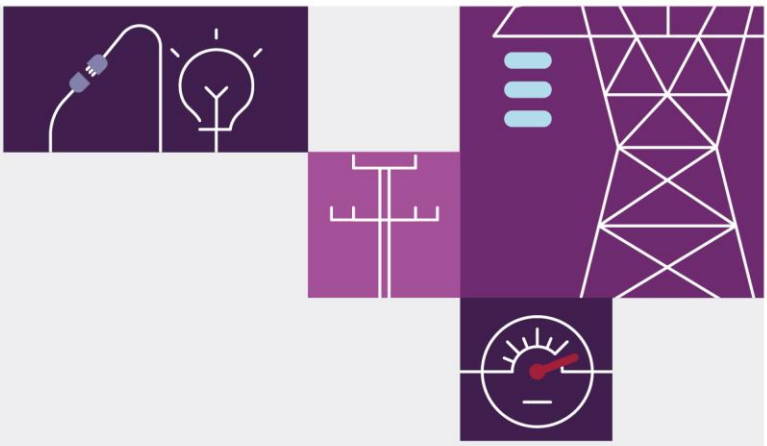
Reliability and Emergency Reserve Trader (RERT)

May 2023

Quarterly Report Q1 2023

A report for the National Electricity Market



Important notice

Purpose

AEMO publishes the Reliability and Emergency Reserve Trader (RERT) Quarterly Report under clause 3.20.6 of the National Electricity Rules.

Disclaimer

AEMO has made reasonable efforts to ensure the quality of the information in this document but cannot guarantee its accuracy or completeness. This document or the information in it may be subsequently updated or amended.

This document does not constitute legal or business advice, and should not be relied on as a substitute for obtaining detailed advice about the National Electricity Law, the National Electricity Rules or any other applicable laws, procedures or policies.

Accordingly, to the maximum extent permitted by law, AEMO and its officers, employees and consultants involved in the preparation of this document:

- make no representation or warranty, express or implied, as to the currency, accuracy, reliability or completeness of the information in this document; and
- are not liable (whether by reason of negligence or otherwise) for any statements or representations in this document, or any omissions from it, or for any use or reliance on the information in it.

Copyright

Version control

Version	Release date	Changes
1	12/05/2023	First issue

Executive summary

Reliability and Emergency Reserve Trader (RERT) is an intervention mechanism under the National Electricity Rules (NER) that allows AEMO to contract for emergency reserves, such as generation or demand response, that are not otherwise available in the market. AEMO uses RERT as one of a number of mechanisms in the event that a critical shortfall in reserves is forecast. RERT may be activated when it is the most suitable mechanism after market options have been exhausted, typically during periods when the supply demand balance is tight.

3 February 2023 RERT - Queensland

On 3 February 2023 in Queensland, high temperatures drove high operational demand, which resulted in a forecast Lack of Reserve 2 (LOR2) and subsequently an actual LOR1.

In response to the forecast LOR2, AEMO contracted 115MW of short notice reserves. Of this, 95MW of reserves were pre-activated and 31MWh activated.

AEMO acted to minimise the total cost to consumers by pre-activating and activating the lowest possible cost reserves. The pre-activation costs for reserves which were subsequently not needed led to the total cost per megawatt hour (MWh) of reserves exceeding the average value of customer reliability (VCR).

The total cost payable by AEMO for this RERT event was $1.4 million, including intervention costs. The cost per MWh was $50,487, which is greater than the VCR of $44,538 per MWh for Queensland.

16 March 2023 RERT - New South Wales

On 16 March 2023, New South Wales experienced quickly changing demand. AEMO contracted 140MW of short notice reserves within 20 minutes in response to a forecast LOR2, which subsequently developed into an actual LOR2 condition. As AEMO did not pre-activate or activate these reserves, no costs were incurred.

AEMO’s contracting and activation of RERT was consistent with the principles of having the least distortionary effect on the market, while maximising the effectiveness of reserve contracts at the least cost to end use consumers of electricity. At the time of contracting and activation, AEMO had estimated the average amount payable under reserve contracts to be less than the estimated average VCR, see section 4 for more detail.

This report is published under clause 3.20.6 (b) of the NER, and accounts for reserve contracts entered into and activated by AEMO in the period from 1 January 2023 to 31 March 2023.

Contents

Tables

1 RERT activity summary Q1 2023

1.1 Contracting

In Q1 2023, medium notice reserves, long notice reserves and interim reserves were not contracted.

In Q1 2023, short notice reserves were contracted on 3 February 2023 in Queensland and 16 March 2023 in New South Wales;

1.2 Activation

AEMO intervened in the market by activating RERT on one occasion during the reporting period, on 3 February 2023, due to a forecast LOR2 condition which subsequently developed into an actual LOR1 in Queensland.

