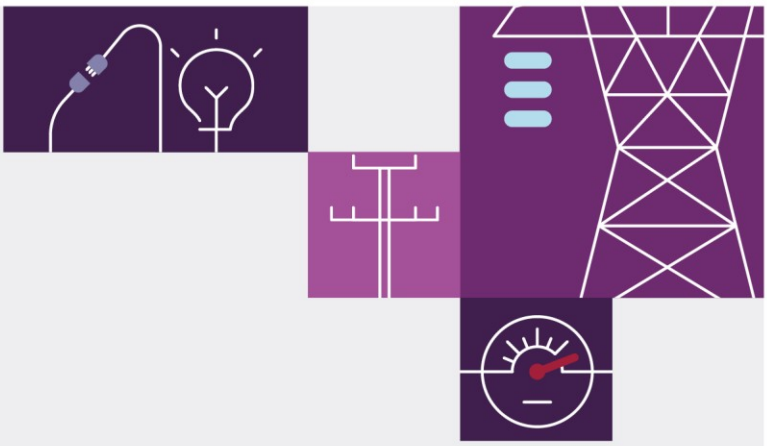
AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

Update to 2021 Electricity Statement of Opportunities

April 2022

A report for the National Electricity Market



Important notice

Purpose

The purpose of this publication is to provide an Update to the 2021 Electricity Statement of Opportunities for the National Electricity Market, due to material changes to the forecasts of the supply demand balance in New South Wales that were set out in the 2021 Electricity Statement of Opportunities, including the announcement by Origin Energy regarding the potential earlier retirement of Eraring Power Station in August 2025. AEMO publishes this Update under clause 3.13.3A(b) of the National Electricity Rules. This publication is generally based on information available to AEMO as at 18 February 2022 unless otherwise indicated.

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Version control

Version	Release date	Changes
1	14/4/2022	First release

Executive summary

Significant new relevant information has become available since AEMO released the 2021 *Electricity Statement of Opportunities* (ESOO) in August 2021[1], including the recent announcement by Origin Energy[2] for the potential early retirement of Eraring Power Station in August 2025 and announcements by AGL Energy about Bayswater Power Station[3]. This Update to the 2021 ESOO provides an updated reliability forecast and information about proposed generating units and network developments for which formal commitments have not yet been made.

Under the National Electricity Rules (NER), this Update to the 2021 ESOO identifies a forecast reliability gap in the coming five years, defined according to the Retailer Reliability Obligation (RRO), and provides indicative reliability forecasts in the second five years of the forecast.

In this Update to the 2021 ESOO, where only existing and committed developments are included, AEMO projects expected unserved energy (USE) above the reliability standard of 0.002% USE:

- **In New South Wales from 2025-26, four years earlier than the 2029-30 gap identified in the 2021 ESOO,**
- **In Queensland from 2029-30, just within the 10-year outlook of the ESOO, and**
- **In Victoria from 2028-29, the same as in the 2021 ESOO.**

While this assessment demonstrates a change in forecast reliability given the incorporation of updated information, additional investments in the National Electricity Market (NEM) are expected. This Update to the 2021 ESOO provides extended reliability analysis to identify the scale of investments that are needed and have been foreshadowed by other announcements and information regarding potential investments. The additional analysis in this Update to the 2021 ESOO focuses on New South Wales.

If committed before the 2022 ESOO, additional investments in New South Wales – including those identified in AEMO's Draft 2022 *Integrated System Plan* (ISP)[4] and those being pursued by the New South Wales Government[5,6] – will improve the reliability forecast that AEMO will publish later this year. These investments are not yet classified as committed according to AEMO's ESOO and reliability forecast methodology.

This report projects that **if the additional investments noted above are developed ahead of the Eraring Power Station retirement, reliability in New South Wales is forecast to remain within both the reliability standard and the Interim Reliability Measure (IRM) of 0.0006% USE following the closure of Eraring Power Station**, as presented in Figure 1 below.

In 2025-26, immediately following the announced potential withdrawal of Eraring Power Station:

- Ignoring the projected development of long-duration storage and generation consistent with the announced tender schedule and 2021 *Infrastructure Investment Objectives (IIO) Report* under the *Electricity Infrastructure*

[1] At https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/nem_esoo/2021/2021-nem-esoo.pdf.

[2] At https://www.originenergy.com.au/about/investors-media/origin-proposes-to-accelerate-exit-from-coal-fired-generation/.

[3] AGL has updated the expected closure year for Bayswater and Loy Yang A power stations in New South Wales and Victoria respectively, however both closure dates remain beyond current ESOO timeframes.

[4] At https://aemo.com.au/en/energy-systems/major-publications/integrated-system-plan-isp/2022-integrated-system-plan-isp.

[5] To meet the *Electricity Infrastructure Investment Act*'s Infrastructure Investment Objectives (IIO), as reported in https://aemo.com.au/-/media/files/about_aemo/aemo-services/iio-report-2021-summary.pdf.

