

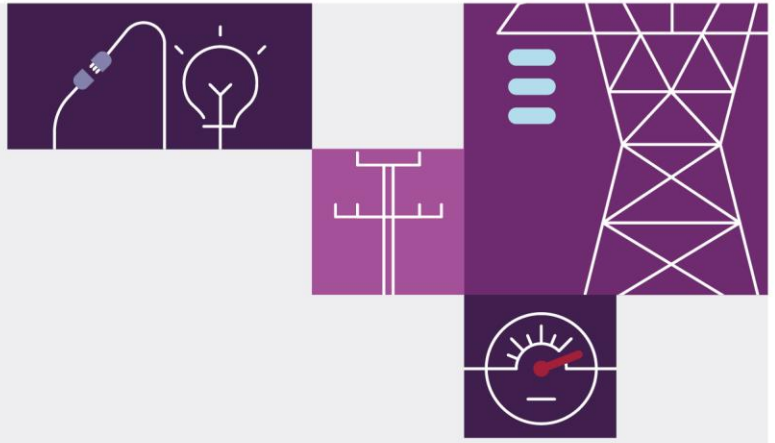
NEM Lack of Reserve Framework Report

1 April to 30 June 2023

July 2023

A report for the National Electricity
Market on the operation of the
Lack of Reserve Framework





Important notice

Purpose

AEMO has prepared this document under clause 4.8.4B of the National Electricity Rules to report on the operation of the NEM Lack of Reserve Framework for the period from 1 April to 30 June 2023.

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Version control

Version	Release date	Changes
1	26/07/2023	Initial release

Executive summary

This report has been published in accordance with clause 4.8.4B of the National Electricity Rules (NER).

In the reporting period 1 April to 30 June 2023 (Quarter 2 2023), AEMO declared 88 individual Lack of Reserve (LOR) conditions in total in the National Electricity Market (NEM)¹. Table 1 shows the number and type of LOR conditions declared in Quarter 2 2023.

Table 1 LOR conditions declared in Quarter 2 2023

LOR declarations		Total
LOR1	Actual	25
	Forecast	37
LOR2	Actual	1
	Forecast	24
LOR3	Actual	0
	Forecast	1
Total		88

This compares with 65 LOR conditions declared in the previous reporting period (Quarter 1 2023), and 185 LOR conditions declared for Quarter 2 2022 (excluding the market suspension period 15-24 June 2022)².

Quarter 2 2023 covered the mid-to-late autumn months and the first month of winter:

- Across the NEM, most of the LOR declarations in this quarter were due to decreased generation availability (including energy limitations) and reduced net import.
- Many of the forecast LOR conditions did not eventuate into actual LOR conditions, mainly because additional generation was made available, or transmission network service providers (TNSPs) were able to reschedule planned transmission outages.
- The LOR conditions in New South Wales, Queensland, Victoria and South Australia were mainly driven by decreased generation availability and reduced net import.
- There were no LOR conditions declared in Tasmania.

Of the 88 LOR declarations in Quarter 2 2023:

- For all 62 LOR1 declarations, the reserve requirement was set by the sum of the two largest credible risks (LCR2).
- There were 6 LOR2 declarations where the reserve requirement was set by the largest credible risk (LCR).
- There were 19 LOR2 declarations where the reserve requirement was set by the Forecast Uncertainty Measure (FUM).
- There was one LOR3 declaration due to available supply being below forecast demand.

¹ Forecast or actual LOR1, LOR2, or LOR3. LOR is described in clause 4.8.4 of the NER. AEMO's considerations and methodology, and the LOR levels, are outlined in AEMO's Reserve Level Declaration Guidelines, at <https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Security-and-reliability/Power-system-operation>.

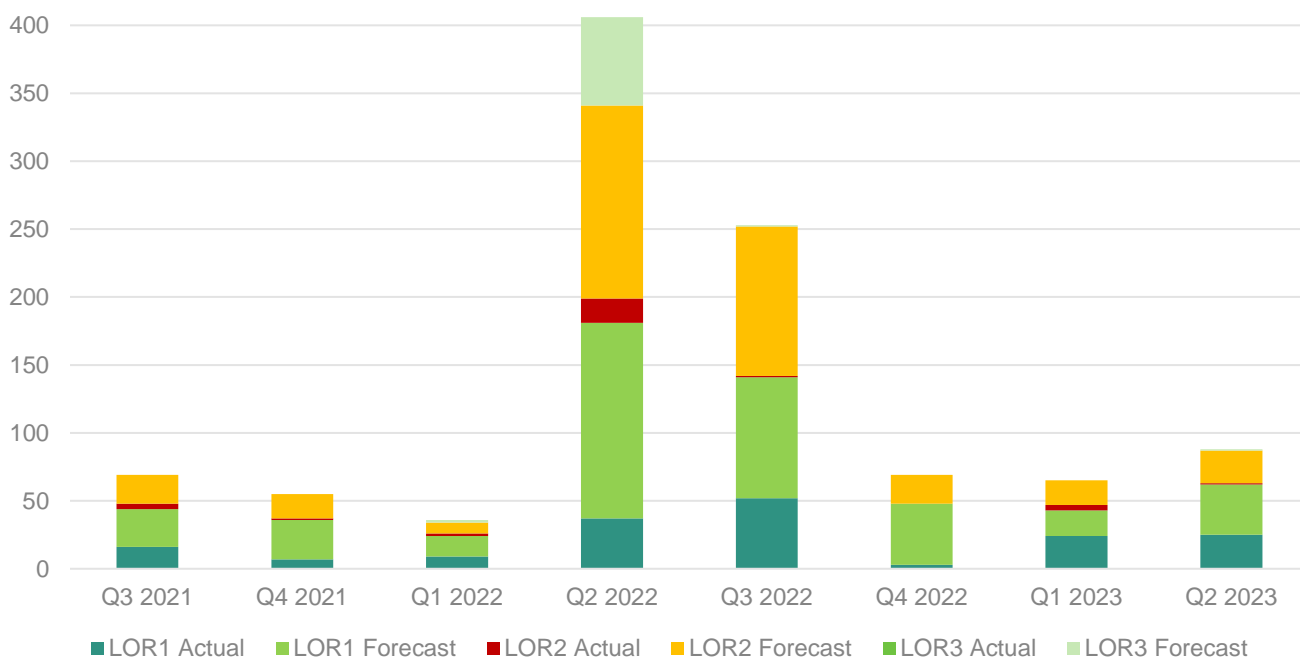
² Previous quarterly reports are on AEMO's website at <https://aemo.com.au/energy-systems/electricity/national-electricity-market-nem/system-operations/power-system-operation/nem-lack-of-reserve-framework-quarterly-reports>.



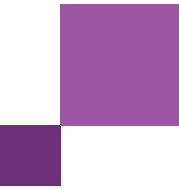
This means 22% of LOR conditions were declared when the reserve requirement was set by the FUM. For comparison, in Quarter 1 2023, 11 of the 65 LOR declarations were set by the FUM (17%), and in Quarter 2 2022, 40 of the 185 LOR declarations were set by the FUM (22%).

Figure 1 below shows the historical trend of actual and forecast LOR conditions from Quarter 3 2021 to Quarter 2 2023. It shows that, as noted above, the total number of LOR declarations in this reporting period increased significantly compared to last quarter but is moderately lower than the same period last year (Quarter 2 2022).

Figure 1 Quarterly comparison of actual and forecast LOR conditions, Q3 2021 to Q2 2023



The next report on the NEM Lack of Reserve Framework, for the reporting period 1 July 2023 to 30 September 2023, will be published by 31 October 2023.



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1 Introduction

This report has been published in accordance with clause 4.8.4B of the National Electricity Rules (NER), to provide a high-level analysis of how the Lack of Reserve (LOR) framework is operating. This report covers the period from 1 April to 30 June 2023 (Quarter 2 2023).

Unless otherwise noted, all times in this report are National Electricity Market (NEM) time (Australian Eastern Standard Time [AEST]).

The report is divided into three sections:

- **Reserve Level Declaration Guidelines** – a summary of changes to the Guidelines over the past quarter, and the retraining of the Bayesian Belief Network (BBN).
- **LOR conditions declared** – details of all LOR conditions declared or revised during the past quarter (based on market notices). For each condition declared, the report indicates the required reserve level and whether the requirement was set by the Forecast Uncertainty Measure (FUM), or the largest credible risk/s (LCR) in the region. The reserve requirement can be set by the largest credible risk (LCR, for LOR2 conditions) or the sum of the two largest credible risks (LCR2, for LOR1 thresholds). The FUM value for each relevant period is also provided.
- **Review of performance** – a review of the performance of the LOR framework and any observed trends, providing an assessment of FUM values compared to previous quarters, determinants of reserve level requirements, number of LOR declarations, and leading factors or causes of LOR declarations.

Please direct all LOR inquiries to www.aemo.com.au/Contact-us. In the inquiry form field 'What is your enquiry regarding?', write "**LOR Framework Report**".

The next report on the NEM Lack of Reserve Framework, for the reporting period 1 July 2023 to 30 September 2023, will be published by 31 October 2023.

2 Reserve level declaration guidelines

2.1 Changes in the reporting period

During the reporting period, there were no changes to the Guidelines³.

2.2 Retraining of the Bayesian Belief Network

The BBN is the algorithm which determines the FUM, which in turn can determine LOR levels. This process is summarised in the Guidelines. The intention of retraining the BBN is to update the network to include recent historical data since the last retraining. AEMO commenced the retraining in July 2023 to include data up to 30 June 2023. The retraining involves a three-stage process:

1. Extract-Transform-Load (ETL) stage, to extract historical data up to 30 June 2023, perform data validation and cleansing, and compile the data into the structured format required to incorporate into the network.
2. Analysis and modelling stage, to update the network and compile the network nodes.
3. Test and verification stage, to ensure the retrained network is suitable for production implementation.

AEMO is in the final stage of retraining and plans to implement the retrained BBN into production shortly, pending final verification and readiness checks in the pre-production environment.

2.2.1 Results from retraining

To verify the retraining, AEMO completed a backcast of all forecast intervals from April 2022 to June 2023 inclusive, using the existing BBN and the retrained BBN. The intention of the backcast is to provide an indication of the magnitude of changes to future FUM values.

Changes in 90th, 50th (median) and 10th percentiles FUM values between the existing and retrained BBN backcasts are listed below. Minor changes were identified for some other forecast horizons and distribution statistics but are not listed here. Maximum, mean, and minimum values are to still be included in visuals for review of actual FUM values in Section 4.1 of this report.

- New South Wales – 90th percentile FUM values decreased by 78 megawatts (MW) for the 24 hours ahead forecast horizon and 71 MW for the 60 hours ahead forecast horizon. Median percentile FUM values decreased by 41 MW for the 24 hours ahead forecast horizon and by 53 MW for the 60 hours ahead forecast horizon. 90th, median, and 10th percentile FUM values for all other forecast horizons were relatively unchanged.
- Queensland – 90th percentile FUM values increased by 42 MW for the 24 hours ahead forecast horizon. Median percentile FUM values increased by 27 MW for the 12 hours ahead forecast horizon and decreased by 34 MW for the 24 hours ahead forecast horizon. 90th, median, and 10th percentile FUM values for all other forecast horizons remained relatively unchanged.
- South Australia – 90th percentile FUM values decreased by 61 MW for the 60 hours ahead forecast horizon. 90th, median and 10th percentile FUM values for all other forecast horizons remained relatively unchanged.

³ The Guidelines are at <http://aemo.com.au/Electricity/National-Electricity-Market-NEM/Security-and-reliability/Power-system-operation>.

- Tasmania – 90th percentile FUM values decreased by 12 MW for the 24 hours ahead forecast horizon and increased by 26 MW for the 60 hours ahead forecast horizon. 90th, median, and 10th percentile FUM values for all forecast horizons remained relatively unchanged.
- Victoria – 90th, median, and 10th percentile FUM values for all forecast horizons remained relatively unchanged.

3 Lack of Reserve conditions declared

Table 2 provides a high-level summary of the counts of forecast and actual LOR conditions for the reporting period (Quarter 2 2023) based on the declaration count principles.

Declaration count principles

For the reporting period, AEMO determined the total count for LOR conditions based on the following principles:

- All market notices making the initial declaration of a forecast or actual LOR condition with an effective date during the reporting period were counted.
- Any market notices which updated previously issued forecast or actual LORs at the same level for a given effective date (in relation to the reserve requirement, reserve capacity available, or effective period) were not counted, to prevent double-counting of a continuing condition.
- In cases where forecast LORs were cancelled but subsequently re-issued with approximately the same effective period, re-issues were not counted, to prevent double-counting of effective periods.
- Updates to existing LOR conditions where the LOR level changed were counted as separate LOR conditions.
- Any forecast LORs which were subsequently declared as actual LORs at the same LOR level were counted once. In Table 2, these are shown as actual conditions only. For example:
 - Where a forecast LOR1 was issued and later an actual LOR1 was declared for a similar period, only the actual LOR1 was counted.
 - If the initial forecast was for a forecast LOR2 condition and this was later declared as an actual LOR1, this would be counted as two LOR conditions, due to the differing LOR levels.
- Continuous LOR conditions which spanned multiple periods throughout a day are counted as individual LOR declarations for each period covered. For this purpose, a NEM trading day is split into four 6-hour periods: morning peak covers 0400 hrs to 1000 hrs, mid-day covers 1000 hrs to 1600 hrs, evening peak covers 1600 hrs to 2200 hrs, and overnight covers 2200 hrs to 0400 hrs on the next day⁴. The maximum count allocated to each trading day is four.

