Violette Mouchaileh

Australian Energy Market Operator

Submission made via email to NEMReform@aemo.com.au

31 March 2025

Dear Ms Mouchaileh,

Subject: Development of the Voluntarily Scheduled Resource Guidelines – Consultation Paper

SA Power Networks welcomes the opportunity to provide feedback on AEMO's Consultation Paper on the development of the Voluntarily Scheduled Resources Guidelines (the Guidelines).

We strongly supported the AEMC's Final Determination on the *Integrating Price Responsive Resources into the NEM* Rule Change (the Rule). However, we consider that some elements of the VSR Guideline as currently proposed by AEMO could lead to an inefficient deployment of the rule. Our key points of feedback are as follows, and are expanded throughout the submission:

1. We *do not support* AEMO's proposed *zonal classifications* for VSR participation, based on congestion modelling zones. We propose that AEMO consider a staged approach to zonal classifications, initially using NEM regions and transitioning to congestion modelling zones over time as the volume of aggregated resources increases across these zones.

2. We *do not support* AEMO's proposed *VSR registration threshold* of 5MW. We consider that the full benefits of the reform would not be realised if this threshold were to be implemented and instead recommend that a participation threshold of 1MW be considered, with a potential transition to a higher threshold over time.

3. We *support* AEMO's proposed arrangements for *sharing VSR standing data with DNSPs,* namely that NMIs, including SSPs within a VSR be made available to DNSPs via MSATS, and that embedded network on-market child NMIs within a VSR need not be made available to DNSPs.

4. We *do not support* AEMO's proposed arrangements for *sharing VSR bid data with DNSPs*, namely that aggregate VSR bid quantities be made available to DNSPs in a post-market arrangement. We consider that efficient integration of VSRs into the distribution network can only be achieved by providing DNSPs with NMI-level *forecast* bid quantities and hence propose an opt-in framework for VSRPs to provide forecast VSR bid data to DNSPs.

We look forward to continuing to engage constructively with AEMO to deliver the lowest cost whole-of-system approach to enabling the energy transition. Should you have questions on any aspect of our submission, please contact Liam Mallamo, Industry Development Lead, at liam.mallamo@sapowernetworks.com.au.

Travis Kauschke

Strategy & Development Manager

Zone classifications

An effective implementation of the Rule will ultimately be dependent on the volume of resources electing to participate as a VSR. We consider that a key determinant of a proponent's ability to form a VSR and participate in the market as a VSRP is their ability to aggregate sufficient resources within nominated VSR zones.

We understand that the determination of VSR zone classifications must balance multiple factors, including the need to maximise VSR uptake whilst ensuring that system security can be maintained. However, we do not support the current proposal to use congestion modelling zones as the bounds for VSR zones. The use of congestion modelling zones is likely to restrict early VSR uptake, particularly when coupled with AEMO's proposed capacity threshold of 5MW for VSR registration. We note that the two parameters are inherently coupled – a lower registration threshold could allow for a greater number of VSR zones, whilst larger zones could allow for a higher registration threshold.

Where a VSRP seeks to operate a single large resource as a VSR, their ability to do so will not be restricted by VSR zones. However, the majority of VSR participation is likely to come from aggregated resources, whether aggregated large batteries or aggregated behind-the-meter resources. In the latter case, many virtual power plants (VPPs) today are in a nascent state, with few being likely to have sufficient resources aggregated within a single congestion modelling zone to participate as a VSR.

The Consultation Paper notes that the use of DNSP network boundaries is not a preferred option, but that consideration must still be given to the effective deployment of dynamic operating envelopes (DOEs) and emergency backstop functions. Where a VSR is participating in a state supplied by multiple DNSPs, such as Victoria or New South Wales, the resources within that VSR would likely receive DOEs from multiple DNSPs, regardless of whether the VSR was aggregated within a congestion modelling zone or across the NEM region. Whilst this may introduce short-term complexities for VSRPs, we do not consider this to be a material issue in the longer term, noting that significant effort is currently underway to ensure that the rollout of DOEs and emergency backstop functions by DNSPs is done in a nationally consistent fashion. We do not see a need to align VSR zones with DNSP network boundaries and would suggest that doing so would unnecessarily restrict VSR uptake.