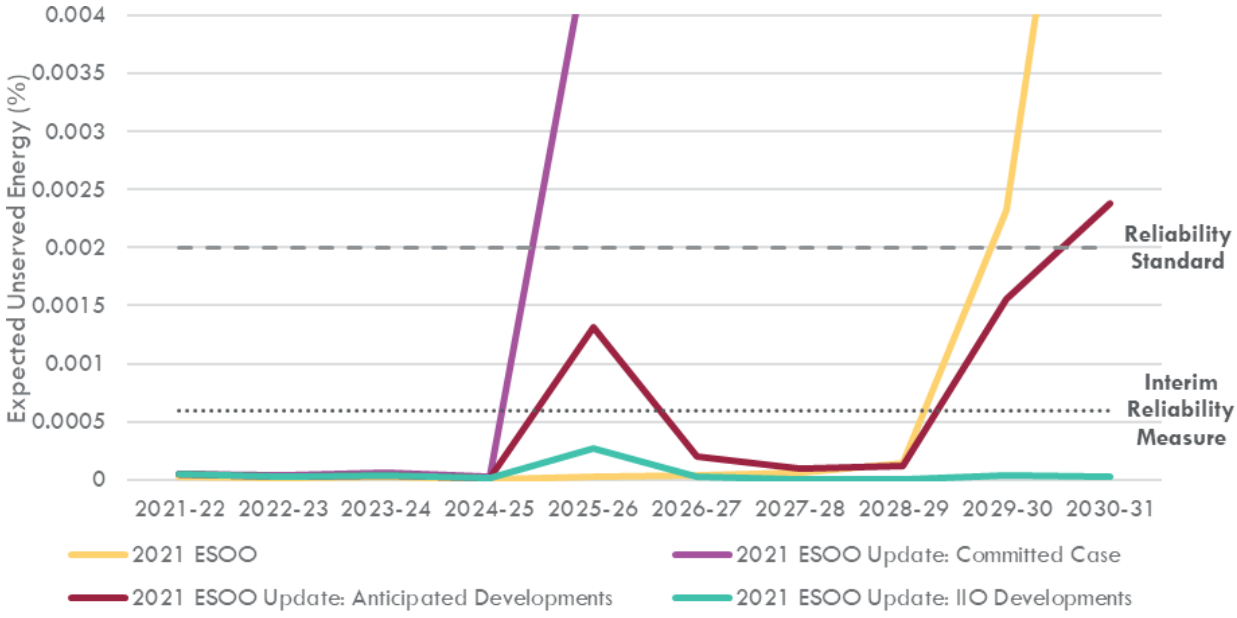
[6] As announced by the New South Wales Government, in response to the Eraring closure; see https://www.energy.nsw.gov.au/nsw-response-to-closure-of-eraring-power-station.

Investment Act 2020 (NSW), if other currently anticipated generation projects and projects actively pursued by the New South Wales Government become committed and are completed on schedule, then reliability is forecast to meet the reliability standard. This includes the announced *Waratah Super Battery*, a new Network Standby Battery providing up to 700 megawatts (MW) and 1,400 megawatt hours (MWh) of storage. In this case, additional capacity would be needed to meet the IRM (for example, approximately 510 MW of 4-hour storage depth, or approximately 880 MW of 2-hour storage depth, or approximately 2,000 MW of wind generation that is accessible to the Sydney-Newcastle-Wollongong area during peak events) – see '*Anticipated developments*' case in Figure 1.

- If developments consistent with the Infrastructure Investments Objectives (IIO) report[7] to meet the *Electricity Infrastructure Investment Act 2020* (NSW) are all developed, reliability outcomes are forecast to meet the IRM (see '*IIO Developments*' case in Figure 1).

  1. Without the long-duration storage capacity of the IIO developments, reliability outcomes are forecast to be marginally above the IRM. Additional capacity would be needed to meet the IRM (for example, approximately 90 MW of 4-hour storage depth, or approximately 130 MW of 2-hour storage depth).
  2. A range of announced projects by various proponents, capable of being delivered ahead of 2025-26 (for example, battery solutions at the Eraring[8] and Liddell[9] power station sites), demonstrate the market is able to deliver additional capacity to meet the IRM in these cases (but have not been included in either case).

Figure 1 Forecast unserved energy against IRM and reliability standard in New South Wales, three ESOO Update cases and 2021 ESOO, 2021-22 to 2030-31



Note: 'Committed' case is the ESOO reliability assessment, assuming existing and committed developments only.

After 2025-26, as Figure 1 demonstrates, actionable investments in the Draft 2022 ISP, particularly the HumeLink and Sydney Ring projects (assumed to have been developed in both the *Anticipated Developments* and *IIO*

[7] At https://aemo.com.au/-/media/files/about_aemo/aemo-services/iio-report-2021.pdf?la=en.

[8] At https://www.originenergy.com.au/about/investors-media/origin_progresses_plans_for_nations_largest_battery_at_eraring_power_station/.

[9] At https://www.agl.com.au/about-agl/media-centre/asx-and-media-releases/2022/march/agl-s-hunter-energy-hub-takes-shape-with-liddell-grid-scale-batt.

Developments forecasts), are forecast to maintain reliability in New South Wales to meet both the reliability standard and IRM until additional generation retirements occur. At this point, consistent with the 2021 ESOO, additional developments would be required (see the 2021 ESOO[10] for further details).

Separate to this updated reliability assessment, AEMO is also assessing power system security consistent with NER clause 5.20, and will publish results as they become available.

[10] At https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/nem_esoo/2021/2021-nem-esoo.pdf.

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1 Updating the 2021 *Electricity Statement of Opportunities*

1.1 Reason for publishing update under National Electricity Rules clause 3.13.3A(b)

National Electricity Rules (NER) clause 3.13.3A(b) requires AEMO to publish updates to the Electricity Statement of Opportunities (ESOO) for the National Electricity Market (NEM) as soon as practicable when new information becomes available that materially changes the supply or demand projections, including plant retirements. A range of updates have occurred since the publication of the 2021 ESOO in August 2021[11], including the recent announcement by Origin Energy for the potential early retirement of Eraring Power Station in August 2025. Collectively these are considered significant new information, requiring an update to the 2021 ESOO.