⁴ This is due to trading day rather than calendar day to prevent double-counting of a continuous condition.

Table 2 Summary of forecast and actual LOR conditions, with causing factors

Effective date ^A	Region	LOR1		LOR2		LOR3		Cause and resolution
		Actual	Forecast	Actual	Forecast	Actual	Forecast	
3/04/2023	NSW		1					With a 4 day lead time, a forecast LOR1 was declared and cancelled several times with an effective period ranged 17:30 – 19:00. The forecast LOR1 condition worsened due to changes in generation availability and net imports (MN 107096, MN 107124, MN 107190, MN 107193, MN 107195, MN 107199).
4/04/2023	NSW		1					A forecast LOR1 was declared with effective period 17:30 – 19:00 (5 day lead time) due to decreased generation availability (MN 107097). The forecast LOR1 condition was cancelled due to increased generation availability (MN 107125).
5/04/2023	NSW		1					A forecast LOR1 was declared with effective period 17:30 – 19:00 (6 day lead time) due to decreased generation availability (MN 107098). The forecast LOR1 condition was cancelled due to increased generation availability (MN 107126).
6/04/2023	NSW		1					A forecast LOR1 was declared with effective period 17:30 – 19:00 (6 day lead time) due to decreased generation availability (MN 107099). The forecast LOR1 condition was cancelled due to increased generation availability (MN 107127).
29/04/2023	NSW		1		1			Mid-day: With a 39 hour lead time, a forecast LOR2 condition with effective period 14:00 - 15:00 was declared and cancelled twice, due to changing generation availability (MN 107626, MN 107627, MN 107630, MN 107636). Evening peak: A forecast LOR1 was declared with effective period 17:00 – 18:30 (28 hour lead time) due to decreased generation availability and net imports (MN 107638). The forecast LOR1 condition was updated to effective period 17:30 – 18:00 and later cancelled due to increased generation availability and net imports (MN 107642, MN 107645).
30/04/2023	NSW		1		1			A forecast LOR2 was declared with effective period 16:30 – 17:00 (53 hour lead time) due to decreased generation availability (MN 107635). The forecast LOR2 condition was cancelled due to increased generation availability (MN 107639). With a 50 hour lead time, a forecast LOR1 condition with effective period 16:30 - 17:00 was declared and cancelled several times, due to changing generation availability (MN 107640, MN 107648, MN 107650).
1/05/2023	NSW		1					With a 3 day lead time, a forecast LOR1 condition with effective period ranging from 17:30 - 19:00 was declared and cancelled twice, due to changing generation availability (MN 107641, MN 107649, MN 107651, MN 107652).

Lack of Reserve conditions declared

Effective date ^A	Region	LOR1		LOR2		LOR3		Cause and resolution
		Actual	Forecast	Actual	Forecast	Actual	Forecast	
2/05/2023	NSW		1					A forecast LOR1 was declared with effective period 17:00 – 19:00 (7 hour lead time) due to decreased generation availability (MN 107684). The forecast LOR1 condition was updated to effective period 17:30 – 18:30 and later cancelled due to increased generation availability (MN 107685, MN 107691).
3/05/2023	NSW		1					A forecast LOR1 was declared with effective period 18:00 – 18:30 (1 hour lead time) due to decreased generation availability (MN 107710). The forecast LOR1 condition was cancelled due to increased generation availability (MN 107711).
4/05/2023	NSW	1						A forecast LOR1 was declared with effective period 17:00 – 21:00 (6 hour lead time) due to decreased generation availability (MN 107715). The forecast LOR1 condition was updated to effective period 17:30 – 19:30 (5 hour lead time), improving due to increased generation availability (MN 107721). An actual LOR1 condition was present between 17:30 – 20:00 due to decreased generation availability and was cancelled due to increased net imports (MN 107744, MN 107745).
5/05/2023	NSW	1			1			A forecast LOR2 was declared with effective period 17:30 – 19:00 (30 hour lead time) due to decreased generation availability (MN 107718). The forecast LOR2 condition was cancelled due to increased generation availability (MN 107722). With a 29 hour lead time, a forecast LOR1 condition with effective period ranging from 17:30 - 19:00 was declared and updated several times, due to changing net imports (MN 107726, MN 107746, MN 107748, MN 107749). An actual LOR1 condition was present between 18:00 – 19:00 due to decreased generation availability and was cancelled when the effective period elapsed (MN 107756, MN 107757).
6/05/2023	NSW	1						A forecast LOR1 was declared with effective period 17:30 – 18:00 (2 hour lead time) due to decreased generation availability and increased forecast demand (MN 107764). An actual LOR1 condition was present between 17:30 – 18:30 due to decreased generation availability and increased forecast demand and was cancelled when the effective period elapsed (MN 107767, MN 107768).
7/05/2023	NSW	1						A forecast LOR1 was declared with effective period 17:30 – 19:30 (7 hour lead time) due to decreased generation availability (MN 107769). An actual LOR1 condition was present between 17:30 – 20:00 due to decreased generation availability and was cancelled when the effective period elapsed (MN 107778, MN 107779).

Lack of Reserve conditions declared

Effective date ^A	Region	LOR1		LOR2		LOR3		Cause and resolution
		Actual	Forecast	Actual	Forecast	Actual	Forecast	
8/05/2023	NSW	1			1			<p>With a 5 day lead time, forecast LOR1 and LOR2 conditions were declared, updated and cancelled several times, due to changing effective period and forecast reserve level. The effective period ranged from 16:30 - 20:00. The forecast LOR conditions worsened due to changes in generation availability and net imports (MN 107706, MN 107719, MN 107723, MN 107729, MN 107752, MN 107770, MN 107773, MN 107771, MN 107774, MN 107782, MN 107784, MN 107792).</p> <p>An actual LOR1 condition was present between 18:00 – 19:00 due to decreased generation availability and was cancelled when the effective period elapsed (MN 107794, MN 107795).</p>
9/05/2023	NSW		1		1			<p>A forecast LOR1 was declared with effective period 17:00 – 19:30 (6 day lead time) due to decreased generation availability (MN 107707).</p> <p>With a 5 day lead time, the forecast LOR condition worsened due to changes in generation availability and was re-declared as a forecast LOR2 with effective period 17:30 – 19:00 (MN 107720, MN 107753).</p> <p>The forecast LOR2 condition was cancelled due to increased generation availability (MN 107724).</p>
17/05/2023	NSW	1						<p>An actual LOR1 condition was present between 18:00 – 18:30 with no prior forecast due to decreased generation availability and was cancelled when the effective period elapsed (MN 107948, MN 107949).</p>
22/05/2023	NSW	1						<p>A forecast LOR1 was declared with effective period 18:00 – 18:30 due to decreased generation availability (MN 107992).</p> <p>An actual LOR1 condition was present between 18:00 – 18:30 due to decreased generation availability and was cancelled when the effective period elapsed (MN 107993, MN 107994).</p>
23/05/2023	NSW	2			1			<p>Morning peak: An actual LOR1 condition was present between 07:00 - 07:30 with no prior forecast due to increased forecast demand and was cancelled when the effective period elapsed (MN 107999, MN 108000).</p> <p>Evening peak: With a 68 hour lead time, forecast LOR1 and LOR2 conditions with effective period ranging from 17:30 - 20:30 were declared and cancelled several times, due to changing generation availability and FUM level (MN 107976, MN 107981, MN 107985, MN 107987, MN 107991, MN 108003, MN 108004, MN 108005, MN 108006, MN 108018, MN 108020).</p> <p>An actual LOR1 condition was present between 17:00 – 21:30 due to decreased generation availability and was cancelled when the effective period elapsed. (MN 108016, MN 108019, 108024).</p>
24/05/2023	NSW	2						<p>Morning peak: A forecast LOR1 was declared with effective period 07:00 – 08:00 (11 hour lead time) due to decreased net imports (MN 108023).</p>

Lack of Reserve conditions declared

Effective date ^A	Region	LOR1		LOR2		LOR3		Cause and resolution
		Actual	Forecast	Actual	Forecast	Actual	Forecast	
								<p>An actual LOR1 condition was present between 06:30 – 07:30 due to decreased net imports and was cancelled when the effective period elapsed (MN 108032, MN 108041).</p> <p>Evening peak: With a 28 hour lead time, a forecast LOR1 was declared and updated several times with an effective period ranging from 17:00 – 21:00. The forecast LOR1 condition worsened due to changes in generation availability and net imports (MN 108010, MN 108023, MN 108050).</p> <p>An actual LOR1 condition was present between 17:00 - 21:00 due to decreased generation availability and net imports and was cancelled when the effective period elapsed. (MN 108054, MN 108089, MN 108090, MN 108091).</p>
25/05/2023	NSW	2		1				<p>Morning peak: A forecast LOR1 was declared (1 hour lead time) with effective period 07:00 – 07:30 due to decreased generation availability (MN 108094).</p> <p>An actual LOR1 condition was present between 07:00 - 08:00 due to decreased generation availability and was cancelled when the effective period elapsed (MN 108097, MN 108099).</p> <p>Evening peak: With a 13 hour lead time, a forecast LOR1 was declared and updated several times with an effective period ranging from 16:30 – 20:00. The forecast LOR1 condition worsened due to changes in generation availability (MN 108093, MN 108094, MN 108101, MN 108111, MN 108120).</p> <p>An actual LOR1 condition was present between 16:30 - 21:30 due to increased forecast demand and decreased generation availability (MN 108122, MN 108155, MN 108157).</p> <p>An actual LOR2 condition was present between 20:00 - 20:30 due to decreased generation availability and was cancelled when the effective period elapsed (MN 108160, MN 108165).</p>
26/05/2023	NSW	1			1			<p>A forecast LOR1 was declared (6 day lead time) with effective period 17:30 - 19:00 due to increased forecast demand (MN 107968).</p> <p>The forecast LOR1 condition was cancelled due to increased generation availability (MN 108012).</p> <p>With a 67 hour lead time, a forecast LOR2 was declared and updated several times with an effective period ranging from 17:30 – 19:30. The forecast LOR2 condition worsened due to changing FUM level and net imports (MN 108026, MN 108042, MN 108045, MN 108046, MN 108053, MN 108092, MN 108104, MN 108109).</p> <p>With a 26 hour lead time, the LOR condition was re-declared as a forecast LOR1 with effective period 16:30 - 20:30 due to a reduced FUM level (MN 108112, MN 108187).</p> <p>An actual LOR1 condition was present between 17:30 - 20:30 due to decreased generation availability and net imports and was cancelled when the effective period elapsed (MN 108197, MN 108211).</p>
27/05/2023	NSW	1						<p>With a 24 hour lead time, a forecast LOR1 was declared and cancelled several times with an effective period ranged 17:00 – 19:00. The forecast LOR1 condition worsened</p>

Lack of Reserve conditions declared

Effective date ^A	Region	LOR1		LOR2		LOR3		Cause and resolution
		Actual	Forecast	Actual	Forecast	Actual	Forecast	
								due to changes in generation availability and net imports (MN 108194, MN 108212, MN 108213, MN 108214, MN 108223). An actual LOR1 condition was present between 17:30 - 19:30 due to decreased net imports and was cancelled as generation availability increased (MN 108231, MN 108239).
29/05/2023	NSW		1					A forecast LOR1 was declared (5 day lead time) with effective period 17:30 - 19:00 due to decreased net imports (MN 108048). The forecast LOR1 condition was updated to effective period 18:00 – 18:30 and later cancelled due to increased generation availability (MN 108190, MN 108260).
30/05/2023	NSW	1						A forecast LOR1 was declared (7 hour lead time) with effective period 17:30 - 19:00 due to decreased net imports (MN 108265). An actual LOR1 condition was present between 17:30 - 18:00 due to decreased net imports and was cancelled when the effective period elapsed (MN 108287, MN 108296).
20/06/2023	NSW	1						With a 3 day lead time, a forecast LOR1 was declared, updated and cancelled several times with an effective period ranged 17:30 – 19:00. The forecast LOR1 condition worsened due to changes in net imports (MN 108560, MN 108576, MN 108627, MN 108638). An actual LOR1 condition was present between 17:30 - 19:00 due to decreased net imports and was cancelled when the effective period elapsed (MN 108640, MN 108642).
21/06/2023	NSW	1						With a 50 hour lead time, a forecast LOR1 was declared and cancelled twice with an effective period ranged 17:30 – 19:30. The forecast LOR1 condition worsened due to changes in net imports (MN 108629, MN 108639). An actual LOR1 condition was present between 17:30 - 19:30 and was cancelled due to decreased forecast demands (MN 108647, MN 108648).
22/06/2023	NSW		1					With a 4 day lead time, a forecast LOR1 was declared and cancelled several times with an effective period ranged 17:30 – 18:30. The forecast LOR1 condition worsened due to changes in generation availability (MN 108577, MN 108630, MN 108644, MN 108649, MN 108669, MN 108672).
3/04/2023	QLD		1					With an 18 hour lead time, a forecast LOR1 with effective period 18:00 – 18:30 was declared and cancelled twice, due to changing generation availability (MN 107189, MN 107192, MN 107196, MN 107200).
5/04/2023	QLD		1					A forecast LOR1 was declared with effective period 17:30 – 19:00 (3 hour lead time) due to decreased generation availability (MN 107246). The forecast LOR1 condition was cancelled due to increased generation availability (MN 107251).

