

9 March 2018

John Pierce  
Chair  
Australian Energy Market Commission

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Brisbane QLD 4122  
T 07 3347 3100

Dear Mr Pierce

### **Reliability and Reserve Trader Rule change proposals**

In the context of an energy transformation that presents greater real-time operational challenges, the Australian Energy Market Operator (AEMO) seeks enhanced Reliability and Emergency Reserve Trader (RERT) tools to support the provision of reliable electricity supply.

With this in mind, AEMO seeks the Australian Energy Market Commission's consideration of two rule change proposals seeking changes to the RERT framework as follows:

- Reinstatement of Long Notice RERT provisions in the National Electricity Rules prior to summer 2018-19, while the proposal for an Enhanced RERT is considered; and
- Broader enhancement to the RERT framework.

AEMO requests the rule change to reinstate Long Notice RERT be considered as an urgent rule change. This would require rule changes to be in place by June 2018 to enable AEMO to utilise the Long Notice RERT tool to deliver secure and reliable supply during summer 2018-19, while the AEMC considers the accompanying Enhanced RERT proposal.

Procurement of RERT during summer 2017-18 and the ARENA/AEMO demand response trial highlighted potential improvements to the existing RERT framework. Attached to the Enhanced RERT proposal is a suggested end-to-end High Level Design for the AEMC's consideration, developed in consultation with industry participants during 2017.

I look forward to working with you and your team as you consider these proposals. Please do not hesitate to contact Violette Mouchaileh, Group Manager Market Enhancement, on 03 9609 8551 should you wish to discuss any aspect of the proposals further.

Yours sincerely



Peter Geers  
**Executive General Manager, Markets**

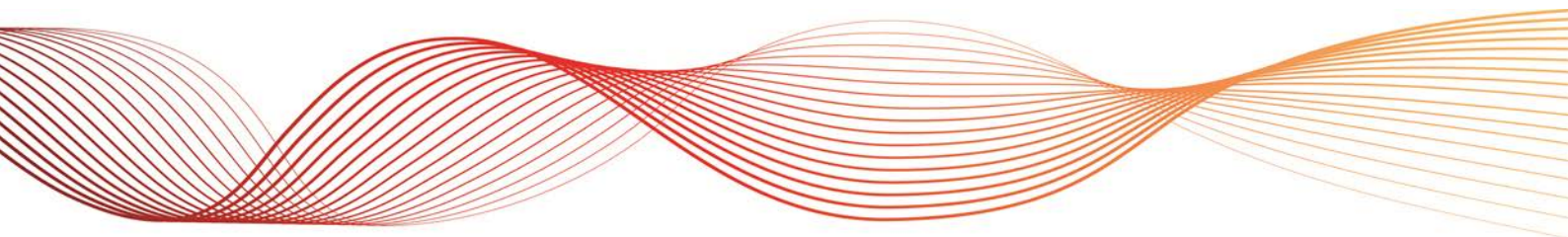
Attachments:

Rule Change Proposal - Reinstatement of Long Notice RERT; Rule Change Proposal - Enhanced RERT; High level Design – Enhanced RERT



# PROPOSAL FOR AN ENHANCED RELIABILITY AND RESERVE TRADER (RERT)

**March 2018**







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# 1. PURPOSE

The purpose of this submission is to request the Australian Energy Market Commission (AEMC) consider an enhanced Reliability and Emergency Reserve Trader (RERT). As system operator, AEMO now operates the National Electricity Market (NEM) in the context of greater uncertainty, variability and a tighter supply-demand balance driven by some of the following factors:

- a growing proportion of variable renewable generation (on-grid and behind the meter);
- an aging fleet of thermal generation; and
- unexpected retirement of capacity increasing risk of forced outages.

Within this context of greater uncertainty and tightening supply-demand balance, AEMO considers there is a need for a reserve arrangement to act as a “backstop” or safety net to mitigate against the risks associated with unanticipated shortfalls. To this end, and taking into account the current arrangements, stakeholder feedback, and learning from the ARENA/AEMO Demand Response trial and RERT process for 2017/18 summer, AEMO proposes an enhanced RERT as a stronger safety net to mitigate against the risks associated with unanticipated shortfalls. An enhanced RERT, as presented in AEMO’s attached high-level design, would enable procurement over a longer period with standard terms and conditions rather than highly bespoke contracts.

## 1.1 AEMO proposal

To inform AEMO’s proposal, AEMO carried out a process with stakeholders (involving workshops, meetings, and one-one briefings/discussions) prior to the end of 2017. Attachment 1 outlines AEMO’s High Level Design proposal in detail, including specifics of products that could be procured and changes to the RERT framework. This includes changes to the way AEMO currently implements the RERT, as well as a number of proposed changes to the NER.

The key elements of the proposal include:

- AEMO will consult on changes to the Rules and the Reliability Standard Implementation Guidelines (RSIG) to clarify how AEMO should implement the Reliability Standard for the purposes of procuring RERT.
- AEMO will undertake an annual risk assessment of the potential for unserved energy over a one to three year time period. If shortfalls are identified relative to the standards defined in the RSIG, AEMO will seek to procure RERT reserves.
- AEMO will procure reserves in the form of standardised products, delivering the key services. This will provide greater clarity to potential providers, facilitate comparison between offers, encourage competition and reduce the complexity of activating resources during emergency conditions.
- Key standardised elements will include notification times, availability periods, response duration and requirements to demonstrate the additionality of the offered response. AEMO will still negotiate on some elements if a key low cost resource is at risk of being excluded.
- Reserves to be procured for up to 12 month period when a shortfall is identified, or up to three years if an extended shortfall is projected and analysis indicates that multi-year contracts would be lower cost. In effect, this would enable standing reserves to be put in place depending on the risks and costs in each jurisdiction at the time of the assessment.

## 1.2 Rule proposal

The High Level Design identified three key areas requiring enhancement to the regulatory framework:



- Procurement horizon and contracting period
- RERT and the Reliability standards.
- Standardisation of reserve products

Please note, the first two of these enhancements require rule changes. The third (standardisation of reserve products) does not require rule changes and is included here for completeness.

## 2. BACKGROUND

The RERT is a function conferred on AEMO to enter into reserve contracts with resources not available to the market, to ensure reliability of supply meets the reliability standard and to maintain power system security. RERT is a last resort function, along with directions, exercised to address an expected shortfall in the market.

From 1 November 2017, AEMO has been unable to enter into Long Notice RERT contracts, reducing the procurement period from 9 months to 10 weeks prior to reserve being required. This follows removal of the RERT sunset clause in June 2016 in order to “minimise any distortionary effects of the RERT’s indefinite extension”.

Recent reviews and advice have recognised the benefits of an enhanced (strategic) reserve mechanism, aimed at providing AEMO with the necessary tools to manage the system through shortfalls. These include the Finkel Review, which acknowledged shortcomings in the existing framework and recommended assessment (by mid-2018) of the need for a strategic reserve mechanism to act a safety net. AEMO’s advice to the Commonwealth Government on Dispatchable Capacity recommended development of an enhanced (strategic) reserve mechanism to mitigate the near-term risks of unserved energy in the power system and avoid supply disruptions from summer 2018-19.

Procurement of the RERT for summer 2017/18 together with the ARENA/AEMO DR trial have highlighted some opportunities to enhance the existing RERT framework, which are discussed further below. AEMO considers currently-available safety nets provide insufficient flexibility for managing unexpected events or meeting public expectations about continuous energy supply and avoidance of load shedding.

To better understand the issues and potential changes, AEMO established a process to develop a High Level Design for a reserve framework, which was completed at the end of 2017. In developing the High Level Design, provided at Attachment 1, AEMO has consulted with a range of stakeholders through its Expert Panel and its Working Group, government, and held sessions with the AEMC and Reliability Panel. This engagement included holding workshops, meetings, and one-one briefings/discussions.

