AEMC

RULE

Australian Energy Market Commission

## DRAFT RULE DETERMINATION

# NATIONAL ELECTRICITY AMENDMENT (ENHANCEMENT TO THE RELIABILITY AND EMERGENCY RESERVE TRADER) RULE 2019

**PROPONENT**
AEMO

7 FEBRUARY 2019

## INQUIRIES

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## ABOUT THE AEMC

The AEMC reports to the Council of Australian Governments (COAG) through the COAG Energy Council. We have two functions. We make and amend the national electricity, gas and energy retail rules and conduct independent reviews for the COAG Energy Council.

# SUMMARY

1 This draft determination sets out a series of changes to the National Electricity Rules (NER) that will provide the Australian Energy Market Operator (AEMO) with the flexibility and appropriate discretion when using the Reliability and Emergency Reserve Trader (RERT or emergency reserves) to manage the transition in the power system, while doing so at least cost to consumers, and in a transparent manner.

2 The draft rule improves the RERT framework, by embedding it clearly within the reliability framework, providing AEMO with more flexibility about how and when to purchase standby electricity supplies for events like extreme heatwaves, while improving transparency and keeping costs to consumers as low as possible.

3 The draft rule is made in response to a rule change request from AEMO. The Commission's draft rule is a more preferable rule. The draft rule will allow AEMO to procure emergency reserves for the 2019-20 summer, if needed, utilising the new framework.

**Why is there a need to change the current Reliability and Emergency Reserve Trader framework?**

4 The RERT is an existing intervention mechanism that allows AEMO to contract for additional, emergency reserves such as generation or demand response that are not otherwise available in the market. They are additional reserves because they are in addition to the "buffer" that is made available by the market as part of the usual operation of the power system. The RERT is an important part of the regulatory framework, allowing AEMO to use a safety net at times when a shortfall in market reserves is forecast, or where practicable, to maintain power system security. These additional reserves are commonly referred to as "emergency reserves" or "strategic reserves" since they are used as a last resort when the market hasn't otherwise provided reserves to reduce the likelihood of blackouts, typically during periods when the demand supply balance is tight, for example, summer.

5 There are different types of emergency reserves, based on how much time AEMO has to procure the RERT prior to the reserve shortfalls occurring: long-notice (between nine months and 10 weeks ahead of a projected shortfall currently, and up to 12 months under the draft rule); medium-notice (between ten weeks' and 7 days' notice of a projected shortfall); and short-notice RERT (between 7 days' and three hours' notice of a projected shortfall). Typically, AEMO sets up a RERT panel of providers for both the medium-notice and short-notice RERT and only enters into an emergency reserve contract under the relevant notice mechanism when it has identified a projected shortfall and after seeking offers from RERT panel members.

6 Some form of a regulatory mechanism that allows the operator to contract for emergency reserves has existed since the start of the NEM. Prior to 2017, AEMO had only entered into RERT contracts three times and it had never been dispatched. This changed in 2017, when AEMO entered into a number of emergency reserve contracts. Since that time, AEMO has used the RERT a number of times, including November 2017, January 2018, and most recently in January 2019.

7 This increase in use of the RERT reflects the changing system needs, including a growing proportion of variable renewable generation, an aging fleet of thermal generation, a tightening supply-demand balance, peakier demand and higher temperature peaks. The work that AEMO has done, as well as the Commission's analysis in the *Reliability Frameworks Review*, have highlighted a number of issues with the current Rules framework for emergency reserves. It is important that the emergency reserves framework is fit for purpose.

8 Further, a necessary consequence of using emergency reserves more frequently is that the costs associated with the RERT have increased. Consumers, in particular, have expressed concerns with the lack of transparency about the procurement and use of emergency reserves and its impact on electricity bills. Consumers have also expressed concerns about whether the current processes have resulted in consumers paying increased costs for the same amount of reserves (in-market or emergency) that would have been there anyway. In addition, there have been concerns about the high costs of emergency reserves and low predictability of these costs associated with the use of the RERT to date. The Commission considers that it is important to address these concerns in order to address affordability concerns as a key issue for all consumers.

9 Therefore, the Commission considers that there is a need to enhance the emergency reserve framework to provide AEMO with the flexibility it needs to meet the operational challenges arising from the transition, while containing the increased costs of doing so.

**RERT is part of a broader context**

10 It is also important to recognise the broader context and consequences of the changes occurring in the energy market and power system. While the NEM has historically operated well within the reliability standard, providing sufficient supply to date, supply-demand conditions have tightened in recent years. Commercial investment in new or existing dispatchable generation is, however, being challenged by uncertainty over the mechanisms that will be used to implement government policies. Coupled with increasing temperatures that can drive demand to peak when power systems are already under strain, confidence in there being adequate future generation capacity that can meet changing system needs is being questioned. This results in increased focus and pressures on the industry, from the system operator through to market participants and consumers.

11 The Commission is cognisant of these changes and pressures, and has been working with AEMO as a priority to keep the rules current and responsive so that AEMO can manage the changing operational dynamics, particularly given changes to the way the system responds to feasible shocks such as extreme weather events. For example, AEMO have been making improvements to their forecasting processes, and the Commission made a number of recommendations to improve transparency of these processes in our *Reliability frameworks review.*

12 However, not all of the changing dynamics in the market can be addressed by one part of the market and regulatory arrangement, the RERT – at the very least it will only help these issues indirectly, at a very high cost. For example, emergency reserves cannot address distribution network issues or outages. Nor can emergency reserves be used to manage

changing outcomes (such as increased volatility) in the wholesale market. Technical system security challenges are distinct from reliability concerns and are often very complex, and are better addressed through targeted regulations. Similarly, investment uncertainty needs to be addressed through the development of stable regulatory mechanisms that can accommodate changing policy objectives.

13 We are working with the Energy Security Board (ESB), the Australian Energy Regulator (AER), AEMO and stakeholders to help identify issues and targeted, least cost solutions for these challenges, and then deliver the required tools – through a series of rule changes that provide the right incentives, obligations and safety nets. Some of the work already underway to assist with reliability outcomes includes the Retailer Reliability Obligation (RRO), which will require companies to hold contracts or invest directly in dispatchable energy to meet peak demand. Once this is in place, the reliance on the RERT should be materially reduced.

14 Another example of the need for a separate, targeted solution rather than the use of the RERT was shown when, in early January 2019 AEMO released its final report on last year's Queensland and South Australia system separation incident. In that incident a lightning strike on a transmission tower led to a cascade of events resulting in an interruption to electricity supply for some customers in Victoria, NSW and Tasmania. This security incident, which had the potential to cause state-wide blackouts, gave new insight into the power system's resilience to frequency events and provided evidence of a deficit in primary frequency response from generators across the NEM. As a result, AEMO has made a number of recommendations, including generators providing frequency control responses where feasible by mid 2019, consistent with the Commission's recommendations in the *Frequency control frameworks review*. We will work closely with AEMO and other stakeholders to deliver rule changes that may be needed within this timeframe.

**How do emergency reserves fit into the overall reliability framework?**

15 Reliability means that the power system has an adequate amount of capacity (generation, demand response and transmission capacity) to meet consumer needs. A reliable power system therefore requires adequate investment and disinvestment as well as appropriate operational decisions, so that supply and demand are in balance at any particular point in time.

16 The core objective of the existing reliability framework in the NEM is to deliver desired reliability outcomes through market mechanisms to the largest extent possible. In a reliable power system, the expected level of supply in the market will include a buffer, known as in-market reserves. Expected supply will be greater than expected demand. In the event that the supply / demand balance tightens, spot and contract prices would rise, which will inform operational decisions and provide an incentive for entry and expansion, addressing any potential reliability problems as or before they arise. This allows the actual demand and supply to be kept in balance, even in the face of shocks to the system.

17 The NER contains the reliability standard for the National Electricity Market (NEM), currently at 0.002 per cent expected unserved energy (USE). The reliability standard is set every four years following a review by the Reliability Panel, which comprises experts from large energy users, consumer groups, generators, network businesses, retailers and AEMO. Crucially, this

is not zero per cent since this would be too costly for consumers. The reliability standard represents a trade-off between the prices paid for electricity and the cost of not having energy when it is needed: increasing levels of reliability involves increased costs.

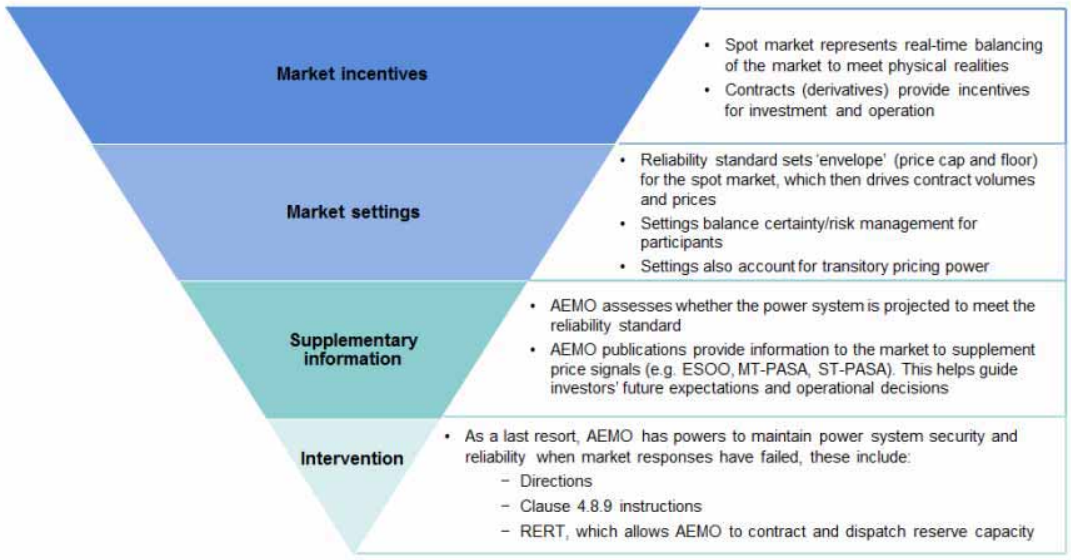
18 As system operator, AEMO operates the system to meet the reliability standard. For example, it publishes a range of long-term forecasts in its Electricity Statement of Opportunities as to whether or not the reliability standard is projected to be met in the long-term. In the medium-term, AEMO models the power system through its medium-term projected assessment of system adequacy (PASA) to probabilistically project whether the expected USE (i.e. a probability-weighted average across a number of scenarios) for a given year, in a given region, exceeds 0.002 per cent. The expected values of USE outcomes are proportional to their likelihood of occurring i.e. events with a high probability of occurring are given more weight than events with a low probability of occurring. An expected shortfall, relative to the reliability standard, is termed a low reserve condition. AEMO provides all this information to the market to allow the market to respond to what it projects could be a future shortfall in reserves.

19 In the short-term (pre-dispatch and short-term PASA), AEMO operationalises the reliability standard through lack of reserve (LOR) declarations. In this case, AEMO forecasts the level of reserves that are required to be in the market (i.e. MW required). This level is at least the size of the largest likely gap in available capacity, or larger to take into account forecasting uncertainty (e.g. that there will be a margin of error in any assumptions that feed into the modelling). If the forecast amount of reserves available falls below the LOR2 level, then AEMO considers this to be a breach of the reliability standard and informs the market of this, expecting a response.

20 If market participants do not respond to an expectation from AEMO that the reliability standard will not be met, by making more reserves available, then AEMO may intervene in the market through using the RERT or clause 4.8.9 instructions or directions. Intervention by procuring emergency reserves under RERT can occur across a number of timeframes:

- To the extent that low reserve conditions are being forecast, AEMO can procure emergency reserves up to one year out, under the draft rule.
- As forecasts move closer to real time and the risks of reserve shortfalls become more accurate, AEMO can use medium-term (between ten weeks and 7 days ahead of a projected shortfall) and short-term (up to 7 days ahead of a projected shortfall) to procure RERT resources.

**Figure 1: Current framework with escalating series of interventions**




## Overview of the draft Rule

21 The draft rule enhances the RERT framework, by embedding it clearly within the reliability framework, providing AEMO with necessary flexibility to determine the risk of reserve shortfalls, and how and when to purchase standby electricity supplies for events like extreme heatwaves, while keeping costs to consumers as low as possible. Specifically, the draft rule:

- Clarifies how the RERT - the NEM's safety net - fits into the broader reliability framework by directly linking the RERT procurement trigger and volume to the reliability standard. Under the draft rule, AEMO can procure emergency reserves when it forecasts a breach of the reliability standard and has made a declaration under the lack of reserve (LOR) or low reserve condition (LRC) framework. As system operator, AEMO incorporates the reliability standard within its day-to-day operation of the market, e.g. by providing information to the market as to whether or not the reliability standard is expected to be met. The draft rule also sets the amount of emergency reserves - the procurement volume - to an amount that AEMO reasonably expects is required to meet the gap identified by an expected breach of the reliability standard, giving AEMO flexibility as to how much to procure. Linking the procurement process explicitly to the reliability standard (through the LRC and LOR declarations) limits the misallocation of reliability risks, in terms of how they are managed in the NEM.
- Extends the maximum procurement lead time for emergency reserves from nine to 12 months, allowing AEMO to procure emergency reserves through the RERT mechanism up to a maximum of 12 months ahead of an identified shortfall, which will:
  - broaden the pool of potential RERT providers and therefore potentially reduce costs associated with the RERT

  - create consistency with the lead time under the RRO that is currently under development.
- Balances the potential for increased distortions to invest in market reserves, associated with the increased lead time,[1] by strengthening the out-of-market provisions. The wholesale market is the primary means by which reliability is delivered and incentives to invest in market reserves need to be preserved. The strengthened provisions are:
  - that generation or load which has been in the market (including via a demand response arrangement) for 12 months prior to signing a RERT contract cannot provide emergency reserves through the RERT
  - that generation or load capacity cannot be in the wholesale market (including through a demand response arrangement) for the duration of their contract to provide emergency reserves, i.e. they cannot use the same capacity both in the RERT, and providing demand response or generating in market.
- Introduces a provision that will guide the procurement of RERT contracts, suggesting that emergency reserves should not typically exceed a $/MWh value. This $/MWh value is to be estimated by AEMO, based on the avoided cost of load shedding, in other words, based on the costs that would have been incurred, had the RERT not been used, and load shedding had occurred. In practical terms, this would be the average value of customer reliability of the consumers that would have lost supply, estimated by the AER through its review to determine the values different customers place on having a reliable electricity supply.
- Improves the cost recovery process such that costs associated with emergency reserves are recovered, where possible, from those consumers who contributed to the need for the RERT, in the region in which the emergency reserves were used. The costs associated with the direct and immediate activation of RERT costs (e.g. usage or activation charges) will be recovered in proportion to market customers' consumption over the period in which the RERT resource is activated. This will provide an incentive for consumers to minimise their consumption of energy at times the RERT may be required, in order to minimise RERT costs. All other costs associated with the procurement of emergency reserves (e.g. availability costs) will be recovered in proportion to market customers' consumption during the billing periods in which payments were made, over the length of the contract. These costs are recovered as broadly as possible so as to be non-distortionary.
- Increases and enhances the transparency and reporting requirements that are associated with the RERT in order to better inform market participants, policy makers, consumers and other interested parties about the costs of the RERT, and what is driving the use of the RERT in order to guide these parties to make more informed operational and investment decisions, as well as to better budget and plan for RERT related charges. The increased transparency arrangements include:

1 For example, an increase in the procurement lead time will likely increase the payments that providers could receive under the RERT increasing the incentive for a provider to exit the wholesale market and provide emergency reserves. This would be a distortion and result in increased wholesale costs for consumers.

  - AEMO publishing a quarterly RERT report, if necessary due to the addition of new information, covering both forward-looking (indicative costs of emergency reserves, and analysis of any procurement of emergency reserves); and backward-looking (updated emergency reserve costs and volumes, forecasts that indicated RERT intervention was required, impact on market reliability)
  - AEMO publishing a report within five business days of the dispatch / activation of the RERT, detailing preliminary estimated RERT costs and estimated volumes of emergency reserves dispatched/activated
  - AEMO to maintain a methodology report, explaining how it determined the amount of emergency reserves to procure, as part of its RERT procedures.
- Allowing AEMO to use any emergency reserves procured to be dispatched in order to manage power system security, where feasible.

22 An overview of the changes, compared to the current arrangements and AEMO's proposal is provided at the end of this summary.

**The reliability standard remains appropriate**

23 The reliability standard is not set at zero per cent expected USE. In simple terms, the reliability standard requires there be sufficient generation and transmission interconnection in a region such that at least 99.998 per cent of forecast total energy demand in a financial year is expected to be supplied. In other words, the reliability standard implies that some load shedding (0.002 per cent and below) is acceptable when considering the costs that would be involved in trying to eliminate USE between 0.002 per cent and zero. It is *expected* USE since the standard is measured as the weighted-average across a wide range of possible outcomes that could lead to USE, where the weights are the probabilities (or likelihood) that USE will occur.

24 In operating the system to meet the reliability standard, AEMO has the flexibility in how it uses its forecasting processes to implement the reliability standard in its day-to-day activities. It does so through its Reliability Standard Implementation Guidelines, where AEMO explains exactly how it determines if the reliability standard is breached or not, through its different forecasting and information provision, and modelling processes.

25 Some of AEMO's concerns raised in relation to the RERT in its rule change request related to the appropriateness of the reliability standard – in particular whether the reliability standard adequately captures community expectation of how risks now facing a changing power system are managed and how the reliability standard deals with an increasingly peaky system. Given these views, the Commission has considered the appropriateness of the reliability standard in this rule change request. It sought advice from the Reliability Panel and also engaged Brattle to review risk management approaches in reliability frameworks.

26 The Commission considers that the reliability standard is still appropriate; however, recognises that how it is operationalised may need to change. In considering the appropriateness of the reliability standard, as noted above, a non-zero reliability standard is crucial because of the trade off between affordable power and the cost of not having energy when it is needed. Not only could it be prohibitively expensive to try to maintain a 100%

level of reliability, practically, it is impossible as there will always be the possibility some unlikely combination of events could occur such that there is insufficient supply to meet demand.

27 The Commission agrees with AEMO that the nature of the system is changing. The changing characteristics of the generation fleet and the increase in extreme weather events make the power system less stable, more volatile and difficult to operate. This in and of itself does not suggest that the reliability standard is no longer appropriate but does mean that the way the power system is operated to meet the standard may need to change. The Commission considers that the current framework is flexible enough to adapt to accommodate this. AEMO - as is appropriate for the system operator - has flexibility and discretion as to how the reliability standard is incorporated in its day-to-day operations, particularly through its modelling and forecasting of the risk to the power system. Box 7 of the draft determination provides more information on the flexibility available to AEMO in its reliability assessment.

28 For example, if AEMO considers that a more peaky system has changed the underlying distribution of USE outcomes, it could change the weighting of some of the extreme outcomes (e.g. a one-in-ten year outcome) accordingly, through consultation of the Reliability Standard Implementation Guidelines (RSIG) with industry. In addition, the lack of reserve (LOR) declaration framework which operates in the short-term, is not directly linked to the expected USE metric. Moreover, this was recently changed to incorporate forecasting uncertainty, allowing errors with temperature or generation availability to be captured in AEMO's modelling. The draft rule preserves this flexibility for AEMO, given that flexibility continues to be important to make sure that the reliability framework remains fit for purpose in the changing environment.

29 The reliability framework establishes that AEMO should target zero load shedding in real-time, and gives it a number of tools to manage this, including tools to manage extreme events. If AEMO forecasts that there are not enough reserves in the market in real-time, and there is an insufficient response from the market to provide additional reserves, and that there are no reserves procured or available through RERT, then these extreme events are managed through rotational load shedding.

30 Rotational load shedding occurs through AEMO directing networks to reduce load by turning power off to some areas to maintain balance in the system. It is called rotational load shedding because the outages for consumers are typically kept to about 30-60 minutes, with load shedding rotated between suburbs and regions. Typically, lines supplying critical infrastructure (such as hospitals) and the CBD are exempt from rotational load shedding. While rotational load shedding is regrettable because of the impact on the customers affected, its objective is to avoid an even wider loss of supply, or even an extreme grid shut down. To avoid the rarity of rotational load shedding (the recent events being the third time rotational load shedding has been used in the NEM for reliability purposes) would incur significant costs that consumers have advised that they are unwilling to pay.

**Benefits for the long-term interests of consumers**

31 The draft rule promotes reliability of the power system, at lowest cost to consumers. The draft rule allows AEMO to procure emergency reserves from outside the market that can be

used as a last resort in order to minimise the chances of load shedding for consumers. This promotes the likelihood that consumers will experience a reliable supply. However, the draft rule also seeks to balance the trade-offs of a more reliable system, with the costs associated with reliability. The draft rule does this by clearly linking the procurement decision to the reliability standard. As noted above, the reliability standard is reviewed by the Reliability Panel, who seeks to strike a balance between having enough generation capacity to cover almost all scenarios, and keeping costs as low as possible for consumers.

32 In addition, the draft rule seeks to increase the number of reserve providers available to AEMO by increasing the procurement lead time from nine to 12 months. This will also give AEMO a longer period of time to enter into reserve contracts, which should reduce the costs associated with emergency reserves. This needs to be balanced against the potential the longer lead time has to increase market distortions, and so the draft rule strengthens the out-of-market provisions, as well as introducing a $/MWh guide for RERT costs. These changes should also minimise costs for consumers associated with emergency reserves.

33 Finally, stakeholders have raised concerns around the transparency of RERT events, and the emergency reserve framework more broadly. For example, they have expressed concerns around the information provided to the market when AEMO uses RERT - particularly in 2017-18 as it was the first time emergency reserves were ever dispatched. The draft rule addresses these concerns by building on existing reporting requirements to introduce new and enhanced requirements so that all interested parties have access to clear, timely and meaningful information to help them manage operational and investment decisions.

**Interaction with the Retailer Reliability Obligation**

34 The Commission is working closely with the ESB on the development of the rules to give effect to the RRO. Under the RRO, if a gap that was identified three years out still persists one year out, then AEMO becomes the Procurer of Last Resort (PoLR), and will be allowed to enter into contracts for emergency reserves using the RERT mechanism. However, if the PoLR is used, then some of the costs associated with the emergency reserves procured by AEMO will be passed through to (any) non-compliant liable entities under the RRO.

35 These arrangements are currently being developed through the ESB's development of the Rules to put in place the RRO. As discussed above, the Commission has made the procurement lead time of the RERT consistent with the PoLR (i.e. 12 months ahead of a shortfall in the draft rule). The Commission will continue to monitor any interactions as the RRO is finalised between the draft determination and the final determination.

**Implementation**

36 Prior to the final rule commencing, two key documents will need to be revised:

1. The Reliability Panel will need to update its RERT guidelines.
2. Once the Panel has updated its guidelines, AEMO will need to update its RERT procedures.

37 The RERT guidelines and RERT procedures are subject to consultation processes under the NER which could take a significant amount of time to complete. Recognising the importance

of the RERT and the desire for AEMO to procure emergency reserves (if required) under the new framework for summer 2019-20, the Commission has proposed an approach that would not change the consultation requirements under each of the processes described above, but would allow the revised guidelines and procedures to be put in place faster, enabling the mechanism to be available for use well in advance of summer 2019-20. The savings in the timeframe are achieved through the Panel and AEMO undertaking work faster than that specified by the NER in order to get the guidelines and procedures in place as soon as possible.

38 Consistent with the relevant consultation processes stipulated by the NER, via transitional arrangements the Commission will require:

- The Panel to publish its latest RERT guidelines, taking into account the amending rule, by **27 June 2019.**
- AEMO to publish its RERT procedures, taking into account the amending rule and the updated RERT guidelines, by **31 October 2019.**

39 These timeframes allow the new RERT framework to be fully implemented prior to summer 2019-20, such that, if required, AEMO can procure emergency reserves under the new framework.

### Consultation and next steps

40 The Commission invites submissions on this draft rule determination, including the more preferable draft rule, by **21 March 2019**. Following consideration of submissions, the Commission intends to publish its final determination by 2 May 2019. If any stakeholder wants to discuss aspects of this draft determination with the Commission, please do not hesitate to contact Sarah-Jane Derby on (02) 8296 7823 or sarah.derby@aemc.gov.au to request a meeting.

Table 1: **Summary of draft rule**

| RERT AND RELIABILITY FRAMEWORK | CURRENT ARRANGEMENTS | AEMO'S PROPOSAL | COMMISSION'S DRAFT RULE | COMMISSION'S RATIONALE |
|---|---|---|---|---|
| Procurement trigger | NER trigger clause is ambiguous but implies it is the reliability standard | Broader risk assessment framework i.e. its economic cost minimisation (ECM) model and additional risk metrics. | Links trigger explicitly to reliability standard through the declaration of low reserve conditions (LRCs) and lack of reserves (LORs). | Linking the procurement process explicitly to the reliability standard limits the misallocation of reliability risks. This minimises market distortions (i.e. indirect costs) and results in lower cost outcomes for consumers since it keeps the RERT framework and the reliability standard explicitly linked. |
| Governance of the trigger | Governance shared by the NER, Reliability Panel and AEMO | • No proposal for a governance structure in relation to the ECM.<br>• No proposed changes other than proposing for some risk metrics to be set externally. | No changes - same as AEMO's proposal and current arrangements | The reliability standard is reviewed by the Reliability Panel, which makes decisions about the level of reliability and costs on behalf of consumers. This is appropriate given that the Panel comprises experts from large energy users, consumer groups, generators, network businesses, retailers and AEMO. Similarly it is |

| RERT AND RELIABILITY FRAMEWORK | CURRENT ARRANGEMENTS | AEMO'S PROPOSAL | COMMISSION'S DRAFT RULE | COMMISSION'S RATIONALE |
|---|---|---|---|---|
| | | | | appropriate that AEMO operates the system to meet the reliability standard given that it is the system operator. |
| Reliability standard and reliability framework | Current reliability standard; one reliability standard for the market and for RERT. | Revised reliability standard incorporating risk aversion and loss aversion concepts. In the absence of this, delink RERT procurement from the reliability standard. | Reliability standard is appropriate; existing framework provides flexibility to AEMO as how it operationalises this in its day-to-day operations e.g. in its forecasting activities. | There is no evidence to suggest that the metric is no longer appropriate. Stakeholders commented that it remained appropriate, and in fact, consumers were far more concerned about price than reliability. AEMO has the flexibility to change how it operates the system in respect of the reliability standard. |
| Procurement volume | RERT procurement framework disconnected from rest of the reliability framework. | Broader risk assessment described above used to determine both whether to procure and how much. | Explicit link to reliability standard (through LORs and LRCs) with some flexibility provided to AEMO for practicality (e.g. to use the broader risk assessment). | Linking the procurement process explicitly to the reliability standard limits the misallocation of reliability risks. This minimises market distortions (i.e. indirect costs) and results in lower cost outcomes for consumers since it keeps the |

| RERT AND RELIABILITY FRAMEWORK | CURRENT ARRANGEMENTS | AEMO'S PROPOSAL | COMMISSION'S DRAFT RULE | COMMISSION'S RATIONALE |
|---|---|---|---|---|
| | | | | RERT framework and the reliability standard explicitly linked. Provides flexibility to AEMO to procure emergency reserves, given the capacity procured under this mechanism is typically not firm. |
| Procurement lead time | A maximum of nine months. | A maximum of 12 months. | A maximum of 12 months, as per AEMO's proposal. | Broadens the pool of potential RERT providers and so reduces the costs associated with the RERT. Creates consistency with the lead time under the RRO. |
| Contracting duration | Implied by the procurement lead time (nine months) but not prescribed explicitly in the NER. | Allowing multi-year (specifically, three years) contracting in some circumstances when it would be lower cost to do so. | Maximum term of the contract is implied by the procurement lead time (maximum of 12 months) with the term to be consistent with addressing the gap(s) identified through LORs and LRCs. | Procurement lead time and contracting duration should be consistent to minimise market distortions (i.e. costs). |
| Out-of-market provisions | • Cannot participate in RERT if in the market for the trading intervals | No proposed changes. | • Cannot participate in RERT if in the market (or under a demand | Emphasises that the wholesale market is the primary means by which |

| RERT AND RELIABILITY FRAMEWORK | CURRENT ARRANGEMENTS | AEMO'S PROPOSAL | COMMISSION'S DRAFT RULE | COMMISSION'S RATIONALE |
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| | to which contract relates.<br>• Implementation of the provision is unclear. | | response arrangement) for the past 12 months, and for the duration of the contract.<br>• Clarifies implementation by specifying that the provisions applies to the wholesale market and demand response with registered participants. | reliability is delivered. |
| Payment structure | Not prescribed in the NER. | High-level design discussed payment caps on each individual payment type (e.g. availability payments), specifically, a $30,000/MWh cap on dispatch payments. | Introduces guidance for AEMO ($/MWh basis) that RERT costs should not exceed the estimated average VCR of those loads that would have been shed, had the counterfactual of not having RERT been involuntary load shedding. AEMO has the flexibility to estimate this amount, depending on each jurisdiction's circumstances, and incorporating VCR estimates from the AER. | Provides guidance to AEMO when entering into emergency reserve contracts to ensure that the costs associated with these are reasonable, i.e. unlikely to exceed VCR. |

| RERT AND RELIABILITY FRAMEWORK | CURRENT ARRANGEMENTS | AEMO'S PROPOSAL | COMMISSION'S DRAFT RULE | COMMISSION'S RATIONALE |
|---|---|---|---|---|
| Reporting requirements | There are a number of reporting requirements in the NER. | No proposed changes. | Building on existing requirements, and current practice by AEMO, including:<br>• A quarterly report with forward-looking and backward-looking reporting on costs, forecasting and activities.<br>• A report to be published within five business days of dispatch event.<br>• Setting out a methodology for procurement volume. | Informs market participants, policy makers, consumers and other interested parties about the costs of the RERT, and what is driving the use of the RERT in order to guide these parties to make more informed operational and investment decisions, as well as to better budget and plan for RERT related charges. |
| Cost recovery | Smeared across market customers as a share of consumption between 8am and 8pm on business days for the relevant billing week. | No proposed changes. | • Activation/dispatch costs to be recovered as a share of consumption over the dispatch intervals of the activation event.<br>• All other contractual costs as a share of consumption over the billing period in which | Recover usage costs from those that were consuming at the time, i.e. those that contributed to the RERT event. All other costs are recovered as broadly as possible so as to be non-distortionary. |

| RERT AND RELIABILITY FRAMEWORK | CURRENT ARRANGEMENTS | AEMO'S PROPOSAL | COMMISSION'S DRAFT RULE | COMMISSION'S RATIONALE |
|---|---|---|---|---|
| | | | payments were made, over the length of the contract.<br>• Recovered in the region where RERT was used. | |
| Dispatch trigger | NER trigger is the reliability standard and, where practicable, power system security. AEMO operationalises through its processes. | No proposed changes. | No changes - same as proposed by AEMO and current arrangements. | Allows AEMO to use whatever reserves available in real-time to manage the system. |
| Standardised products | Not prescribed in NER. | Proposed to standardise products (through standard contractual terms and conditions), with some variations allowed. | • Agree with AEMO that standardised products would be helpful, but no changes to the NER proposed since standardisation should be left to AEMO to develop.<br>• If AEMO wishes to standardise products, the draft rule requires it to publish standardised contract terms and conditions. | Can provide clarity and transparency to stakeholders. |

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## APPENDICES



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# 1 AEMO'S RULE CHANGE REQUEST

## 1.1 The rule change request

On 9 March 2018, the Australian Energy Market Operator (AEMO) (proponent) submitted a rule change request to the Australian Energy Market Commission (AEMC or Commission) seeking broad changes to the Reliability and Emergency Reserve Trader (RERT or emergency reserves). These proposed changes included: increasing the amount of time AEMO has to enter into emergency reserve contracts prior to projected shortfalls from nine months to one year (and beyond in some circumstances); taking into account a broader risk assessment framework when procuring emergency reserves; establishing standardised RERT products, with standardised elements including notification lead times and availability periods.

AEMO considered that these broader changes to the RERT framework will help manage the "risks of unanticipated shortfalls" of supply to meet demand in light of greater uncertainty and a tightening supply-demand balance, "driven by a growing proportion of variable renewable generation, an aging fleet of thermal generation and unexpected retirement of capacity increasing risk of forced outages."[2]

The rule change request and accompanying proposed rule are available on the AEMC website.[3] AEMO also submitted a high-level design document that set out its desired specification for an enhanced RERT.

### BOX 1: REINSTATEMENT OF THE LONG-NOTICE RERT

At the same time as this rule change request was submitted, AEMO also submitted a rule change request on 9 March 2018 that sought to extend the period allowed for AEMO to contract for reserves ahead of a projected shortfall in supply to meet demand, in effect, reinstating the long-notice RERT. The AEMC considered this an urgent rule and so progressed it under an expedited process, making the final rule on 21 June 2018.

The final rule increased the lead time available for AEMO to procure out-of-market reserves through the RERT, to nine months ahead of a projected shortfall, effectively reinstating the long-notice RERT. This has allowed AEMO to procure reserves under the long-notice RERT for the 2018-19 summer.

In the final determination for that rule change request, the Commission noted that while the potential of the mechanism to distort outcomes remains unchanged since the Commission considered similar issues in 2016, several conditions in the market have changed since then, including the changing generation mix and the ARENA-AEMO RERT trial, which has demonstrated the existence of resources, primarily demand response, capable of participating in the RERT. The trial also found that a longer lead time is required for these types of

2 AEMO, rule change request, p. 2.

3 For more information, see the project webpage: https://www.aemc.gov.au/rule-changes/enhancement-reliability-and-emergency-reserve-trader

reserves, e.g. to install relevant equipment. This was confirmed through stakeholder feedback to the reinstatement of the long-notice RERT rule change.

Further, the Commission considered that to the extent that emergency reserves are required, having more resources able to participate in the RERT through a longer procurement lead time may improve the efficiency of the procurement process. This may put downward pressure on the direct costs of emergency reserves, if it is needed.

Source: AEMC, *Reinstatement of the Long Notice RERT, final determination,* June 2018

## 1.2 Rationale for the rule change request

In the rule change request AEMO noted that in the context of greater uncertainty being experienced in the National Electricity Market (NEM) and a tightening supply-demand balance, it considered that there is a need for a reserve arrangement to mitigate against the risks associated with unanticipated shortfalls.[4] It stated that an enhanced RERT, as presented in its high-level design document attached to the rule change request, would be a stronger safety net to mitigate against the risks associated with unanticipated shortfalls.[5]

AEMO identified three main concerns with the current emergency reserve framework:

- The procurement lead time and contracting duration are too short — AEMO stated that the current limit on signing contracts for reserves has the potential to limit the availability, or increase the cost, of reserves.[6]
- There is a lack of a comprehensive risk assessment framework — AEMO is concerned that its market projections indicate a heightened risk of significant load shedding over upcoming summers, even when the projected unserved energy (USE) over a broad range of scenarios meets the reliability standard.[7] The current framework, with the RERT procurement trigger based on the reliability standard, is designed to balance the benefits to consumers of having reliable electricity supply against the costs associated with increasing levels of reliability in the NEM. The appropriateness of the reliability standard and these trade-offs is therefore being considered through this rule change.
- RERT products are currently bespoke which is problematic for AEMO and potential providers— reserves are currently procured through highly bespoke, negotiated contracts. AEMO stated that this creates uncertainty for potential providers and makes it difficult for AEMO to compare offers, and is highly time-consuming.[8] AEMO would prefer to procure standardised products, e.g. common notification times and availability periods.[9]

4 AEMO, *Enhancement to the RERT, rule change request,* p. 2

5 AEMO, *Enhancement to the RERT, rule change request*, p. 2

6 For example, AEMO notes that the procurement of RERT, and the associated costs (e.g. assessing tenders) represents a significant time commitment and cost, meaning that the inability to enter into longer-term agreements leads to inefficient procurement processes. Also, AEMO considers that the inability to enter into longer-term agreements means potential resources, such as diesel gensets, may not be able to be procured in the most efficient way. AEMO, *Enhancement to the RERT, rule change request,* p.6.

7 AEMO, *Enhancement to the RERT, rule change request*, p. 6

8 AEMO, *Enhancement to the RERT, rule change request*, p. 6

## 1.3 Solution proposed in the rule change request

AEMO sought to resolve the issues discussed above by proposing a rule (proposed rule) that reflected elements of a new high-level design for the RERT that it attached to its rule change request.

AEMO's solution proposed: a longer lead time and contracting duration; a broader risk assessment framework; standardisation of products; and other modifications. These are discussed in turn below.

### 1.3.1 A longer lead time and contracting duration

AEMO proposed that emergency reserves be procured over a longer time horizon. In particular, AEMO considered that:[10]

- emergency reserves should be able to be procured up to one year ahead of an identified shortfall under an annual contract (i.e. increasing the procurement lead time from nine months to one year)
- if a longer-term requirement for emergency reserves (over multiple years) is projected - with the forecasts taking into account committed or highly likely new projects - emergency reserves may be able to be procured for up to three years, enabling multi-year contracts. AEMO proposed this could only occur if analysis indicated this would be a lower overall cost than procuring annually.

### 1.3.2 A broader risk assessment framework

AEMO considered that the NER trigger for procuring emergency reserves (i.e. procurement trigger), and the determination of the volume to be procured (i.e. procurement volume), should be in the context of a broader risk assessment. It stated that this "should take into account the risk of unserved energy, not just the "expected" value."[11] AEMO did not provide further information on this in its rule change request.

However, since submitting its rule change request, , AEMO provided additional information in support of its proposal. This recommended that the procurement of RERT should be delinked from the reliability standard and that a standing reserve be created to provide the "insurance function" in the overall reliability framework.

AEMO also proposed that the reliability framework should set the level of the required standing reserve over a defined horizon (akin to determining the sum to be insured) by taking account of:[12] "

- the nature of the tail risk - using a range of supplementary metrics

9 In 2017, through a trial with ARENA, tenders were held for standardised products, leading to strong and competitive offers from potential providers that be directly put on the RERT panel.

10 AEMO, Enhancement to the RERT, rule change request, p. 7

11 AEMO, *Enhancement to the RERT, rule change request,* p. 7

12 AEMO, *NEM Reliability Framework - Additional information from AEMO to support its Enhanced RERT rule change proposal*, 2018, p. 3.

- the risk appetite for different levels of load shedding expressed both in cost and limits terms
- the cost structure and optimal mix of resources that can prevent or mitigate load shedding."

### 1.3.3 Standardisation of products

Based on consultation with industry providers, the findings of the ARENA trial, and AEMO's operational requirements, AEMO noted it intends to move towards standardised RERT products. AEMO proposed to define distinct emergency reserve products to be procured from the market that would deliver AEMO's operational requirements but also reflect the supply constraints on the system.[13] For example, AEMO outlined a set of products that would be defined by season (summer or not summer), time blocks (12pm-4pm business days; 4pm-8pm business days and all other times) and with specific notification lead times (10 minute, 60 minute and 24 hour). AEMO considered that implementing these changes could be addressed through revising the Reliability Panel's RERT Guidelines and AEMO's RERT procedure — a rule change is therefore not necessarily required.[14]

### 1.3.4 Other aspects of the high-level design

AEMO's high-level design proposal also includes a number of design choices, some of which are similar to existing arrangements, with others being more notably different from existing arrangements. AEMO's design provides details on:[15]

- Specifications for AEMO's standardised products, e.g. which technologies would be eligible and what additional requirements are appropriate (i.e. provisions that seek to minimise market distortions by making sure that emergency reserves provided under the RERT will be in addition to in-market reserves).
- The procurement process, including the tender process, how the scheme would be funded and the payment structure of offers.
- Dispatch procedures and implications of dispatching the RERT (e.g. consequences of non-delivery of emergency reserves).

### 1.3.5 Additional information to support its enhanced RERT rule change proposal

In November 2018, AEMO submitted additional information to support its enhanced RERT rule change proposal. The additional information considers the appropriateness of the existing NEM reliability framework in the context of the observed trends in the drivers of unserved energy. AEMO's findings in the paper are that:

- the risk of load shedding in the NEM is increasing due to a tightening of the supply-demand balance, a trend of increasing maximum temperatures, and the variability of renewable resources and the observed recent increase of forced outages at thermal plant

13 AEMO, *Enhancement to the RERT, rule change request,* p. 8
14 AEMO, *Enhancement to the RERT, rule change request,* p. 8
15 AEMO, Enhancement to the RERT, rule change request

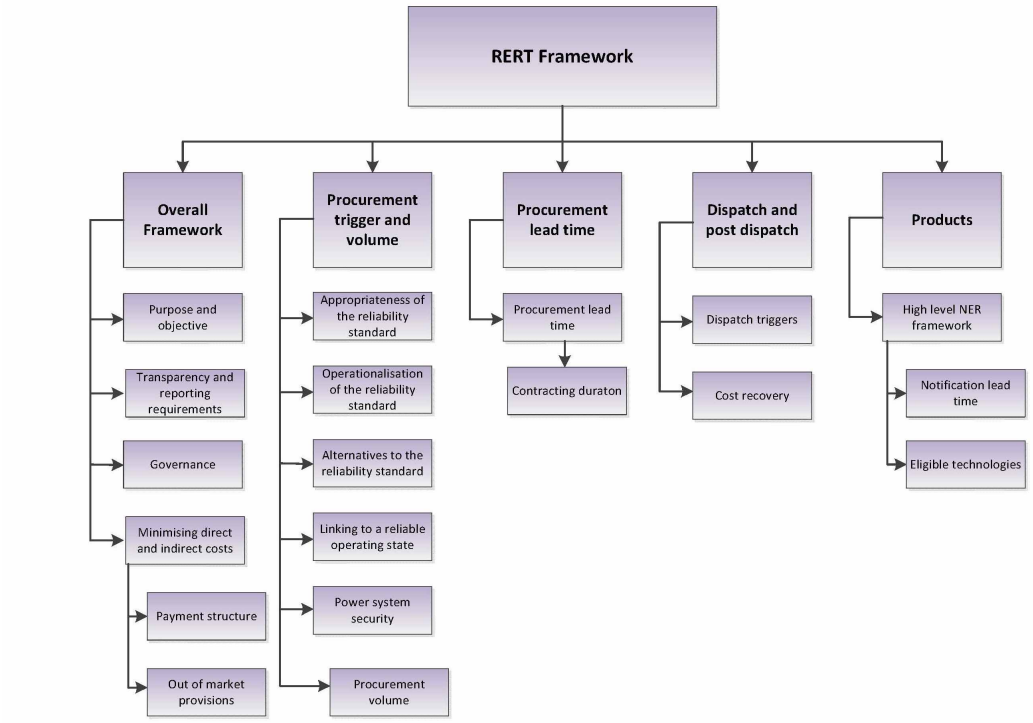
- the NEM reliability framework is not suited to increasing risk and uncertainty, namely, increasing tail risk (i.e. the risk of rare events)
- the reliability framework should incentivise the optimal resource mix with the lowest cost
- this suggests that there should be various changes to the RERT framework.

This additional information is discussed further in chapter 4.

## 1.4 Scope of the rule change request

The rule change considers the entire emergency reserve framework. The scope of the rule change is depicted in Figure 1.1 below.

**Figure 1.1: Scope of this rule change**




## 1.5 Interaction with the Retailer Reliability Obligation

On 19 December 2018, the Council of Australian Governments (COAG) Energy Council agreed to the final draft bill of National Electricity Law (NEL) amendments which will give effect to the Retailer Reliability Obligation (RRO), as presented by the Energy Security Board (ESB). The ESB will also progress a final package of Rules to be brought to the COAG Energy Council for approval in the first half of 2019 to facilitate commencement of the obligation by 1 July 2019.

The RRO builds on existing spot and financial market arrangements in the electricity market to facilitate investment in dispatchable capacity. It is designed to incentivise retailers, on behalf of their customers, to support the reliability of the power system through their contracting and investment in resources.

The RRO does this by requiring electricity retailers (and other liable entities) to demonstrate they have entered into sufficient contracts for dispatchable capacity (including demand response) to cover their share of system peak demand at the time of the gap between demand and supply. The obligation to secure sufficient qualifying contracts would be triggered if there is a material gap between forecast demand and supply three years out from the period in which the gap is forecast and the AER has subsequently made a 'T-3 reliability instrument'.[16]

If the gap persists one year out from the forecast gap, then AEMO is able to apply to the AER to make a 'T-1 reliability instrument'. Where a T-1 reliability instrument is made, and liable entities have not sufficiently demonstrated contract cover that they are required to have under the RRO, then AEMO becomes the Procurer of Last Resort. The Procurer of Last Resort (PoLR) allows AEMO to enter into contracts for reserves through the RERT mechanism.

In other words, the PoLR will use the RERT mechanism, to procure emergency reserves. Once the RRO has been triggered AEMO's procurement of reserves will occur through the RERT mechanism, and the rules that are under consideration in this rule change request.

However, the cost recovery arrangements for emergency reserves procured under the PoLR will differ, and are currently being developed through the ESB's development of the Rules to put in place the RRO.

The Commission is working closely with the ESB on the development of the rules to give effect to the RRO. Where relevant in this determination we discuss the interactions between the RRO and this rule change.

## 1.6 The rule making process

On 21 June 2018, the Commission published a notice advising of its commencement of the rule making process and consultation in respect of the rule change request.[17] A consultation paper identifying specific issues for consultation was also published. Submissions closed on 26 July 2018. The Commission received 25 submissions as part of the first round of consultation.

On 4 October 2018, the Commission extended the period of time for making a draft determination, reflecting the complexity and cost implications of the issues being considered, and to allow time for advice from the Panel and AEMO's views on the appropriateness of the

16 When AEMO identifies a material gap three years out, it has to apply to the AER to make a "T-3 reliability instrument". This instrument is then the trigger for the RRO mechanism and obligations, such as requiring retailers to have enough contracts in place.

17 This notice was published under s.95 of the National Electricity Law (NEL)

reliability standard to be considered.[18] AEMO supplied its additional views on the reliability standard to the Commission in November 2018.

On 18 October 2018, the Commission published an options paper for this rule change. The options paper details: how the RERT procurement trigger could be designed, how emergency reserve procurement volumes could be set, and how the Commission will consider the appropriateness of the reliability standard. Submissions to the options paper closed on 29 November 2018. The Commission received 20 submissions to the options paper.

On 31 January 2019, the Commission further extended the period of time for making a draft determination, by one week to 7 February 2019.

The Commission has also undertaken a large range of additional stakeholder consultation on this rule change request, including through:

- three technical working groups on 4 September, 20 November and 14 December 2018, with the technical working group comprising a range of industry stakeholders[19]
- one public workshop for the rule change on 12 November 2018, which was also webcast[20]
- one-on-one meetings with a large number of stakeholders.

The Commission considered all issues raised by stakeholders in submissions. Issues raised in submissions are discussed and responded to throughout this draft rule determination. Issues that are not addressed in the body of this document are set out and addressed in appendix A.

## 1.7 Consultation on draft rule determination

The Commission invites submissions on this draft rule determination, including the more preferable draft rule, by 21 March 2019.

Any person or body may request that the Commission hold a hearing in relation to the draft rule determination. Any request for a hearing must be made in writing and must be received by the Commission no later than 14 February 2019.

Submissions and requests for a hearing should quote project number ERC0237 and may be lodged online at www.aemc.gov.au.

All enquiries on this project should be addressed to Sarah-Jane Derby on (02) 8296 7823 or sarah.derby@aemc.gov.au.

## 1.8 Structure of draft rule determination

The structure of this draft determination is as follows:

- Chapter 2 provides background information on the RERT

18 The reliability standard is important because the RERT can be triggered and so procured if AEMO forecasts that the standard will be breached.

19 Discussion notes from each of these meetings are available on the project page.

20 Recordings from the webcast are available on the project page.

- Chapter 3 summarises the draft rule determination
- Chapter 4 discusses the appropriateness of the reliability standard
- Chapter 5 outlines the procurement trigger and volume
- Chapter 6 discusses procurement lead time and contracting duration
- Chapter 7 discusses minimising market distortions
- Chapter 8 details cost recovery of the RERT
- Chapter 9 discusses transparency and reporting requirements
- Chapter 10 covers the dispatch trigger of the RERT and standardised products
- Chapter 11 discusses implementation
- Appendix A summarises other issues raised in submissions
- Appendix B sets out the legal requirements under the NEL
- Appendix C summarises the Reliability Panel's advice on the reliability standard
- Appendix D sets out the Commission's detailed assessment of procurement options.

# 2 BACKGROUND

This chapter summarises:

- how the reliability framework operates in the National Electricity Market (NEM), which provides context to the operation of the Reliability and Emergency Reserve Trader (RERT or emergency reserves) given the RERT exists within this broader framework
- the current RERT framework and how it works in practice.

## 2.1 Reliability in the NEM

The RERT is a safety net which has formed part of the reliability framework since the start of the NEM. It is a tool that allows AEMO to intervene in the market in the event that demand exceeds supply and there is a shortfall of market reserves. While the focus of this rule change is on emergency reserves, it is worth understanding how the reliability framework operates more broadly in order to consider changes to the RERT framework in this context.

### 2.1.1 Reliability versus security

A "reliable power system" has enough generation, demand response and network capacity to supply customers with the energy that they demand with a very high degree of confidence. A reliable power system therefore requires adequate investment and disinvestment as well as appropriate operational decisions, so that supply and demand are in balance at any particular point in time.

Reliability is distinct from system security. A secure system is one that is able to operate within defined technical limits, even if there is an incident such as the loss of a major transmission line or large generator. Security events are mostly caused by sudden equipment failure (often associated with extreme weather or bushfires) that results in the system operating outside of defined technical limits, such as voltage and frequency.

Reliability issues occur where the demand-supply balance in the system is tight, typically at times of peak demand for electricity, generally on very hot days. For example, when emergency reserves were exercised in both January 2018 and 2019, it was in the middle of the afternoon with the temperature exceeding 40 degrees Celsius in Victoria.[21] In contrast, security issues can arise at any time - and at present, more often than not tend to occur at off-peak times, when there are low demand conditions.[22] For example, the South Australian state-wide blackout that occurred in September 2016 was a security event, in relatively mild demand conditions.

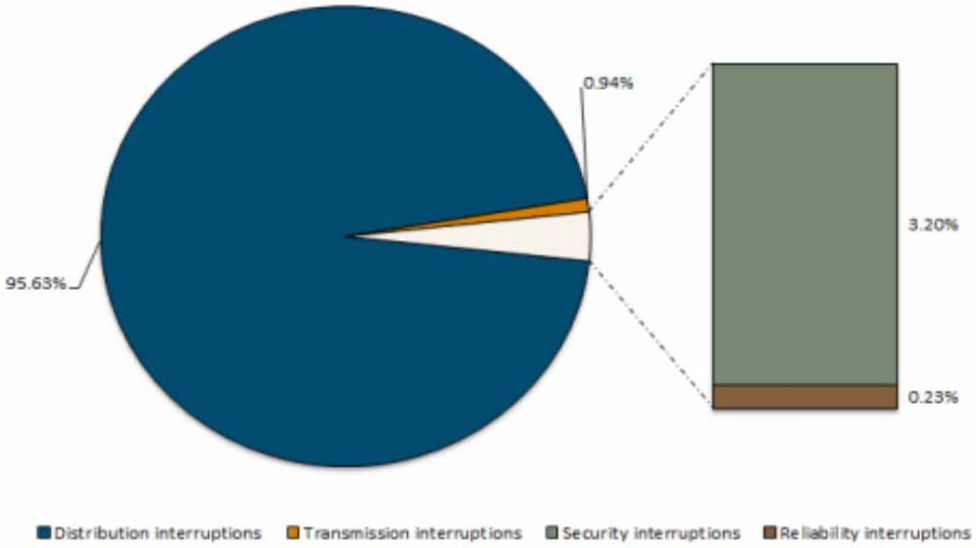
21 AEMO activated reserve contracts to maintain the power system in a reliable operating state. The contracts were activated at 14:00 AEST on 19/01/2018. See: market notice 60843, 19 January 2018, 13:43, market intervention

22 For example, on 2 December 2017, AEMO directed on a participant in South Australia to maintain the power system in a secure operating state, with the direction issued at 00:00. The direction was issued at 00:00 02/12/2017, with effect from 01:00 hrs 02/12/2017. See: market notice 60176, 2 December 2017, 0:02, market intervention.

## BOX 2: SUPPLY INTERRUPTIONS

Consistent with the various elements of a reliable power system described above, there are a number of causes of supply interruptions to customers: reliability (i.e. having insufficient generation to meet demand); security (e.g. load being shed to manage frequency across the system); or network (e.g. a particular line being out driving a network outage). The RERT only addresses reliability-related supply interruptions, which as shown in the brown area of the graph below only account for a small fraction of supply interruptions to consumers in the NEM.

**Figure 2.1: Sources of supply interruptions in the NEM: 2007-08 to 2016-17**




Source: AEMC analysis and estimates based on publicly available information from: AEMO's extreme weather event and incident reports and the AER's RIN economic benchmarking spreadsheets.

The figure shows an indicative analysis of sources of supply interruptions in the NEM over the period 2007-08 to 2016-17.

This shows that supply interruptions that stem from reliability issues (not having enough supply to meet demand), are relatively limited in number. Over the period, only about 0.23 per cent of total supply interruptions (in terms of GWh) was the result of inadequacy of supply, noting that this is well below the reliability standard. This is much smaller than the amount of security interruptions that have occurred: over the past 10 years there have been 3.20 per cent (nearly 10 times more) supply interruptions for security. The vast majority of supply interruptions were network interruptions, specifically from the distribution network.

Note: The reliability standard is a maximum expected unserved energy of 0.002 per cent of demand in a financial year - NER clause 3.9.3C. The amount of unserved energy associated with the reliability interruptions in the chart is well below 0.002 per cent of demand. The only year when there was unserved energy in excess of the standard was in 2008-09.

Note: AEMO is currently reviewing the events of 24 and 25 January 2019 to determine the extent of load shedding. This chart only covers up to 30 June 2017.

### 2.1.2 The reliability framework

Consistent with the National Electricity Objective (NEO), the reliability framework has been designed to balance two costs:

- Costs of reliability - Maintaining reliability involves costs. The higher the level of reliability, the more that investment in capacity (e.g. more generation, demand-side resources or network assets) and/or more stringent operating conditions is required, all of which impose costs on parties, and ultimately consumers. For example, having more generation being operated more stringently (i.e. having more generation being operated to meet a higher standard of reliability) creates higher per unit costs of electricity. These costs will be reflected in consumer prices.
- Costs of unserved energy (USE) - The alternative to providing energy, no matter the cost, is not to supply the energy under certain conditions. That is to allow for an expected level of supply interruptions to consumers. This also has a cost - reflecting the customer's willingness to pay for the reliable supply of electricity (this is known as the value of customer reliability). If a customer has their electricity supply interrupted, when they were willing to pay to consume electricity, they will face costs e.g. lost production if it is a business; or a colder / hotter home for residential customers with air conditioning.

Figure 2.2 provides a summary of the existing reliability framework, including the reliability standard, the reliability settings and AEMO's intervention mechanisms. Reliability in the NEM is largely driven through market participants responding to financial incentives and information provided about the need for resources.

**Figure 2.2: Current framework with escalating series of interventions**

### Market incentives

The core objective of the existing reliability framework in the NEM is to deliver efficient reliability outcomes through market mechanisms to the largest extent possible. In a reliable power system, the expected level of supply in the market will include a "buffer", known as in-market reserves. Expected supply will be greater than expected demand.

As the expected supply/demand balance tightens, spot and contract prices will rise which will inform operational decisions and provide an incentive for entry and increased production, addressing any potential reliability problems as or before they arise. This allows the actual demand and supply to be kept in balance, even in the face of shocks to the system. This framework also provides incentives for an efficient mix of technologies to be deployed.

Put simply, market participants respond to financial, operational and other incentives (such as information provided by AEMO, including on the reliability standard) to provide the level of reliability that is expected by the reliability standard.

### Reliability standard and reliability settings

The reliability standard (for generation and inter-regional transmission elements) is the maximum expected USE in a region of 0.002 per cent for a given financial year as a share of total energy demanded in that region. In general terms, 'unserved energy' means the amount of customer demand that cannot be supplied within a region of the NEM due to a shortage of generation or interconnector capacity.[23]

The NER contains the reliability standard for the NEM, currently at 0.002 per cent expected USE. The reliability standard is set every four years following a review by the Reliability Panel, which comprises members who represent a range of participants in the NEM, including large and small consumer representatives, generators, network businesses, retailers and AEMO. Crucially, the reliability standard is not zero per cent since this would be too costly. Instead the reliability standard represents a trade-off between the prices paid for electricity and the cost of not having energy when it is needed: increasing levels of reliability involves increased costs. The reliability standard is set at a level that provides a balance between delivering reliable electricity supplies and maintaining reasonable costs for customers (i.e. an economic trade off between affordability and reliability, based on what consumers value).

As system operator, AEMO operates the system to meet the reliability standard. It incorporates the reliability standard within its day-to-day operation of the market, including informing the market that the reliability standard is not being met. It does this through its forecasting and information provision processes, which determine whether or not there is a breach in the reliability standard. These are discussed in more detail below.

Chapter 4 discusses the reliability standard in more detail, including how AEMO implements the reliability standard in its operations, such as the processes it uses to determine a breach of the reliability standard.

23 See also the definition of unserved energy in Chapter 10 of the NER.

In addition to the reliability standard, there are also the reliability market settings that are closely linked to, and derived directly from, the 'reliability standard'. These form a price envelope for spot prices and are: the market price cap[24] , the market floor price[25], the cumulative price threshold[26] and the administered price cap.[27]

**Information to the market**

AEMO is required by the NER to publish various materials which provide information to market participants – and any other interested parties – on matters pertaining to the reliability standard; that is, over and above the information contained in contract and spot market prices.

For example, it publishes a range of long-term forecasts in its Electricity Statement of Opportunities as to whether or not the reliability standard is projected to be met in the long-term. In the medium-term, AEMO models the power system through its medium-term projected assessment of system adequacy (PASA) to project whether the expected USE (i.e. a probability weighted average across a number of scenarios) for a given year, in a given region, exceeds 0.002 per cent. The expected values of USE outcomes are proportional to their likelihood of occurring i.e. events with a high probability of occurring are given more weight than events with a low probability of occurring. An expected shortfall, relative to the reliability standard is termed a low reserve condition. AEMO provides all of this information to the market to allow the market to respond what it projects could be a shortfall in reserves.

In the short-term (pre-dispatch and short-term PASA), AEMO operationalises the reliability standard through lack of reserve (LOR) declarations. In this case, AEMO forecasts the level of reserves that are required to be in the market (i.e. MW required). This level is at least the size of the largest credible contingency, or larger to take into account forecasting uncertainty (e.g. that there will be a margin of error in any assumptions that feed into the modelling). If the forecast amount of reserves available falls below the LOR2 level, then AEMO considers this to be a breach of the reliability standard and informs the market of this, expecting a response.

The purpose of these forms of supplementary information is to inform the market of prevailing and forecast conditions, and when reserves may be running low, in order to elicit a market response. In particular, if AEMO identifies a breach of the reliability standard through its forecasting and information processes, it is required to inform the market of this, and typically first seeks a market response. These types of information help market participants make operational and investment decisions with respect to reliability and also help AEMO manage the power system.

24 Currently $14,500/MWh, indexed annually.

25 Currently -$1,000/MWh.

26 Currently $216,900,indexed annually.

27 The administered price cap of $300/MWh applies when an administered pricing period is declared by AEMO whenever the sum of the spot price in the previous 336 consecutive trading intervals (that is, seven days) exceeds the cumulative price threshold.