Lack of Reserve conditions declared

Effective date ^A	Region	LOR1		LOR2		LOR3		Cause and resolution
		Actual	Forecast	Actual	Forecast	Actual	Forecast	
11/04/2023	QLD	1						<p>A forecast LOR1 was declared with effective period 18:00 – 18:30 (22 hour lead time) due to increased forecast demand (MN 107389).</p> <p>Several updates to the forecast LOR1 condition were issued (12 hour lead time) due to changes in effective period and forecast reserve level. The effective period ranged 17:30 – 20:00. The forecast LOR condition worsened due to changes in forecast demand (MN 107392, MN 107398).</p> <p>An actual LOR1 condition was present between 17:30 – 20:00 due to decreased generation availability and was cancelled due to increased generation availability (MN 107406, MN 107409).</p>
12/04/2023	QLD	1			1			<p>With a 26 hour lead time, forecast LOR1 conditions with effective periods 17:30 - 20:30 and 21:00 - 22:00 were declared and updated several times, due to changing generation availability and net imports (MN 107399, MN 107413).</p> <p>A forecast LOR2 was declared with effective period 18:00 – 18:30 (11 hour lead time) due to decreased generation availability (MN 107416).</p> <p>The forecast LOR2 condition was re-declared as a forecast LOR1 (9 hour lead time) condition due to increased generation availability (MN 107417, MN 107418).</p> <p>An actual LOR1 condition was present between 17:30 – 20:00 due to decreased generation availability and net imports and was cancelled due to increased generation availability (MN 107429, MN 107431).</p>
14/04/2023	QLD		1					<p>A forecast LOR1 was declared with effective period 18:00 – 18:30 (8 hour lead time) due to decreased generation availability (MN 107466).</p> <p>The forecast LOR1 condition was cancelled due to increased generation availability (MN 107468).</p>
16/04/2023	QLD	1						<p>With a 28 hour lead time, forecast LOR1 conditions were declared, updated, and cancelled several times, due to changing effective period and forecast reserve level. The effective period ranged 17:30 – 19:00. The forecast LOR conditions worsened due to changes in generation availability (MN 107473, MN 107475, MN 107478, MN 107488, MN 107490, MN 107493, MN 107494).</p> <p>An actual LOR1 condition was present between 18:00 – 19:00 due to decreased generation availability and was cancelled when the effective period elapsed (MN 107495, MN 107499).</p>
17/04/2023	QLD	1						<p>With a 6 day lead time, forecast LOR1 conditions were declared, updated, and cancelled several times, due to changing effective period and forecast reserve level. The effective period ranged 17:00 – 19:30. The forecast LOR conditions worsened due to changes in generation availability and net imports (MN 107395, MN 107421, MN 107443, MN 107471, MN 107501, MN 107505).</p>

Lack of Reserve conditions declared

Effective date ^A	Region	LOR1		LOR2		LOR3		Cause and resolution
		Actual	Forecast	Actual	Forecast	Actual	Forecast	
								An actual LOR1 condition was present between 17:30 – 19:00 due to decreased generation availability and was cancelled when the effective period elapsed (MN 107512, MN 107513).
19/04/2023	QLD		1					A forecast LOR1 was declared with effective period 18:00 – 18:30 (7 days lead time) due to decreased generation availability and net imports (MN 107420). The forecast LOR1 condition was cancelled due to increased generation availability (MN 107513).
8/05/2023	QLD		1		1			A forecast LOR2 was declared with effective period 18:00 – 18:30 (4 days lead time) due to decreased net imports (MN 107716). The forecast LOR2 condition was cancelled due to increased net imports (MN 107727). A forecast LOR1 was declared with effective period 17:30 – 19:00 (4 days lead time) due to decreased generation availability (MN 107728). The forecast LOR1 condition was cancelled due to increased generation availability (MN 107754).
9/05/2023	QLD		1		1			With a 6 day lead time, forecast LOR1 and LOR2 conditions were declared and cancelled several times, due to changing effective period and forecast reserve level. The effective period ranged 17:30 – 18:30. The forecast LOR conditions worsened or improved due to changes in generation availability and net imports (MN 107705, MN 107751, MN 107717, MN 107725, MN 107800, MN 107808).
10/05/2023	QLD		1					A forecast LOR1 was declared with effective period 17:30 – 18:00 (12 hours lead time) due to decreased net imports (MN 107810). The forecast LOR1 condition was cancelled due to increased generation availability (MN 107816).
23/05/2023	QLD		1					With a 10 hour lead time, forecast LOR1 conditions were declared and cancelled twice, due to changing forecast reserve level. The effective period was 18:00 – 19:00. The forecast LOR conditions improved due to changes in net imports (MN 108001, MN 108007, MN 108017, MN 108022).
25/05/2023	QLD	1						A forecast LOR1 was declared with effective period 17:30 – 18:30 (8 hours lead time) due to decreased net imports (MN 108100). An actual LOR1 condition was present between 17:30 – 18:30 due to decreased generation availability and net imports and was cancelled when the effective period elapsed (MN 108136, MN 108153).
30/05/2023	QLD	1						With a 5 day lead time, forecast LOR1 conditions were declared, updated and cancelled several times, due to changing effective period and forecast reserve level. The effective period ranged 17:30 – 19:00. The forecast LOR conditions worsened due to changes in generation availability (MN 108114, MN 108261, MN 108264, MN 108268).

Lack of Reserve conditions declared

Effective date ^A	Region	LOR1		LOR2		LOR3		Cause and resolution
		Actual	Forecast	Actual	Forecast	Actual	Forecast	
								An actual LOR1 condition was present between 17:30 – 18:00 due to decreased generation availability and net imports and was cancelled when the effective period elapsed (MN 108286, MN 108295).
31/05/2023	QLD		1					A forecast LOR1 was declared with effective period 6:30 – 7:00 (6 days lead time) due to decreased generation availability (MN 108115). The forecast LOR1 condition was cancelled due to increased generation availability (MN 108189).
04/05/2023	SA		1					A forecast LOR1 was declared and updated several times (18 hour lead time), due to changing effective period and forecast reserve level. The effective period ranged 06:00 - 08:30. The reserve condition worsened or improved due to changes in net import and generation availability (MN 107702, MN 107709, MN107712, MN 107713). The forecast LOR1 condition was cancelled due to decreased forecast operational demand (MN 107714).
10/05/2023	SA		2		2			Morning peak: With a 7 day lead time, forecast LOR1 and LOR2 conditions were declared, updated and cancelled several times, due to changing effective period and forecast reserve level. The effective period ranged 07:00 – 09:00. The forecast LOR conditions worsened or improved due to changes in generation availability (MN 107708, MN 107730, MN 107772, MN 107780, MN 107781, MN 107785, MN 107787, MN 107788, MN 107804, MN 107806). Evening peak: A forecast LOR1 was declared and cancelled twice with effective period 17:30 – 18:30 (7 day lead time and 3 day lead time) due to changed generation availability and forecast operational demand (MN 107708, MN 107730, MN 107775, MN 107789). With a 66 hour lead time, forecast LOR2 conditions were declared, updated, and cancelled several times, due to changing effective period and forecast reserve level. The effective period ranged 17:00 – 18:00. The forecast LOR conditions worsened or improved due to changes in FUM level and generation availability (MN 107780, MN 107781, MN 107785, MN 107787, MN 107788, MN 107802, MN 107805).
12/05/2023	SA		1		1			A forecast LOR1 was declared with effective period 07:30 – 08:30 (4 day lead time) due to decreased generation availability (MN 107790). The forecast LOR1 condition was cancelled due to increased generation availability (MN 107807). With a 4 day lead time, forecast LOR2 conditions were declared, updated, and cancelled several times, due to changing effective period and forecast reserve level. The effective period ranged 07:00 – 09:00. The forecast LOR conditions worsened or improved due to changes in generation availability, FUM level and net import (MN 107786, MN 107796, MN 107798, MN 107799, MN 107801, MN 107803, MN 107811, MN 107817, MN 107821, MN 107822, MN 107823).

Lack of Reserve conditions declared

Effective date ^A	Region	LOR1		LOR2		LOR3		Cause and resolution
		Actual	Forecast	Actual	Forecast	Actual	Forecast	
17/05/2023	SA		3		1			<p>Morning peak: A forecast LOR1 was declared with effective period 06:30 – 09:00 (5 day lead time) due to decreased generation availability (MN 107843). The forecast LOR1 condition was updated to effective period 07:00 – 09:00 and later cancelled due to increased generation availability (MN 107863, MN 107881).</p> <p>Evening peak: With a 7 day lead time, forecast LOR1 conditions were declared, updated, and cancelled several times, due to changing effective period and forecast reserve level. The effective period ranged 17:00 – 22:00. The forecast LOR conditions worsened or improved due to changes in generation availability and forecast operational demand (MN 107818, MN 107843, MN 107863, MN 107877, MN 107881).</p> <p>A forecast LOR2 was declared with effective period 19:00 – 19:30 (5 day lead time) due to increased forecast operational demand (MN 107839). The forecast LOR2 condition was updated to effective period 18:30 – 20:00 and later cancelled due to increased generation availability (MN 107848, MN 107862).</p> <p>Overnight: A forecast LOR1 was declared with effective period 22:00 – 03:30 (5 day lead time) due to decreased generation availability (MN 107843, MN 107844). The forecast LOR1 condition was updated to effective period 22:00 – 02:00 (18th) and later cancelled due to increased generation availability (MN 107863, MN 107865, MN 107881, MN 107878).</p>
18/05/2023	SA		1					<p>A forecast LOR1 was declared with effective period 07:00 – 08:30 (5 day lead time) due to decreased generation availability (MN 107844). The forecast LOR1 condition was updated and later cancelled due to increased generation availability (MN 107865, MN 107878).</p>
01/06/2023	SA		1					<p>A forecast LOR1 was declared with effective period 08:30 – 09:30 (20 hour lead time) due to decreased generation availability (MN 108306). The forecast LOR1 condition was cancelled due to increased generation availability (MN 108309).</p>
26/06/2023	SA	1			1			<p>A forecast LOR2 was declared with effective period 18:00 – 19:30 (66 hour lead time) due to decreased generation availability and increased FUM level (MN 108706). The forecast LOR2 condition was updated to effective period 18:00 – 20:00 and later cancelled due to increased generation availability (MN 108707, MN 108712). With a 51 hour lead time, forecast LOR1 conditions were declared and updated several times, due to changing effective period and forecast reserve level. The effective period ranged 18:00 – 20:30. The forecast LOR conditions worsened or improved due to changes in generation availability and forecast operational demand (MN 108715, MN 108737, MN 108739, MN 108749, MN 108754). An actual LOR1 was present with effective period 19:00 – 19:30 due to decreased generation availability (MN 108766).</p>

Lack of Reserve conditions declared

Effective date ^A	Region	LOR1		LOR2		LOR3		Cause and resolution
		Actual	Forecast	Actual	Forecast	Actual	Forecast	
27/06/2023	SA		4		4		1	<p>The actual LOR1 condition was cancelled when the effective period elapsed (MN 108767).</p> <p>Morning peak: A forecast LOR1 was declared with effective period 07:00 – 10:00 (4 day lead time) due to decreased generation availability (MN 108698).</p> <p>The forecast LOR1 condition was updated to effective period 07:30 – 08:00 and later cancelled due to increased net import (MN 108735).</p> <p>With a 3 day lead time, forecast LOR2 conditions were declared, updated, and cancelled several times, due to changing effective period and forecast reserve level. The effective period ranged 07:00 – 10:00. The forecast LOR conditions worsened or improved due to changes in generation availability, FUM level and net import (MN 108706, MN 108708, MN 108714, MN 108721, MN 108728, MN 108738, MN 108741, MN 108750, MN 108752).</p> <p>Mid-day: A forecast LOR1 was declared and updated twice with effective period 10:00 – 15:00 and 15:30 – 16:00 (4 day lead time) due to changed generation availability (MN 108698, MN 108716, MN 108735).</p> <p>The forecast LOR1 condition was cancelled due to increased net import.</p> <p>With a 3 day lead time, forecast LOR2 conditions were declared, updated, and cancelled several times, due to changing effective period and forecast reserve level. The effective period ranged 10:00 – 12:00 and 14:30 – 16:00. The forecast LOR conditions worsened or improved due to changes in generation availability, FUM level and net import (MN 108706, MN 108708, MN 108714, MN 108728, MN 108748, MN 108750, MN 108752).</p> <p>Evening peak: With a 5 day lead time, forecast LOR2 conditions were declared, updated, and cancelled several times, due to changing effective period and forecast reserve level. The effective period ranged 16:00 – 22:00. The forecast LOR conditions worsened or improved due to changes in generation availability and net import (MN 108681, MN 108693, MN 108697, MN 108704, MN 108706, MN 108708, MN 108714, MN 108721, MN 108725, MN 108728, MN 108730, MN 108738, MN 108741, MN 108748, MN 108750, MN 108752, MN 108756, MN 108757, MN 108759).</p> <p>With a 4 day lead time, forecast LOR1 conditions were declared, updated and cancelled several times, due to changing effective period and forecast reserve level. The effective period ranged 16:30 – 18:30 and 19:00 – 22:00. The forecast LOR conditions worsened or improved due to changes in generation availability and net import (MN 108698, MN 108716, MN 108755, MN 108758, MN 108762).</p> <p>With a 67 hour lead time, forecast LOR3 conditions were declared, updated and cancelled several times, due to changing effective period and forecast reserve level. The effective period ranged 18:00 – 20:00. The forecast LOR conditions worsened or improved due to changes in generation availability and net import (MN 108727, MN 108729, MN 108740, MN 108747, MN 108751).</p>