Consistent with the Reliability Forecast Guidelines[12], in preparing this Update to the 2021 ESOO, AEMO has updated the scenario parameters that define the *Central scenario* (see Section 1.2 below), and has applied the latest generation commitments and announcements (see Chapter 2). A summary of the changes between the 2021 ESOO published in August 2021 and this Update to the 2021 ESOO is in Appendix A1.

Separate to reliability assessments, AEMO is also assessing power system security following the retirement of Eraring Power Station, consistent with NER clause 5.20, and will publish results as they become available.

1.2 Updating the ESOO Central scenario to *Step Change*

The 2021 ESOO used the *Progressive Change* demand scenario developed for the 2021 *Inputs, Assumptions and Scenarios Report* (IASR)[13] as the ESOO Central scenario.

Following extensive industry stakeholder consultation, the *Draft 2022 Integrated System Plan* (ISP) identified the *Step Change* scenario as the most likely of the scenarios outlined in the 2021 IASR. Consistent with the Draft 2022 ISP, and in alignment with the Reliability Forecast Guidelines, AEMO's modelling for this Update to the 2021 ESOO now considers:

- The *Step Change* demand scenario the most likely or Central scenario for reliability modelling.
- The individual inputs that specify the *Step Change* demand scenario to be most likely, as they appropriately capture many non-linear effects of a power system and industry in transition.

Consistent with the 2021 ESOO methodology[14], only the demand forecast from the *Step Change* scenario has been applied. Unlike the ISP, which follows a methodology[15] that may forecast earlier generator retirement dates

[11] At https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/nem_esoo/2021/2021-nem-esoo.pdf.

[12] At https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/nem_esoo/2021/reliability-forecast-guidelines.pdf.

[13] See https://aemo.com.au/-/media/files/major-publications/isp/2021/2021-inputs-assumptions-and-scenarios-report.pdf.

[14] See https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/nem_esoo/2021/esoo-and-reliability-forecast-methodology-document.pdf.

[15] At https://aemo.com.au/-/media/files/major-publications/isp/2021/2021-isp-methodology.pdf.

than participants have announced, the ESOO must retain the generator retirement dates provided by participants, and no earlier retirements have been considered.

The *Step Change* demand forecast used for this Update uses all input drivers of demand for the *Step Change* scenario specified in the 2021 IASR, adjusted to incorporate 2021-22 financial year demand observations. The impact of this change, in 2025-26 for example, is a marginally higher peak demand, with operational demand being approximately 55 megawatts (MW) higher than the 2021 ESOO Central forecast, net of aggregated distributed battery operation.

1.3 Cases modelled in this updated assessment

This Update to the 2021 ESOO includes a *Committed* case reliability forecast identifying any 'forecast reliability gaps' in the coming five years, defined according to the Retailer Reliability Obligation (RRO), and an indicative projection of any forecast reliability gaps in the second five years of the forecast. This case includes only existing and committed generation developments from the latest Generation Information publication[16], with key changes described in Chapter 2. Unless specified otherwise, all inputs and assumptions for all cases used in this Update to the 2021 ESOO align with the published 2021 ESOO.

In addition to the *Committed* case, this Update to the 2021 ESOO includes two cases that consider additional transmission and generation developments compared to the *Committed* case – the *Anticipated Developments* case and New South Wales Infrastructure Investment Objectives case (*IIO Developments* case). These cases demonstrate the potential reliability improvements if additional announced projects and schemes (which do not yet meet AEMO's criteria for committed inclusion[17]) are developed. Chapter 3 describes these additional developments.

1.4 Reliability measures and the RRO

The ESOO measures reliability using expected unserved energy (USE), and compares forecast USE against both

- the **Interim Reliability Measure (IRM)** of 0.0006% of the total energy demanded in a region for a financial year, and
- the **reliability standard** of 0.002% of the total energy demanded in a region for a financial year.

For the purposes of the RRO, the IRM of 0.0006% USE is the standard until 30 June 2025[18], after which the reliability standard reverts to 0.002% USE. AEMO reports on both standards for information purposes.

For the RRO[19], components of any reliability forecast or indicative reliability forecast[20] must indicate whether or not there is a *forecast reliability gap*. Details on the reliability forecast are included in Chapter 3.

AEMO must request a **T-3 reliability instrument** for any identified reliability gaps in the reliability forecast at least three months before the *T-3 cut-off day* for the relevant reliability gap (NER 4A.C.2(a)), where the *T-3 cut-off day*

[16] At https://aemo.com.au/energy-systems/electricity/national-electricity-market-nem/nem-forecasting-and-planning/forecasting-and-planning-data/generation-information.

[17] Commitment criteria and classifications are explained under the 'Background information' tab in each Generation Information publication.

[18] Temporary changes to the RRO were introduced by the National Electricity Amendment (Retailer Reliability Obligation trigger) Rule 2020. They expire in June 2025.

[19] For more information on the RRO, see https://www.energy.gov.au/sites/default/files/retailer_reliability_obligation_factsheet.pdf.

