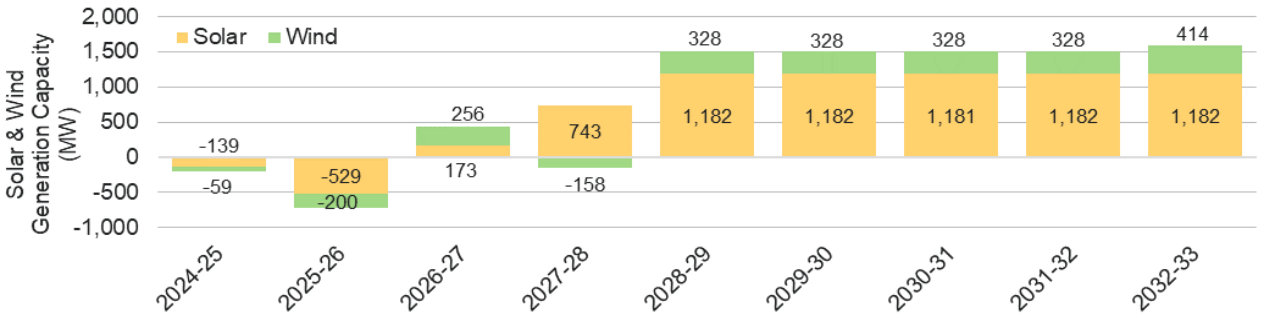
Total Capacity



Difference from 2023 ESOO







NEM capacity changes

Committed and Anticipated Investments sensitivity