1.3 Costs incurred

The total amount payable by AEMO under RERT in Q1 2023 was $1.4 million. Table 1 shows a breakdown of the amounts payable in Queensland including payment type for all contracts activated in Q1 2023. No costs were incurred in NSW as reserves were not pre-activated or activated.

Additional RERT costs can be incurred in Q3 2023 through the settlement revision process, however revisions are not expected.

Table 1 Short notice RERT costs incurred for Q1 2023

NEM region	Availability costs ($)*	Pre-activation costs ($)	Activation costs ($)	Intervention costs ($)	Total cost ($)
Queensland	0	$910,336.40	$505,640.53	$8,722.33[1]	$1,424,699.26
Total cost					$1,424,699.26

* Availability payments do not apply for short notice contracts. NER 3.20.6(d)(1) requires average values per region, which in the case of a single event in a region are the same values as calculated for that event.

[1] Intervention costs are subject to change under clause NER 3.12.1(a).

2 Reserve procurement

2.1 Panel arrangements

By the start of Q1 2023, AEMO had a panel of providers representing estimated additional reserves of up to 2,136MW in total across the NEM. In order to become panel members, providers enter into short notice panel agreements with AEMO.

These agreements enable potential RERT providers to offer reserves in short notice situations on pre-negotiated contract terms. The short notice RERT panel is one of the tools AEMO can use to help ensure the reliability standard in a region is met. Short notice reserve panel agreements were entered into in South Australia, Victoria, New South Wales, and Queensland.

In consultation with relevant State governments, and as required by the RERT guidelines[2], AEMO entered into panel agreements with potential reserve providers that met detailed cost, technical, and verification criteria.

RERT resources can have different response lead times, activation conditions, costs, and response capabilities; as a result, not all resources will necessarily be activated for a given shortfall event.

Under the panel agreements for short notice situations, there are no fixed costs or availability costs incurred, and payments are made based on pre-activation and/or megawatt hours (MWh) activated. There is no cost to consumers unless this reserve is pre-activated and/or activated[3].

AEMO did not enter into panel arrangements for medium notice reserve in Q1 2023.

2.2 Short Notice reserves contracted

AEMO must take all reasonable actions to ensure reliability of supply by negotiating and entering contracts to secure the availability of reserves under reserve contracts. In short notice situations, AEMO may enter into a short notice reserve contract in response to a forecast or actual LOR2 or LOR3 condition. The Reserve Level Declaration Guidelines published by AEMO provide guidance for determining the term and quantity associated with a reserve shortfall.

In addition to forecast or actual LOR2 and/or LOR3 conditions, other factors such as projected assessment of system adequacy (PASA) generator availability, may also be considered as inputs into the decision-making process for contracting short notice reserves. Under AEMO's panel arrangements, AEMO can contract for short notice reserves with no cost to consumers (unless the reserve is pre activated or activated). RERT contracting occurs in the context of highly uncertain and complex power system conditions, where actual and projected reserve levels can change at short notice.

AEMO contracted 115MW of short notice reserve in Queensland on 3 February 2023 in response to forecast LOR2, which subsequently developed into an actual LOR1 condition. AEMO contracted all available short notice

[2] At https://www.aemc.gov.au/sites/default/files/2020-08/Updated%20Amended%20Panel%20RERT%20Guidelines%20-%2018%20August%202020%20-%20Final%20for%20publication_0.pdf.

[3] For more information on RERT costs, please refer to the AEMO website at https://aemo.com.au/en/energy-systems/electricity/emergency-management/reliability-and-emergency-reserve-trader-rert.

reserves in Queensland based on the forecast capacity reserve requirement of 525MW. This was contracted in case they would be required to maintain reserves, thereby reducing the potential risk of load shedding in Queensland. The risk of load shedding existed due to the forecast high demand of over 10,000 MW which became an actual operational demand of 9,816 MW.

AEMO contracted 140MW of short notice reserve in New South Wales on 16 March 2023 in response to a forecast LOR2 condition, which subsequently developed into an actual LOR2 condition. AEMO did not contract all reserves due to the operational lead time required from the reserve providers and because the forecast LOR2 appeared shortly before the trading intervals forecast to be in shortfall. The actual LOR2 had a total shortfall of 328MW.

Table 2 below shows short notice reserve contracts entered into by AEMO in Q1 2023. The 'Time' column in Table 2 sets out the initial term (reserve period) of each contract. This is the period that was considered reasonably necessary at the time of contracting to cover the period of the forecast LOR conditions and to cover operational requirements such as forecast uncertainty, pre-activation periods, activation periods, deactivation periods, and minimum activation durations.