**Intervention mechanisms**

As effective as information processes can be in delivering the desired reliability outcomes through market incentives, they do not always elicit the outcomes needed. If the market fails to respond to the information AEMO publishes (for example, by shifting outages in order to increase production), AEMO may use the tools available to it to intervene in the market, namely:

- AEMO has RERT obligations. These allow AEMO to contract for reserves ahead of a period where in-market reserves are insufficient to meet the reliability standard - the RERT is the subject of this rule change and is discussed in more detail in section 2.2, including how AEMO identifies that there is a gap in in-market reserves, and so how many emergency reserves it decides to procure.
- In addition, if there is a risk to the secure or reliable operation of the power system, AEMO can use directions or instructions under NER clause 4.8.9 to:
    - Direct a generator to increase its output, cancel or shift an outage or not to go offline, if this is possible and can be done safely. To be effective, the generator must have enough time to 'ramp up'. If the generating unit is not already generating, it can take time for it to start up and to connect to the network and begin to ramp up. Even generators which are currently generating cannot typically change their output instantly.
    - Direct a large energy user, such as an industrial plant, to temporarily disconnect its load or reduce demand. If there continues to be a shortfall in supply, even after these measures have been implemented, AEMO may instruct a network service provider to commence involuntary load shedding as a last resort to avoid the risk of a wider system blackout, or damage to generation or network assets.

However, although AEMO is expected to do all in its power to avoid load shedding using the above intervention mechanisms, there will be times when involuntary load shedding will be regrettable, but, unavoidable because the level of investment and operational decisions are being driven by a reliability standard that is non-zero.

The Commission, in 2018, completed its *Reliability Frameworks Review*, where it made a number of recommendations with respect to the broader intervention framework. The Commission will initiate a project to progress this recommendation shortly, titled *System Strength and Intervention Mechanisms in the NEM*.

### 2.1.3 Reliability in practice

On any given day, market participants use information provided by AEMO, as well as their own information and forecasting processes to make operational (e.g. how much generation to offer into the market and at what time) or investment (e.g. whether or not to invest in more generation or demand response) decisions. AEMO also updates its information processes and forecasts on a regular basis, in order to inform itself of the state of the power system.

Box 3 illustrates scenarios of how market participants and AEMO apply the reliability framework in practice.

## BOX 3: RELIABILITY IN THE NEM

Consider a hot summer day when there is high demand forecast. AEMO's processes forecast that there are not enough reserves in the market and AEMO publishes an LOR2 (which is a declaration that indicates to the market that there are not enough reserves) seeking a market response.

**Scenario 1**

Generator A has three units: two are baseload coal, and the last is a gas unit. Generator A sees the forecast LOR2 and associated forecast high prices. Its own information and forecasts also suggests that these are likely to occur. Generator A starts its third unit and offers it into the market, which has a high marginal cost, knowing that there is a high likelihood of high prices, which would enable it to recover its costs. As a result, supply availability increases and AEMO cancels the LOR2 - a market response was sufficient and there are once again enough reserves in the market. Reliability is maintained.

**Scenario 2**

In this scenario, no market response occurs (for example, either due to participants having different views to AEMO as to what the forecast entails; or there is insufficient available capacity in the market; or no planned outages could be cancelled) and the forecast LOR2 persists. AEMO determines that it will intervene through emergency reserves. It dispatches unscheduled emergency reserve contracts (say, demand response) at a time that it has determined is the latest by which it needs to intervene. This has the effect of reducing demand and there are once again enough reserves in the market for the duration of the RERT event. Reliability is maintained.

**Scenario 3**

Assume in this scenario that emergency reserves (and directions) are not available to AEMO in sufficient quantities or in sufficient time and the market does not respond as there is no spare generation or demand response. The forecast LOR2 persists into an actual LOR2. At that point, one unit unexpectedly trips, leading to a drop in reserves and an actual LOR3 occurring - this means that load shedding is imminent due to the market having run out of reserves.

AEMO then instructs networks to shed load in the affected region. This is typically done is a controlled manner, through what is known as rotational load shedding. With this type of load shedding, consumers are "rotated", i.e. groups of consumers are interrupted for a limited amount of time (such as 30 minutes), then their supply is restored while another group is interrupted and so on.

Note: LOR2 stands for lack of reserve level 2. An LOR2 means that there are insufficient reserves in the market, which then allows AEMO to seek a market response. The LOR framework is described in more detail in chapter 4.

Involuntary load shedding is the last resort, after all other avenues have been exhausted, and is typically done so as to avoid potentially larger issues occurring, such as interconnector flows exceeding secure limits (i.e. the system being in an insecure state), with the risk of more widespread blackouts should a further contingency occur. Rotational load shedding is initiated by AEMO through instructions to network service providers to shed blocks of load. It is manually initiated, with the load shedding manually rotated across load blocks to deliver an equitable outcome.

The order and location of the interruptions are based on a schedule set by each jurisdiction, based on priorities. Essential services such as hospitals and other sensitive consumers (such as businesses in the CBD or critical industries) are typically not high on the load shedding list. Furthermore, businesses or energy users that require very high levels of reliability (e.g. data centres and emergency services) typically have back-up plans such as back-up generators or uninterruptible power supply units to manage their own reliability, in the event of load shedding. As AEMO notes, "load shedding arrangements vary from state to state, but the objective of rotational load shedding is to minimise the impact on any one group of customers."[28]

Load shedding schedules are confidential, except in South Australia.[29] In South Australia, according to SAPN (the local distributor), rotational load shedding typically only lasts for about 30-40 minutes for a group of customers before it is "rotated" to a different group, and the CBD and areas with critical infrastructure are excluded.[30]

### Reliability performance

Load shedding for the purpose of reliability has been rare, and as mentioned above, only accounts for a small share of all outages. Up until 30 June 2018, there were only two reliability events in the NEM, as shown in the figure below. There was also load shedding in January 2019.[31]

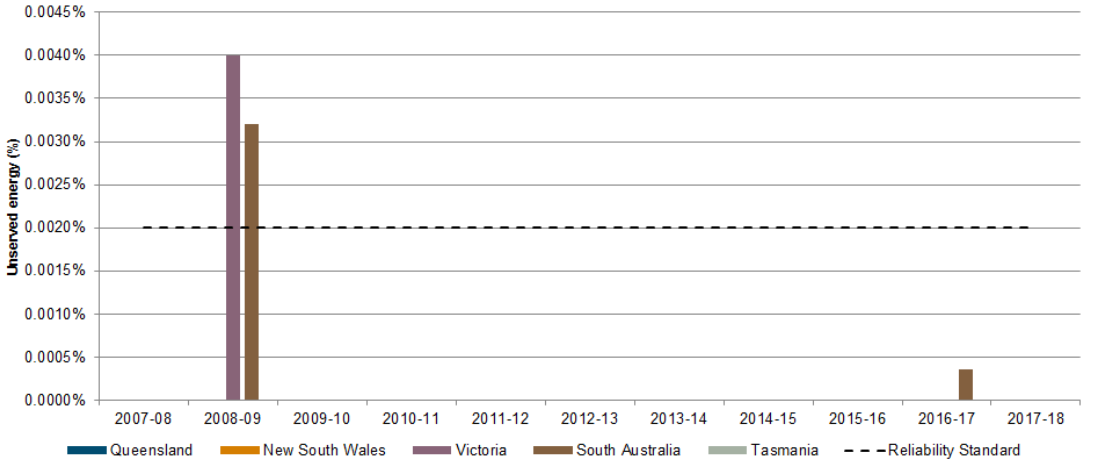
28 See https://www.aemo.com.au/Media-Centre/Media-Statement—-NSW-Electricity-supply-demand-update

29 SA's list is available here: https://www.sa.gov.au/__data/assets/pdf_file/0008/34982/Manual-load-shedding-list-June-2018.pdf

30 See https://www.sapowernetworks.com.au/outages/load-shedding/

31 AEMO are currently reviewing events of 24 and 25 January 2019 to determine extent of load shedding. No information is available to the Commission on this at this point in time.

**Figure 2.3: USE in the NEM (2007-08 to 2017-18)**




Source: AEMO

On 29 January 2009:

- 280 MW was shed for about three hours in Victoria, or approximately 3 per cent of consumers, repeated every half an hour, over three hours, i.e. a different group of consumers (3 per cent) would have been shed every half an hour, for the total event duration of three hours. [32] Put another way, a total of 18 per cent of consumers experienced blackouts for half an hour.
- 140 MW was shed for 1.5 hours in SA, or approximately 4 per cent of consumers, every half an hour, for 1.5 hours (or 12 per cent of consumers for half an hour).

On 30 January 2009:

- 340 MW was shed for about three hours in Victoria, or approximately 3 per cent of consumers, every half an hour, for three hours. (or 18 per cent for half an hour)
- 90 MW was shed for 1.5 hours in SA, or approximately 3 per cent of consumers, every half an hour, for 1.5 hours (or 9 per cent for half an hour).

On 8 February 2017, 300MW was shed (although AEMO only instructed 100MW to be shed, with 300MW shed instead due to a software error). This affected about 10 per cent of SA's customers for about 30 minutes.[33] If 100MW had been shed as expected, then only about 3 per cent of SA consumers would have been affected.

32 The Commission notes that these are estimates based on the amount of load shed as a share of demand at the time. It also assumes that groups of consumers (3 per cent of load) being load shed are "rotated" every half an hour - or thereabouts - to minimise the impact of load shedding on individual consumers, as is the practice.

33 It is unlikely that load would have been rotated in this event as it only lasted for about half an hour.

By means of comparison, the actual unplanned system average interruption duration index (SAIDI)[34], for Ausgrid for 2016/17 averaged across all customer types was 79 minutes. [35] This is 79 minutes for all consumers on average for every year from distribution issues and is typically double what a small percentage of consumers would experience in rare circumstances from wholesale reliability situations.

## 2.2 NER framework for the RERT - current arrangements

The following sections set out how the emergency reserve framework currently operates under the NER. It does not include any changes proposed under the draft rule. Further detail on how the RERT currently operates is contained in each individual chapter in the determination.

### What is the RERT?

The RERT is one of three existing intervention mechanisms in the NEM as discussed above.[36] The RERT allows AEMO to contract for emergency reserves (generation or demand-side capacity that is not otherwise available to the market through any other arrangement). AEMO can use these emergency reserves in the event that it determines that market participants are not meeting the reliability standard (i.e. when AEMO projects that unserved energy in a region is expected to be greater than 0.002 per cent of total energy demanded in that region for a financial year) and, where practicable, to maintain power system security.

The RERT guidelines, which are reviewed and prepared by the Reliability Panel, specify three types of emergency reserves based on how much time AEMO has to procure emergency reserves prior to the projected reserve shortfalls occurring:

- long-notice RERT - between nine months' and ten weeks' notice of a projected reserve shortfall
- medium-notice RERT - between ten weeks' and one week's notice of a projected reserve shortfall
- short-notice RERT - between seven days' and three hours' notice of a projected reserve shortfall.

Typically, AEMO sets up a RERT panel of providers for both the medium-notice and short-notice RERT and only triggers the procurement contract when it has identified a potential shortfall and after seeking offers from RERT panel members.[37] There is no panel for the long-notice RERT; rather, contracts are signed following the close of a public tender process.

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34 SAIDI is a common measure of distribution network reliability, and is defined as the sum of the duration of each sustained customer interruption (in minutes), divided by the total number of distribution customers. SAIDI excludes momentary interruptions (one minute or less duration).

35 Data provided by IPART for 2017 Annual market performance review, see p. 143.

36 In addition to the RERT, if there is a risk to the secure or reliable operation of the power system, AEMO can use directions or instructions under NER clause 4.8.9 to: direct a generator to increase its output, if this is possible and can be done safely; or direct a large energy users, such as a large industrial user, to temporarily disconnect its load or reduce demand.

37 AEMO has the discretion to use a tender process in addition to using panel members in the case of the medium-notice RERT.

The NER provide the high-level framework within which AEMO may procure and dispatch emergency reserves,[38] including requiring AEMO to:

- have regard to the RERT principles in the NER[39]
- have regard to the RERT guidelines which are made and published by the Reliability Panel[40]
- comply with the procedures for the exercise of emergency reserves, which are made and published by AEMO.[41]

The RERT principles provide that:[42]

- actions taken should be those which AEMO reasonably expects, acting reasonably, to have the least distortionary effect on the operation of the market
- actions taken should aim to maximise the effectiveness of reserve contracts at the least cost to end use consumers of electricity.

The RERT guidelines, prepared by the Reliability Panel, provide additional guidance to AEMO on the RERT principles and to the cost-effectiveness of emergency reserves. AEMO is required to take into account the RERT guidelines when exercising emergency reserves. The RERT guidelines specify what AEMO may take into account when it is determining whether to enter into contracts for emergency reserves (that is, in procuring the RERT) and in dispatching/activating emergency reserves.

AEMO also publishes a procedure for the exercise of emergency reserves under clause 3.20.7(e) of the NER in accordance with the rules consultation procedures. This procedure takes into account the RERT principles and RERT guidelines. AEMO also makes and publishes an operating procedure for the dispatch and activation of reserve contracts. AEMO's procedure for the exercise of the RERT document provides information on AEMO's procedures in relation to the RERT panel, the evaluation of tenders, procurement of the RERT, the publication of information and the activation/dispatch of emergency reserves.

**Purpose of the RERT**

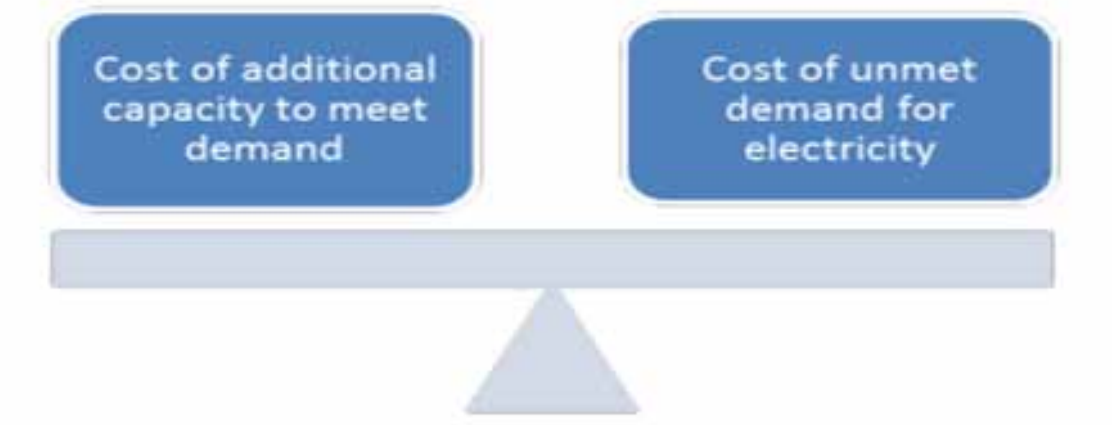
The current purpose of the RERT is for it to be used as a safety net only in the event that the market fails to achieve the desired level of reliability i.e. the reliability standard. This is clear when examining previous reviews into the RERT.

For example, in reviewing the RERT in 2011, the Panel noted that the reserve trading provisions which were replaced by the RERT essentially enabled the market operator to procure additional reserves if a shortfall of reserves was forecast. It acted as a "safety net" in the event that the market did not deliver sufficient reserves to ensure that the reliability standard of 0.002 per cent USE was met.[43]

38 Rule 3.20 of the NER.
39 Clause 3.20.2(b) of the NER.
40 Clause 3.20.8 of the NER.
41 Clause 3.20.7(e) of the NER.
42 Clause 3.20.2(a)(3) and clause 3.20.2(b) of the NER.
43 https://www.aemc.gov.au/sites/default/files/content/3b955d3e-93bf-4666-a27f-25662f407d74/Final-Report.pdf

The reliability standard captures the trade-offs between the cost of load shedding and the cost of providing higher reliability which is meant to reflect the economically-efficient level of reliability as shown in Figure 2.4. The reliability standard is discussed in more detail in chapter 4.

**Figure 2.4: Setting the reliability standard**




This purpose is given effect through the existence of the procurement trigger, which relates to making sure that there is reliability of supply, as discussed next. In practice, this trigger is given effect through the operationalisation of the reliability standard (how this occurs is discussed in chapter 4), with AEMO procuring emergency reserves after the identification of an expected breach of the reliability standard.

Based on the existing NER framework, the RERT is therefore "safety net" in the sense that it is available to be used in the exceptional event that the market fails to deliver against the reliability standard – it is not designed to be used on an enduring basis.

**Procurement trigger**

Under the NER, AEMO may determine to enter into emergency reserve contracts to ensure that the reliability of supply in a region or regions meets the reliability standard for the region, and where practicable, to maintain power system security.[44] In practice, this is typically achieved through the operationalisation of the reliability standard where AEMO incorporates the reliability standard within its day-to-day operation of the market, and the declaration of lack of reserve (LRC) or lack of reserve (LOR) conditions. These are discussed in more detail in chapter 4.

In procuring emergency reserves, AEMO must consult with persons nominated by relevant jurisdictions with respect to any determination to enter into reserve contracts.[45]

**Procurement lead time and contracting period**

44 Clause 3.20.3(b) of the NER.
45 Clause 3.20.3(c) of the NER.

Under the current NER, AEMO must not enter into an emergency reserve contract, or renegotiate, more than nine months prior to when AEMO reasonably expects the reserves to be needed, i.e. when AEMO identifies a shortfall.[46] The procurement lead time refers to the amount of time AEMO has to enter into emergency reserve contracts (prior to the date that AEMO expects the emergency reserves under the contract may be required to ensure reliability of supply, and where practicable, to maintain power system security).

The contracting period refers to the duration of the emergency reserve contract. The NER do not prescribe a specific contract duration for emergency reserve contracts; however, the procurement lead time specified in the NER acts as a maximum limit on the duration of a emergency reserve contract because AEMO is not permitted to enter into contracts in respect of in-market reserve shortfalls that are expected to occur outside that lead time.

### Procurement volume

The NER do not prescribe the amount of emergency reserves that AEMO should procure once it has identified a potential shortfall.

### Types of reserves

The NER specify that AEMO may enter into one or more contracts with any person in relation to the capacity of:[47]

- scheduled generating units, scheduled network services or scheduled loads (being scheduled emergency reserve contracts)
- unscheduled reserves (being unscheduled emergency reserve contracts).

As such, the NER do not have restrictions on the types of technologies[48] that can participate in the RERT.

### Out-of-market provisions

Under the NER, AEMO must not contract for scheduled emergency reserves if such reserves have been submitted, or are likely to be submitted or otherwise available for dispatch, in the trading interval(s) to which the contract would relate.[49] The NER also specify that any emergency reserve contracts entered into must contain a provision that the other party to the contract has not and will not otherwise offer the reserve which is the subject of the contract in the market for the trading intervals to which the contract relates (except in accordance with that contract).[50]

### Direct costs and payment structure

The NER do not prescribe any types of costs or payment structure with respect to the RERT.

### Cost recovery

46 Clause 3.20.3(d) of the NER.
47 Clause 3.20.3(a) of the NER.
48 The NER do not have any restrictions but some technologies may not be technically capable of participating in the RERT.
49 Clause 3.20.3(h) of the NER.
50 Clause 3.20.3(j) of the NER.

The NER require that RERT costs incurred by AEMO be met by fees imposed on market customers in the region where emergency reserves have been procured and/or dispatched.[51] Cost per market customer is proportional to the energy consumption of that customer in the relevant region during certain time periods.[52] If emergency reserves are required in multiple regions, cost sharing arrangements must be agreed between the regions and AEMO when entering the contracts.[53] Costs are recovered through the usual weekly settlement processes.

The NER do not prescribe how market customers (e.g. retailers) then recover these costs from end consumers. Market customers typically do so based on the conditions of the contracts with their consumers. For example, tariffs in residential contracts (while not a NER restriction), tend to only change once per year. Other contracts may have different conditions, including the ability for retailers to pass through RERT costs, should they choose to, in a more timely manner.

**Information provided to the market**

As soon as practicable after emergency reserves are dispatched, the NER requires that AEMO publish a report detailing a number of things, including the circumstances giving rise to the need to dispatch emergency reserves and the processes associated with such dispatch.[54] The remainder of NER clause 3.20.6 requires AEMO to provide more information to the market, including reporting on the cost and recovery of the cost of the emergency reserves. AEMO may also inform the market every time it enters into a new RERT contract[55] and there are a series of market notices that it must publish in the lead up and during the activation/dispatch of emergency reserves.[56]

**Dispatch of the RERT**

In the first instance, AEMO must determine the latest time for exercising emergency reserves and publish a notice of any foreseeable circumstances that may require implementation of the RERT.[57] Once such time has arrived, the NER state that AEMO may dispatch emergency reserves to ensure that the reliability of supply meets the reliability standard, and where practicable, to maintain power system security.[58] AEMO must also take into account the RERT guidelines before dispatching emergency reserves.[59]

Further, during periods of supply scarcity, AEMO must use its reasonable endeavours to act in accordance with the following sequence: dispatch all valid dispatch bids and offers, then exercise the RERT and then implement directions and clause 4.8.9 instructions.[60]

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51 Clause 3.15.9(a) of the NER.
52 Clause 3.15.9(e) of the NER.
53 Clause 3.20.3(f) of the NER.
54 Clause 3.20.6(a) of the NER.
55 In accordance with the RERT guidelines.
56 See Clauses 4.8.5, 4.8.5A, 4.8.5B of the NER.
57 Clause 4.8.5A and clause 4.8.5B of the NER.
58 Clause 3.20.7(a) of the NER.
59 Clause 3.20.7(f) of the NER.
60 Clause 3.8.14 of the NER.

If emergency reserves are dispatched, AEMO applies intervention pricing (also known as "what-if" pricing or "but-for" pricing) in all circumstances.

## 2.3 The Reliability and Emergency Reserve Trader in practice

Prior to 2017, the RERT had been procured but had never been activated (i.e. dispatched).[61]

In 2017, AEMO procured reserves through the long-notice RERT and added providers to its short- and medium-notice RERT panel. As a result, for the 2017-18 summer, AEMO stated that it expects a total of 1,150 MW of RERT (884 MW of demand response resources and 266 MW of generation) capacity to be available. Some of this capacity was then dispatched, as summarised in the consultation paper.[62] Based on these two events, the Commission has set out how it understands that the RERT works in practice under the current framework in Box 4. The Commission also notes that AEMO has entered into reserve contracts for 2018-19 and that the RERT was used in January 2019. Detailed information on the January 2019 event is not yet available.

### BOX 4: THE RELIABILITY AND EMERGENCY RESERVE TRADER IN PRACTICE UNDER THE CURRENT FRAMEWORK

The following shows a hypothetical, simplified example of how the RERT works in practice.

For simplicity, in this example, all emergency reserve contracts are assumed to be unscheduled demand response contracts with an activation lead time of more than 30 minutes.

In August Year 1, AEMO identifies a breach of the reliability standard in the medium-term PASA for January and February of Year 2. AEMO informs the market of this through an LRC declaration and seeks a market response. If one is not forthcoming, AEMO tenders for long-notice RERT. Assuming a successful tender process, AEMO enters into long-notice RERT contracts to procure out-of-market reserves to meet the reliability standard.

In January Year 2, AEMO's short-term PASA forecasts LOR2s for the following week. AEMO seeks a market response. The market responds by offering more generation into the market through short-term PASA, leading to a higher forecast reserve margin in the market, cancelling the LOR2.

In February Year 2, AEMO's short-term PASA once again forecast LOR2s for the following week. AEMO seeks a market response. The day before the forecast gap, the LOR2 persists - there has been insufficient market response. AEMO decides to intervene, and informs the market of its intention.

It then seeks additional reserves from the short-notice RERT panel, as the forecast gap in

61 Unscheduled reserves are said to be activated while scheduled reserves are said to be dispatched. In this determination, both terms are used to mean the act of AEMO dispatching reserves.

62 See https://www.aemc.gov.au/sites/default/files/2018-06/Consultation%20paper_0.pdf

short-term PASA is more than it had contracted for through the long-notice RERT.

On the day of the gap, as the gap persists in pre-dispatch and the market has not sufficiently responded, AEMO then decides to dispatch emergency reserves. It assesses all its emergency reserve contracts and dispatches RERT based on the lead times associated with the relevant contracts and based on least cost combinations. For example, the least cost contract has an activation lead time of two hours, so AEMO makes its decision to intervene two hours ahead of the gap.

Before dispatching emergency reserves, AEMO dispatches all valid dispatch bids and offers first to meet demand, then activates (dispatches) emergency reserves. As the emergency reserve contracts are demand response contracts, they have the effect of reducing demand in the market. This restores the level of reserves in the market to an LOR2 level.

Consider a simple case where:

- demand is 8,000MW
- generator availability is 8,500MW (including spare generation capacity from other regions via interconnectors)
- reserves are 500MW
- the LOR2 level (i.e. the level of reserves needed in the market) is 1,000MW.

Reserve levels are about 500MW short, triggering an LOR2. AEMO contracts 500MW of emergency reserves and dispatches 8,000MW of generation to meet demand. It then dispatches 500MW of emergency reserves and the balance changes to:

- demand is 7,500MW
- generator availability is unchanged at 8,500MW (including spare generation capacity from other regions via interconnectors)
- reserves are 1000MW
- the LOR2 level (i.e. the level of reserves needed in the market) is 1,000MW.

There would once again be enough reserves in the market.

The temperature then drops suddenly, leading to a further fall in demand. This leads to even higher reserve level, which cancels the LOR2. AEMO, however, cannot yet de-activate the emergency reserves as the contracts have a minimum run time that is yet to elapse. Once the minimum run time has elapsed, AEMO then cancels the RERT activation.

Source: AEMO, RERT event reports and AEMC analysis.

# 3 DRAFT RULE DETERMINATION

## 3.1 The Commission's draft rule determination

The Commission's draft rule determination is to make a draft more preferable rule. The draft more preferable rule enhances the Reliability and Emergency Reserve Trader (RERT or emergency reserves) framework, by:

- clarifying how the RERT - the NEM's safety net - fits into the broader reliability framework by directly linking the procurement trigger to the reliability standard through the low reserve condition (LRC) and lack of reserve (LOR) declarations.
- setting the amount of emergency reserves - the procurement volume - to an amount that AEMO reasonably expects is required to meet the gap identified by a breach of the reliability standard, giving AEMO flexibility as to exactly how much to procure.
- extending the procurement lead time to 12 months in order to: broaden the pool of potential emergency reserve providers and so reduce costs associated with the RERT; and create consistency with the lead time under the retailer reliability obligation (RRO) that is currently under development.
- strengthening the out-of-market provisions that define who can provide emergency reserves to make sure that distortions to the energy market - which would increase costs to consumers - are minimised. The strengthened provisions are:
  - that providers who have not been in the market (including through a demand response arrangement with a registered participant) for 12 months prior to signing an emergency reserve contract cannot participate in the RERT
  - that RERT providers cannot be in the wholesale market (including through a demand response arrangement with a registered participant) for the duration of the emergency reserve contract, i.e. they cannot be both in the RERT, and providing demand response or generating in market.
- further limiting distortions and minimising costs by introducing a payment guide that the average amount payable for emergency reserves should not exceed the avoided cost of load shedding. In practical terms, this would be the average value of customer reliability of the consumers that would have lost supply.
- improving the cost recovery process such that costs associated with emergency reserves are recovered, where possible, from those that were consuming at the time that emergency reserves were needed:
  - The costs associated with the direct and immediate activation of emergency reserves (e.g. usage or activation charges) will be recovered in proportion to market customers' consumption over the period in which the emergency reserve was activated.
  - All other costs associated with the procurement of reserves (e.g. availability costs) will be recovered in proportion to market customers' consumption during the billing period in which those costs were incurred.

- enhancing the reporting requirements that are associated with the RERT - particularly in relation to costs of emergency reserves and when emergency reserves will be used - in order to improve transparency. The increased transparency arrangements include:
  - AEMO publishing a quarterly RERT report, if necessary due to the addition of new information, covering information such as indicative costs and updated costs.
  - AEMO publishing a report within five business days of the dispatch / activation of emergency reserves, detailing preliminary estimated emergency reserve costs and estimated volumes of RERT dispatched/activated.
  - AEMO to maintain a methodology report, explaining how it determined the term of each emergency reserve contract and amount of emergency reserves to procure, as part of its RERT procedures.

The draft more preferable rule also includes some transitional rules to address the need for guidelines and procedures to change as a result of the rule, and the applicability of the new reporting requirements with respect to emergency reserve contracts entered into, and dispatch/activation that occurred, prior to the commencement date.

The Commission's reasons for making this draft determination are set out in section 3.4 and in more detail in the relevant chapters and appendices.

This chapter outlines:

- the rule making test for changes to the NER
- the more preferable rule test
- the assessment framework for considering the rule change request
- the Commission's consideration of the more preferable draft rule against the NEO.

Further information on the legal requirements for making this draft rule determination is set out in Appendix B.

## 3.2 Rule making test

### 3.2.1 Achieving the NEO

Under the NEL the Commission may only make a rule if it is satisfied that the rule will, or is likely to, contribute to the achievement of the NEO.[63] This is the decision making framework that the Commission must apply.

The NEO is:[64]

> to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to:
>
> (a) price, quality, safety, reliability and security of supply of electricity; and
>
> (b) the reliability, safety and security of the national electricity system.

63 Section 88 of the NEL.
64 Section 7 of the NEL.

The Commission has identified that the relevant aspects of the NEO are the efficient investment in, and efficient operation and use of, electricity services with respect to the price and reliability of supply of electricity, and reliability of the national electricity system because:

- The RERT is one of the intervention mechanisms available to AEMO to manage reliability of the power system in the event that the power system is not expected to meet the reliability standard.
- The direct costs of the RERT are passed on to market customers (e.g. retailers) in the region where the RERT was used, and ultimately recovered from consumers. This means that the use of emergency reserves has an impact on prices, while the indirect costs such as market distortions also have implications for reliability and prices.

The framework used for assessing whether the proposed rule will, or is likely to, contribute to the achievement of the NEO is set out in section 3.3 below.

### 3.2.2 Making a more preferable rule

Under s. 91A of the NEL, the Commission may make a rule that is different (including materially different) to a proposed rule (a more preferable rule) if it is satisfied that, having regard to the issue or issues raised in the rule change request, the more preferable rule will or is likely to better contribute to the achievement of the NEO.

In this instance, the Commission has made a draft more preferable rule. A summary of reasons is provided below. More detailed reasons for making this draft more preferable rule, including detailed analysis of the issues raised and appropriate response to them, are set out in Chapters 4 to 10, as well as the accompanying appendices.

The draft more preferable rule is referred to throughout this draft determination as the "draft rule".

### 3.2.3 Making a differential rule

Under the Northern Territory legislation adopting the NEL, the Commission may make a differential rule if, having regard to any relevant MCE statement of policy principles, a different rule will, or is likely to, better contribute to the achievement of the NEO than a uniform rule. A differential rule is a rule that:

- varies in its term as between:
  - the national electricity system, and
  - one or more, or all, of the local electricity systems, or
- does not have effect with respect to one or more of those systems

but is not a jurisdictional derogation, participant derogation or rule that has effect with respect to an adoptive jurisdiction for the purpose of s. 91(8) of the NEL.

As the rule relates to parts of the NER that currently do not apply in the Northern Territory, the Commission has not assessed the rule against the additional elements required by the Northern Territory legislation.[65]

## 3.3 Assessment framework

In assessing whether the proposed rule will, or is likely to, contribute to the achievement of the NEO the Commission has considered the following principles:

- **Promoting reliability of the power system**: A reliable power system is a crucial part of the energy market and the long-term interest of consumers. The Commission had regard to the potential benefits to reliability brought about by the proposed rule change; in particular, that the RERT is a safety net mechanism available to AEMO to use at times when a supply shortfall is forecast (i.e. there is a lack of in-market reserves), or, where practicable, for power system security.
- **Minimising direct costs**: Emergency reserves carry direct costs to consumers in terms of availability and activation payments, administrative costs, as well as compensation costs. The Commission had regard to the effect that the proposed solution will have on the potential for direct costs associated with the RERT to be paid for by consumers.
- **Minimising market distortions**: Minimising distortions on market participants (i.e. market distortions) is important in order to minimise indirect costs, which could be substantial. For example, it would not be desirable for a generator to withdraw from the spot market, in anticipation that it would receive higher revenue through emergency reserve payments. Such an outcome would increase the wholesale costs of electricity, and so would be passed on to consumers, while providing no reliability benefit. The Commission has therefore had regard to the distortionary impact of the proposed solution.
- **Improving transparency**: Transparency of the RERT framework, procurement and activation decisions, as well as costs is crucial to underpin market participants' understanding of how emergency reserves are used and to inform the decisions that they make. Transparency can also assist in guiding consumers of electricity in their decisions about when and how much to consume. The Commission had regard to how the proposed solution improves transparency for both market participants and consumers.
- **Efficient risk allocation**: It is important that the risks associated with managing reliability and the cost of load shedding are being allocated appropriately to those who are best placed to manage those risks. This will serve to reduce overall costs by allowing risks to be better managed. The Commission had regard to how efficiently reliability risks would be managed under the proposed solution.

This assessment framework is consistent with that set out in the consultation paper for this rule change request.

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65 From 1 July 2016, the NER, as amended from time to time, apply in the NT, subject to derogations set out in regulations made under the NT legislation adopting the NEL. Under those regulations, only certain parts of the NER have been adopted in the NT. (See the AEMC website for the NER that applies in the NT.) National Electricity (Northern Territory) (National Uniform Legislation) Act 2015.

## 3.4 Summary of reasons

The draft rule made by the Commission is attached to and published with this draft rule determination. The key features of the draft rule are:

- strengthening the links between the broader reliability framework and the emergency reserves by drawing an explicit link between the reliability standard, through the low reserve condition (LRC) and lack of reserve condition (LOR) declarations, to the RERT procurement trigger and volumes
- extending the lead time that AEMO can procure emergency reserves ahead of a projected shortfall to a maximum of 12 months.
- strengthening the out of market provisions to minimise distortions to other markets from the existence of the RERT by:
  - placing a restriction on RERT providers who have offered reserve in the energy market or under a demand response arrangement in the 12 months prior to signing an emergency reserve contract from participating in the RERT
  - putting in place a restriction on emergency reserve providers from participating in the energy market or providing reserve under a demand response arrangement for the duration of the contract.
- establishing a clear approach to cost recovery with availability and pre-activation costs smeared as broadly as possible across all consumers; and recovering activation costs from those market customers who are consuming during the trading intervals in which emergency reserves are dispatched or activated, in proportion to their consumption at that time (i.e. those that can be considered to be driving the need for the RERT).
- introducing a requirement that the average amount payable by AEMO, using reasonable endeavours, under the terms and conditions of the emergency reserve contracts should not exceed the estimated load shedding VCR on a $/MWh basis in a given financial year
- establishing new reporting requirements to improve transparency associated with the RERT, including:
  - a report published within 5 business days of the dispatch/activation of emergency reserves, detailing preliminarily estimated emergency reserve costs and estimated volumes of emergency reserves dispatched/activated
  - a quarterly RERT report with a forward-looking and backward-looking aspect. The forward-looking element details indicative availability costs, expected activation and pre-activation costs, and detailed analysis of any procurement of reserves. The backward looking aspect includes updated emergency reserve costs and volumes, forecasts that indicated RERT intervention was required, impact on market reliability and power system security (where applicable) and enhanced existing requirements under Clause 3.20.6(a) of the NER[66].

66 For example, detailed explanation of any changes in dispatch outcomes due to the dispatch of scheduled reserves or activation of unscheduled reserves

Having regard to the issues raised in the rule change request and during consultation, the Commission is satisfied that the more preferable draft rule will, or is likely to, contribute to the achievement of the NEO than the rule proposed by AEMO for the following reasons:

- **Promoting reliability of the power system**:
  - By providing more certainty to the market that AEMO will only intervene after the market has had a chance to respond (within the known limitations of the RERT framework), the draft rule maximises the ability of the market to maintain system reliability, rather than AEMO through an intervention.
  - By reinforcing the link between the reliability standard and the RERT procurement trigger and reserve volumes, the draft rule delivers the level of reliability that reflects consumer preferences, and therefore, consumers' willingness to pay. It remains appropriate for the Reliability Panel - as an independent body, representing a range of parties including large and small consumers, retailers, generators, networks and AEMO - to continue to make decisions and recommendations about consumers' willingness to pay, through the reliability standard.
  - By increasing the procurement lead time and clarifying the procurement process, the draft rule potentially broadens the pool of RERT providers, which could increase the emergency reserves available to support system reliability, in the event that emergency reserves are needed. In addition, increasing the procurement lead time to 12 months creates consistency with the lead time under the RRO that is currently under development.
- **Minimising direct costs**:
  - By contributing to an efficient emergency reserve procurement process through a longer procurement lead time and a more transparent dispatch process, the draft rule reduces barriers to participation and therefore enables a greater number of providers to offer RERT services.
  - By introducing a provision that the costs of the emergency reserves should reflect the value of load shedding, the draft rule limits the exposure of consumers to emergency reserve costs.
- **Minimising market distortions**:
  - A longer procurement lead time drives lower direct costs; but has the potential to increase market distortions. Therefore, by strengthening the out-of-market provisions for RERT providers, for example, providers that have offered emergency reserves in the market or under a demand response arrangement in the last 12 months cannot participate in RERT, the draft rule minimises the potential for distortions such as reducing incentives for market participants to invest in market generation.[67]
  - Similarly, by introducing a more cost reflective approach to who pays for emergency reserves, the draft rule reduces distortions associated with consumers inefficiently consuming.

67 These distortions are further minimised by not allowing multi-year reserve contracting as proposed by AEMO.

  - By explicitly linking the procurement trigger and volumes to the reliability standard, the draft rule avoids the distortions that would occur if the RERT was delinked from the reliability standard, as proposed by AEMO in their rule change request. This is explained further in chapter 7.
- **Improving transparency**:
  - By clarifying the procurement trigger, the draft rule makes it unambiguous as to when AEMO may procure emergency reserves, and this would be clear to all market participants, as well as consumers (where relevant).
  - By linking the level of emergency reserves AEMO should procure to the reliability standard, the draft rule enables market participants and consumers to manage operational and investment decisions better and improves transparency.
  - By introducing new reporting requirements that clearly explain the reasons for RERT procurement the draft rule improves the ability of retailers, consumer groups, governments and policy makers to explain costs and benefits of emergency reserves to consumers and the industry more broadly. It also allows lessons to be learned.
  - By requiring indicative emergency reserve costs to be provided the draft rule could enable retailers and end customers to better budget and plan for RERT related charges (e.g. potentially hedging these risks and costs). Similarly, the timely provision of cost information would help with budgetary reporting.
- **Efficient risk allocation**:
  - By strengthening the link between the reliability standard (with its associated governance structure) and the RERT, the draft rule allows reliability risks to continue to be managed primarily by the market, with the Reliability Panel continuing to manage reliability risks on behalf of consumers, when reviewing the reliability standard and settings.
  - By introducing a more cost reflective approach to the RERT, the draft rule facilitates incentives for consumers to make efficient consumption decisions.

# 4 APPROPRIATENESS OF THE RELIABILITY STANDARD

This chapter discusses the appropriateness of the reliability standard, which is relevant to this rule change given that the existing procurement trigger for the Reliability and Emergency Reserve Trader (RERT or emergency reserves) is the reliability standard. AEMO, in its rule change request, considered that the existing procurement trigger is no longer appropriate - given this, the Commission examined whether or not the reliability standard, as procurement trigger, is appropriate.

This chapter first sets out AEMO's views and stakeholder feedback with respect to the reliability standard. It also discusses the Commission's analysis and conclusions on whether or not the reliability standard is appropriate.

## 4.1 Background and context

In its rule change request, AEMO noted that the reliability standard may no longer be appropriate given changing system conditions, in particular, a more peaky system and one with more common extreme weather events.[68] It also stated that community expectations have shifted so that jurisdictional governments are unwilling to tolerate load shedding and are intervening themselves directly in the market as a result.[69]

In its rule change request, AEMO did not propose a specific solution to the issue that it raised with the procurement trigger. Instead, it stated that it wished to have a trigger that takes into account a broader risk assessment, which would include the risk of unserved energy (USE), not just the expected value of USE.[70]

AEMO subsequently, in its submission to the consultation paper, clarified its position that the procurement trigger should be removed and be substituted with a broad risk assessment.[71]

In the options paper, the Commission set out its approach to considering the appropriateness of the reliability standard. In particular, it noted that there would be two key inputs that will be important in assisting the Commission consider the appropriateness of the reliability standard and reach conclusions:[72]

- Advice from the Reliability Panel - Given the role of the Reliability Panel in reviewing and providing advice on the reliability standard and settings to the AEMC every four years,[73] the Commission wrote to the Panel to seek its views on the appropriateness of the reliability standard as a procurement trigger for the RERT.[74] This advice was received on

68 AEMO, rule change request, p. 6.
69 Ibid. p. 3.
70 Ibid., p. 7.
71 AEMO, submission to consultation paper, p. 7.
72 AEMC, Enhancement to the RERT, options paper.
73 Clause 3.9.3A(d) of the NER.
74 If requested to do so by the AEMC, the Reliability Panel must provide advice to the AEMC in relation to the safety, security and reliability of the national electricity system: s 38(4) of the NEL.

28 September 2018 and is included in Appendix C. The letter requesting the advice as well as the advice itself can be found on the AEMC website.

- AEMO views on the current reliability standard - In November 2018, AEMO provided additional information to the Commission to support this rule change request. This additional information was specifically focussed on its views on the appropriateness of the reliability standard, including its views on what it thinks the issues are with the existing reliability standard. AEMO's paper may be found on the AEMC website and a brief summary is available in section 4.3.1.

In addition to the advice from the Panel and additional information provided by AEMO, the Commission also held a public workshop in November to discuss the appropriateness of the reliability standard. The technical working group also discussed this topic.

The next sections briefly describe the reliability standard and then set out the views of all stakeholders and the Commission's conclusions, having had regard to the evidence presented to it.

## 4.2 The reliability standard

### 4.2.1 The reliability standard

The reliability standard (for generation and inter-regional transmission elements) is the maximum expected USE in a region of 0.002 per cent for a given financial year as a share of total energy demanded in that region. In general terms, 'unserved energy' means the amount of customer demand that cannot be supplied within a region of the NEM due to a shortage of generation or interconnector capacity.[75]

The standard has three main aspects: form, level and scope:

- The *form* of the standard is the method by which reliability is measured. The NEM standard is an output-based measure expressed in terms of 'expected unserved energy per region per year'. This is also an expression of risk - i.e. the expected level of electricity at risk of not being supplied to consumers in a region.
- The *level* of the standard specifies how much USE is acceptable as a percentage of annual demand per region. The level is currently set at 0.002 per cent USE.
- The *scope* of the standard defines what does and does not count towards the NEM's reliability performance. In terms of the electricity supply chain, the standard currently includes generation and bulk transmission capacity and excludes distribution networks. In terms of events, the standard currently excludes power system security incidents, with certain limited exceptions.

The reliability standard is not set at zero per cent expected USE. The current reliability standard is 0.002 per cent expected USE and is defined in the NER.[76] In simple terms, the reliability standard requires there be sufficient generation and transmission interconnection in a region such that at least 99.998 per cent of forecast total energy demand in a financial year

75 See also the definition of unserved energy in Chapter 10 of the NER.

76 See clause 3.9.3C(a) of the NER.

is expected to be supplied. In other words, the reliability standard implies that some load shedding (0.002 per cent and below) is acceptable when considering the costs of eliminating USE between 0.002 per cent and zero.

A non-zero standard is crucial because setting the level of the reliability standard involves a trade-off between the prices paid for electricity and the cost of not having energy when it is needed. Increasing the levels of reliability means increased costs as explained in chapter 2. Assessing this trade-off is important, and is frequently informed by the value of customer reliability - how much are customers willing to pay for a reliable supply. Consumers would not be willing to pay for a 100 per cent reliable system, since such a system would also be very costly. Indeed, guaranteeing a reliability standard of zero per cent expected USE is impossible, because it is always conceivable that some very unlikely combination of events could occur such that there is insufficient supply to meet demand.

Box 5 discusses the value of customer reliability in more detail.

### BOX 5: VALUE OF CUSTOMER RELIABILITY

The value of customer reliability (VCR) plays an important role in deciding and delivering a range of standards, settings and other policy parameters in the NEM, including the reliability standard and settings. Until recently, VCRs have only been estimated a limited number of times, with no single body responsible for determining VCRs. This has led to variations in both the methodology and the resulting VCRs in previous estimations.

**Latest estimates**

The latest estimates of VCR are from AEMO's study undertaken in 2014. AEMO's study reported NEM-wide results by customer class, as well region-wide results. The table below summarises the NEM-wide results, nothing that the $33,460/MWh figure often quoted refers to the aggregate NEM-wide average.

**Table 4.1: NEM-level VCR results ($/MWh)**

| CUSTOMER CLASS | VCR ($/MWH) |
|---|---|
| Residential | 25,950 |
| Agriculture | 47,670 |
| Commercial | 44,720 |
| Industrial | 44,060 |
| Direct connect customers (customers directly connected to the transmission network) | 6,050 |
| Aggregate NEM wide value | 33,460 |

Source: AEMO http://www.aemo.com.au/-/media/Files/PDF/VCR-final-report—PDF-update-27-Nov-14.pdf

**AER's work**

On 5 July 2018, the Commission made a final rule to make the AER responsible for calculating VCR estimates. This rule requires the AER to develop a VCR methodology, and calculate the first VCR estimates under that methodology by 31 December 2019.

The AER published a consultation paper in October 2018, noting its proposed approach to borrow from AEMO's approach, build upon it and adapt it to meet the current challenges and transformation of the energy sector recognising, for example, the greater deployment of distributed energy resources.

The AER intends to finalise its methodology by May 2019 when it plans to conduct its survey of customers, with a draft report due in August 2019 and a final report with final VCR values published in December 2019.

Source: AER, https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/values-of-customer-reliability-vcr; AEMO http://www.aemo.com.au/-/media/Files/PDF/VCR-final-report—PDF-update-27-Nov-14.pdf

It is AEMO's responsibility to incorporate the reliability standard within its day-to-day operation of the market, and to inform the market of any projection that the reliability standard is expected to not be met. This is discussed next.

### 4.2.2 Operationalisation of the reliability standard

While AEMO provides information to the market based on, and operates the system with reference to the reliability standard, in its day-to day-operation of the power system AEMO seeks to 'clear the market' such that no demand goes unserved, i.e. no load is shed.

In practice, further clarity with regard to how AEMO interprets the reliability standard is provided in AEMO's *Reliability Standard Implementation Guidelines* (RSIG). The RSIG specify how AEMO triggers the RERT in practice and in accordance with the NER.

#### Medium-term and long-term

Over the medium- and long-term (i.e. from seven days ahead to nine months ahead[77]), the RSIG states that AEMO identifies a breach of the reliability standard when it declares a low reserve condition (LRC).[78] This is determined when AEMO's medium-term Projected Assessment of System Adequacy (PASA) probabilistically projects that expected USE for a given year in a given region exceeds 0.002 per cent.

AEMO projects the expected value of unserved energy in medium-term PASA by:[79]

77 AEMO is prohibited from purchasing reserves greater than nine months ahead of real time under clause 3.20.3(d) of the NER.

78 In accordance with clause 4.8.4(a) of the NER.

79 In accordance with clause 3.7.2 of the NER and the RSIG.

- carrying out a number of iterations of power system simulation runs for 10 per cent probability of exceedance (POE)[80] demand and 50POE demand[81]
- averaging (i.e. taking the mean) all unserved energy outcomes in 10POE runs and repeating this for 50POE runs
- weighting the average (i.e. the mean) 10POE outcomes and average 50POE outcomes 30 per cent and 70 per cent respectively to obtain an expected value, i.e. what AEMO defines as expected USE.[82]

This expected USE value is an annual value. AEMO repeats this analysis for the two-year horizon - but reports annual USE separately. If the annual expected USE value as determined through the process above is more than 0.002 per cent in a given region then AEMO declares a low reserve condition (LRC) to inform the market that it has projected USE in excess of the reliability standard.[83]

In other words, the reliability standard is operationalised by AEMO as an annual expected USE – so if the current forecast of annual expected USE is less than 0.002 per cent for a given region, then the reliability standard is said to be met.

Using this approach there is a clear, mathematical link between the reliability standard as defined in the NER and the process for determining whether the reliability standard is being met.

#### Short-term

In the pre-dispatch (a day ahead) and short-term PASA (seven days ahead) timeframes, AEMO operationalises the reliability standard through lack of reserve (LOR) declarations in accordance with AEMO's *Reserve Level Declaration Guidelines* which AEMO is required to update in accordance with the NER.[84]

AEMO identifies that in-market reserves are running low if reserves available in the market fall below the required reserve level as determined by the LOR methodology.[85] The reserve threshold at which emergency reserves can be activated is called LOR2. LOR2 is the relevant level as monitoring LOR2s is one of the actions that AEMO may take in relation to the RERT according to the RERT guidelines and RERT procedures. The RSIG also state that AEMO will use an LOR2 to decide whether to intervene under rule 3.20 of the NER (i.e. the RERT).

LOR2 is calculated as follows:[86]

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80 A POE shows the probability that a value will be exceeded It is usually abbreviated to POE. For example, 10 per cent probability of exceedance is referred to simply as 10POE. For example, if 10POE demand is, say, 9,000 MW, this implies that there is a 10% probability that demand is higher than 9,000 MW. Another way of putting this is that demand may be higher than 9,000 MW one every 10 years.

81 Similarly, if 50POE demand is 7,000 MW, this means that there is a 50% probability that demand is higher than 7,000 MW - or a one-in-two year occurrence.

82 90POE outcomes are not separately weighted but are implicitly included in the 50POE outcomes.

83 This is relevant as monitoring LRCs is one of the actions that AEMO may take in relation to the RERT according to the RERT guidelines and RERT procedures. The RSIG also state that AEMO will use an LRC to decide whether to intervene under clause 4.8.9 (directions) or rule 3.20 (RERT) of the NER.

84 Clause 4.8.4A of the NER.

85 In accordance with Clause 4.8.4(b) of the NER. For more information, see AEMO's reserve level declaration guidelines.

86 See AEMO's reserve level declaration guidelines are available at https://www.aemo.com.au/Stakeholder-Consultation/Consultations/Consultation-on-initial-version-of-Reserve-Level-Declaration-Guidelines

- As a minimum, the LOR2 reserve level is the largest identified credible contingency event, typically the loss of the largest generating unit in a region
- However, AEMO then applies a forecasting uncertainty measure (FUM) to this minimum level in order to account for forecasting uncertainty such as wind or demand forecast deviations. If the FUM is larger than the largest credible contingency event, then the FUM sets the LOR2 reserve level.

In simple terms, AEMO procures emergency reserves when the amount of reserves in the market fall below the LOR2 level, and only after a market response has not been forthcoming.

To be clear, there is no mathematical link between the LOR framework and the reliability standard. However, AEMO operationalises the reliability standard through the LOR framework. Specifically, LOR2s and LOR3s (i.e. when the market has run out of reserves and involuntary load shedding is imminent) is an assumption of a breach of the annual reliability standard under the RSIG.

## 4.3 Stakeholders' views

### 4.3.1 AEMO's views

AEMO's views as outlined in the rule change request, submission to the consultation paper, additional information paper and the options paper are set out below.

**Rule change request**

In its rule change request AEMO considered that there is inconsistency between the operational objectives of the current RERT (meeting the reliability standard, which allows some load shedding in a financial year) and directions (maintaining a reliable operating state which implies no load shedding).[87]

It noted that it considered the trigger for procuring emergency reserves, and the determination of the volume to be procured, should be in the context of a broader risk assessment. This should take into account the *risk* of USE, not just the "expected" value.[88] It did not provide more detail as to how this would work.

With respect to the reliability standard, it made the following comments:[89]

- AEMO's modelling highlighted a heightened risk of load shedding in 2018-19 and 2019-20 in Victoria and, potentially, South Australia, even when the projected USE over a broad range of scenarios meets the reliability standard
- AEMO noted that (at the time this was written) in Victoria in 2018-19, under AEMO's "neutral" demand growth scenario, the risk of not meeting the reliability standard is projected to be nine per cent (approximately one-in-ten year event), and the risk of some USE is approximately 25 per cent (i.e. every four years)

87 AEMO, rule change request, p. 6.
88 Ibid. pp. 7,8.
89 Ibid. p. 6.

- AEMO stated that it is likely that the reliability standard may not be met during extreme ("peaky") demand scenarios, even if AEMO projects that the reliability standard (i.e. expected USE) will be met across the average of all scenarios.
- AEMO noted that this meant that significant load shedding could occur during severe demand and supply conditions, which does not meet the expectations of most stakeholders.

**Submission to the consultation paper**

In its submission to the consultation paper, AEMO stated that:[90]

- The current reliability standard based on average annual USE does not consider the uncertainty dimension of a more volatile market, and has an inherent disconnect with AEMO's operational reliability decision-making.
- Operational reliability refers to the management of supply and demand over operational timeframes (minutes, hours and days). Extreme events with the potential for high impact occur relatively frequently in the power system.
- At the planning stage, the average USE can be within the reliability standard, even if a number of individual scenarios might contain high levels of USE. In real-time during periods of supply scarcity, however, AEMO is required to use its reasonable endeavours to dispatch bids and offers, then activate reserve, before utilising its powers of direction or instruction (such as to initiate load shedding).

AEMO also stated the RERT can be considered as an "insurance product" for the NEM and its end consumers and noted that the main value of an insurance product arises from the amount of protection it offers in plausible extreme conditions.[91] Continuing with the insurance analogy, AEMO explained that when a typical household decides whether to buy car insurance, it does not make the purchase conditional on the annual expected loss in accidents exceeding some percentage of household income, noting that instead, it will likely assess the cost of insurance, potential losses in accidents, especially those arising from extreme events and the likelihood of those events happening.[92]

AEMO noted that similar insurance consideration should be given to the reliability of energy supply, particularly given reliability related USE is likely to be correlated with high demand periods during extreme weather conditions, where a sudden loss of power could lead to significant community costs, for example, due to health-related issues.[93]

**Additional information paper**

AEMO further developed its thinking and in its additional information paper, made the following points:[94]

90 AEMO, submission to the consultation paper, pp. 2, 6.
91 Ibid. p. 6.
92 Ibid.
93 Ibid.
94 AEMO, additional information paper, p. 31.

- Increasing tail end risks raises a question about the appropriateness of the current reliability standard which compares an average USE measure to a single 0.002 per cent threshold.
- The current reliability standard does not adequately address the following two issues:
  - It assumes a single cost of VCR – if VCR varies by customer segment, timing and magnitude of load shedding then the average USE metric will not be proportional to the cost of load shedding.
  - It ignores the value of insurance and risk mitigation – the current reliability standard approach does not recognise the value of reducing the risk of USE (i.e. reducing the range, or extremity of potential USE outcomes), hence the insurance value and benefit of a safety net that limits costs in extreme USE events is not considered in the trade-off.
- Failure to incorporate these two aspects means the current reliability standard will not incentivise the optimal resource mix.
- Linking RERT procurement in a binary form to the current reliability standard can lead to an on-again, off-again procurement trigger which could increase overall RERT costs.

AEMO added that the current reliability standard does not signal the value of risk management in mitigating against extreme USE outcomes. Using such a metric to balance the reliability trade-off assumes that society is risk neutral (i.e. it weighs upside and downside outcomes equally and places no explicit value in avoiding extreme USE outcomes).[95] It also stated that the average USE metric ignores risk aversion which is counter to most evidence of human behaviour. To the extent that society is risk averse then it will prefer to pay a premium to avoid downside outcomes.[96]

It added that it has become more important to ensure that the RERT, as a supplementary procurement mechanism, is able to act as an effective safety net and provide insurance to society when the energy market alone does not deliver the efficient resource mix.[97] It also stated that the most usual way of managing tail-risk, (i.e. where there is a low probability of a high consequence event) is to take out insurance and RERT should be considered as a form of insurance.[98]

### Submission to the options paper

In its submission to the options paper AEMO reiterated some of its earlier points and stated that the current standard does not set an efficient reliability level and as such RERT procurement should be delinked from it.[99] It also stated that the average VCR used in the current reliability standard underestimates the true cost of load shedding and its risk neutral approach fails to signal the value of risk mitigation and insurance.[100]

95 Ibid. p. 32.
96 Ibid. p. 34.
97 Ibid.
98 Ibid.
99 AEMO, submission to the options paper, p. 5
100 Ibid.

AEMO added that the current standard based on an average USE has the following issues:[101]

- It does not adequately take into account the severity of tail-end risks - other metrics such as conditional tail risk and "USE at risk" can provide better insights.
- It equally weights all USE events. If there is a higher cost, for example, of more severe USE events then this metric underestimates the cost of load shedding.
- It ignores risk aversion which is a common human behaviour, as evidenced by the prevalence of insurance products in daily life.

In the same submission, AEMO also proposed that the AEMC should modify the reliability standard and framework so that it reflects the true cost and risk trade-offs and is fit-for-purpose in the current NEM, noting that an efficient reliability framework would then subsume the proposed assessment framework for RERT, which will automatically link RERT procurement back to the framework.[102]

AEMO also noted that a key concern about the current reliability standard is the lack of explicit metrics on USE risk limitation.[103] It therefore proposed that the AEMC could seek advice from experts from other markets that specialise in risk management to determine whether some explicit risk management standard should be incorporated in the reliability framework.[104]

### 4.3.2 Stakeholders' views

Stakeholders' views on the appropriateness of the reliability standard, as expressed in submissions to the consultation paper and options paper are summarised below.

**Submissions to the consultation paper**

The overwhelming majority of stakeholders explicitly stated that the reliability standard remains appropriate.[105] AEMO and the SA Government were the only explicit proponents of moving away from the reliability standard for the purpose of the RERT procurement trigger.

The SA Government specifically suggested that a standing reserve reduces the need for market interventions as they can allow economically-efficient resources to be targeted to provide responses at times of uncertainty.[106]This would also address the inconsistency between the objective of the current RERT framework (which implies some load shedding) and directions (which can be used to meet a reliable operating state, which means no load shedding).[107]

A number of stakeholders, including consumers and their representative organisations:

101 Ibid.

102 Ibid. p. 12.

103 Ibid. p. 5.

104 Ibid. p. 6.

105 Stakeholders that considered that the reliability standard remains appropriate include: Major Energy Users, Energy Networks Australia, EUAA, Flow Power, TransGrid, Clean Energy Council, Snowy Hydro, Brickworks, ERM Power, SACOSS and St Vincent de Paul, Bluescope, Australian Energy Council, Meridian, Energy Australia, Origin.

106 SA Government, submission to consultation paper, pp. 2-3.

107 Ibid.

- considered there was not sufficient evidence provided to suggest community and government sentiment has changed (as asserted by AEMO).[108]
- noted the VCR review to be completed by the AER in 2019 would form an important input in any reconsideration of the standard - with some stakeholders warning that this rule change should not pre-empt the AER's VCR review.[109]
- did not support the use of other metrics to the current reliability standard.[110]

The Energy Users Association of Australia (EUAA) considered that the best current indicator of consumers' attitudes is the feedback given in consumer consultations on network revenue resets.[111]

- The EUAA's participation in these consultations concluded that the overwhelmingly important issue for all customers is affordability. This was definitely the view of its members.
- The EUAA states that consumers are satisfied with the current level of reliability and want to see this delivered at a lower cost.

Some stakeholders also commented specifically on the operationalisation of the reliability standard. In particular:

- The Australian Energy Council and Snowy Hydro believe the Reliability Panel could assist AEMO by providing interpretations of the reliability standard that can be used in forecasts with shorter horizons that one year.[112]
- ERM Power considered that AEMO's forecasts tend to overestimate demand, noting that AEMO's forecast uncertainty measure (FUM) has potential to result in increased activation of RERT. For example, it stated that Victoria in the summer period has never achieved the AEMO's 1-in-10 year maximum demand. ERM Power also believes AEMO's methodology in weighting USE outcomes is highly conservative as it ignores POE outcomes below 50POE forecasts.[113]
- Origin also noted that AEMO's USE forecasts may be conservative, for example, due to its processes not considering 90 POE demand scenarios to balance out 10 POE scenarios.[114]
- Meridian had concerns around the operationalisation of the standard, particularly in light of the addition of the FUM through the LOR2 process. Meridian believes the NER or RERT guidelines should provide AEMO with clearer guidance on balancing the costs and risks of any early intervention against any potential cost savings.[115]

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108 Stakeholders that made this point include: Clean Energy Council, Bluescope, Australian Energy Council, Brickworks, SACOSS/StVdP, Meridian, Snowy Hydro, Energy Australia

109 Stakeholders that made this point include: SACOSS/StVdP, Australian Energy Council, Energy Australia, Energy Users Association of Australia, Meridian, TransGrid

110 EUAA, BlueScope, Snowy Hydro, Meridian, Flow Power, MEU, AEC

111 EUAA, submission to the consultation paper, p. 5.

112 AEC and Snowy Hydro: submissions to consultation paper.

113 ERM Power, submission to consultation paper, p. 2.

114 Origin, submission to consultation paper, p. 1.

115 Meridian, submission to consultation paper, p. 2.

- By contrast, TransGrid stated the value that customers place on avoiding high impact low probability events has not been adequately taken into account by the regulatory framework.[116]

In terms of the insurance analogy used by AEMO:

- Specifically, the Energy Efficiency Council (EEC) noted that RERT provides a form of insurance for the electricity system and that the NEM already relies on a number of mechanisms, including involuntary load-shedding and System Restart Ancillary Services to minimise the impact of unplanned supply outages.[117]
- The SA Government noted that reserves should be considered as an insurance product to manage market risk on a routine and ongoing basis over a long-term period.[118]

**Submissions to the options paper**

With the exception of AEMO, all stakeholders[119] that commented on the reliability standard in their submissions to the options paper, stated that it is appropriate.