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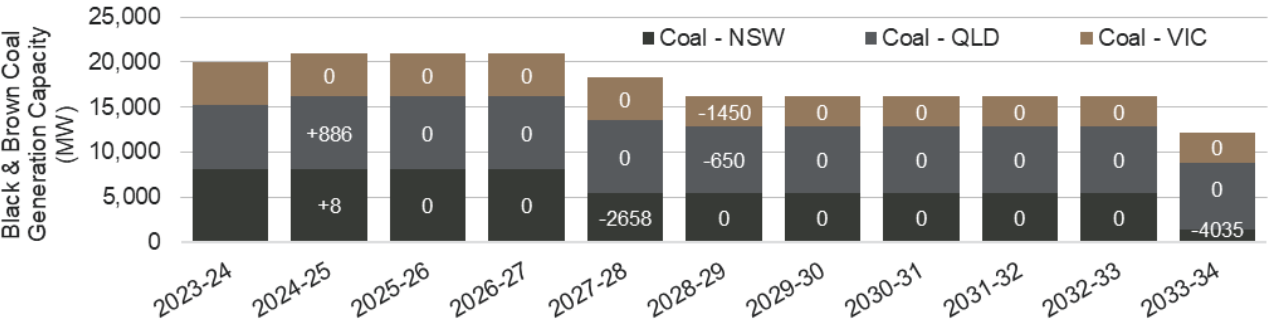
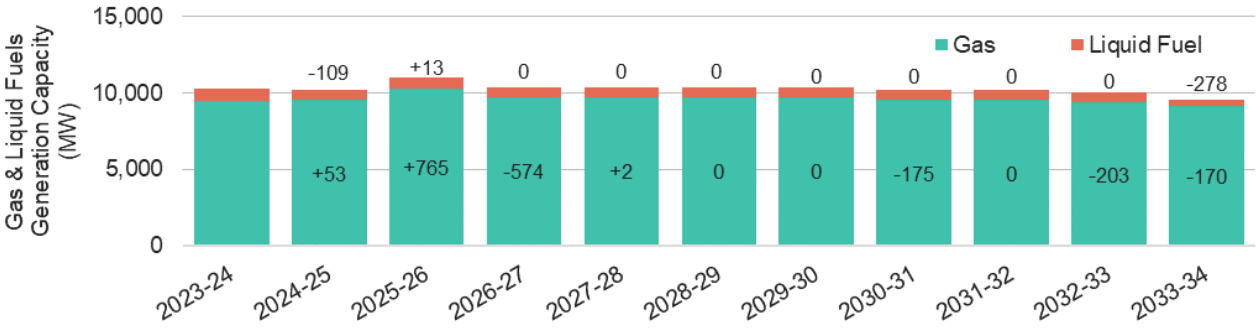
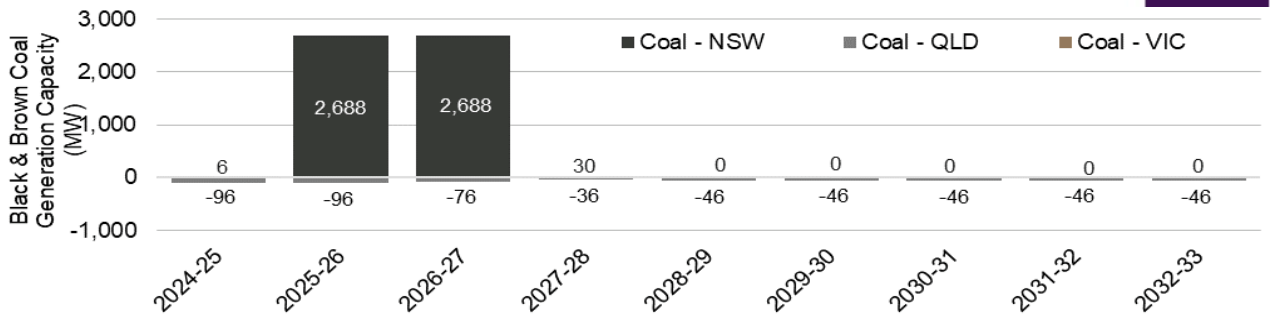
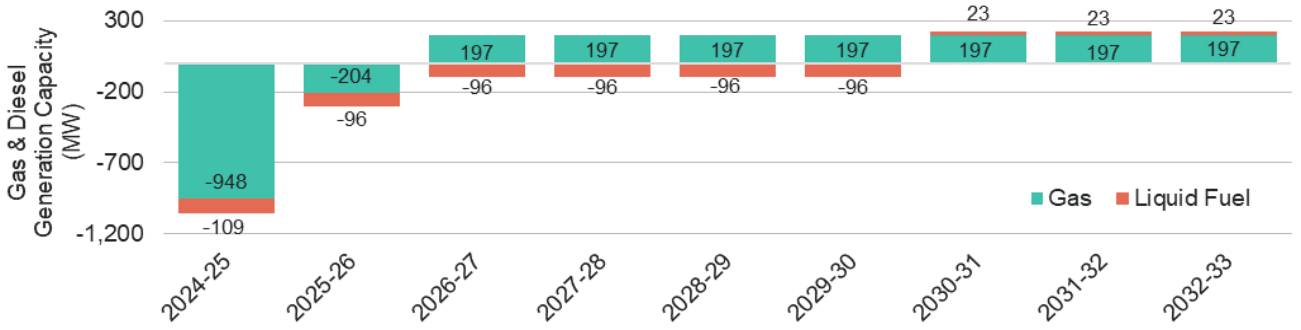