Table 2 Short notice reserve contracted

Provider	Location of reserve	Contracted reserve capacity	Time*	Date	Basis for contract
Origin Energy Electricity Limited	Queensland	10	17:30 to 21:00	3 February 2023	Forecast LOR2
Origin Energy Electricity Limited	Queensland	11	17:00 to 19:00	3 February 2023	Forecast LOR2
Enel X Australia Pty Ltd	Queensland	4	17:30 to 19:00	3 February 2023	Forecast LOR2
Shell Energy Retail Pty Ltd	Queensland	36	17:30 to 20:30	3 February 2023	Forecast LOR2
EnergyAustralia Pty Ltd	Queensland	13	17:30 to 20:30	3 February 2023	Forecast LOR2
AGL Energy Services Pty Ltd	Queensland	34	17:30 to 19:00	3 February 2023	Forecast LOR2
Visy Industries Australia Pty Ltd	Queensland	7	17:30 to 19:30	3 February 2023	Forecast LOR2
Sub total		**115**			
Tomago Aluminium Company Pty Ltd	New South Wales	100	18:20 to 19:20	16 March 2023	Forecast LOR2
Endeavour Energy Network Operator Partnership	New South Wales	40	18:00 to 19:00	16 March 2023	Forecast LOR2
Sub total		**140**			

* Please note AEMO contracts for short notice reserve at no cost. These contracts may, or may not, be subsequently activated. If activated, the initial contracted times may not align with eventual activation times, because activation times may be refined as conditions evolve.

2.3 AEMO's methodology for contracting RERT

Where market mechanisms are not successful in alleviating a reserve shortfall and the latest time to intervene has been reached, AEMO may intervene in the market by issuing a direction or a clause 4.8.9 instruction or by exercising the RERT in accordance with NER clauses 3.8.14 and 3.20.

AEMO's approach to determining its choice of supply scarcity mechanism when the need for intervention arises (RERT, direction, or clause 4.8.9 instruction) is detailed in the Supply Scarcity Procedure[4].

In making this decision, AEMO must use reasonable endeavours to choose the mechanism, or combination of mechanisms, that is effective in addressing the supply scarcity conditions while minimising the associated direct and indirect costs.

AEMO's procedure for the exercise of RERT sets out the methodology which it follows in determining the triggers for RERT, as well as the quantity and term of reserves contracted.

AEMO followed its procedures and the NER in contracting for short notice RERT, including:

- RERT Panel recruitment.
- Publication of notices.
- Requiring that reserves are not otherwise offered to the market or engaged.
- Determining the term and quantity of reserves to be contracted.
- The basis for determining the estimated Value of Customer Reliability (VCR).

Under NER clause 3.20.2(b), AEMO must have regard to the RERT principles in exercising the RERT. These principles stipulate that AEMO is to take actions that have the least distortionary effect on the operation of the market, and actions taken should aim to maximise the effectiveness of reserve contracts at the least cost to end use consumers of electricity.

When entering into reserve contracts, AEMO factored these RERT principles into its decision-making:

- To minimise distortionary effects on the operation of the market, AEMO categorises RERT into the following three types based on their pre-activation and activation times:
  - Type 1 – capacity that can be pre-activated and activated in less than 30 minutes. These contracts are pre-activated and activated post-contingency (when an actual LOR3 occurs).
  - Type 2 – capacity where the sum of the pre-activation and activation lead times is greater than 30 minutes, but the activation lead time alone is less than 30 minutes. This means that for this capacity to be activated post-contingency (when an actual LOR3 occurs), it must be pre-activated in advance of the actual LOR3.
  - Type 3 – capacity whereby activation requires more than 30 minutes. This capacity needs to be pre-activated and activated in advance to ensure RERT is delivered on time.
- The use of these categories allows for minimal pre-activation and activation, since Type 1 and 2 categories can be activated post-contingent (during LOR3). This not only minimises impacts on the market, but also maximises the effectiveness of reserve contracts at the least cost to end use consumers of electricity.
- During the establishment of the RERT panel, AEMO implemented the use of VCR as the maximum for assessing offers by potential RERT panel members, based on the pre-activation and activation of reserves for one hour or more.

[4] The Supply Scarcity Procedure can be found in appendix A of the Short Term Reserve Management procedure numbered SO_OP_3703, at https://aemo.com.au/energy-systems/electricity/national-electricity-market-nem/system-operations/power-system-operation/power-system-operating-procedures.