We note the Consultation Paper proposes the "*potential use of NEM regions as VSR zones in the early years of dispatch mode, when VSRs are expected to be small, with a transition to VSR zones that better support system security as VSRs grow."* We would support such a transitional classification and suggest that this would be the most prudent way to implement VSR zones. Ensuring that the barriers to entry as a VSR remain as low as possible at the outset of the Rule implementation is critical to driving longer-term VSR uptake, whilst still providing flexibility for VSR zones to change over time as deemed necessary. The nominal date of May 2030 for a review of VSR zone classifications would allow sufficient time to determine whether congestion modelling zones could sufficiently support existing and future VSR uptake.

VSR nomination thresholds

The capacity threshold for a VSRP to register a resource or set of resources as a VSR, combined with the nominated VSR zones, is a key determinant of VSR uptake and hence the benefits realised through the Rule implementation. The Consultation Paper proposes a VSR registration threshold of 5MW, primarily to manage the increased complexity of system operations with a large volume of registered VSRs. Whilst we understand the need to maintain system security, with control room management being key to doing so, we consider that a 5MW threshold for VSR registration would significantly restrict VSR uptake and introduce risk to realising the benefits of the Rule.

Large distribution connected battery systems

The threshold for bi-directional units such as batteries to be scheduled today is 5MW, with many proponents opting to restrict the outputs of their system below this threshold to avoid the increased costs and connection studies that would otherwise be required. Enabling AEMO and DNSPs to gain visibility over the operation of these resources is critical to efficient system operation, noting that significant growth is currently being seen in connections of this size. A VSR registration threshold of 5MW would require a VSRP to aggregate multiple sub-5MW batteries together in order to participate as a VSR. This would assume that a number of these resources are owned and operated by the same party, who could then register as a VSRP and aggregate two or more batteries into a VSR.

This assumption would not align with the current experience of ourselves and other DNSPs, where an increasing number of proponents are seeking to install sub-5MW battery systems, with many parties only operating a single battery. Requiring multiple sub-5MW batteries to be aggregated for VSR participation would thus significantly reduce the ability of these resources to participate as VSRs, and in-turn significantly reduce the uplift in visibility provided to both AEMO and DNSPs over the operation of this group of resources. However, we expect that over time, the portfolio of these battery operators will grow, and many parties may operate multiple sub-5MW batteries capable of aggregation in a VSR.

Distributed CER

A significant volume of future storage requirements in the NEM is forecast to be met by distributed CER storage, with many of these resources being orchestrated as part of a VPP, and hence potential candidates for participation as a VSR. The application of a 5MW threshold for VSR registration to distributed CER, however, would likely materially impact the number of current VPPs that could participate, particularly when coupled with the proposed VSR zone classifications. South Australia currently has the highest level of VPP uptake nationally, with more than 18 VPPs currently active. Whilst no clear data on VPP participation is available today, we expect that many of these VPPs would not have 5MW of aggregated resources available within the state and would thus be restricted from registering as a VSR.

We consider that implementing a staged approach to the VSR registration threshold would balance the need to encourage early VSR adoption with the need to maintain a secure and manageable power system. An initial threshold of 1MW could be applied, aligning with current thresholds for market registration and bid increments, allowing as many assets as possible to participate as a VSR, whether aggregated CER or single large distribution connected batteries. This threshold could be reviewed over time, in parallel with a review of VSR zones, considering whether sufficient new volumes of aggregated resources have been made available such that the VSR registration threshold could be increased, with the aim of ensuring that large amounts of 1MW to 5MW VSRs do not pose a long-term threat to AEMO's ability to perform operational management of the power system.