Reasons for supporting the existing reliability standard (metric and level) included that:

- The market is working to provide reliability as implied by the reliability standard and it has been doing so successfully – market participants through the existing governance structure of the reliability standard are best placed to manage the risks associated with reliability.[120]
- The existing reliability standard does factor in peakiness of demand and the USE forecasts will change as peakiness changes, in contrast with AEMO's views on the subject.[121]
- There is no evidence that consumers want a higher level of reliability or no USE – in fact, consumers are primarily concerned about reducing electricity prices.[122]
- there no evidence that "political VCR" is reflected in consumers' VCR.[123]
- Alternative metrics to USE are less appropriate as they overstate the risk to the system and/or do not take into account size and duration of interruptions.[124]
- High-impact, low-probability (HILP) events best describe security-type issues, not reliability issues – reliability events are managed in a controlled manner through rotational load shedding, thereby minimising the impact on consumers. [125]

116 TransGrid, submission to consultation paper, p. 3.

117 EEC, submission to consultation paper, p. 1.

118 SA Government, submission to consultation paper, p. 3.

119 AEC, Stanwell, Flow Power, Snowy Hydro, MEU, EUAA, EA, Alinta, ECA: submissions to options paper.

120 Snowy Hydro, submission to options paper, p. 4, Stanwell, submission to options paper, p. 4

121 MEU, submission to the options paper, p. 4, EnergyAustralia, submission to the options paper, p. 2, Origin, submission to the options paper, p. 1..

122 MEU, submission to options paper p. 2, EUAA, submission to the options paper, p. 3, ECA, submission to the options paper, p. 3., Flow Power, submission to options paper, p. 5.

123 EUAA, submission to the options paper, p. 7, AEC, submission to the options paper, p. 2.

124 Snowy Hydro, submission to options paper, p. 7, AEC, submission to the options paper p. 2., ECA, submission to the options paper, p. 6.

125 Flow power, submission to options paper, p. 5, AEC, submission to the options paper, p. 2.

In terms of affordability, Energy Consumers Australia (ECA) noted that affordability continues to be the number one priority for consumers. The latest results of its Energy Consumer Sentiment Survey (which is carried out every six months), show that consumers are overall far more satisfied with the reliability of their service than they are with the value for money.[126]

Stakeholders made the following additional points:

- Snowy Hydro noted that it would be premature for AEMO to be proposing to make significant changes to arrangements and structures when they have not settled issues regarding the VCR and forecasting.[127]
- Major Energy Users (MEU) stated that there is a stronger argument for increasing the level of USE than for reducing it as this might result in lower costs for consumers without resulting in a discernible reduction in reliability.[128]
- EUAA said the approach taken by AEMO seems to overestimate the achievable accuracy in modelling rare events and the ability to deploy this model to efficiently allocate resources given how statistically rare these events are.[129]
- Stanwell noted that if the current reliability standard does not accurately reflect customers' expectations of reliability, proper consideration of the reliability standard through the Reliability Panel is the appropriate approach.[130]
- Meridian noted that a more appropriate outcome may be to request the Reliability Panel to conduct a review of how to implement a change to deal with the issues of 'tail risk' (if the AEMC considers that the need for this is made out) and enable all participants to actively participate in this.[131]

On the insurance analogy and risk aversion theory used by AEMO:

- EUAA noted that in the private market where attempts are made to "over insure" a risk, a very swift and hard push back is brought from industry when they see inefficient capital allocation.[132]
- It further noted that if the RERT is meant to be a "last resort" insurance policy under AEMO's proposed changes, it risked becoming a second or third last resort, leading to higher costs to consumers from higher procured volume.[133]
- The AEC stated that risk-aversion bias is relevant to a risk of catastrophic failure, such as might happen in a property fire. However, a controlled rotational load shedding event (i.e. what occurs with a reliability-related event) is not of this nature.[134]

On VCR and how reliability is managed in the NEM:

126 ECA, submission to options paper, p. 3.
127 Snowy Hydro, submission to options paper, p. 6.
128 MEU, submission to the options paper, p. 2.
129 EUAA, submission to the options paper, p. 2.
130 Stanwell, submission to options paper, p. 4.
131 Meridian, submission to options paper, p. 3.
132 EUAA, submission to options paper, p. 5.
133 Ibid. p.9
134 AEC, submission to options paper, p. 2.

- Meridian noted that an assessment of VCR for reliability purposes requires an assessment of the likely costs to be incurred by customers who are actually affected at the time of shedding and not some theoretical whole of year and whole of market average.[135]
- This was echoed by the EUAA, which noted that a more appropriate approach to estimating VCR (for the purposes of reliability) might be to get information on the most likely outcome for a NEM reliability event e.g. a short duration (30 to 60 minutes) rolling outages impacting a small subsection of consumer demand at any given time.[136]

### 4.3.3 Technical working group

The technical working group discussed this issue on 14 December 2018 and noted that all the stakeholders that commented on the reliability standard in submissions stated that it was appropriate and that changing the reliability standard itself was not necessary.

It was broadly considered that high-impact, low-probability events (e.g. a system black) were security events and not reliability events. It was acknowledged that emergency reserves are not procured to mitigate such catastrophic events (and would be largely ineffective in these situations in any event).

There was discussion that reliability-related events involved controlled, precise, rotational load shedding that did not interrupt an individual customer's supply for more than an hour, as explained in chapter 2. If an event involved load shedding across the system for greater than 24 hours (which is unlikely to be a reliability event in the first place, as reliability events tend to be shorter in duration), mandatory restrictions would be imposed.

Mandatory restrictions[137] on the use of electricity may be imposed by a jurisdiction as a means of controlling demand and averting a situation where there is insufficient generation capacity to meet demand, particularly in situations where mandatory load shedding is or would otherwise be necessary. These restrictions may come into effect during periods of extreme demand or instances where a sudden decrease in available capacity occurs, for example due to industrial action.[138]

It was also noted consumers reliant on continuous supply were likely to have plans in place such as back-up generators or uninterruptible power supplies (UPSs) installed.[139]

## 4.4 Reliability Panel advice

The Reliability Panel has a number of responsibilities that are related to this rule change request, specifically:

135 Meridian, submission to options paper, p. 4.

136 EUAA, submission to options paper, p. 6.

137 Rule 3.12A of the NER.

138 The Commission will examine mandatory restrictions through its work on *System Strength and Intervention Mechanisms in the NEM*.

139 A UPS is a machine that provides near-instantaneous emergency power to a load when there is a power cut, meaning that power as felt by the user is "uninterruptible".

- under the NER the Panel has an ongoing and periodic obligation to review and provide advice on the reliability standard and settings to the AEMC every four years, with its most recent review of the reliability standards and settings published in April 2018[140]
- in reviewing the standard and settings, the Panel must comply with a Reliability Standard and Settings Guideline, which it prepares, the most recent of which was published in December 2016 with this version guiding the most recent review of the standards and settings[141]
- the Panel is also required under the NER to develop and publish guidelines that provide guidance for AEMO in its operation of the RERT.[142]

Given the role of the Panel, the Commission wrote to seek the Panel's views on the appropriateness of the reliability standard as a procurement trigger for the RERT.[143] In particular, the Commission requested that the Panel draw on previous work that relates to this rule change request as identified above, informed by its expert views, and present views back to the Commission on:

- whether the reliability standard i.e. 0.002 per cent expected unserved energy remains appropriate for the NEM
- whether there was any evidence in the recent review of the reliability standard and settings that the standard may need to be tightened, in some or all conditions, to meet community expectations, including any stakeholder submissions on this point
- the potential costs and benefits arising from any tightening of the reliability standard
- whether the Panel considered a different metric to the reliability standard (i.e. a metric that is different from expected USE per region per year) as part of its analysis and any views on its appropriateness
- the implications that might arise if the RERT's procurement trigger was delinked from the reliability standard and what implications this may have for the reliability settings.

The advice was provided to the Commission on 28 September 2018. Both the request for advice and the advice itself can be found on the Commission's website.

The Panel's key points may be summarised as follows:

- The form of the reliability standard should be retained as USE.
- The Panel did not review the 0.002 per cent USE level of the reliability standard in its most recent review because the threshold requirements for its reassessment were not met. The threshold requirements are set out in the guidelines for the review and include: (i) any changes in AEMO's value of customer reliability measure (ii) any changes in the way consumers use electricity that suggest many consumers are markedly less reliant on grid-supplied electricity.[144]

140 Clause 3.9.3A(d) of the NER.
141 Clause 3.9.3A(e) of the NER.
142 Clause 3.20.8 of the NER.
143 In accordance with section 38(4) of the NEL.
144 The Panel also considered other factors such as changes in the costs of new entrant generation since 2014 and the benefits of predictability and stability.

- Submissions received to the 2018 review considered the current level of the standard was appropriate.
- Modelling conducted for the Panel's 2018 review forecasts the system will provide a level of reliability significantly better than then 0.002 per cent reliability standard in all national electricity market regions, for the review period.
- Modelling indicates the additional cost of moving to zero expected USE under the Victorian base scenario would increase wholesale energy costs by nearly 7 per cent ($200 million per annum) in that region, as measured against current market outcomes.[145]
- The RERT's procurement trigger should be linked to the reliability standard – at least for medium- and long-notice RERT.
- In relation to the short-notice RERT (reserves procured up to seven days in advance), the Panel considers it less clear whether or not the procurement of the reserves should be linked to the reliability standard.

For further information, see Appendix C.

## 4.5 Commission's analysis and conclusions

### BOX 6: SUMMARY OF COMMISSION'S CONCLUSIONS

The reliability standard is not set at zero per cent expected USE. In simple terms, the reliability standard requires there be sufficient generation and transmission interconnection in a region such that at least 99.998 per cent of forecast total energy demand in a financial year is expected to be supplied. In other words, the reliability standard implies that some load shedding (0.002 per cent and below) is acceptable when considering the costs that would be involved in trying to eliminate unserved energy between 0.002 per cent and zero. It is *expected* USE since the standard is measured as a weighted-average across a wide range of possible outcomes that could lead to USE, where the weights are the probabilities (or likelihood) that USE will occur.

In considering the appropriateness of the reliability standard, as noted above a non-zero reliability standard is crucial because of the trade off between affordable power and the cost of not having energy when it is needed. This was reinforced by consumer feedback on this rule change, where consumers were more concerned about price than reliability. Not only could it be prohibitively expensive to try to maintain a 100 per cent level of reliability, practically, it is impossible because there is always the possibility that some unlikely combination of events could occur such that there is insufficient supply to meet demand.

The Commission agrees with AEMO that the nature of the system is changing. The changing

145 To be clear, the 7 per cent increase in wholesale energy costs was specifically for the Victorian base modelling scenario. Under alternative scenarios the cost of moving to zero expected unserved energy could be far higher. An alternative scenario where unserved energy exceeds the reliability standard (0.002 per cent expected unserved energy) in Victoria through early coal-fired generation retirement was also modelled. Achieving an expected outcome of zero unserved energy under this scenario would involve a 20 per cent increase in wholesale energy costs (an additional $600 million per annum), compared to current Victorian wholesale energy costs.

characteristics of the generation fleet and the increase in extreme weather events make the power system less stable, more volatile and difficult to operate. This in and of itself does not suggest that the reliability standard itself is no longer appropriate (indeed, stakeholders commented that it remains appropriate), but does mean that the way the power system is operated to meet the standard may need to change.

The Commission considers that the current framework is flexible enough in order to adapt to accommodate this. AEMO - as is appropriate for the system operator - has flexibility and discretion as to how the reliability standard is incorporated in its day-to-day operations, particularly through its modelling and forecasting of the risk to the power system.

For example, if AEMO considers that a more peaky system has changed the underlying distribution of USE outcomes, it could change the weighting of some of the extreme outcomes (e.g. a one-in-ten year outcome) accordingly, through consultation of the Reliability Standard Implementation Guidelines (RSIG) with industry. In addition, the LOR declaration framework which operates in the short-term, is not directly linked to the expected USE metric. Moreover, this was recently changed to incorporate forecasting uncertainty, allowing errors with temperature or generation availability to be captured in AEMO's modelling. The draft rule preserves this flexibility for AEMO, given that flexibility continues to be important to make sure that the reliability framework remains fit for purpose in the changing environment.

The Commission also assessed the appropriateness of the reliability standard specifically with respect to high-impact, low-probability (HILP) events, due to concerns from AEMO that the reliability standard did not appropriately capture these types of events, based on theories such as risk aversion, which suggest that consumers tend to be risk averse when it comes to HILP events.

The reliability framework establishes that AEMO should target zero load shedding in real-time, and gives it a number of tools to manage this, including tools to manage extreme events. If AEMO forecasts that there are not enough reserves in the market, and there is an insufficient response from the market to provide additional reserves, and that there are no reserves procured or available through RERT, then these extreme events are managed through rotational load shedding.

Rotational load shedding occurs through AEMO directing networks to reduce load by turning power off to some areas to maintain balance in the system. It is called rotational load shedding because the outages for consumers are typically kept to about 30-60 minutes, with load shedding rotated between suburbs and regions. Typically, lines supplying critical infrastructure (such as hospitals) and the CBD are exempt from rotational load shedding. While rotational load shedding is regrettable because of the impact on the customers affected, its objective is to avoid an even wider loss of supply, or even an extreme grid shutdown. To avoid the rarity of rotational load shedding (the recent events being the third time rotational load shedding has been used in the NEM for reliability) would incur significant costs that consumers may be unwilling to pay.

Therefore, the Commission concluded that the reliability standard remains appropriate with

respect to these types of events because reliability events are managed through rotational load shedding and typically lasts for a short amount of time, compared to events such as a system-wide blackouts.

Power system security HILP events can, however, have a significant impact on consumers. However, these types of events are best managed through the existing power system security framework, e.g. security directions and frequency control. The RERT cannot address these types of events.

### 4.5.1 Rationale for a centrally-determined reliability standard

In most markets the price for a particular good is decided at any moment in time through the buyers (the demand-side) and the sellers (the supply-side) agreeing on a price at which to transact. In effect, customers signal the value they place on the supply of a particular good and when a shortfall in supply is forecast, a price signal is provided to the market to drive investment in new supply. In such markets, there is no need for a minimum level of supply to be determined by a central body.

For a number of reasons, electricity differs from other commodities in this respect. First, it is not cost effective to store electricity in bulk - although the economics of this are rapidly changing. This means that (generally) electricity must be produced by generators and delivered to customers in real time. In addition, electricity customers generally have little direct involvement in the market and instead are represented by their retailer. In the absence of a wide-spread adoption of smart meters and time-of-use tariffs, most electricity customers currently have neither the means nor the ability to express their preferences quickly.

While these factors may in time be less significant as a result of technological developments (for example in batteries and adoption of smart meters) they are still material today. Together, these factors limit the ability of the demand-side to send accurate and effective price signals regarding the 'optimal' level of electricity supply. Further, if customers cannot reveal their willingness to avoid very high prices through their consumption decisions, the price of electricity would predominately be set by the supply-side.[146]

It is for these reasons that energy markets tend to rely on regulatory solutions for ensuring reliability. Such solutions have been a feature of the NEM since it commenced.[147]

The reliability standard is one such regulatory solution. As noted by the Reliability Panel, the reliability standard embodies a trade off, *made on behalf of consumers*, between the prices paid for electricity and the cost of not having energy when we need it.[148] As noted above, in other commodity markets, this trade off is made directly by the consumer.

146 Albeit, with some limited demand-side participation who have the ability to signal their price sensitivity and curtail load without impacting other customers.

147 For a more detailed discussion, please see: https://www.aemc.gov.au/sites/default/files/content/ef134ef7-90b2-4d05-abfc-3ab9370bf3fd/Final-report.PDF, pp. 11-12.

148 Reliability standards and settings review, final report, 2018, p. 9.

**Is the reliability standard fit for purpose?**

As a regulatory solution, the reliability standard is inevitably imperfect. Any standard determined by one body (in this case, the Reliability Panel which reviews the standard to provide advice to the AEMC, which ultimately determines the standard within the NER) has insufficient information to make the trade off that would perfectly reflect consumers' preferences. Even if all individual consumer preferences were known to the body, the reliability standard needs to be relatively simply articulated in order to be operationalised in real-time, which means that it cannot represent the myriad of complexities relating to the trade off. For example different consumers valuing reliability at different levels to one another and at different times.

The pertinent question is therefore whether the reliability standard, both in terms of the metric (maximum expected USE per region per financial year) and level (0.002 per cent), is appropriate and meets the needs of consumers, knowing that the reliability standard itself cannot be perfect.

The Commission sets out its analysis of whether or not the existing reliability standard is appropriate next.

### 4.5.2 Is the USE metric appropriate?

Much historic consideration has been given to whether the metric is appropriate, and the underlying rationale as to why it was adopted remains unchanged. For example, the Panel considered this matter in 1998, 2007, and 2016 and concluded that the metric is fit for purpose.[149] The Panel reiterated this review in advice requested for this rule change.[150] The Commission's views are consistent with those that have been expressed by the Panel since 1998, and are laid out below.

**Alternative metrics**

The current metric reflects the amount of energy that is not supplied. Alternatives metrics, such as those relating to the frequency of supply interruptions, or their cumulative duration, could be used instead of, or as well as, the current USE measure.

There are a range of different metrics that could be used to express and assess the reliability of the NEM. Some of these are detailed below:

- **Loss of load probability (LOLP)**, which is the proportion (or probability) of the days per year, half-hours per year, or events per season, in which available generating capacity is insufficient to serve demand.
- **Loss of load expectation (LOLE),** which is the expected number of days per year in which available generating capacity is insufficient to serve demand, or the half-hours per year in which capacity is insufficient to serve half-hourly load.

149 Reliability Panel, Determination on reserve trader and direction guidelines, NECA website(www.neca.com.au), June 1998;Reliability Panel, Comprehensive Reliability Review, 2007; Reliability Panel, RSSR Guidelines 2006.

150 See appendix C.

- **Deterministic standards**, which define a minimum amount of reserve generation capacity.
- **The conditional tail expectation**, is the average MW of USE providing that USE occurs.[151]

Alternative metrics of reliability have significant limitations. While time based measures such as LOLP and LOLE provide information about the frequency of interruptions, as AEMO acknowledges, they provide no information on the actual volumes of energy not supplied.[152]

LOLP expresses the likelihood of load being lost but not the severity; for the same value of LOLP, a supply interruption may be less than 1 MWh (very minor) or greater than 1000 MWh (very serious). Therefore, LOLP has less physical significance and is difficult to interpret. As the AEC notes LOLP easily exaggerates risks for typical stakeholders.[153] This is because LOLP shows the risk of any unserved energy occurring. So for example, 50 per cent LOLP metric could mean a 50 per cent probability of a trivial amount of USE. In terms of conveying risk, with peakier system conditions,[154] the Commission might expect that LOLP metric is less conservative as interruption events might be deeper but rarer and less frequent.

In contrast to LOLP, LOLE is expressed in terms of hours or days (rather than a percentage) and as such there is a physical significance associated with the metric that makes it easier to interpret. However, like LOLP, LOLE does not recognise the degree of capacity or energy shortage. The Commission appreciates the international summary of metrics provided by AEMO[155] and notes that LOLE is used in a number of jurisdictions.[156] However, for the reasons discussed below the Commission considers that the USE is more appropriate for the NEM. The Commission also acknowledges that comparisons across different jurisdictions are difficult due to differing factors such as market design, competitive structure, level of interconnection, and the VCR.

The Commission notes a deterministic standard may be relatively simple to implement, but the actual level of reliability it provides is a function of the number of generators actually in service at any given time and in some cases may just be more an expression of redundancy rather than energy not delivered to consumers, which is more relevant to consider in relation to reliability.

The Commission agrees with AEMO that tail-risks or tail-end events and risk aversion are difficult to capture in any metric. This is because these types of events are rarely observed and are projected to occur in extremely rare circumstances.

In its rule change proposal and subsequent documents and submissions, AEMO raised the concepts of "risk aversion" and "loss aversion", which they say, are reasons why the reliability

151 AEMO, additional information to support the enhanced RERT rule change, p.15.

152 AEMO, additional information to support enhanced RERT rule change proposal, p. 12.

153 AEC submission to the options paper, p. 2

154 As identified by AEMO.

155 AEMO, additional information to support enhanced RERT rule change, p. 11.

156 The Commission considers AEMO's conclusion "that the NEM standard is generally not as restrictive as standards in other countries" is not well-founded. The Commission notes Snowy Hydro's assessment of AEMO's comparison of metrics as "alarmist" and "meaningless". Snowy Hydro submission to options paper, p. 7.

standard is no longer appropriate since the reliability standard does not explicitly take those concepts into account.

Specifically, in its submission to the options paper for this rule change request, AEMO proposed that the AEMC "could seek advice from experts from other markets that specialise in risk management to determine whether some explicit risk management standard should be incorporated in the reliability framework and if so, the appropriate form and level of the metrics."[157]

Therefore, the Commission engaged Brattle to examine reliability frameworks in other jurisdictions, and how they implement reliability in practice. Brattle's report may be found on the Commission's website.[158]

Brattle, in reviewing how other jurisdictions assess reliability, found that no jurisdictions explicitly incorporate tail risk or tail-end events into their reliability assessments.[159] However, over time, new methods or ways of better capturing tail risks may be developed.

Brattle's other findings with regard to other jurisdictions are summarised next.

**Lessons from other jurisdictions**

Brattle examined four jurisdictions, namely, PJM, ISO-NE, Great Britain and ERCOT. It found that two of the four jurisdictions have reliability standards which are more stringent than an efficient standard, i.e. one that equates the cost of increasing wholesale-level reliability with the value to consumers of making that increase.

Some key insights include the following:

- PJM and ISO-NE both have a standard of "1 in 10" loss of load expectation, which they operationalise as one wholesale-level reliability outage per ten years, or an expected probability of having an outage of 0.1 per year (0.1 LOLE). Brattle found that it has been estimated that this 0.1 LOLE standard implies a VCR of about US $200,000/MWh.[160]
- The modelling in Great Britain uses a "least worst regret" approach (and explicitly rejects probability-weighted approaches), which allows a range of possible future scenarios to be incorporated without assigning probabilities to each one.

Least worst regret approaches typically minimise the worst-case regret (or loss), whereby regret cost is typically expressed as total cost minus minimum cost. Risk aversion is accounted for as the outputs of this methodology are affected by extreme scenarios.

In addition, in all four jurisdictions, the reliability frameworks ultimately result in procuring more resources than system modelling shows is needed to meet the reliability standard. Brattle concluded that, to a certain extent, this over-procurement may be the result of concerns that reliability modelling does not adequately capture all of the risks facing the

157 AEMO, submission to options paper, p. 6.

158 Brattle, High-Impact, Low-Probability Events and the Framework for Reliability in the National Electricity Market, February 2019, available on the project page.

159 Ibid.

160 By contrast, the latest estimates of VCR in the NEM - average NEM-wide - is $33,460. See AEMO http://www.aemo.com.au/-/media/Files/PDF/VCR-final-report—PDF-update-27-Nov-14.pdf.

system, or that some of the risks associated with HILP events cannot be reliably estimated. It also concluded that it could be because system operators are concerned about power system security risks, and as a result, procure more resources in order to manage both reliability and security events. Another possible reason could be because system operators may have an incentive to over-procure, since over-procurement is costly for consumers but not for system operators (whereas under-procurement would be costly for system operators and consumers).

In particular, it also concluded that PJM and ISO-NE in particular carry higher reserve margins than a "risk neutral" energy-only market design whose prices reflect VCR, due to conservatisms built into the 1-in-10 LOLE standard, the design of the capacity auction, and reliability modelling techniques.

**Hybrid standards**

The Panel has previously assessed the possibility of a hybrid standard. The Panel found that hybrid standards, in effect, are as restrictive as their most restrictive element and that introducing an additional parameter, therefore, may cause the reliability standard to be tightened, with associated cost to consumers.[161] In other words, if there are two individual metrics that form one hybrid metric, the outcomes would be driven by the more conservative of the two metrics. Meridian agree and believe that the addition of a new metric to the current standard would result in the more conservative metric being applied.[162]

The Commission agrees that introducing an additional parameter, therefore, may cause the USE standard to be inadvertently tightened. If tightening the standard was deemed to be appropriate, then a more efficient and clearer way to do this would be to tighten the USE metric itself, rather than introducing a second metric.

**Conclusions**

Noting the significant limitation of alternative metrics, the Commission considers that the existing reliability standard is still fit for purpose at this time. This is consistent with stakeholder feedback (summarised section 4.3), with the majority of stakeholders opposing the use of other metrics to the current reliability standard.

The current USE standard is an energy standard consistent with a market whereby energy and capacity are traded together via integration of the spot and contract market. This design is well suited to placing value on cumulative, long-term energy shortfall and thus rewarding additional energy generation or consumer responses to reduce that shortfall. Introducing an alternative individual or hybrid standard is likely to create conflicting objectives that cannot readily be incorporated into the market design. For instance, introducing parameters to limit the frequency or depth of individual events may unavoidably affect the cumulative, long-term energy shortfall.

161 AEMC Reliability Panel 2007, Comprehensive Reliability Review, Final Report, December 2007, Sydney

162 Meridian, submission to the consultation paper, p. 3.

These views are consistent with that provided by the Reliability Panel in its advice for this rule change process:[163]

> "At the start of the market, the standard was established as maximum expectation of unserved energy of 0.002 per cent. Part of the reason for establishing the standard on unserved energy was that it clearly fits within the market based environment of the NEM. The potential for interruption of individual consumers is then a function of the regional reliability, which in turn is assessed by the system operator on the basis of market data. This is consistent with the underlying principles of the NEM, rather than looking at occurrences of interruptions which would be more consistent with capacity based arrangements."

The Commission therefore concludes that the USE metric remains appropriate.

The Commission recognises that any reliability standard needs to adapt and evolve over time as the energy system transforms - particularly in a world of large transformation that is occurring in the power system at present. Indeed, there is an amount of discretion available to AEMO as to how to operationalise the reliability standard - the inputs and assumptions that underpin the projections may change as the power system changes, which means that the current framework provides some flexibility to AEMO to adapt how it operationalises the reliability standard to changes to the system.

The Commission also acknowledges that any standard has inevitable drawbacks. For example, a USE standard fails to reflect the value of load shedding associated with the frequency or length of interruptions (to the extent these are not implicitly captured in a total USE metric). However, having analysed other metrics, the Commission considers that the current metric best reflects the economic cost of not having electricity when needed.

The Commission further notes that, in general, energy shortfalls to individual consumers would be managed by rotating the shortfalls. This further indicates that a total USE metric, which is based on an expected value, is appropriate.

### 4.5.3 Is the level (0.002 per cent) appropriate?

The level of the reliability standard is a trade off between the cost of load shedding and the cost of providing reliable electricity. A non-zero reliability standard is crucial because of the trade off between affordable power and the cost of not having energy when it is needed. Not only could it be prohibitively expensive to try to maintain a 100% level of reliability, practically it is impossible because it is always possible that some unlikely combination of events could occur such that there is insufficient supply to meet demand.

The Commission has not undertaken a quantitative assessment of whether the level of the standard is appropriate. However, the Commission has taken into account quantitative evidence (such as ECA's energy consumer sentiment survey) to conclude that there is not a sufficiently strong case to change the level of the reliability standard.

163 See https://www.aemc.gov.au/sites/default/files/2018-10/Letter%20of%20Advice%20from%20the%20Reliability%20Panel.pdf

The reliability standard is a key determinant of the reliability settings (including the market price cap). Changes to the reliability standard would therefore involve reconsidering all the associated reliability settings. Substantial changes to the reliability standard, market price cap and the other reliability settings can provide instability to the investment environment, increasing investment risk and potentially increasing costs to consumers.

As a result, any changes to the reliability standard requires careful review of the evidence.

The Commission considers that the following shows that there is not enough evidence to change the level of the reliability standard:

- The Panel considered this matter in 2018 and determined that a materiality threshold had not been met for a review in the level of the reliability standard.[164] In making this decision, and consistent with the factors identified in its guidelines[165] the Reliability Panel noted:
  - the absence of any change in AEMO's value of customer reliability measure since the previous RSSR review.
  - changes in the way consumers use electricity do not suggest they are markedly less reliant on grid-supplied electricity.
  - other factors such as changes in the costs of new entrant generation since 2014 and the benefits of predictability and stability.
- As noted in section 4.3.2, the vast majority of stakeholders, including all consumer representative bodies and consumers which commented on this matter, have stated that the level of reliability they receive is appropriate,or if anything too high (i.e., delivering too high a level of reliability) given the resultant higher prices.[166]
- This includes the ECA's Energy Consumer Sentiment Survey, with results consistently showing that consumers are overall far more satisfied with the reliability of their service than they are with the value for money of electricity products.[167]
- This was reflected in the Panel's advice provided to the Commission as well.

The Commission also notes that in 2010, the definition of the reliability standard was changed from being expected USE exceeding 0.002 per cent over 10 years to being the expected unserved energy exceeding 0.002 per cent in a given financial year. Under the old definition, the ex-post assessment reported by AEMO would have shown that reliability standard was met over the past 10 years. However, under the existing definition, the reliability standard was breached in the 2008-09 financial year. In that sense, when the change was made, while the level did not explicitly change, the reliability standard was implicitly tightened.

164 Reliability Panel, Reliability standard and settings review 2018, final report, 30 April 2018,Sydney

165 See https://www.aemc.gov.au/sites/default/files/content/4d5fb7a2-5143-4976-a745-217618b49e73/REL0059-Final-guidelines.PDF

166 See, for example, ECA's submission to the options papaer.

167 ECA, submission to options paper, p. 4

**The role of VCR in setting the level of the reliability standard**

AEMO has stated that one of the drawbacks of the reliability standard is that it assumes a single VCR number. The Commission notes that VCR is only one of the criteria that the Panel uses in order to assess the level of the reliability standard, as noted above.

The Commission acknowledges that determining VCR is complex - it is not one value but many values, which vary by customer segment and indeed, from person to person, at any point in time. As each consumer's VCR is not known at each point in time, for practical reasons, the best available option is used (historically, AEMO's estimates of VCR; soon to be the AER's estimates of VCR).

The Commission also notes that, with respect to the reliability standard, the relevant VCR is the average VCR of the customers that are load shed in the event of a reliability event. In the NEM, this is likely to be based on the load shedding list. Given that the load shedding list is different in each jurisdiction, set by the relevant jurisdictional government taking into account a variety of factors, the VCR for the purposes of reliability would vary from region to region. If for example, in a region, residential consumers are the first to be load shed, then the average VCR of residential consumers [168] would be the relevant VCR for that region. If in another region, the first customers to be shed is a large industrial load, then the VCR of that industrial load would be the relevant VCR.

The AER is now in the process of updating the VCR as discussed in Box 5. If, as an example, the AER publishes different types of VCR for the purpose of reliability, then it would be open for the Panel to take more than one VCR into account when reviewing the reliability standard.

The Commission notes that the AER will update the VCR by the end of 2019.[169] A material change to the VCR may warrant a change to the reliability standard at that time, noting that any such change should take into account the benefits of predictability and stability in the investment environment.

### 4.5.4 Operationalisation of the reliability standard

The Commission notes that AEMO is responsible for operationalising the reliability standard in the reliability standard implementation guidelines and may update its process through the rules consultation procedures, i.e. by consulting with participants and other interested persons before making changes. However, AEMO has significant discretion and flexibility as to how it operationalises the reliability standard. The Commission considers that this continues to be appropriate given the complexities involved in operationalising the reliability standard - AEMO, as power system operator, remains the most appropriate body to do so as it has all the information that it needs and understanding of the power system required to undertake such projections. The Commission has not proposed any changes to this.

AEMO states that the "average USE" metric equally weights all USE events and that if there is a higher cost of more severe USE events, then this metric underestimates the cost of load

168 More granular estimates of the exact group of consumers whose turn it is to be load shed would be preferable but are unlikely to be practical to estimate.

169 AEMC, Establishing VCRs, Rule determination, 5 July 2018.

shedding. However, as noted in the background section, AEMO projects *expected* USE, not average USE - expected USE is a probability-weighted average of all modelled USE outcomes.

Probability-weighted means that low-probability events are given a proportionally small weight, with high-probability events are given a proportionally high weight. For example, 10POE (i.e. a one-in-ten year event) is likely to be a rare event, and would be weighted as such, i.e. with a low weight. As a result, tail-risks are accounted for in the framework through the 10POE outcomes. How changes to tail risks could be accommodated is discussed further in the implications section below.

As a result, the Commission considers that it is more appropriate to use the term "expected USE" (in accordance with the NER) rather than average USE, as average may be misconstrued to mean that probability is not taken into account.

**Medium-term estimates**

Existing weightings have been in place since around 2002 and are based on a mathematical approach to approximate a normal distribution of USE outcomes, using three points (10POE, 50POE and 90POE).[170]

Using this mathematical approach, the three weightings are:

- 30.44 per cent for the 90POE
- 39.12 per cent for the 50POE
- 30.44 per cent for the 10POE.

In medium-term PASA (from eight days to two years ahead), AEMO projects expected USE by weighting the average (i.e. the mean) 10POE outcomes and average 50POE outcomes 30 per cent and 70 per cent respectively to obtain an expected value. It does not model 90POE outcomes separately but instead assumes that it is zero. The 70 per cent figure is derived from combining the 50POE and 90POE weighting. This is because AEMO makes the simplified assumption that 90POE outcomes and 50POE outcomes are the same, which justifies combining the weights. However, this is a conservative assumption since 50POE outcomes tend to be positive outcomes, while 90POE outcomes are (assumed to be zero). As a result of assigning a 70 per cent probability to 50POE outcomes, 50POE outcomes are being assigned a higher probability than would be implied by their likelihood of occurring and the implied 90POE outcomes is not zero.

This does not occur in ESOO and EAAP expected USE modelling whereby AEMO uses all three weights. This means that, all else being equal (assumptions and inputs), expected USE results from medium-term PASA would be more conservative than those from ESOO and EAAP. Put another way, medium-term PASA is likely to show higher expected USE outcomes, and more likely to show a breach of the reliability standard than the ESOO and EAAP. In practice, the inputs and assumptions used in ESOO and EAAP differ from those of the medium-term PASA such that the expected USE outcomes are not directly comparable.

170 See https://www.aemo.com.au/-/media/Files/Electricity/NEM/Planning_and_Forecasting/NEM_ESOO/2018/2018-Electricity-Statement-of-Opportunities.pdf for more information, p.90

### Short-term estimates

In the short-term (within eight days), AEMO uses the LOR framework, as noted above. The LOR2 trigger was recently changed to include the FUM, or forecasting uncertainty measure, allowing errors with temperature or changes in generation availability to be captured in AEMO's modelling.[171] The minimum size of the LOR2 trigger is the size of the largest credible contingency, i.e. the largest unit in the region. The FUM increases this number if the likelihood of forecast uncertainty is high enough, and if the size of this uncertainty is larger than the size of a single credible contingency event. In those instances, the LOR2 level is set at the value of the FUM. AEMO intervenes if the amount of reserves in the market is lower than the level implied by the LOR2 calculation.

The Commission notes that, in the short-term, AEMO does not project expected USE and instead manages the system to a tighter reliability standard for operational purposes. Consider a scenario where a rare event occurs or is expected to occur due to extremely high temperatures. Presumably, this would be reflected in AEMO's short-term forecasts, including in pre-dispatch. Forecast demand would be higher, generators would be expected to revise their availability - both upwards (due to expectations of higher prices) and downwards (due to expected lower performance of units during heat events). The FUM, which is aimed at capturing forecasting uncertainty, would also likely rise. The forecast LOR2, and the gap implied by it (i.e. the gap between reserves available in the market and reserves that needs to be in the market) would also reflect this rare event.

AEMO would then be able to use the short-notice RERT, and seek tenders from RERT panel providers and enter into enough reserve contracts to withstand the rare event. If this rare event, in hindsight, turns out to be an extreme weather event, such as one-in-10 year event, then short-notice RERT trigger and the way that reliability is managed in the short-term, would have allowed AEMO to procure reserves to meet this event, assuming there were enough offers from RERT panel members.

### Implications

The Commission is therefore of the view that there is already an element of conservatism built into AEMO's modelling processes for the purposes of implementing reliability, even though the reliability standard itself is set by the Commission and reviewed by the Reliability Panel. This is consistent with other jurisdictions - as discussed above, Brattle found that all four jurisdictions[172] that it examined target a reliability standard that is much higher than justified on the basis of the expected benefits of avoided outages (i.e. similar to what would occur in the NEM when using the expected USE metric), or procure more resources than required to meet their reliability standard, or both.[173]

The Commission notes that this is expected of a system operator, given the role that it plays in managing the system and the incentives that it faces. The risks associated with not having enough reliability are borne by both consumers and the system operator. However, the costs

171 AEMC 2017, Declaration of Lack of Reserve Conditions, Rule Determination, 19 December 2017, Sydney

172 PJM, ISO-NE, Great Britain and ERCOT.

173 Brattle's report is available on the project page.

of procuring more reserves than needed are borne by consumers alone - the system operator does not bear any risks in procuring more. The Commission notes that this is why the governance framework for reliability involves independent organisations setting and reviewing the reliability standard, and doing so on behalf of consumers while weighing the costs and benefits of reliability.

The Commission considers that it is appropriate for the system operator to have discretion in how to operationalise the reliability standard, including using all the powers available to it to operate the power system, with a view to avoid any load shedding on the day. The Commission is of the view that there is already an element of conservatism built into AEMO's forecasting processes and the reliability framework as well that provides more certainty to AEMO and consumers that the reliability standard will be met.

The Commission agrees with AEMO that the nature of the system is changing. The changing characteristics of the generation fleet and the increase in extreme weather events make the power system less stable, more volatile and difficult to operate. This in and of itself does not suggest that the reliability standard itself is no longer appropriate but does mean that the way the power system is operated to meet the standard may need to change. The Commission considers that the current framework is flexible enough in order to adapt to accommodate this. AEMO - as is appropriate for the system operator - has flexibility and discretion as to how the reliability standard is incorporated in its day to day operations, particularly through its modelling and forecasting of the risk to the power system.

AEMO has the flexibility to change the inputs and assumptions behind USE and LOR projections, through consultation on the Reliability Standard Implementation Guidelines (RSIG) with industry. While the Commission considers that the current framework is appropriate and that it can be considered that there is already conservatism built into the system (which is appropriate given the consequences), the Commission acknowledges that flexibility continues to be important to make sure that the reliability framework remains fit for purpose in an environment where the power system is rapidly changing.

Through the RSIG, AEMO has a number of tools at its disposal to manage extreme events. For example, if AEMO considers that a more peaky system has changed the underlying distribution of USE outcomes, it could change the weighting of some of the extreme outcomes (e.g. a one-in-ten year outcome) accordingly, through consultation of the RSIG with industry. The draft rule preserves this flexibility for AEMO, given that flexibility continues to be important to make sure that the reliability framework remains fit for purpose in the changing environment.

Box 7 provides a simplified example of how the framework provides flexibility with respect to reliability assessments, as the conditions in the market change over an 18-month period. In particular, the example focusses on changes in weather forecasts which affect demand.

BOX 7: OPERATIONALISATION OF RELIABILITY FRAMEWORK IN PRACTICE

**18-months ahead of the gap**

- Through the medium-term PASA, AEMO carries out a weekly assessment of expected USE for two years ahead. In this particular week, based on its assumptions about demand and supply, assume that it does not project any expected USE for the period in 18 months' time.
- These assumptions are based on weighting different probabilities of demand. Medium-term PASA weights a 10 per cent POE (meaning that only 10 per cent of demand outcomes will be higher than this amount) by 30 per cent; and a 50 per cent POE (meaning that in any range of measurement, this value is the most likely to occur) is weighted 70 per cent.
- Given AEMO does not project any expected USE, it therefore informs the market that there are enough in-market reserves: there is no need for the market to provide more reserves.

**Six-months ahead of the gap**

- AEMO has been updating its reliability assessment weekly.
- At six months ahead of the gap, it updates its demand forecasts. The Bureau of Meteorology is now forecasting a hotter summer. Say that this is reflected in its demand forecasts, i.e. forecast demand is being *higher*.
- Therefore, when estimating its scenarios through the medium-term PASA, the quantities of demand that feed into USE calculations are higher. Consequently, the projections of in-market reserves are lower and so AEMO forecasts a breach of the reliability standard i.e. expected USE in excess of 0.002 per cent.
- AEMO still uses the same weightings that were discussed above. While the weightings have not changed, AEMO, in this scenario, is using higher demand inputs, which is driving the changes in the projections in the reliability standard.
- Given that a breach is forecast, AEMO then publishes an LRC to inform the market that AEMO is projected that there are not enough market reserves meet the reliability standard, and so seeks a market response.
- If a market response is insufficient or not forthcoming, then AEMO can intervene by purchasing emergency reserves through long-notice RERT.
- Assume that the market doesn't respond, and so AEMO procures 100 MW of emergency reserves.

**Seven-days ahead of the gap**

- Seven days ahead of the gap, AEMO's reliability assessment switches to a more operational-type assessment whereby AEMO targets zero USE.
- It no longer uses probabilities of USE, but rather, assesses how many reserves are needed to avoid any load shedding.
- The Bureau of Meteorology has further updated its demand forecasts, and it is expected to be even hotter, with little wind.
- Assume these updated conditions are reflected in AEMO's short-term forecasts.

- Forecast demand is higher than what was expected six months ago. Generators would be expected to revise their availability – both upwards (due to expectations of higher prices associated with the increased demand) and downwards (due to expected lower performance of units during heat events).
- Given the extreme conditions, the forecasting uncertainty measure (FUM) that AEMO factors into its calculation of short-term reserves, would also likely rise.
- AEMO's short-term forecasting processes now show that there are not enough reserves in the market to avoid load shedding.
- AEMO publishes a forecast LOR2 notice to the market, seeking a market response. Assume the response required is 200 MW. If a market response is not sufficient or forthcoming, AEMO would then:
  - Be able to dispatch the 100MW of RERT it had already procured.
  - Be able to use the short-notice RERT and seek tenders from RERT panel providers and enter into 100MW of additional emergency reserve contracts, and dispatch those.
  - It could also issue directions in order to manage the system e.g. tell generators to move outages.

The box above only shows how flexibility is built into the framework through changes in the demand side. The above shows that AEMO has the flexibility to adjust its demand forecasts over time, which has the effect of updating reserve requirements, and so changing the volume of emergency reserves that it requires to manage reliability. In addition, AEMO could update its demand forecasting methodology to update these more often to further enhance its flexibility. The Commission notes that AEMO is currently consulting on its demand forecasting methodology.[174]

There are also examples of flexibility on the supply side as well. For example, if a generator knows that three of its units will be unavailable for maintenance for a lengthy period of time, it is required to change its availability in medium-term and short-term PASA (which are civil penalty obligations). AEMO's weekly update would then reflect higher expected USE outcomes associated with lower generation (even with the weights unchanged).

In addition, AEMO also factors in forced outages in its reliability assessment in the medium-term PASA. It does so through its simulations, with each run of the simulation using a random pattern of forced outage rates (i.e. one simulation may assume no forced outages, another may assume four generators being unavailable at the same time and so on). To the extent that this methodology is no longer appropriate, AEMO could also consult on changes to this through its RSIG and medium-term PASA processes.

In the short-term PASA and pre-dispatch, as noted in the box, the FUM would capture uncertainty, including in relation to generator availability, including intermittent generation.

174 See https://www.aemo.com.au/Stakeholder-Consultation/Consultations/National-Electricity-Market-Demand-Forecasting-Methodology-Issues-Paper-Consultation

This typically has the effect of increasing the market reserve requirement, to account for the potential for multiple generators experiencing forced outages, for example.

The Commission also notes that it examined forecasting and information provision, including the forecasts that underpin reliability assessment in the NEM through its Reliability Frameworks Review. In the review, it made a number of recommendations with respect to forecasting, including for the AER to submit rule change requests in relation to reporting of forecasting deviations.

### 4.5.5 HILP, reliability and security events

**HILP events and reliability events**

Throughout this rule change request, AEMO has raised concerns around the appropriateness of the reliability standard in the context of HILP events.

**A HILP event** is the term use for high-impact events that have a low-probability of occurring. They can be seen as rare events, but catastrophic-type events. Outside of the NEM, this could include events such as a house fire where the entire house is lost, unexpected death or severe floods. In the NEM, this would typically be associated with system black events, whereby an entire region loses power supply, or an event whereby a larger proportion of consumers lose power. These events, in the NEM, would typically last longer than an hour.

Importantly, these events affect everyone. For example, consider a system black event such as the one that occurred in South Australia in September 2016. Electricity consumers, the system operator and indeed everyone in South Australia was affected by this significant event, including for almost four hours until power was initially restored to the first consumers.

**Reliability events**, on the other hand, only occur due to supply inadequacy, i.e. when the market has run out of reserves. These events, even when large, are managed through involuntary load shedding, which, as explained in Box 8 below, is done in a controlled, rotational manner. Importantly, AEMO, at that point in time, instructs load shedding so as to avoid larger blackouts, including potentially system-wide blackouts occurring, which would have a far larger impact on consumers.

#### BOX 8: ROTATIONAL LOAD SHEDDING IN THE NEM

Load shedding is initiated by AEMO through instructions to network service providers to shed blocks of load. It is manually initiated, the load shed is manually rotated across load blocks to deliver an equitable outcome. While load shedding is regrettable because of its impact on the customers affected, its objective is to avoid an even wider loss of supply, or even an extreme grid shutdown.

The order and location of the interruptions are based on a list set by each jurisdiction, based on priorities. Essential services such as hospitals and other sensitive consumers (such as large

shopping centres and critical industries) are typically not on top of the load shedding list.

Furthermore, businesses or energy users that require very high levels of reliability (e.g. data centres and emergency services) typically have back-up plans such as back-up generators or uninterrupted power supply units to manage their own reliability, in the event of load shedding.

According to AEMO, load shedding arrangements vary from state to state, but the objective of rotational load shedding is to minimise the impact on any one group of consumers.

Load shedding lists are confidential, except in South Australia. In SA, according to SAPN, rotational load shedding typically only lasts for about 30-40 minutes for a group of customers before it is "rotated" to a different group, and the CBD and areas with critical infrastructure are excluded.

Source: AEMO, SA Government https://www.sa.gov.au/__data/assets/pdf_file/0008/34982/Manual-load-shedding-list-June-2018.pdf, SAPN https://www.sapowernetworks.com.au/outages/load-shedding/

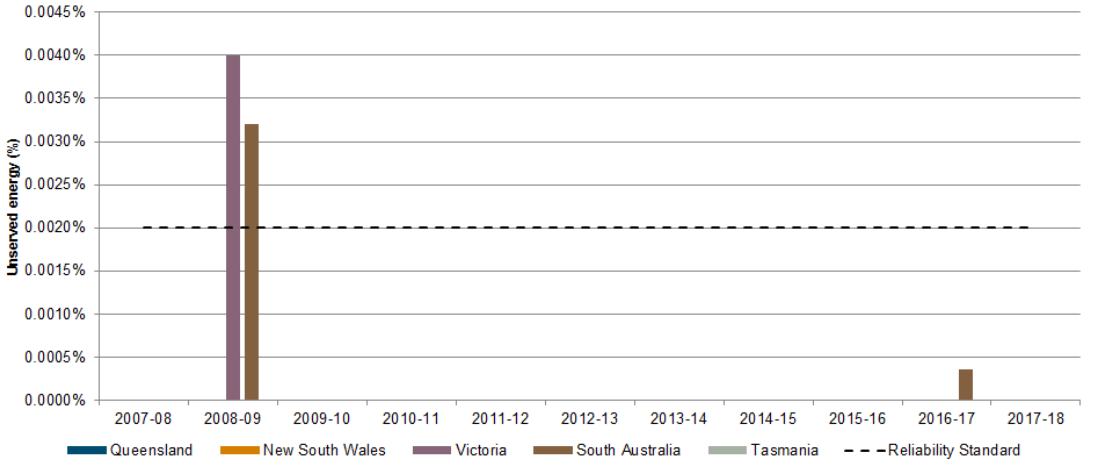
Given that load is shed on a rotational basis, the impact felt by each customer, while regrettable, is only felt for a short amount of time. While some customers may be affected to a greater extent, for example if a businesses' operations are interrupted at a critical time, and they do not have back-up generators or UPS units, given loads are rotated consumers are unlikely to be affected for longer than one hour. However, if the reliability event is particularly large, the system operator would be affected to a greater extent than each consumer would. The system operator, in managing the entire system, would "feel" the entire event and experience the event through the total amount that needed to be shed, rather than through a rotational basis. In addition, such an event would likely put the system under stress - and impact on other security related variables (all of which are the responsibility of the system operator to manage) - further increasing the impacts to the system operator.

As a result, individual consumers would only be affected by a large reliability event for a short amount of time. This should not have a significant impact on the community due to health-related costs, or costs associated with large impact events such as region-wide blackouts, although some customers may be more affected than others, if for example, even a short interruption is inconvenient, such as for a restaurant or small businesses. Not all of those businesses may have back-up generators, for example, or UPSs. But on the other hand, a large reliability event would have a much higher impact on the system operator.

**Can reliability events be HILP events?**

There have only been a few reliability events in the past decade that the Commission can draw from in order to provide practical experience as to how consumers experience reliability outages, as shown in the figure below. The most recent event, in January 2019, is not included in the chart below as detailed information on this event is not yet available.

**Figure 4.1: USE in the NEM (2007-08 to 2017-18)**




Source: AEMO

The 2008-09 event was classified as an extreme weather event. Temperatures in excess of 43°C drove the 30-minute Victorian and South Australian market demand to reach record maximums of 10,494MW and 3,383MW respectively on 29 January 2009.[175] An LOR3 was declared on 29 January and again on 30 January 2009, with load shedding occurring in both regions on both days. This was in breach of the reliability standard, and the only time that the reliability standard has ever been breached.

On 29 January 2009:

- 280 MW was shed for about three hours in Victoria, or approximately 3 per cent of consumers, repeated every half an hour, over three hours, i.e. a different group of consumers (3 per cent) would have been shed every half an hour, for the total event duration of three hours. [176] Put another way, a total of 18 per cent of consumers experienced blackouts for half an hour.
- 140 MW was shed for 1.5 hours in SA, or approximately 4 per cent of consumers, every half an hour, for 1.5 hours (or 12 per cent of consumers for half an hour).

On 30 January 2009:

- 340 MW was shed for about three hours in Victoria, or approximately 3 per cent of consumers, every half an hour, for three hours (or 18 per cent for half an hour).
- 90 MW was shed for 1.5 hours in SA, or approximately 3 per cent of consumers, every half an hour, for 1.5 hours (or 9 per cent for half an hour).

On 8 February 2017, 300MW was shed (although AEMO only instructed 100MW to be shed, with 300MW shed instead due to a software error). This affected about 10 per cent of SA's

175 https://www.aemo.com.au/-/media/Files/PDF/180-0091-pdf.pdf

176 The Commission notes that these are estimates based on the amount of load shed as a share of demand at the time. It also assumes that groups of consumers (3 per cent of load) being load shed are "rotated" every half an hour - or thereabouts - to minimise the impact of load shedding on individual consumers, as is the practice.

customers for about 30 minutes.[177] If 100MW had been shed as expected, then only about 3 per cent of SA consumers would have been affected.

By means of comparison, the actual unplanned system average interruption duration index (SAIDI)[178], for Ausgrid for 2016/17 averaged across all customer types was 79 minutes.[179]

This is double what a small percentage of customers would experience under rotational load shedding.

It can be said that the impact on individual consumers is limited through rotational load shedding due to the fact that outages typically only last 30-60 minutes. The Commission considers that generally speaking, reliability events, due to their nature of being managed through rotational load shedding, are unlikely to be "high impact" events, unlike system-wide blackouts or more widespread blackouts.

The Commission acknowledges that when modelling USE outcomes, at least one iteration of the simulation may show a HILP outcome (for example, a large number of generators withdrawing their availability for the same time period due to unrelated issues, leading to severe supply shortfalls).[180] The more simulations a model carries out, the more there may be a chance of such an event being an outcome in the modelling. These outcomes are not completely ignored from the calculation but are instead weighted as part of the 10POE outcomes, and indeed it is appropriate that they are given a weighting in proportion to their probability, rather than a higher weighting, due to rotational load shedding. That is, the cost of USE is (by and large) proportional to the size of the USE event.

**Reliability versus security events**

The Commission cautions against confusing reliability and power system security events: these have different causes and are treated differently in the framework; therefore, the solutions or risk mitigation measures are very different. For example, an event whereby large parts of a region or CBDs have lost supply are unlikely to be reliability events. They are more likely to be the result of technical failures in the power system and classified as power system security events. For example, the South Australian system black that occurred on 28 September 2016 was a HILP event and also a power system security event. These events are managed through the power system security framework. The RERT is not meant to address - nor is it likely that it could actually address - such events.

Power system security events and reliability events are distinct. Security events can occur at any time, while reliability events only occur when reserves are low. Severe reliability events, if not addressed, can lead to the power system being in an insecure state. This typically occurs because when the demand and supply balance becomes really tight, and reserves are

177 It is unlikely that load would have been rotated in this event as it only lasted for about half an hour.

178 SAIDI is a common measure of distribution network reliability, and is defined as the sum of the duration of each sustained customer interruption (in minutes), divided by the total number of distribution customers. SAIDI excludes momentary interruptions (one minute or less duration).

179 Data provided by IPART for 2017 Annual market performance review, see p. 143.

180 The Commission notes that if a large number of units "trip" in close succession of each other, for example, then the event would typically be a power system security event and not a reliability event.

running out, the interconnector may overload, sending the power system into an insecure state.

AEMO would then be required to initiate load shedding to return power system security. These events are reliability events managed by the market and distinct from power system security events that may also lead to the power system being insecure. AEMO could also have used the RERT to address the low reserve balance in the market, prior to the interconnector overloading. However, it would not be expected to use the RERT to avoid widespread blackouts but rather to prevent them from happening, by restoring reserves - this is because the root cause of the problem, in the example above, would be the low reserve (i.e. the root cause is not having enough generation or demand response in the market), which may be addressed through either using the RERT, a direction, or involuntary load shedding. In fact, the RERT would not be able to address a large-scale blackout, nor is the mechanism meant to.

### 4.5.6 Risk and loss aversion, and implications for the NEM

As noted above, the Commission engaged Brattle to examine the reliability framework following feedback from AEMO in its submission that the reliability standard is no longer appropriate and that the AEMC should, as result, seek expert advice on risk management in particular. As part of this work, Brattle examined concepts of risk aversion and loss aversion to determine whether they might suggest an approach for reliability different from comparing expected USE to the reliability standard, and specifically whether a different approach might be needed for managing risks associated with HILP events. Box 9 summarises the findings in relation to risk and loss aversion, while section 4.5.2 above details their findings in relation to international comparisons.

#### BOX 9: RISK AND LOSS AVERSION AND IMPLICATIONS FOR THE NEM

**Risk and loss aversion**

In many circumstances, individuals make decisions which are not consistent with maximising expected financial gains (or minimising expected financial costs). Rather, individuals seem to prefer certainty to uncertain/risky outcomes. For example, people often prefer to purchase insurance against risks such as accidental damage to their possessions, and electricity consumers often prefer a fixed-price retail contract to one that passes through volatile spot prices in the wholesale market. The expected value of an insurance policy (a possible future claim to offset an insured risk eventuating, multiplied by the probability of needing to claim, less the certain up front premium payment) is negative, since the insurance provider will want to recover the expected claims, plus a margin, when it sets the premium. In the second example, electricity consumers do not mind paying a premium above expected volatile spot power prices for a steady price over an extended period. People purchase insurance because they prefer the certainty of being insured, even though it costs money. This type of behaviour is termed "**risk aversion**".

Economic theory provides two different explanations for why individuals are risk averse. In relation to large risks, which could give rise to significant changes in the individual's total wealth, risk aversion is explained by the idea that individuals try to maximise expected utility (the satisfaction they get from money and the goods and services that money buys) rather than expected wealth. The utility of additional wealth declines as wealth gets larger. Expected utility theory is the traditional explanation for risk averse behaviour, so much so that many economists use the terms interchangeably.

When individuals choose to avoid smaller risks, this behaviour is better explained by the concept of "**loss aversion**", one of the tenets of behavioural economics. Loss aversion states that relative to their expectation for the future, individuals dislike the chance of a small loss more than they like the chance of an equally likely gain of the same magnitude. For example, individuals often prefer to buy insurance in circumstances where expected utility theory would predict that the risk is too small to be worth insuring, such as warranties on white goods.

**Lessons from overseas jurisdictions**

Brattle reviewed the reliability frameworks in several US jurisdictions (PJM, ISO-NE, ERCOT) and Great Britain. None of them explicitly discuss risk aversion. As noted in section X in practice, in all four of the overseas jurisdictions that we reviewed, the reliability frameworks ultimately resulted in the system operator procuring more resources than system modelling shows is needed to meet the reliability standard.

**Implications for the NEM**

If rotating outages operate as planned and there is no additional security risk, it seems unlikely that high-impact low-probability (HILP) wholesale-level reliability events would have large impacts on consumers. Consumer preferences over wholesale level reliability risks will depend on the magnitude of the potential impacts that they face. Since the impacts of HILP wholesale level reliability events are relatively small on a per customer basis, there is no need to account for wealth-based risk aversion in measuring expected USE.

It is however possible that consumer preferences in relation to wholesale-level reliability risk might reflect loss aversion, another type of risk aversion, which is observed in other contexts in relation to small losses. If consumer preferences and expectations about wholesale-level reliability in the NEM include loss aversion so that they would prefer to avoid incremental reliability risk, then insurance would be valued by those consumers.

However, there is no obvious way for consumers to signal their preferences because there are no insurance-type products that cover the risk of interruptions caused by wholesale-level reliability events. Similarly, the Australian Energy Regulator's forthcoming update of consumer VCRs, focuses on valuing lost load conditional on an event having occurred, but does not assess consumer attitudes towards risk. Brattle concluded that it did not know whether consumers in the NEM are risk averse in relation to wholesale-level reliability. It might be possible to assess consumer preferences through surveys and directly asking about willingness to pay for insurance against wholesale-level reliability events.

> If survey results indicate a material preference for additional insurance, then adjusting the reliability framework to deliver additional reserves is one form of insurance mechanism that could be implemented in order to address loss aversion. Another form of insurance mechanism would be to pass on to customers that are interrupted the avoided costs of the energy that was not supplied to them and which, in consequence, their supplier did not have to pay for (but would have paid for if the customers' load had not been shed).

Source: Brattle, High-Impact, Low-Probability Events and the Framework for Reliability in the National Electricity Market, January 2019.

**Risk aversion, loss aversion and the reliability framework**

Having had regard to the conclusions provided in Brattle's report and stakeholders' views with respect to risk aversion, the Commission considers that there is no need to introduce additional risk metrics or change the way that risk is taken into account in the reliability framework. As concluded by Brattle, since the impacts of HILP wholesale level reliability events are relatively limited on a per customer basis, there is no need to account for wealth-based risk aversion in measuring expected USE[181] - in other words, there would only be a need to put additional weights on rare events such as HILP events if their impact, as experienced by consumers, was significant.