Taking account stakeholder feedback, the attached High Level Design presents the end-to-end design of a reserve, to give context around how we consider the framework “hangs together”. AEMO acknowledges that some elements of this design can be implemented through the existing framework. Other elements, require changes to the National Electricity Rules (NER). These are discussed further below.

In addition, the remainder of this proposal presents practical and economic arguments for enhancing the RERT to provide greater clarity and structure around the management of uncertain reliability outlooks until any broader framework changes are considered and implemented.

## 3. CURRENT ARRANGEMENTS

### 3.1.1 Existing Rules

Under the current regime, AEMO has mechanisms at its disposal to minimise supply shortfalls. One of these mechanisms is RERT. Under the RERT framework:

- AEMO may enter into one or more contracts with any person in relation to the capacity of:  
(1) scheduled generating units, scheduled network services or scheduled loads (being scheduled reserve contracts); and  
(2) unscheduled reserves (being unscheduled reserve contracts).
- AEMO may determine to enter into 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
- AEMO must consult with persons nominated by the relevant participating jurisdictions in relation to any determination to enter into contracts under paragraph (b).
- AEMO must not enter into, or renegotiate, a reserve contract more than 10 weeks prior to the date that AEMO reasonably expects that the reserve under that contract may be required to ensure reliability of supply and, where practicable, to maintain power system security. For the avoidance of doubt, AEMO may negotiate with potential tenderers in relation to reserve contracts at any time<sup>1</sup>.

AEMO may procure reserves “to ensure that the reliability of supply in a *region* or *regions* meets the *reliability standard* and, where practicable, to maintain power system security”. AEMO implements the reliability standard in a number of contexts in accordance with the Rules and the Reliability Standard Implementation Guidelines (RSIG).

AEMO also has the power to direct or instruct Registered Participants in order to maintain the power system in a reliable operating state.

As set out in clause 3.8.14, during times of supply scarcity, AEMO must use its reasonable endeavours to ensure a market response, RERT dispatch or activation and directions are undertaken in that order.

In addition to the Rules, AEMO is guided by the Reliability Panel’s RERT guidelines. The RERT guidelines cover a range of matters including:

- what information AEMO must take into account when deciding whether to exercise the RERT;
- the relevance of the RERT principles to the exercise of the RERT;
- the actions that AEMO may take to be satisfied that the reserves that are to be the subject of a reserve contract are not available to the market through any other arrangement;
- the process AEMO should undertake in contracting for reserves including the process for tendering for contracts for such reserves;
- the process AEMO should undertake in contracting for reserves in relation to different notice situations, as described in the RERT guidelines, to ensure reliability of supply and, where practicable, maintain power system security;
- any specific or additional assumptions about key parameters that AEMO must take into account in assessing the cost effectiveness of exercising the RERT;
- matters relevant to AEMO managing a portfolio of reserve contracts; and
- additional forecasts that AEMO should take into account prior to exercising the RERT.

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<sup>1</sup> National Electricity Rules clause 3.20.3 (a) – (d)



### 3.1.2 How AEMO implements the Rules

The power system is not in a reliable operating state when load shedding is occurring or expected to occur (NER 4.2.7). The Reliability Standard determines the long-term level of reliability that should be targeted by the market, representing the trade-off between higher levels of reliability and higher system costs. Under the Rules, this is set at an expected level of no more than 0.002% unserved energy for a given financial year. When undertaking long-term assessment of system reliability in the Electricity Statement of Opportunities (ESOO), AEMO calculates a probability-weighted USE assessment, consistent with the RSIG.

Closer to real-time, however, AEMO takes steps during times of supply scarcity to avoid load shedding. If AEMO declares an LOR or low reserve condition (LRC), AEMO is required to determine and publish a notice of any foreseeable circumstance that may require AEMO to intervene and the latest time to intervene. During times of supply scarcity, AEMO must use reasonable endeavours to exhaust market options before exercising RERT. The last resort is further corrective action under NER clause 4.8.9 or section 116 of the NEL. AEMO's objective when exercising RERT is to meet the reliability standard and, where practicable, maintain power system security. The objective of a direction or instruction is for power system security, safety and reliability.

While the rules allow AEMO to direct or instruct a registered participant provided it is available at the time the need arises, the RERT framework allows AEMO to contract for additional (out of market) reserves ahead of a projected reliability shortfall. AEMO is able to activate or dispatch these reserves in operational timeframes to maintain reliability, if a market response cannot be secured.

## 4. PROPOSAL FOR AN ENHANCED RERT

AEMO considers that a safety net is essential to manage the increased uncertainty described above. While AEMO strongly supports preserving the market signals that drive investment, including both high spot prices and a well-functioning contract market, the distortionary effects of load shedding needs to also be taken into account.

The existing RERT provides a framework for procuring reserves to deliver that safety net. However, based on AEMO's experience with RERT for summer 2017-18, our consultation with external stakeholders, and through reviews of international markets, AEMO has identified a number of challenges with the existing RERT framework. The key issues are outlined in section 4.1 below. These challenges reduce AEMO's ability as the market operator to effectively manage reliability in real-time, and potentially increase the overall cost of reserves when they are required. AEMO is therefore proposing a number enhancements to the existing RERT framework, which are outlined in section 4.2.

### 4.1 Need for an enhanced RERT

#### 4.1.1 Procurement horizon and contracting duration

The current 10 week limit on signing contracts for reserves has the potential to limit the availability (or increase the cost of) reserves. In AEMO's submission to the Draft Determination of that rule change<sup>2</sup>, AEMO noted that this restriction "reduces the potential field of RERT providers".

While AEMO appreciates the need to balance minimising market distortions against the longer lead times required for procuring the lowest cost resources, this potentially excludes some resources from delivering reserves, resulting in higher costs. Moreover, AEMO is being made aware of fossil plant shutdowns in excess of 3-years ahead of the event. While it is important to allow the market to respond with minimal distortion, it is also important to have time to put any necessary fall-back positions in place and to make stakeholders comfortable that is well under measured control.

<sup>2</sup> <http://www.aemc.gov.au/getattachment/204c3739-4a45-4ea5-a871-86572cf42fc9/Australian-Energy-Market-Operator.aspx>



AEMO's recent experiences support the position that greater reserves could be made available at lower cost if greater certainty could be offered. For example, in 2017, AEMO collaborated with ARENA to hold a tender for demand side response that could be offered into the RERT. This process revealed that significant quantities of reserves are available, and that the volume of reserves increases and the unit costs decreases over time if a firm contract is available. Although AEMO could potentially negotiate ahead of signing a contract (as can be done under the current RERT framework), the lack of a firm commitment may prevent these reserves from being made available to the market.

AEMO also notes that the procurement of RERT, and the associated overheads with assessing tenders, evaluating resources, planning studies by providers and conducting due diligence, represents a significant time commitment and cost. 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.

#### **4.1.2 Lack of comprehensive risk assessment framework**

There is inconsistency between the operational objectives of the current RERT under NER clause 3.20 (meeting the reliability standard, which allows some load shedding in a financial year) and directions under NER Clause 4.8.9 (maintaining a Reliable Operating State, which means no load shedding). The current Rules note that AEMO can procure reserves to ensure that the Reliability Standard is not breached, but do not provide guidance on how this should be interpreted in the RERT timeframe.

AEMO is concerned that market projections indicate a heightened risk of significant load shedding over upcoming summers, particularly in Victoria and South Australia. In particular, AEMO's modelling highlights a heightened risk of load shedding in 2018-19 and 2019-20 in Victoria and, potentially, South Australia. Critically, even in regions where the projected USE averaged over a broad range of scenarios does not breach the Reliability Standard on a long-term planning basis, AEMO projects that the risk of some unserved energy is high compared with recent levels. For example, in Victoria in 2018-19 under AEMO's "neutral" demand growth scenario, the risk of breaching the reliability standard is projected to be 9%, and the risk of *some* unserved energy is approximately 25%.