3 Intervention on 3 February 2023

3.1 Decision to intervene

3.1.1 Pre-event conditions

From Monday 30 January 2023, a slow-moving trough began to direct a hot, humid airmass over southeast Queensland (QLD), with the Bureau of Meteorology (BoM) issuing low intensity to severe heatwave warnings from Thursday 2nd to Saturday 4th February 2023.

Overnight temperatures leading into the morning of 3 February 2023 came in slightly warmer than the day-ahead forecasts, reaching a minimum of 23.2°C in Archerfield and 21.6°C in Amberley. Dry conditions prevailed during the middle of the day with moist, humid conditions returning with an afternoon sea breeze. This allowed daytime temperatures to warm and track at or slightly above day-ahead forecasts, reaching 35.9°C at 1200 hrs at Archerfield and 36.6°C at 1400 hrs at Amberley.

Forecast LOR1 and LOR2 conditions were declared in Queensland for the evening of 3 February 2023, up to 5 days prior to the day. Forecast LOR conditions were declared, updated, and cancelled several times leading up to the day due to changes in forecast generation availability and demand.

3.2 Assessment of market response and latest time to intervene

On 3 February 2023, AEMO complied with NER clause 3.8.14 and followed its procedures in determining that RERT was the appropriate mechanism to address the conditions of supply scarcity since:

- Direction options had been exhausted as far as reasonably practical; and
- The cost of pre-activating and activating RERT was estimated to be less than that of issuing a clause 4.8.9 instruction for load shedding based on the full pre-activation and activation of reserves forecast to be needed.

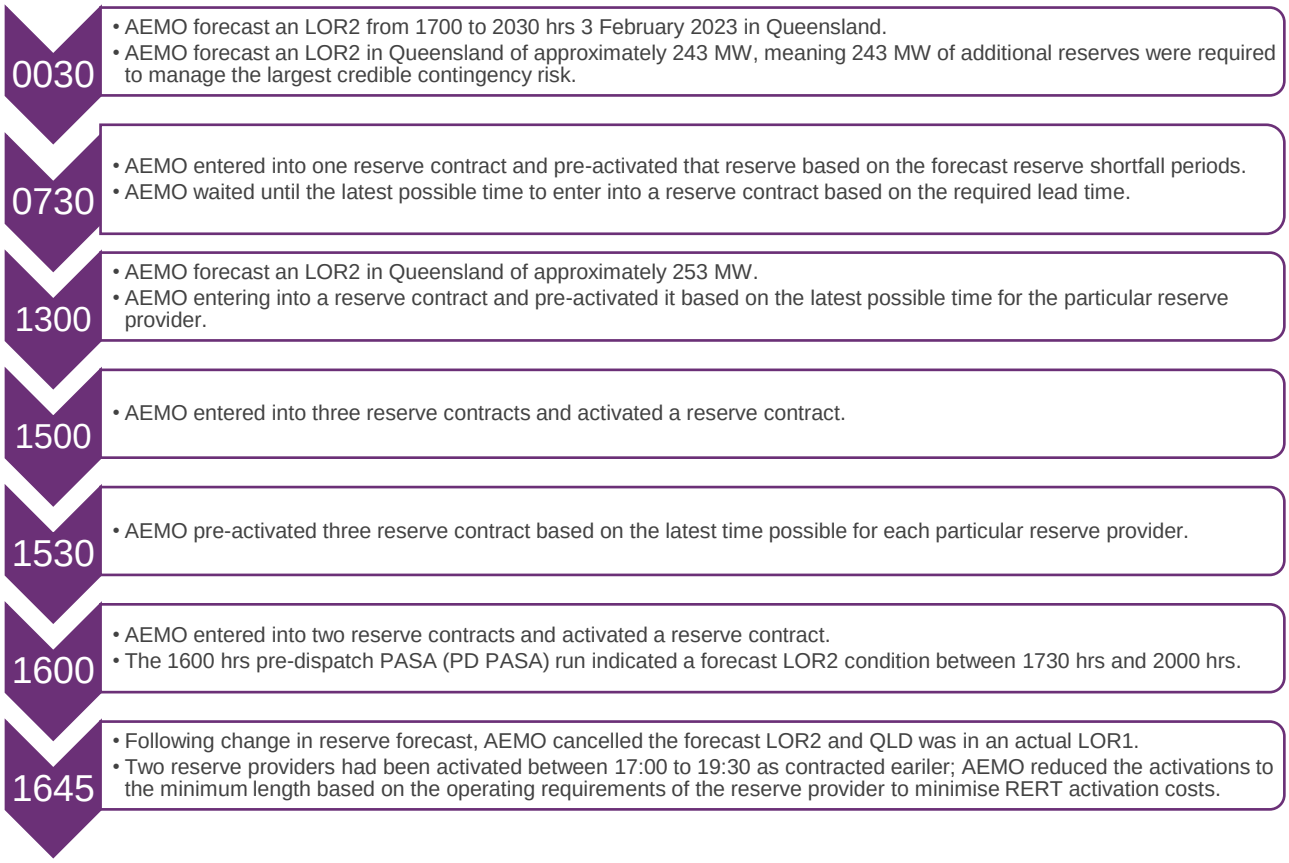
At 1237 hrs AEMO issued MN 105576, forecasting a LOR2 in the Queensland region on 3 February 2023 from 1700 hrs to 1900 hrs. The forecast capacity reserve required was 530MW and the minimum capacity reserve forecast was 277MW. Based on the forecast and the minimum activation lead times, AEMO determined the latest time to intervene was 1600 hrs the same day. Each individual reserve provider was activated at the latest time based on their minimum activation lead time (see section 3.3).

