

*Please note that this webinar will be recorded and published online*



# National Electricity Market 2023 reliability outlook

A briefing on the  
**2023 Electricity Statement of Opportunities**

7 September 2023



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

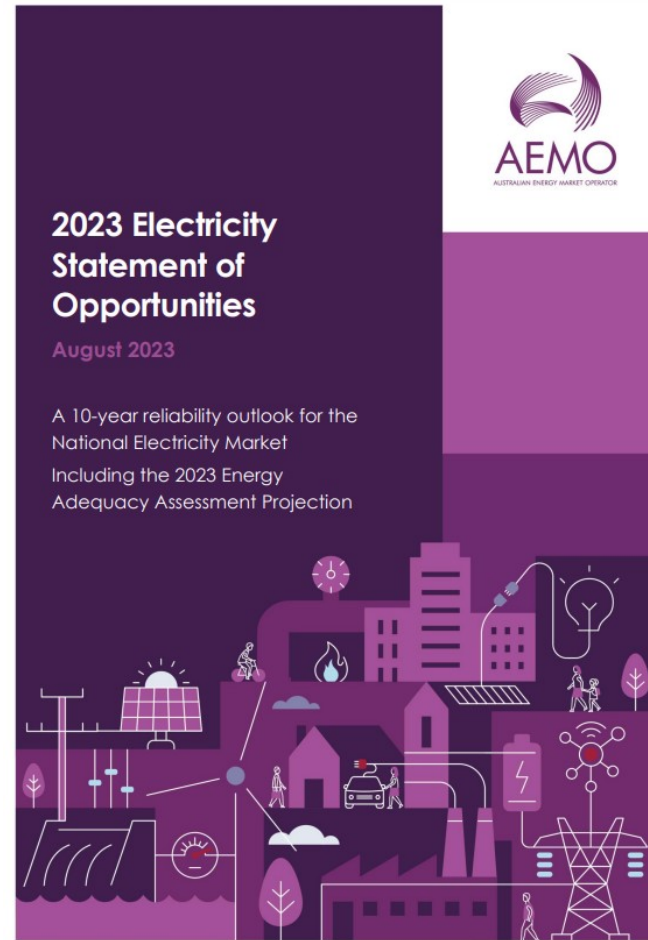
**We pay respect to their Elders  
past and present.**

# Today's agenda

1. Welcome
2. Purpose
3. Introduction
4. 2023 Electricity Statement of Opportunities overview (40 min)
5. Questions and comments (40 min)

# Purpose

- To provide a summary of AEMO's 2023 Electricity Statement of Opportunities, which is a 10-year reliability outlook for the National Electricity Market.
- Provide an opportunity to ask questions of our Reliability Forecasting team.



The report and its supporting materials are available [here](#)

# How to interact

- Please ask questions or make comments using Slido (link provided in Teams chat).
- When we come to your question, we will unmute you to allow you to engage with the response.

[www.sli.do](http://www.sli.do)

#AEMO

Sign in with your name



# Introduction

Merryn York, Executive General Manager  
System Design

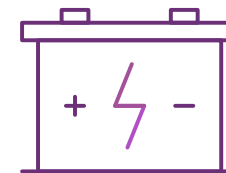
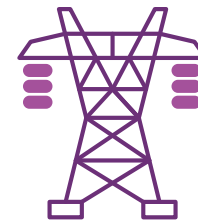
# Key themes

- Australia's commitment to decarbonisation increased, yet **more infrastructure is critical** to maintain reliability as we transition.



- Over the 10-year ESOO horizon, reliability gaps are identified in all mainland regions.

- Planned investments in energy generation, transmission and storage need to be **urgently** delivered to maintain reliability as existing generation capacity retires, including coal and gas.



# 2023 ESOO Overview

Ben Jones, Manager Reliability Forecasting



# What are electricity reliability standards?



Unserved energy (USE) is energy that cannot be supplied to consumers when demand exceeds supply, resulting in involuntary load shedding (loss of customer supply).

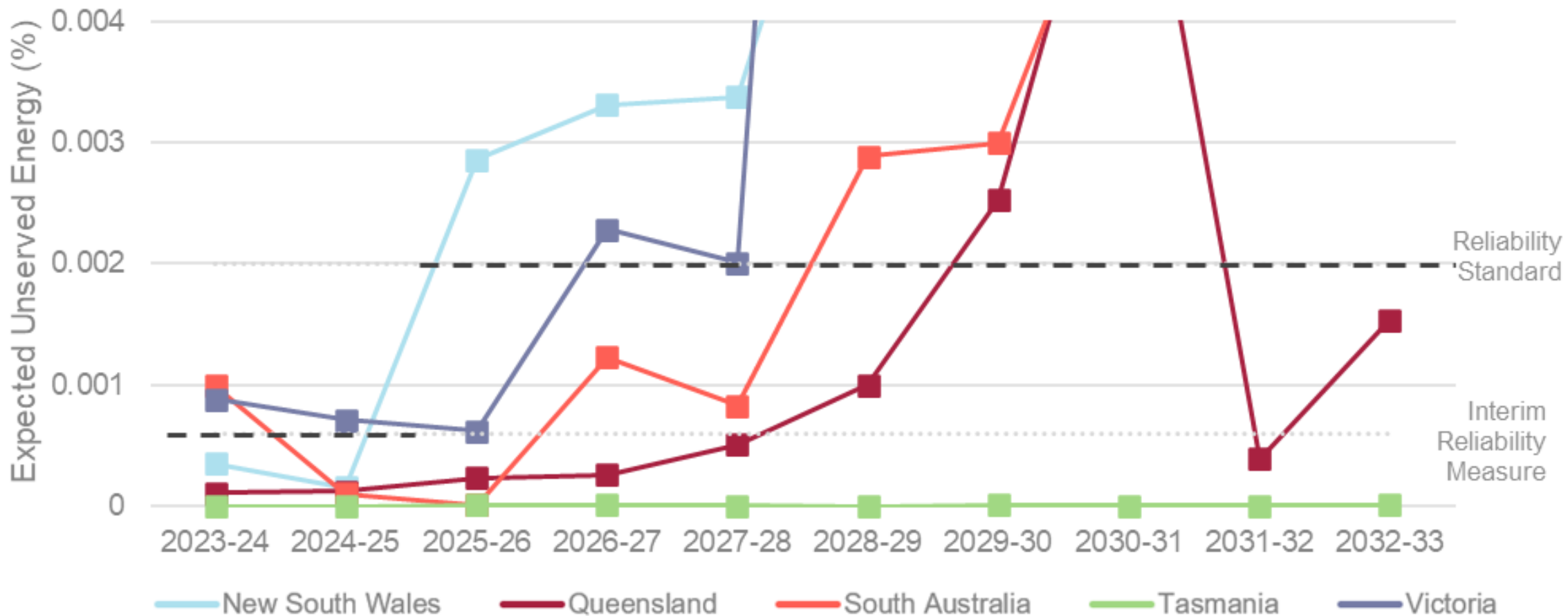
AEMO uses two relevant reliability standards for jurisdictions in the NEM.

- The **Interim Reliability Measure (IRM)** is a measure of expected USE in any region of no more than 0.0006% of energy demanded in any financial year.
- The **reliability standard** is a measure of expected USE in each region of no more than 0.002% of energy demanded in any financial year.