As set out by the Commission in the previous section, reliability events are unlikely to be high-impact events as reliability events are managed through rotational load shedding, which means that consumers areaffected for short periods of time (between 30 minutes to an hour), in order to minimise the impact on any one customer. On the other hand, high impact events are more likely to be power system security events, which are not managed through the reliability or RERT framework.

Since the impact of reliability events are unlikely to be high such as would be experienced in a system wide outage, the existing framework whereby risk aversion is not explicitly taken into account remains appropriate as it appears to continue to reflect consumers' preferences. Changing the reliability framework (e.g. by changing the way the reliability standard is operationalised by AEMO in its day to day operations) in order to be more risk averse with respect to high-impact events would not be in the long-term interest of consumers, and would lead to incurring more costs than consumers are willing to pay.

The Commission acknowledges that from an operational point of view, AEMO experiences reliability events differently and may have an incentive to procure more reserves in order to manage those types of events from a whole-system point of view. This is entirely appropriate for the system operator to be affected this way. However, additional reserves should not be procured for this reason, given that the cost impact would fall on consumers, who would be unlikely to benefit from these additional reserves being procured.

While rotational load shedding is undesirable because of the impact on the customers affected, its objective is to avoid an even wider loss of supply, or even an extreme grid

181 Brattle, High-Impact, Low-Probability Events and the Framework for Reliability in the National Electricity Market, February 2019.

shutdown. To avoid the rarity of rotational load shedding (the recent events being the third time rotational load shedding has been used in the NEM for reliability) would incur significant costs that consumers may be unwilling to pay.

With respect to Brattle's findings on loss aversion as described in the box above, the Commission notes that it has raised the prospect of a potential load shedding compensation mechanism through the wholesale demand response rule change requests.[182] This would act as an insurance product or provide compensation for those who were load shed. It is not clear why the market has not offered such a product in the NEM (in the absence of regulatory intervention).

The Commission also acknowledges that consumer preferences are complex and considers that there may be value in understanding consumer preferences better with respect to reliability and welcomes any work that progresses this understanding, including the AER's VCR study. The Commission also notes that the ECA's Energy Consumer Sentiment Survey, carried out every six months, also already provides a high-level understanding of consumers' preference with respect to reliability. However, to the Commission's knowledge based on the literature review provided by Brattle, no market (either electricity, nor other examples) incorporates loss aversion into modelling or studies.[183]

### 4.5.7 Conclusions

The Commission considers that there is no evidence that has been presented to it to suggest that the level (0.002 per cent) and metric (expected USE per region per year) of the reliability standard is no longer appropriate. The NEM has enjoyed high levels of wholesale-level reliability, with the bulk of supply interruptions being the result of distribution outages. Indeed, the vast majority of stakeholders, including all consumer representative bodies and consumers, have stated that the level of reliability they receive is appropriate (or if anything too high given the cost).

The reliability standard is a regulatory tool that is inevitably going to be imperfect. In particular, it is difficult for the reliability standard to capture the dynamic nature of VCR and consumer preferences with respect to reliability and risk. This is not unique to Australia - reliability standards across other jurisdictions, including those with metrics other than USE, tend to have the same limitations. Due to these limitations, the next best alternative is to have an independent body make decisions around the level of risks and reliability, on behalf of consumers - in the case of the NEM, it is the Reliability Panel and the Commission.

While typically set by a regulatory body, the reliability standard is typically operationalised by system operators. Consistent with lessons from overseas jurisdictions as concluded by Brattle, the way the reliability standard is operationalised by a system operator in its day-to-day operations has an element of conservatism, meaning that more extreme scenarios are often implicitly captured in the modelling, even if not explicitly so. In the NEM, this is particularly true in the short term, where the reliability standard is operationalised (and

182 See https://www.aemc.gov.au/news-centre/media-releases/have-your-say-introducing-mechanism-wholesale-demand-response-national

183 Ibid.

appropriately so) through a framework that is mathematically different from the USE standard. In the short term, AEMO is able to use the LOR framework to attempt to manage rare events (e.g. one-in-10 year events) should the market fail to do so.

The Commission also assessed the appropriateness of the reliability standard with respect to HILP events and considers that the reliability standard remains appropriate with respect to these types of events because:

- reliability events are typically, relatively low impact events due to rotational load shedding that minimises impact on consumers and excludes sensitive consumers such as hospitals
- weighing HILP events according to their likelihood of occurring (i.e. low) multiplied by their impact if they do occur (relatively high, but the same on a $ per MWh basis as lower impact events) is appropriate to meet consumers' preferences with respect to risk appetite and reliability because of the controlled, rotational nature of load shedding that occurs during reliability events.

As concluded by Brattle, it would only be appropriate to put more weight on low probability events if their actual impact on individual consumers was high, which is not the case for reliability related load shedding. Therefore, expecting the market to address these types of rare events or purchasing emergency reserves to manage them would not be in the long-term interest of consumers. While these events may have a high impact on the system operator, consumers should not pay for additional costs in order to mitigate these risks.

Further, the reliability framework provides AEMO with the flexibility to change its forecasting processes, by changing the inputs and assumptions behind its reliability assessments, through consultation with industry. While the Commission considers that the current framework is appropriate, the Commission acknowledges that flexibility continues to be important to make sure that the reliability framework remains fit for purpose in an environment where the power system is rapidly changing. Indeed, in its Reliability Frameworks Review, it made a number of recommendations with respect to improvements to forecasting processes in the NEM.

Therefore, Commission encourages AEMO to use the existing framework and to work with industry, the AER and the Reliability Panel to better understand how consumers value wholesale-reliability risks, given the typical size of these events in relation to other types of supply interruptions, and given that they are managed through involuntary load shedding (i.e. rotational load shedding).

Finally, to the extent that HILP events are security-type events with a high impact on consumers (such as the South Australian system black event), then these are best managed through the existing power system security framework, e.g. security directions and frequency control. The RERT cannot address these types of events.

# 5 PROCUREMENT TRIGGER AND VOLUME

This chapter outlines stakeholders' views as well as the Commission's analysis on the Reliability and Emergency Reserve Trader (RERT or emergency reserves) procurement trigger and procurement volume. It also discusses the governance of the procurement trigger. Specifically, it sets out:

- the current arrangements with respect to the procurement trigger, governance of the trigger and procurement volume
- for the procurement and volume trigger, with respect to reliability:
  - AEMO's and stakeholders' views on each.
  - A summary of the options paper, which put forward procurement trigger and volume options, including stakeholders' views on each option.
  - The Commission's conclusions and analysis.
- AEMO's and stakeholders' views, as well as the Commission's conclusions and analysis, with respect to power system security.

## 5.1 Current arrangements

### 5.1.1 Procurement trigger

The procurement trigger refers to the defined circumstances under which AEMO may procure reserves under the RERT framework, and the governance arrangements regarding decisions to procure emergency reserves.

**Current procurement trigger provisions under the NER**

Under the current arrangements in the National Electricity Rules (NER), AEMO:

- may determine to enter into emergency reserve contracts to "ensure that the reliability of supply in a region or regions meets the reliability standard for the region and, where practicable, to maintain power system security."[184]
- must consult with persons nominated by relevant jurisdictions with respect to any determination to enter into emergency reserve contracts.[185]

The clause allows AEMO the discretion to determine how "to ensure that the reliability of supply….meets the reliability standard". This clause is open to interpretation and may therefore create ambiguity as to exactly when AEMO can procure emergency reserves.

However, this is limited (to a certain extent) by the procurement lead time - i.e., AEMO cannot enter into emergency reserve contracts unless there is a reasonable expectation that such emergency reserves may be required to ensure reliability of supply.

AEMO is required under the NER to have regard to the RERT principles in exercising the RERT (including with regard to procuring emergency reserves), which are that:[186]

184 Clause 3.20.3(b) of the NER.
185 Clause 3.20.3(c) of the NER.
186 Clause 3.20.2(b) of the NER.

- "actions taken should be those which AEMO reasonably expects, acting reasonably, to 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."

These principles limit to some degree AEMO's discretion with regard to the procurement of the RERT.

#### Governance of the procurement trigger

There is no explicit oversight or governance arrangements for the procurement trigger, other than the governance arrangements implied by the reliability standard as discussed in chapter 4. For example, it is AEMO's responsibility to operationalise the reliability standard.

AEMO must also consult with the relevant jurisdictions when determining to procuring reserves.[187] There is little detail provided in the NER about how this consultation occurs.

#### RERT Guidelines

The Reliability Panel prepares guidelines which provide further guidance to AEMO about using the RERT. This includes providing further guidance on what information AEMO must take into account when deciding whether to procure the RERT. There are currently three different types of RERT:

- Long-notice situations where AEMO determines it has more than ten weeks' notice of a projected shortfall in reserves.[188] When it is considering whether to enter into reserve contracts for long-notice situations, AEMO may take into account: the details of the outcome of the medium-term projected assessment of system adequacy (PASA); the outcome of the energy adequacy assessment projection; and any other information that AEMO considers relevant.
- Medium-notice situations where AEMO has between ten weeks' and seven days' notice of a projected shortfall in reserves. When considering whether to enter into reserve contracts here, AEMO may take into account the information identified above.
- Short-notice situations where AEMO has between three hours' and seven days' notice of a projected shortfall in reserves. When it is considering whether to enter into reserve contracts for short-notice situations, AEMO may take into account: the details of the outcome of the short-term PASA and pre-dispatch processes and any other information that AEMO considers relevant.

### 5.1.2 Procurement volume

Procurement volume refers to the amounts under emergency reserve contracts (in MW or MWh, for example) that AEMO may procure, and the governance arrangements regarding decisions about the amount of reserves to procure.

187 Clause 3.20.3(c) of the NER.

188 This timeframe is effectively capped at nine months under clause 3.20.3(d) of the NER, which prevents AEMO from entering into (or renegotiating) reserve contracts more than nine months prior to the date AEMO reasonably expects that the reserve will be required to ensure reliability of supply.

The NER do not set the amount that AEMO should procure once it has identified a potential shortfall. That is, once the procurement trigger has been met, AEMO can decide how many emergency reserves to procure.

AEMO's decision is somewhat limited by the need for AEMO to have regard to the RERT principles when determining the procurement volume.[189] AEMO must also consult with the relevant jurisdictions when determining to procure emergency reserves.[190] The way that AEMO operationalises the reliability standard through the Reliability standard implementation guidelines (RSIG) may influence how much it procures.

Box 10 shows an example of how AEMO has determined how much to procure in the past.

BOX 10: HISTORICAL EXAMPLE

From 15 January 2006 to 10 March 2006, NEMMCO contracted for 375MW of additional reserves for the South Australian and Victorian regions based on its forecasts which showed a potential shortfall of at least 500MW (at a total cost of approximately $4.4M). As some of the emergency reserves had very expensive offers, the AEMC understands that NEMMCO, in consultation with jurisdictions, intentionally short purchased emergency reserves such that the standard was not met.

The contracted emergency reserves were not used as conditions were more favourable than originally forecast, meaning that there was zero unserved energy (USE) in actuality, hence the total costs stated above only reflect availability charges and are likely to have been higher if the reserves were used.

Source: AEMO, AEMO Submission to Reliability Panel review of RERT expiry, 29 September 2010, https://www.aemc.gov.au/sites/default/files/content/8dd95d49-df99-47e8-8786-a84b6cee5ad7/AEMO.pdf, p. 2; Marsden Jacobs Associates, NEMMCO 2005/06 Tender for Reserve Assessment of Energy Response Bid, https://energyconsumersaustralia.worldsecuresystems.com/grants/134/AP-134-EUAA-Assessment.pdf, p. ii

### 5.1.3 Power system security

In addition to reliability, the NER allows AEMO to use RERT for power system security reasons, where practicable.[191]

The RERT guidelines provide further guidance and state that:[192]

> "AEMO may dispatch or activate reserves under reserve contracts to address a power system security event in a transmission network that it has oversight for, if there are suitable reserves that AEMO has contracted under the RERT for long, medium or short-notice situations at an appropriate location, and there is sufficient notice of the power system security event to allow AEMO to dispatch or activate these reserves."

189 Clauses 3.20.2(a) and 3.20.2(b) of the NER.
190 Clause 3.20.3(c) of the NER.
191 Clause 3.20.3(b) of the NER.
192 Section 9 of the RERT guidelines.

### 5.1.4 Reliable operating state

In its rule change request, AEMO noted that there was a disconnect between the objective of the current RERT (where the trigger to procure emergency reserves is driven by the reliability standard, which by definition allows some load shedding to occur) and directions, where the trigger to use directions is in relation to maintaining a reliable operating state (which means no load shedding).[193]

The NER state that the power system is in a reliable operating state when:[194]

- AEMO has not disconnected, and does not expect to disconnect, any points of load connection under clause 4.8.9
- no load shedding is occurring or expected to occur anywhere on the power system under clause 4.8.9 and
- in AEMO's reasonable opinion the power system meets, and is projected to meet, the reliability standard, having regard to the RSIG.

Even though the clause includes a reference to the reliability standard, it also means that the power system is in a reliable operating state when AEMO has not disconnected load - i.e. no involuntary load shedding is occurring or expected to occur.

## 5.2 Procurement trigger

### 5.2.1 AEMO's views in its rule change request, on the consultation paper and subsequent additional information

**Rule change request**

In its rule change request, AEMO described the RERT as being a function conferred on AEMO to enter into emergency reserve contracts with resources not available to the market, to ensure reliability of supply meets the reliability standard and to maintain power system security.[195] It added that RERT is a last resort function, along with directions, exercised to address an expected shortfall in the market.[196]

AEMO considered that the trigger for procuring emergency reserves (i.e. procurement trigger) should occur within the context of a broader risk assessment. It stated that this should take into account the risk of USE, not just the "expected" value.[197]

AEMO also noted that jurisdictional governments are unwilling to tolerate load shedding and are intervening in the market as a result.[198]

AEMO stated that AEMO considers that there is inconsistency between the operational objectives of the current RERT (meeting the reliability standard, which allows some load

193 Clause 4.8.9 of the NER.
194 Clause 4.2.7 of the NER.
195 AEMO, rule change request, p. 6.
196 Ibid.
197 Ibid. p. 7.
198 Ibid. p. 6.

shedding in a financial year) and directions (maintaining a reliable operating state which implies no load shedding).[199]

**Submission to consultation paper**

In its submission to the consultation paper, AEMO stated that linking the RERT procurement to the reliability standard may be inefficient and could lead to higher costs and reliability risk for consumers. The RERT procurement decision should be assessed against a broader framework that considers both the cost and risk of unserved energy versus the cost of the RERT.[200]

AEMO proposed to remove any explicit trigger for procurement, as the assessment will result in an amount of emergency reserves to be procured, which could be zero based on the projected market conditions. In addition to cost of USE and RERT procurement, the following factors should also be considered in the assessment:[201]

- Economic approach that also minimises total costs and 'regret' costs associated with opportunity losses under uncertainty
- Level of insurance provided by RERT
- The outcome of USE measured in terms of level (i.e., MWh), duration and probability of occurrence.

AEMO also stated that it does not think it is appropriate to link the RERT procurement to a reliable operating state, as it would mean no load shedding, which would be prohibitively expensive to maintain. [202]

**Additional information**

In a paper providing additional information to the Commission, AEMO recommended that the procurement of RERT should be delinked from the reliability standard and that a standing reserve be created to provide the insurance function in the overall reliability framework.[203]

### 5.2.2 Stakeholders' views on the consultation paper

In submissions to the consultation paper, stakeholders have raised concerns regarding the lack of parameters guiding AEMO's procurement decisions in the NER. Stakeholders explicitly expressed support for the RERT being a "safety net", "backstop" or "last resort", stating that emergency reserves should only be procured in the event that the market fails to meet 99.998 per cent reliability, not beyond.[204]

Origin suggested that given the potential for increased use of RERT, the governance framework should be strengthened to clarify that the emergency reserves are only to be used

199 Ibid.
200 AEMO, submission to consultation paper, p. 2.
201 Ibid. p. 8.
202 Ibid. p. 7.
203 AEMO, Additional information from AEMO to support its Enhanced RERT rule change proposal, p. 3
204 AEC, EA, Snowy Hydro, Meridian, TransGrid, Origin Hydro Tasmania, CS Energy: submissions to consultation paper

to meet the reliability standard.[205] This was echoed by the Australian Energy Council (AEC).[206] A number of other stakeholders have suggested the procurement trigger is (or should remain) the reliability standard.[207]

However, the Energy Efficiency Council (EEC) stated that there may be a case for standing reserves (i.e. the removal of the procurement trigger).[208] The SA Government supported standing reserves, noting that emergency reserves should be considered as an insurance product to manage market risk on a routine and ongoing basis over a long-term period.[209]

Stakeholders also rejected explicitly linking the procurement trigger to a reliable operating state, as this would imply that AEMO would be required to avoid any load shedding at all time, and aiming for zero USE via the RERT would have significant cost implications.[210]

South Australian Council of Social Services (SACOSS) and St Vincent de Paul noted their concern that AEMO monetising what was previously procured through state governments and the jurisdictional coordinator, stating that energy consumers large and small are willing to act in the common good at times of scarcity, as was demonstrated in South Australia when the South Australian government called on people to reduce air-conditioning use.[211]

### 5.2.3 Overview of the options paper

The Commission considered it was beneficial to test some of the potential design options for the key elements of the RERT with stakeholders in order to get a deeper understanding of stakeholder views.

In particular, it published an options paper in October 2018 which set out three ways in which the procurement trigger for the RERT could be set, and the associated implications for the procurement volume. The options paper is summarised next.

#### Potential issues

The options paper raised three potential issues relating to the current procurement trigger and volume.

- The reliability standard as a procurement may be inefficient, as stated by AEMO.
- The procurement trigger is not clear which may lead to higher direct and indirect costs.[212]
- There may be a general lack of clarity regarding the procurement trigger and volume provisions in the NER and related guidelines leading to uncertainty for market participants, AEMO and RERT providers.[213]

205 Origin, submission to the consultation paper, p. 6.
206 AEC, submission to consultation paper, p. 2.
207 Submissions to the consultation paper: Clean Energy Council, p. 2; EnergyAustralia, p. 3; Snowy Hydro, p. 7; ERM Power, p. 3.
208 EEC, submission to consultation paper, p. 2.
209 SA Government, submission to consultation paper, pp. 2-3.
210 EUAA, TransGrid, ENA, Meridian, Flow Power, AEC: submissions to consultation paper.
211 SACOSS and St Vincent de Paul, submission to consultation paper, p. 2.
212 AEC, submission to the consultation paper, p. 7. Meridian, submission to the consultation paper, pp. 2, 4.
213 Snowy Hydro, pp. 9-10; Origin, p. 6; Energy Networks Australia, p. 5.: submissions to consultation paper.

### Procurement options

The options paper put forward three potential options to address the potential issues discussed above.

The table below summarises the key design features of the RERT for each of the three alternatives as well as current arrangements. More detail on these can be found in the options paper.

Options 1 and 3 are similar – they both explicitly link the procurement trigger to the reliability standard (whatever form this may take) but include a number of design choices aimed at addressing concerns relating to the level of discretion provided to AEMO in exercising emergency reserves and improving transparency and clarity.

The main difference is that option 3 would include an enhanced role for the NER and/or Reliability Panel in operationalising the reliability standard and so AEMO's day to day operations would change.

Option 2 delinks the procurement trigger from the reliability standard and in fact, removes the explicit procurement trigger altogether. Instead, under option 2 AEMO would procure reserves whenever it is efficient to do so as determined through an economic assessment of the estimated costs of procuring reserves and load shedding. This option primarily addresses AEMO's concerns that the reliability standard is not an appropriate trigger for procuring emergency reserves, leading to the inefficient under-procurement of emergency reserves.

Table 5.1: **Summary of options**

| KEY ASPECT OF RERT AND RELIABILITY FRAMEWORK | CURRENT ARRANGEMENTS | 1. RELIABILITY STANDARD DETERMINES PROCUREMENT TRIGGER AND VOLUME | 2. BROADER RISK ASSESSMENT OF PROCUREMENT TRIGGER AND VOLUME | 3. OPTION 1 + CHANGES TO OPERATIONALISATION OF THE RELIABILITY STANDARD |
|---|---|---|---|---|
| **Procurement Trigger** | NER "trigger" clause ambiguous in the NER | Unambiguous trigger in NER: reliability standard | Broader risk assessment used as trigger | Unambiguous trigger in NER: reliability standard |
| **Reliability standard** | Current reliability standard | Current reliability standard | Current reliability standard for non-RERT aspects of framework. No explicit standard for RERT | Current reliability standard |
| **Operationalisation of the reliability standard** | Using current RSIG method | Using current RSIG method | N/A. Broader risk assessment used to determine both whether to procure and how much | Changes specified in the NER or Panel guidelines about how the reliability standard is operationalised.<br>Nature of those specific changes yet to be determined. |
| **Procurement volume** | Largely at AEMO's discretion | Explicit link to reliability standard | Broader risk assessment used to determine both whether to procure and how much | Explicit link to reliability standard.<br>Changes specified in the NER or Panel guidelines about how the reliability standard is operationalised. |
| **Governance** | Governance shared by the NER, Reliability Panel and AEMO | Largely consistent with status quo | Overarching principles about risk assessment framework might be contained in the NER or Panel guidelines | Guidance given to AEMO as to how to operationalise the reliability standard either in the NER or the Panel's guidelines |
| **Broader** | One reliability standard for | One reliability standard for | RERT procurement framework | One reliability standard for both the |

| KEY ASPECT OF RERT AND RELIABILITY FRAMEWORK | CURRENT ARRANGEMENTS | 1. RELIABILITY STANDARD DETERMINES PROCUREMENT TRIGGER AND VOLUME | 2. BROADER RISK ASSESSMENT OF PROCUREMENT TRIGGER AND VOLUME | 3. OPTION 1 + CHANGES TO OPERATIONALISATION OF THE RELIABILITY STANDARD |
|---|---|---|---|---|
| **reliability framework** | both the market and RERT | both the market and RERT | disconnected from rest of the reliability framework | market and RERT.<br><br>Changes to operationalisation of reliability standard would apply to the entire reliability framework. |

In terms of the procurement trigger:

- Option 1 would clarify the NER to explicitly and unambiguously link the procurement trigger to the reliability standard
- Option 2 would delink the RERT procurement trigger from the reliability standard entirely and give AEMO the discretion to trigger RERT through its own processes
- Option 3 would, like option 1, clarify the NER to explicitly and unambiguously link the procurement trigger to the reliability standard, but the way the reliability standard is operationalised would change.

The governance of the procurement trigger would remain unchanged under option 1. Under option 3, the Panel or the NER would have an enhanced governance role around operationalisation. Option 2 would introduce different governance arrangements for the procurement trigger, with the decision about the both the trigger and volume ultimately falling to AEMO.

### 5.2.4 AEMO's views on the options paper

**Option 1**

AEMO was the only stakeholder that explicitly opposed option 1. It stated that it does not consider that option 1 is in the long-term interest of consumers for the following reasons:[214]

- It might under-utilise cost effective resources to manage involuntary load shedding, leading to higher involuntary USE costs to consumers.
- It might expose the market to a large amount of load shedding risks in plausible but extreme USE events.
- It could increase the direct cost of emergency reserves as potential providers might need a higher availability payment to recover their costs if they are not certain whether they will be required in the future.

**Option 2**

AEMO supported option 2 and proposed another slight modification to explicitly incorporate some risk metrics. Under this option, emergency reserves would be procured to minimise the combined load shedding and emergency reserve costs, subject to containing USE risk within a tolerable threshold. AEMO did not expand on the trigger aspect of this proposal.[215]

AEMO stated that its proposed assessment framework will deliver an efficient reliability outcome, which is the explicit objective of the procurement methodology and consistent with the NEO. It also noted that while some cost will be incurred for RERT procurement, it will result in lower USE cost and risk; and that ensuring an efficient reliability outcome should take primacy over the notional linkage between RERT and the reliability standard.[216]

214 AEMO, submission to options paper, p. 7.
215 Ibid. p. 9.
216 Ibid. p. 11.

AEMO stated that under its proposed procurement option, emergency reserves can be used as an effective safety-net and insurance mechanism to fill in the gap (if any) between the optimal reliability level and that delivered by the market.[217]

#### Option 3

AEMO also did not support option 3 and disagreed with the way the reliability standard was proposed to be "operationalised" under this option. AEMO was concerned about the methodology - for example, AEMO considered that using a single, or even a few "benchmark years" with 0.002 per cent USE would not lead to a representative monthly distribution of USE and would be contradictory to the very design of the current reliability standard.[218]

### 5.2.5 Stakeholders' views on the options paper

#### Transparency and governance

In submissions to the options paper, some stakeholders commented on an additional oversight of the procurement trigger, drawing parallels with the retailer reliability obligation (RRO):

- ERM Power stated that there is a role for the Australian Energy Regulator(AER) (as proposed in the RRO to verify requests for reliability instruments) to review and approve AEMO's forecasts and RERT procurement plan prior to the commencement of any long- or medium-notice RERT procurement process. With regard to short-notice RERT procurement, ERM believes this would be better left to post procurement reporting.[219]
- AGL encouraged the AEMC to explore implementing an independent RERT trigger verification function (similar to that proposed under the RRO), held by the AER to oversee AEMO decisions to activate the RERT. [220]

Stakeholders[221] stated that transparency was crucial to improve the RERT framework regardless of their views on the procurement options. Generally this was because of concerns that the existing lack of transparency has led to higher costs, inability to plan ahead or pass on costs, as well as ambiguity and uncertainty.

#### General views on RERT procurement

Enel X stated that the existence of emergency reserve mechanisms in energy-only markets is an acknowledgement that energy price signals alone cannot ensure that the reliability standard will be met, and/or that markets are not guaranteed to deliver politically acceptable combinations of reliability and cost.[222] It added that standing reserve framework serve to provide assurance that reliability can be delivered.[223]

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217 Ibid. p.3.
218 Ibid. p. 7.
219 ERM Power, submission to options paper, p. 4.
220 AGL, submission to options paper, p. 2.
221 Including Stanwell, EA, Alinta, ERM Power, Infigen, Enel X, EEC, Meridian: submissions to options paper
222 Enel X, submission to options paper, p. 2
223 Ibid.

The Energy Efficiency Council (EEC) stated that it was not yet clear if there is a need for standing reserves in the NEM, but that this issue needs to be properly investigated.[224]

Other stakeholders reiterated their views that the RERT should be a last resort mechanism used in the event of market failure - generally speaking, stakeholders were concerned that if this was not the case, then consumers would face higher costs.[225]

Energy Users Association of Australia (EUAA) noted that if the RERT is meant to be a "last resort" insurance policy under AEMO's proposed changes, it risked becoming a second or third last resort, leading to higher costs to consumers from higher procured volume.[226]

**Option 1**

Most stakeholders explicitly stated their support for option 1.[227]

The main reasons for support were that it would provide the following benefits:

- Providing clarity on the procurement of the RERT which promotes transparency
- Reducing ambiguity
- Decisions would continue to be linked to the reliability standard, thereby allowing the market to continue to respond first – thereby minimising market distortions
- Minimising direct costs to end consumers, consistent with consumers' concerns around costs as opposed to higher reliability

ERM Power acknowledged that option 1 may slightly increase the risk that actual USE may exceed the reliability standard and this small increase in risk could be difficult for both a market operator and governments to accept.[228] The Australian Energy Council (AEC) noted that while option 1 would restrict AEMO's ability to procure beyond the reliability standard, the limitations of those restrictions must be recognised, namely, that if AEMO is minded to target a higher level of reliability, given the complexity of the process, it will be very difficult to ensure substantive compliance with it.[229]

EnergyAustralia suggested linking procurement explicitly to low reserve condition (LRC) and lack of reserve (LOR) declarations in order to achieve the policy position of option 1.[230]

Enel X did not explicitly support option 1 but stated that while it agreed that this option would provide greater certainty to industry and consumers, the success of the RERT framework under such an approach will rely on robust forecasting, and information about reliability shortfalls being revealed to potential capacity providers with sufficient time to enable the development of a portfolio of reserves once the decision to procure RERT has been made.[231]

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224 EEC, submission to options paper, p. 2

225 Flow Power, Hydro Tasmania, Infigen: submissions to options paper.

226 EUAA, submission to options paper, p.9

227 Stanwell, Flow Power, Snowy Hydro, MEU, EUAA, EA, BlueScope, Alinta, ERM Power, AEC, AGL, ENA, Infigen, Origin: submissions to options paper

228 ERM Power, submission to options paper, p. 3.

229 AEC, submission to options paper, p. 2.

230 Energy Australia, submission to options paper, p. 3.

231 Enel X, submission to options paper, p. 4.

### Option 2

Most stakeholders (excluding, as noted above, AEMO), including all consumer groups that commented on this topic, explicitly stated that they did not support option 2.[232] The main reasons for rejecting option 2 were that it would:

- Increase direct and indirect costs of emergency reserves as they would be procured more often and to a reliability standard that is higher than the market is expected to deliver.
- Create inefficiencies due to placing decision-making on reliability matters in the hands of AEMO, and AEMO is not best placed to manage these risks.
- Introduce a capacity-type mechanism or standing reserves which would be inconsistent with how the NEM works, and would be highly distortionary and reduce innovation.
- Significantly reduce transparency and accountability of RERT process.

Enel X stated that it supported AEMO's recommendation to create a standing reserve as it would provide more certainty to reserve providers and assurance that reliability can be delivered. However, they are concerned that an entire "de-linking" of the reliability standard from the RERT framework and a move toward a dynamic assessment of risks and costs may induce further complexity and uncertainty in how AEMO procures and activates reserves.[233]

While Infigen does not support option 2 for longer timeframes, it stated that option 2 is attractive in that it provides a more explicit framework for implementing the underlying principles of the reliability standard. It noted that if it were applied to both the procurement of short-notice RERT and the activation of emergency reserves, this could potentially help AEMO better align the costs and benefits of RERT procurement.[234]

### Option 3

There were mixed views on option 3:

- Some stakeholders expressed explicit support for it[235] including a preference for it over option 1 in most instances, because it would provide further guidance on the reliability standard and amplify the benefits of option 1.
- A number of stakeholders[236] supported the idea of option 3 but stated they needed more information on how operationalisation and governance would work so as to be able to have a firm view, particularly given concerns around too much prescription being provided to AEMO in the NER, and the unintended consequences of limiting AEMO's discretion.
- AEMO, Stanwell, MEU and Infigen [237] did not support option 3 – for AEMO, the rationale is similar to why it did not support option 1. For other stakeholders, the concern was both

232 Stanwell, Flow Power, Snowy Hydro, MEU, EUAA, EA, BlueScope, Alinta, ERM Power, AEC, AGL, ENA, submission to options paper
233 Enel X, submission to options paper, p. 3.
234 Infigen, submission to options paper, p. 5.
235 Snowy Hydro, AEC, AGL, ENA, Alinta: submissions to options paper.
236 Flow Power, EUAA, EA, ERM Power: submissions to options paper.
237 Submissions to options paper.

around the complexity of the process, reduced transparency and concerns around prescription.

Snowy Hydro stated that the Reliability Panel should have the guidance role;[238] this was also supported by ENA (Energy Networks Australia).[239]The AEC also supported option 3 and saw this option as working as such:[240]

- It would require the Reliability Panel to commission expert advice into what finite USE AEMO should target in weekly, monthly and multi-monthly outlooks.
- These sub-annual USE targets would be used by AEMO as a cap on any RERT acquisitions.

Similarly Alinta supported a requirement for the Reliability Panel to provide expert advice into what set amount of unserved energy (USE) AEMO should be targeting for different time horizons.[241]

Flow Power suggested that option 3 should continue to be considered and recommend it be adopted after an initial (trial) period of 2 years of option 1. This means that option 1 needs to include a requirement, that after two years, it be reviewed on the basis to further codify AEMO actions and triggers.[242]

Stanwell stated that developing a methodology for sub-annual USE targets (as per option 3) would make the process more complex and less flexible, potentially decreasing market participant clarity and AEMO's range of operational responses.[243] The Major Energy Users (MEU) is concerned that, as the RERT is needed only occasionally, to include significant direction in the rules has the long term potential to lock in processes that in the future may not be appropriate to generate the lowest cost for emergency reserves or for the wider market.[244]

### 5.2.6 Technical working group

The technical working group discussed the stakeholder feedback on the three options on 14 December 2018. The technical working group noted that:[245]

- Most stakeholders explicitly stated their support for the option 1.
- Most stakeholders explicitly stated that they did not support option 2, which would effectively delink RERT from the reliability standard and create two sets of standards.
- Stakeholder views were mixed on option 3, and asked a number of clarifying questions about how this would work.

238 Snowy Hydro, submission to options paper, p. 2.
239 ENA, submission to options paper, p. 4.
240 AEC, submission to options paper, p. 4.
241 Alinta, submission to options paper, p. 2.
242 Flow Power, submission to options paper, p. 10.
243 Stanwell, submission to options paper, p. 7.
244 MEU, submission to options paper, p. 8.
245 See https://www.aemc.gov.au/sites/default/files/2018-12/Technical%20Working%20Group%20%233%20-%20Discussion%20Notes.pdf

There was discussion that irrespective of which procurement trigger option was progressed, there might be merit in the AER providing additional oversight over both AEMO's forecasts and AEMO's RERT procurement plan.

It was recognised that developing the additional guidance required for option 3 would be mathematically challenging and may not be feasible.

### 5.2.7 Commission's analysis and conclusions - procurement trigger

> BOX 11: DRAFT RULE
>
> The draft rule clarifies the procurement trigger and links it explicitly to the reliability standard by stating that AEMO can only procure emergency reserves when it identifies and declares an LRC (identified through the medium-term PASA) or LOR (identified through short-term PASA and pre-dispatch), through clause 4.8.4.
>
> The draft rule promotes transparency and clarity of the RERT framework while making sure that the procurement process is aimed at minimising direct and indirect costs. Linking the procurement process explicitly to the reliability standard further limits the misallocation of reliability risks, in terms of how they are managed in the NEM.
>
> The draft rule also introduces and updates a number of reporting requirements to further support transparency and accountability as they required AEMO to provide detailed information to the market in terms of how it has made its procurement assessment, intended to give market participants enough information to assess and understand AEMO's actions with respect to procurement of RERT.

In order to assess each option against the assessment framework described in chapter 3, the Commission fleshed out each option further. For more detailed information on the refined options and the Commission's assessment of the options, see Appendix D.

**Refined options**

The options discussed next have been refined since the options paper but are referred to as option 1, option 2 and option 3 for simplicity.

Under option 1, the RERT procurement trigger would be explicitly linked to the reliability standard (through the LOR and LRC frameworks, i.e. the frameworks used by AEMO to operationalise the reliability standard). Consistent with the Commission's conclusions in Chapter 4, the reliability standard and the way it is operationalised would remain unchanged under this option[246] and there would continue to be one reliability standard for the market and the RERT. There would be no additional oversight of the procurement trigger.

Option 2 would remove the explicit procurement trigger and give AEMO discretion on when and how much emergency reserves to procure through its economic minimisation model

246 Unless AEMO chooses to consult on and amend the RSIG.

(ECM) and externally-set risk metrics. The ECM would minimise the cost of emergency reserve contracts and the cost of load shedding (derived from a value of customer reliability). There would be a high-level framework in the NER for the procurement of emergency reserves. The Panel would then be required to provide additional guidance on procurement (including on the ECM) and set the risk metrics. AEMO would be required to produce a methodology document to explain its assessment process, in accordance with the Panel guidelines and NER. There would be no oversight from the AER and the role of jurisdictions would remain unchanged. The reliability standard would remain as is and be delinked from the RERT framework, in effect, creating two sets of reliability standards.

Option 3 is the same as option 1 except in the following way:

- The Reliability Panel would provide guidance to AEMO on how to operationalise the reliability standard in relation to the RERT.
- In light of stakeholder feedback, this guidance would be quite prescriptive e.g. the Panel would work out what the USE target should be by month, if a monthly standard is achieved. AEMO would still forecast USE against that target as per current arrangements.

**Assessment of options - the draft rule meets the NEO**

The Commission has assessed each option against the assessment framework and concluded that option 1 is the option that best meets the long-term interests of consumers and the NEO. The draft rule, discussed in the next section, therefore introduces option 1 in the NER by clarifying the existing procurement trigger and associated rules.

This is because:

- **The draft rule improves transparency and clarity.**
  - The draft rule clarifies AEMO's use of the RERT to be its intended purpose, i.e. to be used as a safety net, as a last resort, potentially reducing emergency reserve costs for consumers compared to the status quo.
  - Option 2, on the other hand, would see the RERT being more like a mechanism aimed at meeting a reliability target that is different (and likely, more conservative) than the reliability standard. It would imply that the RERT would be used as an "insurance mechanism" targeting a different standard, would be inconsistent with the intended purpose of the RERT.
  - The draft rule also improves transparency and clarity of the RERT framework since it would be unambiguous and it would be known to all market participants when AEMO is likely to procure emergency reserves.
  - Under the other options, but particularly option 2, there would likely be reduced transparency since the framework would be more dynamic and change frequently, introducing more uncertainty for market participants as procurement would be based on AEMO's assessment at a particular point in time.
- **The draft rule minimises direct and indirect costs.**

  - The draft rule best minimises market distortions (i.e. indirect costs) and so results in lower cost outcomes for consumers since it keeps the RERT framework and the reliability standard explicitly linked.
  - Option 2 would be highly distortionary, as it would delink RERT from the reliability standard, ultimately leading to higher costs for consumers, through distortions to the market such as the crowding out of investment. These are discussed in more detail in chapter 4.
- **The draft rule limits the misallocation of risks with respect to how reliability is managed.**
  - Reliability risks are best placed with those that can best manage it. In the NEM, risks are managed by the market, with the Reliability Panel also managing risks on behalf of consumers. Reliability risks are not typically managed by system operators, as they have an incentive, in their role, to be conservative with respect to reliability.
  - The draft rule further strengthens the link between the reliability standard (with its associated governance structure) and the RERT, meaning that reliability risks continue to be managed primarily by the market, with the Reliability Panel continuing to manage reliability risks on behalf of consumers, in setting of the standard.
  - In contrast, option 2, would delink the RERT from the reliability standard and the reliability framework more generally leading to two standards. This would lead to a reliability being partly managed by AEMO, rather than the Panel on behalf of consumers.

- **The draft rule is also simpler to implement in relation to governance, promoting transparency and clarity of arrangements.**
  - Option 3 would introduce an additional burden of regulation, level of governance and complexity for operationalisation.
  - Furthermore, the draft rule is preferred to option 3 since the potential practical limitations associated with option 3 may lead to unintended consequences (such as the RERT being procured more often than needed).
- **The draft rule supports reliability of the power system at lowest cost**
  - The draft rule does soby providing certainty to the market that AEMO will only intervene after the market has had a chance to respond (within the known limitations of the RERT framework)
  - The draft rule also delivers the level of reliability that reflects consumer preferences, as discussed in chapter 4 and therefore, consumers' willingness to pay, as implied by the reliability standard as assessed by the Reliability Panel.
  - In contrast, while option 2 would lead to higher levels of reliability, it has the potential to impose additional costs on consumers, beyond consumers' preferences and willingness to pay, as procurement would be delinked from the reliability standard.

The Commission notes that one of AEMO's reasons for delinking RERT from the reliability standard is that the market price cap (MPC) is lower than the VCR, and therefore, there are

economically-efficient reserves above MPC but below the VCR that AEMO should be able to procure. The Commission agrees that these reserves are economically-efficient and notes that AEMO may procure emergency reserves above the MPC but below the VCR (specifically, the VCR of load shedding, or estimated load shedding VCR, as noted in chapter 7), if the procurement trigger has been met.

The MPC in the NEM is specifically not set at the VCR as VCR is only one of the inputs into the Panel's decision when reviewing the level of the MPC. The Panel also takes into account other factors, such as the benefits of stability to the market and benefits of limiting exposure to excessive high prices. The MPC is then set at a level high enough to incentivise enough investment to meet the reliability standard. As noted in Chapter 4, the reliability standard remains appropriate, and there would be no need to delink RERT from it.

**The draft rule**

The draft rule introduces option 1 into the NER. In particular, the draft rule introduces a procurement trigger for the RERT that is clear and unambiguous - by directly linking it to the reliability standard, i.e. through the low reserve and lack of reserve declarations under clause 4.8.4 of the NER. These declarations are the method by which AEMO currently identifies that the reliability standard is not being metthrough the medium-term PASA for an LRC and short-term PASA and pre-dispatch for LORs, and informs the market accordingly.

### 3.20.3 Reserve contracts

**Procurement trigger and lead time**

...

(f) Except as otherwise prescribed under the *Rules*, *AEMO* must not enter into, or renegotiate, a *reserve contract* for a *region*:

(1) unless it has made a declaration under clause 4.8.4 for that *region*; and

(2) more than 12 months prior to the:

(i) commencement of any time period specified in the declaration in accordance with clause 4.8.5(a1)(2); or

(ii) where no such time period is specified, the date *AEMO* reasonably expects that the *reserves* under that contract may be required to address the *low reserve* or *lack of reserve* condition,

having regard to the *reliability standard implementation guidelines*.

For the avoidance of doubt, *AEMO* may negotiate with potential tenderers in relation to *reserve contracts* at any time.

Put simply, AEMO can only procure emergency reserves when it identifies a breach of the reliability standard, i.e. when it projects that expected USE is more than 0.002 per cent in the medium term. It cannot procure emergency reserves to bridge the gap between 0.002 per cent and zero in the medium-term. In the short-term, as per the Panel RERT Guidelines,

AEMO may only procure emergency reserves when reserves in the market fall short of the reserve margin required, as implied by LOR2.

As a result, the draft rule provides clarity to market participants and potential RERT providers as to when AEMO is likely to intervene in the market. AEMO stated in its submission that this option could increase the direct cost of emergency reserves as potential providers might need a higher availability payment to recover their costs if they are not certain whether they will be required in the future.

The Commission notes that the reliability framework by definition cannot provide "certainty" that RERT will be needed. However, linking the procurement trigger explicitly to the reliability standard providers more clarity, not less, about when it will be needed given that AEMO regularly updates its reliability assessment, i.e. its projections of when the reliability standard is not being met. The draft rule also introduces a number of new reports, in addition to existing requirements, with respect to the procurement of reserves, to provide additional transparency, as discussed in more detail in Chapter 10.

These additional draft rules relevant to the procurement trigger are:

**3.20.6 Reporting on RERT by AEMO**

**Information to include in RERT report – reserve contracts**

...

(d) The RERT report must include a detailed explanation of:

...

(2) *AEMO's* modelling, forecasts and analysis used to determine:

(i) whether to enter into those *reserve contracts*...

The Panel, under the draft rule, continues to be required to provide any additional guidance that it sees fit with respect to the procurement trigger through the Panel Guidelines. AEMO's RERT procedures will also need to be updated to reflect the draft rule. How this will occur is discussed in Chapter 11.

Other governance arrangements would remain the same. For example, under the draft rule, AEMO continues to have the ability to determine how to operationalise the reliability standard through its day-to-day operations. Operationalisation of the reliability standard is discussed in more detail in Chapter 4. Should AEMO pursue changes to operationalisation through consultation with industry, then the changes made would apply to the RERT procurement trigger. These arrangements are therefore the same as the current arrangements.

**Additional oversight is not introduced**

The draft rule does not introduce oversight by the AER or a different organisation as suggested by some stakeholders. The Commission considers that this is not necessary given the clarity that the draft rule provides with respect to when AEMO may use the RERT. Compared to the status quo, the draft rule also further limits the misallocation of risks with

respect to reliability, through making sure that the procurement trigger is explicitly linked to the reliability standard.

Furthermore, the Commission notes that the RRO is a distinct framework from the RERT - the oversight that exists within the RRO is in context of that mechanism, which has specific design features that make oversight possible and desirable. For example, the RRO requires identified liable entities to provide contractual positions to the AER in the event of an identified gap. The AER would then be able to use these contracts to determine whether or not there is a gap, and ultimately, whether or not these entities were compliant.

This design feature is unique to the RRO and does not exist within the reliability framework under which the RERT operates. The RERT and the reliability framework do not contain such information disclosure and sharing requirements that would be needed for oversight to work in practice. If an oversight to the RERT procurement trigger were introduced, the AER would not have any additional information, other than AEMO's assessments and forecasts, to determine if a gap does exist.

However, the Commission agrees with stakeholders' comments about the importance of transparency in minimising direct and indirect costs. The draft rule therefore introduces a number of new and updated reporting requirements for AEMO to report on RERT procurement in a timely and regular manner. These requirements are discussed in more detail in Chapter 9. For example, the draft rule requires AEMO to report on the forecasts, modelling and analysis used to determine whether to trigger the RERT, which promotes transparency and accountability.

These enhanced reporting requirements also address concerns raised by stakeholders with respect to oversight of the procurement trigger and as they would provide detailed information to the market in terms of how AEMO has made its procurement assessment, giving market participants enough information to assess and understand AEMO's actions with respect to procurement of emergency reserves. This improves accountability and clarity around the procurement trigger.

#### Role of jurisdictions

The draft rule also does not make any changes to existing governance arrangements with respect to jurisdictions. Currently, the NER requirement in clause 3.20.3(c) of the NER is for AEMO to *consult* with jurisdictions. The intent of the clause is for AEMO to consult with jurisdictions with respect to the cost of procurement, should the procurement trigger be met. However, despite this consultation requirement it is ultimately AEMO's decision as to whether or not to procure emergency reserves, based on the procurement trigger.

Box 12 provides an example of how it would work in practice, based on a stylised example of how a hypothetical event would work in practice, drawing on information set out in Chapters 2 and 3.

### BOX 12: ROLE OF JURISDICTIONS IN PRACTICE

Consider an extremely hot January where the Bureau of Meteorology is forecasting a rare and extreme heatwave in the following week. In addition, there is a high risk of bushfires. This event had been unexpected until then, and AEMO had not already procured emergency reserves.

AEMO's forecasting processes, including the forecasting uncertainty measure (FUM), would reflect the extremely high temperatures implied by the heatwave. As a result, its demand forecasts would reflect the extreme weather event. At the same time, the FUM would also increase the level of reserves needed in the market, due to the potential for forecasting deviations due to the extreme weather. Generators would also derate availabile capacity due to temperature ratings, leading to lower scheduled generation availability.

As a result, the short-term PASA would start forecasting LOR2s which indicate that there will not be enough reserves in the market to cover demand on the day of the extreme weather event.

Assume this occurs about seven days ahead of the projected heatwave day and shows a gap of 100MW for a Wednesday afternoon. AEMO would first seek a market response (including telling the market the latest time that it would intervene) and if one is not forthcoming, it would then contact its short-notice RERT panel members, and seek tenders for the projected shortfall.

The projected shortfall would reflect the amount of additional reserves needed to meet demand during the extreme weather event. AEMO would then seek to contract for 100MW of reserves through short-notice RERT contracts. Before doing so, it would contact the relevant jurisdiction, and discuss the extreme weather event, the shortfall and the costs of procuring reserves. Jurisdictions may provide feedback on, for example, which contracts to purchase given the costs of these contracts, although AEMO also has to have regard to cost minimisation when entering into contracts under the RERT principles.

Following feedback from jurisdictions, AEMO would then seek to enter into 100MW of reserve contracts, four days ahead of the shortfall. On the Wednesday of the shortfall, close to the dispatch intervals of the shortfall, AEMO would then dispatch said reserves to meet demand, if the LOR2 persists.

Consumers would therefore be unlikely to experience supply interruptions as a result of the extreme weather, at least not on the wholesale level. They may, however, still experience distribution outages due to the extreme weather caused by bushfires, for example.

In this simple example, emergency reserves were only needed in one region. In the event that they are needed in more than one region, *AEMO* must agree with the jurisdictions on cost-sharing arrangements between the regions as well as consult with them on costs.[247]

247 Clause 3.20.3 (e) of the draft rule, unchanged from the status quo.

In addition to the explicitly recognising the need to consult with jurisdictions prior to AEMO procuring reserves; there are also numerous examples of how jurisdictions have managed situations where they were concerned about the demand and supply balance. These have occurred in a number of different ways, and have included the following:

- The South Australian and NSW Governments have in the past, called on the public to reduce consumption during particularly hot days, for example, by pre-cooling houses prior to the afternoon peak. For example, the relevant Minister may have issued a press release; or appeared on the local evening news. In other words, jurisdictions have asked consumers to voluntarily reduce demand in order to relief pressure on the grid and avoid possible involuntary outages.
- The South Australian Government invested in diesel generation to be used as emergency reserves. The Commission understands that the diesel generators were part of the short-notice RERT panel - this carried no cost to electricity consumers since panel members do not get paid just to be on the panel. These reserves providers are only paid when AEMO enters into contracts with them to provide emergency reserves, which can occur up to seven days before a projected shortfall. There is also a medium-notice RERT panel. In other words, the SA Government (through SA Power Networks (SAPN) in this instance) was like any other member of the short-notice RERT panel. The effect of this was to increase the availability of emergency reserves available to South Australia - and, unlike other emergency reserves on the short-notice RERT panel - effectively guarantee that these would able to be used if shortfalls arose.
- Jurisdictions can also smooth the pathway to allow the market to invest in power stations in order to enable generation suppliers to come online more quickly - particularly in the face of projected shortfalls.

**Reliable operating state as a procurement trigger**

The Commission notes that it remains appropriate in an operational timeframe for AEMO to use any of its available powers, on the day, to achieve no USE, i.e. no load shedding. AEMO considered there was a disconnect between the use of directions and procurement of emergency reserves. While this may be true over long term timeframes, in the short term (operational timeframes) there is no disconnect because the RERT has the same trigger as reliability directions, namely LOR2s.

The Commission agrees with AEMO and other stakeholders that it would not be appropriate to link the procurement trigger to a reliable operating state. Aiming for zero USE at all times would be extremely costly to consumers - especially for long-notice RERT. AEMO would be required to procure a significant amount of reserves (in fact, an infinite amount) to avoid any load shedding at all times. It would also effectively delink RERT procurement from the reliability standard as well. As discussed above, this would be distortionary to market outcomes. AEMO would continually be required to provide a level of reliability that is much higher than the reliability standard. As a result, the Commission concludes that it is not appropriate to base the RERT procurement trigger on the reliable operating state.

## 5.3 Procurement volume

### 5.3.1 AEMO's views in its rule change request and on the consultation paper

AEMO's views on procurement volume are reflected in its views on the procurement trigger, as under its proposal, they would be one and the same. Specifically, AEMO proposed that a "broader risk assessment" framework should be applied to the procurement trigger and volume. AEMO would use the same assessment framework to determine both whether or not to procure, and if so, how much to procure.

As noted in the procurement trigger section, in its rule change request, AEMO considered that the determination of the volume to be procured (i.e. procurement volume), should be in the context of a broader risk assessment. It stated that this should "take into account the risk of USE, not just the "expected" value."[248]

As noted above, in addition to cost of USE and RERT procurement, the following factors should also be considered in the assessment:[249]

- Economic approach that also minimises total costs and 'regret' costs associated with opportunity losses under uncertainty
- Level of insurance provided by RERT
- The outcome of USE measured in terms of level (i.e., MWh), duration and probability of occurrence.

### 5.3.2 Stakeholders' views on the consultation paper

In its submission to the consultation paper for the *Reinstatement of the long-notice RERT*, the Victorian Government stated that it requires accurate information on the level of reliability that should be targeted in order to prevent outages at a reasonable cost, and suggested that there should be a clear framework for setting a "capacity target for reserves, informed by an assessment of the reserve requirement over each hour of the peak demand event".[250] The Victorian Government also suggested that this target should be published before AEMO seeks contracts.

There were mixed views in submissions to the consultation paper with respect to being more prescriptive regarding the procurement volume, i.e. how much AEMO should be able to procure.

Some stakeholders opposed further prescription:

- TransGrid stated that due to complexity, it is not a matter for the NER.[251]
- Major Energy Users considered that AEMO should have flexibility to decide on what reserves it needs but the level acquired needs to be constrained by a requirement to minimise the cost that consumers will incur by having that reserve available.[252]

248 AEMO, rule change request, p. 7.
249 Ibid. p. 8.
250 Victorian Department of Environment Land Water and Planning, Submission to the consultation paper of the Reinstatement of the Long Notice RERT, p. 2.
251 TransGrid, submission to consultation paper, p. 3.
252 MEU, submission to consultation paper, p. 4.

- Meridian considered the appropriate location for any linkage between procurement trigger and volume would be in the RERT guidelines as this would enable appropriate technical input and regular updating for experiences gained from RERT activations.[253]

Some stakeholders advocated for greater NER prescription:

- The AEC and Origin suggested the NER should clarify that the procurement volume must be limited to meeting the reliability standard.[254]
- ERM Power suggested that should the National Energy Guarantee be implemented, the definition of any reliability 'gap' should be used as a proxy for RERT volumes required.[255]
- The Energy Networks of Australia supported clarification to the extent the NER are unclear as to the objective of procurement of reserves.[256]

Most stakeholders considered the current level of transparency to be unsatisfactory.[257]

### 5.3.3 Overview of the options paper

The options on procurement volume as set out in the options paper are summarised in section 5.2.3.

With respect to procurement volume:

- Option 1 would clarify the NER to explicitly link the procurement trigger to the reliability standard through LORs and LRCs, thereby setting the amount to be procured to be around the amount needed to meet the reliability standard.
- Option 2 would delink the RERT from the reliability standard and give AEMO the discretion as to how much to procure through its own processes.
- Option 3 would, like option 1, set the volume to the identified breach of the reliability standard. The main difference would be that, under option 3, changes to how the reliability standard is operationalised would affect the volume to be procured.

### 5.3.4 AEMO's views on the options paper

As noted in section 5.2.4, AEMO supported option 2 but not options 1 and 3. With respect to option 2, this would mean using the following inputs to determine the procurement volume:[258]

- Forecast USE outcomes: The USE forecast would come from a wide range of POE, weather pattern and outage scenarios.
- Cost of USE: The cost of USE would be informed by VCR based on the relevant characteristics such as time, duration, magnitude and (if possible) customer segment.

253 Meridian, submission to consultation paper, p. 4.
254 AEC and Origin: submissions to consultation paper.
255 ERM Power, submission to consultation paper, p. 4.
256 ENA, submission to consultation paper, p. 4.
257 CEC, MEU, Flow Power, Meridian, EA, Snowy Hydro, ENA: submissions to consultation paper.
258 AEMO, submission to options paper, p. 9.x

- Cost and operating characteristics of RERT resources: The cost of RERT would consist of availability, activation and usage cost. Operating characteristics of these resources, such as lead time and usage limit would also be taken into account.
- Some externally set metrics that set the limitation of allowable USE risk in the system.

AEMO would then procure the volume that minimises economic cost (the economic cost minimisation model or ECM), taking into account externally-set risk metrics.[259]

### 5.3.5 Stakeholders' views on the options paper

As noted in section 5.2.5, stakeholders[260] stated that transparency was crucial to improve the RERT framework regardless of their views on the procurement options - their comments on transparency typically applied to both the trigger, and the volume to be procured.

Similarly, stakeholders' views on the procurement volume is reflected in their views on the procurement trigger in section 5.2.5 above: there was strong support for option 1, mixed views on option 3, and little support for option 2.

The next few paragraphs summarise additional comments provided by stakeholders in submissions with respect to the procurement volume specifically.

#### Options 1 and 3

In the options paper, the Commission discussed the potential for adding a margin of error to how much AEMO can procure (in addition to the identified gap). Stakeholders were generally against this,[261] stating that the USE projection process already factors in margins of errors through probabilistic modelling. AEC and Infigen, in response to comments that a margin of error may be needed for "non-firm" demand response resources, noted that probabilistic modelling should take firmness and other "uncertain" parameters into account as well.[262]

#### Option 2

AEC supported applying AEMO's economic cost minimisation model to any reserves purchased in order to meet the reliability standard, i.e. the approach once used by NEMMCO.[263]

### 5.3.6 Technical working group

The technical working group did not specifically discuss procurement volume as distinct from the procurement trigger. As noted in section 5.2.6, there was discussion that irrespective of which procurement trigger option was progressed, there might be merit in the AER providing additional oversight over both AEMO's forecasts and AEMO's RERT procurement plan.

259 Ibid.
260 Including Stanwell, EA, Alinta, ERM Power, Infigen, Enel X, EEC, Meridian.
261 ENA, Infigen, AEC: submissions to options paper.
262 AEC and Infigen, submissions to options paper.
263 AEC, submission to options paper, p. 3.

### 5.3.7 Commission's analysis and conclusions

BOX 13: DRAFT RULE

The draft rule sets the procurement volume to an amount that AEMO considers is reasonably necessary to meet the gap identified by a breach of the reliability standard (that is, the forecast shortfall identified in the relevant LRC or LOR declaration).

The draft rule also includes reporting requirements with respect to the methodology AEMO will use to identify the amount to be procured, and details around how it has gone about doing so, including reasons why it has exercised its discretion and procured more than identified by the forecast gap.

The Commission considers that the draft rule provides clarity and improves transparency around the use of the RERT, and will lead to lower cost for consumers, while continuing to promote reliability.

As noted above, in order to assess each option against the assessment framework described in Chapter 3, the Commission fleshed out each option further and concluded on some design features which it consulted on through the options paper. For more detailed information on the refined options and the Commission's assessment of the options, see Appendix D.

**Refined options**

Under option 1, the RERT procurement volume would be explicitly linked to the amount needed to meet the breach of the reliability standard (through the LOR and LRC frameworks, i.e. the frameworks used by AEMO to operationalise the reliability standard), but with some discretion provided to AEMO as to exactly how much to procure. There would be no changes to the governance structure of this, with AEMO ultimately deciding how much to procure, based on the identified gap.

As noted above, Option 2 would remove the explicit procurement trigger and give AEMO discretion on when and how much to procure through its economic minimisation model (ECM) and externally-set risk metrics. There would be a high-level framework in the NER for the procurement of RERT. The Panel would then be required to provide additional guidance on procurement (including on the ECM) and set the risk metrics. AEMO would be required to produce a methodology document to explain its assessment process, in accordance with the Panel guidelines and NER. The procurement volume would be set through this document, with AEMO likely to use an ECM model, while taking into account the risk metrics set by the Panel.

Under Option 3, procurement volume would be set in the same manner as under Option 1 but changes to the procurement trigger through changes in how the reliability standard is operationalised would affect the volume procured. Since this was ruled out in the procurement trigger discussion, option 3 is not discussed separately here.

**Assessment of options - the draft rule meets the NEO**

The Commission then assessed each procurement volume option against the assessment framework and concluded that option 1 was the option that would best meet the long-term interests of consumers and the NEO.

The draft rule, discussed in the next section, therefore introduces option 1 in the NER by introducing rules around how to set the procurement volume.

The draft rule promotes the NEO because:

- **The draft rule improves transparency of the RERT framework.**
  - It does so by setting in the NER how much AEMO should procure, which is an improvement on the status quo whereby this amount is not known or set in any form[264]. Knowing how much AEMO is likely to procure or how the volume is set enables market participants to manage operational and investment decisions better and improves transparency.
  - On the other hand, the amount to be procured under option 2 would be dynamic and depend on the outputs of AEMO's model, which would reduce transparency.
- **The draft rule provides more certainty.**
  - The draft rule sets AEMO's use of emergency reserves to be around the identified gap, implied by a breach of the reliability standard (be it expected USE or LOR2) albeit with some ability for AEMO to operationalise the reliability standard i.e. how this occurs in practice.
  - This will make it clearer for market participants as to how much will be procured, assisting participants in understanding what the costs of the RERT are. Under option 2, there would be no certainty around how much AEMO can procure.
- **The draft rule improves consistency of the RERT framework**
  - The draft rule makes sure that the procurement volume, like the trigger, is linked to the reliability standard, thereby clarifying that the purpose of the RERT is as a last resort mechanism after the market has failed.
  - This is in contrast with option 2, whereby the volume procured would not be related to the reliability standard, meaning that the practical outcomes associated with reliability would be delinked from the reliability standard. As argued in the procurement trigger section, this is distortionary for market participants and will lead to higher costs for consumers.