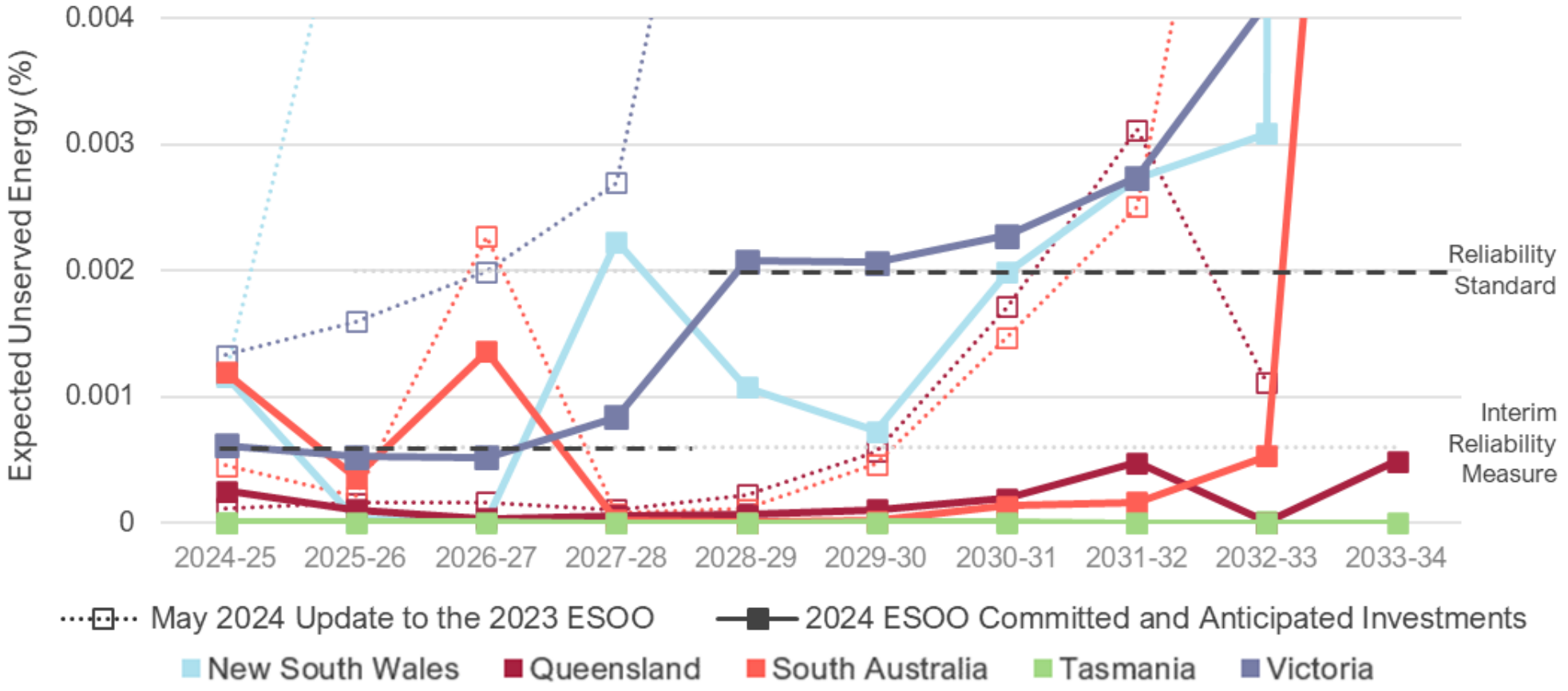
Difference from 2023 ESOO





Committed and Anticipated Investments

Comparison with *May 2024 Update to the 2023 ESOO*



* New Information since 2023 ESOO

Committed and Anticipated Investments

Positives

Hunter Power Station & Waratah Super Battery included

Numerous batteries included across mainland regions. *