3.3 Intervention event

RERT contracts vary in terms of pre-activation and activation lead times, as well as response times (for example, an industrial load responding to a request to reduce load under RERT may need several hours to prepare plant or undertake a safe shutdown) and minimum continuous run times.

On 3 February 2023, in response to forecast LOR2 conditions in Queensland, based on the minimum lead times of RERT providers, AEMO followed the procedure for the exercise of RERT[5] to take the actions summarised in Figure 1. Note that the times used in Figure 1 are illustrative, please refer to market notices for precise timings of events.

Figure 1 High RERT activation level timeline (AEST)



The eventual maximum demand in Queensland on 3 February 2023 was lower than forecast expectations due to the influence of weather, RERT activations, and load reductions. Storms impacted Brisbane briefly from 1300 hrs and developed again to the west of Brisbane from 1530 hrs. The combination of the sea breeze, cloud cover, and storms reduced temperatures in Archerfield from 1300 hrs to 1600 hrs by up to 2°C, and in Amberley from 1500 hrs to 1800 hrs by up to 4.5°C. As a result, the afternoon ramp in demand plateaued from 13:30 as cloud cover increased and an isolated storm passed through Brisbane, before beginning to increase until 15:30 when further storms developed, suppressing the ramp once again. At 1600 hrs, AEMO updated its forecast as demand was impacted by response from isolated storm activity, resulting in a peak operational demand of 10,462 MW. At 1630 hrs, impacts of storm activity eased and AEMO updated its forecast demand once again, resulting in a peak operational demand of 10,194 MW. Following the storms and the reduction in temperatures, the afternoon ramp in demand slowed, eventually peaking at 9,816 MW at 1730 hrs.

[5] See the RERT procedure at https://aemo.com.au/-/media/files/electricity/nem/security_and_reliability/power_system_ops/procedures/so_op_3717-procedure-for-the-exercise-of-the-reliability-and-emergency-reserve-trader.pdf?la=en.

AEMO proceeded to deactivate all reserve contracts at the earliest possible times. All reserves were de-activated by 1930 hrs, reflecting either the deactivation lead time required by the reserve providers, or the activation instruction end time. At 1930 hrs, AEMO issued MN 105607 to declare the activation of RERT and AEMO intervention event had ended.

On 3 February 2023, AEMO instructed the activation of 31MWh of RERT. Where the volume of RERT delivered by a RERT provider is greater than the amount set out in the activation instruction, the payment is only for the volume activated. Table 3 shows a breakdown of RERT instructed per 30-minute period.

Table 3 RERT activation instruction in Queensland on 3 February 2023

30-minute period ending	RERT activated capacity (MW)
17:00	11
17:30	21
18:00	10
18:30	10
19:00	10

3.4 Intervention pricing

Intervention pricing was applied for this event in accordance with NER 3.9.3(b) for the intervention period from the trading intervals (Tis) ending 1705 hrs to 1930 hrs on 3 February 2023.

Intervention pricing is applied based on the constraints populated into the National Electricity Market Dispatch Engine (NEMDE). These constraints are created by AEMO's RERT scheduling tool based on the times the contracted reserves are scheduled. Intervention pricing on 3 February 2023 reflects 31 MWh of RERT load applied throughout the RERT intervention pricing period.

3.5 Changes in dispatch outcomes

The activation of RERT resulted in changes in dispatch outcomes. The activation of RERT reserves in Queensland had the effect of decreasing the demand for electricity, which decreased the amount of generation in all regions except Victoria and Tasmania. This is shown in Table 4, which compares the difference in output between the physical and revised pricing runs. Table 5 compares the variation in total interconnector flows between the physical and revised pricing runs, showing minor changes in interconnector flows during the RERT event.