[20] See https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/rsig/reliability-forecast-guidelines.pdf for more.

is the day that is three years before the first day the forecast reliability gap period starts (National Electricity Law [NEL] 14G (3)). AEMO is, however, only able to make the request if the reliability forecast is published in the six months immediately preceding the *T-3 cut-off day* (NER 4A.C.2(b)(3)). For this Update to the 2021 ESOO, reliability gaps identified for summer 2025-26 fall outside the above criteria.

2 Updated generation information

This Update to the 2021 ESOO incorporates all updated information from developers and market participants from AEMO's latest *Generation Information*, published 22 February 2022[21].

AEMO's *Generation Information* publishes a variety of information on the capabilities of existing and proposed generators, as advised by owners and developers. Figure 2 shows the pipeline of NEM projects reported in the 22 February 2022 publication. As announced projects become more advanced, they meet more of the required criteria and are classified as anticipated, then committed, and are eventually added to existing generation.

Since the 2021 ESOO was published in August 2021, numerous projects have become sufficiently advanced to be considered committed for the *Committed* case reliability and indicative reliability forecast.

Figure 2 New generation pipeline as of 22 February 2022 *Generation Information* (gigawatts [GW])

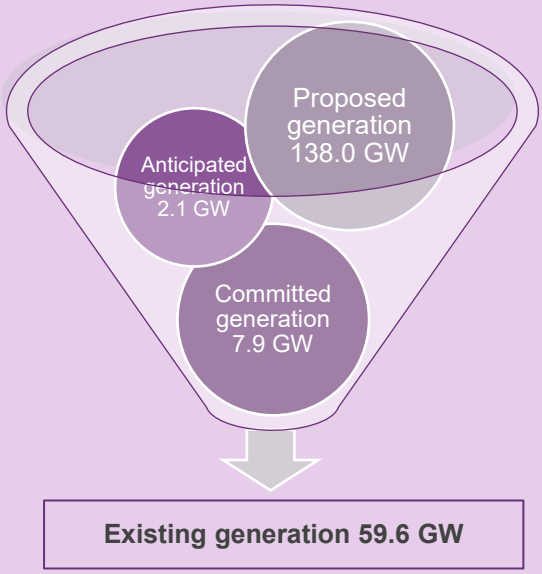


Table 1 shows the changes in committed nameplate capacity compared to the 2021 ESOO, by region, for the 2025-26 forecast year (the financial year when Eraring Power Station is now scheduled to retire). Notable generator and storage changes include[22]:

- Energy Australia's *Tallawarra B* power station in New South Wales is now considered committed.
- AGL's *Hunter Valley Gas Turbine* in New South Wales is now withdrawn.
- *Temporary Generation South* in South Australia has been approved to withdraw to transfer the turbine to a new site. This new site, *Bolivar Power Station*, is considered anticipated but not yet committed.

Table 1 Changes in committed nameplate capacity in the Update to the 2021 ESOO (April 2022) compared to the 2021 ESOO (August 2021), for the 2025-26 forecast year (MW)

	New South Wales	Queensland	South Australia	Tasmania	Victoria
Wind capacity	396	172	210	0	0
Solar capacity	421	245	151	0	0
Gas capacity	266	0	-123	0	0
Coal capacity	-2,880	0	0	0	0

[21] At https://www.aemo.com.au/energy-systems/electricity/national-electricity-market-nem/nem-forecasting-and-planning/forecasting-and-planning-data/generation-information.

[22] AGL has updated the expected closure year for Bayswater and Loy Yang A power stations in New South Wales and Victoria respectively, however both closure dates remain beyond current ESOO timeframes.

3 Reliability forecast

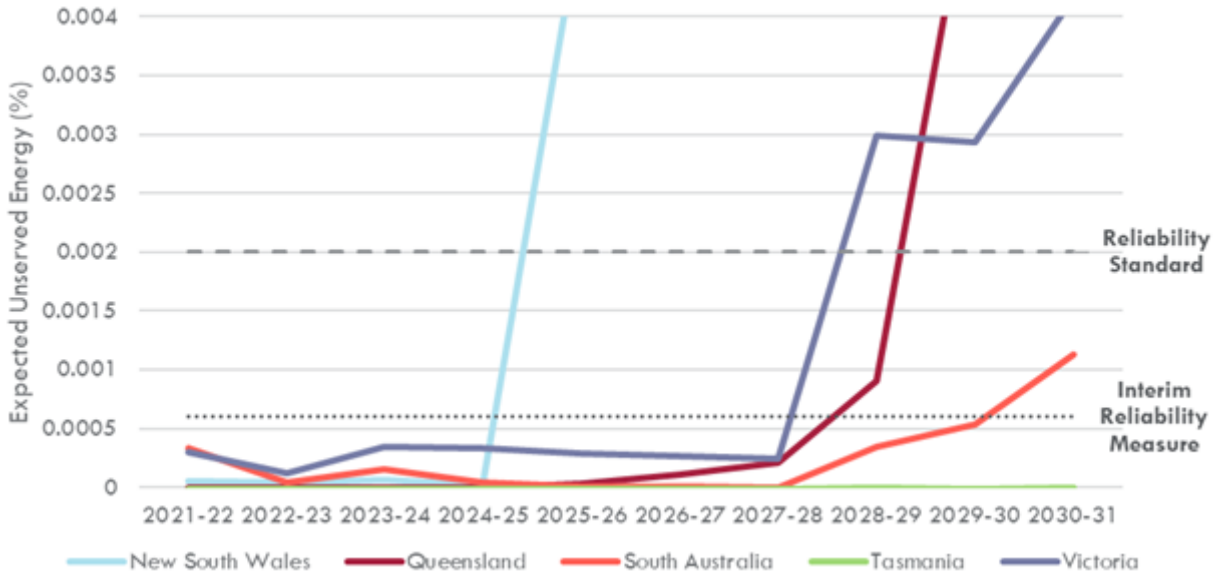
3.1 Updating the 2021 ESOO reliability and indicative reliability forecasts