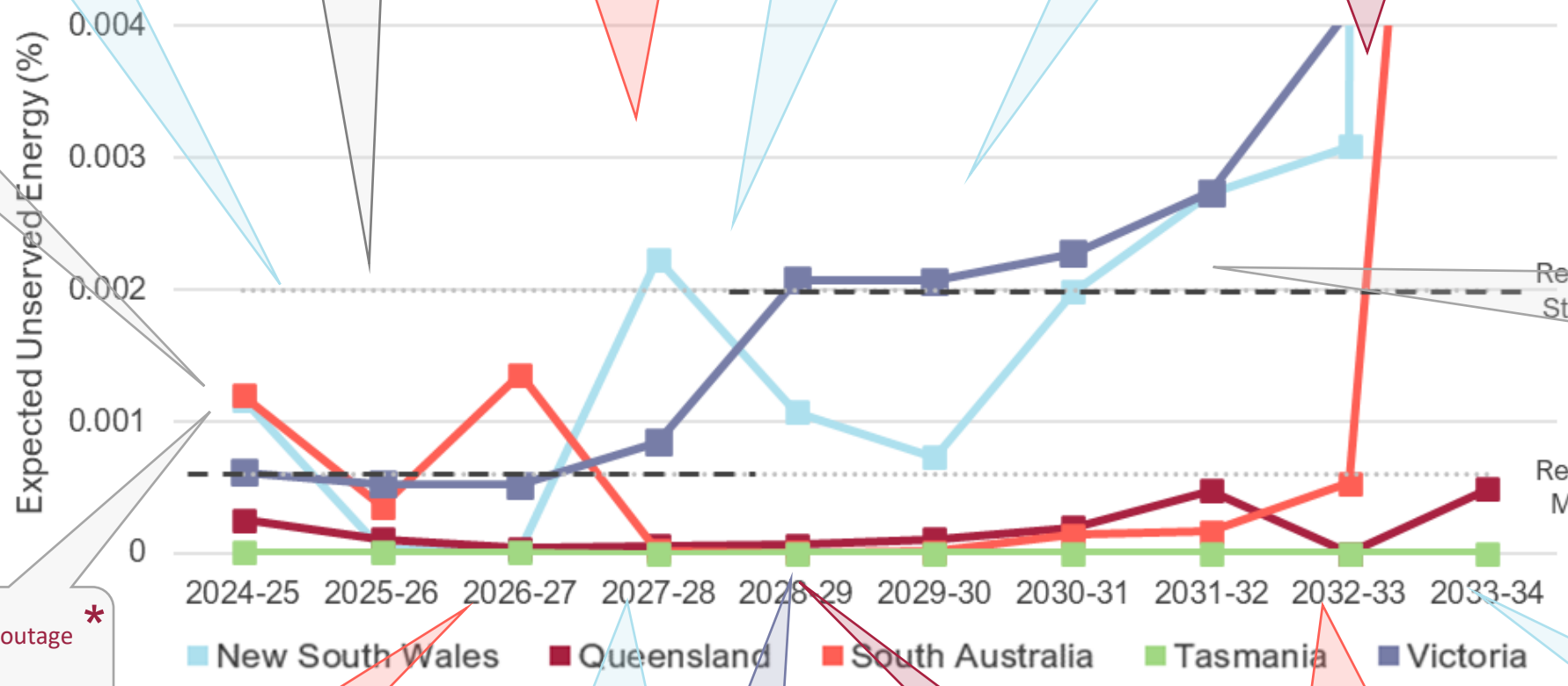
Expected completion of PEC stage 2 *

HumeLink * and Orana BESS; then Liddell and New England BESS included

Snowy 2.0 included

Borumba included

Lower coal outage rates *



Forecast demand increases in most regions, however lower than previously forecast. New sub-regional demand allocations in NSW and QLD. *