Table 4 Summary of total energy generation during 3 February 2023 RERT event (MWh)

	NSW	QLD	SA	TAS	VIC
Physical run	22,080	23,441	4,085	1,921	14,209
Pricing run	22,012	23,385	4,064	1,928	14,281
Change	-67	-56	-22	6	72

Table 5 Summary of total interconnector flows during 3 February 2023 RERT event (MWh)

	Terranora	QNI	VIC-NSW	Heywood	Murraylink	Basslink
Physical run[A]	-399	1,397	1,991	-1,141	152	-1,061
Pricing run[A]	-399	1,390	2,060	-1,127	154	-1,055
Change	0	-7	69	14	3	6

A. Positive numbers are for flows flowing north or west, negative for flows flowing south or east.

3.6 Impact on reliability

For the 3 February 2023 RERT event, there was no manual involuntary load shedding. AEMO activated RERT on the basis of forecast LOR2 which developed into an actual LOR1 condition.

4 Cost of exercising RERT

NER clause 3.20.2(b)(2) requires that when AEMO activates RERT it should have regard to the RERT principles, including the principle that actions taken should aim to maximise the effectiveness of the reserve contracts at the least cost to end-use consumers of electricity. Accordingly, AEMO activated reserve contracts based on location, cost, capacity, time to activate, minimum activation time, and the profile of the forecast lack of reserve.

AEMO acted to minimise the total cost to consumers by pre-activating and activating the lowest possible cost reserves. The pre-activation costs for reserves which were subsequently not needed led to the total cost per megawatt hour (MWh) of reserves exceeding the average value of customer reliability (VCR).

The total cost of exercising RERT in Q1 2023 was $1.4 million, which includes pre-activation, activation, and intervention costs. The cost per MWh has been calculated based on the total cost divided by the MWh delivered for the activation event. The average cost per MWh associated with exercising RERT in Q1 2023 is $50,487 per MWh, which exceeds the average VCR of $44,538 per MWh for Queensland. This was due to the RERT event on 3 February, where AEMO activated 31MWh of reserves at approximately 1600 hrs in anticipation of an expected LOR2 from 1730 hrs. At the time of activation, the expected costs of the 115 MW of contracted reserves was $19,658 per MWh. The actual activation cost per MWh was $18,000, which reflects the rate paid for the reserves delivered, excluding the pre-activation and market compensation costs.

Table 6 shows a breakdown of the costs associated with exercising RERT during Q1 2023.

Table 6 Costs associated with activating RERT in Q1 2023

	State	Pre-activation costs ($)	Activation costs ($)	Intervention costs ($)*	Total cost ($)	Cost per megawatt hour ($/MWh)
3 February 2023	QLD	$910,336.40	$505,640.53	$8,722.33[6]	$1,424,699.26	$50,487

*Intervention costs represent the compensation paid to Market Participants due to the intervention event (for example, to compensate for energy generation which is displaced by RERT capacity), and to Eligible Persons (Settlement Residue Auction [SRA] holders) due to changes in interconnector flows, and therefore changes in the value of Settlement Residues. Note that these costs are subject to change under clause NER 3.12.1(a). A negative value means affected participants need to pay AEMO.

Table 7 below presents the cost recovery for the activation event, including a breakdown of the cost recovery from Market Customers using electricity during the RERT event (Usage) and cost recovery from Market Customers using electricity in the billing week[7] (Other), as per NEM clause 3.20.6(f)(2). All RERT costs were recovered from Market Customers. This table is represented on a per trading interval basis as a .csv file on our website[8].

Table 7 Breakdown of how costs were allocated to the Market Customers, RERT Q1 2023

Region	Participant Category	Payment type	Recovery period start	Recovery period end	Amount Recovered	Period Total Energy (MWh)	Recovery rate ($/MWh)
QLD	Market Customers	Usage	3/02/2023 17:05	3/02/2023 18:00	$166,741	22,849.01	$7.30
QLD		Usage	3/02/2023 17:35	3/02/2023 19:30	$347,622	18,262.09	$19.04

[6] Intervention costs are subject to change under clause NER 3.12.1(a).

[7] The billing period is the period ending Saturday 4 February 2023.

[8] https://aemo.com.au/energy-systems/electricity/emergency-management/reliability-and-emergency-reserve-trader-rert/rert-reporting

Region	Participant Category	Payment type	Recovery period start	Recovery period end	Amount Recovered	Period Total Energy (MWh)	Recovery rate ($/MWh)
QLD		Other	29/01/2023 0:05	5/02/2023 00:00	$910,336	1,140,993.70	$0.80

On 3 February 2023, the forecast LOR2 became an actual LOR1. As such, the contingency risk and avoided manual load shedding as a cost is zero. Had the forecast LOR2 of 243 MW eventuated then the credible contingency risk would have put at least $10.8 million of customer load at risk.

