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MASS Review Consultation Team

Submitted by email to [mass.consultation@aemo.com.au](mailto:mass.consultation@aemo.com.au)

**SA Power Networks' submission to the Australian Energy Market Operator Draft Determination:  
Amendment of the Market Ancillary Service Specification – DER**

SA Power Networks welcomes the opportunity to comment on the Australian Energy Market Operator (AEMO) Draft Determination on amendment of the Market Ancillary Service Specification (MASS) for distributed energy resources (DER).

SA Power Networks is committed to supporting the distributed energy transformation to secure a stable future for renewables in South Australia. We believe that residential batteries aggregated in Virtual Power Plants (VPPs) have the potential to add tremendous value in efficiently maintaining system security and frequency stability in the high-DER electricity system of the future. It is very important, therefore, that the market rules support and encourage the efficient participation of these resources in the market to the fullest extent possible, in particular in the provision of fast frequency support services.

South Australia is at the forefront of VPP adoption nationally, with more than 6,600 residential batteries enrolled in nine VPPs. Several of these VPPs have been participating in the FCAS market through AEMO's VPP Market Demonstrations trial. We consider that our experience in partnering with industry leaders like AGL, Simply Energy, Rheem and Tesla to trial innovative ways to manage VPPs on the South Australian network and support their market activities gives us specific insights into some of the issues raised in the MASS review.

We understand that the MASS review has considered three main issues:

- a. The issue of metering accuracy at VPP sites, where the review has found that the 1s metering approach trialled in AEMO's VPP Demonstrations produces an unacceptable level of inaccuracy in measurement for Fast FCAS frequency response services, which may distort the market as it limits AEMO's ability to verify that the response paid for was actually provided;
- b. The location of metering for FCAS market validation purposes, either at the connection point or at the device providing the FCAS response; and
- c. Other concerns with the interaction of small scale DER with the system that could impact on system security, outlined on pages 17 and 18 of the Draft Determination.

As we are a Distribution Network Service Provider (DNSP), our submission is concerned mainly with the third of these.

Our primary concern is that the Draft Determination seems to conflate technical concerns around distribution network constraints and system security risks with the metrology requirements for market settlement and validation. The system security issues appear to be the primary driver for retaining the 50ms metrology requirement of the current MASS for the Fast FCAS service, but it is not

clear how this helps to address the system security issues raised. AEMO has indicated in its consultation on the MASS review that retaining the 50ms measurement requirement in the MASS is not expected nor intended to exclude VPPs from participating in FCAS markets. It considers that some VPPs will move to implement the required 50ms metering and continue to participate in the Fast FCAS market, while others could continue to participate in the slower FCAS markets. That being the case, it would seem that the system security issues will remain, as in practice the same batteries will be responding in the same manner to the same local frequency droop curves regardless of the markets they are registered in. Some of the issues raised in the Draft Determination will also arise from the growth in non-VPP-participating batteries, and/or from the coordinated response of DER to price signals other than the FCAS market.

It seems, therefore, that we cannot rely on the MASS to address these issues of system or network security. These are issues of great importance and we will need to put robust technical solutions in place regardless of the outcome of the MASS review. For example, we consider that 'dynamic operating envelopes' are the key to ensuring VPPs operate safely within distribution network constraints, and we have trialled this approach successfully with Tesla's SA-VPP during its participation in the FCAS market over the past two years.


We understand there is some disagreement between the various VPP proponents and technology vendors as to the likely cost of 50ms metering, and the extent to which this cost would present a material barrier to VPP adoption, or a material erosion of value to VPP customers. We understand from the Draft Determination that there is some consensus that 100ms or 200ms metering would be sufficient to address the market validation accuracy issue, and that this could be widely supported using existing equipment at lower cost than 50ms metering. As a DNSP we are not experts in these matters. As a general principle, however, we consider that the NEO will be served if the MASS specifies the least-cost metering standard that satisfies market settlement requirements, as this will encourage the highest level of market participation and minimise the cost to customers. On that basis we consider that it would be prudent to undertake further investigation into this issue before a final decision is made.

We would, therefore, urge AEMO to consider deferring its decision on the MASS until further work can be done with all stakeholders. This could include some additional trials as required, to put in place a pathway forward that is effective in mitigating the system security risks identified while still encouraging and enabling DER to participate as fully as possible in the provision of fast frequency response, synthetic inertia and other high-value system services.

Our comments here are further detailed in the Attachment to this letter.

If you wish to discuss any aspect of our submission, please contact Bryn Williams, Network Strategy Manager at [bryn.williams@sapowernetworks.com.au](mailto:bryn.williams@sapowernetworks.com.au) or on 0416 152 553.