# ESOO central scenario

## Expected unserved energy

Central outlook



# Demand & supply



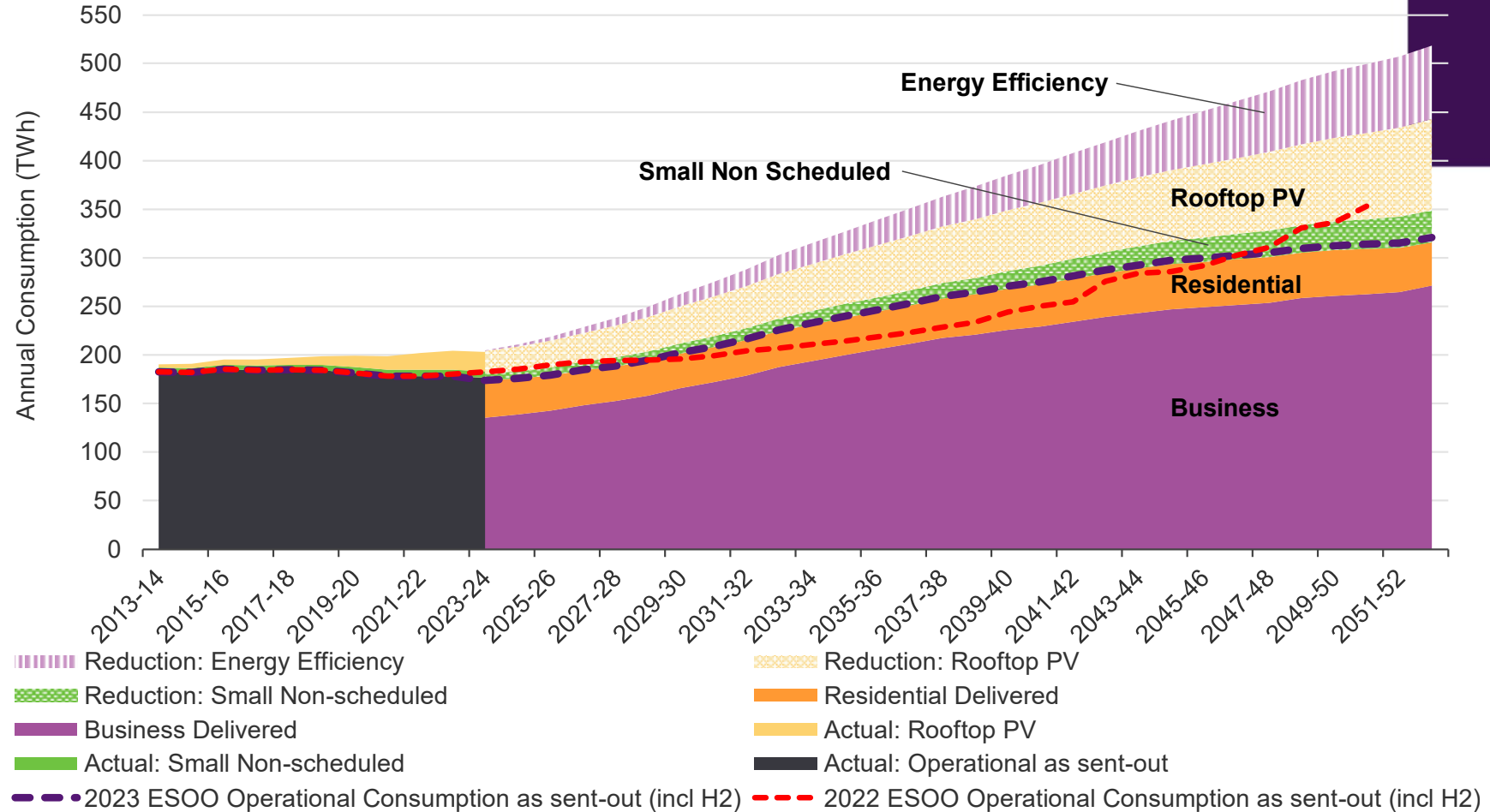


Reliability gaps are forecast in all mainland National Electricity Market regions over the coming 10-year period, without more committed developments.

# Decarbonisation policies increase electrification in the medium term, but a slower rate of growth is forecast

- The **Step Change** scenario remains the *ESOO Central scenario*.
- Growth in consumption is anticipated from population and economic growth, electrification including electric vehicles, industrial activities and emerging hydrogen production opportunities.

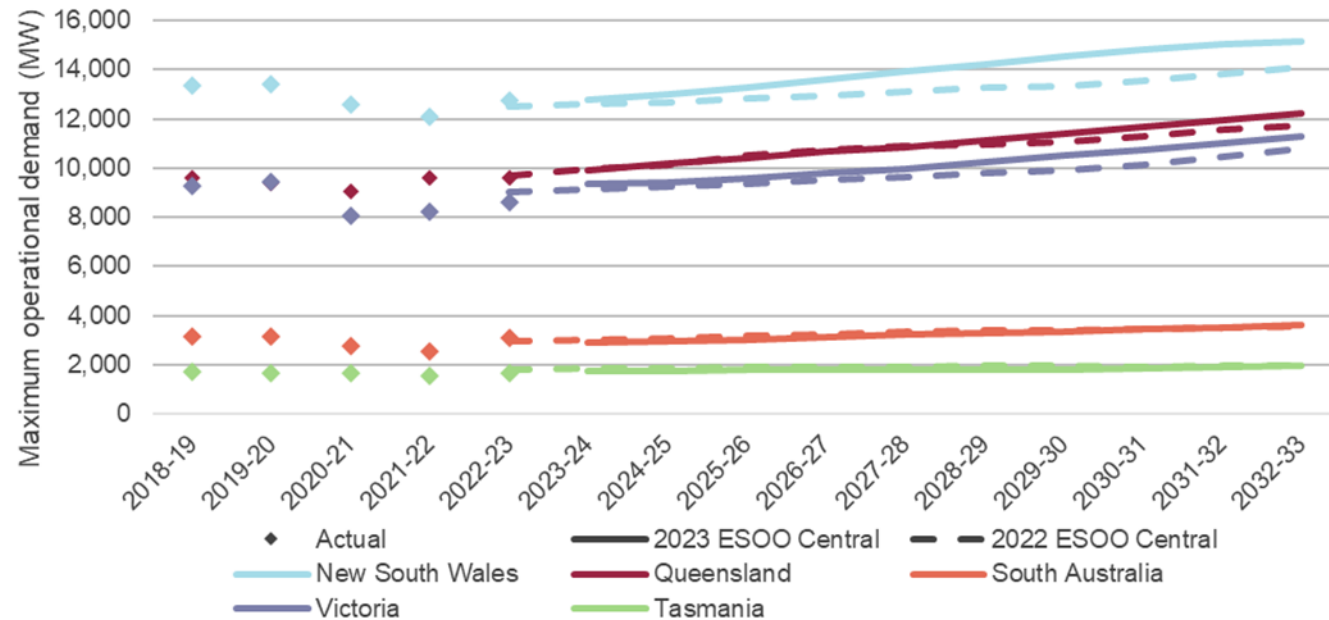
Annual energy consumption, *ESOO Central Scenario*



# Maximum demand forecasts follow similar trends to consumption

- Maximum demand forecasts typically follow consumption patterns, although consumer energy resource investments has a lessening influence on maximum demand, as peak loads occur after sunset, negating rooftop PV's impact.
- Forecast improvements include greater consideration of pricing impacts, and incorporation of humidity such that the 'feels like' temperature is a driving influence.

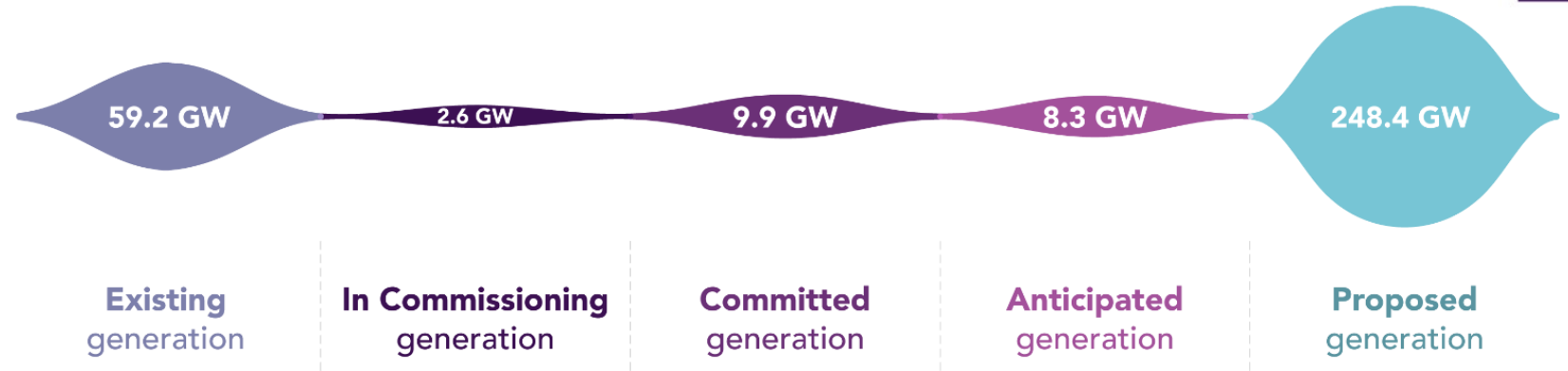
**Maximum operational demand,**  
*ESOO Central Scenario, 50% probability of exceedance*



# New capacity is being developed, and a large pipeline of proposed projects offer future solutions

- There is a substantial pipeline of future generation and storage projects in various stages of development, from proposed projects to those that are close to finishing their commissioning in the NEM.

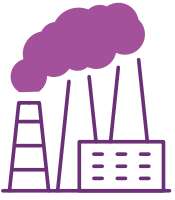
**Generation and storage development pipeline,**  
*informed by developers, July 2023*



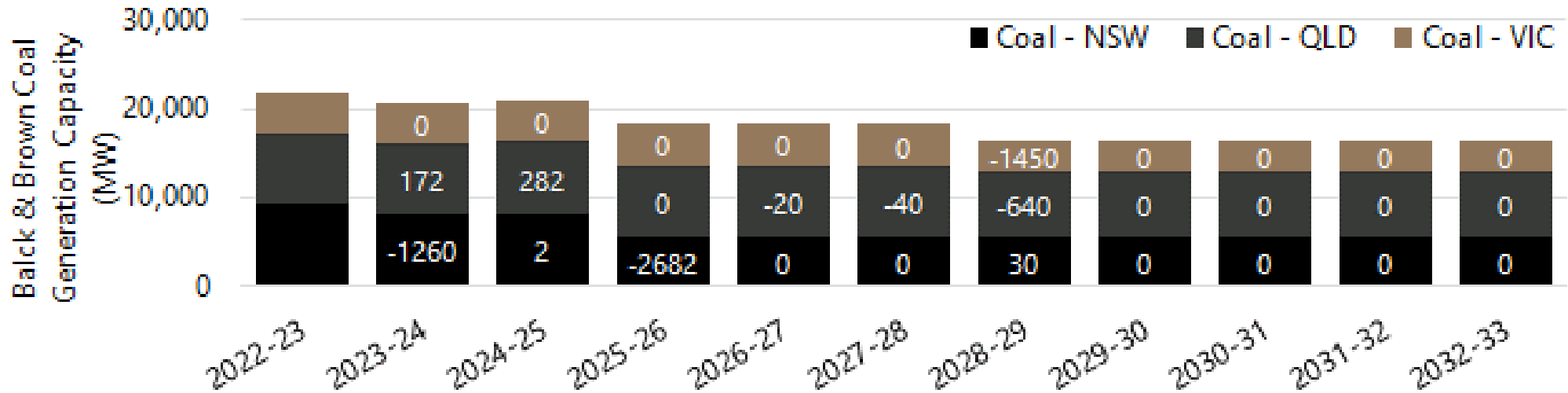


While growth in firm and renewable capacity is coming, coal and gas closures are imminent.