Negatives

Higher gas outage rates *

Advised closure of Torrens Island B and Osborne

Advised closure date for Eraring Power Station *

Advised closure of Yallourn

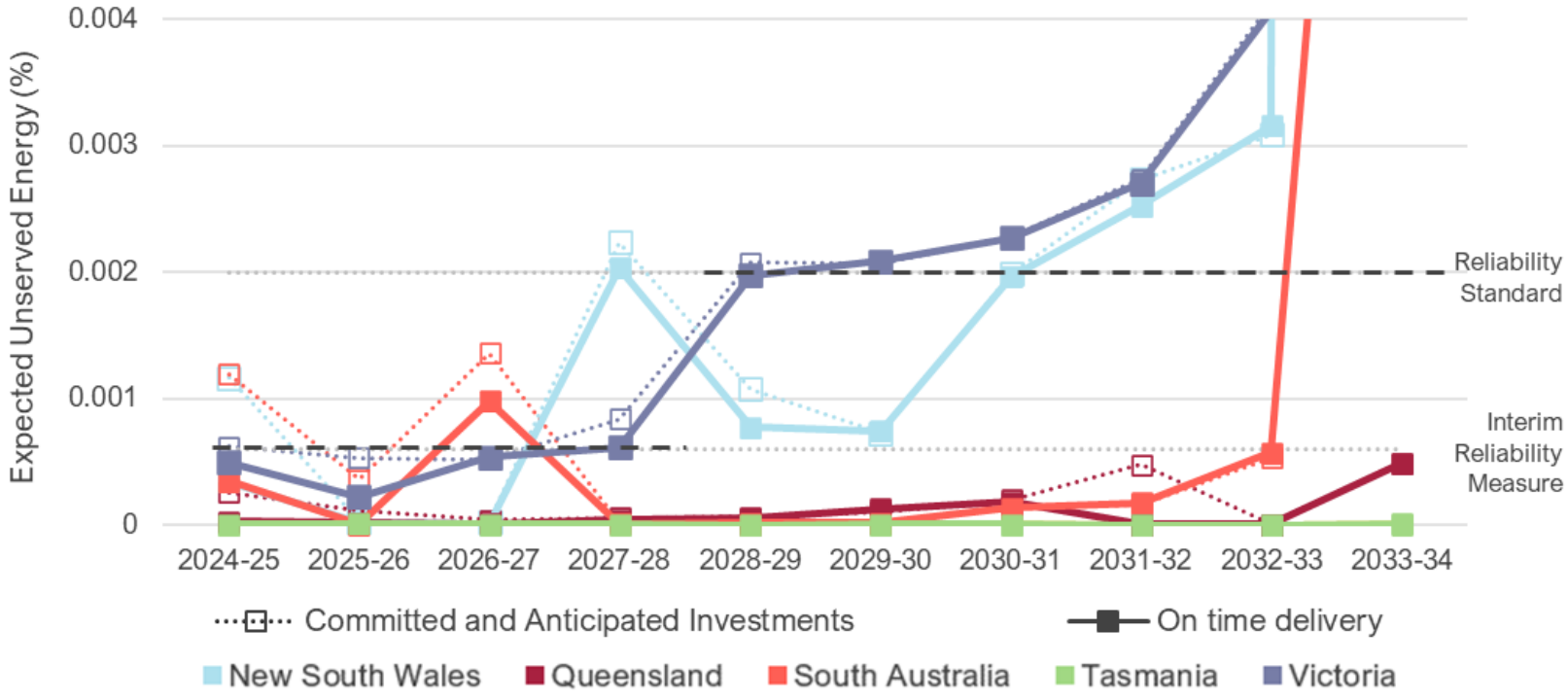
Expected closure of Callide B

Expected closure of remainder of Synergen fleet and Hallett GT

Expected closure of Baywater and Vales Point now within the 10 year horizon – big gaps impact all nearby regions.

On Time Delivery

The delivery of transmission, generation and storage projects at the dates envisioned by developers has a material impact on reliability.



Projects where on-time delivery materially impacts reliability	Year	Region
Hunter Power Station, Waratah Super Battery*	2024-25	NSW
Blyth BESS, Goyder South Wind Farms	2024-25	SA
Hydrogen Jobs Plan Generator, Mannum BESS, Templers BESS	2025-26	SA
Koorangie BESS, Latrobe Valley BESS, Melbourne Renewable Energy Hub	2025-26	VIC
Terang BESS	2026-27	VIC
Maryvale Solar Hybrid	2027-28	NSW
Gnarwarre BESS, Mortlake Battery, Wooreen ESS	2027-28	VIC
Borumba Pumped Hydro	2031-32	QLD

*not modelled, but could materially improve reliability if capacity is released ahead of summer

Reliability improvements with additional investments

Includes 'on-time' sensitivity

Actionable *(and other)* transmission developments:

- Hunter-Central Coast REZ (December 2027)
- *Western Melbourne Metro (AVP Project – July 2028)*
- Sydney Ring South (September 2028)
- Sydney Ring North [Hunter Transmission Project] (December 2028)
- Gladstone Grid Reinforcement (March 2029)
- Mid North SA REZ Expansion (July 2029)
- VNI West (December 2029)
- *Eastern Melbourne Metro (AVP Project – July 2030)*
- Marinus Link Stage 1 (December 2030)
- New England REZ Link (June 2031)
- Queensland SuperGrid South (September 2031)
- Marinus Link Stage 2 (December 2032)
- QNI Connect (March 2033)
- New England REZ Link 2 (June 2033)