5 AEMO's intervention process

AEMO's general process for deploying RERT is documented in SO_OP_3717 - Procedure for the Exercise of the Reliability and Emergency Reserve Trader.

AEMO considers that it followed all relevant provisions under NER clause 4.8 and procedures in SO_OP_3717 in the exercising of RERT in Q1 2023, to the extent it was able to do so.

A1. Appendix A1

The tables below provide a summary timeline for RERT events in Q1 2023.

Table 8 Timeline of key events on 3 February 2023 Queensland

Date	Event/comment
03/02/2023 **0028 hrs** **MN 105544**	AEMO ELECTRICITY MARKET NOTICE The Forecast LOR2 condition in the Qld region advised in AEMO Electricity Market Notice No. 105540 has been updated at 0030 hrs 03/02/2023 to the following: [1.] From 1700 hrs 03/02/2023 to 2030 hrs 03/02/2023. The forecast capacity reserve requirement is 525 MW. The minimum capacity reserve available is 282 MW. [2.] From 2100 hrs 03/02/2023 to 2130 hrs 03/02/2023. The forecast capacity reserve requirement is 525 MW. The minimum capacity reserve available is 468 MW. AEMO is seeking a market response. AEMO estimates the latest time it would need to intervene through an AEMO intervention event is 1430 hrs on 03/02/2023. Manager NEM Real Time Operations
03/02/2023 **0729 hrs** **MN 105553**	AEMO ELECTRICITY MARKET NOTICE. Reliability and Emergency Reserve Trader (RERT) Intention to negotiate for additional reserve - QLD1 Region- 03/02/2023 Refer to AEMO Electricity Market Notice no. 105544. AEMO intends to commence negotiations with RERT Panel members for the provision of additional reserve by issuing requests for tender for the following period of time; 17:30 to 21:30 hrs 03/02/2023 If reserve is required, the period of activation or dispatch will be within this period but may not be for the entire period. AEMO will issue a further advice if reserve is contracted. Manager NEM Real Time Operations
03/02/2023 **0805 hrs** **MN 105556**	AEMO ELECTRICITY MARKET NOTICE. AEMO Intervention Event, Reliability and Emergency Reserve Trader (RERT) - QLD1 Region - 03/02/2023 Refer to AEMO Electricity Market Notice no. 105553. AEMO has entered into a reserve contract and may implement a AEMO Intervention Event by dispatching that reserve contract to maintain the power system in a Reliable operating state during the following period of time; 17:30 to 21:30 hrs 03/02/2023 If reserve is required, the period of activation or dispatch will be within this period, but may not be for all the entire period. AEMO will issue a further advice if the reserve contract is dispatched/activated. Manager NEM Real Time Operations
03/02/2023 **1237 hrs** **MN 105576**	AEMO ELECTRICITY MARKET NOTICE The Forecast LOR2 condition in the Qld region advised in AEMO Electricity Market Notice No. 105559 has been updated at 1230 hrs 03/02/2023 to the following:

Date	Event/comment
	[1.] From 1700 hrs 03/02/2023 to 1900 hrs 03/02/2023. The forecast capacity reserve requirement is 530 MW. The minimum capacity reserve available is 277 MW. AEMO is seeking a market response. AEMO estimates the latest time it would need to intervene through an AEMO intervention event is 1600 hrs on 03/02/2023. Manager NEM Real Time Operations
03/02/2023 **1531 hrs** **MN 105586**	AEMO ELECTRICITY MARKET NOTICE. AEMO Intervention Event, Reliability and Emergency Reserve Trader (RERT) - QLD1 Region- 03/02/2023 Refer AEMO Electricity Market Notice no. 105556 AEMO has dispatched/activated reserve contract(s) to maintain the power system in a Reliable operating state. The reserve contract(s) was dispatched/activated at 17:30 hrs 03/02/2023 and is forecast to apply until 20:30 hrs 03/02/2023 AEMO has implemented an AEMO intervention event for the duration the reserve contract(s) is dispatched/activated/ To facilitate the RERT process, constraints commencing with the following identifiers may be evident at various times in dispatch, #RT_QLD1 Manager NEM Real Time Operations
03/02/2023 **1535 hrs** **MN 105588**	AEMO ELECTRICITY MARKET NOTICE. AEMO Intervention Event - Intervention price dispatch intervals - 03/02/2023 Refer AEMO Electricity Market Notice no. 105586 An AEMO Intervention Event, the dispatch of Reliability and Emergency Reserve Trader (RERT) has been implemented. The AEMO Intervention Event commenced at 17:30 hrs 03/02/2023 and is forecast to apply until 20:30 hrs 03/02/2023 AEMO declares all dispatch intervals during the AEMO Intervention Event to be intervention price dispatch intervals. The AEMO Intervention Event is expected to affect dispatch quantities for intervention pricing purposes from the 17:35 hrs dispatch interval on 03/02/2023 Manager NEM Real Time Operations
03/02/2023 **1821 hrs** **MN 105602**	AEMO ELECTRICITY MARKET NOTICE Actual Lack Of Reserve Level 1 (LOR1) in the QLD region - 03/02/2023 An Actual LOR1 condition has been declared under clause 4.8.4(b) of the National Electricity Rules for the QLD region from 1815 hrs. The Actual LOR1 condition is forecast to exist until 1900 hrs. The forecast capacity reserve requirement is 1047 MW. The minimum capacity reserve available is 989 MW. Manager NEM Real Time Operations
03/02/2023	AEMO ELECTRICITY MARKET NOTICE.