Data sharing arrangements between VSRPs, DNSPs and AEMO

The AEMC's final Rule determination requires VSRs to operate within the constraints of the distribution network, practically implemented by way of DNSPs provision of time and locationally varying import and export limits to VSRs within a DOE. We strongly supported this decision, noting that the most efficient way to integrate new connections into the distribution network is via flexible connections, ensuring that the technical limits of the network can be maintained whilst increasing network utilisation and delivering efficiency benefits for all customers.

Generating efficient DOEs for a given resource, however, requires a short-term forecast of the operation of that resource. DNSP initiatives to deploy DOEs to date have largely focused on integrating solar PV, a resource which is forecastable, and which only requires one-way communication. Integrating price-responsive resources such as batteries into a flexible connection via a DOE, however, introduces significant forecasting uncertainty. In the absence of reliable data regarding the short-term operations of a battery, a DNSP must make a series of assumptions, with these assumptions typically being based on a limited historical dataset of the battery's operations and requiring significant conservatism to ensure the technical limits of the network are maintained. These conservative assumptions lead to batteries being inefficiently curtailed and the surrounding network being underutilised.

DNSPs receiving short-term operational forecasts of a VSRs operation, by way of receiving the MW bid quantity, will significantly improve our ability to generate efficient DOEs for these resources, providing the optimum allocation of network capacity. This will in-turn reduce the magnitude of constraints imposed on a battery and improve their ability to participate in the market, as well as reducing costs for all consumers by way of increased network utilisation.

The Consultation Paper proposes that DNSPs be provided with MW bid quantities from VSRPs, but that this data would only be provided in a *post-market* manner, and that only *aggregate* VSR bid quantity data would be available from AEMO. We do not support this proposal, noting that post-market data does not provide a material uplift in our ability to generate efficient DOEs for VSRs and that the provision of aggregate VSR bid data introduces additional uncertainties in the generation of NMI-level DOEs.

Provision of forecast bid quantities

Forecast bid data is required for DNSPs to generate efficient DOEs. Whilst the use of post-market data could be used to improve a DNSPs estimates of VSR behaviour over time, this would imply that future market behaviour is purely influenced by past market behaviour, an assumption that we do not see as credible and that would not provide DNSPs with any material uplift in their understanding of a resources operation beyond that currently available through metering and SCADA data today.

We understand that AEMO and other parties may have concerns regarding the provision of sensitive market data to DNSPs, noting that some DNSPs are beginning to deploy network-owned batteries, with some of these batteries being operated in the market by third parties. We do not consider that there are any confidentiality, privacy or competitive concerns with respect to forecast bid quantities being shared with DNSPs. The AER's ring-fencing guidelines restricts DNSPs from operating network owned batteries in the market. A class-waiver has however been granted to allow DNSPs to *lease* some portion of the capacity of these batteries to a third-party for market operations, but this operation would be entirely managed by that third party. A DNSP has no additional insights or control of the market portion of these batteries' operation than any existing third-party owned battery.

Forecast VSR bid quantities provided to DNSPs would be used purely for the purposes of efficiently managing the distribution network via the provision of DOEs to resources participating in a VSR, and the receipt, storage and use of this data would be subject to existing ring-fencing requirements, ensuring that it cannot be used for any competitive market purposes.

Provision of NMI level bid quantities

The limits of the distribution network vary significantly in time and location, reflected by the fact that DOEs are provided to resources enrolled in a flexible connection on a NMI-level basis[1]. Where a DOE is being provided to a battery or other price-responsive resource, the calculation of that DOE takes into consideration the local network construction, other customers supplied by the same upstream network assets and the behaviour of both the resource receiving the DOE and neighbouring resources. Each of these factors is unique to the individual resource, varying on a NMI-by-NMI basis. We thus do not support the provision of only aggregate VSR bid quantities to DNSPs, reflective of the fleet-wide behaviour of a VSR where multiplate resources are being aggregated. This would require DNSPs to disaggregate the data to a NMI-level for use as input to DOE calculations, an operation that we feel DNSPs are not best-placed to do.