In accordance with AEMO's *ESOO and Reliability Forecast Methodology*[23], the *Committed case* reliability forecast includes only existing and committed generation and transmission developments[24]. Specifically, this assessment therefore does not include:

- Major transmission investments that have not yet completed all necessary approvals, including HumeLink and Sydney Ring Project (the new transmission developments to unlock congestion and enable the benefits of Snowy 2.0 to be delivered to the NEM), and other actionable investments identified in the Draft 2022 ISP.
- Other anticipated or proposed generation developments.
- Transmission investments as proposed by the New South Wales Government[25].

The changes incorporated in this Update to the 2021 ESOO lead to an increase to the forecast of expected USE in a number of NEM regions compared to the 2021 ESOO Central reliability forecast. Figure 3 shows the updated reliability and indicative reliability forecasts for 2021-22 to 2030-31 for all regions.

Figure 3 Reliability and indicative reliability forecasts, all regions, *Committed* case, 2021-22 to 2030-31



[23] At https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/nem_esoo/2021/esoo-and-reliability-forecast-methodology-document.pdf.

[24] Consistent with the 2021 ESOO, transmission projects listed as Anticipated in the 2021 IASR that meet the ESOO definition of Committed are included in the *Committed* case. Projects included are listed on page 35 of the 2021 ESOO, at https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/nem_esoo/2021/2021-nem-esoo.pdf.

[25] At https://www.energy.nsw.gov.au/nsw-response-to-closure-of-eraring-power-station and through consultation with the New South Wales Government in preparation of this update.

The key observations in forecast USE over the horizon of the *Committed* case are:

- In New South Wales, expected USE is now forecast to **exceed the reliability standard of 0.002% USE from 2025-26** when Eraring Power Station retires[26]. This is four years earlier than forecast in the 2021 ESOO. Without additional investments beyond existing commitments, USE in New South Wales is forecast to continue to increase, particularly after the retirement of Vales Point Power Station in 2029-30.
- Victoria shows forecast expected USE above the reliability standard from 2028-29, when Yallourn Power Station is scheduled to retire. This is consistent with the 2021 ESOO.
- Queensland now shows an increase in expected USE in later years at levels higher than forecast in the 2021 ESOO[27]. The higher forecast is driven by reduced inter-regional reliability support from New South Wales.
- In South Australia, expected USE is now higher than forecast in the 2021 ESOO, predominantly caused by the withdrawal of Temporary Generator South, and while the new Bolivar Power Station is yet to be classified as a committed project. South Australia is also impacted by reduced inter-regional reliability support from New South Wales.
- The reliability forecast for Tasmania is consistent with the 2021 ESOO.

A reliability gap for RRO purposes is forecast if expected USE in a region:

- Exceeds 0.0006% of the total energy demanded in that region for a given financial year between 2021-22 and 2024-25.
- Exceeds 0.002% of the total energy demanded in that region for a given financial year between 2025-26 and 2030-31.

Reliability gaps are now forecast to occur against the reliability standard of 0.002% from 2025-26, as summarised in Table 2. For the gap identified in 2025-26:

- The size of the **forecast reliability gap** is 590 MW.
- The **forecast reliability gap period** is between 1 December 2025 and 28 February 2026 and between 1 June 2026 and 30 June 2026.
- The region in which the forecast reliability gap is forecast to occur is New South Wales.
- AEMO's **one-in-two year peak demand forecast** for the forecast reliability gap period is 13,274 MW (reported on a 50% probability of exceedance [POE], 'as generated' basis).
- The **trading intervals** during the forecast reliability gap period are those that fall between 15:00 and 21:00 on weekdays in December 2025 and January, February and those that fall on weekdays between 18:00 and 19:00 during June 2026.
- Expected USE in the reliability gap period is 2.08 gigawatt hours (GWh).

Considering the outlook identified in this chapter, unless sufficient new generation or transmission capacity reaches the criteria to be considered committed ahead of the 2022 ESOO publication, AEMO will be required to raise a T-3 reliability instrument at that time.

[26] Expected USE in New South Wales reaches approximately 0.005% in 2025-26, and continues to rise without new investments.

[27] Expected USE in Queensland reaches approximately 0.005% in 2029-30, and continues to rise without new investments.

Table 2 Update to the 2021 ESOO reliability gaps (MW)

Region	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31
New South Wales	590	980	1,080	1,550	2,560	2,550
Queensland	-	-	-	-	770	1,340
Victoria	-	-	-	330	360	700

Note: reflects the new capacity required throughout the identified reliability gap periods for expected USE to be within the reliability standard.

For transparency, and separate to the reporting requirements in relation to the RRO, Table 3 shows the equivalent gaps if measured against the IRM.

Table 3 *Committed* case equivalent gaps against the IRM (MW)

Region	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31
New South Wales	1,470	2,860	1,610	1,970	3,780	3,100
Queensland	-	-	-	340	1,330	1,760
South Australia	-	-	-	-	-	430
Victoria	-	-	-	1,220	1,140	1,620

Note: Reflects the new capacity required throughout the identified reliability gap periods for expected USE to be within the IRM.