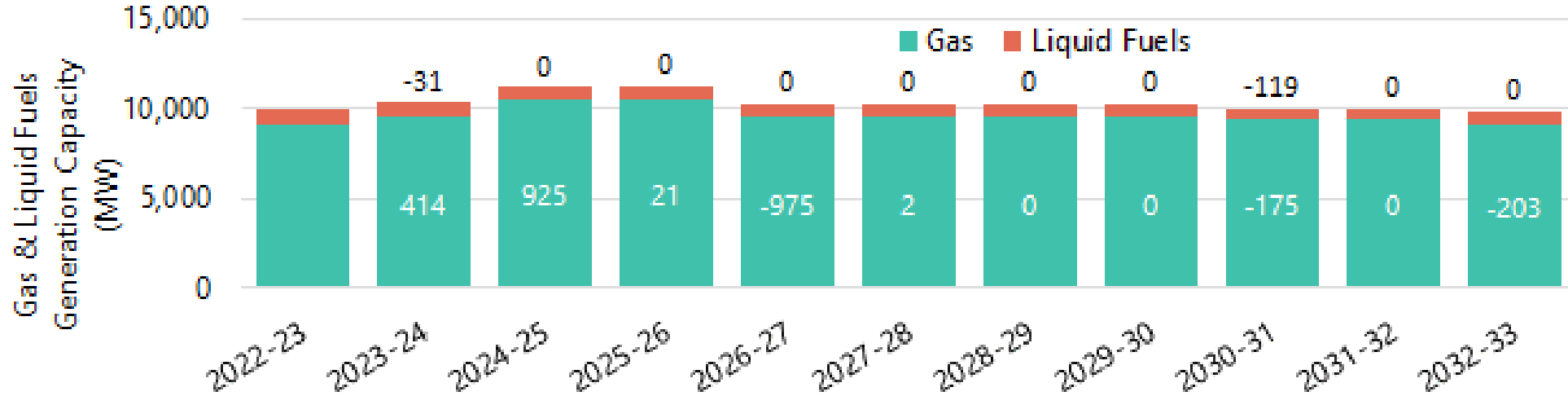
# Black and brown coal closures are expected in NSW, QLD & VIC



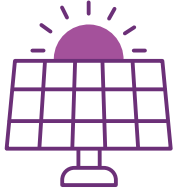
Assumed capability during typical summer conditions, by generation type, 2022-23 to 2032-33



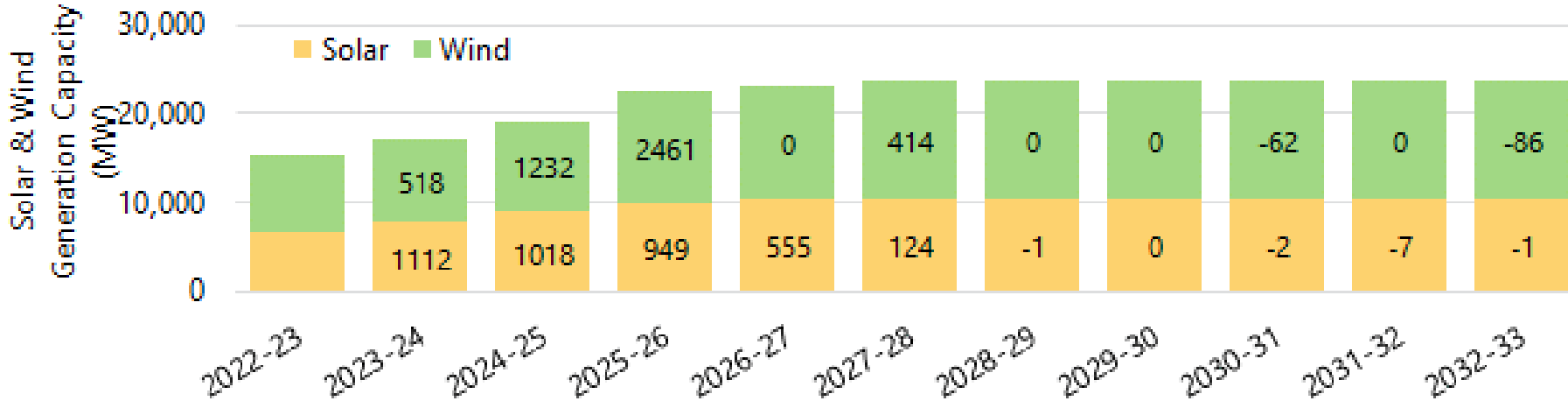
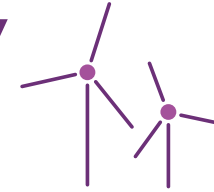
# Gas capacity remains stable, although closures are expected in some regions



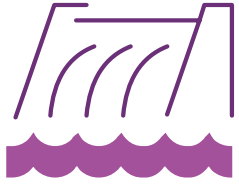
Assumed capability during typical summer conditions, by generation type, 2022-23 to 2032-33



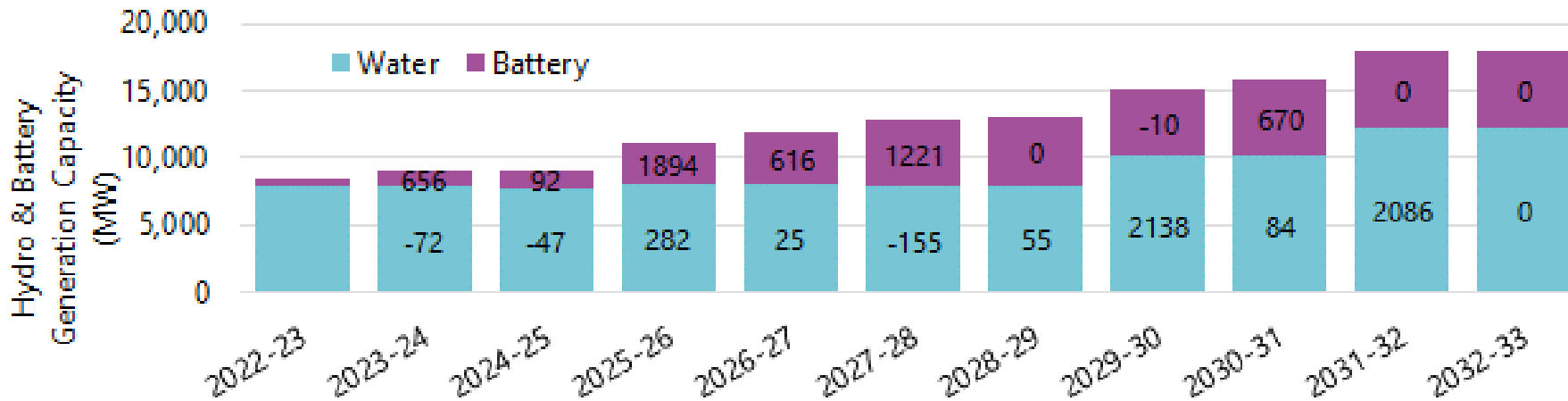
# Growth in solar and wind capacity continues to be developed



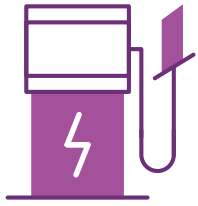
Assumed capability during typical summer conditions, by generation type, 2022-23 to 2032-33



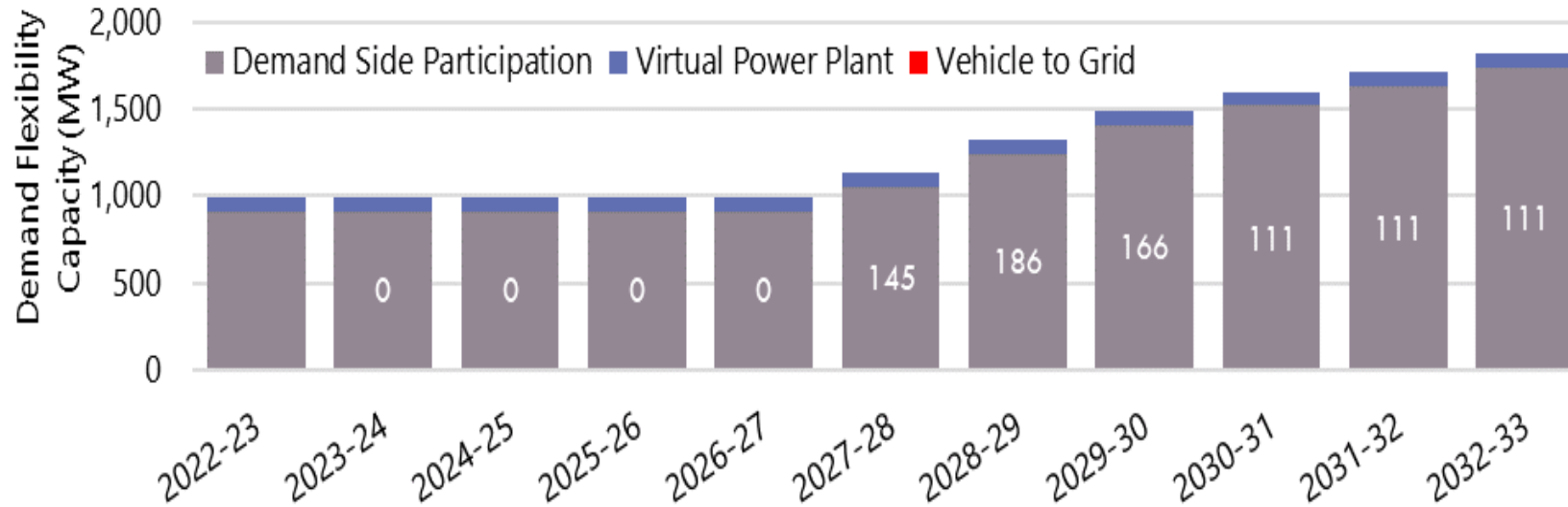
# Battery firming and key pumped hydro solutions are being developed



