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Australian Energy Market Commission
PO Box A2449
Sydney South NSW 1235

Re: Response to *Enhancement to the Reliability and Emergency Reserve Trader – Options Paper*

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1. INTRODUCTION

Infigen Energy (Infigen) welcomes the opportunity to provide a submission to the Options Paper prepared by the AEMC. Infigen has a 557 MW portfolio of wind capacity across New South Wales, South Australia and Western Australia and a further 113 MW of wind generation under construction in New South Wales. We are also developing a 25MW/52MWh Battery Energy Storage System (BESS) adjacent to our existing 278.5MW Lake Bonney Wind Farm in South Australia.

We are active participants in the energy market, delivering services to our large C&I customers using innovative mixes of renewable generation, demand response and hedging products.

We note that this Options Paper addresses only a narrow component of the rule change request, and we have restricted our commentary in this submission to only those issues raised in the Options Paper.

2. INFIGEN'S VIEW OF THE RERT

Under the Reliability and Emergency Reserve Trader (RERT) framework, AEMO can procure emergency reserves when projected levels of unserved energy is expected to breach the reliability standard.

AEMO may enter into RERT contracts to “ensure” that the region meets the reliability standard – this trigger is then effectively operationalised through the RERT Guidelines and the Reliability Standard Implementation Guidelines. Currently, AEMO triggers RERT procurement when projecting a Low Reserve Condition (LRC), i.e., unserved energy exceeding 0.002% on an annual basis (medium-term) or when projecting an LOR2 condition (approximately, load shedding on a single contingency but subject to other supply and demand uncertainties) over shorter timeframes (short-term).

AEMO then currently has discretion as to the actual volume of RERT to be procured, subject to the RERT principles (minimising distortions and maximising effectiveness at least-cost to consumers, as well as consulting with the relevant jurisdiction).

Infigen considers that the purpose of the RERT framework should be to provide AEMO with last resort powers to procure emergency reserves. Allowing for the possibility of some level of unserved energy is a necessary part of delivering low-cost power to consumers, avoiding the need for “gold plating” the grid and noting (as presented by the AEMC) that even avoiding all transmission level unserved energy would have only a small impact on consumer reliability of supply given outages in the distribution network.

Minimising intervention in the market is important because it reduces uncertainty for investors and market participants, reduces the risk of distorting investment signals, and reduces the risk of distorting real-time price signals. For example, increasing quantities of highly flexible battery storage and demand side response is likely to enter the market. As energy limited resources, being able to plan dispatch to best meet system needs and maximise revenue is critical, but this planning is complicated by AEMO directions/activation of RERT and the subsequent intervention framework.

3. RESPONSE TO QUESTIONS

3.1 Appropriateness of the reliability standard

Infigen supports the AEMC’s proposed approach to considering the appropriateness of the reliability standard.

3.2 Option One – Reliability standard determines procurement trigger and volume

Under Option 1, the trigger for the procurement of RERT and the volume of RERT to be procured would be more clearly defined: the trigger would be explicitly linked to a projected breach of the reliability standard, with the volume to be procured limited to that sufficient to just avoid that trigger.

Infigen considers that this option is strictly better than the status quo: it would improve certainty for both AEMO and for participants, and would seem to better align the spirit with the wording of the Rules.

Medium term considerations

Infigen considers that there is not the need for additional error margins to be incorporated into this process. Rather, AEMO could (and should) incorporate any limitations (e.g., number of activations) and any mandated performance standards (e.g., expected availability of RERT reserves at peak times) into its modelling, and use this to determine the appropriate number and combination of providers to avoid the trigger.

For example, consider if all RERT providers agreed to only be activated up to five times per year, but were 100% reliable when called upon.

- If AEMO's Monte Carlo scenarios have a maximum of 100 MW of unserved energy (USE) in any given period and never have more than five instances of unserved energy in a given year, then a single 100 MW RERT provider would clearly be sufficient to reduce projected USE below 0.002%.
- If some scenarios had more than five instances of USE, then a single 100 MW provider might *still* be sufficient to reduce USE below 0.002%.
- If many scenarios had more than five instances of USE, AEMO might need to procure an additional provider (say, 200 MW) to ensure that projected USE fell below the standard.

In this way, the volume to be procured is consistent with the initial modelling that triggered the procurement. Ideally, the choice of RERT providers would also be optimised within the process, such as by trading off the cost of different providers. In the above example, if a RERT provider could deliver 100 MW but for 10 activations, that might be lower cost than procuring 200 MW.