3.2 Developments needed to address forecast reliability gaps

While the *Committed* case reliability forecast demonstrates a reliability gap, numerous developments are advancing and have the potential to substantially improve reliability following the exit of Eraring Power Station.

In New South Wales, existing and projected network limitations are forecast to restrict the ability to transfer power from areas north and south of the Sydney, Newcastle and Wollongong load centres. As such, actions to improve the reliability outlook in New South Wales should focus on:

- Development of transmission projects that increase the ability to transfer power from regions into the Sydney, Newcastle and Wollongong area. Such upgrades are particularly relevant to access the reliability benefits of the expected commissioning of the Snowy 2.0 development in 2025-26.
- Additional generation and storage investments; however, without further transmission investment this would have limited impact if located outside the Sydney, Newcastle and Wollongong area.
- Implementation of demand reduction schemes such as the New South Wales peak demand reduction scheme (PDRS).

The Draft 2022 ISP identified an actionable transmission project, the Sydney Ring (Reinforcing Sydney, Newcastle and Wollongong Supply) project, that will improve the reliability of supply to these load centres. Additionally, in response to the Eraring Power Station retirement announcement, several private sector and New South Wales Government supported projects (both storage and transmission) have been identified as plausibly able to be commissioned and improve reliability prior to the reliability gap period.

To increase transparency and inform the market and policy-makers, this Update to the 2021 ESOO assesses the potential reliability impacts of various combinations of investments that are not yet committed under AEMO's

ESOO methodology[28]. These sensitivities show whether additional market or government-led developments would be effective in meeting the reliability standard or IRM, thereby demonstrating the scale of additional developments needed to address the reliability gaps identified in this Update to the 2021 ESOO.

3.2.1 Improving reliability with anticipated developments

The *Anticipated Developments* case includes generator and transmission developments additional to the *Committed* case.

Anticipated generator projects are defined as those that meet at least three of AEMO's five commitment criteria[29] and have submitted a *Generator Information* survey in the previous six months. To be classified as committed, generators must satisfy all five criteria.

There are several transmission development projects in New South Wales that similarly meet some, but not all, development criteria. These transmission developments, if developed, would reduce many of the intra-regional limitations that are currently preventing existing and committed generator access to the Sydney, Newcastle and Wollongong load centres.

The *Anticipated Developments* case considers the following generation, storage and transmission developments in addition to the *Committed* case:

- **Anticipated generation developments** across the NEM in the February 2022 *Generation Information* publication, including:
  1. 1,706 MW of large-scale solar and wind generation projects.
  2. 268 MW of battery energy storage systems.
  3. The 123 MW Bolivar Power Station in South Australia.
- **Actionable transmission developments** in the Draft 2022 ISP[30], including:
  1. HumeLink by July 2026.
  2. Sydney Ring project (Reinforcing Sydney, Newcastle and Wollongong Supply) by July 2027.
  3. New England Renewable Energy Zone (REZ) transmission link by July 2027.
  4. Marinus Link Cable 1 by July 2029.
- **Additional projects proposed by the New South Wales Government**:
  1. The announced *Waratah Super Battery*[31], a 700 MW, 1,400 megawatt hours (MWh) Network Standby Battery, expected to operate flexibly as a system protection integrity scheme (SIPS) when needed, and operating as a normal market battery, providing direct discharge at other times.
  2. Upgrades to the southern transmission corridor to the Sydney, Newcastle and Wollongong load centres, including the *Bannaby – Sydney West* transmission line. Additional augmentations would further improve reliability outcomes

[28] At https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/nem_esoo/2021/esoo-and-reliability-forecast-methodology-document.pdf.

[29] Commitment criteria are explained under the Background Information tab in each regional spreadsheet on AEMO's Generation Information web page, at https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Planning-and-forecasting/Generation-information.

[30] Actionable transmission developments in the Draft 2022 ISP outside the ESOO's 10-year modelling horizon were not modelled.

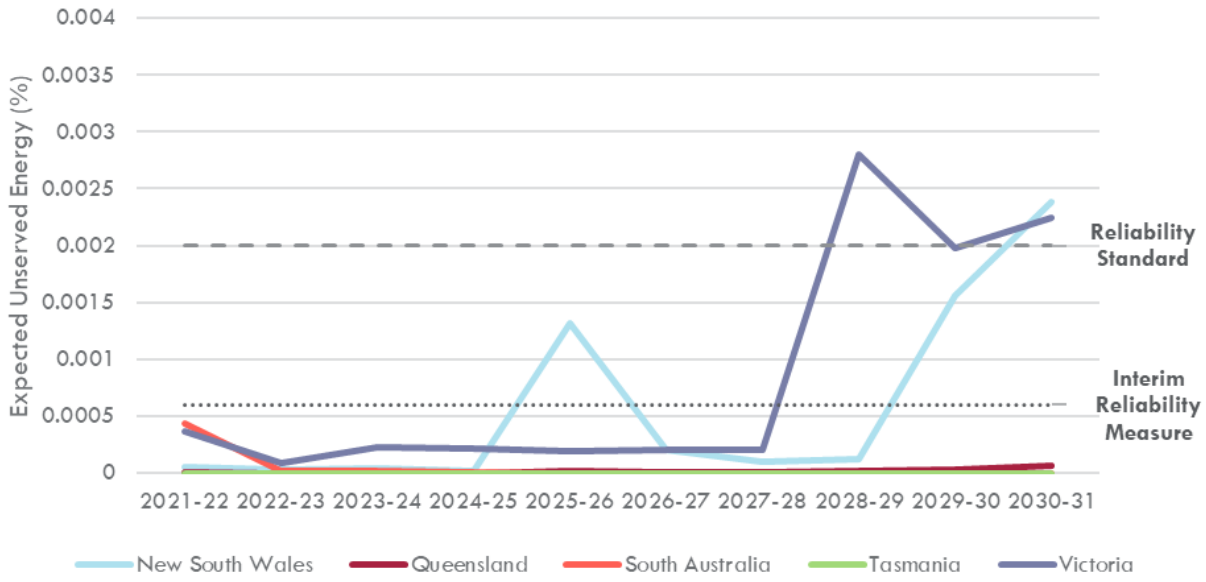
[31] At https://www.energy.nsw.gov.au/waratah-super-battery.