Assumed capability during typical summer conditions, by generation type, 2022-23 to 2032-33



# Demand side participation can offset the need for utility solutions



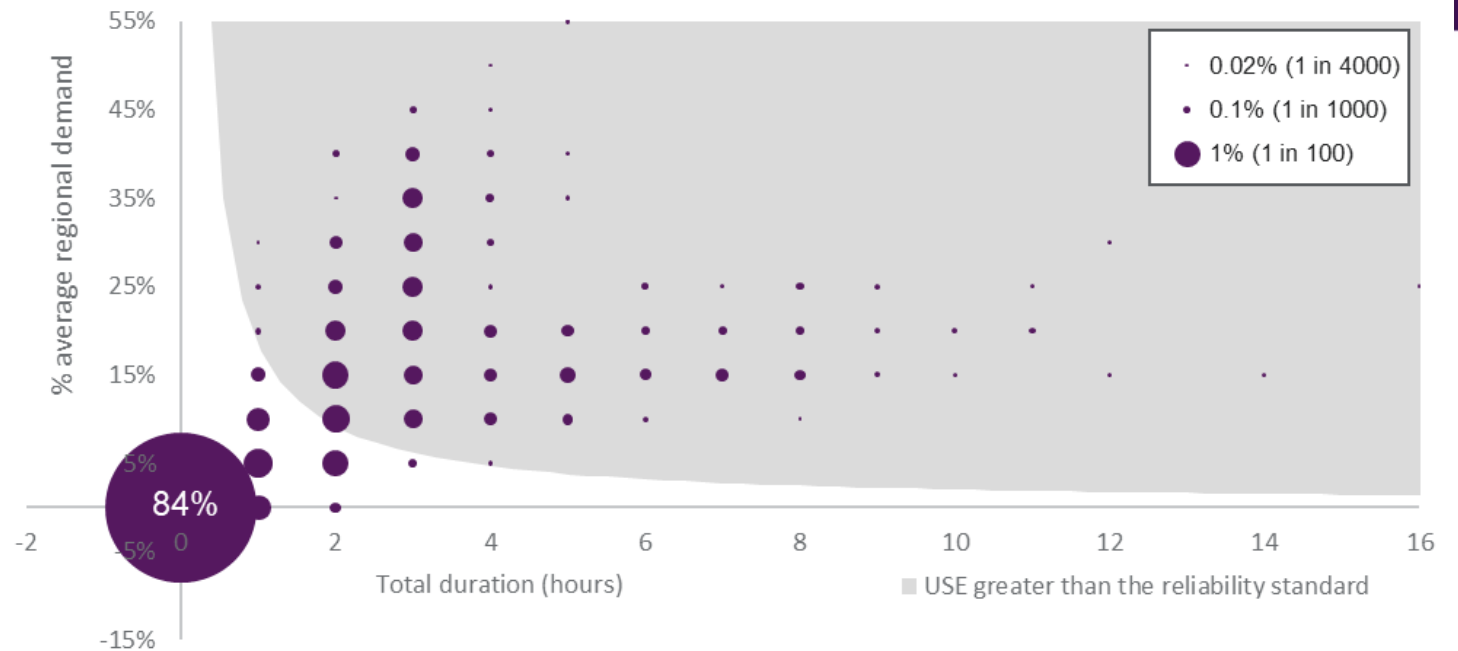
Assumed capability during typical summer conditions, by generation type, 2022-23 to 2032-33

# The IRM is forecast to be exceeded in some NEM regions this summer

Key supply scarcity risks:

- Availability of wind resources
- Generator outages
- **El Niño weather patterns**
- Commissioning of renewable generation, dispatchable capacity and transmission.
- Natural gas and coal are critical to maintain a reliable power system.

### Probability density of forecast USE in South Australia 2023-24, Central scenario



# Reliability gaps forecast in South Australia and Victoria in 2023-24

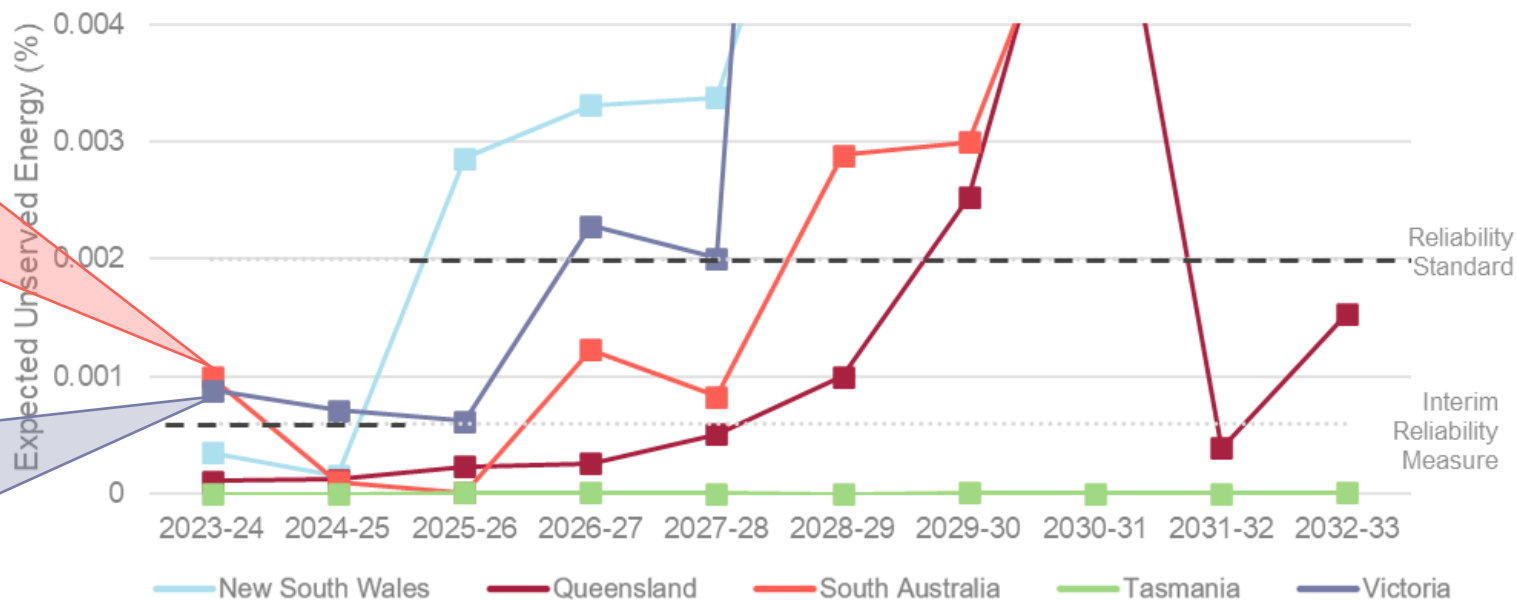
## Reliability gaps forecast in South Australia in 2023-24