RERT providers with lower levels of reliability (if reliability less than 100% were accepted by AEMO) could either be incorporated through further Monte Carlo simulations (likely to be challenging) or through a direct scaling metric (e.g., a 98% reliable resource is assumed to only deliver 98% of its rated capacity, and its payment is scaled accordingly).

Short term considerations

On shorter timeframes, the proposal to limit RERT procurement to just avoiding an LOR2 condition is reasonable, and seems consistent with AEMO's current procedures.

The new Forecast Uncertainty Measure (FUM) framework for defining LOR2 conditions already includes generous safety margins: from 0.5 to 15 hours ahead, the FUM is sufficient to cover 98% of projected supply and demand scenarios¹. The level of required reserves (and hence, potentially, the procurement of RERT) is strongly contingent on this confidence level (e.g., a requirement for a higher confidence level, such as 99%, would increase reserve requirements and frequency of RERT procurement – resulting in more false positives and higher RERT costs but fewer missed USE events).

Given the significance of the FUM confidence levels, it would be appropriate for these levels to be set by the Reliability Panel through a consultation process, allowing consideration of the costs and benefits of tighter confidence intervals. The necessity for any additional error margins in procuring RERT (e.g., the additional 10% currently used by AEMO) could be considered and defined at the same time. These factors could alternatively be consulted on and defined in the Reliability Standard Implementation Guidelines.

¹ [https://www.aemo.com.au/-/media/Files/Electricity/NEM/Security and Reliability/Power System Ops/Overview-of-new-method-for-determining-Lack-of-Reserve-V2.docx](https://www.aemo.com.au/-/media/Files/Electricity/NEM/Security%20and%20Reliability/Power%20System%20Ops/Overview-of-new-method-for-determining-Lack-of-Reserve-V2.docx)

Infigen notes that despite frameworks to unwind intervention during settlement, “what if” pricing is complex and difficult to administer. This is likely to be exacerbated as more flexible energy storage is introduced to the market, where bids necessarily need to consider usage over recent periods. As such, avoiding pre-activation payments and requiring resources to respond on short time-frames (e.g., 10 minutes) would minimise unnecessary distortions.

Impacts on consumers

Infigen considers that this approach would provide greater clarity for consumers, generators and for AEMO.

- It would help ensure that the reliability standard, a well consulted and agreed trade-off between reliability and cost, is applied to the market.
- Providing clear guidelines would allow the market to plan accordingly, with both consumers and providers of RERT able to project likely usage (and, to some extent, costs) over a given period.
- Potential RERT providers will have clearer expectations of the volume to be procured, which should result in more competitive offers and encourage participants to use the energy market where possible.

3.3 Option 2 – Broader risk assessment of procurement trigger and volume

Under this approach, rather than procuring and dispatching RERT to defined standards, AEMO would conduct a full economic assessment and seek to procure RERT that minimises the total cost to consumers of RERT *plus* an assigned value of customer reliability (VCR). For example, using a RERT demand response provider requiring no availability or activation payments but having a usage cost of \$20,000/MWh would, in theory, be considered lower cost to consumers than load shedding at a VCR of \$25,000/MWh to \$45,000/MWh. Infigen considers that AEMC has accurately described the issues around this option, subject to the comments below.

On a theoretical level, advocating this approach would seem to hinge on out of market reserves being more efficient than increasing the market price cap (MPC). Infigen can see that there is a theoretical argument to be made here – a higher MPC increases contracting risks, and amplifies adverse consumer welfare consequences of transient generator market power episodes. If combined with constraints on investment, a higher MPC (e.g. to the VCR) could conceivably deliver higher levels of reliability but at higher cost than out of market reserves. However, this is still a market distortion and we consider the Reliability Panel is best placed to consider this issue, including commissioning modelling if necessary.

This approach requires consideration of the *probability* of USE over any given time period. For example, if AEMO projects a 10% chance of 100 MW USE for a one hour period with a VCR of \$30,000/MWh, the expected cost of USE is 100 MW x 1 hour x

$\$30,000/\text{MWh} \times 10\% = \$300,000$. A 100 MW activated to avoid that risk could only be justified at a cost of $\$3,000/\text{MWh}$. This is less than the MPC, and such a resource should operate in the market, accepting market risk or contracting with retailers. Note that this economic analysis must be on the basis of projected USE, not projected activations to avoid LOR2 conditions (for example)².

Medium term considerations

In the medium term, this option would require sophisticated simulations. AEMO would need to consider, for each period, the likelihood that AEMO would have activated any procured RERT providers (given whatever short-term implementation of the reliability standard is ultimately applied), regardless of whether USE actually occurred in that period.