Date	Event/comment
1932 hrs **MN 105607**	End of Reliability and Emergency Reserve Trader (RERT) dispatch for - QLD1 Region - 03/02/2023 and end of AEMO Intervention Event. Refer AEMO Electricity Market Notices 105592 Activation of reserve contract(s) has ended. The reserve contract(s) were activated from 17:00 hrs 03/02/2023 to 19:30 hrs 03/02/2023 The AEMO Intervention Event ended from 19:30 hrs 03/02/2023 Manager NEM Real Time Operations

Table 9 Timeline of key events on 16 March 2023 New South Wales

Date	Event/comment
16/03/2023 **1703 hrs** **MN 106706**	AEMO ELECTRICITY MARKET NOTICE AEMO declares a Forecast LOR2 condition under clause 4.8.4(b) of the National Electricity Rules for the NSW region for the following period: From 1800 hrs 16/03/2023 to 1830 hrs 16/03/2023. The forecast capacity reserve requirement is 700 MW. The minimum capacity reserve available is 682 MW. AEMO is seeking a market response. AEMO estimates the latest time it would need to intervene through an AEMO intervention event is 1730 hrs on 16/03/2023. Manager NEM Real Time Operations
16/03/2023 **1707 hrs** **MN 106708**	AEMO ELECTRICITY MARKET NOTICE. Reliability and Emergency Reserve Trader (RERT) Intention to negotiate for additional reserve - NSW1 Region- 16/03/2023 Refer to AEMO Electricity Market Notice no. 106706. AEMO intends to commence negotiations with RERT Panel members for the provision of additional reserve by issuing requests for tender for the following period of time; 18:00 to 19:00 hrs 16/03/2023 If reserve is required, the period of activation or dispatch will be within this period but may not be for the entire period. AEMO will issue a further advice if reserve is contracted. Manager NEM Real Time Operations
16/03/2023 **1723 hrs** **MN 106713**	AEMO ELECTRICITY MARKET NOTICE. AEMO Intervention Event, Reliability and Emergency Reserve Trader (RERT) - NSW1 Region - 16/03/2023 Refer to AEMO Electricity Market Notice no. 106708. AEMO has entered into a reserve contract and may implement a AEMO Intervention Event by dispatching that reserve contract to maintain the power system in a Reliable operating state during the following period of time; 18:00 to 19:00 hrs 16/03/2023 If reserve is required, the period of activation or dispatch will be within this period, but may not be for all the entire period. AEMO will issue a further advice if the reserve contract is dispatched/activated. Manager NEM Real Time Operations
16/03/2023	AEMO ELECTRICITY MARKET NOTICE

Date	Event/comment
1754 hrs **MN 106716**	Actual Lack Of Reserve Level 2 (LOR2) in the NSW region - 16/03/2023 An Actual LOR2 condition has been declared under clause 4.8.4(b) of the National Electricity Rules for the NSW region from 1750 hrs. The Actual LOR2 condition is forecast to exist until 1830 hrs. The forecast capacity reserve requirement is 700 MW. The minimum capacity reserve available is 372 MW. AEMO is seeking an immediate market response. An insufficient market response may require AEMO to implement a AEMO intervention event. Manager NEM Real Time Operations

Glossary

This document uses many terms that have meanings defined in the National Electricity Rules (NER). The NER meanings are adopted unless otherwise specified.

Term	Definition
ESOO	Electricity Statement of Opportunities
IRM	Interim reliability measure
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.
NER	National Electricity Rules
RERT	Reliability and Emergency Reserve Trader
USE	Unserved Energy
VCR	Value of Customer Reliability