**Why?** Numerous factors including higher forecast probability of low wind with high demand conditions.

## Reliability gaps forecast in Victoria from 2023-24

**Why?** Numerous factors including revised wind availability have resulted in the increase.

**Expected unserved energy**  
*Central outlook*

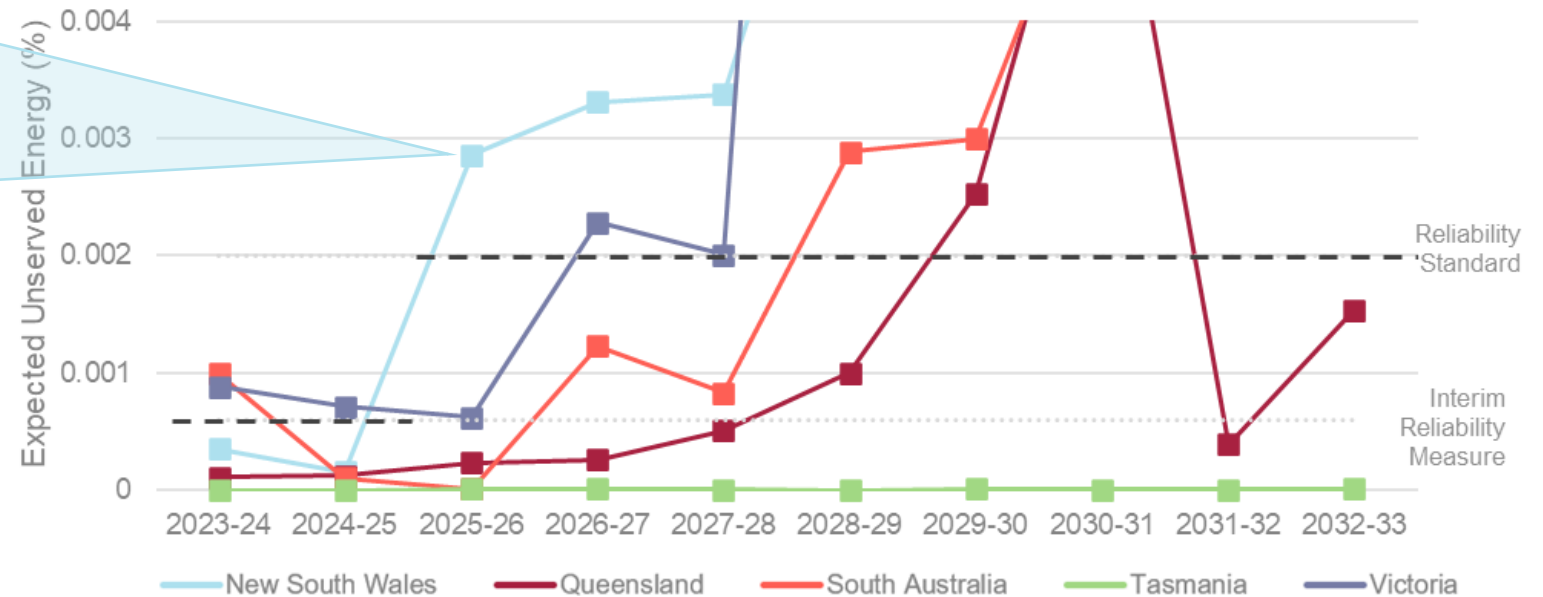


# Reliability gap forecast in New South Wales from 2025-26

Reliability gaps are forecast in New South Wales from 2025-26

Why? Eraring retirement, while higher demand and lower DSP forecasts also increase risks.

Expected unserved energy  
Central outlook



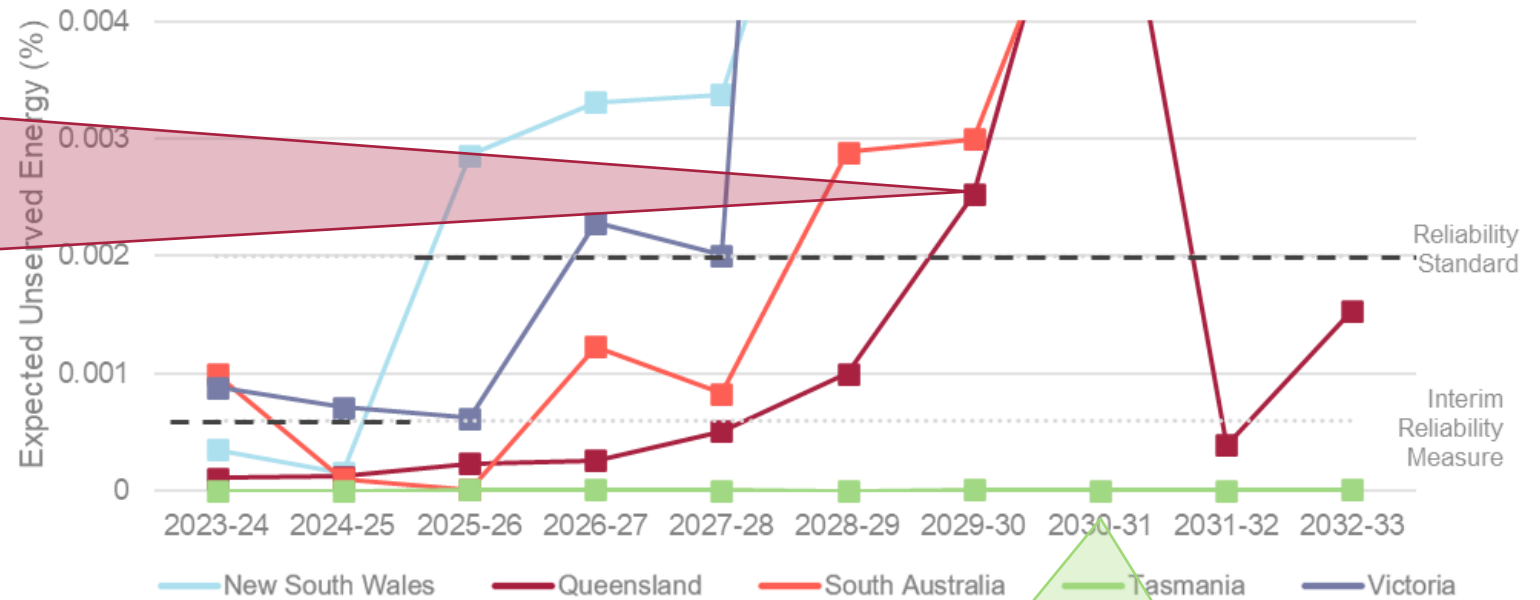


# Reliability gaps forecast in Queensland from 2029-30

## Reliability risks increase in Queensland from 2029-30

**Why?** Risks increase when Callide B retires, and as demand increases. In 2031-32, Borumba Pumped Hydro commissions, reducing risks.

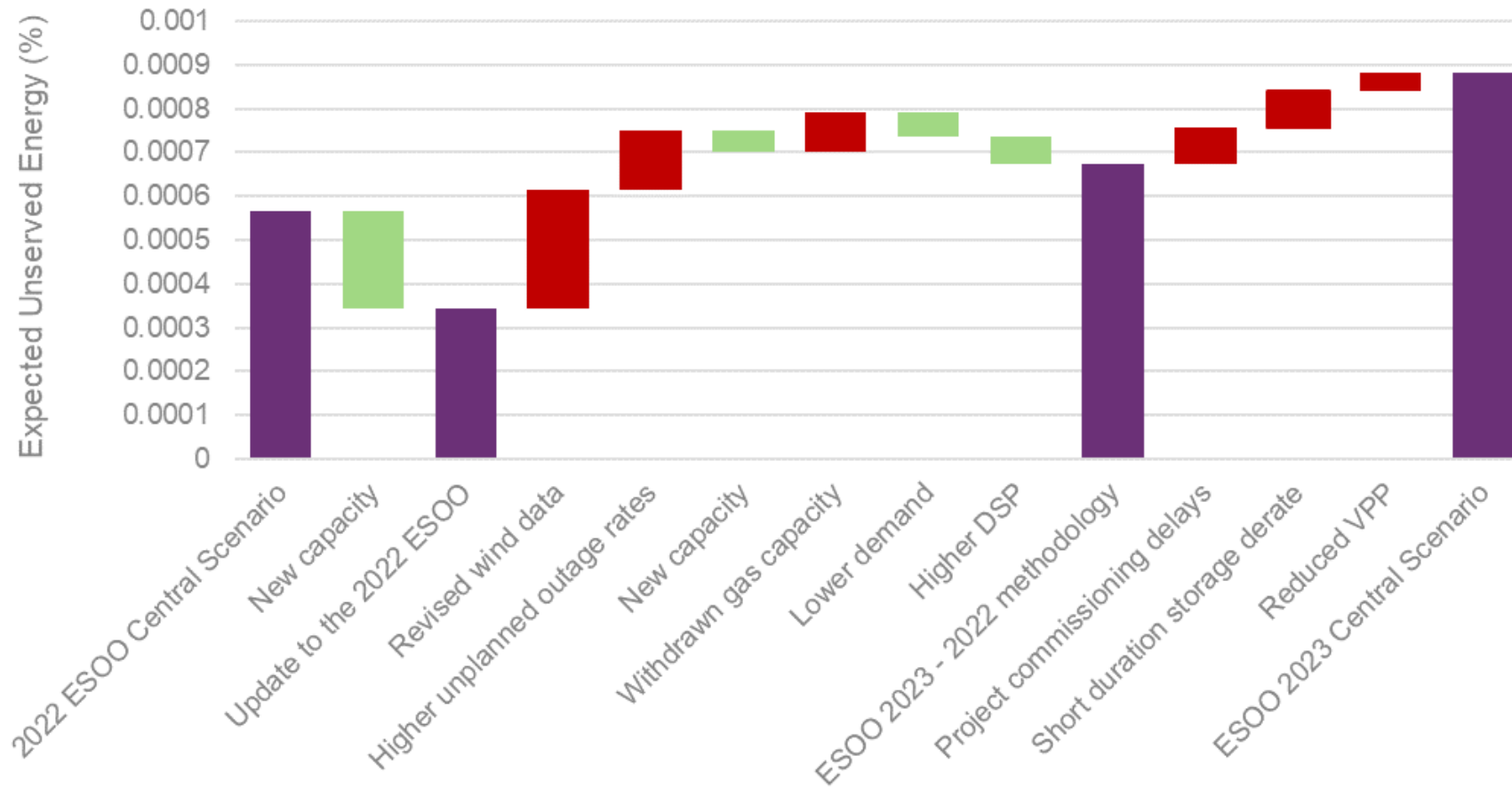
Expected unserved energy  
Central outlook