Effective date ^A	Region	LOR1		LOR2		LOR3		Cause and resolution
		Actual	Forecast	Actual	Forecast	Actual	Forecast	
								<p>Overnight: With a 4 day lead time, forecast LOR1 conditions were declared, updated and cancelled several times, due to changing effective period and forecast reserve level. The effective period ranged 22:00 – 02:30 (28th). The forecast LOR conditions worsened or improved due to changes in generation availability and net import (MN 108698, MN 108699, MN 108716, MN 108717, MN 108736, MN 108760).</p> <p>With a 3 day lead time, forecast LOR2 conditions were declared, updated, and cancelled several times, due to changing effective period and forecast reserve level. The effective period ranged 22:00 – 02:00 (28th). The forecast LOR conditions worsened or improved due to changes in generation availability, FUM level and net import (MN 108706, MN 108708, MN 108709, MN 108713, MN 108728, MN 108730, MN 108738, MN 108741, MN 108748, MN 108750, MN 108752).</p>
28/06/2023	SA		1		3			<p>Morning peak: With a 39 hour lead time, forecast LOR2 conditions were declared, updated, and cancelled several times, due to changing effective period and forecast reserve level. The effective period ranged 07:00 – 10:00. The forecast LOR conditions worsened or improved due to changes in generation availability and FUM level (MN 108764, MN 108771, MN 108773, MN 108776).</p> <p>A forecast LOR1 was declared with effective period 08:30 – 09:00 (19 hour lead time) due to decreased generation availability (MN 108778).</p> <p>The forecast LOR1 condition was cancelled due to increased generation availability (MN 108779).</p> <p>Evening peak: With a 49 hour lead time, forecast LOR2 conditions were declared, updated, and cancelled several times, due to changing effective period and forecast reserve level. The effective period ranged 17:30 – 22:00. The forecast LOR conditions worsened or improved due to changes in generation availability (MN 108764, MN 108771, MN 108773, MN 108775, MN 108776).</p> <p>Overnight: With a 49 hour lead time, forecast LOR2 conditions were declared, updated, and cancelled several times, due to changing effective period and forecast reserve level. The effective period ranged 22:00 – 03:00 (29th). The forecast LOR conditions worsened or improved due to changes in generation availability and FUM level (MN 108764, MN 108765, MN 108769, MN 108770, MN 108771, MN 108774, MN 108776, MN 108777).</p>
29/06/2023	SA				1			<p>With a 68 hour lead time, forecast LOR2 conditions were declared, updated, and cancelled several times, due to changing effective period and forecast reserve level. The effective period ranged 07:00 – 08:30. The forecast LOR conditions worsened or improved due to changes in generation availability and FUM level (MN 108753, MN 108765, MN 108769, MN 108772, MN 108773, MN 108774, MN 108777).</p>
23/05/2023	VIC		2		1			<p>Morning peak: With a 3 day lead time, a forecast LOR1 condition with effective period 07:30 – 08:00 was declared and cancelled twice, due to changing generation availability (MN 107969, MN 107986, MN 107996, MN 107997).</p>

Lack of Reserve conditions declared

Effective date ^A	Region	LOR1		LOR2		LOR3		Cause and resolution
		Actual	Forecast	Actual	Forecast	Actual	Forecast	
								<p>Evening peak: A forecast LOR2 was declared with effective period 17:00 – 17:30 (30 hour lead time) due to decreased generation availability and decreased net import and later cancelled due to increased generation availability (MN 107982, MN 107984).</p> <p>The LOR condition was re-declared as a forecast LOR1 with effective period 17:30 – 18:00 (27 hour lead time) due to increased generation availability and later cancelled due to increased generation availability (MN 107988, MN 107997).</p>
Total		25	37	1	24	0	1	

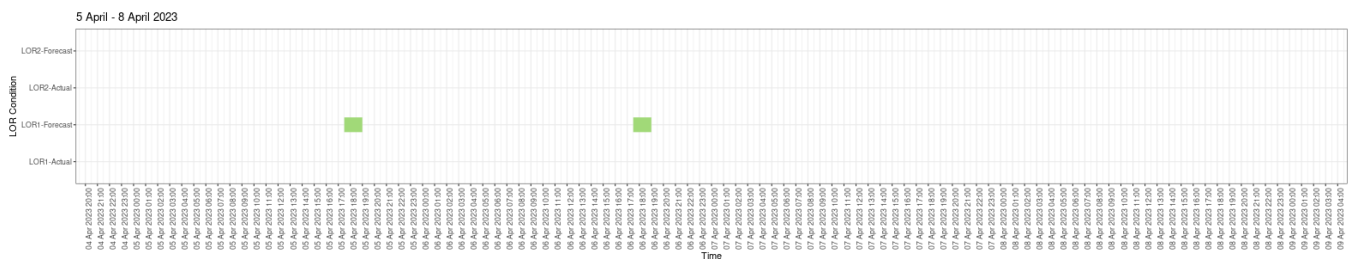
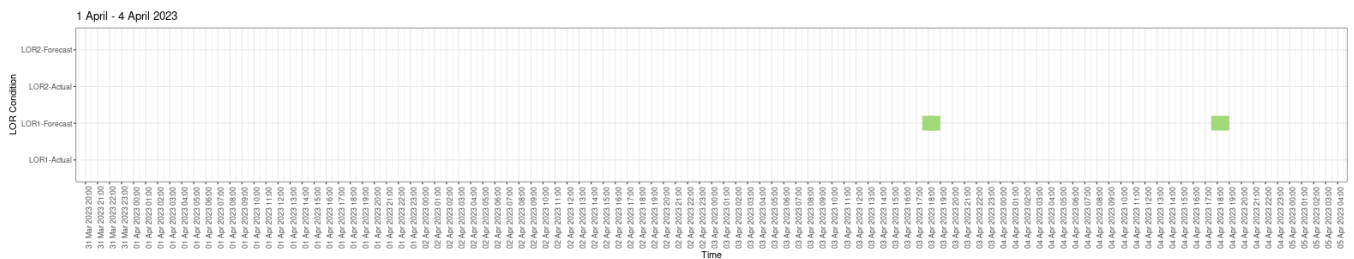
A. Effective date is the date on which the condition occurred or was expected to occur and may differ from the date on which a market notice advising of the forecast or actual condition was issued.

3.1 LOR declarations during the reporting period – Gantt chart

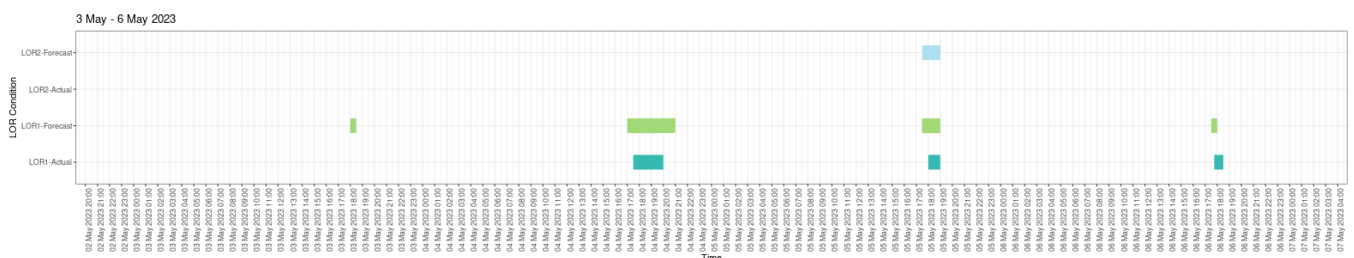
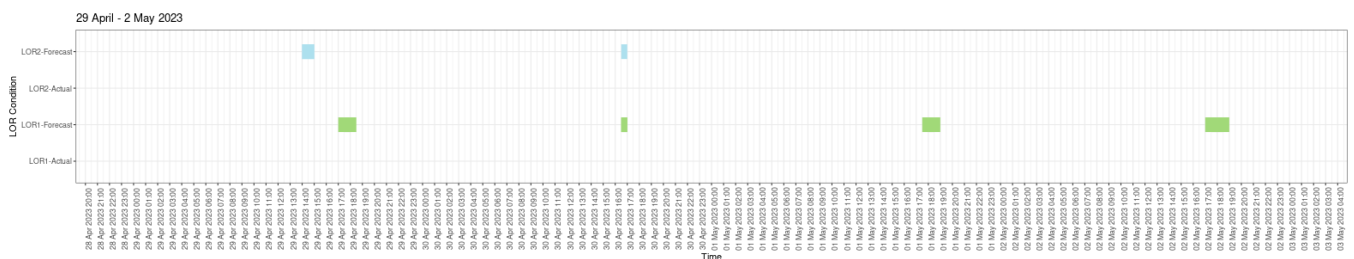
This section shows the LOR declarations during the reporting period 1 April to 30 June 2023 for each region using Gantt charts. Each Gantt chart covers a four-day period. Periods with no LOR declarations were omitted and not graphed.

Forecast and actual LOR1, LOR2 and LOR3 conditions including updates are shaded according to the legend at the bottom of each page for the corresponding effective periods based on the market notices.