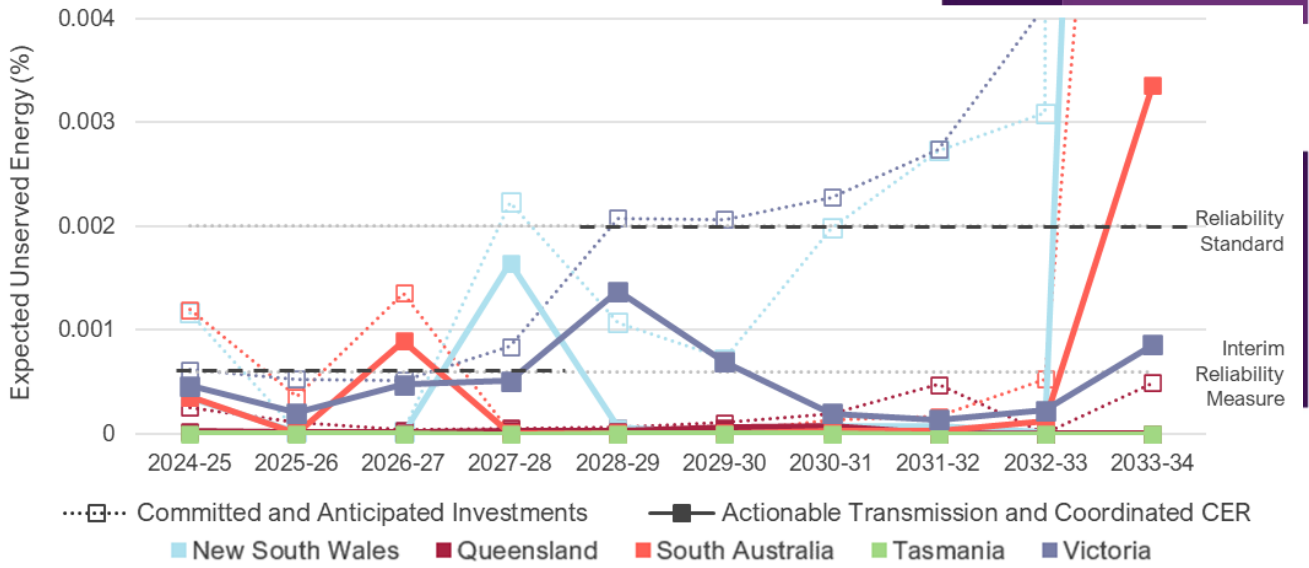
CER developments:

- Virtual Power Plant, Vehicle to Grid and Demand Side Participation as projected by AEMO

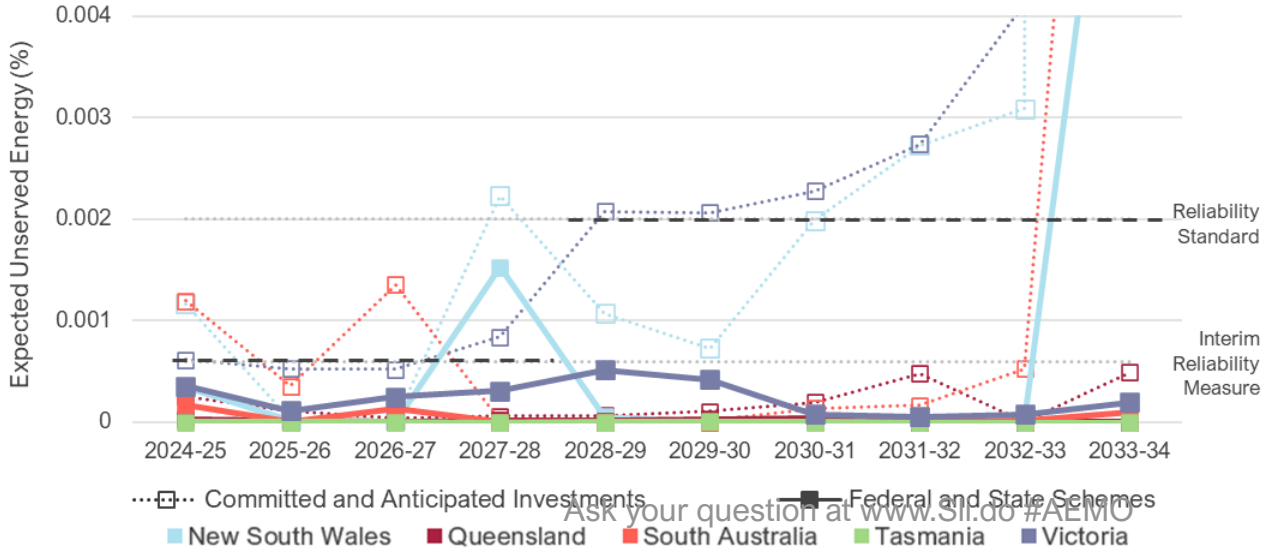
Federal and State Schemes:

- All committed and anticipated developments applied without default delays
- All awarded ARENA, New South Wales and VRET2 project recipients not already considered
- New South Wales Long Duration Storage targets
- Kogan Creek GT (as part of QEJP)
- Capacity Investment Scheme storage tender in VIC/SA.
- Further stages of CIS, NSW, SEC or offshore wind tenders not considered

Actionable transmission and coordinated CER



Federal and State Schemes



Reliability gaps (Committed and Anticipated Investments)

These targets will influence the tendering requirement for Interim Reliability Reserves… changed slightly since the May IRR tenders

Reliability gaps and equivalent gaps against the IRM

Region	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34
New South Wales	265	-	-	570	285	105	680	850	890	3,560
Queensland	-	-	-	-	-	-	-	-	-	-
South Australia	200	-	230	-	-	-	-	-	-	870
Tasmania	-	-	-	-	-	-	-	-	-	-
Victoria	10	-	-	130	605	635	675	785	1140	1,505

May 2024 Update reliability gap

2024-25
270
-
-
245

Split between SA and VIC has changed

Reliability gaps and equivalent gaps against the Reliability Standard

Region	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34
New South Wales	-	-	-	55	-	-	-	195	265	3,065
Queensland	-	-	-	-	-	-	-	-	-	-
South Australia	-	-	-	-	-	-	-	-	-	620
Tasmania	-	-	-	-	-	-	-	-	-	-
Victoria	-	-	-	-	20	20	65	165	450	870

Reserves

- Following the release of the May 2024 Update to the 2023 ESOO, AEMO opened a tender for **Interim Reliability Reserves (IRR) for the coming summer** in New South Wales (**270 MW**) and Victoria (**245 MW**) to help address identified gaps above the Interim Reliability Measure.
  - This is additional to any RERT sought across the NEM.
- Following the release of the 2024 ESOO, AEMO has extended the tender to South Australia (**200 MW)** following the newly identified gaps in that region.
- Any IRR procurement must be approved by the relevant State Government.

System Security Requirements

- A need for at least 22 optimally placed large synchronous machines (with support from existing hydro units) to maintain minimum fault level requirements.
  - Could be provided by synchronous condensers, service contracts with existing units, new gas turbines with clutches, or retrofitting of retiring generators.
  - These investments need to be developed ahead of the identified need so that a predominantly IBR based power system may continue to operate reliably and securely as coal retires.
- The uncontrolled dispatch of distributed photovoltaics (DPV) at times when DPV is high relative to underlying demand poses significant operational challenges in minimum operational demand periods
  - There is an increasingly urgent need for ongoing installations to include the implementation of more sustainable solutions.
  - The implementation of measures in the National CER Roadmap is urgent and important to ensure operational solutions are implemented as soon as possible.

Questions and discussion

Ask your question at www.Sli.do #AEMO

Thank you for attending

Share your feedback in the post event survey.

The recording and presentation will be published on the ESOO webpage.

AEMO

AUSTRALIAN ENERGY MARKET OPERATOR

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