3. Additional 330 kilovolt (kV) transmission lines as part of the Central West Orana REZ transmission link.
4. Demand side participation and aggregated energy storage components of the PDRS[32].

Figure 4 shows forecast expected USE for the *Anticipated Developments* case:

- With only the additional projects developed in this sensitivity, expected USE in New South Wales is forecast to be above the IRM of 0.0006% USE when Eraring Power Station retires in 2025-26, but within the reliability standard. The HumeLink transmission development in 2026-27 helps reduce reliability risks by improving southern New South Wales generation capacity, such as Snowy 2.0, to reach the Sydney, Newcastle and Wollongong load centres during times of supply scarcity.
- Reliability in Queensland, South Australia and Victoria is forecast to be improved compared to the *Committed* case, due to anticipated generation and the availability of inter-regional reliability support.
- Victorian expected USE is still forecast to be above or close to the reliability standard from 2028-29 after the retirement of Yallourn Power Station.
- After Vales Point Power Station in New South Wales is scheduled to retire in 2029, expected USE in New South Wales is forecast to rise again, and to be greater than the reliability standard of 0.002% in 2030-31.

Figure 4 Forecast USE against IRM and reliability standard, all regions, *Anticipated Developments* case, 2021-22 to 2030-31



In the *Anticipated Developments* case, equivalent reliability gaps are forecast to occur against the reliability standard and IRM only in New South Wales and Victoria. The equivalent gaps are significantly smaller than those identified in the *Committed* case and are shown for informative and comparative purposes only, as summarised in Table 4 and Table 5 below.

[32] See https://www.energy.nsw.gov.au/government-and-regulation/energy-security-safeguard/peak-demand-reduction-scheme.

Table 4 *Anticipated Developments* case equivalent reliability gaps against the reliability standard (MW)

Region	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31
New South Wales	-	-	-	-	-	220
Victoria	-	-	-	270	-	70

Table 5 *Anticipated Developments* case equivalent reliability gaps against the IRM (MW)

Region	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31
New South Wales	660	-	-	-	800	1,050
Victoria	-	-	-	1,330	830	900

This *equivalent reliability gap* reflects the amount required during the *reliability gap period*, applying the ESOO and Reliability Forecasting Methodology. This is equivalent to the capacity being available in summer months (December to February) only, in this case.

3.2.2 Further reliability improvements with New South Wales Government-supported developments

The *IIO Report*[33], published by the Consumer Trustee for New South Wales, includes a roadmap for building generation and long-duration storage projects as required by the *Electricity Infrastructure Investment Act 2020* (NSW)[34]. The roadmap includes generation projects to provide 33,600 GWh of electricity per year and 2 gigawatts (GW) of long-duration storage by the end of 2029.

The *IIO Developments* case incorporates all generation and transmission projects considered in the *Committed* and *Anticipated Developments* cases. In comparison to the *Anticipated Developments* case, the *IIO Developments* case also includes:

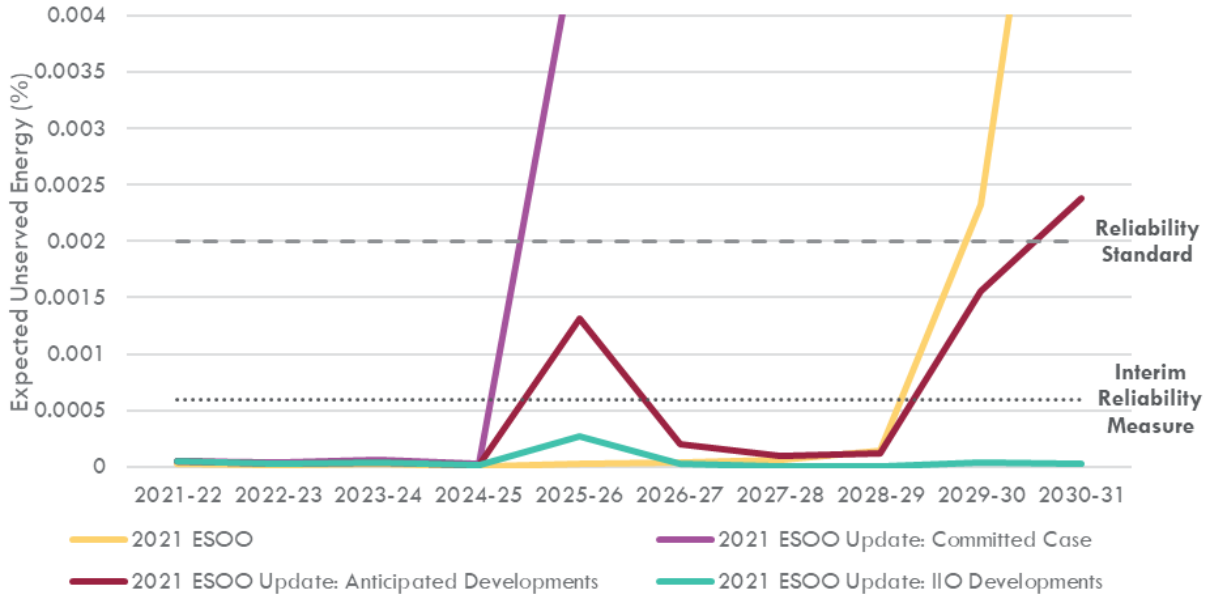
- More than an additional 3 GW of variable renewable energy (VRE) generation and 600 MW of long-duration storage by 2025-26 in New South Wales.
- More than an additional 10 GW of VRE generation and more than 2 GW of additional long-duration storage by 2030-31 in New South Wales.