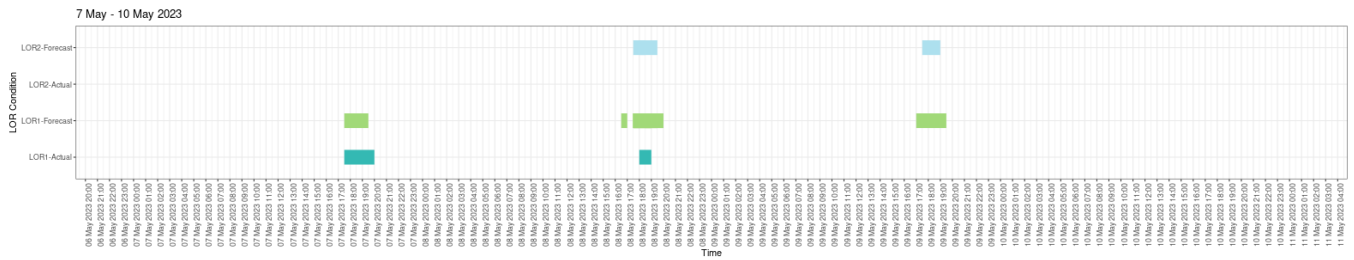
3.1.1 New South Wales



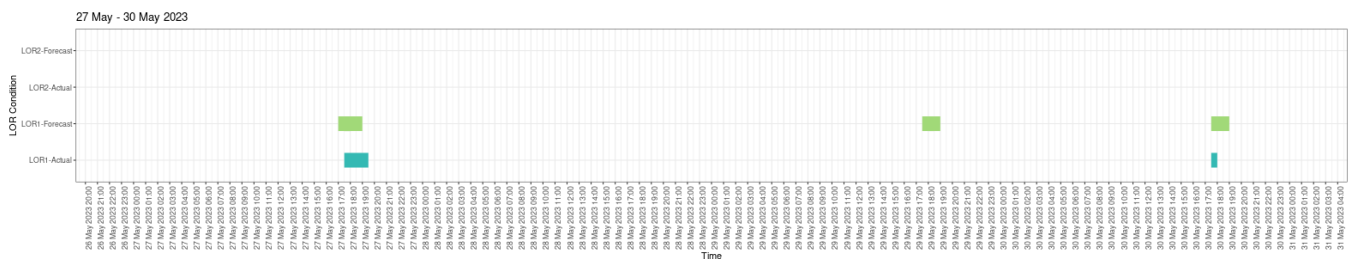
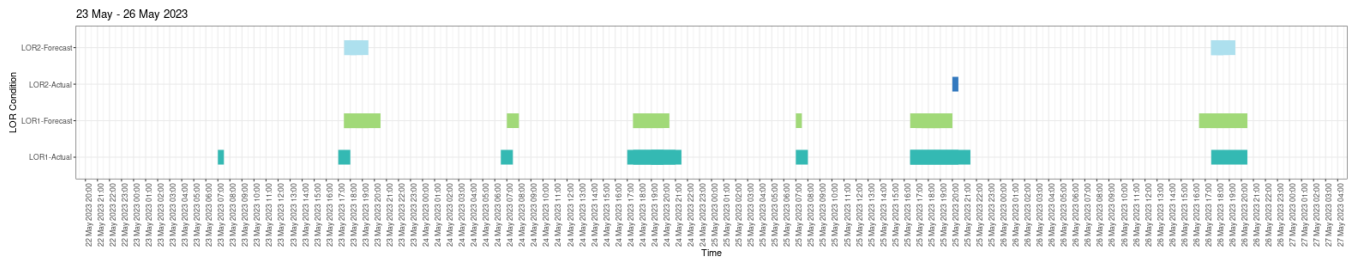
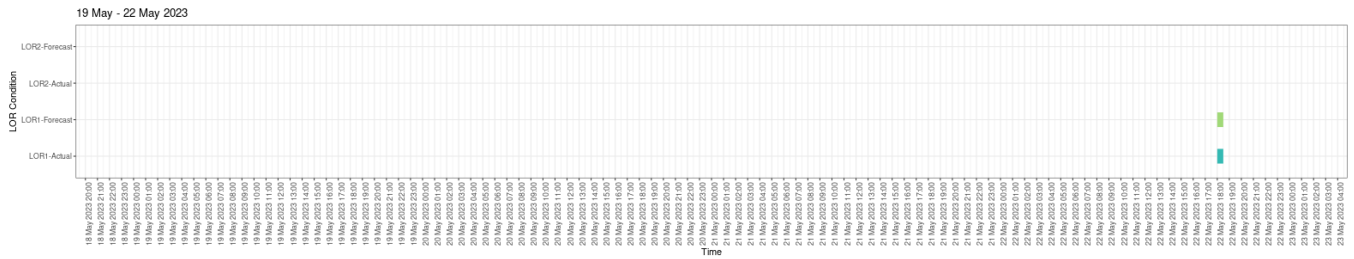
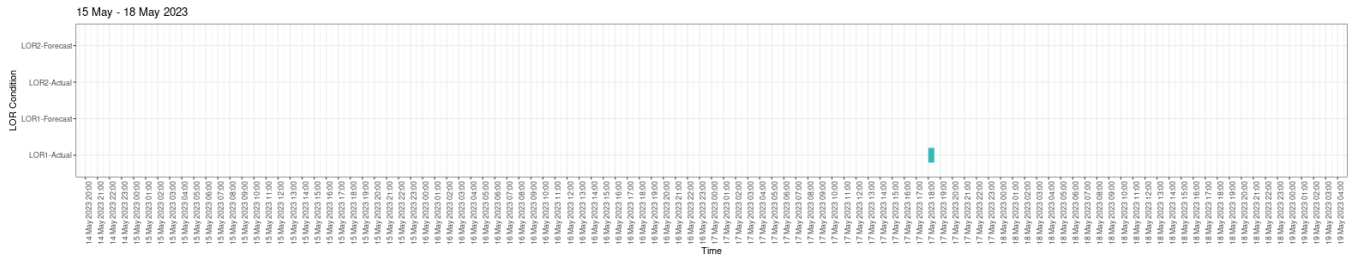
There were no LOR declarations in the period from 9 April to 28 April 2023.



Lack of Reserve conditions declared

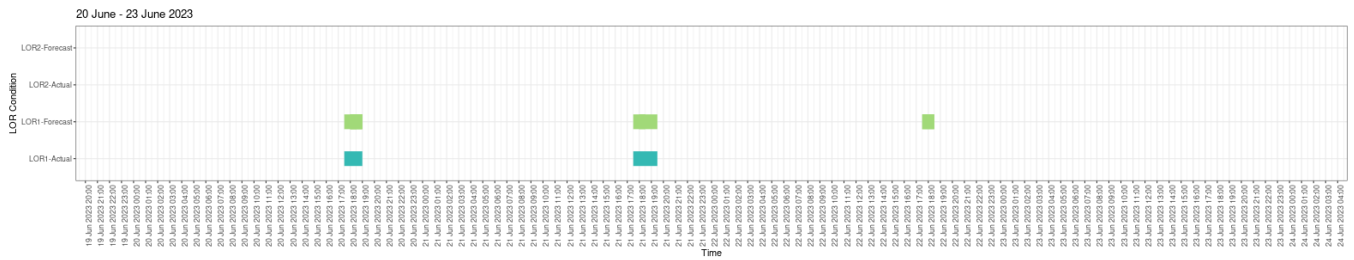


There were no LOR declarations in the period from 11 May to 14 May 2023.



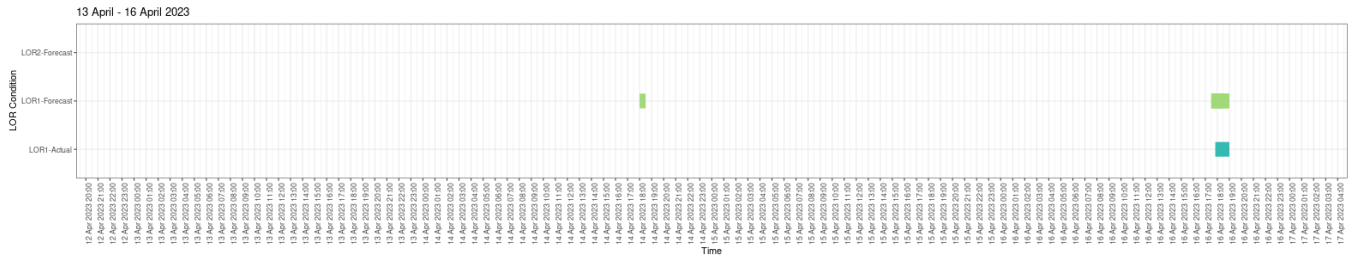
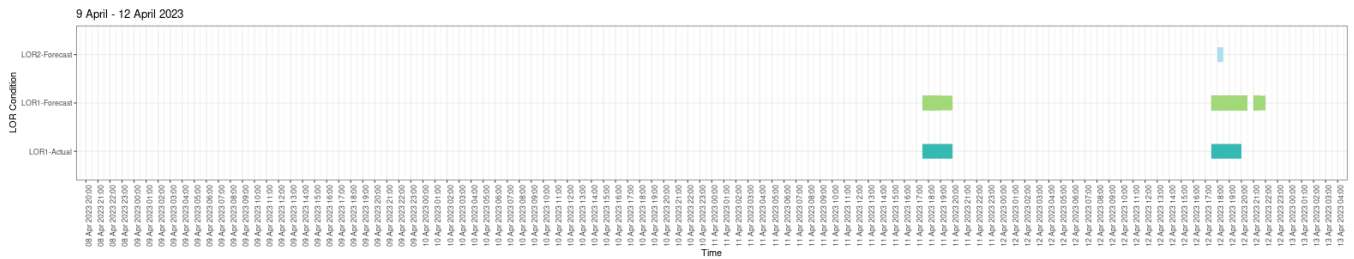
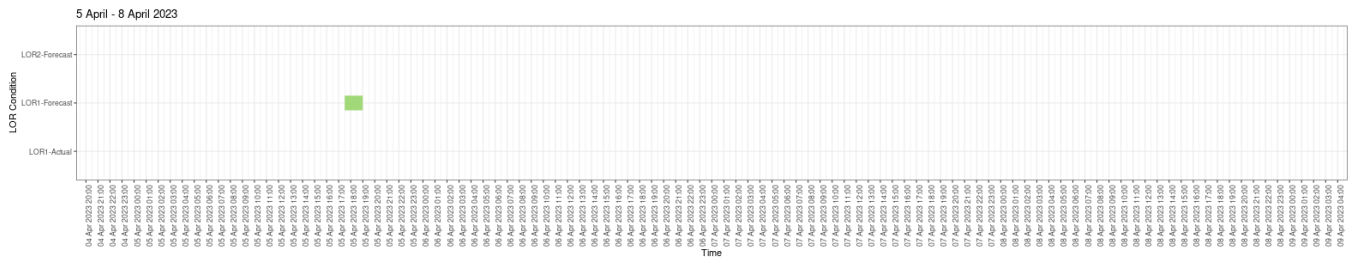
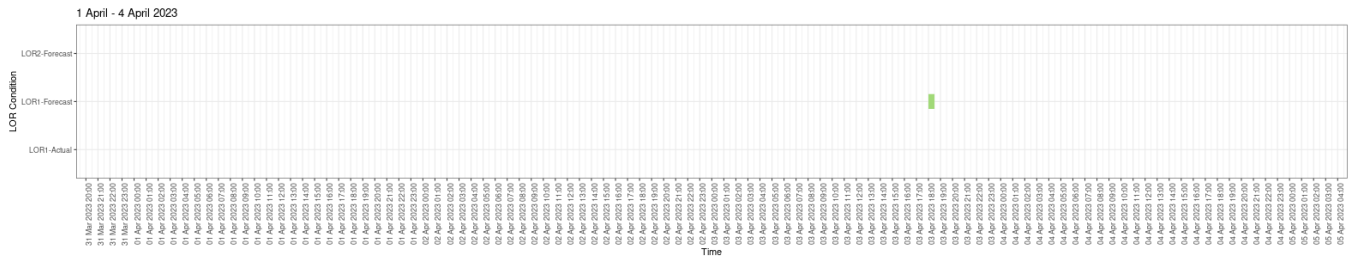
There were no LOR declarations in the period from 31 May to 19 June 2023.



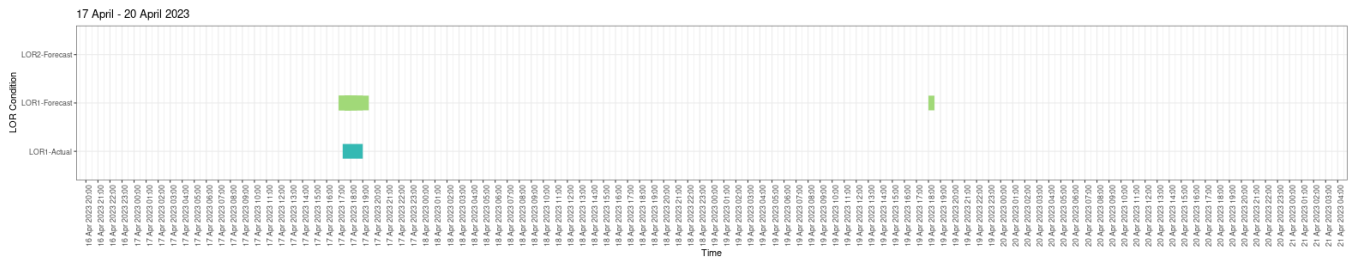


There were no LOR declarations in the period from 24 June to 30 June 2023.

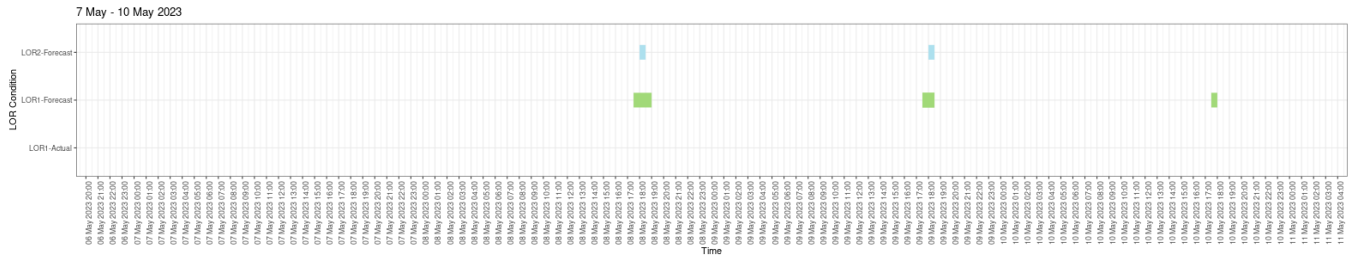
3.1.2 Queensland



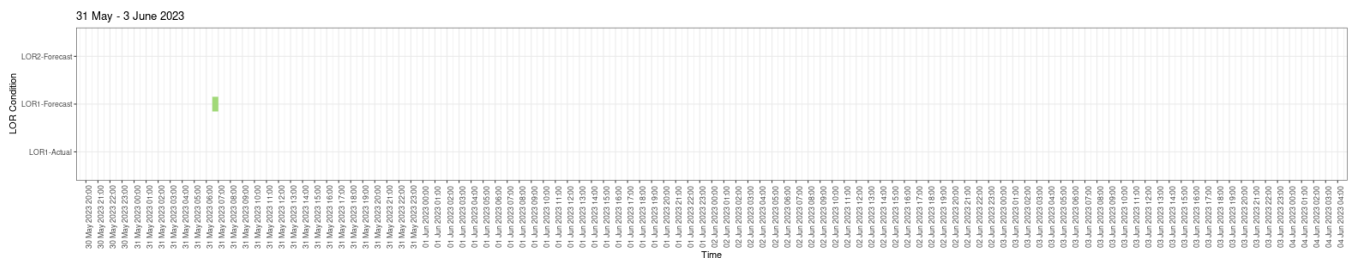
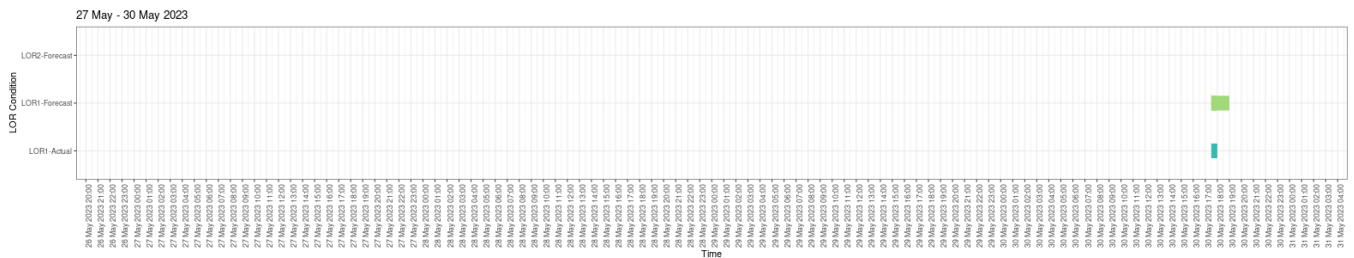
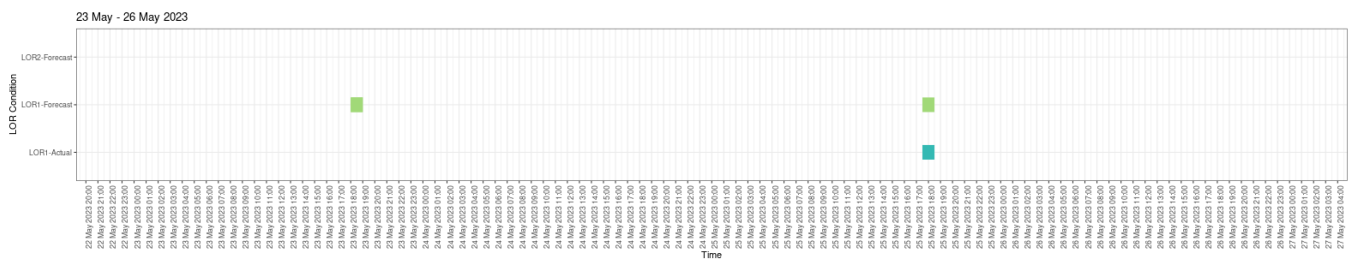
Lack of Reserve conditions declared