Reliability risks remain with the IRM in **Tasmania** over the ESOO horizon

# Factors driving revised ESOO outlook Victoria 2023-24

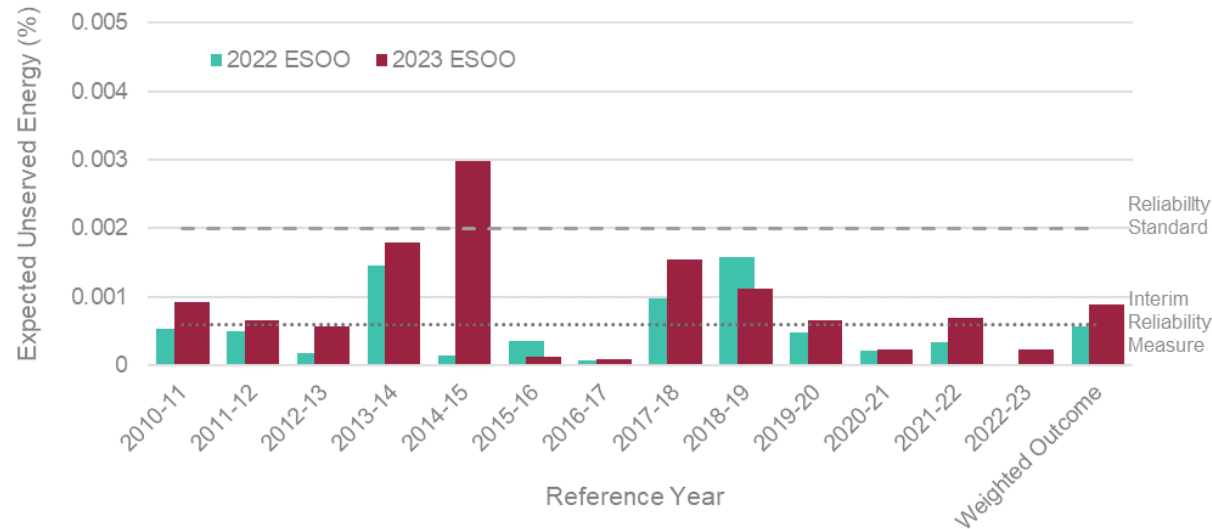
Factors driving change in the ESOO outlook



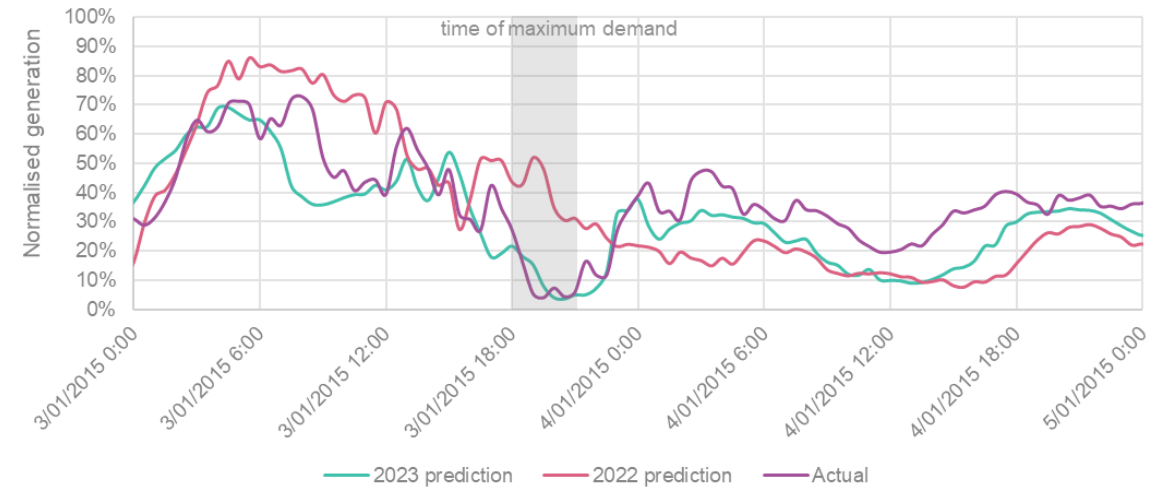
# Wind availability at time of high demand is a key driver of reliability risk

A revision to the prediction of wind generation suggests that low wind conditions coincident with high demand are more probable.

**Expected unserved energy by weather year**  
Victoria 2023-24

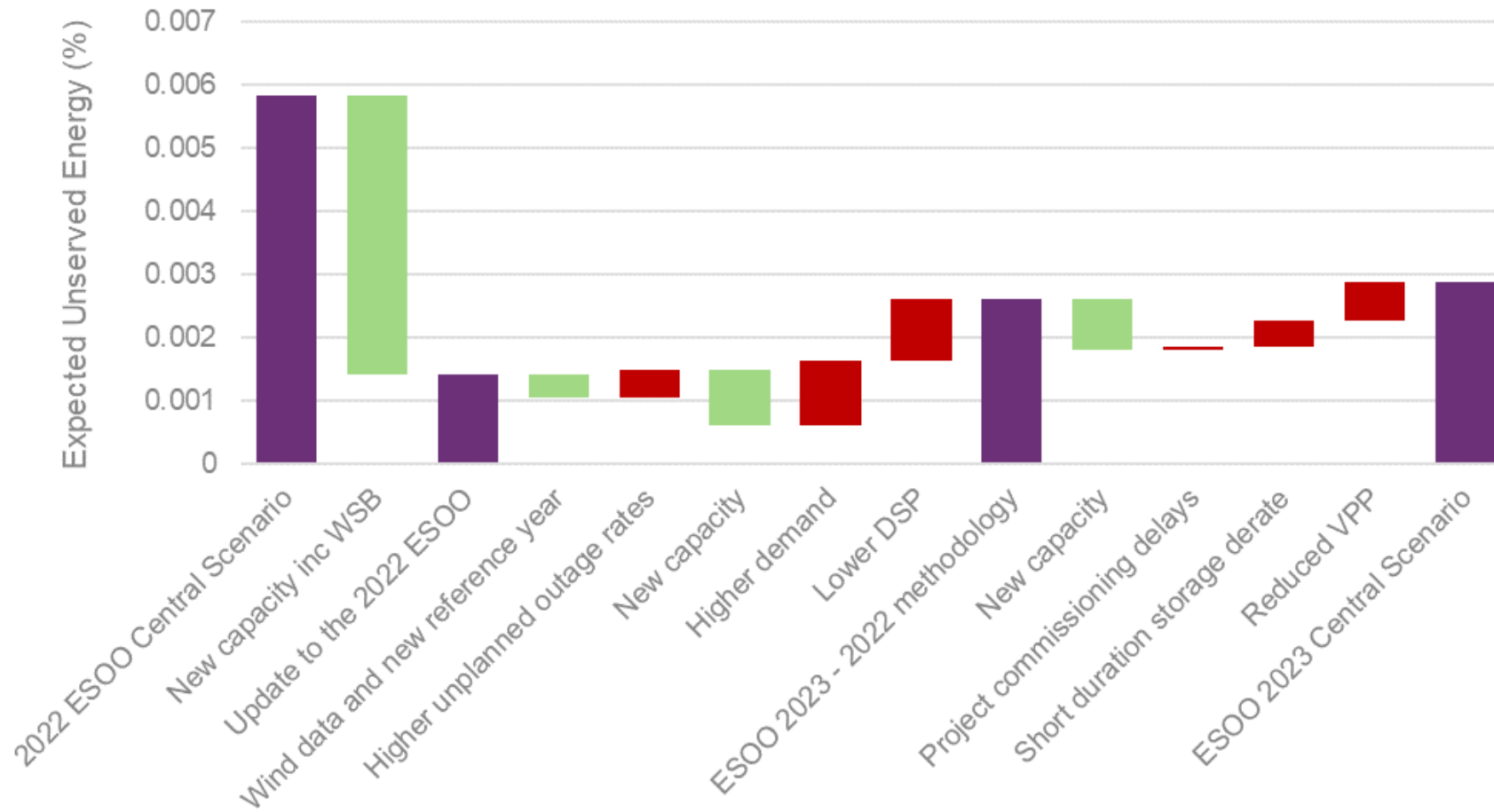


**Revised wind generation prediction**  
Victoria 2014-15 weather year peak day



# Factors driving revised ESOO outlook New South Wales 2025-26

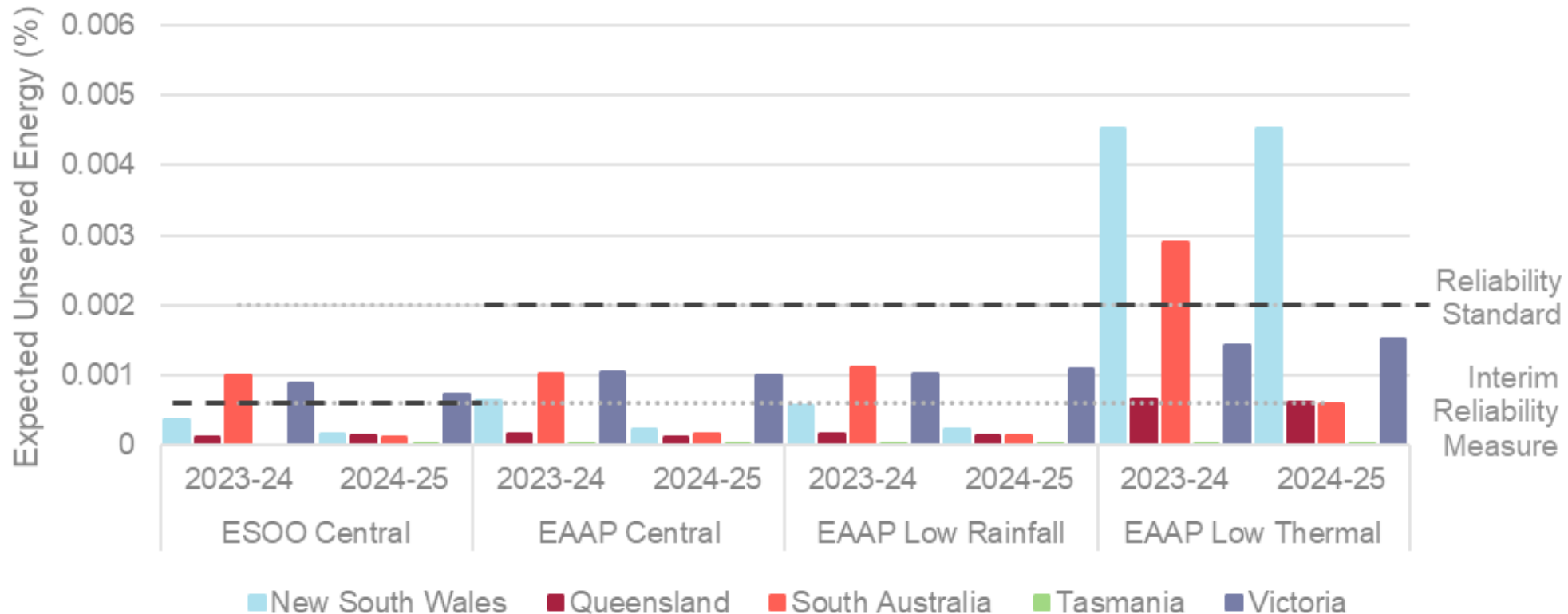
Factors driving change in the ESOO outlook