In generating their bid quantities for provision to AEMO, VSRPs will take either a 'bottom-up' or 'top-down' approach, generating aggregate forecasts of their fleet either by determining operation of each resource and its capacity over the forecast period at a device level, or by determining a fleet-wide target and allowing each resource to adjust its own behaviour in order to best meet that target. We understand that not all VSRPs will employ a bottom-up forecasting approach, and hence not all VSRPs will have accurate NMI-level forecasts available. However, where these forecasts are available, we consider that the provision of NMI-level data to DNSPs will play a crucial role in ensuring that all DOEs generated for VSRs are as efficient as possible.

Opt-in, DNSP-led data provision framework

The provision of forecast, NMI-level bid VSR bid quantities to DNSPs is critical to efficiently integrate these resources into both the local distribution network and the wider energy system. However, we understand that there are significant complexities involved in doing so, noting the variations in forecasting methodologies and capabilities employed by VSRPs, and that there is no interface currently in place between VSRPs and any party, including AEMO, to provide NMI-level bids for an aggregated VSR.

Recognising the importance of these data-sharing arrangements, but also the operational limitations on both AEMO and VSRPs, we propose an opt-in, DNSP-led framework for the provision of forecast NMI-level VSR bid quantities.

Under this framework:

- VSRPs would have the *option* of providing forecast bid-quantities to DNSPs for their VSRs.
    - Where a VSRP does not opt to provide this data to a DNSP, that DNSP would still be able to receive aggregate post-market bid quantities for that VSR from AEMO.

[1] For the purposes of this submission, 'NMI-level' refers to either a primary NMI or a SSP where one may exist. *Section 5.1* of our submission to the AEMC's Draft Determination on the Rule Change provides more details on data sharing to DNSPs involving SSPs.

- VSRPs would provide a 24-hour forecast of their bid-quantities to DNSPs.

- VSRPs would provide NMI-level bid-quantities to DNSPs where this data is available.
    - Where a VSR contains any single resource of 1MW or greater, NMI-level data must be provided for that resource, but aggregate data could be provided for other resources within the VSR, or for VSRs consisting only of small resources where no NMI-level data is available.

- This data would be provided directly from VSRPs to DNSPs, with no need for AEMO to be 'in-the-loop' or interface with any new VSRP or DNSP systems. Over time, this process could be enhanced to include multiple iterations, taking into consideration the pre-dispatch provided by AEMO to a VSR in order to further refine the DOE generated by the DNSP.
    - We refer AEMO to *Section 2.1* of our submission to the AEMC's Draft Determination on the Rule Change, where we outline our proposed data-sharing arrangements between DNSPs, VSRPs and AEMO, noting that such an iterative model is preferential long-term, but may not be necessary at the outset of the Rule implementation.

- This data would be provided via a nationally consistent DNSP to market interface. This interface could leverage the existing CSIP-AUS protocol or take the form of a new interface. We note that discussions are currently underway between DNSPs and with industry regarding the potential for such an interface, with this being one of several key use cases.

VSRPs that elect to provide day-ahead, NMI-level forecasts of their VSR bid-quantities would receive a more optimal allocation of network capacity, by way of allowing DNSPs to remove a layer of conservatism in their DOE generation. This would reduce the level of constraints imposed on that VSR and allow them to increase their bid quantities when compared with a VSR connected to the same part of the network opting *not* to provide this data to a DNSP. We consider that this increased network access could materially improve the access of a VSR to market revenue and would additionally drive unit cost reductions for all consumers by way of increasing network utilisation.

SA Power Networks has shared this proposed framework with a major VPP operator, who supported the proposal in principle and considered that for prospective VSRPs, a minimal uplift in technical capability required to participate could deliver a material improvement to the performance of their VSR. As the development of the Guideline continues, we recommend that AEMO consider the merit of such a model and engage closely with DNSPs and prospective VSRPs to realise the most efficient deployment of data-sharing arrangements between these parties.