#### Draft rule

The draft rule introduces a new clause which links how much AEMO can procure to the reliability standard. The Commission notes that the draft rule is different from the status quo, whereby there is no explicit guidance in the NER with respect to how much AEMO can procure. Specifically, the draft rule states that:

### 3.20.3 Reserve contracts

264 Under the status quo the procurement volume is in part constrained by the RERT principles.

**Terms and conditions of a contract**

...

(k) Except as otherwise prescribed under the *Rules*, *AEMO* must use reasonable endeavours ensure that:

...

(2) the amount of *reserve* procured under a *reserve contract* is no more than *AEMO* considers is reasonably necessary to address the *low reserve* or *lack of reserve* condition...

having regard to the *RERT principles*.

The draft rule does not set the volume that AEMO can procure at just the gap identified by the LRC declaration or LOR declaration, but rather, sets the amount at what AEMO thinks is *reasonably necessary* to address the gap.[265] In other words, the draft rule gives AEMO some discretion to determine how much it can procure in emergency reserves. This is because the Commission thinks it is appropriate to allow AEMO to procure the right combination and amount of reserves to ensure that the reliability standard is met, once there is an identified breach, i.e. to promote reliability of the power system.

The intent of this is to provide AEMO with the ability to assess the tenders it receives efficiently and provide it with the ability to minimise direct RERT costs once the procurement trigger has been met. For example, there could be non-firm reserves within the mix of tenders (likely if some of the emergency reserves are demand response), or reserves with other restrictions. Being too prescriptive with respect to how much it can procure may limit the number of providers and lead to expensive emergency reserves being procured ahead of less expensive ones.

AEMO is best placed, consistent with the rest of the reliability framework, to manage the power system and operationalise mechanisms such as the RERT, within the existing governance framework. It is therefore best placed to decide which contracts are the best RERT contracts and how much it needs to procure in order to ensure the reliability standard is met, while minimising costs.

The Commission considers that this addresses some of AEMO's concerns with respect to option 1 "under utilising cost effective resources" to manage reliability.

Reporting requirements

The draft rule also introduces a number of reporting requirements, building on existing provisions, in order to promote transparency and accountability with respect to procurement volume, consistent with stakeholder feedback, including:

265 The draft rule also contains a provision that states "except as otherwise prescribed under the rules". This provision is a recognition of the interactions between the Retailer Reliability Obligation in the event that the method for setting procurement volumes differ from the draft rule's method.

- requiring AEMO to update its RERT procedures to explain how it will determine the appropriate term of a reserve contract and how much to procure (i.e. a methodology) in accordance with the NER
- reporting[266] the following with respect to reserve contracts:
  - how much it has procured
  - the analysis it has used to procure emergency reserves
  - if it has exercised its discretion and has procured more than what is implied by the LOR and LRC gap, explain why it has done so.

Specifically, the draft rules are:

### 3.20.6 Reporting on RERT by AEMO

**Post-dispatch or activation report**

(a) If *AEMO dispatches* or *activates reserves*, then *AEMO* must, as soon as practicable, and in any event no later than 5 business days thereafter, *publish* and make available on its website a report that includes details of:

...

(2) the total estimated volume (in MWh) of *reserves dispatched* or *activated* under each *reserve contract,*

for the relevant *region*.

**Information to include in RERT report – reserve contracts**

...

(d) The RERT report must, with respect to any *reserve contracts* entered into by *AEMO* include a detailed explanation of:

...

(2) *AEMO's* modelling, forecasts and analysis used to determine:

...

(ii) the amount of *reserve* procured under those *reserve contracts*, including how those amounts were determined in accordance with the methodology specified in clause 3.20.7(e)(2),

and where *AEMO* procured an amount of *reserves* greater than any shortfall identified in the relevant declaration under clause 4.8.4, an explanation of why a greater amount was procured.

**Information to include in RERT report – dispatch or activation of reserves**

266 see chapter 9.

...

(e) The RERT report must, with respect to any *reservesdispatched* or *activated* under *reserve contracts*, include a detailed explanation of:

...

(7) the amount of *reserves dispatched* or *activated*, and if applicable, why such amounts were different to those previously forecast or modelled by *AEMO.*

### 3.20.7 AEMO's exercise of the RERT

...

(e) *AEMO* must develop, *publish*, and may amend from time to time, in accordance with the *Rules consultation procedures*, procedures for the exercise of the *RERT* under this rule 3.20 that take into account the *RERT principles* and *RERT guidelines*. These procedures must include:

...

(2) a methodology to be used by *AEMO* to determine the appropriate term of a *reserve contract* and the amount of *reserves* to procure in accordance with clause 3.20.3(k)(2)

With respect to AEMO's ECM model, the Commission is of the view that AEMO could use this model should it choose to assess which emergency reserves are procured, consistent with meeting any gap identified by a breach of the reliability standard based on their costs. As noted above, more prescription in this regard is not desirable in the NER. The Commission thinks it is best left to AEMO to decide if this model is the best approach to procuring reserves in order to promote reliability in the power system.

Furthermore, existing forecasting processes already involve an amount of conservatism and implied "margins of errors" which reduces the risk of the reliability standard not being met. This is why the Commission did not think that an explicit margin of error to the gap identified by the LOR and LRC declarations would be appropriate - the margins of error are already inbuilt within the forecasting processes.

## 5.4 Power system security

In the consultation paper, the Commission asked stakeholders if it continues to be appropriate for AEMO to have the discretion to use the RERT for power system security.

### 5.4.1 AEMO's views

AEMO did not comment on this aspect in its rule change request but in its submission to the consultation paper, noted that so far AEMO has not used the RERT for this purpose but

considers this to be a valuable option in its toolkit and noted that its proposed assessment framework should not be applicable when assessing RERT for system security purposes.[267]

### 5.4.2 Stakeholders' views

Some stakeholders were supportive of the use of RERT for power system security as long as it was the lowest cost option.[268] TransGrid and Origin disagreed, stating that security is managed through FCAS and other frameworks.[269]

Meridian considered it appropriate that AEMO retains the right to utilise RERT reserves procured for whatever purpose for system security events. Meridian stated that customers would be badly served if available reserves were not utilised when necessary.[270] The Australian Energy Council (AEC) clarified that the purpose the power system security provision is likely that if RERT has been procured for reliability purpose, may be subsequently dispatched for system security - this circumstance does not seem problematic to the Australian Energy Council.[271]

### 5.4.3 Commission's analysis and conclusions

**BOX 14: DRAFT RULE**

The draft rule has removed certain references to "power system security", to clarify that only in circumstances where AEMO has already procured RERT services for reliability purposes and these resources could help with a power system security issue, then AEMO may dispatch said reserves if practicable to do so.

The draft rule promotes transparency since it makes it clear that AEMO may dispatch RERT for power system security purposes if emergency reserves have already been procured, and not to procure RERT to meet power system security needs.

The RERT is primarily a tool to manage reliability in the event of a market failure. It has been designed as such.

However, the Commission understands that AEMO can already use the RERT for power system security if AEMO *has already procured RERT* for reliability, and a system security issue emerges for which it would be appropriate to use RERT, then it may do so rather than risk the system being insecure.

Power system security and reliability are two distinct frameworks in the NEM and are managed through different frameworks and governance structures. System security issues

267 AEMO, submission to consultation paper, p. 8.
268 BlueScope, MEU ENA: submissions to consultation paper.
269 TransGrid and Origin: submissions to consultation paper.
270 Meridian, submission to consultation paper, p. 3.
271 AEC, submission to consultation paper, p. 7

are best addressed through security frameworks such as FCAS and power system security directions.

The RERT framework, as currently designed and assessed by the Commission, is a reliability mechanism. The design features in the draft rule made by the Commission also assume that the RERT is a reliability mechanism.

Out-of-market provisions, for example, assume the RERT is procured for reliability purposes and the draft rule clarifies that AEMO cannot contract emergency reserves if they are in the energy market or subject to a demand response arrangements with a registered participant for the term of the contract or at any time during the 12 months prior. However, if RERT is to be procured for power system security, this would not be appropriate - the restriction would need to apply to the relevant power system security service.

Designing the RERT so that AEMO may use it to procure for power system security would involve a different assessment framework and different design features. Box 15 explores some of the considerations the Commission would need to make if out of market reserves (i.e. the RERT) were to be designed for security.

### BOX 15: A RERT MECHANISM FOR POWER SYSTEM SECURITY

The following considerations would need to be taken into account with respect to the key RERT features:

- procurement trigger – the procurement trigger would need to clarify which power system security events the RERT could be used for (all of them? some of them?) and what the precedence of use would be. For example, would RERT take precedence over 5-minute FCAS?
- procurement volume – AEMO would be required to provide methodology assessment details for each type of power system security event the RERT would be used for. For example, how it would assess RERT procured for, say, managing voltage or system strength or FCAS and so on.
- procurement lead time and contracting duration – the assessment with respect to these two design features would be in the context of all other power system security services or implied power system security services, and what length of time would be appropriate so as to minimise any distortions with respect to each service. This may also depend somewhat on which service takes precedence as well.
- product standardisation - AEMO would need to standardise products specifically for each type of service to be provided as the requirements for each type of service would differ significantly.
- out-of-market provisions – whether and how to limit the procurement of emergency reserves from providers who are otherwise "out of the market" would need to take into account all services provided. The length of time for which the restriction would apply may differ from product to product, for example.

- cost recovery – the basis on which RERT costs should be recovered may need to change depending on which service is provided.

When considering such a mechanism, the Commission would also need to have regard to how power security events are currently managed and whether such a mechanism would be more preferable to existing arrangements or other potential arrangements.

Despite the fact that reliability and power system security are governed by two different frameworks, the Commission considers that it continues to be appropriate for AEMO to use reserves that have already been procured for reliability purposes for power system security if practicable. The Commission agrees with Meridian that consumers would be badly served if all available reserves were not used by AEMO as necessary.

The draft rule, therefore, clarifies the circumstances in which RERT can be used for power system security. The procurement trigger clearly links the RERT to the reliability standard, and in particular, to the declarations of LORs and LRCs.

As discussed in chapter 10, the dispatch trigger in the NER is unchanged,[272] meaning that AEMO may still dispatch for power system security purposes if feasible, assuming it has also procured RERT for reliability purposes.

The Commission also notes that it is currently examining the intervention framework more broadly through its work on *System Strength and Intervention Mechanisms in the NEM*. The Commission has a significant system security work program.[273]

272 Clause 3.20.7(a) of the drfat rule.

273 For more detail, refer to: https://www.aemc.gov.au/our-work/our-current-major-projects/keeping-energy-system-secure-and-reliable

# 6 PROCUREMENT LEAD TIME AND CONTRACTING DURATION

This chapter considers the procurement lead time (i.e. how long in advance of the projected shortfall AEMO can enter into a Reliability and Emergency Reserve Trader (RERT or emergency reserves) contract) and contracting duration (i.e. the length of the emergency reserve contract). For these two elements of the framework, this chapter outlines:

- current arrangements in the NEM
- AEMO's views
- stakeholders' views
- the Commission's analysis and conclusions.

## 6.1 Procurement lead time

The procurement lead time refers to the amount of time AEMO has to enter into contracts (i.e. procure emergency reserves) prior to the date that AEMO expects the emergency reserves under the contract may be required to ensure reliability of supply (i.e. when a reserve shortfall is expected).

For example, a procurement lead time of up to nine months means that AEMO cannot enter into an emergency reserve contract if the expected reserve shortfall is in a year's time. It can only enter into an emergency reserve contract for a shortfall expected to occur up to nine months ahead.

### 6.1.1 Current Arrangements

Under the NER, AEMO must not enter into an emergency reserve contract, or renegotiate an existing emergency reserve contract, more than nine months prior to when AEMO reasonably expects the emergency reserves to be needed.[274]

#### BOX 16: REINSTATEMENT OF THE LONG-NOTICE RERT

On 9 March 2018, AEMO submitted a rule change request that sought to extend the period allowed for AEMO to contract for reserves ahead of a projected shortfall, in effect, reinstating the long-notice RERT. The AEMC considered this an urgent rule and so progressed it under an expedited process, making the final rule on 21 June 2018.

The final rule increased the lead time available for AEMO to procure out-of-market or emergency reserves through the RERT, to nine months ahead of a projected shortfall, effectively reinstating the long-notice RERT. This allowed AEMO to procure emergency reserves under the long-notice RERT for the 2018-19 summer.

274 Clause 3.20.3(d) of the NER.

In the final determination for that rule change request, the Commission noted that while the potential of the mechanism to distort market outcomes remains unchanged since the Commission considered similar issues in 2016, several conditions in the market have changed since then, including the changing generation mix and the ARENA-AEMO RERT trial, which has demonstrated the existence of resources, primarily demand response, capable of participating in the RERT. The trial also found that a longer lead time is required for these types of emergency reserves, e.g. to install relevant equipment. This was confirmed through stakeholder feedback to the reinstatement of the long-notice RERT rule change.

Further, the Commission considered that to the extent that the RERT is required, having more resources able to participate in the RERT through a longer procurement lead time may improve the efficiency of the procurement process. This may put downward pressure on the direct costs of the RERT, if it is needed.

Source: AEMC, *Reinstatement of the long notice Reliability and Emergency Reserve Trader*, final determination, June 2018.

### 6.1.2 AEMO's views

#### Rule change request

In its rule change request, AEMO recommended that emergency reserves should be allowed to be procured up to one year ahead of an identified shortfall.[275] AEMO considered that the longer lead time would allow time for potential emergency reserve providers to make the necessary preparations (such as seeking demand response from consumers, installing any necessary control systems, procuring and shipping diesel gensets, etc.). AEMO also considered that this could reduce the significant overheads involved in planning, procurement and conducting due diligence on potential resources, for both AEMO and for providers, reducing the costs of emergency reserves.

AEMO went on to note that in extending the procurement lead time, care would need to be taken to avoid distorting market investment signals. The potential for longer contracts would need to be balanced against risk of drawing reserves out of the energy market (e.g., if AEMO contracts for reserves were more attractive to potential providers than contracts being offered by retailers, for example).

#### Submission to consultation paper

In its submission to the consultation paper, AEMO reiterated its views expressed in its rule change request, that having a longer procurement lead time for reserves would provide more certainty to potential providers and reduce total procurement costs. [276] For example, a longer procurement lead time provides AEMO more time to plan the procurement process and carefully evaluate offers from competitive tender.

275 AEMO, rule change request, p. 7.

276 AEMO, submission to the consultation paper, pp. 2, 5.

AEMO also noted that a one-year procurement lead time would be consistent with procurer of last resort (PoLR) function under the retailer reliability obligation (RRO).[277]

### 6.1.3 Stakeholders' views

**Submissions to consultation paper**

In the consultation paper, the Commission sought stakeholder feedback on increasing the procurement lead time from nine months to one year. There were mixed views on increasing the procurement lead time, but on balance, there was support for having a one year lead time.

Stakeholders[278] in favour of increasing the procurement lead time to one year argued increasing the procurement lead time would:

- encourage more demand response, since demand response providers typically require a longer lead time in order to set up portfolios of demand response capable of providing emergency reserve services, e.g. they need time to sign up customers
- ensure it is consistent with the procurer of last resort function under the RRO, where AEMO applies to the AER to make a 'T-1 reliability instrument' one year prior to where the forecast shortfall exists, and if approved, becomes the procurer of last resort for that shortfall
- reduce costs through greater participation and the associated benefits if the increase in lead time leads to a larger pool of emergency reserve providers.

Stakeholders[279] that opposed increasing the procurement lead time gave reasons including:

- it would be inefficient for AEMO to procure emergency reserves a year ahead of projected shortfalls, when, at that point in time, market participants have less information than they would closer to real time, such as information which would enable them to make more informed procurement decisions e.g. what demand response will be available
- existing arrangements are largely workable with the proposed design parameters and timeframes of the RRO, they are not so different that it would warrant a change in approach, and there are limited other compelling reasons as to why the lead time should be increased.

**Submissions to options paper**

The options paper did not explicitly discuss the procurement lead time. However, in its submission to the options paper, Enel X noted that there should be sufficient lead time to enable reserve providers to develop a portfolio of reserves. It stated that in its experience, at least six months is needed to build a portfolio of demand response capable of providing emergency reserves.[280]

277 See chapter 1 for more information on the RRO.
278 Stakeholders included: EEC, MEU, BlueScope Steel, ENA, Meridian, EUAA, CitiPower Powercor & United, AEMO
279 Stakeholders included: AEC, Snowy Hydro, Energy Australia and Origin
280 Enel X, submission to options paper, p. 3

It also stated that reserve providers prefer longer duration contracts,[281] including those longer than a year. This is discussed in section 6.2.3.

### 6.1.4 Commission's analysis and conclusions

**BOX 17: DRAFT RULE**

The draft rule increases the maximum procurement lead time from nine months to 12 months. The draft rule therefore allows AEMO to procure emergency reserves through the RERT mechanism up to a maximum of 12 months ahead of an identified shortfall.

The Commission considers increasing the procurement lead time to 12 months increases the range of resources that can potentially provide emergency reserves, which will place downward pressure on the cost of delivering emergency reserves. In addition, increasing the procurement lead time to 12 months creates consistency with the lead time under the RRO that is currently under development. Further, the Commission is of the view that the increase is unlikely to create significant, distortionary impacts on the market; particularly because other aspects of the draft rule strengthen the out-of-market provisions to minimise distortions.

There are also a number of minor consequential changes in the draft rule as a consequence of changing the procurement lead time.

The Commission recently considered the issue of the procurement lead time through its consideration of the *Reinstatement of long notice reliability and emergency reserve trader* rule change request. In the final determination for this, the Commission set out that having a procurement lead time of nine months (an increase from 10 weeks) would promote the long-term interests of consumers, since it would have a net positive impact on the procurement process and the costs associated with procuring emergency reserves, leading to AEMO being able to access more emergency reserves, and more reserves efficiently, should they be needed. The Commission did not consider a longer procurement lead time at the time - only whether or not to reinstate the long-notice RERT, which at the time it was removed from the NER had a nine-month procurement lead time.

The Commission agrees with AEMO's and stakeholders' comments regarding the potential benefits of further increasing the procurement lead time to one year, and considers that a longer procurement lead time would further expand the pool of potential RERT providers, in particular, demand response providers or aggregators of behind the meter technologies, by reducing barriers to participation. These providers of emergency reserves require a longer lead time in order to participate in the RERT - the time is typically used to sign up customers and install any relevant equipment. Providers typically state that they need at least six months.

281 Ibid, p. 5.

While a 12-month lead time is longer than six months, when taking into account AEMO's procurement process (typically lasting about three-to-four months, based on the last couple of years), and the typical shortfalls that tend to span across summer, the lead time under the draft rule can result in more efficient outcomes. A longer lead time can increase the pool of potential providers, placing competition tension on the costs of procuring emergency reserves.

The benefits of increasing the lead time have to be weighed up against the costs of doing so. The longer the lead time, the higher the potential for market distortions e.g. if a market participant decides to withdraw existing capacity from the market because it is more lucrative for them to provide emergency reserves. The longer the lead time is, the more likely these distortions will arise; given that the potential for reserve providers to earn more money is increased. A longer lead time also means that AEMO may enter into contracts (and incur costs on behalf of the market) based on forecasts longer ahead of time, meaning that they might be less accurate. Such costs might have been avoided had AEMO only been able to enter into contracts nearer the time of the projected shortfall. However, on balance, the Commission considers that the 12-month procurement lead time strikes the right balance between reducing barriers to participation and the associated reduction in costs; and the potential costs of market distortions. In particular, this is since the Commission is strengthening the out-of-market provisions, which are designed to minimise distortion, in the draft rule as discussed in Chapter 7.

In addition, increasing the procurement lead time to 12 months creates consistency with the lead time under the RRO that is currently under development by the ESB. It is important to have consistency between these frameworks since the trigger for emergency reserves under the RRO is a trigger for use of the RERT mechanism. This is discussed further below.

To conclude, the Commission considers that a 12-month procurement lead time is appropriate because it:

- **Will decrease the barriers to participation in the RERT**, enabling more potential providers to offer emergency reserves and so potentially reducing costs.[282]
- **Is unlikely to give rise to significant market distortions** such as those that might arise from longer procurement times.

The draft rule therefore states the following regarding the procurement lead time:[283]

> **3.20.3 Reserve contracts**
>
> **Procurement trigger and lead time**
>
> …
>
> **(f)** Except as otherwise prescribed under the Rules, AEMO must not enter into or renegotiate, a reserve contract for a *region*:

282 For example, a sufficient lead time to give potential providers the opportunity to sign up customers and install relevant equipment to engage in demand response.

283 AEMO is only required to specify a time period when it declares an LOR or LRC under clause 4.8.5(a1)(2) of the NER to the extent reasonably practicable. As a result, the draft rule introduces clause 3.20.3(f)(2)(ii) to address this.

> **(1)** unless it has made a declaration under clause 4.8.4 for that *region*; and
>
> **(2)** more than 12 months prior to the:
>
> (i) commencement of any time period specified in the declaration in accordance with clause 4.8.5(a1)(2); or
>
> (ii) where no such time period is specified, the date *AEMO* reasonably expects that the *reserves* under that contract may be required to address the *low reserve* or *lack of reserve* condition, having regard to the *reliability standard implementation guidelines*.

**Interaction with the RRO**

The Commission acknowledges the interactions between the RRO and the RERT. In particular, if a T-1 reliability instrument is made by the AER under the RRO, then AEMO would become the procurer of last resort and could purchase reserves through the RERT mechanism. Under the current design of the RRO this would need to happen one year ahead of a shortfall. As a result, there would need to be, in the NER, the ability for AEMO to procure emergency reserves, for the purpose of the RRO, one year ahead of a shortfall. Therefore, increasing the lead time to 12 months is consistent with this.

The rules associated with the RRO are currently being developed. Given that the RRO would require changes to the NER and is still being finalised, the Commission will continue to monitor RRO developments between the draft determination and final determination.

In the meantime, the draft rule, as quoted above, includes the provision "except as otherwise prescribed under the Rules" in recognition that the Rules implementing the RRO may amend the NER to be consistent with the final RRO design.

## 6.2 Contracting duration

The contracting period refers to the duration of an emergency reserve contract. This is different from the procurement lead time. The procurement lead time refers to how long in advance of a projected shortfall AEMO can enter into emergency reserve contracts (up to 12 months under the draft rule) whereas the contracting duration refers to how long the term of the reserve contract can be, once that threshold has been reached.

### 6.2.1 Current Arrangements

The NER do not prescribe a specific contract duration for emergency reserve contracts; however, the procurement lead time specified in the NER acts as a maximum limit on the duration of an emergency reserve contract because AEMO is not permitted to enter into reserve contracts in respect of reserve shortfalls that are expected to occur outside that lead time. Put another way, the procurement lead time implies that the term of the contract itself may not be longer than nine months. Put simply, the end of the contract must be no longer than nine months away.

As an example, if AEMO identifies shortfalls for the next two summers, it would not be able to sign a two-year emergency reserve contract. Instead, it could only enter into emergency reserve contracts in respect of reserve shortfalls that will occur within nine months of the entry into the contract, as implied by the procurement lead time of nine months.

### 6.2.2 AEMO's views

#### Rule change request

In its rule change request, AEMO considered that allowing multi-year contracting could lower the barrier to entry for new demand side resources. The inability to enter into longer-term agreements means that resources may not be able to be procured in the most efficient way.[284]

#### Submission to the consultation paper

In its submission to the consultation paper, AEMO stated:[285]

> While AEMO proposed to contract for up to three years, this will be done only if it is expected to lead to lower cost of RERT consistent with the RERT Guidelines and the RERT Principles under clause 3.20.2(b) of the NER. For example, in year t, AEMO identifies persisting gaps for year t+1, t+2 and t+3. In this case, signing a three-year contract for part of the volume gap could offer greater certainty to the resource provider and avoid administrative overheads, leading to lower total procurement costs.

### 6.2.3 Stakeholders' views

#### Submissions to the consultation paper

In the consultation paper, the Commission consulted on AEMO's proposal to allow multi-year (three-year) contracting if it is cheaper to do so in the event of a multi-year shortfall. Stakeholders' views on contracting duration were mixed with some preference for the status quo (i.e. disallowing multi-year contracting) due to cost concerns.

Reasons provided by stakeholders[286] who opposed multi-year contracting included:

- The RERT is meant to be an emergency reserve mechanism and not a normal feature of the market[287] and so allowing multi-year contracting would make it more "normal".
- Allowing emergency reserves to be contracted for up to three years could impede market responses and may therefore undermine investor confidence.[288]

Reasons provided by stakeholders[289] supporting multi-year contracting included:

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284 AEMO, rule change request, p. 6, 10.

285 AEMO, submission to the consultation paper, p. 5.

286 Stakeholders who opposed multi-year contracting included: CEC, ENA, AEC, EnergyAustralia, Snowy Hydro, Transgrid, Hydro Tasmania and Origin.

287 TransGrid submission to the consultation paper, p. 2.

288 Hydro Tasmania submission to the consultation paper, p. 2.

289 Stakeholders who supported multi-year contracting included: MEU, Flow power, BlueScope, EUAA, CitiPower Powercor & United, AEMO

- Having the ability to procure for up to three years should further encourage demand response bids and assist in a lower cost provision of emergency reserves.[290]
- Allowing multi-year contracting would provide more certainty to emergency reserve providers by potentially providing a longer term stream of payments (i.e. over multiple years) in return for ensuring reserves are available.[291]

**Submissions to the options paper**

While this was not a specific subject for consultation in the options paper, a number of stakeholders commented on this aspect, including:

- The MEU stated that there are some significant set up costs in order to provide RERT services and that amortising the costs over a longer term could lead to lower overall RERT costs, noting that some providers may need multi-year contracts to help with this.[292]
- Enel X supported AEMO's proposal to have the option to sign multi-year contracts if it will lead to lower costs, noting that whether longer contracts result in a lower overall cost will depend on the nature of the contracts – and their balance between availability and utilisation costs.[293]
- EEC noted that while AEMO should not require providers to provide contracts for longer than one summer, the auction process should consider the length of availability that is offered by a provider.[294]
- The AEC, however, stated that a three-year timeframe is well beyond the construction lead time of new market-based plant, meaning that it would not be possible for AEMO to undertake a meaningful economic trade-off when purchasing across an extended timeframe.[295]

### 6.2.4 Commission's analysis and conclusions

#### BOX 18: DRAFT RULE

Through the draft rule the maximum term of the contract is implied by the procurement lead time (maximum of 12 months). The term of the contract must be for the period reasonably necessary to address the shortfall, having regard to the RERT principles.

The Commission considers that multi-year contracting would create significant distortions to market participants' incentives to invest and lead to higher costs to consumers. It considers that the benefits in terms of lower direct costs that could accrue through multi-year contracts would be outweighed by pre-empting market responses over a time period that is well within

290 BlueScope submission to the consultation paper, p. 2.
291 CitiPower, Powercor & United submission to the consultation paper, p. 2.
292 MEU, submission to options paper, p.6
293 Enel X, submission to options paper, p. 5.
294 EEC, submission to options paper, p. 3
295 AEC, submission to options paper, p. 4.

investment timeframes.

The contracting duration for emergency reserves should be aligned with the procurement lead time.

The potential benefit of multi-year contracting is that AEMO may be able to contract emergency reserves at lower cost through multi-year contracts. This is because multi-year contracts can provide more certainty for providers, thereby potentially increasing the number of potential providers and lowering RERT procurement costs. This was noted by a number of stakeholders. However, it is not clear that these benefits that would always accrue, or whether multi-year contracts are required for these benefits to accrue. Any benefits would be difficult to assess at the time of procurement and would be highly dependent on the level of information available three years ahead of a potential shortfall. As such, any assessment made three years ahead of a shortfall would also likely only include a direct cost assessment, and not include the costs associated with distortions to investment and operational incentives that affect market participants.

On the other hand, there are potential costs in the form of distortions such as:

- direct costs - direct costs may be higher because of costs incurred that turn out to have been incurred unnecessarily in hindsight (e.g. if what happens closer to real time shows that emergency reserves were not needed)
- indirect costs - i.e. potential distortions to the investment and operational incentives that market participants have, as described in the section above, and in detail in Chapter 7.

As information changes, and more becomes available closer to real time, procurement decisions regarding emergency reserves are made more efficiently, which lowers direct cost. There is a trade-off since leaving the procurement decision too late could actually result in an insufficient amount of resources being procured; however, procuring emergency reserves early could result in them unnecessarily being procured.

The Commission considers that the potential costs of multi-year contracting (i.e. associated with market distortions) outweigh the potential benefits. In particular, the Commission has significant concerns around multi-year contracting reducing incentives for market participants to invest or respond to market signals, and provide reliability at lowest cost to consumers.

The Commission considers that three years is too long a time period for RERT procurement as it would likely pre-empt a market response. The Commission notes that three years is well within investment timeframes and intervening too early would significantly reduce investment incentives for market participants - as mentioned in the previous section, this is even more relevant with new technologies can be deployed quickly. In addition, the RRO - which would first be triggered three years out - aims to provide strong incentives on market participants to bring resources to the market that should fill any shortfall of capacity during this time, thereby reducing the need for emergency reserves. Allowing AEMO to procure these resources that cover this timeframe would overlap with the obligations put on market participants under the RRO.

The issues with multi-year contracts are compounded by the fact that these contracts are likely to carry availability payments for providers, unlike shorter-term contracts. As expectations change closer to real time and shortfall amounts change (most likely disappearing), there could have been inefficient sunk costs incurred by consumers as a result of procurement of emergency reserves that was, in the end, potentially not needed. In contrast, in the market, the market participant investing into new generation or demand response would be the one bearing the risk of the investment, not consumers, as is the case under RERT.

Therefore, the Commission does not think that multi-year contracting for emergency reserves is appropriate. The Commission's draft rule makes it clear that the term of the contract must be for a period reasonably necessary to address the relevant shortfall (identified by the procurement trigger), which would prevent multi-year contracting, having regard to the RERT principles.

In other words, under the draft rule:

- the maximum contracting duration, in effect, should be no greater than the procurement lead time (i.e. one year under the draft rule)
- the expected contracting duration is to cover a timeframe that is consistent with the identified shortfall.

The draft rule is:[296]

> **3.20.3 (**k**)** Except as otherwise prescribed under the *Rules*, *AEMO* must use reasonable endeavours to ensure that:
>
> > **(1)** subject to subparagraph (f)(2), the term of a *reserve contract* is no longer than *AEMO* considers is reasonably necessary to address the relevant *low reserve* or *lack of reserve* condition;

In other words, AEMO still has some discretion as to exactly how long each contract is (with a maximum of one year), having regard to the RERT principles around minimising direct and indirect costs. Box 19 explains how this would work in practice.

### BOX 19: CONTRACTING DURATION

Consider a situation where AEMO declares an LRC where it identifies shortfalls for 2019-20, specifically for the months of:

- November 2019
- January 2020
- March 2020
- June 2020

296 In the draft rule, subparagraph (f)(2) is the procurement lead time, i.e. a maximum of 12 months.

In this instance, it would likely be cheaper and more practical for AEMO to sign contracts that cover multiple months, rather than sign individual contracts for each distinct month.

In the example above, AEMO would be able to sign a contract in March 2019 (i.e. 12 months ahead of the end of the shortfall, i.e. March 2020), with the term of the contract being from November 2019 to March 2020, assuming that there are no availability payments accrued prior to November 2019. This would allow AEMO to procure emergency reserves 12 months ahead of a projected shortfall, and for these contracts to cover the entire summer period.

AEMO could only sign a contract covering November 2019 to June 2020 in June 2019 (i.e. 12 months ahead of June 2020) and only if it meets the RERT principles of minimising costs.

The Commission considers that it is appropriate to clarify that the term of the contract must be for a period reasonably necessary to address identified shortfalls.

This clarification minimises costs and situations where AEMO contracts for emergency reserves for the maximum allowed term (12 months) potentially with availability payments being incurred, even if the shortfall is only for say, one month.

The Commission notes that although multi-year contracting would not be able to occur under the draft rule, the Commission is not proposing any changes to the medium- and short-notice RERT panel arrangements - any emergency reserve providers could choose to be on the panel for as long as they wish - there are no restrictions for how long a provider can be on the panel.

# 7 MINIMISING MARKET DISTORTIONS

This chapter outlines stakeholders' views and the Commission's analysis on the potential for market distortions associated with a mechanism like the Reliability and Emergency Reserve Trader (RERT or emergency reserves).

It also outlines stakeholders' and the Commission's views with respect to two key features of the RERT that stakeholders have identified as being crucial to minimise the risk of distortions from use of the mechanism, namely:

- the existing out-of-market provisions in the National Electricity Rules (NER)
- a payment structure.

## 7.1 Market distortions and the RERT

### 7.1.1 Current arrangements

Strategic reserves, like the RERT, have the potential to distort the operational and investment incentives of market participants. For example, market participants may withdraw capacity that is currently available in the market to participate in RERT, which is a distortionary outcome.

There are provisions and design features in place to limit market distortions that may arise as a consequence of the RERT:

- NER out-of-market provisions, which aims to make sure that emergency reserves procured are meant to be in addition to what the market would otherwise provide, discussed in more detail in section 7.2.1.[297] These out-of-market provisions state that providers cannot be in the market[298] and also participate in the RERT, for the trading intervals to which the emergency reserve contract relates.
- NER limitation on the procurement lead time (see chapter 6 for more detail).[299] Currently, the procurement lead time limits AEMO's ability to procure emergency reserves up to nine months ahead of a projected shortfall. The draft rule increases the procurement lead time to 12 months.
- The RERT principles in the NER, one of which states that AEMO should take actions that AEMO reasonably expects have the least distortionary effect on the market, [300] discussed in section 7.3.
- Restriction prescribed in the RERT guidelines on availability payments for being a member of the RERT panel,[301] also discussed in section 7.3.

297 Clauses 3.20.3(h) and 3.20.3(j) of the NER.

298 As defined by chapter 10 of the NER, i.e. any of the markets or exchanges described in the Rules, for so long as the market or exchange is conducted by AEMO.

299 Clause 3.20.3(d) of the NER.

300 Clause 3.20.3(b) of the NER.

301 Section 6 of the RERT guidelines.

- NER provisions in relation to the dispatch of emergency reserves to require AEMO to dispatch all valid bids and offers ahead of using the RERT.[302] This clause applies during times of supply scarcity[303] and requires that AEMO dispatches scheduled bids and offers first before using emergency reserves.
- NER provisions around how to price during an intervention event, known as intervention pricing. It is meant to maintain/restore market signals during an AEMO intervention event, including exercise of the RERT.[304]

### 7.1.2 AEMO's views

#### Rule change request

In its rule change request, AEMO stated that it could manage concerns around market distortions through setting appropriate caps on availability payments and restrictions on resources transitioning between the energy market and the RERT.[305]

#### Submissions to consultation paper

In response to the potential concerns around market distortions raised by the Commission in the consultation paper and by stakeholders in submission to the consultation paper, AEMO stated that at times of supply scarcity, the NER provides for RERT to be activated only after all valid dispatch bids and offers have been dispatched.[306] It stated that this should not dis-incentivise responses from market participants in a competitive market, especially given intervention pricing will preserve the price signal to the participants.[307]

AEMO noted that the concern that the RERT would attract resources away from the energy market seems somewhat unfounded in a competitive market, where non-transient market power cannot be sustained due to competition from multiple suppliers:[308]

- Given the RERT is intended to be activated only after dispatching scheduled bids and offers first during times of supply scarcity, if a participant withholds its resources from the energy market in the hope of receiving a higher payment by signing the RERT, it will be out-ranked by other suppliers who directly offer their capacity into the energy market.
- AEMO stated however that it is possible that if the availability payment were too high, it could potentially make the provider favour the RERT even if they do not expect to be dispatched.

#### Submission to options paper

In response to the Commission's comments around market distortions in the options paper and further stakeholder feedback on the potential for market distortions, AEMO agreed that in principle, generation resources at the margin might opt to participate in the RERT instead

302 Clause 3.8.14 of the NER.
303 Supply scarcity is not defined in the NER.
304 Clause 3.9.3 of the NER.
305 AEMO, rule change request, p. 4.
306 AEMO, submission to consultation paper, p. 6
307 Ibid. p. 4
308 Ibid.

of the energy market.[309] However, it questioned the practical significance of such an effect and recommended that the AEMC should undertake some formal analysis to quantify the cost of market distortion and its impact on wholesale energy costs.[310]

It also stated that market distortions can be reduced by the following measures:[311]

- Implementing the recommendation in the AEMC's *Reliability Framework Review* with respect to wholesale demand response.
- Introducing its proposed procurement methodology, which will place a limit on the amount of availability cost a potential provider can receive from RERT.
- Strengthening out-of-market provisions in the NER for RERT providers.

### 7.1.3 Stakeholders' views

**Submissions to consultation paper**

In the consultation paper, the Commission asked for stakeholders' views on market distortions. There was overwhelming agreement that the RERT should be out of market and most stakeholders expressed concerns around the distortionary effects of the RERT and changes proposed in the rule change request. For example, stakeholders noted that they have knowledge of market distortions, specifically examples of in-market demand response being withdrawn from the market to participate in the RERT[312] or of potential in-market demand response providers choosing instead to participate in RERT.[313]

Two stakeholders thought the market distortionary aspect of the RERT was not a significant issue:

- As the frequency of such occurrences are relatively rare and so short lived, the Major Energy Users (MEU) is concerned that the weight applied by the AEMC about the RERT's ability to distort the market is excessively overstated and the market distortions caused by the RERT are modest in the extreme and have much less impact than other distortions already accepted in the market.[314]
- As noted in the section above, AEMO also thought that the distortionary aspect is overstated.[315]

**Submissions to options paper**

In submissions to the options paper, a number of stakeholders reiterated their concerns around market distortions and the risk posed by RERT with respect to dampening investment signals.[316]

309 AEMO, submission to options paper, p.12
310 Ibid.
311 Ibid. p. 12
312 Meridian, submission to consultation paper, p. 5
313 EnergyAustralia, submission to consultation paper, p. 6
314 MEU, submission to consultation paper, p. 3
315 AEMO, submission to consultation paper, p. 12.
316 Flow Power, EUAA, AGL, Infigen and Enel X: submissions to options paper.

### 7.1.4 Commission's analysis and conclusions

**Why is the Commission concerned with market distortions?**

The Commission has set out its views on the potential for distortions in previous determinations that related to the RERT mechanism[317] and provides an overview of its concerns below.

Withdrawal of capacity

The RERT may lead to capacity being withdrawn from the market, where a revenue stream may be uncertain, in favour of guaranteed returns from participation due to availability payments or even at the prospect of very high usage payments, if the emergency reserves are activated.

To the extent that capacity withdrawn from the energy market needs to be replaced, the remaining energy resources with a higher cost than those withdrawn are likely to be required, thus raising the average price of electricity. At the same time, availability payments for the capacity withdrawn from the energy market and offered via emergency reserves would still accrue, meaning additional costs for consumers.

Crowding out investment

Similarly, if market participants know that the system operator has capacity on stand-by to intervene on tight demand and supply balance days, this may dampen investment signals in capacity to participate in the market, most likely peaking capacity.

The implication is that this may crowd out potential in-market arrangements that would have occurred in its absence — even if the stand-by emergency reserves are not in the market. In some cases the crowding out effect may result in a higher overall system cost with no net "physical" increase in capacity available to the system, or even a decrease of capacity, compared to the counterfactual of not having emergency reserves.

Inefficient risk allocation

With a mechanism like the RERT, responsibility for the management of market risks may be considered to be placed in the hands of centralised bodies rather than the market participants who have clear commercial incentives to ensure the risks of non-supply are met in the most efficient manner.

In this instance, the management of market risk is placed in the hands of the system operator, which may have an incentive to be conservative with respect to reliability due to its role as operator, with the risks ultimately being borne by consumers.

Similarly, procurement lead time inefficiency may also occur due to inefficient risk allocation. For say, a two-year contract, procurement decisions would be occurring well ahead of dispatch, which may lead to inefficient decisions as to the amount, type and location of emergency reserve procured. This also applies to the pre-activation decisions or notification

317 See, for example AEMC, Extension of the Reliability and Emergency Reserve Trader, Final Determination, 23 June 2016 and AEMC, Reinstatement of long notice Reliability and Emergency Reserve Traded, Final Determination, 21 June 2018.

lead time, whereby, for example, contracting for capacity 24 hours ahead of a projected shortfall may dampen market signals to respond on the day of the shortfall.

The market, like the system operator, makes decisions in advance as well — however, they bear the risks of these decisions.

Cost inefficiency

The cost of emergency reserves could be considered unhedgeable and unpredictable for retailers, resulting in cost inefficiencies being passed onto market customers (such as retailers), and ultimately borne by consumers.[318]

**Is there a problem?**

The Commission has responded to comments from AEMO questioning the significance of the potential for market distortions. In the options paper, the Commission explained that:[319]

- there are likely to be distortionary effects if availability payments are made
- there may be distortionary effects *even without* availability payments.

The Commission further noted that, unlike AEMO's comment that there is no market power and therefore no incentive for participants to withdraw capacity from the market to earn more in the , *transient* pricing power is an inherent feature of a competitive wholesale market.[320]

This transient pricing power tends to coincidence with times when there is likely to be a RERT activation, i.e. when the demand and supply balance is tight. In these instances, it may therefore be more profitable to withhold resources from the market to receive a higher payment in the RERT. This can occur even without availability payments, although high availability payments would likely make it even more profitable to withdraw capacity.

As a result, the Commission continues to be concerned with the potential for market distortions, particularly in the context of an emergency reserve mechanism that is being used more frequently. Having said that, the Commission is conscious that there are new and different types of resources that are participating in the RERT these days, such as demand response, which have a different nature.

AEMO subsequently suggested that the Commission should undertake a quantitative analysis to quantify the costs of market distortions. The Commission is satisfied that the feedback it has received with respect to market distortions over the past decade and more recently through this rule change's consultation process is evidence enough that the RERT has the potential to be distortionary. Examples include:[321]

- Examples of withdrawal of capacity as reported by Meridian
- Examples of parties previously interested in in-market demand response instead choosing to participate in RERT, as reported by EnergyAustralia.

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318 Some of these concerns will be addressed by the Commission's conclusions on transparency - see chapter 9.

319 AEMC, Enhancement to the Reliability and Emergency Reserve Trader, options paper, p.51

320 Ibid. p.51

321 Meridian and EnergyAustralia: submissions to consultation paper.

Indeed, previous decisions made with respect to the RERT have primarily been due to concerns from a broad range of stakeholders regarding the potential for distortions. This was particularly highlighted last summer given the high availability costs associated with the emergency reserve contracts. The Commission is also concerned, like many other stakeholders, about the high direct costs imposed on market participants (and ultimately end customers), and notes that the higher the direct costs (particularly for availability-type payments), the higher the possible non-direct (distortionary) costs are likely to be.

The Commission also notes that strategic reserves, in other jurisdictions, also tend to have some design features aim at making sure that the emergency reserves procured through these mechanisms are in addition to what is available in the market due to concerns around market distortions.[322]

As a result of continued stakeholder concerns, including practical examples of market distortions occurring and shortfalls in the existing out-of-market provisions, the Commission is satisfied that this is an issue of significance.

The Commission has also, in meeting with stakeholders, been provided with additional examples of the above which were provided in confidence.

Similarly, the AER, in its inaugural wholesale electricity market performance report, noted that during its enquiries with respect to the RERT, many markets participants stated the following: "It was argued market demand response products are now in direct competition with the RERT. Market participants stated the higher priced RERT mechanism is redirecting customers from existing demand response agreements, rather than creating an incentive for new capacity and security services, or new demand response contracts. Large consumers are declining to continue demand response arrangements in favour of the possibility of securing a more lucrative RERT contract, for example."[323]

The AER noted that it will monitor the impact of the RERT on investment signals and demand-side participation, as a result.

While minimising market distortions is part of the broader assessment framework of the Commission as described in chapter 3 and informs other decisions within this determination, the Commission proposes to specifically address stakeholders' concerns regarding market distortions in two ways:

- by strengthening out-of-market provisions, discussed in section 7.2.
- through introduction of a payment guide, discussed in section 7.3.

## 7.2 Out-of-market provisions

### 7.2.1 Current arrangements

The rationale for the below provisions is to minimise the potential for market distortions by making sure that only reserves that are not in the market are participating in the RERT.

322 See, for example, Belgium and Texas strategic reserves, as described in appendix F of the AEMC's *Reliability Frameworks Review* - interim report.

323 AER, wholesale electricity market performance report 2018, p.61]

**Clause 3.20.3(h)**

Under the NER, AEMO must not contract for scheduled reserves for which dispatch offers or bids have been submitted (or considered by AEMO to be likely to be submitted), or if such reserves are otherwise available for dispatch, in the trading intervals to which the contract relates.[324] Paragraph (h) prohibits AEMO from entering into scheduled reserve contracts for which dispatch offers or bids have been submitted or are considered by AEMO to be likely to be submitted or otherwise available for dispatch in the relevant trading intervals.

**Clause 3.20.3(j)**

Clause 3.20.3(j) contains a requirement for emergency reserve contracts (scheduled and unscheduled) to include a provision that "the other party to the contract has not and will not otherwise offer the reserve…in the market for the trading intervals to which the contract with AEMO relates except in accordance with the contract".

"Market" is defined in Chapter 10 of the NER as "any of the markets or exchanges described in the Rules, for so long as the market or exchange is conducted by AEMO". This is a fairly broad definition and is not particularly prescriptive in terms of what types of markets are included or excluded.

**Both clauses – length of restriction**

The out-of-market restrictions only apply to the trading intervals to which the contract relates. For example, for short-notice RERT, this could be as short as a few trading intervals. For long-notice RERT, this would typically be longer — typically covering business days over the summer peak, for example.

In the consultation paper, the Commission asked a specific question around this aspect, based on a suggestion by the South Australian Government to consider more rigorous ring-fencing between emergency reserves and the wider market if the Commission is concerned about market distortions, for example, by increasing the current restriction from the trading intervals to which the contract relates to an entire financial year.[325] In other words, this would increase the out-of-market restriction to one year.

**The RERT guidelines**

The RERT guidelines specify the steps AEMO may take to inform itself that the relevant emergency reserves are "not available to the market through any other arrangements".[326]

While the guidelines adopt the NER definition of "market", they do not expand on the meaning or types of "other arrangements". This gives AEMO broad discretion.

**AEMO's procedures**

AEMO's procedures contains a number of sections that are relevant:

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324 Clause 3.20.3 (h) of the NER.

325 SA Government, submission to *Reliability Frameworks review* - interim report, p.3.

326 Sections 7, 8.1 and 8.2 of the RERT guidelines.

- Section 3.3 of AEMO's procedures [327] requires RERT panel members to confirm that any offered reserve involving the reduction of load is not subject to any demand side management, network support or other similar contracts or arrangements.
- Section 4.3 replicates the wording in clause 3.20.2(h) of the NER and notes that "AEMO will investigate its own records to ascertain whether it is likely that dispatch offers or dispatch bids might be submitted…or might otherwise be available for dispatch…"
- Section 8.6.1 suggests that tenders will be rejected where the offered emergency reserve is the subject of any demand side management arrangement, network support agreement or other similar contracts or arrangements.
- Section 10.3.1 allows AEMO to assess any available information to determine whether a reserve is available to the market through any other arrangement.

The procedures adopt the NER definition of "market" and use the undefined phrase "other similar contracts or arrangements", giving AEMO broad discretion.

**Contract templates**

The long-notice RERT contract template used for the 2018 expression of interest round[328] also provides additional information with respect to this. Specifically, it states that providers must have an undertaking that the emergency reserve will not be offered in the market and third-party reserve providers must obtain written confirmation that the reserve is not being offered in the market through any other means or subject to any other arrangement.

### 7.2.2 AEMO's views

As noted in section 7.1.2, AEMO, in its submission to the options paper noted that market distortions could be reduced by strengthening out-of-market provisions in the NER.[329] It did not express a view as to how this could be done.

### 7.2.3 Stakeholders' views

**Submissions to the consultation paper**

In submissions to the consultation paper, a number of stakeholders raised concerns about the application and transparency of existing provisions:

- Meridian believed that the out-of-market provisions are appropriate but is concerned that their application be clear and transparent. Meridian is not sure that increasing the limitation to 12 months is appropriate.[330]

327 See https://www.aemo.com.au/-/media/Files/Stakeholder_Consultation/Consultations/Electricity_Consultations/2018/RERT/Draft-of-Procedure-for-the-Exercise-of-RERT-v50-clean.pdf.

328 The Commission notes that the contract template is no longer available online and may change for future rounds.

329 AEMO, submission to options paper, p.12

330 Meridian, submission to consultation paper, p. 5. As noted earlier, the Commission asked a specific question around increasing the restriction from "the trading intervals to which the contract relates" to "12 months".

- TransGrid is concerned that AEMO's application of out-of-market provisions and contracts means that networks cannot access demand response for non-market services (e.g. network support).[331]
- EnerNOC (now known as Enel X) stated that there is a lack of a defined framework for AEMO to police the "no double dipping" principle. Last summer, AEMO was unable to provide participants guidance on this and some participants interpreted the "no double dipping" provisions more liberally than others.[332]
- EnerNOC recommends: a robust set of eligibility criteria, administered by AEMO, to give participants clear guidance as to what constitute dual-participation.[333]

ERM Power considers that there is a strong case to allow for on-market demand response to be used for the RERT if it would not otherwise be dispatched, as dispatch of emergency reserves occurs due to LOR2s, not due to high prices.[334]

#### Submissions to options paper

In submissions to the options paper, stakeholders provided general comments on market distortions, as noted above. AGL also added that it supported removing the risk of market participants "double dipping", whereby the same generation or customer load is offered into the RERT and wholesale demand response.[335]

#### Technical working group

This topic was discussed with the technical working group on 20 November 2018. Discussion notes are available on the AEMC's website.[336] The discussion included:

- It was broadly considered that it would be appropriate for the restriction to be backward looking (i.e. previous 12 months from the date that the contract is signed) and also forward looking from the date that the contract is signed to the end of the contract.
- There was also broad agreement that a forward looking restriction beyond the end of the contract does not seem appropriate - there is no need to restrict emergency reserves from participating in the market once they are no longer in the RERT.
- The implications of retiring generators was also discussed – whether upon exit of the market, a recently retired generator should be permitted to participate in the RERT, but should be prevented from re-entering the market for a period of 12 months following expiry of the RERT contract.
- With respect to the definition of "market" in the out-of-market provisions, it was considered that, as a high-level principle, it is appropriate for providers to be able to participate in both the RERT and also provide other services as long as those services are

331 TransGrid, submission to consultation paper, p. 2 ]
332 EnerNOC, submission to consultation paper, p.1
333 Ibid.
334 ERM Power, submission to consultation paper, p. 5.
335 AGL, submission to options paper, p.2
336 https://www.aemc.gov.au/sites/default/files/2018-11/Technical%20Working%20Group%20%232%20-%20Discussion%20Notes.pdf

unrelated to energy (e.g. a provider would be able to provide services to the RERT and FCAS). However, they may not work well in all circumstances.

### 7.2.4 Commission's analysis and conclusions

BOX 20: DRAFT RULE - OUT-OF-MARKET PROVISIONS

The draft rule focuses on making sure the spot market is the primary means by which reliability is delivered by:

- requiring that AEMO ensures providers who have been in the market (or have contracted the relevant capacity under a demand response arrangement with a registered participant, including aggregators) at any time during the 12 months prior to signing a RERT contract do not participate in the RERT
- making sure that AEMO ensures RERT providers are not participating in the market (or contract the relevant capacity under a demand response arrangement with a registered participant, including aggregators) for the term of the contract.

The draft rule also introduces an obligation on market participants to comply with the above out-of-market provisions.

**Benefits of the draft rule**

The draft rule promotes reliability being delivered by market participants through the wholesale market, first and foremost, and provides clear signals to the market that the RERT is an out-of-market service that is only to be used after market responses have been exhausted. It clarifies that the out-of-market obligations also apply to RERT providers, not just to AEMO when entering into contracts. These improvements introduced by the draft rule will limit the incentives for distortionary behaviour by potential emergency reserve providers. Importantly, the draft rule does not prevent RERT providers from entering the spot market once their RERT contract has ended

The draft rule also promotes transparency and reduces the likelihood of a double standard being applied as it clearly sets out what counts as being out of market.

Based on feedback received from stakeholders, the Commission has narrowed down the issues associated with existing out-of-market provisions as such:

- The restriction only applies to the "trading intervals to which the contract relates", which allows for providers to move in and out of market with relative ease.
- The definition of market is not prescriptive and implementation of what is in and out of market is unclear.

The Commission examines both in turn next.

**Length and time period for out-of-market restriction**

The current restriction in the NER on participating in the market applies to the trading intervals to which the contract relates – this could be anywhere from a few trading intervals to particular trading intervals over a few months.

The Commission is concerned that the restriction is too short, which makes it easy for providers to move in and out of the market rapidly. For example, assume AEMO has identified that emergency reserves are needed for six trading intervals on a Monday. A RERT provider would be able to offer its services in the market throughout the rest of the year, and indeed, the week or day of the shortfall, except for the six trading intervals identified by AEMO.

The ease of transitioning from the market to emergency reserves has the potential to be highly distortionary as it may incentivise in-market capacity to shift outside of the market — thereby providing reliability at a higher cost than if they had stayed in the market.

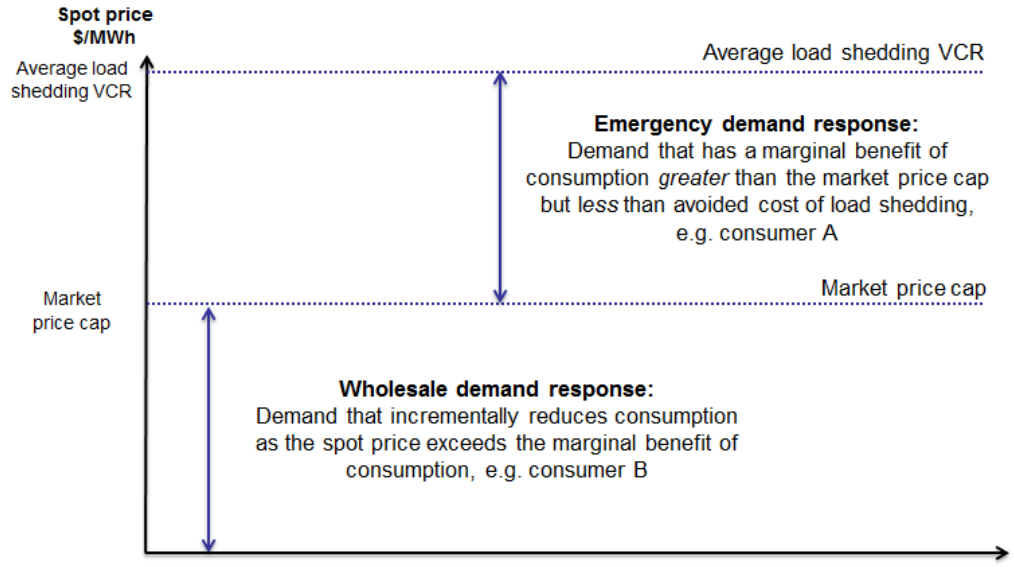
In theory, there is a clear principle for what should be in and what should be out of market; however, there are practical issues which make it difficult to delineate between the two, as shown in a demand response example in Box 21.

### BOX 21: DELINEATION BETWEEN WHAT IS IN THE MARKET AND WHAT IS NOT

Consider demand response as a case study on how capacity might be defined as being "in" or "out" of the market.

Theoretically, if a customer ("customer A") has a VCR higher than MPC, but below the avoided cost of load shedding, i.e. the average VCR of consumers to be shed when the market runs out of reserves, through rotational load shedding (or "estimated shedding VCR") then it would be more efficient for these customers to be shed instead. Since their VCR is clearly above the MPC it is evident that they are "out of the market".

**Figure 7.1: Delineation between what is in the market and what is not**




Source: AEMC

However, in practice, the delineation of what is in market and out of market for demand response is not as "clean" as in the above figure:

- Customer A's value of customer reliability is not static – it will vary at different times of the day depending on a variety of factors, including what it is consuming electricity for. For example, if Customer A is a restaurant that is only open for dinner, its VCR may be quite high (above the cost of involuntary load shedding) during the evening and night; but during the afternoon when the restaurant is closed but the staff are at work preparing for dinner, its VCR may be lower, but still above the MPC; whereas when the restaurant is closed in the morning, its VCR may be lower than the MPC and so it may wish to engage in demand response with its retailer.
- Further, VCR is also difficult to measure, and its measurement depends on the point in time and circumstances people have recently experienced. It would be difficult to see how individuals could reflect their VCRs at all times.

It would therefore be difficult for AEMO or anyone else to inform itself if a provider's VCR is below or above the MPC at any particular point in time. The best estimate, at present, is from AEMO's 2014 VCR study (described in Chapter 3). As noted in that chapter, the AER is currently updating the methodology for calculating VCR and new values are expected by the end of 2019.

Given the practical issues associated with knowing exactly who is in and out of market in a dynamic manner, and given the potential for distortion with this aspect of the RERT framework, the Commission considers that stronger provisions are needed.

There are two key questions with respect to strengthening the provisions:

1. How long should the out-of-market provision be for? (e.g. 12 months as suggested in the consultation paper)

2. To what time period should the provisions apply (e.g. 12 months prior to signing the contract as suggested in the consultation paper? or 12 months after signing the contract? Beyond the contract period?)

Length of out-of-market provisions

With respect to the first question, the Commission is of the view that the appropriate length is one which is long enough to minimise distortions and yet not so long as to exclude a significant number of efficient emergency reserve providers.[337] As noted in Box 21, VCR is dynamic and difficult to capture in practice, although the AER's work on estimating VCRs may help to provide some guidance in this regard.

On the one hand, a 12-month provision may exclude some potential out-of-market providers, e.g. if their VCR changes rapidly within a year. On the other hand, allowing reserves to move in and out of market quickly may be highly distortionary, as there is no easy way, in practice, to verify providers' VCRs.

The Commission concludes that the benefits of a longer out-of-market provision outweigh the potential costs in terms of limiting providers. A longer provision is appropriate given the significant potential for market distortions including examples provided to us by stakeholders of distortions occurring last summer. A longer provision would also incentivse a market response first, over and above an emergency reserve mechanism, which is an intervention, in the event that a response is needed to meet the reliability standard.

Time period of out-of-market provisions

Having decided on a longer provision, there are a number of options with respect to which time period it should apply. A backward-looking approach would see the restriction applied as follows: providers must not have been in the market in the previous 12 months at the time of signing the contract. A forward-looking approach could be applied to the length of the contract, for a set period of time from when the contract is signed, or for a set period of time from when the contract ends.

The Commission's view is that the provision should be backward-looking (i.e. previous 12 months at the time of signing the emergency reserve contract) and also forward-looking but only up to the end of the contract (i.e. the period covering the signing of the contract to the end of the contract, which would also include the dispatch intervals to which the contract relates).

This is because:

- The backward-looking element limits incentives to shift *existing* market capacity into the RERT - it would send a clear signal to the market that entering into an emergency

337 Those with a VCR above MPC but below load shedding VCR.

reserve contract is a major decision with respect to which markets they should be participating in.

- The forward-looking element should end when the contract ends as it is appropriate for emergency reserve capacity to move into the market once a contract has ended should the provider wish to do so. As such, a forward-looking restriction beyond the end of the contract does not seem appropriate.

Specifically, the draft rule is:

### 3.20.3 Reserve contracts

Offering reserve into the market or under a demand response arrangement

(g) When contracting for the provision of:

(1) *scheduled reserves* under *scheduled reserve contracts*, *AEMO* must not enter contracts in relation to capacity of *generating units*, *scheduled network services* or *scheduled loads* for which *dispatch offers* or *dispatch bids* have been submitted or are considered by *AEMO* to be likely to be submitted or be otherwise available for *dispatch* at any time during:

(i) the period from the date of execution of the *scheduled reserve contract* until the end of its term; and

(ii) the 12 month period immediately preceding the date of execution of the *scheduled reserve contract*, except where that capacity was *dispatched* under a reserve contract; and

(2) *unscheduled reserves* under *unscheduled reserve contracts*, *AEMO* must not enter contracts in relation to:

(i) the capacity of *generating units considered by AEMO to have been sent out or otherwise available to the market; or*

(ii) capacity considered by AEMO to be subject to a demand response arrangement

at any time during the 12 month period immediately preceding the date of execution of the *unscheduled reserve contract*, except where that capacity was *dispatched* under a reserve contract.