Put another way, if these conditions continued, in the absence of reserve procurement AEMO would expect the reliability standard to be breached one year in ten, with some load shedding to occur every four years. This breach of the reliability standard is particularly likely during peaky demand years (e.g., 10% POE peak demands) even if, averaged over all scenarios, the projected USE was less than 0.002%.

This analysis means that significant load shedding could occur during severe but plausible (based on historical observations) supply and demand conditions, potentially with economically efficient reserve options left on the table. AEMO does not consider those outcomes would meet most stakeholder expectations.

Again, AEMO notes that there will always be scenarios where the standard is breached, but it may not be reasonable above a certain point. Jurisdictions have demonstrated an unwillingness to tolerate load shedding in their regions, even at levels that do not breach the reliability standard. This has resulted in the South Australia government investing in new battery storage peaking generation<sup>3</sup> and New South Wales funding the procurement of reserves through the ARENA/AEMO tender process.

#### **4.1.3 Highly bespoke products are difficult to compare and implement**

AEMO currently procures RERT through highly bespoke, negotiated contracts. This creates uncertainty for potential providers, makes it difficult for AEMO to compare offers, and is highly time consuming for all parties.

In contrast, ARENA and AEMO are conducting a three year pilot demand response program, designed with reference to the ERCOT strategic reserve model. Tenders were held in 2017 for standardised

<sup>3</sup> <https://www.premier.sa.gov.au/index.php/jay-weatherill-news-releases/7198-south-australia-is-taking-charge-of-its-energy-future>

products, leading to strong and competitive offers from potential providers which could be directly compared.

## 4.2 Proposed changes

Attachment 1 provides AEMO's High Level Design proposal, which outlines a pathway to addressing the issues raised above. The sections below highlight several key elements of the proposal for the AEMC consideration.

### 4.2.1 Allowing longer-term RERT procurement

AEMO is proposing that the NER be changed to allow RERT to be procured over a longer time horizon. In particular, AEMO recommends that:

- Reserves can be procured up to one year ahead of an identified shortfall under an annual contract
- If a longer-term requirement is projected, taking into account committed or highly likely new projects, reserves can be procured for up to three years if analysis indicates this would be lower overall cost. This in effect enable "standing reserves" to be put in place where needed.

These longer lead times would allow time for potential participants to make the necessary preparations (such as seeking demand response from consumers, installing any necessary control systems, procuring and shipping diesel gensets, etc.). It will also reduce the significant overheads involved in planning, procurement and conducting due diligence on potential resources, for both AEMO and for providers. This has the potential to reduce the costs of the RERT, provided that multiple-year contracts were only procured when a protracted need was found to be likely.

Care would also 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 contracts for reserves were more attractive than those that being offered by retailers, for example). This could be managed in several ways, including:

- Limitations on resources transitioning from the energy market to RERT. This could include restrictions on resources that had operated in the energy market in the preceding 12 months, as well as prudential requirements such as providers being required to demonstrate why they couldn't participate in the energy market.
- Capping the availability payments that can be offered to reserves, therefore encouraging providers to focus on usage costs as their primary revenue stream. This reduces the ongoing cost of reserves and minimises the potential economic consequences of uncertain forecasts.

Given that the reserves are out-of-market and only activated as a last resort to load shedding, and the use of intervention pricing during any activations, the price signals for market investment (whether as merchant generation or through signing new contracts) would still exist. Reserves would typically only be dispatched during periods of very tight supply-demand, with correspondingly high prices; even given the potential for over-commitment of reserves, these prices should be preserved for participants through intervention pricing. Firm project announcements would be also considered when determining any reserve requirements or shortfalls.

### 4.2.2 Clarifying the implementation of the reliability standard

AEMO considers that the trigger for procuring 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 unserved energy, not just the "expected" value. AEMO considers that the conditions for reserve procurement currently lack clarity and transparency, and it would be beneficial for both AEMO and the market to have clear guidelines for how these risks should be evaluated.



AEMO sets out how it will implement the reliability standard in its RSIG<sup>4</sup>. To provide greater clarity to the market, AEMO intends to propose and consult on changes to the RSIG which would provide more clarity on the conditions under which AEMO would procure reserves, and the volume to be procured, consist with the Reliability Standard.

There may also be opportunities to economically efficiently improve reliability. At the extreme, even if the risk of unserved energy was comparatively low, if there existed reserves that required no availability payments, but with usage costs between the MPC and the estimated VCR, this should be an economically efficient outcome. For example, AEMO's experience with procuring RERT for summer 2017-18 has revealed that there are resources available to the market that require very low (or no) availability payments, but have usage costs above the Market Price Cap. These reserves are unlikely to be contracted in the market, or respond to wholesale market price signals, under current market settings, therefore contracting for them has a low likelihood of distorting the wholesale or retail market processes. However, activating these reserves would likely be economically preferable to consumers if the costs are below their specific value of customer reliability (VCR).

The identification and procurement of such reserves could be considered as part of a more comprehensive risk assessment. Reserves procured under such arrangements would help AEMO mitigate against unexpected system events (e.g., long-term unplanned outages of units or extreme heat events), with minimal cost impacts on consumers.

#### **4.2.3 Developing standardised products**

AEMO currently procures RERT through highly bespoke, negotiated contracts. This creates uncertainty for potential providers, makes it difficult for AEMO to compare offers, and is highly time consuming for all parties.

Based on consultation with industry providers, the AEMO/ARENA auction process and AEMO's operational requirements, AEMO intends to move towards standardised "products" for reserves. In this framework, AEMO would define distinct products to be procured from the market that would deliver AEMO's operational requirements but also reflect the supply constraints on the system.

This will provide greater certainty and clarity to both potential providers (by clearly defining what AEMO is seeking from the market) and AEMO's control room (by provide clearly defined products that reduce complexity during emergency situations). We expect that standardisation, over time, facilitates more efficient outcomes because it creates an environment for tradable products, secondary trading, better price discovery, and competitive outcomes.

AEMO considers that implementing these changes can be addressed through revising the RERT Guidelines and RERT Procedures within the current Rules. In Attachment 1, AEMO has outlined a set of products that meet AEMO's minimum operational requirements and which industry has indicated are practical to deliver; the key features are outlined below. AEMO would undertake further industry consultation through the process of changing the Guidelines and Procedures.

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<sup>4</sup> [https://www.aemo.com.au/media/Files/Electricity/Consultations/2015/Reliability Standard Implementation Guidelines Final Report.pdf](https://www.aemo.com.au/media/Files/Electricity/Consultations/2015/Reliability%20Standard%20Implementation%20Guidelines%20Final%20Report.pdf)

<i>Products to procure</i>	<i>Key features</i>
<p><b>Seasonal:</b></p> <ul style="list-style-type: none"> <li>• Summer (December - March)</li> <li>• Not-summer (other times)</li> </ul> <p><b>Time blocks</b></p> <ul style="list-style-type: none"> <li>• 12pm to 4pm, business days</li> <li>• 4pm to 8pm, business days</li> <li>• All other times</li> </ul>	<p><b>Operation:</b></p> <ul style="list-style-type: none"> <li>• Providers elect notification time of 10 minutes, 60 minutes or 24 hours</li> <li>• Most respond for up to 3 hours</li> </ul> <p><b>Payment streams</b></p> <ul style="list-style-type: none"> <li>• Tenders specify required availability payments, usage payments and pre-activation payments (24 hour product only)</li> </ul>

## 5. HOW THE PROPOSED RULE CONTRIBUTES TO THE NATIONAL ELECTRICITY OBJECTIVE (NEO)

The NEO is 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 price, quality, safety, reliability, and security of supply of electricity; and the reliability, safety and security of the national electricity system.