There were no LOR declarations in the period from 21 April to 6 May 2023.



There were no LOR declarations in the period from 11 May to 22 May 2023.



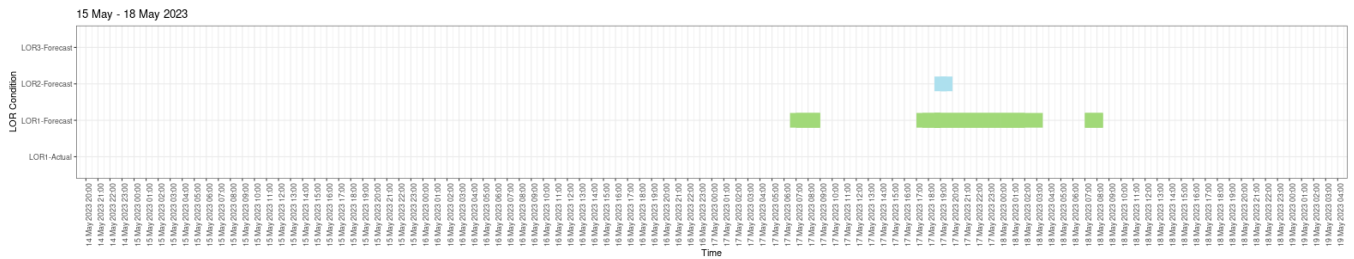
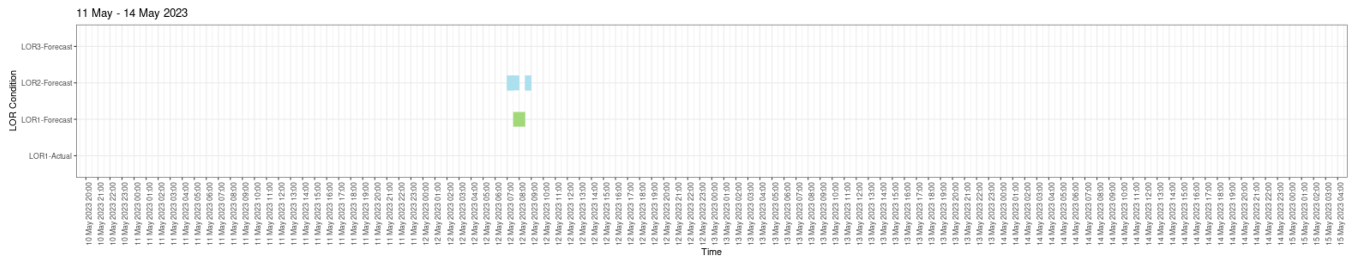
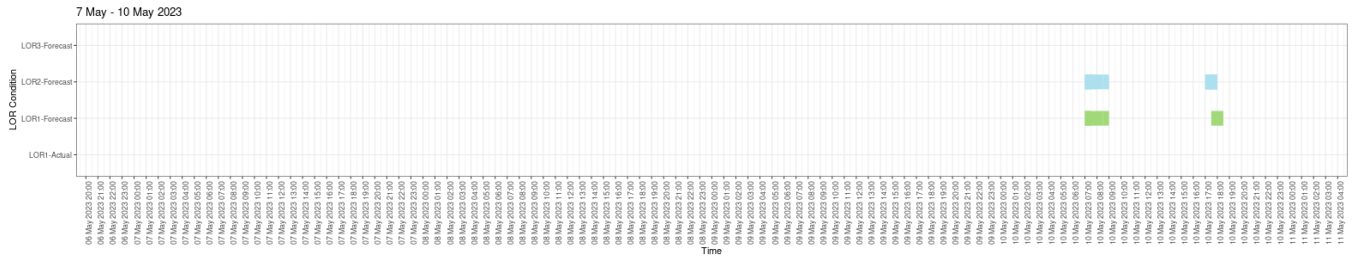
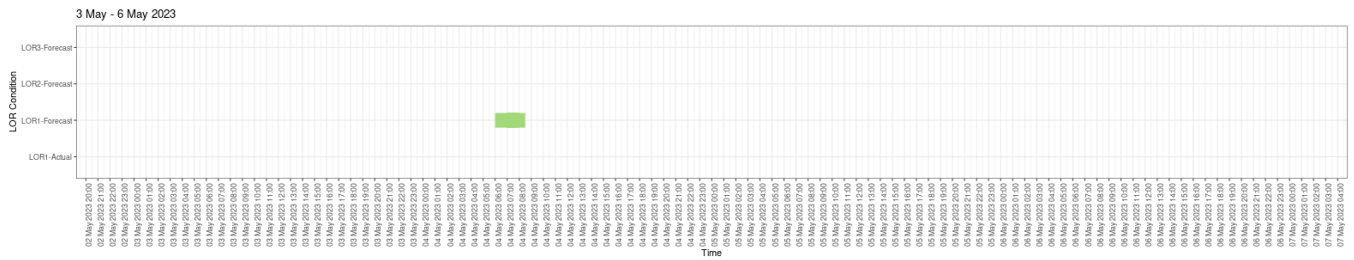
There were no LOR declarations in the period from 4 June to 30 June 2023.

3.1.3 South Australia

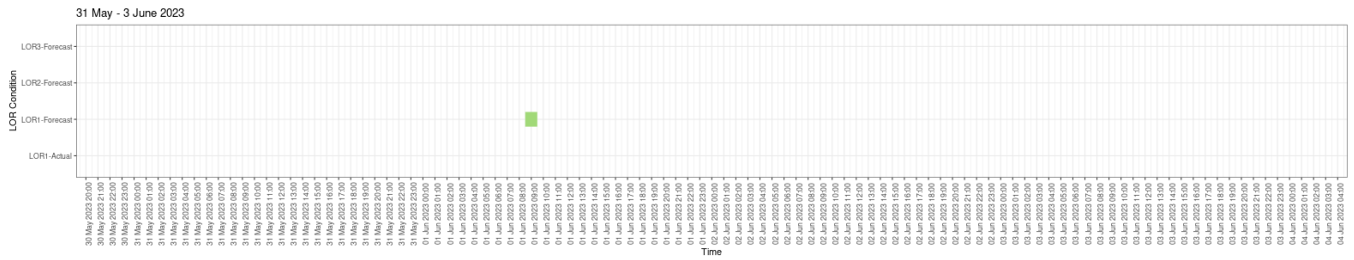
There were no LOR declarations in the period from 1 April to 2 May 2023.



Lack of Reserve conditions declared



There were no LOR declarations in the period from 19 May to 30 May 2023.



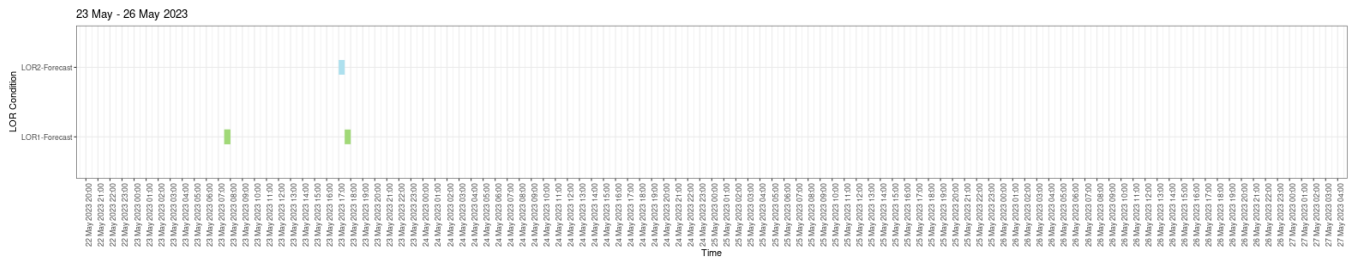
There were no LOR declarations in the period from 4 June to 23 June 2023.





3.1.4 Victoria

There were no LOR declarations in the period from 1 April to 22 May 2023.



There were no LOR declarations in the period from 27 May to 30 June 2023.

3.1.5 Tasmania

There were no LOR declarations in the period from 1 April to 30 June 2023.



4 Review of performance

4.1 Forecast Uncertainty Measure values

As in Section 2.1, this section will compare the 10th, 50th (median) and 90th percentile FUM values for this reporting period to those for each quarter from Quarter 2 2022 to Quarter 2 2023 (Figure 2 to Figure 6). FUM values decreasing is indicative of the distribution tightening with decreasing forecast uncertainty.

The most material changes in FUM values between Quarter 2 2022 and Quarter 2 2023 are summarised in this section. For forecast horizons not mentioned in this section, the changes from Quarter 2 2023 were minor:

- New South Wales – 10th percentile FUM values decreased for the 2, 24 and 60 hours ahead forecast horizons. Median and 90th percentile FUM values decreased for all forecast horizons.
- Queensland – 10th percentile FUM values increased for the 6, 12, and 24 hours ahead forecast horizons. The median FUM values increased across all forecast horizons. 90th percentile FUM values increased across all forecast horizons except the 24 hours ahead forecast horizon which decreased.
- South Australia – 10th percentile FUM values increased for the 6 and 12 hours ahead forecast horizons and decreased for the 24 and 48 hours ahead forecast horizons. Median FUM values decreased for the 60 hours ahead forecast horizon. 90th percentile FUM values increased for the 48 and 60 hours ahead forecast horizons.
- Tasmania – 10th percentile FUM values increased for the 24, 48 and 60 hours ahead forecast horizons. The median FUM values increased across all forecast horizons except the 2 hours ahead forecast horizon which decreased. 90th percentile FUM values increased for the 6, 24, 48, and 60 hours ahead forecast horizons and decreased for the 12 hours ahead forecast horizon.
- Victoria – 10th, median and 90th percentile FUM values decreased across all forecast horizons.