As discussed above, AEMO would need to make an estimate of its forecasting accuracy and likelihood of “false positives”. This could potentially be in the existing Monte Carlo framework, or could require a more complex risk framework (incorporating the FUM methodology) be applied for each period of a simulation, with appropriate treatment of outages. In particular, the simplistic approach outlined in the Options Paper (requiring only an assessment of USE in Monte Carlo simulations) would *not* be sufficient and would overestimate the economically efficient amount of RERT³.

This option might also see RERT procured on a regular basis, leading to more frequent market interventions. This increases complexity for market customers, particularly those with responsive in-market generation or load (e.g., battery storage). It will also increase the risk of flexible resources preferring to tender for RERT rather than operate in the market.

Given these issues, Infigen does not support Option 2 for RERT procurement in the medium term (e.g., long-notice RERT). If this option were to be progressed, it should be restricted to resources with no availability or activation payments, only usage payments, and with short call times (ideally 10 minutes or less), to minimise market distortions.

Short term considerations

On shorter timeframes Option 2 is attractive in that it provides a more explicit framework for implementing the underlying principles of the reliability standard. If it were applied to both the procurement of short notice RERT and the activation of RERT resources, this could potentially help AEMO better align the costs and benefits of RERT procurement.

² It would be interesting to understand the *projected* USE and avoided USE for historical periods where RERT was activated and therefore the implicit cost (\$/MWh) of those resources when activated.

³ Unless there were no usage or pre-activation payments – if only availability payments made available, and there were no costs associated with the intervention framework, then actual USE would be a reasonable approximation.

- Over longer timeframes, certainty around USE will be lower, representing a higher barrier to activating RERT (which is appropriate, given greater opportunity for market response over longer timeframes)
- Closer to real-time, as certainty improves, the activation of RERT would explicitly consider the economic trade-offs between USE and the cost of resources given AEMO a clearer economic framework
- Resources with short call times will be more valued, incentivising less distortionary capacity

It would, however, likely be more complex for AEMO to administer, which may be less attractive to AEMO.

Under this option, it may be appropriate to require RERT contract costs to be made public (like all other bids and offers), to facilitate transparency around AEMO's cost-benefit decisions. AEMO would also need to publish more detail of its statistical models and the expectation value of projected unserved energy.

Benefits to consumers

This framework theoretically better captures underlying consumer preferences, which could improve consumer welfare. However, a requirement to continuously evaluate economic costs and benefits is very complex (and presumably part of the reason that a pre-determined standard, derived from fundamentals, is applied in the NEM).

3.4 Option 3 – Option 1 + changes to the operationalisation of the reliability standard

Under this option, modelling would be used to operationalise the annual reliability standard over shorter periods. For example, modelling of when USE is likely to occur could be used to pro-rata annual USE across months or subsets of months. Rather than limiting 0.002% USE on an annual basis, AEMO would then apply monthly GWh limits for USE when determining whether to procure RERT.

Without more details on a proposed approach, it's difficult to see whether this is likely to improve market certainty. As noted in the Options Paper, the time frame on which the reliability standard is resolved is critical. For example, procuring RERT to limit monthly USE to a pre-determined level may improve signals on that time frame, but it is not clear how AEMO would make decisions on RERT procurement within that timeframe. Conversely, in the medium term, setting monthly USE limits does not seem to provide more certainty or improved consumer outcomes compared to assessing USE over a longer period.

Of the two options suggested in the Options Paper:

- Applying a fixed monthly target (e.g., set at the largest level of USE expected in any month in modelling scenarios that meet the reliability standard) would seem relax the reliability standard.



- Applying the annual standard pro-rata between months based on modelling would seem to tighten the reliability standard (as it represents a strictly tighter constraint than an annual target).

Further work would be needed to outline the costs and benefits of specific options for this proposal.

4. CONCLUSION

Infigen supports greater transparency around RERT procurement and activation, and all these options would seem to provide better signals for triggering and procuring RERT.

At this level of analysis, Infigen would:

- Support Option 1
- Tentatively support Option 2 for the short-term procurement and activation of RERT, but at this time not for regular procurement of long-notice (or similar) RERT given the risk of increased intervention.
- Does not support Option 3, pending further detail of more concrete proposals.

If the AEMC combined Option 2 with other options, Infigen supports capping the level of RERT procured at the level required to just avoid an LRC/LOR2 condition.

Infigen looks forward to continuing to engage with the AEMC on these issues, and would be happy to further discuss any of the points raised in this submission. If you have any questions about this submission please contact Joel Gilmore on joel.gilmore@infigenenergy.com or 0411 267 044.

Yours sincerely,

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