The relevant aspects of the NEO for RERT are the promotion of the efficient operation and use of electricity services for the long term interests of consumers with respect to price and reliability and security of supply.

The proposed enhancements of the RERT are likely to contribute to the reliable and secure supply of electricity where, in light of increased variability around demand and the changing generation mix, there is a risk that the current reliability standards and mechanisms may not be adequate to respond to existing and emerging power system events. The RERT mechanism enables additional reserves over and above those already in the NEM to be called on at short notice, reducing the need for involuntary load shedding during power system reliability and security incidents. AEMO notes that involuntary load shedding, which is a relatively blunt instrument, does have an economic cost.

Procuring reserves may create more efficient outcomes compared to involuntary load shedding because involuntary load shedding does not differentiate between customers. A mechanism which enables supply to be maintained to those who value it most will deliver a more efficient use of electricity services. Further a longer lead time for procurement of reserves better enables the market to deliver additional capacity, including demand resource, at more cost effective prices.

Procuring reserves may also contribute to delivering efficiently priced electricity by facilitating the development of further demand response, as has been observed with the ARENA trial. Over time, this response may become available to the energy market, reducing the cost of electricity for consumers. We also expect that moving from bespoke to more standardisation facilitates more efficient market outcomes because it creates an environment for tradable products, secondary trading, and better price discovery and competitive outcomes.

AEMO notes that procuring any out of market services raises the risk that resources would be drawn out of the energy market by more favourable conditions offered in the market. This should be managed



by appropriate caps set on the availability payments, and restrictions on resources transitioning between the energy market and the RERT. However, AEMO also notes that the proposed framework (and, in particular, multi-year contracting) might lower the barrier to entry for new demand side resources that could, over time, transition into the energy market (at which point, newer and presumably higher cost reserves would be procured under the RERT, if still required). This would help mitigate the costs and long-term impact of market distortions.

As discussed in Section 4, the out-of-market nature of the RERT should have little impact on investment signals in the market (which are predominantly driven by high prices, rather than periods of USE).

## 6. EXPECTED BENEFITS AND COSTS OF THE PROPOSED RULE

AEMO expects an Enhanced RERT to provide a stronger safety net to AEMO in its role as system operator. As mentioned above, a longer procurement period than the existing 10-week period would enable inclusion of a wider range of energy and demand response resources, leading to more competitive and cost-effective outcomes for consumers. This safety net would enable AEMO to procure reserve more effectively, with firmer commitment for participants, as a stronger alternative to involuntary load shedding and its associated costs for consumers.

Implementing the change to procurement length would have negligible costs. AEMO has procurement frameworks in place that can be adjusted to cover the longer period. AEMO understands that implementation of standardised products and changes to the interpretation of the Reliability Standard can be implemented through AEMO's Procedures and AEMO's Reliability Standard Implementation Guidelines.

## 7. STAKEHOLDER ENGAGEMENT

AEMO has undertaken a range of industry and government consultation. This has included:

- Establishing an Expert Panel of industry leaders, to advise AEMO on a broad range of issues including reliability and changes to the RERT framework
- Establishing a Working Group, of subject matter experts from across industry. The Working Group assisted AEMO in developing and evaluating an Issues Paper and developing a design proposal (Attachment 1) through conducting a full day design workshop.
  - The Working Group members include representatives from retailers, generators, demand response aggregators and organisations such as ARENA
- Briefing the AEMC and the Reliability Panel on AEMO's proposed framework, and seeking their feedback
- Meeting with representatives from each jurisdiction to seek their feedback on the framework.

At each stage, AEMO has updated its proposed framework to ensure that stakeholder concerns were addressed, that potential resources would be made available, and that AEMO's operational needs would be met. Several key issues that were raised are presented in the table below.

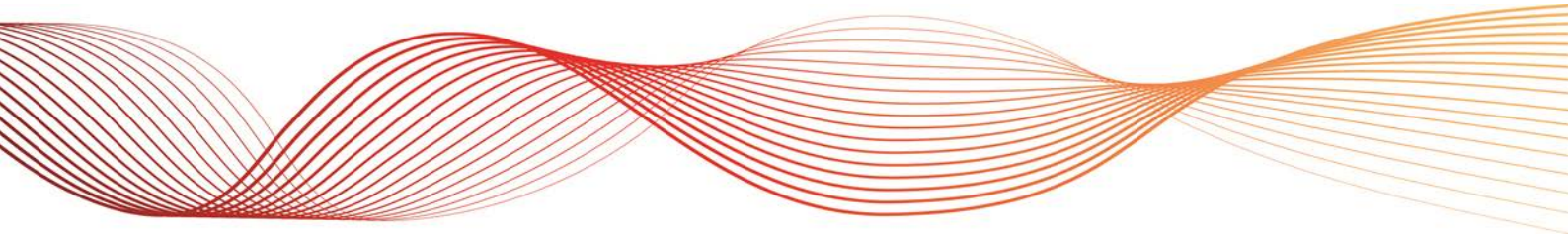
Industry comment	Response and proposed approach
A key issue raised was what impact such a mechanism would have on affordability balanced against reliability.	<p>In designing the framework, AEMO has tried to balance the reliability requirements against affordability whilst minimising the impact on the energy market. Restrictions were put on costs as follows:</p> <ul style="list-style-type: none"> <li>• Placing maximum regional budgets on procurement costs, in consultation with jurisdictions</li> <li>• Imposing caps on the availability and usage payments</li> <li>• Standardising products to create competitive tension, while allow for bespoke features where there may be value for money.</li> </ul>
Scheme should procure reserves that would otherwise not be available to market Should not compete with market for demand response	<p>The enhanced RERT has been designed as follows:</p> <ul style="list-style-type: none"> <li>• Focussing on low availability cost/high usage cost reserves that wouldn't otherwise be viable in the energy market</li> <li>• Limiting ability of resources to deliver both reserves and in-market energy market</li> <li>• Eligibility requirements to limit "siphoning off" market demand response</li> </ul>
Reasonable approach to "benefit stacking"	<ul style="list-style-type: none"> <li>• Allowing some resources (e.g., network support capacity) to also provide reserves</li> </ul>
Need for regular review or sunset clauses	<ul style="list-style-type: none"> <li>• Undertake regular reviews of the key scheme elements to ensure that they still reflect system needs</li> <li>• Established standard for procurement provides clarity and certainty to the market</li> </ul>
The risk assessment undermine the Reliability standard	<ul style="list-style-type: none"> <li>• Risk assessment should assess whether procuring reserves is required to meet the standard as consulted on and defined in the RSIG</li> <li>• Reserves would only be procured if the market does not provide the required resources, or as a short-term solution during a period of transition</li> <li>• Reserves to only be activated as an alternative to likely load shedding, with intervention pricing used to preserve market signals to participants</li> <li>• Reserves provide a mechanism to minimise distortion, rather than interventions – increasing the operator toolkit in real-time</li> </ul>
Important to retain option for bespoke products so as not to exclude some resources (particularly smelters)	<ul style="list-style-type: none"> <li>• The proposed design has allowed for bespoke products on some components. Over time, AEMO expects to move to more standardised products.</li> </ul>
24 hour product distortionary	<ul style="list-style-type: none"> <li>• AEMO currently procures resources requiring advanced notification; under the enhanced RERT framework, AEMO would seek to preferentially procure resources requiring shorter time frames (as little as 10 minutes).</li> <li>• Expectation is that competitive pressures would drive resources requiring shorter notification times</li> <li>• In practice, advance notification of resources has financial implications, but actual commitment of the RERT resource does not occur until close to real-time, thereby minimising market distortion</li> </ul>
What does the NEG means for RERT	<ul style="list-style-type: none"> <li>• The development of the NEG is an ongoing process, but improvements to the RERT framework is required well in advance of next summer</li> <li>• Opportunity for a review or further changes to the RERT if the final NEG design reduces the need for RERT (as it is expected to do)</li> </ul>

## 8. REGULATORY APPROACH

This document outlines AEMO’s proposal for enhancing the RERT. Many elements of the proposed design can be implemented through the existing framework. However, changes to the procurement timelines and, potentially, clarifications on how risks should be assessed, will require changes to the NER.