Figure 2 New South Wales region: FUM values for the reporting period, and compared to previous four quarters

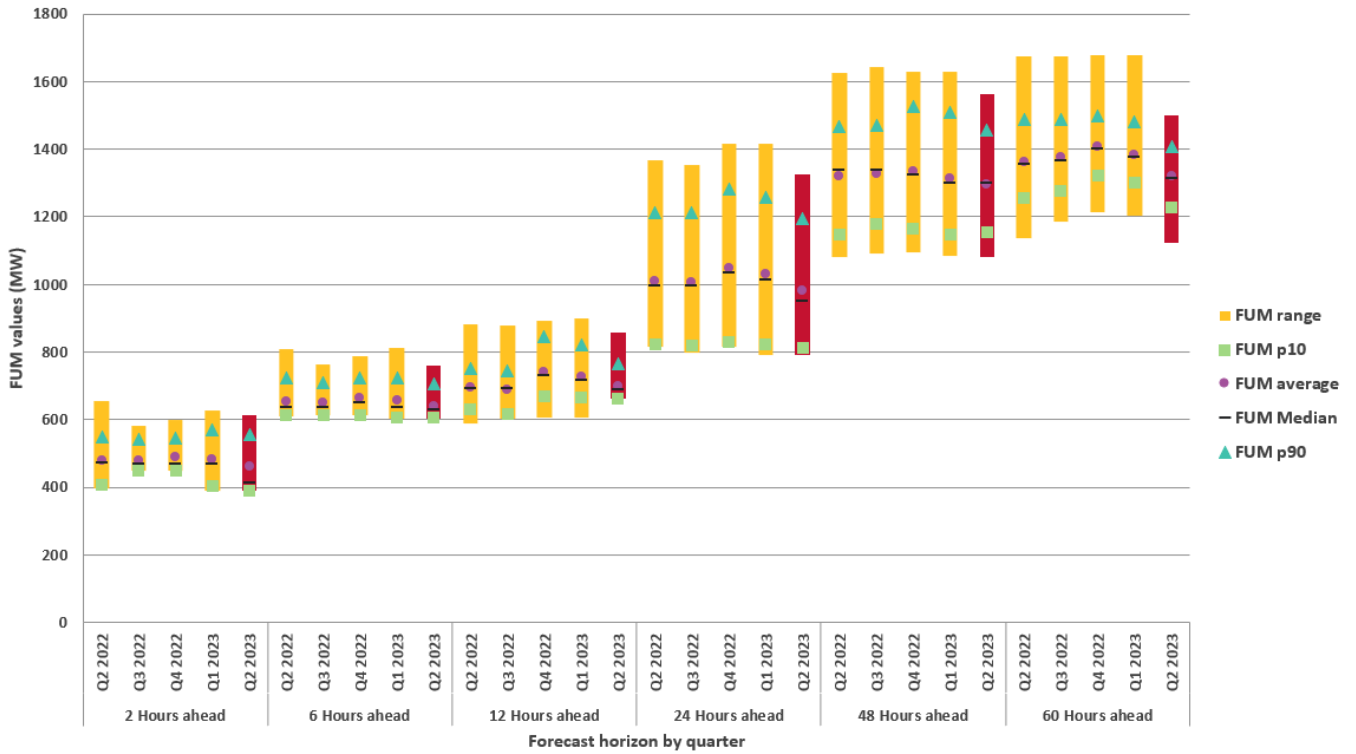


Figure 3 Queensland region: FUM values for the reporting period, and compared to previous four quarters

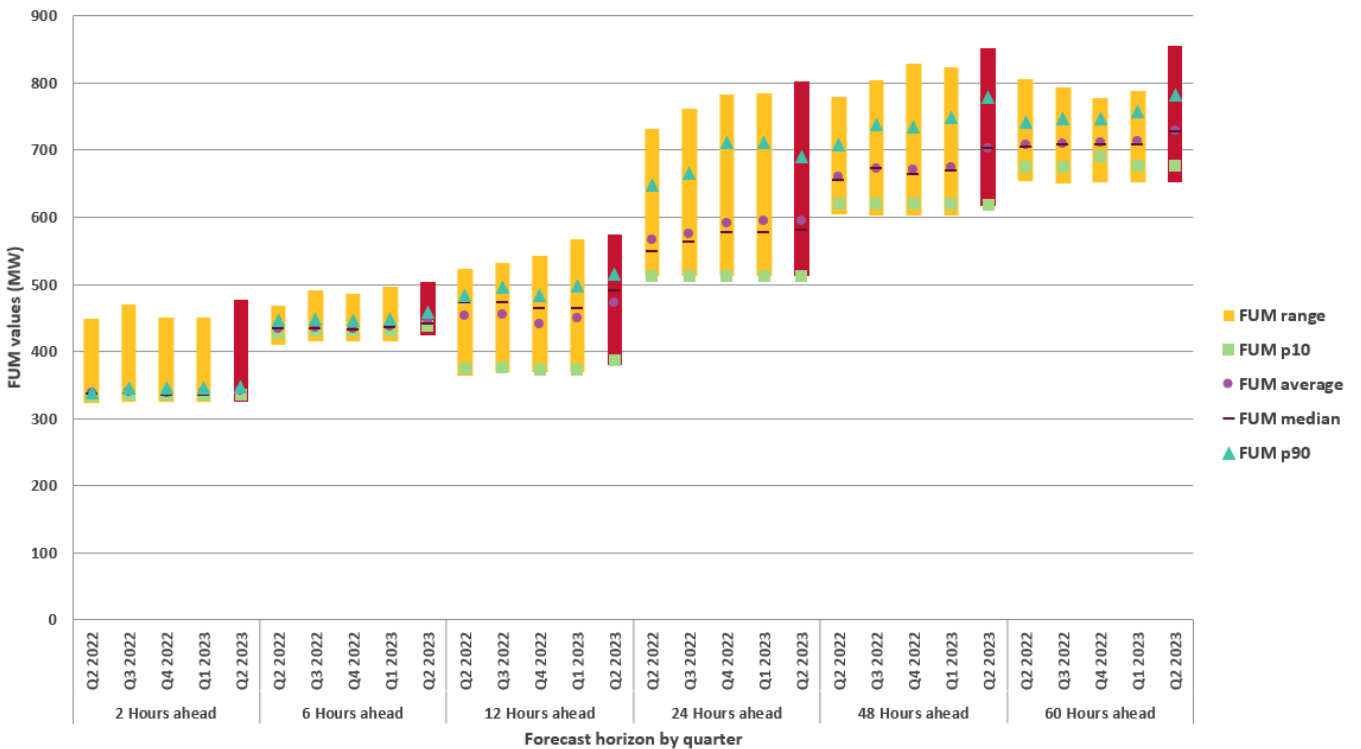




Figure 4 South Australia region: FUM values for the reporting period, and compared to previous four quarters

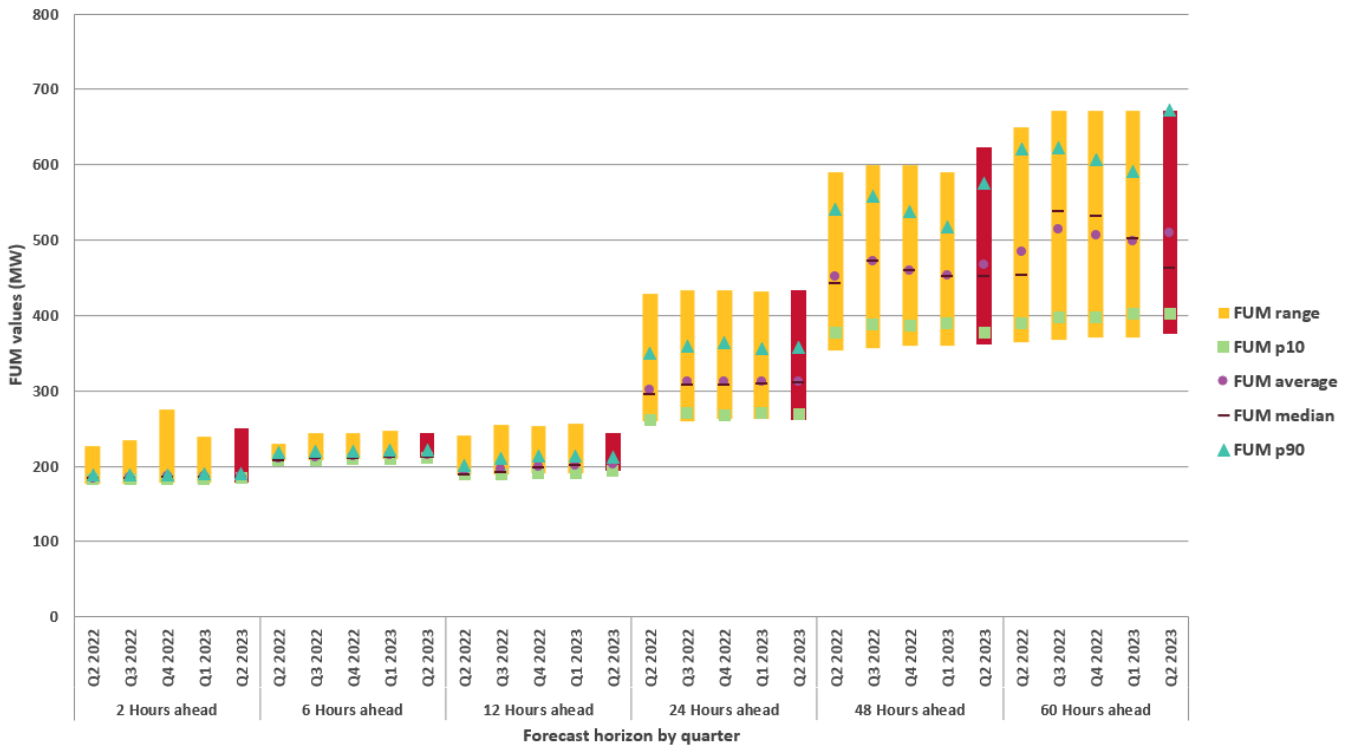


Figure 5 Tasmania region: FUM values for the reporting period, and compared to previous four quarters

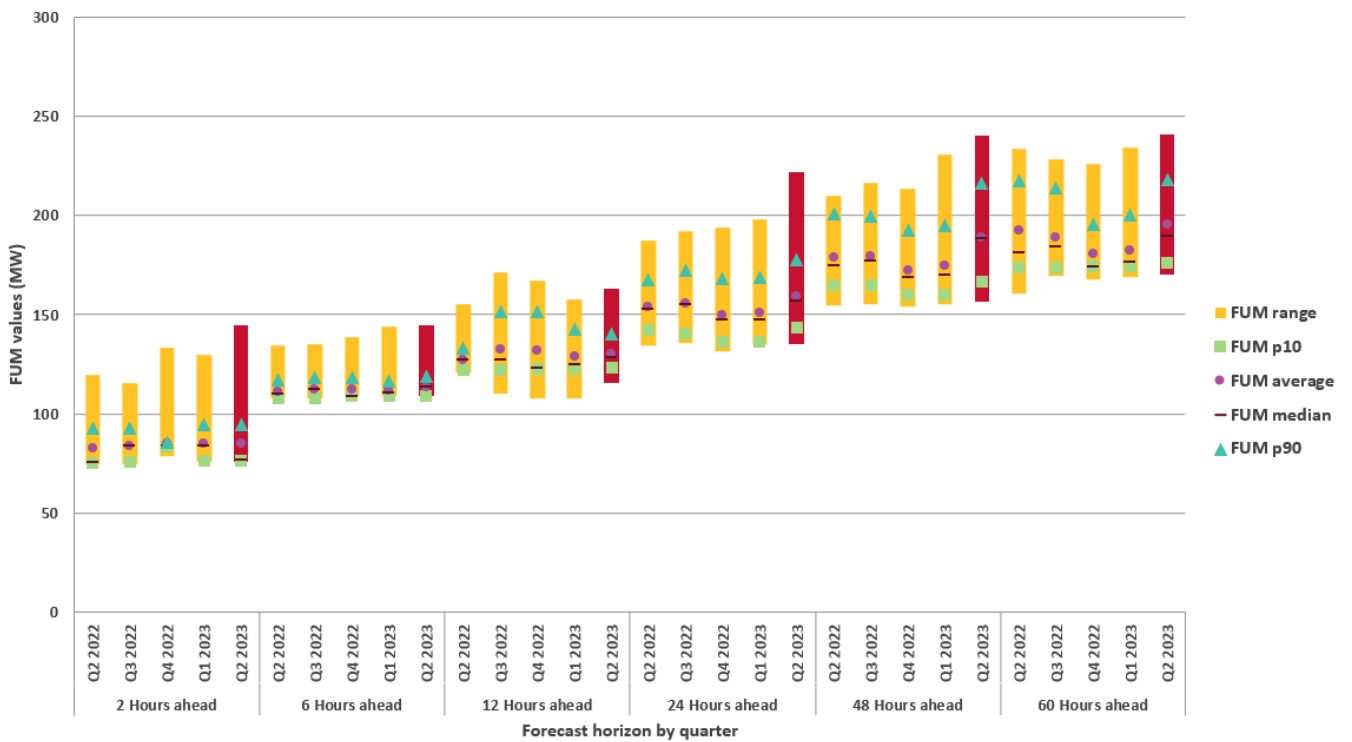
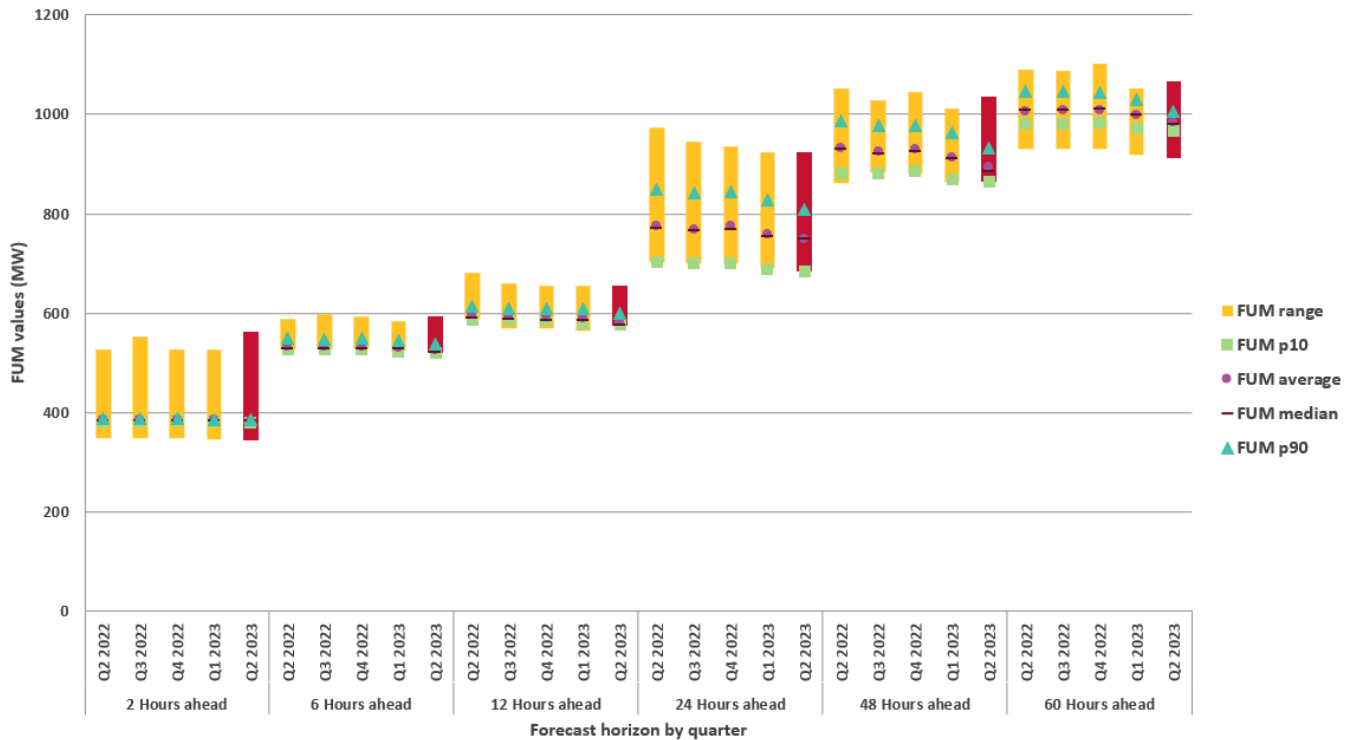




Figure 6 Victoria region: FUM values for the reporting period, and compared to previous four quarters



4.2 Forecast and actual LOR declarations

A summary of the count and causes of declared forecast and actual LOR conditions can be found in Table 2 in Section 3 of this report.