Conclusion

In conclusion, the Commission's draft decision is to strengthen the existing out-of-market provisions in order to promote a market response by:

- preventing providers who have been in the market for 12 months prior to signing an emergency reserve contract from participating in the RERT
- preventing RERT providers from participating in the market for the duration of the contract (i.e. from the time the contract is signed to the end of the contract).

The Commission thinks that these improvements will provide clear signals to the market that the RERT is an out-of-market service that is only to be used after market responses have been exhausted, meaning that the market, through investment in new generation or demand response in market if required, would remain the primary means by which reliability is met in the NEM. These improvements will limit the incentives for potential providers to partake in the behaviour described in section 7.1.1, such as withdrawing capacity from the market.

The Commission notes that the out-of-market provisions would apply to all forms of RERT i.e. long-notice, medium-notice and short-notice RERT.[338]In terms of the RERT panel members, the Commission intends for this provision to apply to them as well. If a short-notice RERT contract is entered into at a point in time, the provider must not have been in the market for the previous 12 months. The Commission expects that AEMO may need to update its procedures, contract templates and/or how it operates the RERT panel as a result.

The Commission also notes that in most instances, the total effective restriction would be longer than 12 months, and could be up to 24 months in some instances. For example, if a long-notice RERT contract is signed on 1 November for the period of December to end March, the backward restriction would apply from 1 November (so previous 12 months) and from November to end March (so an additional four months). The Commission considers that this is appropriate given the need to make sure that emergency reserves are out of market and that the market is the primary means by which reliability is achieved.

Finally, the draft rule does not restrict providers from moving from providing emergency reserves into the market once the RERT contract is completed. This is appropriate as reliability is best met through the market first and foremost - the Commission would therefore want to encourage reserve providers to move from the RERT, into the market, thereby delivering reliability at a lower cost to consumers.

One issue raised by stakeholders is how this restriction would operate in relation to generators who had provided three-year notices of closure, and who were going to close down anyway – should these generators be allowed to participate in the RERT? In order to operate a generating system (including participating in the RERT), generators must be registered or obtain an exemption from registration from AEMO. The effect of generators providing a notice of closure under clause 2.10.1 is that their classification of that generating unit as part of their registration would cease on the closure date. Therefore, even in the absence of the backward looking restriction, they could not immediately participate in the RERT since the generator would need to immediately re-register again or gain an exemption from registering.

Therefore, the Commission also considered whether it was worth providing an exemption for generators that have provided a notice of closure under clause 2.10.1 of the NER to allow those generators to be able to provide emergency reserves without having to wait 12 months once they have closed down. The Commission considers it would be preferable that if there was an emerging reliability issue, then the generator would simply extend its closure date and remain in the market. This is allowed for under the three-year notice of closure rule

338 The NER do not prescribe any type of notice for RERT - these are prescribed in the RERT guidelines.

provisions. The generator would continue to support reliability, through the market first and foremost, consistent with how the reliability framework works. Therefore, the Commission does not think it is appropriate to waive this restriction for these parties.

There may be an instance where the generator would not consider it economically beneficial to extend its closure date and remain in the market, and so would prefer to participate in the RERT. However, the Commission thinks this is unlikely, given that this generator would likely demand high availability payments through the RERT, which would exceed the payment guide which guides what parties AEMO enters into contracts with, as discussed next. The Commission did explore whether the exemption could be waived on a case by case basis by AEMO (e.g. if a significant shortfall suddenly emerges, such that it would be cost effective for this generator to continue operating and receive payments for doing so through the RERT). However, the Commission does not consider that it is appropriate to do this given that reliability in the NEM is driven by the market.

**Definition of market**

The definition of market dictates which markets providers are excluded from participating in, if they participate in the RERT. The definition of market in the NER[339] would suggest that market includes the spot and FCAS markets but is likely to excludes network support and control ancillary services (NSCAS) - on the basis of it being a non-market ancillary service), and arguably, the retail market (on the basis of it being a market not operated by AEMO).

Stakeholders have raised concerns that the unclear definition of market and unclear implementation of the provision with respect to what is included in the definition of market has led to double standards and inconsistencies. The Commission agrees that what should be included in the definition of market should be clear. In considering the best way to address this ambiguity, the Commission examined what should be included in the definition of market.

There are a number of potential approaches including:

- One approach could be to prevent providers that provide emergency reserve services from participating in *any* other conceivably related markets/services administered under the rules including for example NSCAS, FCAS etc.
- Another could be to allow providers to participate in the RERT and also provide other services as long as those services are unrelated to energy (e.g. NSCAS).

In considering what the best approach should be, the Commission had regard to the minimising market distortion principle i.e. whether participating in another market would affect investment and operational decisions made by participants with respect to energy.

While the first approach described above is simple and easy to implement, and therefore transparent and clear, the Commission does not think that it is appropriate, as it assumes participating in all other markets would be distortionary. Instead, the Commission explored the second approach further, as shown in Box 22.

339 Chapter 10 of the NER.

## BOX 22: WHAT SHOULD BE INCLUDED IN THE DEFINITION OF MARKET?

This box explains how the approach that would allow providers to provide emergency reserves and also provide other services as long as those services are unrelated to energy would work in practice.

**Spot energy market**

The Commission is of the view that the spot market should be included in the definition of market (for the purpose of out-of-market provisions). Participating in both the spot market and providing emergency reserves would be distortionary and RERT providers should be excluded from it.

**FCAS**

FCAS is a separate service to emergency reserves – it is not energy. Therefore, providers should be able to participate in the RERT and in FCAS markets.

However, providers that provide both FCAS and energy using the same unit (e.g. a generator) would not be allowed to provide emergency reserves. This would be captured under the spot market participation restriction above. Similarly, a demand response provider providing demand response in the FCAS market only and not the spot market would be able to participate in the RERT.

**NSCAS**

As with FCAS, NSCAS is a separate service to providing emergency reserves and providers should be able to participate in both. However, there may be practical issues with this. There may be circumstances where the NSCAS service is needed for both emergency reserves and network support simultaneously. In theory, as these are two distinct services, there is no "distortionary" concern and it would be appropriate to reward providers for two services.

However, in practice, there may be a coordination problem - e.g. which service would take precedence, emergency reserves or NSCAS? There would be situation where the capacity is not available for network support if they are already providing a response through emergency reserves and a network issue emerges.

**Any other non-market services/ancillary services**

As above – if it is a distinct service, then providers should be able to provide both emergency reserves and the other service.

**Retail**

The retail market should be included in the definition of market with respect to spot-exposed retail customers or wholesale demand response, i.e. any alteration of consumption in response to signals from retailers to do so would count as being in the market - this includes those with demand response contracts provided through aggregators.

For example, a consumer that has a demand response contract with a retailer would not be

able to offer emergency demand response to AEMO in the RERT. The retailer would not be able to "on sell" the demand response to AEMO either. This is because demand response in those circumstances represent energy available to the market and would be clear examples of market distortions.

There may be practical issues with defining market with respect to the retail market. For example, a blanket restriction may exclude large energy users from providing demand response for part of their load through the RERT and part of their load through the market, unless they are separately metered.

The Commission thinks that the second approach, i.e. allowing providers to provide emergency reserves and also provide other services as long as those services are unrelated to energy, is more appropriate. This is because offering reserves in markets where other services are traded would not affect the investment and operational incentives that market participants have with respect to the spot market i.e. investing in generation or wholesale (in market) demand response.

As a result, the draft rule clarifies that AEMO must not enter into emergency reserve contracts if said reserves are in the wholesale market, or the subject of a demand response arrangement, which is defined in the draft rule.

The draft rule is:

**3.20.1 Definitions**

For the purposes of this rule 3.20:

(a) **demand response arrangement** means a contractual arrangement with a *Registered Participant*:

(1) under which a person agrees to the curtailment of *non-scheduled load* or the provision of unscheduled generation in certain specified circumstances; or

(2) to the extent not covered by subparagraph (1), that allows for the curtailment of *non-scheduled load* or the provision of unscheduled generation in response to the demand for, or price of, electricity.

...

(c) references to **market** mean a *market* in connection with the trading of *energy* only, and for the avoidance of doubt, does not include the provision of *market ancillary services*; and

(d) **unscheduled generation** means *generation* from a *generating system connected* to a *transmission system* or *distribution system* which is not a *scheduled generating system* or *semi-scheduled generating system*.

**3.20.3 Reserve contracts**

Terms and conditions of a contract

...

(j) *AEMO* may only enter into a *reserve contract* if the contract contains a provision that the other party to the contract has not and will not otherwise offer the *reserve* the subject of the contract in the *market* or under a demand response arrangement at any time during the period from the date of execution of that contract until the end of its term.

To be clear, the references to market mean only the energy market and the draft rule allows AEMO to enter into reserve contracts with providers that are offering the same reserves as emergency reserves and to other services such as FCAS and NSCAS. In the case of NSCAS in particular, it is possible that the same reserve would be needed at the same time, i.e. when the demand and supply balance is tight. The Commission considers that this is best left to AEMO and providers, through their contracts, to decide on how best to structure the implementation of such contracts.

The Commission considers that the changes above would clarify exactly what was meant by market and that double standards in implementation should no longer occur. The current reporting requirements with respect to out-of-market provisions therefore remain appropriate, with the Panel continuing to be required to provide guidance on the steps AEMO may take to inform itself that the relevant reserves are not available to the spot market through any other arrangements[340] and in turn, AEMO's procedures would be updated to reflect the RERT guidelines and final rule, if and when made.

The draft rule is an improvement on existing arrangements as it:

- clarifies how the out-of-market provisions are to be implemented, leading to more transparency and reducing the likelihood of a double standard being applied.
- improves efficiency by only restricting providers from participating in markets whereby it would be distortionary to do so, while enabling other potential emergency reserve providers to participate in the RERT market, potentially reducing RERT costs.

This is in the long-term interest of consumers as it would minimise the likelihood of market distortions further, meaning that, compared to the status quo, the costs of the emergency reserve mechanism will be lower, taking into account the impact that market distortions have on reliability. For example, it will minimise instances whereby a generator or demand response provider may withdraw capacity (priced under the MPC) to provide the exact same capacity at a higher price through emergency reserves.

**Out-of-market provision obligations for participants**

At present, implementation of these provisions is carried out by AEMO - as mentioned above, this continues to be appropriate given the complexity of determining what is in and what is out of market. AEMO is required to inform itself that reserves are out of market.[341] The

340 Clause 3.20.8 (3) of the draft rule.

341 section 7 of RERT guidelines

Commission understands that AEMO implements these provisions by requiring an undertaking from emergency reserve providers, and a confirmation letter from third-party emergency reserve providers[342] to inform itself that these providers are out of market as per the NER.

However, there is currently no similar requirement or obligation on emergency reserve providers themselves with respect to out-of-market provisions, other than the contract itself. The Commission thinks that it would be appropriate to introduce an obligation on potential emergency reserve providers under the NER so that they are required to comply with the out-of-market provisions.

The Commission thinks that this will strengthen the existing contractual obligations on emergency reserve providers by making it clear that providers themselves are required to inform themselves and inform AEMO with respect to their out-of-market status. The draft rule therefore further improves the implementation of out-of-market provisions and further minimises the risk of market distortions.

The draft rule is:

### 3.20.3 Reserve contracts

Offering reserve into the market or under a demand response arrangement

...

(h) A person must not:

(1) enter into a *reserve contract* in relation to capacity that has been:

(i) sent out into the market; or

(ii) subject to a demand response arrangement,

at any time during the 12 month period immediately preceding the date of execution of the *reserve contract*, except where that capacity was *dispatched* or *activated* under a *reserve contract*; and

(2) in relation to capacity the subject of an existing *reserve contract*:

(i) send out or make available such capacity to the market;or

(ii) enter into a demand response arrangement,

at any time during the period from the date of execution of the reserve contract until the end of its term, except where that capacity is *dispatched* or *activated* under that *reserve contract*.

[The Commission recommends that this provision be classified a civil penalty provision]

342 For example, a retailer providing demand response on behalf of a consumer.

## 7.3 Payment structure

### 7.3.1 Current arrangements

Payment structure refers to the types of payments with respect to emergency reserve contracts.[343]

There is no prescription or guidance as to payment structures with the exception of the RERT panel, whereby AEMO is not allowed to provide availability payments for being a member of the panel.[344]

Based on last summer's RERT reports,[345] the Commission understands that contracts contain the following payments:

- Availability: the costs of being on stand-by, i.e. capacity payments this is typically a $/MW/contract period payment and not specific to one event.
- Pre-activation: the costs of being on stand-by for a specific event, i.e. pre-activation payments for specific events. It is usually expressed as $/MW/event.
- Usage/activation: the cost of the emergency reserves themselves, e.g. usage/activation payments when the RERT is dispatched - this is typically a $/MWh payment.

Both availability and pre-activation payments are capacity-type payments.

Similarly, the NER is silent when it comes to any guidance on these payment types other than the RERT principles, which AEMO must have regard to when it exercises the RERT. One of these principles state that AEMO's actions should aim to maximise the effectiveness of emergency reserve contracts at the least cost to end use consumers of electricity, which effectively requires AEMO to think about cost minimisation (both direct and indirect) when exercising emergency reserves.[346]

How payments are structured and the size of payments affect incentives – as noted above, high availability payments can lead to strong incentives for participants to withdraw capacity from the market to participate in the RERT. In the consultation paper, the Commission asked for stakeholders' views payment structures.

### 7.3.2 AEMO's views

In its rule change request, AEMO, proposed the following payment types, structure and caps:

343 There are also administration costs accrued by AEMO in implementing the RERT and compensation costs paid to participants affected by a RERT dispatch - these are not contractual costs and are not covered here.

344 See section 6 of RERT guidelines. The RERT Panel only applies to short-notice and medium-notice RERT. There is no RERT Panel and no availability payment restriction for long-notice RERT.

345 See https://www.aemo.com.au/Media-Centre/AEMO-Summer-operations-review-report

346 Clause 3.20.2 (b) of the NER.

**Figure 7.2: Payment structure and price cap**

| Pricing approach | Structure | Price cap | 10 minute notification | 60 minute notification | 24 hour notification | Notes |
|---|---|---|---|---|---|---|
| Availability | $/MW per hour available | To be determined | Yes | Yes | Yes | Applies to all hours where the resource is contracted to deliver Reserves |
| Pre-activation | $/MW per activation | To be determined | No | No | Yes | Applies even if activation is cancelled |
| Usage | $/MWh delivered response | $30,000/MWh | Yes | Yes | Yes | Would not be paid if the activation was cancelled by AEMO |

Source: AEMO, high-level design

It noted that usage payments should reflect a "reasonable assumption for the avoided VCR" while availability and pre-activation payments may need to be capped to minimise costs.[347]

For availability payments, AEMO states that it could be structured as such:[348]

- Either a total availability payment for a specific amount of reserves offered, which would be translated into a $/MW per hour payment for settlement purposes
- Or if the capacity isn't fixed, availability could be in the form of a fixed $/MW per hour price

AEMO also noted that a cap of availability payments may be appropriate in order to minimise market distortions and proposed that a principle for enhanced RERT would have "low availability costs but comparatively high usage costs".[349]

**Submissions to consultation paper and options paper**

AEMO did not comment in detail on this aspect on the RERT framework in its submissions. As noted in section 7.1.2, it did state the following:

- in the consultation paper submission, AEMO stated it is possible that if the availability payment were too high, it could potentially make the provider favour the RERT even if they do not expect to be dispatched.
- in the options paper submission, it stated that introducing its proposed procurement methodology will place a limit on the amount of availability cost a potential provider can receive from RERT.

347 AEMO, rule change request, p. 13 .
348 Ibid.
349 Ibid. p. 3

### 7.3.3 Stakeholders' views

**Submissions to consultation paper**

In submissions to the consultation paper, there was some support for a cap on availability payments or low availability payments due to cost (direct and indirect) concerns.[350]

EUAA and BlueScope note that pre-activation costs should be reflective of actual costs, citing the high pre-activation costs on the 18 January as a concern.[351]

In terms of activation/usage/dispatch payments, there was also some consensus that they should be capped or limited:

- Origin Energy stated that the combination of the usage and any availability payment should not exceed the MPC.[352]
- BlueScope wished to understand how AEMO calculated the proposed $30,000/MWh usage cap and the rationale behind having a cap higher than the market cap.[353]

There was also general support for more prescription around payment structure, although stakeholders did not explicitly state that they wish for this cap to be prescribed in the NER,[354] with the exception of Energy Networks Australia (ENA).[355]

**Submissions to options paper**

In its submission to the options paper, Stanwell requested that the AEMC consider whether the ability for AEMO to offer availability payments should be phased out or greatly restricted. For example, if availability payments are to be made for long-notice RERT, it could be limited to only new demand response customers who require capital upgrades to provide the service. It states that this should exclude customers who:[356]

- have previously entered into network support agreements
- have demonstrated an ability to respond to spot prices either through their retailer or on their own
- have entered into previous RERT contracts.

Stanwell also suggested that total RERT payments (on a per megawatt hour basis) should be limited to the VCR.[357] Similarly, Alinta considered it may be useful to utilise the VCR as an absolute price cap of RERT costs AEMO can employ when procuring RERT (or at least be a reference price) for AEMO when undertaking its procurement decisions.[358] On the other hand, MEU did not think it was appropriate to use VCR for the RERT at all given the existence

350 BlueScope, EUAA, ENA, EA, TransGrid, Origin: submissions to consultation paper
351 EUAA and BlueScope: submissions to consultation paper
352 Origin, submission to consultation paper, p. 6
353 BlueScope, submission to consultation paper, p. 3
354 Meridian suggested that it should not be in the NER. Meridian, submission to consultation paper, p. 6
355 ENA, submission to consultation paper, p. 4
356 Stanwell, submission to options paper, p. 7
357 Ibid.
358 Alinta, submission options paper, p. 2

of the MPC.[359] Meridian also mentioned the MPC, stating that at least for the long and medium term, the use of the MPC as a cap on RERT costs should be considered.[360]

On availability payments, Enel X[361] noted that low or no availability payments are likely to limit the number of providers offering RERT contracts, as many demand-side resources would not participate - a lack of competition is likely to drive the cost of RERT contracts higher, which is not in the long-term interests of consumers.[362] Energy Efficiency Council (EEC) stated that payments should consist of all three types of payments, including an availability payment that at least covers the cost of set up and providers a modest margin, since the capacity ideally would not be dispatched.[363]

**Technical working group**

This topic was discussed with the technical working group on 20 September 2018. Discussion notes are available on the AEMC's website.[364]The discussion included:

- Given that there is no prescription at present, participants questioned whether prescription with respect to a payment structure and payment cap was necessary given that, ideally the RERT market should determine the breakdown of payment types.
- Some participants did note that a cap may be helpful in order to limit costs associated with the RERT.

### 7.3.4 Commission's analysis and conclusions

BOX 23: DRAFT RULE - PAYMENT STRUCTURE

The draft rule introduces a payment guide, in $/MWh, for contractual costs of the RERT in a given financial year by:

- introducing a definition for estimated load shedding VCR for the purposes of emergency reserves, i.e. the average VCR (determined by AEMO, but derived from the VCR values developed by the AER) of those loads that would have been shed, had the counterfactual of not having RERT been involuntary load shedding
- introducing a requirement that the average amount payable by AEMO, using reasonable endeavours, under the terms and conditions of the reserve contracts should not exceed the estimated load shedding VCR on a $/MWh basis in a given financial year ("a payment guide")
- requiring the RERT guidelines to provide more guidance on how the estimated load shedding VCR would be determined and applied by AEMO

359 MEU, submission to options paper, p. 5
360 Meridian, submission to options paper, p. 4
361 Formerly known as EnerNOC.
362 Enel X, submission to options paper, p. 5
363 EEC, submission to options paper, p.3
364

- requiring AEMO to report on how it will determine and apply the payment guide.

The draft rule aims to minimise the direct costs of the RERT, noting that the costs of the RERT are ultimately borne by consumers.

To be clear, the guide is not in terms of a maximum dollar value or a maximum budget, nor does it prohibit AEMO from recovering costs above the $/MWh value (as a cap would), in case it is exceeded. This could occur due to uncertainties associated with forecasting reserves ahead of time. If the payment guide is exceeded, then AEMO, should provide reasons as to why that was the case. As a result, the draft rule also introduces reporting requirements on AEMO which promote transparency.

In order to assess whether or not there should be more prescription around payments, the Commission first examined what exactly the RERT is pricing.

**What is the RERT pricing?**

If the RERT is seen as being an out-of-market energy market, consistent with the way the NEM's spot market works, then it would not be appropriate to pay for capacity. If the RERT is seen as being insurance, then the RERT would be more akin to a capacity market, with AEMO buying capacity as insurance.  Table 7.1] shows what a "pure" payment structure would like look under these two approaches.

Table 7.1: **Pure pricing structures**

| PAYMENT TYPES | A "PURE" OUT-OF-MARKET ENERGY MARKET | A "PURE" OUT-OF-MARKET CAPACITY MARKET |
|---|---|---|
| Availability payments | None | Yes - in $/MW |
| Pre-activation payments | None | Yes - in $/MW |
| Usage payments | Yes - in $/MWh | None |
| Overall approach | This would be a $/MWh approach. | This would be a $/MW approach. |

Based on last summer's costs, the pricing structure used was more reflective of a capacity payment, since availability and pre-activation payments accounted for the bulk (94 per cent) of emergency reserve costs.

This appears to be inconsistent with AEMO's original rule change proposal whereby availability payments would be low and usage payments high. The Commission does not think this is the most appropriate approach as it would also be inconsistent with how the spot market prices energy and places risks on consumers associated with availability payments incurred for resources which were ultimately not required.

As discussed throughout this determination, given that the RERT is a safety net in the event that all market and financial incentives have failed to deliver the level of reliability implied by

the reliability standard, pricing emergency reserves using a $/MWh energy approach would be more appropriate.

**Pricing RERT using a $/MWh approach**

In a pure out-of-market energy market pricing structure, the payment for emergency reserves should be no more than the avoided cost of load shedding, i.e. the cost of what would have happened had emergency reserves not been used (the counterfactual). In this instance, the cost of load shedding is reflected in VCR, specifically, in the estimated VCR of those who would have been load shed, had the RERT not been used - or the estimated load shedding VCR.[366]

Therefore, emergency reserve costs should be less or equal to estimated load shedding VCR. Above estimated load shedding VCR, it would be more cost effective and efficient to load shed consumers, rather than use the RERT.

In a *pure* out-of-market energy market, where payment was made exclusively through usage payments, this would translate to:

Usage payments ($/MWh) = max of estimated load shedding VCR.

However, the RERT is not a pure energy product - emergency reserves tend to be unscheduled and only dispatched on rare occasions. As a result, a "pure" out-of-market market pricing structure (i.e. no capacity payments, only usage payments) may not be appropriate.

While the Commission acknowledges stakeholders' concerns around the distortionary aspects of availability payments and suggestions to restrict them, the Commission also accepts stakeholder feedback has suggested that demand response providers (who make up the bulk of RERT providers) typically require availability payments in order to be able to participate in the RERT.[367] The Commission acknowledges that disallowing availability payments altogether, in respect of contracts would limit the number of potential emergency reserve providers and promote inefficiency of the RERT process.

The Commission is therefore of the view that availability payments within contracts should continue to be allowed as they will promote participation in the tender process. Furthermore, in practice, it may also be difficult to implement the suggestion by Stanwell to restrict availability payments to certain types of providers. This is particularly true for demand response through a third-party, where it may not be clear whether the portfolio of customers has changed.

The Commission therefore thinks it would best be left to AEMO to assess whether a tender process from a particular provider is the most optimal one, based on its own analysis and system requirement. In addition, as the tender process becomes more mature, the tender process itself may converge to low availability payments.[368]

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366 In the NEM, when there is an involuntary load shedding events, prices are set to the MPC. This may be below the marginal VCR.

367 See, for example, Enel X's submission to the options paper.

368 As noted by the EEC in its submission to the options paper, maturity of emergency reserve products may lead to lower RERT costs.

The Commission is also of the view that no *individual* type of payments within RERT contracts should be disallowed or capped. While from a theoretical point of view, it would be appropriate to think of the RERT as having low or no availability payments and relatively high usage payments, in practice, it is best left to the competitive tender process to identify and optimise the right pricing structure.

As a result, an appropriate payment structure could be:

(availability payments + pre-activation payments + usage payments) = max (estimated load shedding VCR), where AEMO's tender process would optimise between the three types of payments. This would not preclude some tenders from not have any availability or pre-activation payments.

**Commission's conclusions on payment structures**

To summarise, the Commission is not proposing to restrict or disallow any particular types of payments, or prescribe any particular type of payment structure, with respect to RERT contracts. However, the Commission continues to be of the view that it is appropriate for RERT panel members to not receive any availability payment, just for being on the panel. Availability payments under emergency reserve contracts would only be incurred once the procurement trigger (an explicitly identified breach of the reliability standard) has been met, and only after the market has not responded to the breach.

By contrast, the RERT panel operates on an ongoing basis - members of the panel do not have any obligations to respond to AEMO's requests for tenders, i.e. they are not required to provide emergency reserves. Panel members do not sign RERT contracts until AEMO seeks tenders through the short-notice or medium-notice RERT (once contracts are signed, availability payments may accrue in accordance with the contract) . Paying members for being on the panel would introduce an ongoing cost for emergency reserves which would be ultimately recovered from retailers or consumers. It may also create perverse incentives for potential providers to sign up to be on the panel due to the availability payment, without necessarily ever needed to be called upon to deliver emergency reserves. The Commission is of the view that this would be distortionary.

**Commission's conclusions on payments**

While the Commission is not proposing to be prescriptive in the NER around payment structures, it is aware of the significant direct costs incurred from the use of emergency reserve last summer. These costs are borne by market customers, and ultimately, by consumers when they are passed on through retailers. These costs were incurred despite the existing provisions in the NER that require AEMO to minimise direct and indirect costs when it exercises the RERT. Given the cost concerns raised by most stakeholders, the Commission thinks there should be a guide in terms of the payment terms and conditions of RERT contracts that AEMO enters into. The Commission considers that this cannot be a pure "cap" due to the uncertainties associated with forecasting reserves ahead of time.

Given the pricing principles set out above, the Commission concludes that it would be appropriate, given the circumstances of the NEM and concerns from stakeholders regarding

the direct costs of emergency reserves, for AEMO to use reasonable endeavours to ensure that the average amount payable under RERT contracts it enters into (in $/MWh) does not exceed estimated load shedding VCR.

A number of stakeholders stated that AEMO should pay no more than MPC for emergency reserves. As discussed in the previous section, the Commission thinks that the maximum amount payable for emergency reserves should reflect the true avoided cost of load shedding, which is estimated load shedding VCR.

The Commission considers that applying the payment guide over a given financial year is appropriate given that the reliability standard is also expressed as such (i.e. over a given financial year, as per the NER). Further, the financial year covers the entire summer period, which is when the RERT is most likely to be used.[369]

How would the payment guide work in practice?

The payment guide would first be operationalised on an ex-ante basis, based on AEMO's forecasts or assumptions made at the time of entering into emergency reserve contracts, with ex-post reporting provided with reference to the guide. Box 24 explains how this could work in practice.

### BOX 24: HOW WOULD THE GUIDE WORK IN PRACTICE?

**Ex-ante analysis**

AEMO first estimates the value of estimated load shedding VCR, using information such as available VCR values and the load shedding schedules. Assume its estimate for a particular region is $20,000/MWh.

Every time AEMO is making a decision on entering into RERT contracts in a given financial year, it would apply the following principles:

- (availability + pre-activation + usage) = max (estimated load shedding VCR), which may also be expressed as follows:
  - [ ($ x MW x contracted hours of availability ) + ($ x MW x number of pre-activations) + ($/MWh x forecast MWh to be activated) ] / forecast MWh expected to be activated = max of $20,000/MWh

At that point, the analysis is based on forecasts of how many times and for how long activations would occur. The MWh activated should reflect AEMO's forecasts of how much emergency reserve will be needed.

For additional contracts throughout the year, AEMO would be expected to factor in costs that have already been incurred and any updates to forecasting.

This approach tends to:

369 The Commission is aware, however, that shoulder periods are also of concern to AEMO.

- favour high availability costs and low usage costs when estimations of usage of emergency reserves is high
- conversely, favour low availability costs and high usage costs when estimations of usage of emergency reserves is low.

**Ex-post reporting**

As part of the enhanced reporting requirements introduced by the Commission in this draft rule (see Chapter 9), AEMO is required to report on the costs of the RERT. AEMO would be expected to report on verified (expressed in $/MWh) as well as on the value of $/MWh in the counterfactual.

Ex-post reporting would also ideally include actual energy dispatched (i.e. activated) but also actual avoided loss load. The Commission notes that energy dispatched and avoided loss load may not be the same. Energy dispatched would represent the actual amount of energy that was activated during an event. Avoided loss load would be based on analysis - it would be the amount of load shedding that was avoided through the use of emergency reserves. If in its analysis AEMO concludes that the RERT was not needed in hindsight, then avoided loss load would be equal to zero.

It would be useful to provide a dollar value of both energy dispatched and avoided loss load in ex-post reporting.

**What happens if the payment guide is forecast to be reached?**

In theory, AEMO should only procure emergency reserves that cost less than the payment guide, i.e. when it is cheaper to buy emergency reserves than to load shed. If say, the payment guide is reached and it decides to procure fewer emergency reserves so as not to breach the guide, then this would be theoretically economically efficient. Procuring the additional emergency reserves under that scenario would not be cost-effective - consumers would be better off not incurring the higher costs of emergency reserves in that situation, as the costs would be higher than the avoided cost of load shedding. In other words, it would be cheaper and more preferable to load shed. In the figure in Box X, this would fall above the average load shedding cost line, i.e. above the price at which it would be efficient to purchase emergency reserves.

However, the Commission also considers that AEMO should have flexibility in terms of operationalising the payment guide. In particular, the guide is used on an ex-ante basis which means that it is subject to uncertainties regarding forecasting and reserve requirements change the closer to real time the assessment is made. Similarly, if it turns out after the fact that the $/MWh exceeded the $/MWh payment guide, AEMO would still be able to recover the total costs. To be clear, the payment guide is not a prohibition in that sense. Ex-post requirements are reporting requirements for transparency purposes.

There are some practical considerations with a payment structure and guide discussed in the box above. There could also be a perverse incentive to activate emergency reserves more

often – as this would spread the capacity costs over more dispatch intervals, thereby reducing the $/MWh cost even if absolute costs are higher overall. The ex-ante analysis would be highly dependent on projections, with the complicating factor that the procurement process tends to be staged via different types of notices of RERT.

Further, estimated load shedding VCR is not a fixed value in practice and differs from time to time and from jurisdiction to jurisdiction. As noted above, estimated average load shedding VCR represents the average VCR of those consumers that are interrupted during a load shedding event, in the event that involuntary load shedding is required, i.e. after the market has run out of reserves.

Typically, in the NEM, this is set by jurisdictions based on a load shedding priority list.[370] Different jurisdictions may have different VCRs based on the list, e.g. in some jurisdictions, it may be residential consumers in an area with no essential service (e.g. a hospital) that are shed, in others, it may be smelters or a combination of industrials and residential consumers. The rotational nature of involuntary load shedding may also affect estimates of VCR. With rotational load shedding, each consumer is only interrupted for 30-60 minutes at a time, before the interrupted is rotated through to another group of consumers. The impact of consumers of a long outage would be far more significant than a 30-60 minute outage, and would be reflected in VCR figures, if they are granular enough. The Commission notes that the AER is currently working on updating the VCR at present and intends to examine more granular estimates of VCR as part of that work program.

Given these practical considerations and the inflexibility that would be introduced in terms of being too prescriptive with how exactly the payment guide is operationalised, the Commission thinks prescription in the NER (similar to the MPC whereby a $/MWh number is specified in the NER) is not appropriate. Instead, the draft rule reflects the principle that AEMO must use reasonable endeavours when entering into contracts, such that the average costs of emergency reserves in a given financial year must not exceed estimated load shedding VCR and defines it as described in this chapter.

Specifically, the draft rules are:

### 3.20.1 Definitions

For the purposes of this rule 3.20:

(b) **estimated load shedding VCR** for a *region*, means the average value of customer reliability (expressed in $/MWh) determined by *AEMO* associated with *loadsAEMO* reasonably expects would likely have been shed had *AEMO* not *dispatched* or *activated reserves*,having regard to the priorities set out in the relevant *load shedding procedures* and the values of customer reliability developed by the *AER* under rule 8.12; ...

### 3.20.3 Reserve contracts

370 This list is confidential except in South Australia.

Terms and conditions of a contract

...

(k) Except as otherwise prescribed under the *Rules*, *AEMO* must use reasonable endeavours to ensure that:

...

(3) the average amount payable by *AEMO* under *reserve contracts* for each MWh of *reserves* for a *region* in a *financial year* (expressed in $/MWh) does not exceed the estimated load shedding VCR for that *region*,

having regard to the *RERT principles*.

It also requires the Reliability Panel, through its RERT guidelines, to provide guidance to AEMO on information, assumptions or parameters AEMO must take into take when operationalising the payment guide, and for AEMO to report on how it will operationalise the guide (i.e. its methodology), and generally to report on how it has operationalised it as well including via:

- forward-looking reporting of how it has applied the guide when entering into reserve contracts
- backward-looking reporting consisting of:
  - the estimated costs of avoided load shedding
  - and costs associated with RERT, including in $/MWh
- an annual end-of-financial year report on the breakdown of costs, including in $/MWh

The Commission considers that the additional reporting requirements will improve transparency and provide additional information to market customers that are liable for emergency reserve contracts. This will be in addition to AEMO's current reporting obligations on total costs.

The draft rules with respect to operationalisation of the payment guide are:

**RERT guidelines**

**3.20.8 RERT guidelines**

(a) For the purposes of this rule 3.20, the *Reliability Panel* must develop and *publish* guidelines (the *RERT guidelines*) for or with respect to:

...

(5A) the information, assumptions and parameters *AEMO* must take into account when determining and applying the estimated load shedding VCR for the purposes of clause 3.20.3(k)(3)

**AEMO's procedures**

### 3.20.7 AEMO's exercise of the RERT

...

(e) *AEMO* must develop, *publish*, and may amend from time to time, in accordance with the *Rules consultation procedures*, procedures for the exercise of the *RERT* under this rule 3.20 that take into account the *RERT principles* and *RERT guidelines*. These procedures must include:

...

(3) the basis on which *AEMO* determines and applies the estimated load shedding VCR for the purposes of clause 3.20.3(k)(3)

## Reporting requirements

### 3.20.6 Reporting on RERT by AEMO

Information to include in RERT report – reserve contracts

...

(d) The RERT report must, with respect to any *reserve contracts* entered into by *AEMO* include a detailed explanation of:

...

(5) the basis on which the estimated load shedding VCR was determined for the relevant *region* and applied for the purposes of clause 3.20.3(k)(3).

...

Information to include in RERT report – dispatch or activation of reserves

...

(e) The RERT report must, with respect to any *reservesdispatched* or *activated* under *reserve contracts*, include a detailed explanation of:

...

(9) the estimated costs of *load shedding* (including an amount expressed in $/MWh) in a *region* avoided as a result of the *dispatch* or *activation* of *reserves*;

...

(f) Where *AEMO* has, in accordance with clause 3.15.9, included the amounts arising under a *reserve contract* in a *final statement* provided under clause 3.15.15, the RERT report must include a detailed explanation of:

(1) *AEMO's* costs associated with exercising the *RERT* (including an amount expressed in $/MWh), including the payments under the *reserve*

*contract* for the relevant *billing periods*; and

(2) a breakdown of the recovery of those costs (including an amount expressed in $/MWh) from each *Market Customer*, as determined by *AEMO*, in each *region*.

# 8 COST RECOVERY

Costs incurred procuring Reliability Emergency and Reserve Trader (RERT or emergency reserves) resources are currently recovered from market customers (for example, retailers). There is a process in the NER which determines how such costs are allocated between market customers.

This chapter:

- discusses the current process by which RERT related costs are recovered from market customers (section 8.1)
- outlines AEMO's views on this topic (section 8.2) and other stakeholder feedback (section 8.3)
- provides analysis of the current process and makes a draft determination to change the cost recovery process (section 8.4) to one which is more cost reflective, and hence encourage efficient consumption decision-making by market participants.

## 8.1 Current cost recovery arrangements

Three types of costs arise from the purchase and activation of emergency reserves:

- costs incurred in contracting for the provision of reserves
- costs to compensate affected participants and market customers if emergency reserves are activated
- administrative and operational costs associated with emergency reserves.

For completeness, a brief overview of current arrangements for each is provided below, although only the first of these is in scope for this rule change request. The second is in scope of the AEMC's work on system strength and intervention mechanisms in the NEM.[371]. The third relates to broader issues associated with AEMO's cost recovery arrangements, which are clearly out of scope for this rule change.

### 8.1.1 Contracting costs

Costs incurred in contracting for the provision of reserves are met by fees imposed on market customers.[372]

The allocation of fees to market customers is in accordance with NER clause 3.15.9(e):

> In respect of reserve contracts entered into by AEMO, AEMO must calculate in relation to each Market Customer for each region in respect of each billing period a sum determined by applying the following formula:
>
> $MCP = E \times RRC / \sum E$

371 The Commission understands that AEMO plans to submit a rule change request on the recovery of the compensation costs associated with RERT activation in 2019.

372 NER, clause 3.15.9(a).

where:

MCP is the amount payable by a Market Customer for a region in respect of a billing period;

E is the sum of all that Market Customer's adjusted gross energy amounts in a region (the "relevant region") in each trading interval which occurs between 0800 hours and 2000 hours (EST) on a business day in the billing period excluding any loads in that region in respect of which the Market Customer submitted a dispatch bid for any such trading interval

RRC is the total amount payable by AEMO under reserve contracts which relate to the relevant region in the billing period as agreed under clause 3.20.3(f); and

∑E is the sum of all amounts determined as "E" in accordance with this paragraph (e) in respect of that region.

Simply, costs are recovered in proportion to a market customer's consumption (or, in the case of a retailer, the sum of its customers' consumption) between 8am and 8pm on business days for the billing period (one week) in which the costs were incurred, on a regional basis.[373]

A billing period is defined in the NER as the period of seven days commencing at the start of the trading interval ending 12.30am Sunday.[374]

As noted in section 7.3, there is currently no prescription in the NER regarding the payment structure of emergency reserve contracts. While the Commission understands that the payment structure typically includes one or more of the following features, this is not required by the NER:

- availability costs
- pre-activation costs
- activation costs.

In determining the total amount payable by AEMO under emergency reserve contracts (the RRC):

- Pre-activation and activation costs incurred within a billing period count towards the RRC for that billing period. For example, if $10 million of pre-activation and activation costs are incurred on 8 December, then it would be recovered over the associated billing week.
- Availability costs are allocated to each billing period in proportion to the total contract length to which the availability payments relate. For example, if a total of $12m of activation payments are incurred equally over a 12-week period based on agreed upon terms in the contract, $1m is recovered in any individual billing period over the 12-week period.

373 Throughout this chapter, the term "consumption" is used as shorthand for "adjusted gross energy amount in a region". Of course, many market customers are retailers and are not themselves consuming electricity, but instead are purchasing it from the wholesale market on behalf of their customers.

374 NER, Chapter 10.

### 8.1.2 Compensation costs

Affected participants and market customers (in respect of scheduled load) are entitled to receive compensation in the event of a RERT intervention.[375]

The compensation framework in the NER relates to when AEMO intervenes in the market, which includes directions and the RERT. The AEMC is considering possible amendments to compensation payments for affected participants holistically as part of the AEMC's work on intervention mechanisms and system strength.[376]

As such, this aspect of the RERT will not be considered as part of this rule change request, since it is more effectively considered through these other processes that holistically look at the overall compensation framework.

### 8.1.3 Administrative and operational costs

AEMO incurs administrative costs associated with contracting for and operating reserves. This includes labour costs in preparing and analysing tenders, preparing contracts and determining to activate emergency reserves.

These costs are recovered by AEMO from all market participants as part of the fees.[377] AEMO's broader cost recovery process through fees is out of scope for this rule change determination since this is related to broader consideration of AEMO's cost recovery from market participants.

## 8.2 AEMO's views

AEMO have not raised the issue of how costs incurred in contracting for the provision of reserves are recovered from market customers in their rule change request or in subsequent submissions.

Nevertheless, given the broad scope of issues raised in the rule change request, and stakeholder views on this matter, we are considering this matter as part of the rule change.

## 8.3 Stakeholders' views

### 8.3.1 Submissions to consultation paper

EnergyAustralia[378] suggested changes to the cost recovery process are required in order to reflect usage more closely than under current rules. It suggested that:

- The recovery process needs to recover costs from participants that were benefiting (i.e. using energy) from the reserve at the time it was activated, i.e. the recovery of activation payments and pre-activation payments should be recovered on a usage (MWh) basis across the periods where the reserves were activated (or pre-activated).

375 NER, clause 3.12.2.

376 The Commission understands that AEMO plans to submit a rule change request on the recovery of the compensation costs associated with RERT activation in 2019.

377 NER, clause 3.15.9(g).

378 EnergyAustralia, submission to the consultation paper, p.6.

- Recovery of availability payments cannot be recovered in this manner and should continue to be recovered as they are now.

EUAA also noted that its members, typically larger energy users, do not think that they should contribute to RERT costs given that they have a flat load, whereas RERT costs are largely due to peak demand, which are mainly caused by retail consumers. [379]

In a supplementary submission to the consultation paper, EUAA provided its members' experiences with respect to how retailers recover costs from end consumers and questioned whether retail customers are paying their fair share of RERT costs, or if commercial customers are cross-subsiding retail consumers due to having cost-pass through clauses in contracts. [380]

### 8.3.2 Technical working group feedback

The topic of cost recovery was discussed with stakeholders at a technical working group meeting on 20 November 2018.[381] All members of the group that spoke on the topic agreed that the current process is inappropriate because it does not send appropriate signals for consumption decisions. Most also emphasised that it was important that cost recovery be "fair".

## 8.4 Commission's analysis and conclusions

### BOX 25: DRAFT RULE

The draft rule requires AEMO to recover:

- costs associated with the direct and immediate activation of RERT resources (e.g. activation costs or usage charges) in proportion to market customers' consumption over each of the trading intervals in which the RERT resource is activated, in the region in which RERT was used
- all other costs associated with the procurement of reserves (other than administrative and operational costs) in proportion to market customers' consumption during each of the billing periods in which the costs were incurred, in the region in which RERT was used.

A billing period is defined in the NER as the period of seven days commencing at the start of the trading interval ending 12.30am Sunday.

This approach reflects that costs should be recovered in a cost reflective manner, in order to provide efficient incentives for those parties to avoid the costs. Costs not able to be allocated in a cost reflective manner are recovered in as non-distortionary manner as possible by smearing the costs widely.

379 Energy Users Association of Australia, submission to the consultation paper, p. 3.

380 Energy Users Association of Australia, supplementary submission to the consultation paper, p. 3.

381 Minutes of the meeting can be found on the AEMC's website at: https://www.aemc.gov.au/sites/default/files/2018-11/Technical%20Working%20Group%20%232%20-%20Discussion%20Notes.pdf

### 8.4.1 Cost recovery principles

The AEMC considers that cost relating to the procurement of emergency reserves should be recovered in accordance with the following principles.

**1. Emergency reserve procurement costs should be recovered in full**

It is necessary for RERT procurement costs to be recovered in full, or else emergency reserve providers will be unable to be paid given AEMO is a not-for-profit organisation and has no other means of paying the providers.

**2. Prices should reflect marginal costs**

Cost recovery, is, in effect, the way in which the emergency reserves are *priced*. RERT costs allocated to market customers act as price signals, which in turn influence the behaviour of market participants.

Prices should reflect the marginal costs of providing emergency reserves, in order to incentivise efficient decision-making (such as a decision on whether or not to consume electricity at a particular time). In the context of the RERT the marginal cost is the costs associated with dispatching one more unit of RERT reserves.

Marginal costs are a forward-looking concept. Costs that are already incurred ("sunk" costs), by definition, cannot be avoided or influenced by decisions or behaviour going forward.

Prices which do not reflect costs may incentivise inefficient decision-making, for example, inefficiently high or low consumption levels of electricity. Consumers may consume an inefficiently low level of electricity if prices are too high (compared to cost reflective levels) or vice versa if prices are too low.

**3. Residual costs should be recovered in a non-distortionary manner**

Principles 1 and 2 above can be contradictory.

Marginal costs are, by definition, forward-looking, while total costs can include sunk, already incurred costs. This means that there are residual costs (the difference between total costs and marginal costs) that must be recovered somehow to conform with principle 1. In the case of the RERT, these are typically the availability payments, as discussed below.

The recovery of these costs should be done in a manner which is as non-distortionary as possible. In general, this involves smearing these costs as widely as possible, which in turn means that the difference between the price reflecting marginal costs and the price reflecting marginal cost plus a share of residual costs is minimised. Changes in behaviour in response to this minimised change in price should, in turn, be as small as possible (noting that efficient behaviour is best incentivised were prices to reflect marginal costs only).

**4. Cost recovery should be transparent and readily understandable**

Cost recovery should be transparent and readily understandable to assist with participant understanding and manage expectations of costs associated with emergency reserves.

### 8.4.2 What are the marginal costs of the RERT?

Determining the marginal costs of the RERT is challenging. Below, we consider each of activation costs, pre-activation costs and availability costs.

#### Activation costs

Activation costs are incurred immediately prior to (or simultaneous to) emergency reserves being required.

As a first degree of approximation, it is efficient for activation costs to be recovered from those consuming at the time the RERT resource is required because it:

- provides incentives for those parties to reduce their consumption to the extent that the value derived from that consumption is less than the cost
- avoids the costs being recovered from other parties who were unable to influence the cost from being incurred.

#### Availability costs

At the other end of the timeline spectrum for RERT costs from activation costs are availability costs. Availability costs are typically incurred over the life of the emergency reserve contract (potentially many months) and are incurred regardless of whether or not the RERT ends up being activated.

Such costs are, clearly, not influenced by parties consuming at the time the RERT resource is activated. On this basis, availability costs should not be recovered in proportion to market participants' consumption at those times. To do so would provide disincentives to consume (despite that consumption potentially being efficient). For example, if all parties reduced their consumption by 10 per cent at the time the RERT resource is activated, all parties would have the same proportion of consumption, and would each receive the same share of the same, fixed availability costs. Consumption would have been reduced for no reliability or cost reducing benefit.[382]

Furthermore, if the emergency reserve resource is not activated at all, then costs would not be recovered if the recovery mechanism was based on recovering from consumers when emergency reserves are activated. This is inconsistent with principle 1 in section 8.4.1 above: costs must be recovered in full. In such circumstances, costs could instead be recovered on the basis of, for example, a market customer's demand at the time of system-wide peak demand over the life of the contract - but this would also incentivise market customers to reduce their consumption at these times when no such reduction is necessary.

This begs the question: on what basis should availability costs be recovered?

In general terms, it may be possible to recover activation costs in a cost reflective manner, based on some identifiable and verifiable characteristic *at the time the costs were entered into*.

382 At least until the next time AEMO enters into RERT costs.

For example, AEMO may incur RERT related costs *now* based on its forecasts, which in turn are influenced by *current* forecasts of the level of generation and demand response in the market, which in turn are influenced by *current* financial contractual positions between market customers and generators/demand response providers. Current financial contractual positions could be used as an identifiable and verifiable cost reflective characteristic. The Commission understands that this is the logic behind the cost recovery mechanism of the retailer reliability obligation.

**Pre-activation costs**

Pre-activation costs are incurred ahead of a possible activation of a RERT resource, on the basis of AEMO's forecast requirement of needing the resource. This typically occurs in the hours leading up to activating a RERT.

While the length of time over which pre-activation costs are incurred is far smaller than those for availability costs (typically hours versus months), as with availability costs it is the case that these costs are sunk.It would not incentivise efficient consumption behaviour to recover these costs in proportion to a party's consumption at the time the RERT was required, or during the period of time over which the pre-activated emergency reserves may be used.

Instead, as with availability costs, it may in theory be possible to determine some cost reflective characteristic *at the time the costs were entered into.*

### 8.4.3 Analysis of cost recovery and conclusions

The Commission does not consider that the current cost recovery process is in the long term interest of consumers, because it does not send appropriate price signals to market participants to encourage efficient decision-making (i.e., it does not reflect principle 2). This is because the costs recovered do not reflect marginal costs.

**Activation costs**

As discussed above activation costs are recovered in proportion to a market customer's consumption at specific times of the week, over a week-long period.

Such an approach does not send cost-reflective signals to market participants. Consumers (or their retailers) which are consuming at the specific time emergency reserves are actually required are provided price signals to consume which do not reflect the marginal cost of the RERT at that specific time. This has a number of negative consequences:

- The price signal sent to consumers at the time the emergency reserves are required (i.e. the market price for energy plus the cost associated with RERT) is less than the marginal cost of the emergency reserves plus the cost of energy, potentially encouraging consumption which has a value to the consumer which is less than the cost of its provision.
- The consequence of this could be consumers inefficiently consuming or increasing their demand at this time. Given there is already limited supply, hence emergency reserves being used, this would drive further inefficiencies, increasing the costs of emergency

reserves which could exceed the benefits the individual users would get from increased consumption.

- The price signal sent to consumers at other times of the week encourages inefficient under-consumption at those times. This is because the marginal emergency reserve related costs of consuming at these times is zero, yet the price associated with the emergency reserves is greater than zero. Some customers may respond to the RERT related price signals and reduce their consumption, for no benefit with regard to reliability or cost reduction.
- Costs are borne by parties that were not consuming (or consuming less) when emergency reserves were required. This is most notably when a party undertakes demand response at the time that the RERT was required, only to incur RERT related costs largely regardless of their demand response due to consumption at other times of the week. The Commission understands that this was the case for several customers in Victoria over the last summer. Customers were participating in the RERT through demand response and were paid as such, but were still charged for the RERT itself, despite curtailing demand, creating confusion for such customers.

Instead, the Commission considers that the rules should be changed so that activation costs should be recovered, in full, from those market customers who are consuming (or whose customers - end consumers - are consuming) during the trading intervals in which the RERT is activated, in proportion to their consumption at that time. This will provide more cost reflective prices, consistent with principle 2 and avoiding the problems associated with the current arrangements, noted above.

The Commission appreciates that even this approach is not fully cost reflective. For example, in some circumstances emergency reserves may be activated and costs incurred ahead of the trading intervals where it is actually required. In these circumstances, a strict interpretation of the recovering of forward-looking, marginal costs would suggest that recovery in proportion to consumption during the time emergency reserves were activated is not cost reflective. A market customer modifying its behaviour to reduce its consumption would not impact whether the RERT costs are incurred. Nevertheless, the Commission considers the that cost recovery on the basis of those trading intervals that emergency reserves are activated is likely to be a reasonable approximation of cost reflective pricing. Furthermore, it may be complex for the arrangements to be more cost reflective, contradicting principle 4 (simplicity and transparency).

Similarly, there may be practical implementation aspects that would mean that this approach is not fully cost reflective. Indeed, because of the non-prescriptive nature of emergency reserve contracts, and the differences in terms and conditions of contracts, it may be difficult for AEMO to fully allocate the costs to the relevant trading intervals in an accurate manner.

For example, this could be due to overlapping contracts with different minimum run times and hours of availability. Practical considerations would also have to be made for, say, if under a contract, the provider is to be paid different dispatch charges based on how much is dispatched (e.g. a certain $/MWh for the first 20MW, then a different $/MWh for the next 5MW and so on).

A further potential implementation consideration is that due to the nature of emergency reserves, the time period over which they were delivered is an ex-post calculation for most RERT contracts such that there is a difference between the requested duration of this activation, and final outcome. This will need to be considered further.

A full cost reflective approach could therefore influence exactly what terms and conditions AEMO includes in its contracts, particularly with respect to payment types and forms. For example, a full cost reflective approach may require all reserves to be available between standard hours, and to have the same payment types (e.g. usage payments) and form (e.g. $/MWh). As a result, the draft rule, discussed next, requires AEMO to reasonably allocate usage payments to the relevant trading intervals.

The Commission notes that this may also be addressed if AEMO chooses to standardise products through standardised terms and conditions including payment types, as proposed in its high-level design attached to the rule change request and discussed further in chapter 10.

**Availability and pre-activation costs**

The current cost recovery of availability and pre-activation costs is also not cost reflective.

As noted above, availability and pre-activation costs are sunk at the time that emergency reserves are being used. Basing cost recovery on consumption during specific windows of time, as is currently the case, will send inefficient signals to reduce consumption, despite the fact that doing so will not avoid the costs from being incurred. In turn, to the extent that consumers respond to these signals, consumption will be inefficiently reduced.

Take for example, pre-activation costs of $1m incurred six hours before an expected RERT event. Having incurred the costs, it is not cost reflective to recover these costs on the basis of consumption, either over those six hours, or over the time the emergency reserves are activated. Consumers may reduce their consumption, but this does not avoid the costs - it merely allocates them to those that do not reduce their consumption.

As noted above, it may be possible to allocate costs on the basis of some identifiable characteristic of a market participant *at the time that the costs are incurred*. However, the Commission does not consider such an approach to be appropriate for the RERT, for the reasons set out below. The Commission has considered a variety of measures that could be used, and considers that none of these are ideal, for example:

- One such measure (which the retailer reliability obligation (RRO) is using) is to assign it to retailers based on their contract positions. The rationale being that a retailer's contract position underpins reliability in the market, and so if a shortfall arises, then it must be the case that a retailer is underhedged. However, in the absence of broader framework changes to provide a third party with information on a market customer's contract positions on an ongoing basis (i.e. at any time when RERT activation costs are incurred) this is likely to be costly and difficult to administer, and would also require establishing a full framework around how this would occur. This is likely to be administratively burdensome compared to the cost of the RERT and so the Commission does not consider that this would be appropriate.

- Another measure would be to assign costs based on AEMO's expected demand forecasts. However, at the moment AEMO's demand forecasts are clearly within their control and remit. Given the NEM is not a two-sided market, it would be nigh on impossible to work out what retailer is responsible for causing the costs of the RERT.[383] Indeed, in some cases emergency reserve costs may be incurred, which, with the benefit of hindsight, were not necessary because actual demand was less than AEMO's forecast. Attributing the costs of this to retailers based on forecast demand is not cost reflective and would be inconsistent with the principles described above.

Instead, the Commission considers that availability and pre-activation costs be recovered in a manner which minimises distortions to consumption behaviour, consistent with principle 3 above. This is achieved by smearing it as broadly as possible. Pragmatically, the Commission considers that availability and pre-activation costs should be recovered in proportion to market customers' consumption over the relevant billing period (a week, commencing at the start of the trading interval ending 12.30am on Sunday) over which the costs were incurred.

This serves to keep the $/MWh pricing impact low (because the fixed costs are being divided widely over all MWh consumed within the billing period), and so reduce the distortionary effects of pricing not at marginal cost.

### BOX 26: EXAMPLE OF EMERGENCY RESERVE COST RECOVERY

The following provides an example of cost recovery of emergency reserve costs.

- In October 2018, AEMO enters into an emergency reserve contract. Availability costs relating to the contract are $10,000, paid weekly by AEMO to the emergency reserve provider for a ten-week period starting from the first week of December 2018.
- On Tuesday 29 January 2019, AEMO requires the emergency reserve provider to pre-activate so that it is available to be dispatched on Wednesday 30 January. $50,000 in costs are incurred.
- On Wednesday 30 January, AEMO dispatches the emergency reserve between 3.00pm and 4.00pm. During the first trading period (3.00pm to 3.30pm), costs are $100,000. During the second trading period (3.30pm to 4.00pm), costs are $60,000.

Total costs are recovered as follows:

- $1,000 of availability costs are recovered per week for the ten billing periods (of a week each), in proportion to market customers' consumption during the weekly billing period in which the costs were incurred.
- $50,000 of pre-activation costs are recovered in proportion to market customers' consumption during the weekly billing period commencing at the start of the trading interval ending on Sunday 27 January at 12.30am.

383 A "two-sided market" is one where generators offer quantities of electricity for sale at various prices, and market customers bid to buy quantities of electricity at various prices. In general in the NEM, currently market customers do not bid for electricity.

- $100,000 of activation costs are recovered in proportion to market customers' consumption during the trading interval starting at 3.00pm on Wednesday 30 January.
- $60,000 of activation costs are recovered in proportion to market customers' consumption during the trading interval starting at 3.30pm on Wednesday 30 January.

*Beneficiary pays*

Most stakeholders, such as EnergyAustralia in their submission to the consultation paper, articulated views consistent with a "beneficiaries pays" principle with respect to availability and pre-activation payments. Under this principle, instead of recovering costs on the basis of marginal costs, those that benefit from the RERT costs should pay for the related costs.

This principle, if applied, would likely lead to the same outcome as above for activation payments: it is cost reflective to recover the costs from those benefiting from the activation of the RERT (by being able to consume as a result of it being activated).

However, if applied, this principle would likely lead to very different outcomes for availability and pre-activation payments compared to the cost reflective recovery methodology outlined above. For example:

- It could be argued that the beneficiaries of a RERT pre-activation are all those that consumed on, for example, the relevant day that emergency reserves were activated (or all those that consumed at peak times on the day in which the RERT was activated).
- It could be argued that the beneficiaries of a RERT availability payments are all those that consume at, for example, the peak hours on each day over which the contract is in place, or those that consume when the emergency reserves are activated, and hence it is they that should incur the availability payments.

This principle appears more consistent with the notion of "fair" cost recovery. Some technical working group members articulated that they considered it "fairer" for costs to be recovered in this manner.

While the Commission has carefully considered this feedback from the majority of stakeholders which commented on this matter, the Commission does not agree that this principle should be applied for a number of reasons:

- It conflicts directly with the cost reflective principle for availability and pre-activation payments, and hence may send inefficient pricing signals to consumers. By not smearing the costs as broadly as possible (for example, instead recovering it over specific hours of the day) consumers would have a greater incentive to reduce their consumption, despite this having no or limited impact on whether the costs are incurred.
- It is not clear to the Commission that those consuming at certain times are indeed the beneficiaries of the RERT. That is, it is not clear *who* the beneficiaries are in certain circumstances. For example, if pre-activation costs are incurred, but in the fullness of time the RERT is not required and so not activated, then arguably no one benefited from the RERT costs being incurred.

- While the beneficiaries pay model may appear "fairer", the Commission does not consider it sends the appropriate consumption signals and incentives, and hence is not in the long term interest of consumers.

### 8.4.4 Costs categories are not defined in the NER

As noted above, the categories of cost (availability, pre-activation and activation) that are typically incurred in procuring RERT contracts are not defined in the NER. Instead, they are used by convention by AEMO.

As such, the draft rules are drafted in a way to give the policy effect explained above, but without defining these terms. This also allows AEMO to incur and recover costs which do not neatly fit into one of the above three categories, should such costs arise.

The draft rules require AEMO

- to reasonably allocate usage charges (or equivalent charges) under reserve contracts to the trading intervals during which reserves were dispatched or activated
- to recover such usage charges in proportion to market customers' consumption over the period in which the RERT resource is dispatched or activated
- to recover all other costs associated with the procurement of reserves (other than administrative and operational costs) in proportion to market customers' consumption over the billing period in which the costs were incurred.

Costs are recovered on a regional basis, i.e. from market customers in the region in which RERT was used.

Specifically, the draft rule is:

**3.15.9 Reserve settlements**

(e) In respect of *reserve contracts* entered into by *AEMO*, *AEMO* must calculate in relation to each *Market Customer* for each *region* in respect of each *billing period* a sum determined by applying the following formula:

$$MCP = \left[\frac{E_{UC} \times UC}{\sum E_{UC}}\right] + \left[\frac{E_{OC} \times OC}{\sum E_{OC}}\right]$$

Where:

MCP is the amount payable by a *Market Customer* for a *region* in respect of a *billing period*;

UC is the total usage charges (or equivalent charges) paid by *AEMO* under *reserve contracts*, as allocated in accordance with paragraph (e1);

$E_{UC}$ is the sum of all that *Market Customer's adjusted gross energy* amounts

in the relevant *region*(the "**relevant *region***") in each *trading interval* during which *reserves* were *dispatched* or *activated* under a *reserve contract* in the *billing period*,excluding any *loads* in that *region* in respect of which the *Market Customer* submitted a *dispatch bid* for any such *trading interval*;

$\Sigma E_{UC}$ is the sum of all amounts determined as "$E_{UC}$" in accordance with this paragraph (e) in respect of that *region* for the relevant *billing period*.