# ENHANCED RERT – HIGH LEVEL DESIGN PROPOSAL





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## 1. BACKGROUND

Currently, the Reliability and Emergency Reserve Trader (RERT) is a function conferred on AEMO to enter into reserve contracts, from all resources that are not available to the market, to ensure reliability of supply meets the reliability standard (0.002% USE) and to maintain power system security. RERT is a last resort function, along with directions, exercised when there is an expected shortfall in the market. From 1 November 2017, AEMO will no longer be able to enter into Long Notice RERT contracts. This reduces the period AEMO can enter into reserve contracts from 9 months to 10 weeks prior to the reserve being required. The change was made by the AEMC in June 2016 when the RERT sunset clause was removed, in order to minimise “any market distortionary effects of the RERT’s indefinite extension”.

A number of recent reviews have articulated the need to consider putting in place an enhanced reserve mechanism to mitigate the risks associated with unanticipated shortfalls, and even more so in an environment of tightening supply/demand:

- As a reliability measure, and acknowledging the shortcoming of the existing framework, the Finkel Review recommended assessing by mid-2018 the need for a strategic reserve to act as a safety net in exceptional circumstances as an enhancement or replacement to the RERT (Recommendation 3.4).
- Our Advice to the Commonwealth Government on Dispatchable Capacity, recommended that AEMO, in consultation with the AEMC, its Expert Panel and stakeholders, should immediately develop a strategic reserve mechanism to mitigate the near-term risks of USE in the power system and avoid disruption of supply to consumers.

Following this, AEMO established a process to develop a design proposal by end of 2017. AEMO has consulted with a range of stakeholders. This engagement included holding workshops, meetings, and one-one briefings/discussions.

## 2. PRINCIPLES FOR DESIGN

This document presents AEMO’s proposal for how the RERT could be enhanced to deliver improved reliability and affordability outcomes for the NEM.

AEMO and the industry working group agreed that reserves should be procured:

- To act as a last alternative to load shedding and used during periods of scarcity to avoid load shedding or ensure system security
- To procure resources that would not or could not otherwise operate in the energy market
  - Preference for resources to operate in energy market if possible, so that they can be used to deliver economic benefits as well as reliability. Reserves will not be permitted to switch between the energy market and being enabled for reserves on a daily or weekly basis, for example.
- With the expectation of being rarely activated, with not every product necessarily used in every year
- With the expectation that resources have low availability costs but comparatively high usage costs
- With a technology neutral approach

## 3. STANDARDISED PRODUCT SPECIFICATIONS

Currently, AEMO seeks expressions of interest for the delivery of reserves, allowing participants to nominate the types of services they could deliver (within a standardised contract). A key recommendation of this design is for the development and procurement of standardised reserve products. Although AEMO would expect to negotiate on some components, the use of standard products should reduce the complexity for both procurement and operation of reserves. The proposed design balances AEMO’s operational needs with the capabilities of potential providers.

AEMO will seek to procure reserves for distinct products determined by:

- The NEM region
- A specific time block (e.g., summer peak and off-peak)

Providers will need to be available to deliver their full response at any point during the specified time block, with the characteristics of the response as specified in the sections below.

For both operational and procurement simplicity, AEMO is seeking standard offers for reserves as per the definitions below. In some cases, this may require aggregators to combine and manage multiple physical resources in order to deliver the standard product, and may require contracting additional capacity to ensure a firm response is available at all times during the operating window. Providers should not assume that reserves will only be required on hot days, for example.

In cases where multiple options are defined (e.g., for the required notification period), AEMO will have a preferred option, and in some cases (as explicitly noted) AEMO will consider non-conforming bids. To the extent that such offers are available at a lower cost, AEMO may, at its discretion, procure a portfolio of reserves that AEMO expects will deliver the maximum benefit. More detail of this approach is provided in Section 4.4. Subsequent reviews may consider additional products, such as weather sensitive products that would only be called upon on extreme hot weather days.

### Discussion notes

The Working Group noted there were advantages for both standardised products (providing a “target” for providers, and simplifying procurement and operation) and bespoke products (enabling wider or more efficient participation).

Operationally, AEMO values products that are simple and clear to be dispatched and managed by the control room. Standardised products would also make it easier to compare and value offers. However, it will be important to ensure that overly rigid definitions do not preclude procurement of otherwise valuable or low cost reserves.

The proposed approach is for standardised offers with the opportunity to provide bespoke conditions for some components. When evaluating a least-cost portfolio of resources, AEMO would then consider these options if it would reduce the overall expected cost of reserves. However, AEMO would otherwise prefer standardised products, and may not consider non-conforming offers if sufficient standardised offers were available at reasonable cost.

### 3.1 Time periods

AEMO will procure reserves separately for several seasonal and diurnal time blocks in order to reflect both supply side (availability of reserves) and demand side (times of greatest risk of unserved energy) dynamics. The initial blocks to be procured are presented in the table below; time periods may be

revised for subsequent auctions based on experiences. Business days and times would be defined based on the region in which the resource is located.

Providers may offer reserves (including the same resource) into more than one period.

Variations will not be considered for this component at this time.

	Summer (December to March)	Not summer
12pm to 4pm, business days	Summer afternoon (critical period)	Not-summer day
4pm to 8pm, business days	Summer evening (critical period)	Not-summer evening
All other times	Summer off-peak	Not-summer off-peak

### Discussion notes

The choice of how to divide up the year into seasonal and diurnal blocks (if at all) should consider both the demand side (when reserves are most likely to be required, allowing more targeted procurement) and supply side (whether some resources can only provide for partial periods). More granular services will increase this flexibility, at the cost of complexity.

Modelling by AEMO has indicated that the most critical periods for USE are summer months from 12pm to 8pm. However, USE could still potentially occur at other times, particularly if there are significant supply side shifts.

Feedback from the Working Group was mixed; some considered that splitting services into multiple time periods would facilitate greater participation. For example, residential air conditioning load would only be available during summer periods. Others suggested aggregators could group complementary resources so as to provide reserve across multiple time blocks.

Based on further feedback from the Working Group, AEMO has implemented two peak blocks to better capture the potential supply from business and residential demand side response.

One participant noted that demand response is likely to be greater on the hottest days and less on public holidays; while this aligns with the likely need for reserves, it may have impacts on availability. ERCOT procures a “weather sensitive” product that addresses some of this, and could be considered by AEMO in the medium term.

It was also noted that some providers could deliver 24/7 response for little additional cost. Therefore, it may be appropriate to still procure services during these times if the cost is low – this could be managed under the budget approach below by assigning a lower importance ranking to those periods.

## 3.2 Notification period

Providers must designate the maximum notification period which they are able to respond, selected from the following options:

- 10 minutes
- 60 minutes
- 24 hours

All else equal, shorter notice products will be preferred as they increase the flexibility with which AEMO can call on the reserves. Variations will not be considered for this component at this time.

#### Discussion notes

In relation to reserve requirements, AEMO has identified the need for a short-notification product that can be activated rapidly, particularly in response to unexpected changes in generation supply side. However, longer-notification products may still be valuable to the extent that more reserves can be procured at a lower cost.

The Working Group noted that in order to capture as much of the available supply as possible, there was a need for a short-notice product (demand response, storage units and some diesel gensets), a medium-notice product (capturing the remainder of those assets, as well as some larger industrial loads) and a longer-notice product (behavioural based demand response, mothballed generation, and potentially some industrial loads). Industrial loads could potentially offer increasing levels of response on each timescale (e.g., small response within 10 minutes, but a larger response would be available with 24 hours notification).