# The ongoing availability of fuel is critical to ensure reliability, in addition to capacity availability

**In 2023, the Energy Adequacy Assessment Projection (EAAP) is included**

*EAAP scenarios include expected fuel supplies, extreme drought conditions, and extreme low thermal fuel availability*



# Reliability gaps periods

## Reliability Gaps against the Interim Reliability Measure

Region	Financial year	Reliability gap period	Likely trading intervals	Expected USE for the gap period (GWh)	Reliability gap (MW)
South Australia	2023-24	1 January 2024 – 29 February 2024	5.00 pm – 9.00 pm, working weekdays	0.11	118
Victoria	2023-24	1 January 2024 – 29 February 2024	3.00 pm – 9.00 pm, working weekdays	0.32	120
	2024-25	1 January 2025 – 28 February 2025	4.00 pm – 9.00 pm, working weekdays	0.27	55

## Reliability Gaps against the Reliability Standard

Region	Financial year	Reliability gap period	Likely trading intervals	Expected USE for the gap period (GWh)	Reliability gap (MW)
Victoria	2026-27	1 December 2026 – 28 February 2027	3.00 pm – 9.00 pm, working weekdays	0.86	70
	2027-28	1 December 2027 – 29 February 2028	3.00 pm – 9.00 pm, working weekdays	0.73	4
New South Wales	2025-26	1 December 2025 – 31 March 2026	3.00 pm – 10.00 pm, working weekdays	1.54	191
		1 July 2026 – 31 July 2026	5.00 pm – 9.00 pm, working weekdays	0.16	250
		1 December 2026 – 31 March 2027	3.00 pm – 10.00 pm, working weekdays	1.64	250
	2027-28	1 June 2027 – 30 June 2027	5.00 pm – 9.00 pm, working weekdays	0.18	250
		1 July 2027 – 31 August 2027	5.00 pm – 10.00 pm, working weekdays	0.21	285
		1 November 2027 – 28 February 2028	2.00 pm – 11.00 pm, working weekdays	1.70	285
	1 May 2028 – 30 June 2028	4.00 pm – 10.00 pm, working weekdays	0.22	285	

# Infrastructure investments will improve the reliability outlook

Exploring the role for consumer energy resources, actionable transmission and jurisdictional initiatives



Urgent and ongoing investment in projects needed to maintain energy reliability.

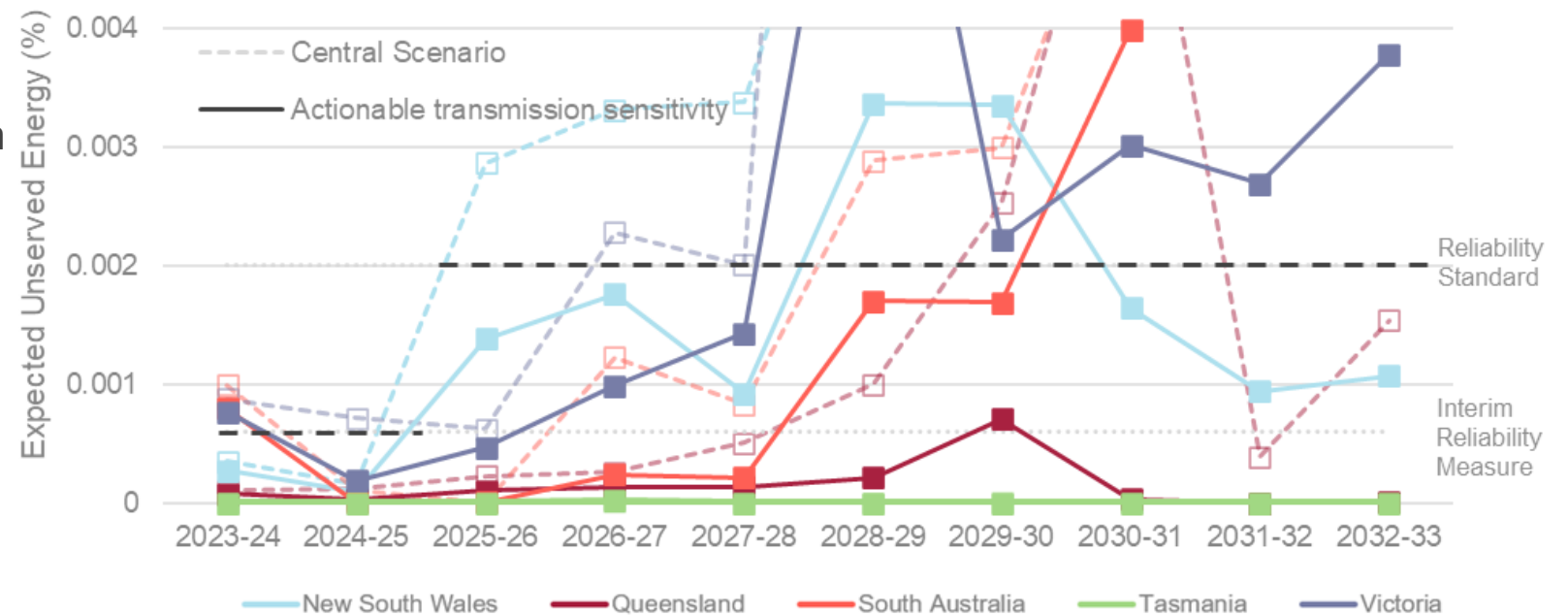


# Reliability gaps reduce with CER orchestration, and delivery of actionable transmission projects

Reliability will noticeably improve to compensate for coal closures if:

- All committed and anticipated transmission, generation and storage developments **commission to schedule**
- **Orchestration of consumer energy resources (CER)** is successfully deployed
- **Actionable transmission investments** are delivered to schedule

**Expected unserved energy, Sensitivity with Orchestrated CER and actionable transmission infrastructure**

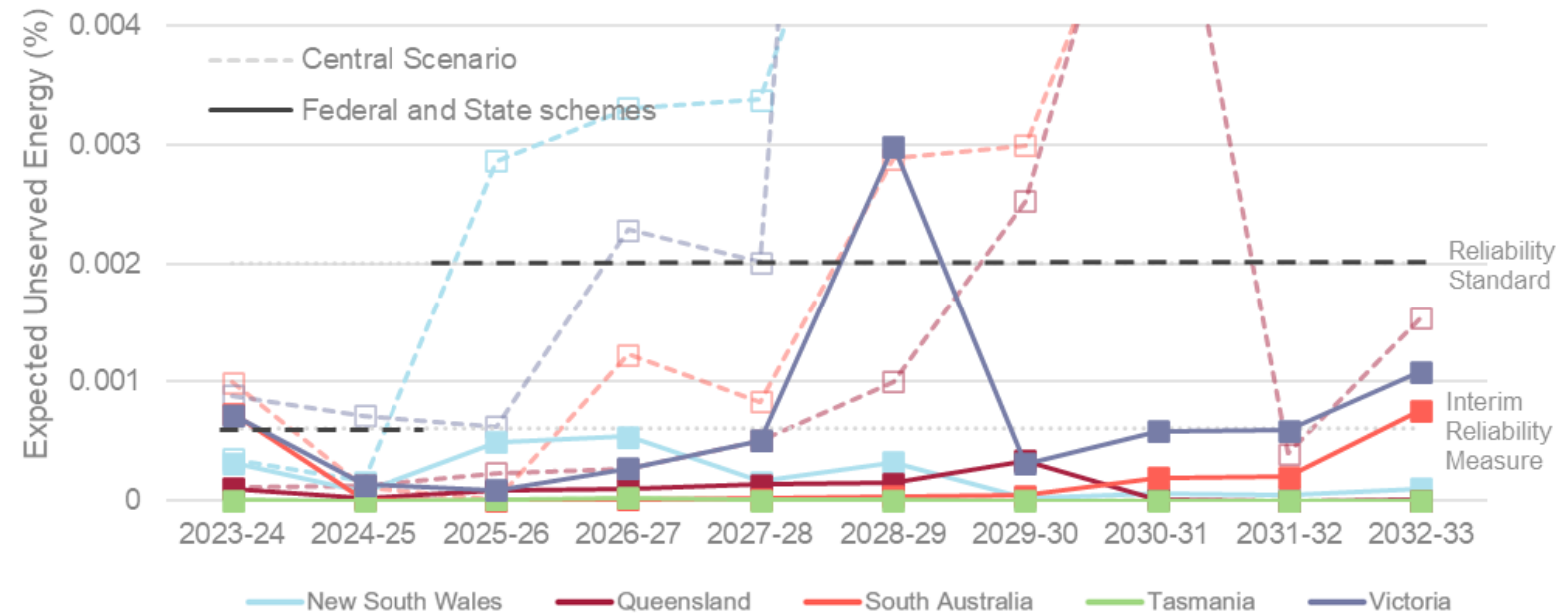


# Reliability gaps reduce if funded infrastructure developments are delivered to schedule

Reliability will significantly improve if:

- **Jurisdictional energy infrastructure investments** are delivered as envisioned, and to schedule

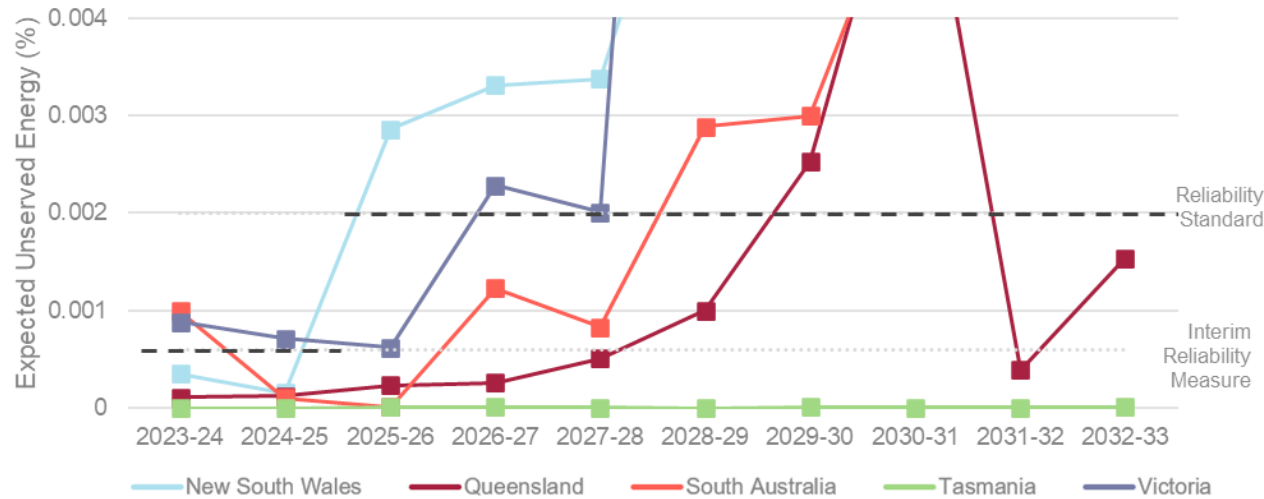
**Expected unserved energy,**  
Sensitivity with Orchestrated CER, actionable transmission and other jurisdictionally supported infrastructure



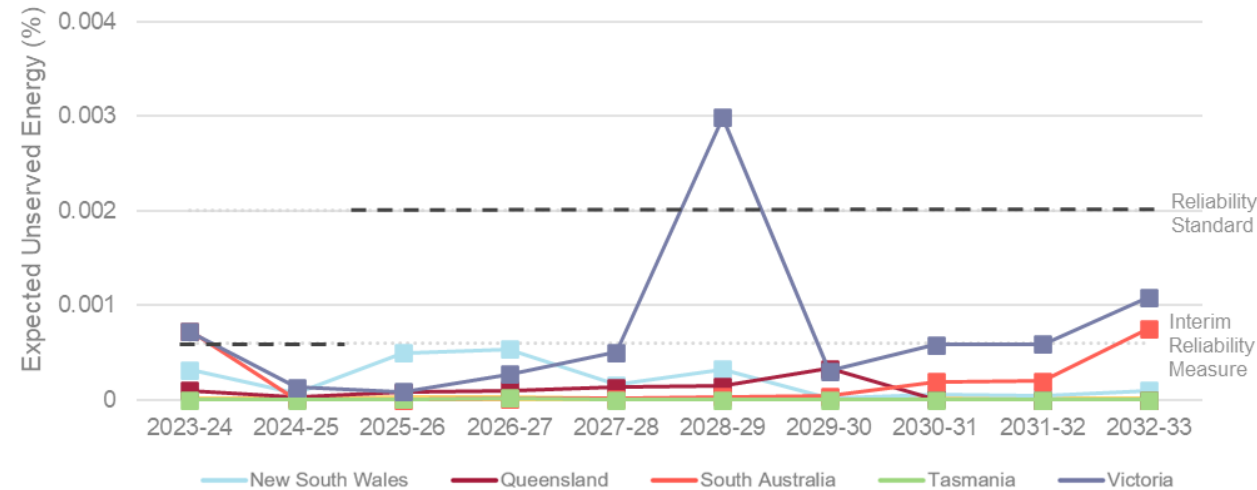
# Summarising the ESOO reliability forecasts

- While new capacity continues to connect, current committed and anticipated developments (generation, transmission and other solutions) are not yet sufficient to offset higher electricity use and advised generator retirements.
- Additional investments in renewable generation, dispatchable capacity, transmission and CER are forecast to reduce reliability risks to below the relevant reliability standard in most regions, if delivered to schedule.

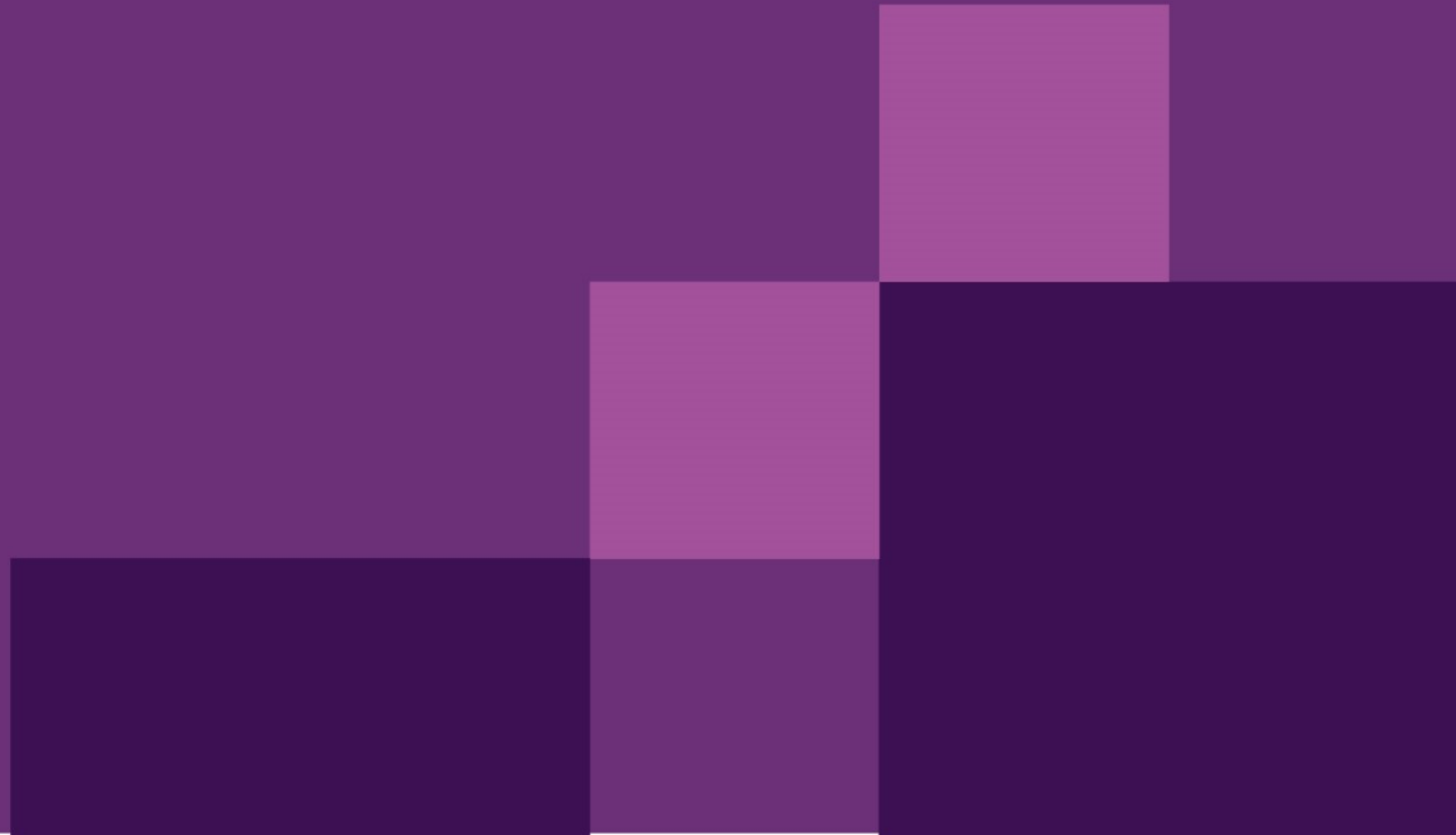
## Expected unserved energy Central outlook



## Expected unserved energy Additional actionable and anticipated developments



# Discussion & next steps



# Thank you

- Download a copy of the [Report](#)
- Please provide feedback on today's webinar through [this feedback form](#).
- Further questions please email: [Energy.forecasting@aemo.com.au](mailto:Energy.forecasting@aemo.com.au)



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