Of the 88 LOR declarations in the reporting period, 62 were for forecast LOR conditions:

- 37 forecast LOR1 conditions were declared.
- 24 forecast LOR2 conditions were declared.
- One forecast LOR3 condition was declared.
- None of the forecast LOR1 conditions were set by the FUM.
- 19 forecast LOR2 conditions were set by the FUM.
- A total of 25 actual LOR1 conditions were declared. Of these, 23 were observed as forecast LOR1 prior to being declared as an actual, therefore not counted as a forecast declaration based on the declaration count principles outlined in Section 3. Two were declared as actual LOR1 conditions without prior forecast.
- There was one actual LOR2 condition declared. It was not observed as a forecast LOR2 condition prior to being declared as an actual.

Table 3 Summary of LOR conditions during reporting period, 1 April to 30 June 2023

Region	LOR1		LOR2		LOR3	
	Actual	Forecast	Actual	Forecast	Actual	Forecast
NSW	18	12	1	7	0	0
QLD	6	9	0	3	0	0
SA	1	14	0	13	0	1
TAS	0	0	0	0	0	0
VIC	0	2	0	1	0	0
Total	25	37	1	24	0	1

Reliability and Emergency Reserve Trader (RERT) activations

During the reporting period, no RERT services were activated⁵.

Table 4 LORs declared during the reporting period by trigger (FUM or LCR)

Effective period	LOR1	LOR2	LOR3
New South Wales (NSW)			
03/04/2023	Forecast		
04/04/2023	Forecast		
05/04/2023	Forecast		
06/04/2023	Forecast		
29/04/2023	Forecast	Forecast	
30/04/2023	Forecast	Forecast	
01/05/2023	Forecast		
02/05/2023	Forecast		
03/05/2023	Forecast		
04/05/2023	Forecast then Actual		
05/05/2023	Forecast then Actual	Forecast	
06/06/2023	Forecast then Actual		
07/05/2023	Forecast then Actual		
08/05/2023	Forecast then Actual	Forecast	
09/05/2023	Forecast	Forecast	
17/05/2023	Actual		
22/05/2023	Forecast then Actual		
23/05/2023	Actual	Forecast	
	Forecast then Actual		
24/05/2023	Forecast then Actual		
	Forecast then Actual		
25/05/2023	Forecast then Actual	Actual	
	Forecast then Actual		

⁵ RERT reporting can be found at <https://aemo.com.au/energy-systems/electricity/emergency-management/reliability-and-emergency-reserve-trader-rert/rert-reporting>.

Effective period	LOR1	LOR2	LOR3
26/05/2023	Forecast then Actual	Forecast	
27/05/2023	Forecast then Actual		
29/05/2023	Forecast		
30/05/2023	Forecast then Actual		
20/06/2023	Forecast then Actual		
21/06/2023	Forecast then Actual		
22/06/2023	Forecast		
Queensland (QLD)			
03/04/2023	Forecast		
05/04/2023	Forecast		
11/04/2023	Forecast then Actual		
12/04/2023	Forecast then Actual	Forecast	
14/04/2023	Forecast		
16/04/2023	Forecast then Actual		
17/04/2023	Forecast then Actual		
19/04/2023	Forecast		
08/05/2023	Forecast	Forecast	
09/05/2023	Forecast	Forecast	
10/05/2023	Forecast		
23/05/2023	Forecast		
25/05/2023	Forecast then Actual		
30/05/2023	Forecast then Actual		
31/05/2023	Forecast		
South Australia (SA)			
04/05/2023	Forecast		
10/05/2023	Forecast	Forecast	
	Forecast	Forecast	
12/05/2023	Forecast	Forecast	
17/05/2023	Forecast	Forecast	
	Forecast		
	Forecast		
18/05/2023	Forecast		
01/06/2023	Forecast		
26/06/2023	Forecast then Actual	Forecast	
27/06/2023	Forecast	Forecast	
	Forecast	Forecast	
	Forecast	Forecast	Forecast
	Forecast	Forecast	
28/06/2023	Forecast	Forecast	
		Forecast	
		Forecast	

Effective period	LOR1	LOR2	LOR3
29/06/2023		Forecast	
Tasmania (TAS)			
NIL			
Victoria (VIC)			
23/05/2023	Forecast	Forecast	
	Forecast		

Note. Yellow shading indicates the requirement was set by the LCR or LCR2, and orange indicates the requirement was set by the FUM.

4.3 Causes of LOR declarations

As summarised in Table 2, a total of 88 LOR conditions were declared during the reporting period: 62 forecast and 26 actual LOR conditions.

Based on Table 2:

- Of the 37 forecast LOR1 conditions declared, 23 resulted in actual LOR1 conditions. These were counted as actual LOR1 conditions based on the declaration count principles outlined in Section 3.
- Of the 24 forecast LOR2 conditions declared, none resulted in an actual LOR2 condition. There was one forecast LOR1 condition which resulted in an actual LOR1 and LOR2 condition. This was counted as an actual LOR2 condition based on the declaration count principles outlined in Section 3.
- There were 14 forecast LOR1 conditions that did not develop into actual LOR1 conditions, and 24 forecast LOR2 conditions that did not develop into actual LOR2 conditions. The reasons were either a market response following the issue of the forecast market notice, or changes to the net import or changes in forecast demand. The market response generally took the form of increased available generation or transmission network service providers (TNSPs) rescheduling planned transmission outages. Some of the forecast LOR conditions were cancelled when the FUM value decreased.
- As Table 4 above shows, during the reporting period there were three instances where actual LOR conditions occurred with no prior forecast. This includes one instance where a forecast LOR1 condition resulted in an actual LOR2 condition.
- The LOR conditions in New South Wales, Queensland, Victoria, and South Australia were mainly driven by decreased generation availability and reduced net import.
- There were no LOR conditions declared in Tasmania.

4.4 Number of LOR declarations compared to previous quarters

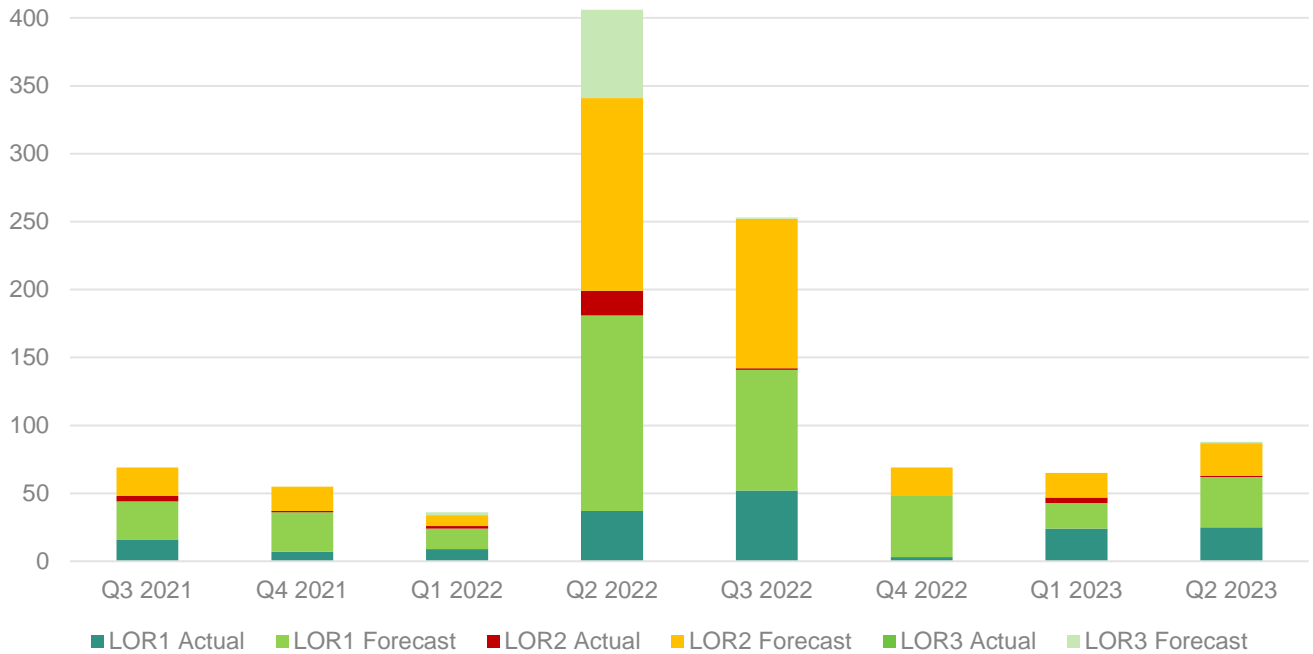
Quarter 2 2023 covered the mid-to late autumn months and the first month of winter.

A total of 88 LOR conditions were declared during Quarter 2 2023 – 62 forecast and 26 actual LOR conditions. This is higher than the 65 LOR declarations recorded in the previous reporting period (1 January to 31 March 2023), but lower than the 185 LOR conditions declared for the same period last year (Quarter 2 2022, excluding market suspension period 15-24 June 2022).



Figure 7 shows the historical trend of actual and forecast LOR conditions in past quarters from Quarter 3 2021 compared to Quarter 2 2023.

Figure 7 Quarterly comparison of actual and forecast LOR conditions, Q3 2021 to Q2 2023



Glossary

This document uses many terms that have meanings defined in the NER. The NER meanings are adopted unless otherwise specified.

For each of the terms below, refer to the Reserve Level Declaration Guidelines⁶ for further information.

Term	Definition
AEST	Australian Eastern Standard Time
BBN	Bayesian Belief Network ⁷
ETL	Extract-Transform-Load
FUM	Forecast Uncertainty Measure (the number of MW representing the level of forecasting uncertainty)
Guidelines	The Reserve Level Declaration Guidelines published by AEMO under clause 4.8.4A of the NER
LCR	Largest Credible Risk – the single largest credible risk in the region
LCR2	Largest Credible Risk 2 – the sum of the two largest credible risks in the region
LOR1	Lack of Reserve level 1. The threshold for an LOR1 is determined by the larger value of either the FUM or the sum of the two largest credible risks in the region (LCR2).
LOR2	Lack of Reserve level 2. The threshold for an LOR2 is determined by the larger value of either the FUM or the largest credible risk in the region (LCR).
LOR3	Lack of Reserve level 3. The threshold for an LOR3 condition is when the forecast reserve for a region is at or below zero.
PASA	Projected Assessment of System Adequacy ⁸
RERT	Reliability and Emergency Reserve Trader ⁹
TNSP	Transmission network service provider

⁶ See AEMO's reserve level declaration guidelines, at https://www.aemo.com.au/-/media/files/electricity/nem/security_and_reliability/power_system_ops/reserve-level-declaration-guidelines.pdf.

⁷ More detail regarding Bayesian Belief Networks is available in the Appendix of AEMO's reserve level declaration guidelines document in the link above.

⁸ See AEMO's Projected Assessment of System Adequacy (PASA) principles, at <https://aemo.com.au/en/energy-systems/electricity/national-electricity-market-nem/nem-forecasting-and-planning/forecasting-and-reliability/projected-assessment-of-system-adequacy>.

⁹ See AEMO's Reliability and Emergency Reserve Trader (RERT) guidelines, at <https://aemo.com.au/en/energy-systems/electricity/emergency-management/reliability-and-emergency-reserve-trader-rert>.