### 3.3 Length of contracts

AEMO will seek to procure one year contracts in the first instance. However, AEMO will consider bids requiring a longer contracting period of up to three years. AEMO may elect to procure some portion of the reserves from longer-term contracts if reserves are projected to be required for multiple years and if it is expected that this would deliver lower overall costs.

#### Discussion notes

The Working Group broadly favoured longer terms (nominally three years), which would provide greater investment certainty. This could potentially increase supply, allowing investment in new resources (e.g., smart meters, storage, diesel gensets, etc.) However, this would be balanced against the reduced flexibility, including the risk of “over-buying” services in the first year, as well as locking out potential new technologies or providers.

It was also noted that providing certainty that reserves would be procured on an ongoing basis (e.g., by guaranteeing a minimum budget or capacity to procure each year) would assist in providing that investment certainty. However, this would again increase the risk of over-procurement if reserves were not projected to be needed in that year.

Given the potential for learning over time, AEMO is proposing to primarily seek one-year contracts. However, longer contracts could be considered for a portion of the total volume to be procured; these could potentially require a volume range to manage any changes in requirements.

### 3.4 Other features

Further product specifications are provided in the table below.

Item	Proposed framework	Notes
Location	Procured regionally, but location within the network may be considered	
Duration of response <i>Providers must be able to deliver the specified response for at least this length of time.</i>	<p>Providers must be able to deliver response for up to three hours in any single activation (when requested by AEMO within the specified time period (Section 3.2)).</p> <p>Providers will not be required to operate beyond the bounds of the specified time period, unless they have also successfully tendered into the neighbouring time period.</p> <p>Variations would be considered, including offers for longer response periods.</p>	<p>If longer response periods are required, AEMO will stagger the activation of multiple resources. “Duration curves” should be managed and submitted by providing offers for multiple blocks.</p> <p>However, if a resource (e.g., an aggregated resource) is flexible in how the response is delivered (e.g., AEMO could activate 300 MW for 1 hour or 100 MW for 3 hours), this should be noted in the tender and will be taken into account by AEMO when selecting the providers.</p>
Type of response	Loads required to “drop by” the nominated MW , generation to “rise to”	See Section 3.7
Recovery period: Time before resource can be called again	Up to 24 hours, as specified by provider	
Limits on number of activations (per year, per day, etc.)	5 activations (excluding tests) per year Variations would be considered, including offers for more activations	Applies per resource; activations in multiple time periods would be counted towards the single activation limit. Balances AEMO’s potential needs with maximising resource participation.
Minimum response to be offered from any single provider	5 MW, then 1 MW increments	Applies to each service offered by a provider. E.g., a provider cannot offer a 2 MW and a 4 MW service, even though in aggregate they would deliver more than 6 MW; aggregation to at least 5 MW must occur at the provider level
Maximum size	No limit per applicant	

**Discussion notes**

The Working Group noted that the length of activation would be up to AEMO to determine. Longer notification periods might require providers to stagger their resource activation, and it might be more beneficial for AEMO to do that staggering if required (and thus potentially have greater instantaneous MW of reserves at our disposal when required).

It was noted that smelters may be unable to offer more than one or two activations per year, or only deliver a response for shorter durations. AEMO would manage this through consideration of variations to the standard products, as discussed above. Fewer activations would be considered if the offer was part of a least-cost portfolio.

### 3.5 Eligible technologies

The response may be provided by a range of technologies, as outlined in the table below. Additional technologies may be eligible to deliver the service with prior approval from AEMO.

In order to minimise distortion of the energy market, generation capacity identifying as “mothballed” will need to provide evidence to AEMO that the generation will not be otherwise activated over the contracting period, and could not reasonably be activated within 24 hours without being selected as a reserve. These restrictions apply to all times of day and week during the contracted season, regardless of which blocks the resource is actually contracted for. (E.g., generation is not allowed to “mothball” only overnight and still offer into RERT.) AEMO may consider generation mothballed on a seasonal basis if the provider can demonstrate the resource would not otherwise be available outside of the RERT.

Resource	Examples (non exhaustive)
Industrial or commercial demand response	Large loads capable of reducing output
Aggregated demand response	Residential or commercial loads controlled by aggregator or retailer
Localised or distributed DER	Backup generators embedded within distribution networks. Load reduction can result from generation by a generator(s) which is behind the meter, however, it cannot be a generator in the NEM which is earning the wholesale price and cannot be contributing to a Small Generation Aggregator portfolio.
Energy storage	Batteries or other embedded energy storage. A range of response durations are likely to be available.
Mothballed generation capacity	Power stations that would otherwise not be available within a 24 hour recall
Network response	Networks reducing voltages to reduce local load

#### Discussion notes

The Working Group supported a technology neutral approach: define requirements and allow providers to determine how to deliver it.

There are some questions around incentives for generation: incorporating mothballed generation into reserves provides more flexibility to AEMO, but would provide incentives to mothball (through fixed payments) that might actually reduce participation in the energy market and drive up prices at other times.

Aggregated demand response could include behavioural response products, potentially facilitated by AEMO. This was seen as a promising approach at the last Working Group meeting, and further analysis will be undertaken.

### 3.6 Additionality requirements

Offered Reserves must be additional to any response that could reasonably be expected at times of generation scarcity (specifically LOR2/LOR3 conditions) or of high market prices. This ensures that any reserves activated by AEMO will be additional to those currently available in the market, and that procuring reserves will not undermine the development of robust demand side response programs by retailers, drive the withdrawal of market capacity, or disincentivise new capacity. In general, participation in the energy market (including responding to price signals, potentially through an aggregator) is preferred to participation in RERT. This will be assessed on the basis of specific units (rather than for a portfolio of generation).

Providers must undertake that the reserves provided to AEMO will not be:

- offered to the energy market through any other means during the period for which the reserves are contracted for RERT; or
- provided or available to be provided pursuant to any demand side management arrangement or agreement during the period for which the reserves are contracted for RERT

In addition to these undertakings, a baseline procedure will be applied to reserves sourced from demand side response, and used to determine the effective response offered, as outlined in Section 3.6. As part of the baseline analysis, AEMO may request further information if a response to high prices is regularly observed outside of periods where the resource is activated.

AEMO may (at its discretion) accept providers that also deliver other services where these services are not intended to avoid, or be triggered by, high price periods. For example, resources may also provide network support services to a TNSP or DNSP, if this would involve being called upon during periods of local network congestion or stress rather than as a hedge against high prices. Resources may also deliver NEM ancillary services if the provider demonstrates it would not be practical or reasonable to offer a demand response into the market. For example, a resource might be able to deliver a short-term response for the Fast Raise service, but not be able to economically deliver a sustained response in the energy market under the current market arrangements and price caps.

In all cases, reserves would not be eligible to deliver both services at the same time, and would need to opt out of delivering alternative services upon receiving an activation (or pre-activation) instruction under RERT. For example, providers of the 10 minute notification product also seeking to offer ancillary services would need to bid as unavailable in the appropriate ancillary services market upon receiving instructions under their RERT contract. Reserves would need to demonstrate the internal procedures and capabilities that would be used to ensure that the Reserve would be available upon activation.

Any wholesale market revenues received by reserves during periods where availability payments are made to those reserves must be transferred to AEMO, to be used to offset the cost of the RERT to consumers. AEMO expects this would apply only to Market generators that are eligible to receive wholesale market revenue (i.e., Scheduled, Non-Scheduled or Semi-Scheduled generators). If resources offer only a portion of their capacity into RERT, this requirement applies only to the portion of wholesale market revenue applying to the component of reserves offered.

AEMO will not seek to recover any avoided costs, for example, if a retailer avoids costs due to the activation under the RERT of demand response within their network.

#### Discussion notes

The Working Group was strongly of the view that reserves should be additive, to ensure that additional response will genuinely be made available to the market (and hence improve reliability), and that additional costs are not incurred for response that would have occurred anyway.