Figure 5 shows the results of the *IIO Developments* case for New South Wales, in comparison to the *Committed* case, the *Anticipated Developments* case, and the 2021 ESOO. With the additional VRE and storage developments included within the *IIO Developments* case, New South Wales reliability is forecast to remain within the IRM over the entire 10-year horizon.

[33] At https://aemo.com.au/-/media/files/about_aemo/aemo-services/iio-report-2021.pdf?la=en.

[34] See https://legislation.nsw.gov.au/view/html/inforce/current/act-2020-044.

Figure 5 Forecast unserved energy against IRM and reliability standard in New South Wales, three ESOO Update cases and 2021 ESOO, 2021-22 to 2030-31



3.3 Summarising the developments required for a reliable power system after Eraring Power Station retires

Updated information regarding generation developments and retirements, including the potential retirement of Eraring Power Station, is expected to lead to a reduction in the reliability of the NEM, particularly in New South Wales. However, if anticipated generation and transmission developments, actionable ISP projects, and transmission investments supported by the New South Wales Government in response to the potential closure proceed to expected schedule, then forecast reliability outcomes are within the reliability standard in 2025-26, and further improve following the completion of the HumeLink and Sydney Ring projects in particular.

To achieve a level of reliability similar to that forecast before the earlier Eraring closure was announced, additional investments in renewable energy and electricity storage are required. While this Update to the 2021 ESOO does not quantify the explicit magnitude of capacity for each development technology required to achieve this level of reliability, the *IIO Developments* case demonstrates that if VRE and storage developments identified in the IIO Report are developed to the published schedule, reliability is forecast to exceed that required to meet the IRM.

Delays to the commissioning of transmission, VRE, or storage developments may reduce the reliability of the power system across the NEM. Long-duration storage development as outlined in the IIO Report may be challenging to deliver within current timeframes if the projects do not proceed soon, given normal lead times.

It has been identified that for reliability outcomes to be consistent with the IRM in 2025-26[35]:

- The *Anticipated Developments* case would require additional capacity – for example, if available year-round, approximately an additional 510 MW of 4-hour storage depth, or 880 MW of 2-hour storage depth or approximately 2,000 MW of wind generation that is accessible to the Sydney-Newcastle-Wollongong area during peak events.

[35] The capacities outlined here refer to generation capacity available year-round, and are therefore on a different basis to the reliability gaps presented in the previous sections.

- Should there be a delay to the long-duration storage component of the *IIO Developments* case, this case would require additional capacity – for example, if available year-round, approximately an additional 90 MW of 4-hour storage depth, or 130 MW of 2-hour storage depth, or approximately 360 MW of wind generation that is accessible to the Sydney-Newcastle-Wollongong area during peak events.

Among the 138 GW of proposed developments that have not been included in these Update to the 2021 ESOO cases, there are numerous shorter-duration storage projects that may further improve reliability. These shorter-duration storages include Origin Energy's 700 MW Eraring Battery, AGL's 500 MW Liddell Battery, and over 2.3 GW of other proposed New South Wales battery projects.

The 2022 ESOO will consider all developments that become committed as appropriate.

A1. Summary of changes since the 2021 ESOO

Table 6 below describes the identified aggregate changes between the 2021 ESOO published in August 2021, and this Update to the 2021 ESOO, focused on the 2025-26 financial year.

Table 6 Summary of changes for 2025-26 in New South Wales since the 2021 ESOO

Description	Change for 2025-26
Change from Progressive Change to Step Change scenarios	Maximum operational demand (as sent out) +225 MW Aggregated distributed battery generation +170 MW (approximately 2-hour duration) Net Impact +55 MW (subject to battery operation)
Newly committed and withdrawn projects	Wind generation +396 MW Solar generation +421 MW Gas generation +266 MW
Eraring withdrawal	Coal generation -2,880 MW
Anticipated / proposed projects	Excluded in *Committed* case Included in *Anticipated Developments* case: 905 MW of solar generation. Included in *IIO Developments* case: *Anticipated Developments*, plus an additional 3,230 MW of VRE generation and 600 MW of long-duration storage.
Waratah Super Battery	Included in Anticipated Developments and IIO Developments cases.
Bannaby-Sydney West Upgrade	Included in Anticipated Developments and IIO Developments cases. Additional transmission line upgrades on the southern transmission corridor to the Sydney, Newcastle and Wollongong load centres are not explicitly modelled, but are being actively pursued by the New South Wales government.