OC is the total amount paid by *AEMO* under *reserve contracts* in the relevant *region* in the *billing period*, other than:

(1) amounts determined as "UC" in accordance with this paragraph (e) in respect of that *billing period*; and

(2) operational and administrative costs described in paragraph (g).

$E_{OC}$ is the sum of all that *Market Customer'sadjusted gross energy* amounts in the relevant *region* in the *billing period*, excluding any *loads* in that *region* in respect of which the *Market Customer* submitted a *dispatch bid* for any *trading interval* during that *billing period*.

$\Sigma E_{OC}$ is the sum of all amounts determined as "$E_{OC}$" in accordance with this paragraph (e) in respect of that *region* for the relevant *billing period*.

(e1) For the purposes of determining amount "UC" in paragraph (e), *AEMO* must reasonably allocate usage charges (or equivalent charges) under *reserve contracts* to the *trading intervals* during which *reserves* were *dispatched* or *activated* in the relevant *region* in the *billing period*.

(f) A *Market Customer* is liable to pay *AEMO* an amount equal to the sum calculated under paragraph (e) in respect of that *Market Customer*.

**Note**

This clause is classified as a civil penalty provision under the National Electricity (South Australia) Regulations. (See clause 6(1) and Schedule 1 of the National Electricity (South Australia) Regulations.)

## 8.5 Cost recovery by market customers from end consumers

So far, this chapter has focused on the recovery of costs incurred (in the first instance) by AEMO from market customers (i.e. typically retailer).

Market customers may or may not recover the costs allocated to them from their customers (i.e., end consumers), consistent with the contractual arrangements between the market customers and end consumers. This process is not currently regulated by the NER. Market customers may also absorb the costs themselves, or factor in these costs when determining tariffs.

Retailers do not consume the electricity they purchase on the spot market themselves, but do so on behalf of their customers (end consumers). As such, any cost-reflective price signals

sent to market customers to influence consumption (related to activation costs) may not, ultimately, be reflected to end consumers. This, of course, is also true of price signals from the spot market - consumers are not necessarily exposed to the spot price or other wholesale market price signals.

Nevertheless, it is appropriate for retailers to manage the risk associated with RERT costs. As with the electricity market more generally, through the competitive retail market, retailers may enter into contractual arrangements with their customers which allocate the RERT costs to those customers, or wear the risk themselves. It is through the competitive market that retailers are incentivised to manage the risks and costs associated with emergency reserves, and the failure to do so efficiently may result in decreased profitability or market share.

By market customers paying for activation costs in proportion to their consumption at the time at which the emergency reserves were activated, and by smearing other costs:

- the pre-conditions for incentives to be placed on consumers to consume when the value they derive from consuming is greater than the cost
- other market participants (and ultimately their customers - other end consumers) do not contribute to the marginal cost of emergency reserves.

How market customers recover RERT related costs from end consumers is not in scope for this rule change. Nevertheless, some concern has been raised with this process.

Firstly, some stakeholders have noted that retailers may be passing on RERT costs with a margin to end consumers.[384]

Retailers are free to pass on (or not pass on) the costs associated with emergency reserves in any manner consistent with their contracts with end consumers. To inform whether cost recovery between a retailer and its customers is consistent with its contracts, and to improve confidence in this part of the RERT framework, transparency measures outlined in Chapter 9 will provide consumers with information about the RERT costs incurred by their retailer.

Secondly, stakeholders have suggested that an absence of transparency and clarity over the likely costs to be recovered from market participants has made it more difficult for market participants to manage the risk of RERT related costs. In turn, this may result in stakeholders passing this risk onto consumers, either through contractual arrangements with individual consumers, or by a general increase in tariffs representing both the quantum of RERT costs and a risk premium.

Greater clarity in the likely costs to be recovered from market participants (discussed in Chapter 9) should mitigate, to an extent, this issue. Retailers, and ultimately their end consumers, should have a better understanding of the likely RERT related costs ahead of time, allowing them to better manage this risk.

384 This was raised by stakeholders during roundtable discussions at the public stakeholder workshop held for this rule change request.

# 9 TRANSPARENCY AND REPORTING REQUIREMENTS

This chapter considers the transparency of the Reliability and Emergency Reserve Trader (RERT or emergency reserves) and reporting requirements, i.e. the information about the RERT framework that AEMO is required to provide to the market. This chapter outlines:

- current arrangements in the NER
- AEMO's views
- stakeholders' views
- the Commission's analysis and conclusions.

## 9.1 Current arrangements

Current arrangements in the NER and the RERT guidelines are set out below. An overview of AEMO's recent reporting practices is also provided.

### 9.1.1 National Electricity Rules

AEMO must report on the RERT in accordance with clause 3.20.6 of the NER.

Clause 3.20.6(a) of the NER requires that as soon as practicable after the RERT is dispatched/activated, AEMO publish[385] a report detailing:

- the circumstances giving rise to the need for the dispatch of scheduled reserves or activation of unscheduled reserves
- the basis on which it determined:
  - the latest time for the dispatch/activation of reserves
  - that a market response would not have avoided the need for the dispatch/activation of emergency reserves
- the changes in dispatch outcomes due to the dispatch/activation of emergency reserves
- the processes implemented by AEMO to dispatch/activate the emergency reserves
- if applicable:
  - the reasons why AEMO did not follow any or all of the processes set out in rule 4.8[386] either in whole or in part prior to the dispatch/activation of emergency reserves
  - the basis upon which AEMO considered it impractical to set spot prices and ancillary service prices in accordance with clause 3.9.3(b).[387]

385 The term "publish" is a defined term in chapter 10 of the NER and in the case of AEMO means making the document available to registered participants electronically (i.e. not the general public).

386 Rule 4.8 includes provisions relating to the determination of the latest time by which AEMO would need to intervene through an AEMO intervention event (see clause 4.8.5A).

387 Clause 3.9.3(b) of the NER requires that AEMO must in accordance with the relevant methodology or assumptions to determine dispatch prices and ancillary service prices, set the dispatch price and ancillary service prices for an intervention price dispatch interval at the value which AEMO, in its reasonable opinion, considers would have applied as the dispatch price and ancillary service price for that dispatch interval in the relevant region had the AEMO intervention event not occurred.

Clause 3.20.6(b) of the NER requires that AEMO must, as soon as reasonably practicable after AEMO has included the amounts arising under a reserve contract in a final statement, publish details of:

- the payments under the emergency reserve contract for the relevant billing periods
- a breakdown of the recovery of those costs by each category of Market Customer, as determined by AEMO, in each region.

Clause 3.20.6(c) of the NER stipulates that within 30 days of the end of each financial year in which AEMO has exercised the RERT, AEMO must publish a report detailing:

- each occasion during the financial year on which it intervened to secure the availability of emergency reserves
- each occasion during the financial year when emergency reserves were dispatched or activated
- its costs and finances in connection with its RERT activities during the financial year according to appropriate accounting standards including profit and loss, balance sheet, sources and applications of funds.

There are also a series of market notices that AEMO must publish in the lead up to the activation/dispatch of the RERT which include:[388]

- the nature and extent of low reserve/lack of reserve conditions and the time period over which these conditions apply
- any foreseeable circumstances that may require implementation of an AEMO intervention event, and an estimate of the latest time AEMO would need to intervene
- AEMO's intent to implement an intervention event.

### 9.1.2 RERT guidelines

The Reliability Panel's RERT guidelines are not currently required under the NER to provide guidance or prescription to AEMO as to what information should be reported to the market (or how it should be reported). [389]

While the methodology by which emergency reserve requirements are determined is not detailed in the RERT guidelines, the guidelines outline the information AEMO may take into account when considering whether to enter into reserve contracts. This information is related to the procurement decisions, and Chapter 5 details what information may be considered by AEMO.[390]

The guidelines specify that AEMO may, within one month after entering into a contract for reserves, publish the name of the counterparty to the contract and the volume and timing of reserves procured under the contract.[391] The Commission may recommend that the Panel

388 See Clauses 4.8.5, 4.8.5A, 4.8.5B of the NER.

389 Clause 11.107.2 of the NER.

390 For long and medium-notice situations this includes: the details of the outcome of the medium-term PASA, and the outcome of the energy adequacy assessment projection. For short-notice situations this includes: the details of the outcome of the short term PASA and pre-dispatch processes. See RERT guidelines, p. 4-5.

391 RERT guidelines, pp. 13-16.

amend the RERT guidelines, to specify that AEMO *must* publish the name of the counterparty and volume and timing of emergency reserves. This would be consistent with section 11.2 of AEMO's RERT procedures. In this regard, the Commission notes there may be merit in AEMO developing and maintaining a clearer register of RERT providers by region and volume. [392]

### 9.1.3 AEMO's recent RERT reporting practices

AEMO's recent reporting of its RERT activities is outlined below.

Ahead of the 2017-18 summer, where emergency reserves were procured for the first time in recent history, AEMO published its 2017-18 Summer Readiness Report to inform the public of its preparation and actions "designed to minimise, as far as possible, the risk of customer supply disruption in the National Electricity Market during the periods of highest demand for electricity from the grid".[393] The report, amongst other items[394], listed the volumes of reserves (in MW) AEMO had procured under the RERT (consistent with the requirements of section 8 in the RERT guidelines) on a regional basis at that point in time and whether the resources were generation or demand response.[395] A share of the demand response resources were procured under the AEMO/ARENA RERT trial, which is discussed in Chapter 2.

Chapter 2 discusses the recent use of emergency reserves. Given it was used in November 2017, in February 2018, AEMO published an event report for the RERT event that occurred on 30 November 2017. The report included an assessment of the intervention[396], description of the intervention process and changes in dispatch outcomes. This event report was published in accordance with clause 3.20.6(a) of the NER. The information in this report was then updated on 23 May 2018 with a revised RERT report provided as an annex to AEMO's Summer 2017-18 operations review.[397]

A second report detailing the activation of the RERT on 19 January 2018 was also provided as an annex to AEMO's Summer 2017-18 operations review, again in accordance with clause 3.20.6(a) of the NER. [398] The Summer 2017-18 operations review also outlined all the RERT costs for the financial year broken down across payment types, as required under clause 3.20.6(c) of the NER.

AEMO's Summer 2018-19 readiness plan specified the volume of long-notice RERT reserve contracts signed and the volume of short-notice and medium-notice RERT panel agreements AEMO has entered into for the 2018-19 summer (consistent with RERT guidelines, section 8). Also AEMO noted that it "advises against using last year's RERT costs as a guide for the upcoming summer as the type of RERT secured and the associated costs are different".[399]

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392 Currently, new RERT provider information often means that older documents are removed from AEMO's website.

393 This report was published on 28 November 2017. See: https://www.aemo.com.au/-/media/Files/Media_Centre/2017/AEMO_Summer-operations-2017-18-report_FINAL.pdf

394 The report also includes the implementation of a range of operational improvements, together with ensuring the availability of fuel for generators (coal, gas, water, and diesel) and the availability and capacity of the transmission network to carry power.

395 Demand response resources were further broken down based on their sector (network, residential, commercial and industrial).

396 Including the timing and volume of reserve contracts enabled.

397 AEMO, *Summer 2017-18 operations review*, 23 May 2018.

398 It was similar in structure and content to the report provided for the 30 November 2017 event.

399 AEMO, *2018-19 summer readiness program and publication of RERT-related costs,* 9 November 2018

AEMO dispatched the RERT in January 2019. AEMO has not yet reported on this, beyond the market notices associated with the activation and dispatch of the RERT.

## 9.2 AEMO's views

AEMO did not specifically raise transparency or the existing reporting requirements in its rule change request. However, given that this rule change is considering the broader RERT framework, the Commission has turned its mind to considering the transparency of the RERT. This is reinforced in light of the significant stakeholder feedback received, that stated that transparency is a key aspect of the framework that could be improved.

AEMO briefly discussed transparency in its submission to the consultation paper for this rule change. AEMO stated:[400]

> "The industry has asked for a more transparent procurement process. AEMO acknowledges that transparency is important and is happy to work more closely with the Reliability Panel or other relevant industry bodies at various important milestones of the procurement process. AEMO has published its Summer Operations Report 2017-18 which gives a detailed description of its activities in the 2017-18 summer. Ultimately AEMO is also required to consult with jurisdictions to finalise the procurement amount."

## 9.3 Stakeholders' views

Many stakeholders expressed strong views on the transparency of the RERT framework, via submissions to the consultation paper, submissions to the options paper and feedback in technical working group meetings.

### 9.3.1 Submissions to consultation paper

In the consultation paper the Commission asked stakeholders whether they considered there should be more transparency of the RERT framework. Most stakeholders that provided a submission to the consultation paper commented on transparency.

Almost all stakeholders advocated for greater transparency. The AEMC has summarised stakeholders' concerns on transparency, as being with respect to wanting more detail on:

- the costs of procuring and dispatching the RERT, including indicative costs and the presentation of relevant statistics to understand the impact of triggering the RERT[401]
    - for example, ERM suggested changes to the framework should: "include requirements on AEMO to report on projected and actual costs as well as providing improved and timelier analysis of the supply-demand balance at the time RERT is dispatched."[402]

400 AEMO submission to the options paper, p. 8.

401 Stakeholders that commented on this included: Flow Power, Clean Energy Council, Snowy Hydro, ERM Power, Energy Users Association of Australia (EUAA), Hydro Tasmania, Brickworks, South Australian Council of Social Service and St Vincent's De Paul Society, Origin

402 ERM Power submission to consultation paper, p. 4.

- the payment structure, that is, information on availability (capacity) and dispatch (energy) payments[403]
  - for example, EUAA noted: "AEMO does not publish the cost/MWh for RERT – whether availability, pre-activation or activation separately, or in total. When the EUAA sought this information, we were eventually provided with a large data set that we were not familiar with and asked to calculate it ourselves. We do not consider this is indicative of a transparent process we are seeking."[404]
- the methodology used by AEMO to assess reserve requirements[405]
  - for example, the AEC supported: "transparency in the assessment of reserve requirements with enough information provided to parties to potentially challenge AEMO's decisions if it has either purchased excessive reserves or has not purchased the least cost reserves".[406]
- the procurement volume more generally[407]
  - for example, AGL considered: "it would be appropriate for the NER to embed some guidance linking the quantum of RERT to be procured with the expected amount required to meet the reliability standard. That said, there is a danger in over-prescription, and a balance between prescription and discretion must be met, to allow for consideration of such factors as cost and availability."[408]
- reporting on past events, including on the accuracy of forecasts in relation to RERT activations[409]
  - for example Meridian stated: "all the information supporting decisions is subject to regular reporting and review; that AEMO produce detailed reports each time the RERT is activated, detailing not only what occurred but what steps AEMO is taking, and requires the market to take, to avoid such reserve requirements in future; and AEMO in their annual review of RERT activation providing detail of decisions made, lessons learned and future steps to be undertaken".[410]

### 9.3.2 Submissions to options paper

While the transparency of the RERT framework was not a core focus of the options paper a number of stakeholders provided their views on transparency in their submissions to the options paper. Stakeholders again reiterated the importance of transparency for the use of emergency reserves, regardless of their views on which of the procurement options put forward in the options paper was best. Stakeholders were generally concerned that the existing lack of transparency has led to higher costs for customers, inability for retailers to

403 Stakeholders that commented on this included: Australian Energy Council (AEC), Snowy Hydro, ERM Power, EUAA
404 EUAA supplementary submission to consultation paper, p. 3.
405 Stakeholders that commented on this included: AEC, Snowy Hydro, Meridian, ERM Power, EUAA, Hydro Tasmania, AGL
406 AEC submission to consultation paper, p. 9.
407 Stakeholders that commented on this included: AEC, Energy Australia, AGL, Clean Energy Council
408 AGL submission to the consultation paper, p. 4.
409 Stakeholders that commented on this included: Bluescope, Energy Australia, Meridian
410 Meridian submission to consultation paper, p. 6.

plan ahead or recover costs, and has created ambiguity and uncertainty more generally in the energy sector.[411]

Specifically, stakeholders noted:

- The timely and transparent publication of RERT information assists customers to appropriately plan for budgeting purposes.[412]
- AEMO is best positioned to understand the needs of the power system and the operational capabilities of reserve providers. Care needs to be taken to not over-prescribe what AEMO should do. However, this is on the provision that there are improvements to the current transparency and reporting requirements of the RERT framework.[413]
- Some commercial and industrial customers were also reluctant to pay the additional RERT charges without greater justification regarding the calculation of the charges. Stakeholders found it difficult to justify the charges given the lack of transparency.[414]
- It may be appropriate to require emergency reserve contract costs to be made public (like all other bids and offers), to facilitate transparency around AEMO's cost-benefit decisions.[415] AEMO would also need to publish more detail of its statistical models and the expectation value of projected USE.[416]
- AEMO should be required to develop and publish robust methodologies to determine both: whether it should procure emergency reserve capacity under the RERT, and the volumes of capacity that it should purchase under the RERT.[417]

Stanwell set out proposed reporting requirements on AEMO. These are shown in the table below.

411 (Stanwell, EA, Alinta, ERM, Infigen, Enel X and EEC)
412 Alinta submission to the options paper, p. 3.
413 EnergyAustralia submission to the options paper, p. 4.
414 Stanwell submission to the options paper, p. 3.
415 In the context of Option 2 for the procurement trigger.
416 Infigen submission to the options paper, p. 6.
417 Energy Efficiency Council submission to the options paper, p. 2.

**Figure 9.1: Stanwell's proposed reporting obligations and timeframes**

| Trigger | Timeframe | Contents |
|---|---|---|
| Procurement – on entering into RERT contract | Shorter than current one month optional requirement2 | Name of the counterparty to the contract and the volume and timing of reserves |
| Procurement – before relevant quarter begins | Within 1 week of quarter beginning | Aggregated RERT costs categorised by payment type |
| Pre-activation | As soon as possible | Market notice indicating total pre-activation costs that will be incurred. |
| Activation | As soon as possible | Market notice of RERT activation. |
| | Within 2 days | Report detailing the total cost of intervention (allowing for the disclaimer that some costs may vary as meter data comes in). |
| End of quarter for which RERT was procured | Within one month of end of quarter | System report detailing:<br>• The forecasts that indicated intervention was required;<br>• The key drivers of the forecast shortfall of reserves;<br>• Details of AEMO's intervention in the market, including;<br>  ○ The volume and cost of reserves procured;<br>  ○ The volume and cost of reserves activated; and<br>• The impact on market reliability. |

Stanwell submission to the options paper, p. 4.

### 9.3.3 Technical working group feedback

At the second technical working group meeting held on 20 September 2018, participants resoundingly supported enhancing the transparency of the RERT framework and made the following suggestions:[418]

- The preliminary incident report could include far more detail and data (e.g. dispatch forecasts and AEMO responses in relation to these forecasts).
- A tiered approach to reporting with the costs associated with a RERT event proportional to the level of detail required in the reporting of the event.

418 Discussion notes from this meeting are available on the project page: https://www.aemc.gov.au/rule-changes/enhancement-reliability-and-emergency-reserve-trader

- It may be helpful to think through the trade-offs involved with regard to: the accuracy of reported data, the speed with which reports are published and the level of detail that needs to be provided.
- Regular reporting on the RERT could occur on a quarterly basis, with this quarterly report replacing the incident and final report. This quarterly report could be provided in place of the annual summary report that AEMO currently must publish after each financial year.
- Requiring AEMO to provide the characteristics (e.g. costs) of individual RERT providers could improve market participants' understanding of the RERT, would be consistent with the "open book" approach used for generators in the NEM and may lead to opportunities to bring RERT providers with costs less than the market price cap into the market.

## 9.4 Commission's analysis and conclusions

### BOX 27: DRAFT RULE

The draft rule:

- introduces a quarterly RERT report with forward-looking and backward-looking elements. The forward-looking element details indicative availability costs, expected activation and pre-activation costs, and detailed analysis of any procurement of RERT. The backward looking aspect includes updated emergency reserve costs and volumes, forecasts that indicated RERT intervention was required, impact on market reliability and enhanced existing requirements under Clause 3.20.6(a) of the NER.
- requires a report to be published as soon as practicable, and in any event no later than five business days after the dispatch/activation of reserves, detailing estimated RERT costs and estimated volumes of emergency reserves dispatched/activated under each reserve contract.
- requires AEMO to develop a methodology, explaining how it determined the amount of reserves to procure, as part of its RERT procedures.

**Benefits of the draft rule**

By introducing new reporting requirements that clearly explain the reasons for emergency reserve procurement the draft rule improves the ability of retailers, consumer groups, governments and policy makers to explain costs and benefits of emergency reserves to consumers and the industry more broadly. It also allows lessons to be learned from past RERT events.

By requiring indicative emergency reserve costs to be provided the draft rule could enable retailers and end customers to better budget and plan for RERT related charges (e.g.potentially hedging these risks and costs). Similarly, the timely provision of cost information would help with budgetary reporting.

A transparent emergency reserve framework is critical since it assists market participants and end users to understand AEMO's procurement decisions (on both a cost and volume basis) and helps them to make informed decisions.

The Commission considers there is a need for greater transparency in the emergency reserve procurement process, with many of these points also raised by stakeholders:

- Greater transparency will improve the ability of retailers, consumer groups, governments and policy makers to explain costs and benefits of emergency reserves to consumers and the industry more broadly.
- Transparency of the RERT is important since it will help parties (market participants and end users) to make efficient investment and operational decisions in response to the information that is revealed. For example, the provision of indicative costs could enable retailers and end customers to better budget and plan for emergency reserve related charges (e.g. potentially hedging these risks and costs). Similarly, the timely provision of cost information would help with budgetary reporting.
- Greater transparency would help to improve general market confidence in the RERT process because the market would have greater understanding of the reasons and conditions that required the procurement of the RERT.
- Greater transparency would also place an increased level of accountability on AEMO's decision making.
- Retrospective reporting would allow lessons to be learned from each RERT procurement/dispatch.

The Commission considers the above benefits associated with greater transparency will be realised through the framework changes detailed below. The benefits of transparency only occur if these offset the costs associated with providing increased transparency to the market. The only potential cost associated with increased transparency is the potential for an added administrative burden on AEMO, since AEMO may need to devote resources to fulfil regular reporting requirements. The Commission has considered this cost-benefit trade-off in developing its draft rule on these aspects as detailed below.

The Commission has set out three distinct reporting streams to enhance information provision:

1. Quarterly RERT report with forward and backward looking elements
2. Report shortly after RERT dispatch
3. Methodology report

The reporting streams are summarised in the table below and described in detail in the text that follows.

Table 9.1: **Summary of reporting streams to enhance transparency**

| NATURE OF REPORT | SPECIFIC TIME FRAME | REPORT CONTENT | PROPOSED CHANGE FROM CURRENT ARRANGEMENTS |
|---|---|---|---|
| Quarterly RERT report with a:<br>1. Forward-looking aspect - providing an update on expected RERT activities<br>2. Backward-looking aspect - reviewing the RERT activities that occurred | Within 30 business days of the end of each quarter | The **forward-looking** element of this report will provide<br>• Indicative availability costs based on reserve contracts procured<br>• Expected activation and pre-activation costs based on modelling outcomes<br>• Costs broken down across payment types and on a regional basis<br>• Modelling/analysis used to assess reserve requirements (i.e. volumes)<br>• Periods in which reserves are expected to be required<br>• Terms of any reserve contracts<br>• Basis on which estimated load shedding VCR was determined and applied for the payment guide.<br>These indicative costs and volumes will be updated each quarter based | The forward-looking element is a new requirement.<br>The backward-looking element builds on existing reports required under clause 3.20.6(a) and 3.20.6(c) of the NER.<br>Main changes:<br>• the frequency of publication<br>• the consolidation of the event reports into one main quarterly report on RERT activity<br>• additional content. |

| NATURE OF REPORT | SPECIFIC TIME FRAME | REPORT CONTENT | PROPOSED CHANGE FROM CURRENT ARRANGEMENTS |
|---|---|---|---|
| | | on AEMO's latest expectations and procurement activities.<br><br>The forward-looking reporting horizon will be defined by the lead time of the procurement, i.e.12 months into the future.<br><br>The **backward-looking** element of this report will include:<br>• Updated RERT costs and volumes<br>• The forecasts that indicated RERT intervention was required<br>• The impact on market reliability<br>• Periods of time when reserves were activated or dispatched<br>• Estimated cost of load shedding avoided as result of dispatch/activation of reserves<br>• Key requirements (as per clause 3.20.6(a) of the NER) including:<br>  • circumstances giving rise to need for dispatch or activation of reserves (this | |

| NATURE OF REPORT | SPECIFIC TIME FRAME | REPORT CONTENT | PROPOSED CHANGE FROM CURRENT ARRANGEMENTS |
|---|---|---|---|
| | | • should include the drivers of the forecast shortfall)<br>• how AEMO determined the latest time for dispatch or activation of reserves<br>• how AEMO determined a market response would not have avoided dispatch or activation of reserves<br>• change in dispatch outcomes due to dispatch or activation of reserves<br>• process implemented by AEMO to dispatch or activate reserves.<br>The final quarterly report for the financial year will also include a financial summary of the costs and finances of all RERT activities for the financial year. In addition it will specify each occasion AEMO intervened to secure reserves and dispatch/activate reserves in the financial year. | |
| Report shortly after RERT dispatch | As soon as possible following the | | As noted in section 9.1.1 above |

| NATURE OF REPORT | SPECIFIC TIME FRAME | REPORT CONTENT | PROPOSED CHANGE FROM CURRENT ARRANGEMENTS |
|---|---|---|---|
| | dispatch/activation of the RERT, and in any event, within five business days. | • Preliminarily estimated RERT costs (pre-activation and activation)<br>• Estimated volumes of reserves<br>• Estimated costs and volumes provided on regional basis. | AEMO is currently required to publish notices relating to the RERT e.g. intent to intervene.<br>The publication of a post-event report with estimated costs and volumes would represent a new requirement. |
| Methodology report | No set timeframe — updated as required | • Describes in detail the processes AEMO follows in procuring the RERT, including, if relevant, any models that AEMO uses to procure RERT and specifically how it determined the amount of reserves to procure. It will also specify the methodology used to determine appropriate term of a reserve contract. | This would form part of AEMO's RERT procedures.<br>Builds on existing requirement. |

### 9.4.1 Quarterly RERT report

The Commission considers current reporting requirements do not provide sufficient detail on:

- the procurement of emergency reserves, including expected costs and analysis of required reserve volumes — in advance of the activation/dispatch of the RERT
- the dispatch/activation of the RERT, including reasons why emergency reserves were used — in post-event reporting.

This view is supported by stakeholder submissions.

The Commission considers it appropriate that AEMO provide thorough detail on these two items in a comprehensive consolidated report that is published each quarter ("the quarterly RERT report"), specifically, no later than 30 business days after the end of each calendar quarter. The Commission notes that if for a particular quarter, there is no new information pertaining to the RERT (with respect to either the procurement or dispatch/activation of reserves) AEMO does not need to publish a report for that period.

#### 3.20.6 Reporting on RERT by AEMO

**RERT report**

(b) *AEMO* must:

(1) *publish* a report (**RERT report**) that includes the information at subparagraphs (d) to (f); and

(2) update the RERT report from time to time

in accordance with paragraph (c).

(c) *AEMO* must:

(1) *publish* the first RERT report on or before [date];

(2) *publish* any updated RERT report no later than 30 business days after the end of each calendar quarter; and

(3) maintain on its website a copy of the RERT report as updated.

**Reporting of expected RERT costs and analysis of required reserve volumes in advance of the activation/dispatch of emergency reserves**

The Commission acknowledges that AEMO's Summer 2018-19 Readiness Plan[419] provides useful detail on the volume of reserves procured in each region, but notes that information on expected RERT costs is lacking.[420]

419 available at: https://www.aemo.com.au/-/media/Files/Electricity/NEM/Security_and_Reliability/AEMO-2018-19-Summer-Readiness-Plan.pdf) .

420 The only commentary of expected costs provided for this coming summer in AEMO's latest 2018-19 Summer Readiness Plan was "The total cost is expected to be lower than last summer (this expectation is based on current understanding of resources made available to the market)." p. 15.

A number of stakeholders have advocated for the provision of indicative costs of expected RERT activities to improve transparency. The Commission considers it appropriate that AEMO is required to publish indicative costs of expected RERT actions, aggregated on a region and payment type basis (i.e. availability, pre-activation and activation). The Commission recognises AEMO should have a relatively accurate figure for availability costs once the RERT tender process is completed. Estimates of pre-activation and activation costs will be based on modelling outcomes. The forward-looking reporting horizon will be defined by the lead time of the procurement, i.e. 12 months into the future.

The Commission is cognisant that the actual activation/dispatch of emergency reserves is subject to a large degree of uncertainty and will depend on real-time system conditions and factors that vary over operational timeframes, such as local network conditions, weather conditions, generation availability (planned and unplanned outages), location of emergency reserve resources and availability of emergency reserves resources. Indeed, AEMO carries out reliability assessments on a weekly basis, which reflect the most recent update of the power system, at that point in time so as to provide more accurate information to the market. As a result, emergency reserve requirements for a future period of time is dynamic.

Notwithstanding these factors, AEMO in determining whether to procure emergency reserves in accordance with the procurement trigger (detailed in Chapter 5) models the system over long-notice and medium-notice timeframes and estimates of pre-activation and activation costs should be derived from this modelling, noting there may be a very wide variation in costs. However, the Commission still considers that this information would be helpful for stakeholders, noting that such estimates would in most instances not be reflective of what actually ends up occurring.

The above requirement may enable market customers (and potentially end users, such as large industrial users) to use indicative cost information to roughly estimate their expected emergency reserve costs by comparing projected emergency reserve costs and their forecast demand with the cost of previous RERT activations and the level of demand during periods of cost allocation. This would directly assist with their budgeting and could help to prevent "bill shock". Indicative costs may also assist with the cost recovery process for retailers, as emergency reserve cost estimates may inform decisions relating to cost pass through for large users and the setting of tariffs for small users.

The Commission considers a transparent process for procuring reserves is critical to promoting market understanding and confidence in the RERT mechanism. This was recognised by a number of stakeholders. To this end, the Commission considers it is appropriate to require AEMO to publish the analysis/modelling (including all assumptions, inputs and outcomes) used to assess reserve requirements (i.e. volumes) accompanied by detailed explanation of the circumstances that necessitate the expected RERT intervention. This analysis should clearly detail the periods in which emergency reserves are expected to be required.

Any decisions around whether AEMO is seeking new RERT Panel members that could be called upon or seeking tenders from the short- or medium-notice RERT panel, in conjunction with reserves procured under the long-notice RERT, will need to also be explained so that

market participants can understand the nature and reason behind the projected shortfall. AEMO should provide the term of any reserve contract.

The Commission considers the above information (expected costs and procured volumes) should be provided as part of a consolidated quarterly RERT report, which is updated every quarter based on the latest expected RERT procurement costs and contracted volumes, i.e. it is updated on a "rolling basis". For example, if after an initial RERT tender process is completed, market conditions change such that a greater supply shortfall is projected and AEMO tenders for more emergency reserves this will be captured in the next quarterly RERT report.[421]

To maintain consistency with existing arrangements, the way the reliability standard works and is operationalised, the Commission thinks that it remains appropriate to report total emergency reserve costs for each financial year. This does not preclude AEMO to also report costs covering other timeframes if they are relevant to market participants or if there are significant costs that have been incurred and that could be reported sooner than in a financial year basis.

Similarly, as discussed in chapter 7, the draft rule introduces: a payment guide for the RERT derived from the estimated load shedding VCR, and expressed in $/MWh for each financial year; as well as associated reporting requirements associated with this guide. These reporting requirements will be captured in the quarterly RERT reports. For more information refer to Chapter 7.

Publishing this report every quarter ensures the market receives the latest RERT volumes and projected costs in a timely manner. It also provides flexibility, which will be useful, if in the future emergency reserves are procured for periods outside the summer when the supply-demand balance has historically been the tightest in the mainland regions. If for a particular period, there was no use or procurement of emergency reserves in the preceding or upcoming period, or otherwise no further updates to any of the information AEMO is required to include in the report, then AEMO would not be required to publish the report.

The Commission considers that visibility of the analysis underpinning the procurement of emergency reserves would help market participants to better understand the circumstances and drivers for emergency reserve procurement, as well as potentially help them to better (more quickly) respond to avoid future RERT procurement.

The Commission notes these reporting requirements will be imposed in addition to existing reporting requirements.

### 3.20.6 Reporting on RERT by AEMO

#### Information to include in report- reserve contracts

421 The Commission recognises that as expected RERT costs are updated on a quarterly basis a situation may arise where if only a few RERT providers are contracted in a particular quarter, it may be possible to calculate the costs associated with an individual RERT provider (as AEMO may announce the counterparties of reserve contracts) by comparing against costs from the previous quarter. It is the Commission's view that is consistent with current arrangements whereby in some cases it is possible to determine costs associated with a particular RERT provider due to the timing of contract announcements and RERT events.

(d) The RERT report must, with respect to any *reserve contracts* entered into by *AEMO* include a detailed explanation of:

(1) the estimated maximum amount payable by *AEMO* under those *reserve contracts* for each *region*, broken down by payment type;

(2) *AEMO's* modelling, forecasts and analysis used to determine:

(i) whether to enter into those *reserve contracts*; and

(ii) the amount of *reserve* procured under those *reserve contracts*, including how those amounts were determined in accordance with the methodology specified in clause 3.20.7(e)(4), and where *AEMO* procured an amount of *reserves* greater than any shortfall identified in the relevant declaration under clause 4.8.4, an explanation of why a greater amount was procured;

(3) the periods in which the *reserves* are expected to be required to address the relevant *low reserve* or *lack of reserve* condition, including whether they align with any time periods identified in the relevant declaration under clause 4.8.4;

(4) the term of the *reserve contract*, including the basis on which *AEMO* considered the term to be reasonably necessary to address the relevant *low reserve* or *lack of reserve* condition; and

(5) the basis on which the estimated load shedding VCR was determined for the relevant *region* and applied for the purposes ofclause 3.20.3(m).

**Post event reporting reviewing the dispatch/activation of the RERT**

The Commission considers it appropriate that existing RERT event reports[422] be consolidated into a comprehensive report published on a quarterly basis, i.e. the quarterly RERT report as described above. As part of the quarterly RERT report, AEMO will review in detail any RERT events that occurred. The policy intent behind this report is that each activation/dispatch of emergency reserves is thoroughly reviewed and detailed within three months (i.e. one quarter) and that the reporting on any particular RERT event is updated if any additional information becomes available. The Commission also considers there is merit in imposing the stricter timeframe for the quarterly RERT reports (i.e. 30 business days after the end of the calendar quarter, replacing the current timing requirement of "as soon as practicable".

The Commission considers the quarterly RERT report should, therefore, include all the key content requirements of clause 3.20.6(a) for each RERT event namely:

- circumstances giving rise to need for dispatch or activation of reserves
- how AEMO determined the latest time for dispatch or activation of reserves

422 Currently required to be published by clause 3.20.6(a) of the NER

- how AEMO determined that a market response would not have avoided the need for the dispatch or activation of reserves
- change in dispatch outcomes due to dispatch or activation of reserves
- process implemented by AEMO to dispatch or activate reserves.

In addition, as largely recommended by Stanwell[423], for each RERT activation/dispatch this quarterly report should also detail:

- the forecasts and analysis that indicated RERT intervention was required
- the impact on market reliability
- verified RERT costs (expressed in $/MWh) and volumes, to the extent possible — including, the respective shares of RERT costs allocated to market customers[424]
- the estimated costs of load shedding (including an amount expressed in $/MWh) in a region avoided as a result of the dispatch or activation of reserves[425]
- periods of time when reserves were activated or dispatched.

The draft rule provides AEMO with the flexibility to structure the quarterly RERT report as appropriate.

While the Commission notes that NER requirements for power system operating incident reports[426] and direction reports[427] do not specify a specific timeframe (i.e. "as soon as reasonably practicable" in the case of directions reports), given the significant costs associated with the RERT and that timely reporting was a key concern for many stakeholders, the Commission considers it appropriate to place a time requirement on the completion of the RERT review report, i.e. within 30 business days of the end of a calendar quarter. This specific timeframe adds certainty and regularity to the reporting.

At present under clause 3.20.6(c) of the NER, AEMO is required to provide a report that includes (amongst other things) all the costs and finances in connection with its emergency reserve activities for the financial year. This requirement will be incorporated into the new arrangements by requiring the final quarterly RERT report for a financial year to include a financial summary of all RERT activities for that financial year. In addition, it will specify each occasion AEMO intervened to secure reserves and dispatch/activate reserves in the financial year.

A quarterly reporting time frame strikes an appropriate balance between timeliness and quality/quantity of information provided, as well the costs associated with the provision of information:

- Resulting in the timely provision of post event analysis that may allow lessons to be learned that may, for example, enhance the prospect of the appropriate amount of reserves being procured, or avoid unnecessary activations of emergency reserves.

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423 See Figure 1.1 above

424 This refers to the costs per individual market customers as opposed to the costs per *category* of market customers as required in clause 3.20.6(b)(2) of the NER.

425 For more information refer to Chapter 7.

426 See clause 4.8.15 of the NER

427 See clause 3.13.6A of the NER

- Providing AEMO the time to comprehensively explain each RERT event and verify the cost information provided.
- Providing stakeholders with more information in a more timely manner than under the status quo.

The Commission notes that while Stanwell suggested the forward and backward looking elements could be provided in separate reports with different timeframes, the Commission considers that a single consolidated report would reduce the administrative burden on AEMO, while still striking the right balance between timeliness, information provision and costs, as noted.

In the Commission's view a transparent, thoroughly-detailed procurement process would promote understanding of the RERT mechanism, and help to alleviate industry concerns that AEMO is purchasing excessive amounts of high cost reserves.[428]

The draft rule is that:

### 3.20.6 Reporting on RERT by AEMO

**Information to include in RERT report - dispatch or activation of reserves**

(e) The RERT report must, with respect to any *reservesdispatched* or *activated* under*reserve contracts*, include a detailed explanation of:

(1) the circumstances giving rise to the need for the *dispatch* of *scheduled reserves* or *activation* of *unscheduled reserves*, including the modelling, forecasts and analysis used by *AEMO* to determine the need for such *dispatch* or *activation* of *reserves*;

(2) the basis on which it determined the latest time for that *dispatch* of *scheduled reserves* or *activation* of *unscheduled reserves* and on what basis it determined that a market response would not have avoided the need for the *dispatch* of *scheduled reserves* or the *activation* of *unscheduled reserves*;

(3) the changes in *dispatch* outcomes due to the *dispatch* of *scheduled reserves* or *activation* of *unscheduled reserves*;

(4) the processes implemented by *AEMO* to *dispatch* the *scheduled reserves* or *activate* the *unscheduled reserves*,

(5) if applicable, reasons why *AEMO* did not follow any or all of the processes set out in rule 4.8 either in whole or in part prior to the *dispatch* of *scheduled reserves* or the *activation* of *unscheduled reserves*;

(6) if applicable, the basis upon which *AEMO* considered it impractical to set *spot prices* and *ancillary service prices* in accordance with clause 3.9.3(b);

428 Concerns expressed by AEC, EUAA and ERM Power (amongst others).

(7) the amount of *reserves* *dispatched* or *activated*, and if applicable, why such amounts were different to those previously forecast or modelled by *AEMO*;

(8) the periods of time in which *reserves* were *dispatched* or *activated*, and if applicable, why such periods were different to those previously forecast or modelled by *AEMO*;

(9) the estimated costs of *load shedding* (including an amount expressed in $/MWh) in a *region* avoided as a result of the *dispatch* or *activation* of *reserves*;

(10) the impact of the *dispatch* of *scheduled reserves* or *activation* of *unscheduled reserves* on:

(i) the reliability of *supply* into the *market*, or

(ii) where applicable, *power system security*

(f) Where *AEMO* has, in accordance with clause 3.15.9, included the amounts arising under a *reserve contract* in a *final statement* provided under clause 3.15.15, the RERT report must include a detailed explanation of:

(1) *AEMO's* costs associated with exercising the *RERT* (including an amount expressed in $/MWh), including the payments under the *reserve contract* for the relevant *billing periods*; and

(2) a breakdown of the recovery of those costs (expressed in $/MWh) from each *Market Customer*, as determined by *AEMO*, in each *region*.

**Information to include in RERT report - end of financial year**

(g) The first updated RERT report following the end of each financial year must, in addition to the requirements of paragraphs (d) and (e) specify:

(1) each occasion during the *financial year* on which it intervened to secure the availability of *reserves*;

(2) each occasion during the *financial year* when a *scheduled generating unit*, *scheduled network service* or *scheduled load* under a *scheduled reserve contract* was *dispatched* or *generating units* or *loads* under an *unscheduled reserve contract* were *activated*;

(3) its costs and finances in connection with its *RERT* activities during the *financial year* according to appropriate accounting standards including profit and loss, balance sheet, sources and applications of funds (including an amount expressed in $/MWh of *reserves* procured).

### 9.4.2 Report shortly after RERT dispatch

The Commission recognises the importance of the timely reporting of RERT costs, with the implications it has for the budgets of participants and end users. To this end, the Commission considers it appropriate that in addition to current requirements under the NER, AEMO

provides information to the market on total preliminarily estimated emergency reserve costs (pre-activation and activation) and volumes as soon as possible, and in any event, within five business days of a RERT event. The Commission expects this information would normally be provided within 48 hours, but notes that RERT events may occur on weekends or public holidays[429] and hence considers that five business days is an appropriate timeframe. This would be new information provided to the market, compared to current arrangements.

Costs will be broken down on a regional basis, such that participants in individual regions can have indication of the costs for which they are liable.

This requirement is consistent with stakeholder feedback. The Commission notes there is international precedence for the quick provision of non-validated data relating to the activation of strategic reserves.[430]

### 3.20.6 Reporting on RERT by AEMO

**Post-dispatch or activation report**

(a) If *AEMO dispatches* or *activates reserves*, then *AEMO* must, as soon as practicable, and in any event no later than 5 business days thereafter, *publish* and make available on its website a report that includes details of:

(1) the total estimated payments made under *reserve contracts*; and

(2) the total estimated volume (in MWh) of *reserves dispatched* or *activated* under *reserve contracts*,

for the relevant *region*.

## 9.4.3 Methodology report

To promote understanding of, and confidence in AEMO's use of the RERT, the draft rule requires AEMO to clearly set out and maintain its methodology for the procurement of emergency reserves. This will describe in detail the processes followed by AEMO in procuring the RERT. Specifically, the report will set out how AEMO determines the amount of reserves to procure, for more information refer to Chapter 5. The methodology report will also specify how AEMO determines the appropriate term of a reserve contract, for more information refer to Chapter 6. The methodology report will form part of AEMO's RERT procedures. The methodology will need to be updated as required, via the same consultation process required for AEMO's RERT procedures, i.e. the rules consultation process.

### 3.20.7 AEMO's exercise of the RERT

(e) *AEMO* must develop, *publish*, and may amend from time to time, in accordance with the *Rules consultation procedures*, procedures for the exercise of the *RERT* under this rule 3.20 that take into account the *RERT principles* and *RERT*

429 I.e. periods when AEMO may have fewer internal resources available

430 For example in Belgium, data on the volumes of strategic reserve required and its impact on prices is provided within 15 minutes of a reserve activation, see Box 28 above.

*guidelines*. These procedures must include:

...

(2) a methodology to be used by *AEMO* to determine the appropriate term of a *reserve contract* and the amount of *reserves* to procure in accordance with clause 3.20.3(l);

### 9.4.4 Who needs RERT information?

The Commission considers that all RERT- related information and reports should be publicly available given the cost of the RERT is passed through to energy consumers, the level of public interest in the RERT and system reliability generally. The draft rule amends the NER to allow this to occur. [431]

The Commission notes that some stakeholders (for example, AEC[432] and Snowy Hydro[433] ) have asserted that the characteristics and costs of individual providers should be publicly provided. The Commission is cognisant that there may be potential confidentiality concerns associated with providing this information. In light of the significant improvements to transparency that will likely be achieved via increased reporting requirements (e.g. quarterly RERT report) the Commission is not convinced that any additional benefit gained from the publication of the characteristics and costs of individual providers would outweigh confidentiality concerns. If stakeholders consider information on individual providers should be provided, the Commission encourages stakeholders to express this in their submissions to the draft determination.

As per Meridian's suggestion[434], the Commission will consider revising the terms of reference for the Reliability Panel's AMPR to explicitly require the Panel to detail any lessons learned from RERT events as well as reflect on costs of RERT activities. The Commission notes that given the wide readership of the AMPR this may help to reach and educate a broader public audience on emergency reserves.

For comparison, an international case study is provided in Box 28. The Commission considers the Belgian strategic reserve to be a good example of a transparent strategic reserve mechanism and has used it to guide its thinking.

#### BOX 28: INTERNATIONAL CASE STUDY – BELGIAN'S STRATEGIC RESERVE

The Belgian government introduced a strategic reserve mechanism to its energy-only electricity market in 2014. Elia (the Belgian system operator) was tasked with organising the mechanism and acquiring a strategic reserve to cover the risk of "structural shortages" during

431 The reporting requirements under clause 3.20.6 currently only require such reports to be made available to registered participants electronically.

432 AEC submission to the consultation paper, p. 9.

433 Snowy Hydro submission to the consultation paper, p. 12.

434 Meridian submission to the consultation paper, p. 6.

winter.

Elia's probabilistic analysis of Belgium's supply adequacy for the following winter that is provided to the Minister is also published. Elia outlines the modelling methodology (including all underlying assumptions) and provides its recommendation on the volume of reserves expected to be required.

Elia informs market players about the stages of a current activation and their impact on the indicators used to set prices for offsetting quarter-hourly imbalances. This publication takes place 15 minutes after real time using non-validated information, and 15 days after the month concerned using validated information.

For the duration of the strategic reserve activation, market participants will have the following information all of which is available via Elia's website, http://www.elia.be/:

- The 'RSS feed' sends updates about a detection of a reserve trigger, but also about different states and volumes during activation as soon as this information is known and gets communicated to the supplier involved. Each visitor can subscribe to receive these updates.
- The page 'Activation status' contains real time information about the current status of strategic reserve — both day-ahead and intraday. This information contains information about the activated trigger, the current status of activation and the volumes reflecting the need of strategic reserve. This information becomes visible from the moment the status/trigger is active.
- The page 'Using regulation capacity' shows the strategic reserve volume activated by Elia in the control area and other balancing resources that were activated during that quarter-hour.
- The page 'Available regulation capacity' shows the instantaneous projection of the volumes that can be activated to offset the imbalances and the marginal prices corresponding to their activation on the basis of nominations.
- On the page 'Imbalance prices', the system imbalance, the net regulation volume and the corresponding imbalance price can be consulted. An indication when there is a strategic reserve need and the evolution of the imbalance of the system also can be found on this page.
- The page 'SR capacity' presents the available strategic reserve generation capacity that can be sold in day ahead, as well as the effective volume sold.
- The page 'Delivery tests' shows the executed tests for strategic reserve suppliers, as well as the maximal power and the period of the test.
- A 'User manual', explains the location of the ELIA website where the necessary information with regards to the mechanism of strategic reserve can be found.

Source: The information presented in this case study is drawn from the following source: Elia, 2017, *The strategic reserve – a mechanism to cover structural shortages*, http://www.elia.be/~/media/files/Elia/Products-and-services/Strategic-Reserve/E9_E_WEB%20_29_11_16_comments3.pdf.

Note: In July 2018 Belgium's government approved the introduction of a new capacity market mechanism, with auctions to take place in 2021, https://www.montelnews.com/en/story/belgium-prepares-to-subsidise-new-gas-plants-/919874.

Note: The 'structural shortage' is calculated on the basis of the Loss of Load Expectation (LOLE), i.e. a statistical calculation used to determine the anticipated number of hours during which it will not be possible for all generation resources available to the Belgian power grid to cover the load, taking account of interconnections, for a statistically normal year.

Note: The latest supply adequacy assessment can be accessed: http://www.elia.be/~/media/files/Elia/Products-and-services/Strategic-Reserve/171129_ELIA%20AR-Winter_UK.pdf.

# 10 DISPATCH TRIGGER AND STANDARDISATION OF PRODUCTS

This chapter considers the following issues:

- dispatch trigger, i.e. when and how AEMO dispatches Reliability and Emergency Reserve Trader (RERT or emergency reserves) once RERT has been procured
- standardisation of RERT products, including prescription of emergency reserve products and two specific product design features, namely, notification lead time and eligible technologies.

For each of these issues, the chapter outlines:

- current arrangements in the NEM
- AEMO's views
- stakeholders' views
- the Commission's analysis and conclusions.

## 10.1 Dispatch trigger

The dispatch trigger refers to the decision to dispatch or activate reserves[435] This decision occurs close to real time, i.e. based on the impending occurrence of a forecast shortfall or power system security event.

### 10.1.1 Current arrangements

There are a number of steps that AEMO must take before it dispatches emergency reserves, which means that in practice, AEMO cannot wait until the very last minute to dispatch emergency reserves. These steps are discussed next.

Under the NER, AEMO must first determine the latest time for exercising the RERT, and publish a notice of any foreseeable circumstances that may require implementation of the RERT.[436]

Once such time has arrived, the NER state that AEMO may dispatch reserves to ensure that the reliability of supply meets the reliability standard, and where practicable, to maintain power system security.[437] AEMO must also take into account the Panel's RERT guidelines before dispatching the RERT.[438]

Section 4.2 of the current RERT guidelines state that AEMO may monitor the outcome of short-term PASA, the pre-dispatch schedule in terms of availability of reserves and any other information it considers relevant when deciding whether or not to dispatch RERT.[439]

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435 The term dispatch in the NER only applies to scheduled reserves. Activation applies to unscheduled reserves. Theyare used interchangeably in this determination.

436 Clause 4.8.5A and clause 4.8.5B of the NER.

437 Clause 3.20.7(a) of the NER.

438 Clause 3.20.7(f) of the NER.

439 The Panel will be reviewing the RERT guidelines post this rule being made as discussed further in Chapter 11.

In practice, the trigger for dispatching the RERT is how AEMO operationalises the reliability standard over the short term, i.e. through the lack of reserve declaration framework, as discussed in Chapter 4. Specifically, AEMO dispatches emergency reserves following a forecast LOR2, actual LOR2 or for very fast reserves, it may wait until an LOR3. To date, there have only been two instances of emergency reserves activations - in both instances, RERT was activated based on forecast LOR2s - see Box 30 for more information on the second event and the consultation paper provides a summary of the events.[440]

In addition to this, the NER specify a particular sequence of events when it comes to interventions during supply scarcity, namely that AEMO should use its reasonable endeavours to: first dispatch all valid bids and offers, then exercise emergency reserves (both subject to "any adjustments which may be necessary to implement action under paragraph (c)"[441]and "any plant operating restrictions associated with a relevant AEMO intervention event"), and finally, issue directions and clause 4.8.9 instructions. [442]

The Commission notes that this specified sequence of events, as well as how the market is priced once the emergency reserves are dispatched, are outside of the scope of this rule change request, but will be examined as part of the *System Strength and Intervention Mechanisms in the NEM* project which will be initiated by the Commission shortly.

### 10.1.2 AEMO's views

In its high-level design attached to the rule change request, AEMO did not propose any changes to the current dispatch trigger framework. It noted that it would continue to dispatch reserves as it is currently does i.e.:[443]

- in response to an LOR2 or LOR3 condition
- to make sure that the system remains secure, if activating reserves is lower cost than directions.

AEMO did not comment on this aspect of the rule change in submissions to the consultation paper or the options paper.

### 10.1.3 Stakeholders' views

Few stakeholders have commented on this aspect. EUAA and BlueScope stated that they saw no reason to change the current framework.[444]

A number of stakeholders raised the following concerns which are related to the dispatch trigger and how RERT is operationalised over the short term:[445]

- Emergency reserves are dispatched following an LOR2 that is not alleviated by a market response, taking into account the reserve activation lead time. In other words, it is based

440 See p. 16 of the consultation paper https://www.aemc.gov.au/sites/default/files/2018-06/Consultation%20paper_0.pdf
441 Paragraph (c) states "any further corrective actions required are implemented in accordance with clauses 4.8.5B and 4.8.9."
442 Clause 3.8.14 of the NER
443 AEMO, Enhanced RERT - high level design proposal, Enhancement to the RERT rule change request, p.15
444 EUAA and BlueScope: submissions to consultation paper.
445 Flow Power, Snowy Hydro, ERM Power and Origin: submissions to consultation paper.

on a forecast supply shortfall and often activated before the forecast shortfall is meant to occur, meaning that emergency reserves are activated before an actual need is present, which is problematic if the forecast shortfall then does not occur.

- Retailers tend to dispatch demand response based on high prices. While a forecast tight demand and supply balance suggests high prices, in the case of the RERT, spot prices are not always high during the entirety of an activation, even with intervention pricing in place.

### 10.1.4 Commission's analysis and conclusions

**BOX 29: DRAFT RULE**

There are no changes to the NER in relation to what triggers the RERT being dispatched with respect to reliability and power system security, other than a minor clarification. (A minor change has been made to Clause 3.20.7(a) of the NER which clarifies that reserves may be dispatched for reliability *or* power system security. The previous drafting stated that reserves may be dispatched for reliability *and* power system security.)

Therefore, AEMO continues to have the discretion as to how to trigger the dispatch of the RERT based on how it operationalises the reliability standard through the *reliability standard implementation guidelines,* and guided by the Panel's RERT guidelines.

The draft rule does however introduce and enhance reporting requirements with respect to dispatch.

Based on feedback received from stakeholders and further analysis, the Commission is of the view that the concerns raised with respect to the dispatch trigger are primarily associated with either:

- the limitations of the nature and purpose of the RERT framework (i.e. a last resort mechanism only to be used once the market has failed to meet the reliability standard)
- broader forecasting processes - which are out of scope of this rule change request.[446]

As a result, there are no changes to the draft rule with respect to the dispatch trigger. Under the draft rule, AEMO continues to be able to dispatch or activate emergency reserves to ensure that the reliability of supply in a region or regions meets the reliability standard or, where practicable, to maintain power system security.[447] The Reliability Panel may continue, as it currently does, to provide additional guidance on the dispatch/activation of RERT in its RERT guidelines.

Power system security is discussed in more detail in chapter 5.

446 The Commission, however, examined forecasting as part of its Reliability Frameworks Review which concluded in 2018. Recommendations in relation to forecasting are being progressed.

447 Clause 3.20.7 (a) of the draft rule, which is unchanged from the current rules, apart from the clarification noted in the footnote in Box 29.

Finally, enhancements to reporting requirements through the draft rule, as discussed in chapter 9, would also help improve transparency around the decisions that AEMO makes when it decides to dispatch RERT. Of particular importance to the dispatch trigger and process for dispatching/activating emergency reserves, the draft rule enhances existing reporting requirements with respect to dispatch/activation of emergency reserves including by requiring AEMO to provide:

- A detailed explanation of why it dispatched emergency reserves, including any modelling, forecasts and analysis used.
- If applicable, reasons why: the amount of emergency reserves that were dispatched or activated; or the periods in which the reserves were dispatched or activated was not in accordance with AEMO's forecasts or modelling.
- The impact that dispatching emergency reserves has on the reliability of supply into the market or on power system security (where applicable).

The relevant draft rules are:

### 3.20.6 Reporting on RERT by AEMO

**Information to include in RERT report – dispatch or activation of reserves**

...

(e) The RERT report must, with respect to any *reserves dispatched* or *activated* under *reserve contracts*, include a detailed explanation of:

(1) the circumstances giving rise to the need for the *dispatch* of *scheduled reserves* or *activation* of *unscheduled reserves*, including the modelling, forecasts and analysis used by *AEMO* to determine the need for such *dispatch* or *activation* of *reserves*;

...

(7) the amount of *reservesdispatched* or *activated*, and if applicable, why such amounts were different to those previously forecast or modelled by *AEMO*;

(8) the periods in which *reserves* were *dispatched* or *activated*, and if applicable, why such periods were different to those previously forecast or modelled by *AEMO*;

...

(10) the impact of the *dispatch* of *scheduled reserves* or *activation* of *unscheduled reserves* on: (i) the reliability of *supply* into the *market*; or (ii) where applicable, *power system security*.

**Nature of the RERT**

The RERT is an out-of-market, last resort mechanism. As a result, emergency reserves typically have a pre-activation (getting ready to be called upon, which usually occurs about 20+ hours ahead of a shortfall) and activation lead time (getting ready to be dispatched), as

well as deactivation lead times (ramping down to zero or ramping up in the case of demand response). AEMO tends to dispatch emergency reserves based on a forecast LOR2, rather than waiting for an actual LOR2 or an LOR3 to occur partly due to reserves being unscheduled (for the most part) and having the requirements that were described above around pre-activation and de-activation.

At the time of a forecast LOR2, prices are generally forecast to be high, approaching or at MPC, for the dispatch intervals to which the LOR2 relates. However, forecast prices, and indeed actual prices, may not be high for the entirety of the RERT activation event, as shown in Box 30.

### BOX 30: PRICES DURING THE 19 JANUARY 2018 ACTIVATION EVENT

On 19 January 2018, AEMO activated emergency reserves for six hours.

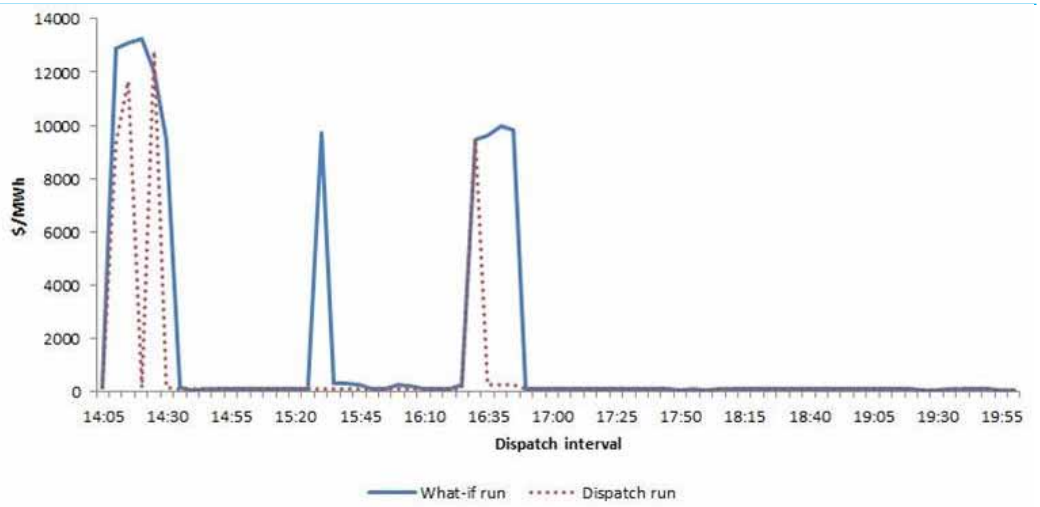
During a RERT event, AEMO prices the market through what is known as intervention pricing or 'what-if' pricing. Intervention pricing aims to restore market signals by ignoring the effect of the intervention on the demand and supply balance. It aims to simulate the counterfactual of how the market would have been prices had the intervention not occurred.

The what-if pricing run in the figure below shows how the market was priced on the 19th of January - these prices would be expected to be high due to the tight demand-supply balance as the what-if run ignores the effect of dispatching RERT (i.e. it assumes the demand and supply balance remained tight).

The dispatch run shows what prices were, including the effect of dispatching emergency reserves. These prices would be expected to be lower as dispatching RERT reduces demand typically (or may increase supply).

Prices were higher in the what-if run on a number of occasions but not consistently high throughout the intervention event.