Any reserves scheme should also not discourage existing or future demand response services from participating in the energy market. The Working Group noted that demand response is an emerging and valuable service for the energy market. Further restrictions on moving between the energy market and the RERT could be applied (for example, not accepting resources that participated in the energy market in the past 12-24 months).

### 3.7 Measuring the response offered

Demand side response, or embedded generation that is not directly metered (and therefore appears only as a reduction in metered load) must offer Reserves on a “drop by” basis. On being activated, Providers will be required to reduce their metered demand by their contracted Reserve quantity for the contracted duration. The measured response will be determined by the baseline methodology outlined below.

If a “drop by” response cannot be offered, or a suitable baseline cannot be determined, AEMO may accept a “drop to” response. In this case, the Provider will be required to reduce their metered demand to a specified level. However, this approach will not be preferred by AEMO when selecting Providers.

Generation resources will be required to deliver a “raise by” response, increasing their output from zero (or an alternative agreed baseline) upon Activation.

#### 3.7.1 Baseline for demand response

A baseline methodology will be applied based on the methodology<sup>1</sup> developed for AEMO’s Demand Response Mechanism (DRM) proposal in 2013, and applied to the recent AEMO/ARENA procurement. This approach was based on methods used internationally and assessed for application within a NEM context. AEMO will seek to incorporate any learnings from implementing the RERT and AEMO/ARENA programs.

When a demand response event occurs, the response calculated for payment is the difference between the metered quantity of the resource and the baseline energy for the resource, where the baseline energy is an estimate of what demand would have been had there been no demand response. This reference level is based on historical load levels during comparable periods, with an adjustment for “on the day” conditions. For aggregated resources, this baseline would be determined based on the portfolio of resources activated for the event.

This methodology will take into account participants which also deliver services in response to other signals (e.g., a resource providing network support services in response to demand). Upon a successful test or activation, participants will need to provide AEMO with a list of periods during the baseline calculation period where they were activated for these alternative services. Providers would need to ensure that the provision of the alternative service does not compromise the baseline calculation (e.g., if there are no appropriate reference periods), otherwise usage payments may be withheld.

Any provider which has notified AEMO ahead of time (e.g., greater than 24 hours) of a planned outage may continue to receive availability payments for that period, subject to AEMO approval, but will not be eligible for any usage payments (if it would otherwise have been called on).

No request for activation or testing would be made for that period. A maximum number of hours per year that a resource could elect to not be available will apply.

<sup>1</sup> p33, [https://arena.gov.au/assets/2017/06/20170607\\_DemandResponse-FundingAnnouncement\\_PUBLIC.pdf](https://arena.gov.au/assets/2017/06/20170607_DemandResponse-FundingAnnouncement_PUBLIC.pdf)



#### Discussion notes

Working Group strongly supported a “drop by” methodology for ensuring additionality of demand response, and noted that aggregators might need to procure additional resources to ensure that sufficient response would always be available.

A “drop by” response is most aligned with the proposed baseline methodology: the baseline methodology proposed would evaluate a much lower performance if the resource had already “dropped to” a target level before the activation was received.

Working Group acknowledged that any resource which had already dropped its output (either intentionally or due to unforced outages) might still be “helping” the system but would not be seen as meeting its obligation to deliver a response on command.

### 3.8 Testing

AEMO will undertake testing of reserves once per contract period (unless successfully activated prior to the test within the relevant period). Testing will be required for each block that the Resource is contracted to provide Reserves for, unless otherwise agreed with AEMO (resources may be exempted if they can demonstrate that there are no material differences in the delivery of the Reserves in different blocks). AEMO may conduct the test at any time during the nominated time period, reflecting the expectation that the resource is expected to be available at any time.

Providers can request a retest (at their own expense); the timing of any retest will be at AEMO discretion.

By default, testing will require activation of the Reserves, and delivery for at least the minimum period set out in Section 3.4. However, at AEMO’s discretion, an alternative testing procedure may be negotiated. Such a procedure might not require an actual reduction in load, although AEMO expects that this would apply only to large loads or generators who can successfully demonstrate that the reserves could have been delivered at the time of the test request. Alternatively, the activation of only a sample (determined randomly) of an aggregated resource or behavioural response might be sufficient.

#### Discussion notes

The Working Group noted that all demand response, particularly large smelters, would want to avoid load shedding during a test if possible. For large, single loads, it may be possible to verify the capability of response without actual load shedding. In contrast, aggregated demand response might need an explicit test that the response will be available on demand, while behavioural response may need to be tested via sampling.

### 3.9 Metering requirements

AEMO will adopt similar requirements to the ARENA/AEMO procurement. In particular, providers will be required to specify the NMI for all resources contributing to an offer, and resources must be metered by a Type 1-4 meter or similar.

## 4. PROCURING THE SERVICES

As with the existing RERT, reserves will be procured through an annual tender process, with the volumes to be procured determined by AEMO modelling and in consultation with the relevant jurisdiction.

A prescribed format will be determined for the tender offers, and will be highly standardised. Non-conforming offers will be allowed for specific items, as noted in this document, but no other negotiation is expected and AEMO will have no obligation to consider non-conforming offers. AEMO will select successful tenderers based on the scheme requirements, and will seek to allocate contracts within a relatively short period of time.

### 4.1 Risk assessment and requirements

To assess the reliability of the NEM in AEMO's ESOO modelling, AEMO undertakes Monte Carlo market simulations across a range of demand, renewable generation and generator outage scenarios. This approach is consistent with AEMO's move towards probabilistic modelling of risk (e.g., AEMO's recent LOR rule change request).

Based on these simulations, AEMO will undertake a risk assessment of the potential for load shedding over the next one to three years. This will be compared to the reliability standard to determine the volume of reserves required.

### 4.2 Tender process

AEMO will hold an annual request for tenders for reserves. The tender will be held mid-year in advance of the following summer (as defined in Section 3.2) and subsequent seasonal periods.

Additional tender rounds may be held if market conditions change materially, for example in response to significant changes to generation availability. Additional tender rounds may have shorter notification and application periods if required. AEMO may also hold additional rounds if it determines that insufficient resources have been offered to ensure a competitive selection process.

A standard set of terms and conditions will be developed, with the expectation that providers will deliver at least the minimum requirements specified in Section 3. However, AEMO will consider variations to contracts if necessary to procure the required quantity of reserves or to deliver improved outcomes to consumers.

#### Discussion notes

Allowing additional auctions to be held will be important to ensure the existing functionality of the RERT is maintained. For example, in the event of significant supply/demand imbalances after the initial auction, it would be prudent for AEMO to have a mechanism for procuring additional reserves.

### 4.3 Structure of offers

Providers must specify the product or products (defined by the notification period required and the time period offered for, as outlined in Section 3.1) that they are offering, and a corresponding price offer. Bids may be structured across three separate revenue streams: availability, pre-activation and usage charges, as defined in the table below. Note that pre-activation charges are only available for the 24 hour notification product.

Price caps may apply to each payment stream. The usage payment should reflect a reasonable assumption for the avoided value of customer reliability, while availability and pre-activation payments may need to be capped to minimise the availability costs.

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

Availability payments should be structured as either:

- A total availability payment for the offered quantity (MW) of reserves, which will be translated into a pro-rata \$/MW per hour payment for the purposes of settlement. For example, a 20 MW embedded generator would state the fixed availability payment required to provide the full 20 MW of reserve.
- As a \$/MW per hour payment directly, if a flexible amount of capacity is being offered and the total availability payment required would scale based on the capacity procured. For example, an aggregator of distributed resources may offer up to 200 MW of reserves at a fixed \$/MW per hour price.

In all cases, the provider may offer additional resources at different prices (e.g., to offer a tiered response).