Yours sincerely,



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## Attachment A – Further feedback

1. SA Power Networks has a strong interest in this issue as South Australia has been at the forefront of VPP adoption nationally, with the majority of the VPPs that have been actively participating in FCAS markets in AEMO's Market Demonstrations located in SA. In early 2021 there were more than 20,000 small-scale batteries installed in SA with a combined capacity of more than 200MWh, similar to the size of the Hornsdale battery. Of these, more than 6,600 are enrolled in VPP schemes, and this continues to grow. The largest of the nine VPPs operating in the state, Tesla's SA-VPP, has recently commenced a rollout to a further 3,000 Housing SA properties, which will bring the total VPP capacity in the state to more than 35MW. SA Government targets and the government's Home Battery Scheme, which specifically aims to accelerate the adoption of 'VPP capable' batteries through subsidies, could see up to 90,000 batteries enrolled in VPPs in South Australia in coming years, which would give a total capacity of more than 450MW, which would be a very material resource in the State's 3GW electricity system.
2. We believe that residential batteries aggregated in VPPs have the potential to add tremendous value in efficiently maintaining system security and frequency stability in the high-DER electricity system of the future. This due to their capability to provide extremely fast frequency response and advanced services like synthetic inertia. It is very important, therefore, that the market rules support and encourage the efficient participation of these resources in the market to the fullest extent possible.
3. We believe that energy storage more broadly will be a very important component of a high renewable energy system. It is important that the market enables owners of storage (both small and large scale) to access the full value stack in order to facilitate investment in the growth of storage capacity within the energy system.
4. In our \$2 million Advanced VPP Grid Integration trial<sup>1</sup>, in partnership with ARENA, Tesla and the CSIRO, we have demonstrated how the use of 'dynamic operating envelopes' provides a model for the safe and effective integration of large market-participating VPPs with the distribution network so that VPPs can bid into FCAS markets and dispatch with confidence, without risk of breaching local network constraints.
5. The Draft Determination proposes that it is not prudent to reduce the granularity of the 50ms measurement requirement for VPPs to the 1s metering tested in AEMO's VPP Demonstrations trial. We understand that the review has found that an alternative measurement resolution of 200ms or 100ms could be effective in mitigating the inaccuracy issue while also meeting the original aim of the AEMO VPP Demonstrations. We understand that respondents to the MASS review have indicated that this level of accuracy should be achievable by a broad range of VPP providers without incurring the additional cost of dedicated high-speed (50ms) metering at every site. On this basis, our understanding is that AEMO's decision has been primarily motivated by the system security risks identified on pages 17 and 18 of the Draft Determination.
6. It is not clear why retaining the 50ms metering requirement in the MASS will help address the system security concerns raised. These concerns have to do with the potential for VPP operation to be impacted by local network constraints or faults, and behaviour of inverters in response to system disturbances, neither of which relate to the measurement regime used for market settlement and validation of FCAS response.

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<sup>1</sup> <https://arena.gov.au/projects/advanced-vpp-grid-integration/>

7. AEMO has indicated in its consultation on the MASS review that retaining the 50ms measurement requirement in the MASS is not expected nor intended to exclude VPPs from participating in markets. It considers that some VPPs will move to implement the required metering and continue to participate in the Fast FCAS market, while others could continue to participate in the slower FCAS markets. That being the case, it would seem that the system security issues will remain, as in practice the same batteries will be responding in the same manner to the same local frequency droop curves regardless of the markets they are registered in.
8. One of the system security risks identified is that large-scale, rapid and coordinated injection or withdrawal of energy from batteries may exceed local network limits. This issue will arise in any event due to the coordinated operation of batteries in response to technical requirements and other price signals (even batteries that aren't aggregated in VPPs), independent of the FCAS market and the MASS. This is an issue that DNSPs must be able to manage in any event. In our view this issue is addressed by the use of 'dynamic operating envelopes' or flexible export limits. We have demonstrated how this approach can mitigate this risk for VPP operation in our Advanced VPP Grid Integration Trial.
9. It would seem, therefore, that the MASS should be concerned only with issues of market integrity and settlement accuracy. The technical issues of grid integration of DER are extremely important and must be addressed, but these will arise independent of the MASS and hence need to be dealt with through a separate process.
10. We also note that there are market penalties to ensure that service providers do not under-deliver on their contracted FCAS response. This will mean that service providers must engage with the DNSP and other parties regarding the integration of DER to ensure that their systems are managed within network constraints and perform as intended when dispatched, to achieve the required market outcomes.
11. VPPs should be encouraged and enabled to participate in the provision of fast frequency support services, not discouraged, or else we risk wasting a tremendous opportunity to unlock the value these extremely fast-acting resources can provide to the wider system.
12. We note that while VPPs will form a material part of the energy system in future, especially in South Australia, they are only operating at small scale today, and hence the risk to broader system arising from the issues identified is relatively small. There is the opportunity for further investigation of these issues, including a second phase trial to answer some of the questions raised in the MASS review that were not answered through the AEMO VPP Demonstrations project, without material risk to system security. Any short term risk to local network performance or system security could be managed through technical limits on the total VPP capacity in a region, and specific limits on the number of market-participating devices allowed within a local distribution network area (an approach we have taken to managing risks in our trials to date).
13. We would, therefore, urge AEMO to consider deferring its decision on the MASS until further work can be done with all stakeholders. This could include some additional trials as required, to put in place a pathway forward that is effective in mitigating the system security risks identified while still encouraging and enabling DER to participate in the provision of fast frequency response, synthetic inertia and other high-value system services.