**Figure 10.1: Prices on 19 January**




Source: AEMC analysis based on MMS data

It could be implied from the chart that the emergency reserves were not needed for the entirety of the intervention event (as consistently high prices would be expected in the what-if run if the RERT had been needed for the entire six hours) – however, this was likely known by AEMO, with reserves dispatched for longer than strictly required due to minimum running times specified in contracts, as well as limitations such as activation lead times. These imperfections associated with the use of the RERT are likely unavoidable given the nature and limitations associated with out-of-market reserves, and procuring reserves ahead of real time when perfect information is known.

This means that energy dispatched/activated under RERT is not the same as avoided load shedding (i.e. what the counterfactual would have been had the emergency reserves not been activated).

Note: There are two runs when RERT is dispatched for the purpose of intervention pricing. The what-if run clears the market as if the intervention had not occurred and sets the price. The dispatch run clears the market taking into account the intervention and sets the quantity.

The Commission notes that the LOR framework is how AEMO operationalises the reliability standard in the short term and the LOR2 trigger for RERT is part of AEMO's RERT procedures. As noted, AEMO may wait until closer to real time to dispatch reserves - one of its obligations is to determine the latest time by which it will intervene. This obligation exists not only for transparency purposes, but it also exists for practical reasons because AEMO has to consider lead times and minimum run times, including potentially differing ones based on each contract.

The Commission notes that AEMO intends to standardise RERT products, including introducing three products with different notification lead time (i.e. the time the product needs ahead of an activation): a 10-minute product, a 60-minute one and a 24-hour product.

The ARENA RERT trial is currently trialling the first two types of products. Products with short "notification" or "activation" or "pre-activation" lead times are likely to allow AEMO to act closer to real time. Notification lead times are discussed in more detail in section 10.2. The Commission encourages AEMO to continue to explore those types of products, particularly those with very short lead times in order to minimise the limitations of the RERT framework. Clearly, however, a trade off must be made if flexible resources with very short lead times are also more expensive.

The Commission also encourages AEMO to continue to choose the latest possible time by which to intervene to be as close to real time as possible, in order to minimise intervening too early, before market participants have had a chance to respond or in case demand conditions do not eventuate as forecast.

**Broader forecasting processes**

To the extent that stakeholders are concerned about the forecasting processes themselves, particularly the difference between their own forecasts and expectations and that of AEMO's, the Commission notes that this is outside of the scope of this rule change. However, the Commission recently made recommendations with respect to this issue in its *Reliability Frameworks Review*. The Commission recommended that the AER submit a number of rule changes to improve the transparency of the methodology associated with AEMO's forecasts.

## 10.2 Standardisation of products

In its rule change request, AEMO included a proposal to standardise RERT products.

### 10.2.1 Current arrangements

**Standardisation and prescription in the NER**

The NER do not provide any specific provisions for the types of products that may participate in the RERT. The NER only state that there may be two types, scheduled and unscheduled reserve products. At present, products are bespoke based on tenders obtained by AEMO, and given effect by bilaterally negotiated contracts.

**Specific design feature - notification lead time**

Notification lead time refers to the length of time a particular RERT provider needs before it can have a RERT product ready for dispatch. For example, a 10-minute product would require 10 minutes' notice in order to be ready for dispatch. There is no prescription around this in the NER.

RERT products are bespoke and subject to negotiated contracts between RERT providers and AEMO. There is no publicly available information on what notification periods exist in existing and historic RERT contracts, although AEMO's RERT event report into the 19 January 2018 activation notes that it pre-activated a reserve contract a day before the shortfall, indicating that it has at least one product with a lead time of more than 20+ hours.[448]

448 See http://aemo.com.au/Electricity/National-Electricity-Market-NEM/Security-and-reliability/Summer-operations-report

However, the ARENA RERT trial is currently trialling a 10-minute and a 60-minute product.

**Specific design feature - eligible technologies**

The RERT is technologically neutral and there is no prescription in the NER with respect to this aspect of the RERT. The Commission understands that, to date, emergency reserve contracts have primarily included demand response, diesel generators and network response, noting that the out-of-market requirements may have an impact on the types of technologies that may be offered into RERT, to some extent.

### 10.2.2 AEMO's views

**Standardisation**

As stated by AEMO in its rule change request, AEMO may choose to standardise products or offer standardised contacts under the NER - AEMO does not require a rule change to do so.[449]

Based on the lessons to date from the ARENA-AEMO trial and other consultation, AEMO developed product specifications for its proposed standardisation of products. It should be noted that AEMO has stated that in the first instance, it intends to allow non-conforming offers to submit tenders to the process, effectively allowing for semi-standardisation of products.[450]

The key design specifications identified by AEMO in its high-level design are:[451]

- time periods: this refers to the time periods for which AEMO will seek to procure reserves to be available, e.g. in summer from 12pm to 4pm on business days
- notification periods: this identifies the lead time required before activation of a reserve product e.g. a 10-minute product would mean that reserves would need to be ready to respond in 10 minutes, as discussed below
- length of contracts: this refers to the contract duration, as discussed in Chapter 6
- eligible technologies: this would identify the technologies that may offer reserves, as discussed below
- out-of-market provisions : this would ensure that offered reserves are in addition to any market response, i.e. that they are not otherwise available to the market, as discussed in Chapter 7
- measuring the response offered: this would set the baseline methodology which would be used to measure the volume of response in the case of demand response
- testing: this would set the testing requirement, e.g. in the case of demand response, providers would need to show that demand is able to be curtailed, say, twice a year.

449 AEMO, Enhancement to the RERT, rule change request, p.8
450 Ibid. p. 18.
451 Ibid. pp 17-31.

#### Prescription in the NER

AEMO did not propose for standardisation to be prescribed in the NER in its rule change request, noting that some aspects of the high-level design are already part of the NER, namely, the out-of-market provisions. Length of contracts is not explicitly part of the NER but is limited by the procurement lead time, as discussed in Chapter 6.

#### Specific design feature - notification lead time

AEMO proposed a 10 and 60 minute lead time, as well as a 24 hour one in its high-level design. AEMO did not propose that this be prescribed in the NER.

#### Specific design feature - eligible technologies

In its high-level design, AEMO proposed to specify examples of technologies that would be eligible to participate in the RERT, but other technologies may be eligible with approval from AEMO.[452] The example technologies include demand response (industrial, commercial, aggregated), and distributed energy resources, energy storage (e.g. batteries).[453]

AEMO did not propose that this be prescribed in the NER.

### 10.2.3 Stakeholders' views

While AEMO is able to develop standardised products without a rule change, the Commission sought stakeholder views on standardisation of products in its consultation paper, including whether governance arrangements around the standardisation of reserves should be contained within the NER, and sought feedback on two key design features - notification lead time and eligible technologies. These are discussed next.

#### Standardisation

Snowy Hydro explicitly opposed AEMO's proposal to standardise products.[454] AEC raised concerns around the potential to limit out-of-market providers due to standardisation.[455]

However, most stakeholders responding to this aspect of the rule change supported standardisation in principle.[456] A number of stakeholders,[457] while supporting standardisation in principle, raised concerns around the potential for standardisation to restrict the number of RERT providers or lead to inefficient outcomes.

In its submission to the options paper, Enel X supported product standardisation as a means to reduce contracting complexity, noting however that care should be taken to make sure that the products are standardised in a technology-neutral way, or in a way that recognises the capabilities and characteristics of different reserves.[458]

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452 Ibid. p. 22.

453 Ibid.

454 Snowy Hydro, submission to consultation paper, p. 12.

455 AEC, submission to consultation paper, p. 9.

456 EEC, MEU, Flow Power, BlueScope, ENA, EA, Meridian, TransGrid, EUAA, CitiPower, EnerNOC and Origin: submissions to consultation paper.

457 MEU, EUAA, Origin, EA, Meridian: submission to consultation paper

458 Enel X, submission to options paper, p. 5.

### Prescription in the NER

There was almost no support for prescription in the NER from the few stakeholders that commented on this aspect:

- ENA stated that specifications should be in a guidelines so as to allow innovative offers.[459]
- Meridian suggested that there may be value in some product specifications being in the RERT guidelines (but not in the NER).[460]
- EUAA suggested that there might be benefit in product specifications being in the NER but only so far as it does not restrict flexibility.[461]

### Specific design feature - notification lead time

Some stakeholders supported AEMO's proposal or noted that AEMO is best placed to decide what the appropriate lead time is.[462]

EnerNOC (now known as Enel X) supported AEMO's proposal but noted its concerns around the distortionary effects of the 24-hour notification product.[463] EnergyAustralia's concerns were similar to EnerNOC's, noting that it could lock in a significant cost to the market without the forecast conditions eventuating.[464]

### Specific design feature - eligible technologies

In the consultation paper, the Commission sought stakeholder views on whether the RERT should be restricted to certain types of technologies. For example, in some overseas jurisdictions, the equivalent of the RERT is limited to demand response or demand response and distributed energy resources. Furthermore, the Commission sought views on whether it is appropriate that networks can provide voltage reduction services as demand response into the RERT.

Most stakeholders supported a technologically neutral approach.[465]

A number of stakeholders commented on networks providing demand response, especially through voltage reduction:

- ENA stated that it is important that demand response resources which do not otherwise respond to wholesale market price signals can participate in RERT.[466]
- AEC noted that a better approach is to refer this matter to the AER and its ring-fencing arrangements surrounding the separation of prescribed and competitive services.[467]

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459 ENA, submission to consultation paper, p. 5.
460 Meridian, submission to consultation paper, p. 5.
461 EUAA, submission to consultation paper, p. 6.
462 Flow Power, BlueScope, ENA and EUAA: submissions to consultation paper
463 EnerNOC, submission to consultation paper, p. 1.
464 EnergyAustralia, submission to consultation paper, p. 5.
465 Flow Power, BlueScope, ENA, Snowy Hydro, Meridian, EUAA, CitiPower Powercor & United and Origin: submissions to consultation paper.
466 ENA, submission to consultation paper, p. 5.
467 AEC, submission to consultation paper, p. 10.

- Meridian stated that the use of voltage reduction has the potential to create adverse impacts for consumers and additional costs.[468]
- CitiPower Powercor & United stated that its provision of RERT is consistent with its ring fencing[469] obligations.[470]

In its submission to the options paper, the Energy Efficiency Council stated that electricity networks are monopolies providing an essential service, and should be expected to provide emergency capacity as part of their contract.[471]

### 10.2.4 Commission's analysis and conclusions

**BOX 31: DRAFT RULE**

The draft rule does not introduce prescription in the NER with respect to a high-level framework for standardised products or for specific design features.

The draft rule does make changes to two product features, namely by introducing a payment guide and clarifying the out-of-market provisions, as discussed in chapter 7.

The draft rule also introduces a new reporting requirement requiring AEMO to publish its standardised emergency reserve contract terms and conditions should it wish to standardise emergency reserve products.

#### Standardisation

The Commission considers that product standardisation for emergency reserves has the following benefits:

- It simplifies the procurement process, making it easier for AEMO to compare different RERT offers.
- It improves transparency for stakeholders as well as reserve providers. At present, AEMO is comparing vastly different products and stakeholders do not have visibility of how AEMO decides between those products.
- It also provides more certainty as to when AEMO will intervene - for example, if there is a 60-minute product (given effect through the standardised terms and conditions), market participants would have more certainty that AEMO would intervene 60 minutes before the projected shortfall and therefore the market would be able to respond until then.

In other words, implementing standardised products would make it easier for AEMO to manage reserve contracts. AEMO would implement these standardised products through introducing standard contractual terms and conditions. It improves efficiency of the RERT procurement process by making it easier for AEMO to compare the different tenders. This is

468 Meridian, submission to consultation paper, p. 5.

469 Ring-fencing refers to the separation of monopoly services and contestable services where a regulated business also offers services into a competitive market.

470 CitiPower Powercor & United, submission to consultation paper, p. 1.

471 EEC, submission to options paper, p. 3.

likely to drive down costs for consumers as well, in the event that the RERT is needed, as it will be far easier for AEMO to "rank" contracts and identify lowest-cost contracts. Standardised products also make it clearer for any interested party to understand exactly what RERT products are, providing additional information to the market in terms of the RERT process.

However, standardised products may limit the number of potential RERT providers if the design features are too restrictive or narrow, which could therefore lead to higher procurement costs. Particular design features may suit particular types of technologies and not others. Products with specifications that are too restrictive may exclude innovative offers.

On balance, the Commission considers that product standardisation is appropriate and the benefits of product standardisation would outweigh the costs if designed properly. The Commission therefore encourages AEMO to continue to take on board lessons from the ARENA RERT trial when designing emergency reserve products, including by allowing for variations as it noted its rule change request so as not to restrict the RERT participation to only a few providers.

**Prescription - high-level framework in the NER**

Having concluded that standardisation of RERT products is appropriate, the Commission, however, does not consider that prescription around a high-level framework for standardised products in the NER would be helpful.

This is because the Commission considers that AEMO is best placed to make product standardisation decisions based on its understanding of RERT products that exist and its own system requirements, as those may change over time. AEMO already has to comply with high-level principles (the RERT principles) such as minimising market distortions. A high-level framework for standardised products would be unlikely to be significantly different from these existing principles.

The draft rule, therefore, does not introduce more prescription in the NER in terms of a high-level framework for standardised products.

The draft rule introduces a requirement for AEMO to publish standard terms and conditions should it wish to standardise products. This is so that the benefits of standardised products would only accrue to the entire market and any interested party if the standard terms and conditions (i.e. the product design features) are known to everyone, through its website.

Specifically, the draft rule is:

### 3.20.7 AEMO's exercise of the RERT

...

(e1) If *AEMO* develops standardised forms of *reserve contracts*, it:

(1) must *publish* and maintain on its website a document that specifies the standard terms, conditions and specifications for each type of *reserve contract*, including permitted variations from those standard terms,

conditions and specifications; and

(2) may amend such document from time to time.

The Commission considers that this would provide the information that market participants and potential emergency reserve providers need in order to make the best decision that they can.

**Prescription - Specific design features**

Generally speaking, the Commission considers that it would also be inappropriately restrictive to embed design features in the NER – it would undermine flexibility and lead to inefficient outcomes. This applies to notification lead time and eligible technologies, discussed next.

The exceptions to this relate to payment structure, which is discussed in chapter 7 as well as out-of-market provisions, discussed in the same chapter. In both of these cases, the Commission considers some prescription is warranted due to cost issues, as discussed in that chapter.

***Notification lead time***

The shorter the notification period or notification lead time, the more time the market has to respond to a shortfall, and the less chance that emergency reserves are unnecessarily dispatched due to changing forecasts. A shorter notification period also means that AEMO is able to use such reserves for unexpected or sudden shortfalls that were not previously forecast.

As noted in the consultation paper, on the other hand, some reserve products require a long notification period, including potentially some industrial loads or behavioural-based demand response,[472] in order to be able to offer their products into the RERT.[473]

On balance, the Commission considers that prescribing notification lead times for products would be restrictive and may limit the number of providers participating in the RERT. As a result, the draft rule does not introduce any prescription with respect to notification lead time.

However, the Commission acknowledges stakeholders' concerns regarding the potential costs of products with long notification lead times. These concerns are being addressed through:

- The payment structure aspect of the RERT, whereby the draft rule introduces a payment guide which would address the cost concerns associated with the 24-hour product, as discussed in chapter 7.
- Enhanced reporting requirements, whereby the draft rule requires AEMO to explain its procurement and dispatch decisions, as well costs of the RERT, in more detail.

The Commission also notes that AEMO is required to comply with the RERT principles when exercising RERT, i.e. AEMO is required to minimise costs.

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472 This generally means that consumers change their behaviour in response to a signal to do so, as opposed to demand response that can be remotely controlled and "automatically" deployed.

473 AEMO, Enhanced RERT - high level design proposal, Enhancement to the RERT rule change request, p.6

***Eligible technologies***

The Commission considers that prescription is not required with respect to eligible technologies.

As with most other design features, it is best left to AEMO and the tender process to determine which technologies would be best to participate in the RERT, noting that the NEM is in a period of rapid technology change and technologically neutral approaches tend to work best, rather than picking winners.

With respect to distribution network service providers (DNSPs) providing demand response through voltage reduction, stakeholders have raised concerns around potential ringfencing breaches.[474] However, the Commission considers that this is a matter for the AER rather than for this rule change. Notably, the AER is able to classify RERT services through its distribution service classification processes and then apply its ringfencing obligations to those services based on their classification.

Most recently, in September 2018, the AER published its final decision on the Distribution Service Classification Guidelines and Asset Exemption Guideline. The AER concluded that RERT services are not to be listed or classified in the baseline services list.[475] This means that the RERT is an unregulated service operating in a contestable market, and therefore, DNSPs would need to comply with its ringfencing obligations in order to participate in the RERT, or seek a ringfencing waiver. Otherwise, they would be in breach of its ringfencing arrangements.

The AER also noted that issues in relation to the RERT will be addressed on a case-by-case basis through the framework & approach process and through regulatory determination processes if relevant and if raised.

474 Ringfencing obligations addresses the risk that a network service provider will cross-subsidise non-distribution services with regulated revenue earned from the provision of distribution services. For example, using its regulated revenue to gain an advantage in the provision of RERT services. Stakeholders expressed concerns that providing RERT services would be in breach of this.

475 See https://www.aer.gov.au/system/files/AER%20-%20Explanatory%20Statement%20-%20Distribution%20Service%20Classification%20Guideline%20-%2028%20September%202018.pdf

# 11 IMPLEMENTATION

This chapter sets out the proposed steps and timetable for implementing the final rule, including the interim steps that will need to be taken by AEMO and the Reliability Panel.[476] The chapter also discusses transitional rules.

The substantive parts of the rule, if made, would commence on **31 October 2019.** This will allow AEMO to procure reserves under this new framework for the 2019-20 summer. The final rule would also contain transitional clauses, commencing on the date the rule is made.

## 11.1 Documents requiring revision if the rule is made

In terms of process, for the final rule to commence two key documents will need to be revised:

- first, the Panel will need to update its RERT guidelines
- then, once the Panel has updated its guidelines, AEMO will need to update its RERT procedures.

The Commission notes that AEMO did not comment on implementation and time frames in its rule change request, but understands that it wants the enhanced RERT (as proposed by AEMO) in place for summer 2019-20. The Commission did not directly consult on the implementation of the rule in either its consultation paper or options paper. As such, stakeholders did not discuss the implementation of the rule in their submissions.

In determining an appropriate commencement date the Commission considered:

- The time frames required by the Panel and AEMO to review required documents, i.e. the guidelines and procedures.
- The desire for the enhanced RERT to be fully implemented prior to summer 2019-20, such that, if required, AEMO can procure emergency reserves under the new framework.[477]

Prior to the commencement of the rule, AEMO would still be able to use the existing RERT framework, including the long-notice RERT, to procure reserves in response to projected shortfalls of supply.

The Commission notes AEMO will also need to make some operational and administrative changes, for example, to comply with additional reporting requirements (set out in chapter 9) for the final rule to commence.

The Commission will work with both the Panel and AEMO to reduce implementation risks.

476 The Commission does not expect the implementation of the draft rule would require any other parties to take additional steps.

477 The supply-demand balance in the NEM has historically been tightest over the summer period.

### 11.1.1 Panel's RERT guidelines

The Panel's RERT guidelines provide additional guidance to AEMO on the RERT principles and to the cost-effectiveness of the RERT.[478] The RERT guidelines specify what AEMO is required to take into account when exercising the RERT.[479]

The guidelines will need to be updated by the Panel to ensure they reflect the final rule. The review of the guidelines must be completed in accordance with the Panel consultation process, outlined in Clauses 8.8.3(d)-(l) of the NER. This consultation process involves:

- The publication of a notice of commencement of the review of the guidelines.
- A period of at least four weeks for stakeholders to provide submissions, following publication of the notice (or such other time specified by the Commission in any request for a review).
- The Panel holding a public meeting (either at its own initiative or if requested).
- The Panel publishing a report[480], following its consideration of submissions.

### 11.1.2 AEMO's RERT procedures

AEMO publishes a procedure for the exercise of the RERT under clause 3.20.7(e) of the NER. This procedure takes into account the RERT principles and RERT guidelines. AEMO's procedure for the exercise of the RERT document provides information on AEMO's procedures in relation to the RERT panel, the evaluation of tenders, procurement of the RERT, the publication of information and the activation/dispatch of the RERT.

Once the Panel has completed its review of the RERT guidelines, AEMO will need to update its procedures to ensure they reflect the final rule and revised guidelines. AEMO's review of its procedures must be completed in accordance with the rules consultation procedures outlined in Rule 8.9 of the NER. The rules consultation process involves:

- The publication of a notice of commencement of the review of the procedures.
- A period of at least five weeks for stakeholders to provide submissions, following publication of the notice.
- AEMO considering all submissions within four weeks, with any public meetings to be held within a further five weeks.
- AEMO publishing a draft report[481], following the conclusion of any meetings.
- A period of at least two weeks for stakeholders to provide submissions on the draft report (or such longer period as determined by AEMO).
- AEMO considering all submissions to the draft report within six weeks.

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478 See section 5 of the RERT guidelines.

479 The RERT guidelines list what AEMO may take into account when it is determining whether to enter into contracts for the RERT and in dispatching the RERT. The guidelines also provide some guidance to AEMO as to how it may contract for reserves and how much time AEMO has to procure the RERT prior to the shortfalls occurring,

480 The report must set out the Panel's recommendations or determinations, its reasons for these recommendations or determinations, and the procedure followed in undertaking the review or determination.

481 The draft report is to set out: AEMO's conclusions and any determinations; its reasons for those conclusions; the procedure followed by AEMO in considering the matter; summaries of material issues raised by stakeholders in submissions and meetings and AEMO's response to each such issue; and in a notice at the front of the draft report, an invitation to make written submissions on the draft report.

- AEMO publishing a final report,[482] following its consideration of submissions.

### 11.1.3 Proposed approach to the review of the guidelines and procedures

As noted above, both the RERT guidelines and RERT procedures are subject to consultation processes under the NER which could take a significant amount of time to complete. Recognising the importance of the RERT and the desire for AEMO to procure emergency reserves (if required) under the new framework for summer 2019-20, the Commission has proposed an approach that would not change the consultation requirements under each of the processes described above, but would allow the revised guidelines and procedures to be put in place faster, enabling the mechanism to be available for use well in advance of summer 2019-20. The savings in the timeframe are achieved through the Panel and AEMO undertaking work faster than that specified by the NER in order to get the guidelines and procedures in place as soon as possible.

The draft transitional rule reflects the Commission's proposed approach to implementation.

Consistent with the relevant consultation processes stipulated by the NER, via transitional arrangements the Commission will require:

- The Panel to publish its final RERT guidelines, taking into account the amending rule, by **27 June 2019**.
- AEMO to publish its RERT procedures, taking into account the amending rule and the updated RERT guidelines, by **31 October 2019**.

To meet both these timeframes, the Commission expects that the:

- Panel will commence its review of the RERT guidelines on 2 May 2019, the date the final determination for this rule is published.
- AEMO will commence its review of the RERT procedures within four weeks from the date the Panel publishes its final RERT guidelines, i.e. no later than 25 July 2019.

Based on these time frames the total implementation time for the new RERT framework will be around six months.

These timeframes allow the new RERT framework to be fully implemented prior to summer 2019-20, such that, if required, AEMO can procure reserves under an enhanced RERT mechanism. The Commission considers these timeframes provide sufficient time for the Panel and AEMO to comprehensively review the required documents, in accordance with the consultation process stipulated by the NER. The Commission emphasises that two rounds of consultation for the review of RERT procedures should be conducted by AEMO (as required by the NER) given the significant concerns around transparency raised by stakeholders.

The Commission seeks stakeholders' views on the proposed approach and timeframes for the review of the Panel's RERT guidelines and AEMO's RERT procedures.

482 The final report is to set out: AEMO's conclusions and any determinations; its reasons for those conclusions; the procedure followed by AEMO in considering the matter; summaries of material issues raised by stakeholders in submissions and meetings and AEMO's response to each such issue.

## 11.2 Other transitional rules

### 11.2.1 Reserve contracts that are signed and in place prior to rule commencement

The final rule will not be retrospective. That is, none of the amendments to the final rule affect any reserve contract entered into prior to the commencement date. For example, if AEMO entered into a reserve contract with provider ABC in September 2019 for the 2019-20 summer period, and the final rule came into effect in October 2019, the terms of AEMO's existing contract with provider ABC would be unaffected by the new RERT framework. To be clear, prior to the commencement of the rule, AEMO would still be able to use the existing RERT framework, including the long-notice RERT, to procure reserves in response to projected shortfalls of supply.

Therefore, the draft transitional rule states "nothing in the amending rule affects any reserve contract entered into prior to the commencement date".

### 11.2.2 New reporting requirements not applicable with respect to reserve contracts entered into, or reserves dispatched/activated, prior to the commencement date

The Commission considers that AEMO should not have to report, using the new reporting requirements, on the contracts that were entered into prior the commencement dates. For example, it would not be appropriate for AEMO to report, under the new reporting requirements, against the payment guide or procurement volume based on its old procurement processes used prior to the commencement of the rule. Instead, the old reporting requirements would apply to those.

Therefore, the draft transitional rule states:

> 11.11[4].1 Definitions
>
> ...
>
> new clause 3.20.6 means clause 3.20.6 of the *Rules* as in force immediately after the commencement date.
>
> old clause 3.20.6 means clause 3.20.6 of the *Rules* as in force immediately before the commencement date.
>
> ...
>
> 11.11[4].5 Amending Rule does not affect old clause 3.20.6
>
> Old clause 3.20.6 continues to apply, and new clause 3.20.6 has no effect, in respect of:
>
> (a) any *reserve contracts* entered into prior to the commencement date; and
>
> (b) any *dispatch* or *activation* of *reserves* that occurred prior to the commencement date.

# 12 ABBREVIATIONS

| | |
|---|---|
| AEC | Australian Energy Council |
| AEMC | Australian Energy Market Commission |
| AEMO | Australian Energy Market Operator |
| AER | Australian Energy Regulator |
| ARENA | Australian Renewable Energy Agency |
| CBD | Central Business District |
| COAG | Council of Australian Governments |
| Commission | See AEMC |
| C&I | Commercial and industrial |
| DR | Demand response |
| EAAP | Energy Adequacy Assessment Projection |
| ECA | Energy Consumers Australia |
| ECM | Economic cost minimisation |
| EEC | Energy Efficiency Council |
| ENA | Energy Networks Australia |
| ESB | Energy Security Board |
| ESOO | Electricity statement of opportunities |
| EUAA | Energy Users Association of Australia |
| EY | Ernst & Young |
| FCAS | Frequency control ancillary services |
| FUM | Forecast uncertainty measure |
| GWh | Gigawatt hour |
| HILP | High-impact low-probability |
| LOLE | Loss of load expectation |
| LOLP | Loss of load probability |
| LOR | Lack of reserve |
| LRC | Low reserve conditions |
| MCE | Ministerial Council on Energy |
| MEU | Major Energy Users |
| MPC | Market price cap |
| MW | Megawatt |
| MWh | Megawatt hour |
| NEL | National Electricity Law |
| NEM | National Electricity Market |
| NEO | National electricity objective |
| NER | National electricity rules |
| NSCAS | Network support and control ancillary services |

| | |
|---|---|
| Panel | Reliability Panel |
| PASA | Projected assessment of system adequacy |
| POE | Probability of exceedance |
| POLR | Procurer of Last Resort |
| RERT | Reliability and Emergency Reserve Trader or emergency reserves |
| RRO | Retailer reliability obligation |
| RSIG | Reliability standard implementation guidelines |
| SACOSS | South Australian Council of Social Services |
| SAPN | South Australia Power Networks |
| SRMC | Short run marginal cost |
| UPS | Uninterruptible power supplies |
| USE | Unserved energy |
| VCR | Value of customer reliability |

# A SUMMARY OF OTHER ISSUES RAISED IN SUBMISSIONS

This appendix sets out the issues raised in the first (consultation paper) and second rounds (options paper) of consultation on this rule change request and the AEMC's response to each issue. If an issue raised in a submission has been discussed in the main body of this document, it has not been included in this table.

Table A.1: **Summary of other issues raised in submissions**

| STAKEHOLDER | ISSUE | AEMC RESPONSE |
|---|---|---|
| **Minimising market distortions** | | |
| ERM Power, submission to consultation paper, p. 5. | ERM Power suggested that there is a case for in-market demand response to participate in the Reliability and Emergency Reserve Trader (RERT or emergency reserves) if they would not otherwise be dispatched because prices during RERT activations remained low, meaning that their in-market demand response was not activated but the RERT was. | The Commission acknowledges that prices are not always high across the entire RERT event. This is discussed in Chapter 10. However, this does not justify allowing in-market resources to participate in RERT. The Commission notes that RERT is an out-of-market mechanism in order to minimise distortions. The Commission is currently considering wholesale demand response through three rule change requests submitted by PIAC/TEC/TAI; South Australian Government; and the AEC. |
| **Cost recovery** | | |
| EUAA, submission to consultation paper, p. 1. | EUAA stated that it has members with flat loads that are now facing very large and unexpected emergency reserve bills for a problem they believe they did not contribute to. | The Commission considers that all loads that are on at the time of a reliability event contribute somewhat to the event.<br>The draft rule introduces a number of reporting requirements aimed at improving transparency, |

| STAKEHOLDER | ISSUE | AEMC RESPONSE |
|---|---|---|
| | | particularly with respect to the expected costs of the RERT and so the impact on customer bills. In addition, the draft rule makes it clear that the amount of reserves that AEMO can purchase is set at an amount that is guided by the reliability standard: this is reviewed by the Reliability Panel and encompasses a trade off between the costs to consumers of load shedding and the costs of having a more reliable system. |
| **Procurement trigger and volume and general procurement process** | | |
| Enel X, submission to options paper, p. 2. | Enel X stated that it supported AEMO's recommendation to create a standing reserve because standing reserve frameworks serve to provide assurance that reliability can be delivered and they also give greater certainty to reserve providers and the industry more broadly regarding the volume of reserves required, the procurement process and associated costs. | The Commission notes that:<br>• Greater certainty to reserve providers has to be balanced against the potential costs of market distortions and of procuring emergency reserves even when it is not needed, as discussed in the procurement trigger chapter (chapter 6).<br>• Standing reserves as the Commission understands it would not only delink RERT procurement from the rest of the reliability framework, creating two different reliability standards as discussed in appendix D, but would also have the effect of having no standard at all since the system operator would procure every year regardless of need.This is unlikely to be in the long term |

| STAKEHOLDER | ISSUE | AEMC RESPONSE |
|---|---|---|
| | | interest of consumers. |
| Infigen, submission to options paper, p. 5. | Infigen tentatively supported option 2 for procurement of short-notice RERT as it provides a more explicit framework for implementing the underlying principles of the reliability standard. | The Commission notes that applying AEMO's assessment model for the short-notice RERT procurement only as proposed under option 2 would have the same impact as applying it for long-notice RERT, i.e. it would lead to two standards resulting in market distortions.<br>Under the draft rule, AEMO may still use its economic cost assessment model to help guide its decisions about how many reserves to procure, if it has identified a breach of the reliability standard. |
| Flow Power, submission to options paper, p. 10. | Option 1 could be adopted as a transitional measure. For example, this could be in place for two years, with option 3 replacing option 1 after two years. | The Commission does not consider that this is appropriate as introducing a sunset clause would limit the benefits of option 1 with respect to certainty and clarity of the emergency reserve framework. |
| **Intervention framework** | | |
| Meridian, submission to consultation paper, p. 6. | A short duration direction (i.e. under clause 4.8.9 of the NER) of minimal impact should be reasonably preferred against an alternative that might require an expensive reserve trigger. | The Commission notes that the sequence in which interventions occur is outside of the scope of this rule change but is being examined through the Commission's work on *System Strength and Intervention Mechanisms in the NEM*, to be initiated shortly. |
| Origin, submission to consultation paper, p. 4. | Consideration should also be given to the appropriateness of using RERT ahead of | The Commission notes that the sequence in which interventions occur is outside of the scope |

| STAKEHOLDER | ISSUE | AEMC RESPONSE |
|---|---|---|
| | directions. Given RERT is designed to operate as a last resort mechanism, it is not clear why generation capacity within the system is not called upon through the directions framework ahead of such intervention. | of this rule change but is being examined through the Commission's work on *System Strength and Intervention Mechanisms in the NEM*, to be initiated shortly. |
| Meridian, submission to options paper, p. 5. | Given the RERT is only intended to be activated at times when the market has failed to deliver sufficient capacity to meet the reliability standard, there is a strong basis for the argument that the market price should be set to the MPC whenever the RERT is activated. | The Commission notes that the way the market is priced when RERT is activated is outside of the scope of this rule change but is being examined through the Commission's work on *System Strength and Intervention Mechanisms in the NEM*, to be initiated shortly. |
| TransGrid, submission to consultation paper, p. 2. | Broadening the definition of unserved energy (USE) in the National Electricity Rules (NER), used by AEMO to inform the market, may result in the need for strategic reserves less often.<br>The current definition of unserved energy in clause 3.9.3C of the NER excludes occurrences from multiple contingency events, protected events and non-credible contingency events. Occurrences similar to load shedding such as voluntary curtailment, mandatory restrictions and large market responses are also not included, even when the effect on consumers is similar to unserved energy. | The Commission notes that the definition of unserved energy is outside of the scope of this rule change. |
| Major Energy Users, submission to options paper, p. 3. | The MEU considers that load shed (whether voluntary or involuntary) should be included in | The Commission notes that the definition of unserved energy is outside of the scope of this |

| STAKEHOLDER | ISSUE | AEMC RESPONSE |
|---|---|---|
| | the calculation of the reliability standard. | rule change. |
| **Forecasting** | | |
| Stanwell, submission to options paper, p. 6. | Given the impact of AEMO's forecasts on market participants and consumers through RERT procurement costs, Stanwell supports a more collaborative and transparent approach to AEMO's forecast development. Stanwell is pleased to note the developments in this area such as the forecast recommendations in the AEMC's Reliability Frameworks Review. | The Commission notes that forecasting is outside of the scope of this rule. The recommendations mentioned by Stanwell are in progress, with the AER expected to submit rule change requests on these recommendations shortly. |
| Snowy Hydro, submission to options paper, p. 10. | AEMO's over forecasting of demand has unnecessarily triggered the activation of the RERT with the direct cost of the RERT being passed on to consumers. As a consequence, AEMO's RERT is impacting market participants. | The Commission notes that demand forecasting is outside of the scope of this rule change but agrees that unnecessary RERT costs are borne by consumers, and should be minimised. The draft rule will minimise the potential for this to occur (e.g. through the clarifications made to the procurement trigger). |
| EUAA, submission to options paper, p. 2. | Alternative simulation-based approaches have merit but are ultimately limited by the quality of forecasts, assumptions and the computational resources deployed. The key demand forecasts by AEMO underpinning these simulations have been demonstrated repeatedly to have a bias toward overestimating demand (particularly in Victoria). | While demand forecasting is outside of the scope of this rule change, the Commission notes that it examines the way AEMO operationalises the reliability standard in Chapter 4. |
| **Other issues** | | |

| STAKEHOLDER | ISSUE | AEMC RESPONSE |
|---|---|---|
| TransGrid, submission to consultation paper, p. 2. | TransGrid supported consideration of the development and use of a 'pre-qualification' panel of reserve providers ahead of time, which could avoid the use of costly contracts a long way in advance, while giving potential reserve providers an indication of the likely need for their services. | The Commission notes that there is already a Panel for short-notice and medium-notice RERT for that purpose. Therefore, the Commission does not consider that anything additional is required. |
| CitiPower, Powercor & United, submission to consultation paper, p. 2. | AEMO's high level design should discuss the communication methods it will use to alert RERT participants of an event, and that the communication options be expanded.<br>Currently participants must check a web portal established by AEMO to know whether an event is being called. A direct link to participants' control centres would enable us to respond faster and potentially offer more products. | The Commission considers that operational matters of this nature are matters for AEMO to consider, rather than the Commission through this rule change. |
| Flow Power, submission to options paper, p. 8. | Reviews of the cost of the RERT (the costs can be well in excess of the VCR) are needed in order to review the economic assessments being undertaken for using RERT and whether these need to be improved. This is also essential to avoiding a regime where the RERT is used every or most years. | The Commission's draft rule improves transparency of the cost and use of the RERT through regular, detailed reporting. The draft rule also clarifies the circumstances in which AEMO may procure emergency reserves. |
| Major Energy Users, submission to options paper, p. 4. | As there is demonstrably an adequate tool for incentivising supply or a decision to voluntarily not take supply in the wholesale market (the | As noted by the Commission, the VCR and MPC are different. The Commission's draft rule introduces a payment guide that reflects the |

| STAKEHOLDER | ISSUE | AEMC RESPONSE |
|---|---|---|
| | MPC) the MEU does not consider that VCR should be used in the wholesale market for any purpose and specifically should not be used for developing the RERT supplies by AEMO. | average VCR of the customers to be shed, which is appropriate as it reflects the cost of load shedding, the counterfactual to using RERT. |
| ERM Power, submission to consultation paper, p. 3. | ERM Power was concerned that the discussion fails to consider that the RERT is not a one shot procurement process, but in fact allows AEMO to procure emergency reserves under different timeframes as the need for procurement is determined. | The Commission understands that there are three different types or notices of emergency reserves. The different types of notice are discussed throughout this determination. For example, the Commission explains the different triggers that exist over the long term, and the shorter term triggers through the lack of reserve framework. |

# B LEGAL REQUIREMENTS UNDER THE NEL

This appendix sets out the relevant legal requirements under the National Electricity Law (NEL) for the AEMC to make this draft rule determination.

## B.1 Draft rule determination

In accordance with s. 99 of the NEL the Commission has made this draft rule determination in relation to the rule proposed by AEMO.

The Commission's reasons for making this draft rule determination are set out in section 3.4.

A copy of the more preferable draft rule is attached to and published with this draft rule determination. Its key features are described in section 3.4.

## B.2 Power to make the rule

The Commission is satisfied that the more preferable draft rule falls within the subject matter about which the Commission may make rules. The more preferable draft rule falls within s. 34 of the NEL as it relates to the regulation of the operation of the national electricity market[483] and the operation of the national electricity system for the purposes of the safety, security and reliability of that system.[484]

## B.3 Commission's considerations

In assessing the rule change request the Commission considered:

- its powers under the NEL to make the rule
- the rule change request
- submissions received during first and second rounds of consultation
- views expressed from stakeholders at the workshop held for this rule change, as well as broader stakeholder views expressed through bilateral meetings
- input from the technical working group
- the Commission's analysis as to the ways in which the proposed rule will or is likely to, contribute to the NEO.

There is no relevant Ministerial Council on Energy (MCE) statement of policy principles for this rule change request.[485]

The Commission may only make a rule that has effect with respect to an adoptive jurisdiction if satisfied that the proposed rule is compatible with the proper performance of AEMO's

483 Section 34(1)(a)(i) NEL

484 Section 34(1)(a)(ii) of the NEL

485 Under s. 33 of the NEL the AEMC must have regard to any relevant MCE statement of policy principles in making a rule. The MCE is referenced in the AEMC's governing legislation and is a legally enduring body comprising the Federal, State and Territory Ministers responsible for energy. On 1 July 2011, the MCE was amalgamated with the Ministerial Council on Mineral and Petroleum Resources. The amalgamated council is now called the COAG Energy Council.

declared system functions.[486] The more preferable draft rule is compatible with AEMO's declared system functions because it is unrelated to them and therefore it does not affect the performance of those functions.

## B.4 Civil penalties

The Commission cannot create new civil penalty provisions. However, it may recommend to the COAG Energy Council that new or existing provisions of the NER be classified as civil penalty provisions.

The draft rule does not amend any clauses that are currently classified as civil penalty provisions under the NEL or National Electricity (South Australia) Regulations.

However, the Commission proposes to recommend to the COAG Energy Council that clause 3.20.3(i) of the draft rule be classified as a civil penalty provision. The Commission considers this provision to be important to the effective operation of rule 3.20 (in particular, the out-of-market provisions discussed in chapter 7) and that a civil penalty will act as an appropriate deterrent for persons entering into reserve contracts with respect to reserve already committed to the market or through any other relevant arrangement. This is intended to supplement any contractual remedies available to AEMO under reserve contracts for breach by the counterparty.

## B.5 Conduct provisions

The Commission cannot create new conduct provisions. However, it may recommend to the COAG Energy Council that new or existing provisions of the NER be classified as conduct provisions.

The draft rule does not amend any rules that are currently classified as conduct provisions under the NEL or National Electricity (South Australia) Regulations. The Commission does not propose to recommend to the COAG Energy Council that any of the proposed amendments made by the draft rule be classified as conduct provisions.

486 Section 91(8) of the NEL.

# C RELIABILITY PANEL ADVICE ON RELIABILITY STANDARD

This appendix sets out the advice provided by the Reliability Panel to the Commission. The Commission had requested the Panel for advice on:

- whether the reliability standard i.e. 0.002 per cent unserved energy remains appropriate for the NEM
- whether there was any evidence in the recent review of the reliability standard and settings that the standard may need to be tightened, in some or all conditions, to meet community expectations, including any stakeholder submissions on this point
- the potential costs and benefits arising from any tightening of the reliability standard
- whether the Panel considered a different metric to the reliability standard (i.e. a metric that is different from unserved energy per region per year) as part of its analysis and any views on its appropriateness
- the implications that might arise if the RERT's procurement trigger was delinked from the reliability standard and what implications this may have for the reliability settings.

The advice was provided to the Commission on 28 September 2018. Both the request for advice and the advice itself can be found on the Commission's website.

The Panel's views are summarised below.

**Whether the reliability standard i.e. 0.002 per cent unserved energy remains appropriate for the NEM**

The Panel acknowledged the reliability standard is "a crucial market standard". The Panel reitrerated its recommendation from its 2018 review of the reliability standard and settings:[487]

"the materiality threshold for reassessing the level of the reliability standard has not been met at this time for the following key reasons:

- the absence of any change in AEMO's value of customer reliability measure
- changes in the way consumers use electricity do not suggest they are markedly less reliant on grid-supplied electricity
- other factors such as changes in the costs of new entrant generation since 2014 and the benefits of predictability and stability."

The Panel noted that "nothing has changed in relation to these factors since the Panel made its final determination, and so there is no new evidence for the Panel to consider in order to change its earlier views that the current reliability standard is still appropriate".[488]

487 Reliability Panel, *2018 Reliability standard and settings review, final report*, p. 13

488 Panel, 2018, *Reliability Panel advice on the Enhancement to the Reliability and Emergency Reserve Trader rule change,* p. 2

However, the Panel acknowledged that "the NEM is transforming, and these materiality criteria may be met in the future".[489] In this regard, the Panel noted that:[490]

- "the AER must publish the results of a VCR study by end of 2019. It is likely that these new VCRs will be different to the previous values that were used in the market. This could therefore be a trigger for the Panel to consider a future reassessment of the reliability standard at or prior to the next four yearly review, particularly, if the study reveals material changes in the value of customer reliability.
- the Panel will also continue to monitor emerging trends and uncertainties that bear on the effectiveness of the reliability standard and settings and which may affect the other two limbs of the materiality threshold to warrant reassessing the reliability settings."

**Evidence that the standard may need to be tightened, in some or all conditions, to meet community expectations, including stakeholder submissions on this point**

The Panel restated its findings from its *2018 Reliability standard and settings review*, "notwithstanding the current level of the standard, EY modelling [conducted for the Panel's review] forecasts the system will provide a level of reliability significantly better than then 0.002 per cent reliability standard in all national electricity market regions, for the review period".[491]

The Panel reported that "submissions received during the consultation process for the 2018 review considered the current level of standard was appropriate.[492] All of the submissions that commented on this issue supported keeping the reliability standard at its current level" i.e. none suggested changing the level.[493]

**Potential costs and benefits arising from the tightening of the reliability standard**

The modelling conducted for the 2018 Reliability standard and settings review provided an estimate of the indicative costs associated with tightening the reliability standard. The Panel noted:[494]

"The modelling indicated that the expected unserved energy under the base scenario conditions in Victoria was very low at around 0.0000003 per cent in 2020-21. EY indicated that reducing this already low level of expected unserved energy to zero would require an additional 1,000 MW of capacity to be in place in Victoria in 2021-21. The additional cost of moving to (close to) zero expected unserved energy under the base scenario would increase wholesale energy costs by nearly 7 per cent ($200 million per annum) in that region, as measured against current market outcomes in Victoria."

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489 Panel, 2018, *Reliability Panel advice on the Enhancement to the Reliability and Emergency Reserve Trader rule change*, p. 3.

490 Panel, 2018, *Reliability Panel advice on the Enhancement to the Reliability and Emergency Reserve Trader rule change*, p. 3.

491 Panel, 2018, *Reliability Panel advice on the Enhancement to the Reliability and Emergency Reserve Trader rule change*, p. 3.
The Panel notes that the unserved energy outcomes presented by AEMO in its 2017 and 2018 Electricity Statement of Opportunities (ESOO) were higher than the unserved energy outcomes forecast by EY. It is important to note that the rationales that underpin these two models are different (as are the accompanying assumptions and sensitivities) so different results are unsurprising.

492 Submissions from EnergyAustralia, Engie, PIAC, ERM Power, Snowy Hydro, EUAA and Origin all supported retaining the current level of the reliability standard.

493 Panel, 2018, *Reliability Panel advice on the Enhancement to the Reliability and Emergency Reserve Trader rule change*, p. 4.

494 Panel, 2018, *Reliability Panel advice on the Enhancement to the Reliability and Emergency Reserve Trader rule change,* p. 4.

### Consideration of different metrics for the reliability standard

Alternative metrics for the reliability standard were not considered by the Panel in the 2018 Reliability standard and settings review.[495]

However, other metrics such as loss of load probability, were considered in the preparation of the 2016 Guidelines that guide the Panel's work on these matters.

As noted in its advice, in 2016 the Panel concluded that the form of the standard should be retained as USE and that it should not be automatically reassessed at each review, for the following reasons:[496]

- "Firstly, the NEM is an energy only market, with no separate market to incentivise investment in capacity. The Panel considers that the best way to determine if there has been sufficient capacity investment to meet customer demand is to measure the extent to which all customer demand has been met. A volumetric measure of energy demand met, such as USE, provides an optimal measure of the relative effectiveness of the NEM to meet customer demand.
- There are benefits in retaining the same form of standard to provide a level of certainty and stability to market participants and USE has been used for the reliability standard since market start. Maintaining the status quo has no inherent value, although a perception that it may be subject to regular change could create market uncertainty, potentially increasing the cost of investment. In the absence of any clearly identifiable benefit of changing the form of the standard, however, and given the limitations of each of the alternative types of measures, the Panel considers that these costs are not justified.
- Finally, the Panel remains satisfied that the form of the standard should remain defined as a probabilistic target for the purposes of system planning, defined as the maximum expected unserved energy. This measure of expected unserved energy is very important, as it recognises that there are many factors that may impact on the level of USE in a given year, with very different probabilities attached to each. A measure of reliability like expected USE recognises that in any given year, there is a risk that outlier events could result in the standard not being met."

Although the above considerations were made in 2016, the Panel acknowledged that:[497]

"Nothing material has changed that would necessitate further consideration of the reliability standard. If there are concerns that the reliability standard is not appropriate in the face of an increasingly peaky supply-demand balance, then the inputs and assumptions in operationalising the reliability standard may need to be reassessed rather than the standard itself. The Panel will continue to monitor system and market trends to confirm that the above conclusions remain valid."

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495 The 2016 guidelines establish that the form of the reliability standard should be retained as unserved energy and should not be assessed at each reliability standard and settings review.

496 Reliability Panel, 2016, *Review of the reliability standard and settings guidelines*, final determination, p. 22

497 Panel, 2018, *Reliability Panel advice on the Enhancement to the Reliability and Emergency Reserve Trader rule change*, p. 6.

### Implications that might arise if the RERT's procurement trigger was delinked from the reliability standard

The Panel considered that "the market price settings and the reliability standard are well integrated and encourages the Commission to maintain that integration. In other words, the Panel does not consider that the RERT's procurement trigger should be delinked from the reliability standard – at least in the long-term".[498]

The Panel elaborated:[499]

"Delinking the procurement trigger from the reliability standard would effectively create a separate standard. Imposing another standard that only relates to procurement of the RERT could distort investment signals. This would be problematic given the current frameworks for reliability in the NEM. So, the Panel would advise against delinking the RERT's procurement trigger from the reliability standard in the NEM, particularly in relation to the long-notice and medium-notice RERT (reserves procured up to nine months, and up to ten weeks, respectively, in advance).

In relation to the short-notice RERT (reserves procured up to ten days in advance), the Panel considers it less clear whether or not the procurement of the reserves should be linked to the reliability standard."

498 Panel, 2018, Reliability Panel advice on the Enhancement to the Reliability and Emergency Reserve Trader rule change, p. 6.
499 Panel, 2018, *Reliability Panel advice on the Enhancement to the Reliability and Emergency Reserve Trader rule change*, p. 6.

# D PROCUREMENT OPTIONS ASSESSMENT

This Appendix provides more detail and analysis on the procurement options, set out in the options paper, assessed by the Commission. In particular, it:

- summarises stakeholder submissions
- sets out the process for assessing options
- discusses options 2 and 3 in detail.

## D.1 Summary of stakeholder submissions to the options paper

In submissions to the consultation paper, there was overwhelming support for option 1, little support for option 2, and mixed views on option 3, as shown in the table below. For a more detailed discussion, refer to Chapter 5.

**Figure D.1: Stakeholders' views on each option**

| Stakeholder | Option 1 | Option 2 | Option 3 |
|---|---|---|---|
| **Consumer groups and energy users** | | | |
| BlueScope | Yes | did not comment | did not comment |
| Energy Consumers Australia | did not comment | No | did not comment |
| Energy Efficiency Council | did not comment | Maybe | did not comment |
| EUAA | Yes | No | Maybe |
| MEU | Yes | No | No |
| **Market bodies** | | | |
| AEMO | No | Yes | No |
| **Generators** | | | |
| AGL | Yes | No | Yes |
| Alinta | Yes | No | Maybe |
| EA | Yes | No | Maybe |
| ERM Power | Yes | No | Maybe |
| Infigen | Yes | Maybe | No |
| Meridian | did not comment | No | No |
| Origin | Yes | No | did not comment |
| Snowy Hydro | Yes | No | Yes |
| Stanwell | Yes | No | No |
| Hydro Tasmania | did not comment | did not comment | did not comment |
| **Networks** | | | |
| ENA | Yes | No | Yes |
| **Industry associations** | | | |
| AEC | Yes | No | Yes |
| **New tech and other** | | | |
| Enel X | Maybe | Maybe | Maybe |
| Flow Power | Yes | No | Maybe |

Source: Stakeholder submissions to options paper.

To be clear, in the table above:

- Option 1 support means supporting linking the procurement trigger explicitly to the reliability standard and setting the procurement volume to the gap identified by a breach of the reliability standard.
- Option 2 support means removal of explicit procurement trigger, and allowing AEMO to make procurement trigger and volume decisions through its assessment model. It also means support for delinking RERT and reliability standard.
- Option 3 support means option 1 support plus the additional constraint on AEMO provided by a different body (most likely the Reliability Panel) through additional guidance provided on how to operationalise the reliability standard. This would apply to entire reliability framework.

## D.2 Assessment of options

In order to assess each option against the assessment framework described in Chapter 3, the Commission fleshed out each option further and concluded on some design features which it consulted on through the options paper. These differences are noted in italics in the table below.

Option 1 is described and discussed in Chapter 5. Options 2 and 3, along with the Commission's conclusions and analysis, are described in more detail below.

Table D.1: **Refined procurement options**

| RERT FRAMEWORK | OPTION 1 | OPTION 2 | OPTION 3 |
|---|---|---|---|
| Procurement trigger | Reliability standard (LOR and LRC)<br>*(Clarification that it would be through LOR and LRC)* | None, except for high-level framework in NER to AEMO's assessment framework | Reliability standard (LOR and LRC)<br>*(Clarification that it would be through LOR and LRC)* |
| Reliability standard | • No changes to reliability standard<br>• One standard for entire reliability framework | • No changes to the reliability standard<br>• Two standards, one for RERT, one for rest of reliability framework | • Changes to reliability standard through operationalisation.<br>• One standard – changes apply to entire framework |
| Operationalisation of the reliability standard | Status quo – i.e. as per AEMO's methodology, which AEMO has the discretion to change through the rules consultation procedures. | N/A. AEMO's assessment framework used to determine both whether to procure and how much. | Reliability Panel provide more guidance which would be quite prescriptive e.g. effectively setting sub-annual targets<br>*(Clarification that the Panel would set the target, rather than having just an advisory role)* |
| Procurement volume | Only as much as AEMO reasonably expects (i.e. there is discretion) is needed to address the gap identified by a breach of the reliability standard<br>*(Clarification that there would be some discretion on how much to procure for practicality)* | AEMO's assessment framework used to determine how much to procure. Framework based on ECM and additional risk metrics.<br>*(Addition of risk metric to take into account AEMO's submission)* | Only as much as AEMO reasonably expects is needed to address the gap identified by a breach of the reliability standard - operationalisation changes would affect this.<br>*(Clarification that there would be some discretion on how much to procure for practicality)* |

| RERT FRAMEWORK | OPTION 1 | OPTION 2 | OPTION 3 |
|---|---|---|---|
| AEMO's economic cost minimisation (ECM) model | AEMO discretion to use ECM. | Assessment framework includes ECM and additional risk metrics. *(Addition of risk metric to take into account AEMO's submission)* | AEMO discretion to use ECM. |
| Governance | • No changes.<br>• No oversight from the AER.<br>*(Confirmation that there is no oversight of the procurement trigger)* | • High-level framework in NER.<br>• Risk metric guidance from Panel in RERT guidelines.<br>• No oversight from the AER.<br>*(Addition of explanation of how the governance structure would work)* | • No changes.<br>• No oversight from the AER.<br>*(Confirmation that there is no oversight of the procurement trigger)* |

Note: Italicised text shows what has been fleshed out or refined since the options paper was released.

## D.3 Option 2 - delinking the reliability standard

### Key design features

The refined option 2 is designed to reflect AEMO's position based on its submissions to date, given that they are the main proponent of this option. Some design choices were also made by the AEMC to reflect what is commonly the case within the existing RERT framework, e.g. by leveraging off the role of the Panel.

Option 2 would remove the explicit procurement trigger and give AEMO discretion on when and how much to procure through its economic minimisation model (ECM) and externally-set risk metrics. The ECM would minimise the cost of emergency reserve contracts and the cost of load shedding (via the value of customer reliability).

There would be a high-level framework in the NER for the procurement of emergency reserves. The Panel would then be required to provide additional guidance on procurement (including on the ECM). The Panel would be required to set the risk metrics.

AEMO would be required to produce a methodology document to explain its assessment process, in accordance with the Panel guidelines and NER. There would be no oversight from the AER and the role of jurisdictions would remain unchanged.

The reliability standard (0.002 per cent expected USE) would remain as is and be delinked from the RERT framework, in effect, creating two reliability standards.

### Commission's conclusions and analysis

Impact of delinking the RERT procurement trigger

This option would delink the RERT from the reliability standard and the reliability framework and so would have the effect of creating two standards. The Commission thinks this is inefficient because it would create distortions with respect to the operational and investment incentives that market participants have and would lead to higher costs for consumers.

Even though under option 2 there would a role for the Panel to play in providing additional guidance to AEMO on the procurement process, the Commission is of the view that the distortions that would arise from delinking the RERT from the reliability framework (for example, it could potentially reduce the incentive that participants have to invest into generation or demand response within the market, if they think AEMO is already intervening to meet a higher level of reliability; or participants make be incentives to shift existing capacity from the market, into the RERT, particularly if RERT pays high availability payments would be significant and would occur even with guidance from the Panel. Market distortions are discussed in more detail in Chapter 7.

Put simply, delinking RERT and the reliability standard would mean that market participants would be expected to provide reliability up to the level of the reliability standard. AEMO, on the other hand, would be able to intervene in the market based on a *different* level of reliability. Given that AEMO's proposal in its submission to the options paper suggested that it wishes to have an additional trigger through a "risk metric", it could be expected that the

level of reliability through the RERT would be higher than what the market would be expected to provide, through the reliability standard. The reliability standard itself balances the risks of reliability and the costs/benefits of higher reliability. The Panel then reviews the level to make sure it is still consistent with consumer preferences, risk levels and cost of providing higher reliability.

It could therefore be expected that AEMO would be intervening regularly so as to meet the higher reliability standard implied by the RERT procurement standard. This would be inconsistent with how the reliability framework works and with the purpose of the RERT as well, whereby the market is expected to respond first, and AEMO is expected to intervene only when the market has failed to respond to meet an agreed upon level of reliability, i.e. the reliability standard. This would also lead to higher RERT costs for consumers compared to the status quo.

Impact on transparency

Even if the standard implied by RERT procurement under this option were less conservative than the reliability standard (i.e. if it implied a lower level of reliability), the Commission would have concerns about this option since it would not be transparenct and clear to market participants what level of reliability AEMO would be targeting versus what the market would be targeting. The Commission considers that it is important that participants are provided with certainty about how the framework will operate over time. This option would introduce more ambiguity into an already ambiguous process.

Compared to the status quo, even with Panel guidance around procurement, this option would promote uncertainty around when AEMO would likely intervene in the market and potentially create distortions, such as those described above (crowding out of investment, e.g.). It would further allocate the risks associated with managing reliability to AEMO (rather than to the market, and to the Reliability Panel, through its role in reviewing the reliability standard) which has the potential to create inefficiencies and investment distortions.

The Commission is strongly of the view that there should only be one reliability standard - for the market and for the RERT. As a result and for the reasons mentioned above, it does not think that option 2 meets the NEO. Ultimately, this option would be most costly and less transparent than the draft rule.

## D.4 Option 3 - enhanced role for Reliability Panel in operationalising the reliability standard

**Key design features**

Option 3 is the same as option 1 except in the following ways:

- The Reliability Panel would provide guidance to AEMO on how to operationalise the reliability standard in relation to the RERT.
- In light of stakeholder feedback, this guidance would be quite prescriptive e.g. the Panel would work out what the USE target should be by month, if a monthly standard is achieved. AEMO would still forecast USE against that target as per current arrangements.

### Commission's conclusions and analysis

The Commission considers that this option would have similar benefits as option 1, and that additional prescription around how to operationalise the reliability standard would amplify some of the benefits, such as shifting the allocation of how reliability risks are managed in favour of the Panel, since they would have a greater role to play in setting the reliability standard. It could further reduce direct and indirect costs.

On the other hand, the potential drawbacks of this option include the introduction of further prescription, regulation and complexity in a system that is already complex. It would also, in effect, remove the discretion that AEMO currently has in operationalising the reliability standard, even though AEMO is the system operator.

Furthermore, it is yet unclear whether it is technically feasible to aim for a weekly/monthly target or operationalise the reliability standard in a better way than it is currently done as noted by a number of stakeholders, including AEMO, in submissions to the options paper.[500] The Commission also considers that in practice it may have unintended consequences, such as AEMO having to procure RERT regularly (and far beyond the reliability standard), depending on how the monthly target is set.

On balance, the Commission does not think that this option is the best option because:

- The benefits are unclear and may lead to unintended consequences.
- The additional burden of regulation and complexity would, on balance, not outweigh the benefits.
- It continues to be appropriate for AEMO to be responsible for operationalising the reliability standard.

Instead, the reporting requirements introduced in this draft rule as discussed above and in chapter 9 will help address stakeholder concerns with respect to AEMO's role in operationalising the reliability standard, which then has a flow on effect on the procurement trigger and volume. For example, the draft rule enhances reporting requirements with respect to the procurement process and volume, requiring AEMO to provide detailed information on its assessment processes, including explaining its forecasts and any deviations from projections of how much RERT was needed. This will improve accountability.

Similarly, to the extent that concerns relate to AEMO's forecasting processes, the Commission notes that it recommended a number of actions with respect to forecasting in its *Reliability Frameworks Review*.[501] These recommendations are under way.

500 The Commission understands that AEMO and the Reliability Panel have examined the possibility of sub-annual targets in the past but did not pursue it further due to technical difficulties.

501 See https://www.aemc.gov.au/sites/default/files/2018-07/Final%20report_0.pdf