No additional usage charges will be payable in the event that a provider delivers more than the agreed response, unless otherwise agreed with AEMO in response to a specific system need (e.g., if more reserves are required to respond to an extreme event, and a provider indicates it can deliver additional response that would be beneficial for the system).

At both the procurement and delivery stage, any applicable MLFs and DLFs for resources will be applied to each category (in the auction/tender) and to settlement, to account for transmission and distribution losses, as well as to provide basic locational signals. Distributed resources spanning multiple connection points will need to provide a breakdown of the component of the amount delivered from each connection point and corresponding MLF/DLFs, unless otherwise agreed with AEMO.

### Discussion notes

AEMO's analysis of RERT procurement has noted that comparing bids with very different cost structures and performance offers is highly challenging. Conversely, the ARENA procurement of standardised products where only a single price (availability payments) was considered was significantly simpler. The Working Group considered that making all three revenue streams available would increase flexibility and that AEMO would be best placed to estimate how frequently each service would be used and hence how we should compare and evaluate options.

Participants noted that usage costs are expected to be relatively high (while availability payments would be relatively low), given the expectation of a rarely used service. Participants noted that if the intent is to attract out-of-market resources, the price cap for usage charges should be higher than the Market Price Cap.

After further consultation on affordability, AEMO has proposed to apply price caps to usage costs, above the budget cap but below the VCR. Caps on availability and pre-activation payments may also be appropriate. AEMO expects that these would be considered further during subsequent reviews.

## 4.4 Selection of providers

When selecting a portfolio of resources, AEMO will consider the total cost of procuring and activating those reserves under a range of scenarios, and seek to minimise the total cost subject to meeting operational requirements and the total standard. AEMO will determine the expected total expenditure on the scheme (including availability, usage and pre-activation payments) based on analysis of potential scenarios.

In general, AEMO will prefer providers which are able to deliver response with a shorter notification period. That is, all else equal, a provider requiring a 10 minute notification period will be preferred to a 24 hour notification period provider.

However, to the extent that a 24 hour notification period Reserve can be offered to AEMO at a lower cost, AEMO will seek to procure a portfolio of reserves that will meet the market needs identified by AEMO and the specified budgets, but which can be procured at the least-cost to consumers.

AEMO may consider other factors in selecting winning tenders, including the ability of the resource to sustain the response longer than the minimum period, specific locational requirements or benefits, and any deviations from the standard contracts.

As discussed in Section 3.6, any spot market revenue received by the provider will be returned to AEMO to offset the cost of the scheme. This potential cost saving will be considered by AEMO in the methodology for selecting providers.

Retailers may potentially benefit from avoided spot market charges associated with a demand response during a period of activation. Further consideration will be given to the potential for avoided costs once a decision has been made on the payment arrangements.

### Discussion notes

The Working Group was broadly happy for AEMO to determine the most appropriate methodology for selecting winners, although noted that process should be transparent and published.

Selection would be significantly easier if only one price differentiates the various products, although AEMO would still be required to choose between 24 hour, 10 minute and 60 minute products.

For the initial procurement round, likely to be beneficial to have an open methodology, allowing for learning on both sides as well as to build on experience from RERT and ARENA this summer.

## 4.5 Scheme funding

AEMO proposes that the current funding mechanism for RERT be continued. The costs of the scheme are to be recovered from loads through their NEM fees, with the costs for reserves in each region allocated pro-rata based on annual energy consumption. Usage costs would be recovered from the region where load shedding was avoided.

## 5. DISPATCH AND ENABLEMENT

As with the current RERT framework, AEMO will dispatch reserves to:

- in response to an LOR2 or LOR3 condition identified in ST-PASA or pre-dispatch
- to ensure that the system remains in a secure state, where activating reserves are lower cost than market directions

AEMO expects that reserves will be activated as a last resort to avoid load shedding, but ahead of directing generators.

Operationally, these reserves are typically activated as close to real-time as possible, which reduces uncertainty, minimises intervention in the energy market, and allows the greatest flexibility from the system operators to ensure reliable and secure supply.

AEMO will develop a methodology that defines how reserves are to be activated. This will consider:

- The preference for delaying the activation of any reserves until closer to real-time when certainty is greatest
- The potential for lower cost activation of 24 hour notification or 60 minute notification reserves compared to 10 minute reserves, or the potential need to activate those reserves to ensure sufficient response is available
- The interaction between directions and activating RERT contracts

### 5.1 Pricing for other market participants

Further analysis is being undertaken on this option, but the preference is for a simpler approach than what-if pricing.

## Discussion

- Working Group broadly supported What-if pricing as the “cleanest” but most complex to implement, but some thought there should be no intervention pricing and some thought the price should be set to the cap when reserves are activated
- It was noted that to the extent that reserves are only rarely activated, the overall impact on the market might be relatively small. Furthermore, it would be expected that prices would be high during periods where reserves were activated.
- Preference was broadly for either what-if pricing or setting the price to the price cap.

## 5.2 Consequences of non-delivery

### 5.2.1 Treatment of availability payments

If delivered response is less than the contracted amount (either during a test or an activation), providers will be required to refund availability payments for the shortfall in capability. This will be calculated from the period from the resource’s last successful test or activation, with the resource’s availability from that time assumed to be the lesser of the resource’s performance at that test or activation and the most recent test or activation.

For example, a 100 MW resource (successfully delivering that response during a test on 1 January) that delivered only 80 MW of response during a test on 1 July will be required to refund 20% of its availability payments from that six month period. Its availability payments going forward will be calculated based on 80 MW of reserve until the next test or activation.

If a testing regime agreed with a provider does not require the physical delivery of a response (e.g., the testing requires only a demonstration of how the response could have successfully been delivered at that time), that test will not count for the purposes of backdating availability payments. In this case, reduced availability payments will be backdated to the start of the contract period.

Additional damages or penalties may apply if the provider is found to have “intended not to deliver”, or if the lack of response was a wilful default.

If a provider notifies AEMO ahead of time that a resource will not be available, they may be eligible to continue to receive availability payments as outlined in Section 3.7.1.

### 5.2.2 Treatment of pre-activation payments

Pre-activation payments will only be paid for the actual response delivered, unless AEMO cancelled the activation of the resource, in which case pre-activation charges will be paid for the lower of the contracted resource amount and the response provided during the last successful test or activation.

### 5.2.3 Treatment of usage payments

In all cases, usage payments will only be paid for the actual response delivered.

No damages will be applied under this framework for a resource that delivers a greater response than was requested, but other market damages may apply (e.g., for a market generator that does not meet its dispatch instructions).

### Discussion notes

The working group noted that there is a trade-off where greater sanctions for non-performance encourage more reliable delivery, but may “scare off” participation. There was consensus that usage and pre-activation payments should not be paid for non-delivery, and availability payments should be refunded.

Some considered that additional damages should be applied for non-performance, particularly for heavy industry, and could be calculated in a bespoke manner. A sliding scale could be applied, with increasing damages applying for greater non-delivery. In Belgium, reserves are procured on the assumption of 100% availability, regardless of conditions.

However, it was agreed that damages should not be applicable if the provider notified AEMO of their reduced availability, up to an agreed number of hours.

## 6. FURTHER WORK

AEMO proposes that further work could be undertaken following the implementation of the enhancements outlined above. This would allow analysis of operation of the scheme and the types of resources being offered, and could consider expansions that would increase both participation and value of the scheme at the expense of additional complexity.

In particular, AEMO proposes to consider:

- A weather sensitive product that would require resources to only deliver reserves on particular types of days, such as summer extreme peak demand days. Given the expected additional residential air conditioner load operating on those days, this product may provide AEMO further flexibility in managing peak demand.
- Whether the proposed consequences of non-delivery are sufficient to encourage a firm response.
- Whether additional time blocks would drive additional value or flexibility.
- Based on the availability of standard products whether an auction process would provide greater levels of competition and price discovery within the reserve market