AEMO

Via email to mass.consultation@aemo.com.au

10th March 2021

Amendment of the Market Ancillary Service Specification (MASS) – DER

Solar Analytics welcomes the opportunity to provide input to AEMO on the DER MASS Review. In preparing this submission, we have referred to the Stage one consultation Issues Paper, v6.0 of the MASS, the VPP Demonstrations FCAS Specification and the VPP knowledge sharing reports as found on the consultation web page.

About Solar Analytics

Solar Analytics is an Australian company founded by solar industry veterans, scientists, developers and passionate photovoltaic (PV) experts. We design, develop and supply intelligent rooftop solar and energy management solutions for residential households and commercial businesses. With 35 staff and 50,000 customers across Australia, we are the leading provider of rooftop solar management in Australia. Our fleet of Distributed Energy Resources (DER) across Australia have real time solar generation and energy consumption measurement that enables us to provide energy management services for our customers. We also provide extracts from our unique data set to seven DNSPs, plus AEMO, ESB, universities and energy regulators.

Solar Analytics does not currently participate in the FCAS markets neither as a MASP nor a technology provider. Since early 2020 we have been researching the opportunities in this space and intend to participate in either or both of these roles in the near future. Our perspective is therefore one of a new entrant, attempting to launch and scale a service in a market traditionally dominated by large entities.

Scope of review

Solar Analytics understands that the DER MASS review is an outcome of the AEMO VPP demonstrations project. The issues paper outlines two options for DER MASS, being:

Option 1: Leave current measurement requirements unchanged

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Option 2: Embed measurement requirements tested in the VPP Demonstrations

with the specifics of Option 2 being presented in section 2.3.2 of the issues paper, and the key changes being

a) Minimum interval for capturing power flow and local frequency to be <= 1 second across all NMIs, rather than <= 50ms as in the current MASS
b) For every 5 megawatts (MW) of aggregated ancillary service capacity per region, a high-speed meter capturing measurements of power flow and frequency with a resolution of less than or equal to 50 ms on a common time scale must be installed.
c) Measurements may be captured at the inverter or controllable device level rather than at the connection point, provided the power flow measurements from the controllable device and generating units behind the connection point, and the grid flow must also be captured.

This option is very similar to the specification used in the VPP demonstrations project, which has been shown, through the knowledge sharing reports, to be sufficient to verify FCAS delivery and detect under-delivery.

We support AEMO's effort to review the MASS as early as practical so that if any changes are adopted, that these can be in place in time to make a smooth transition from the VPP demonstrations project to general market participation. As such, we understand that the scope of changes discussed in the issues paper is limited to the rules tested in the demonstration, or slight variations of them.

However, we would welcome a further review and iteration of the MASS in the near future in order to address other opportunities to reduce barriers to entry and/or increase efficiency with respect to DER participation in contingency FCAS markets. Such opportunities include:

1. Reducing the minimum droop settings for small battery systems so that greater capacity may be enabled, up to the full cycle capacity of a battery
2. Reducing the minimum bid/enablement increment below integer MW so that greater utilisation of smaller VPPs is possible
3. Allowing for participation by distributed PV systems, either as a generator response, measured at the inverter, as a combined battery/PV response, measured at the inverter, or as a combined battery/PV/load response, measured at a connection point

Response to consultation questions

1. *Which option for the ongoing measurement requirements for DER described in Section 2.3 do you want AEMO to implement and why? Should any other options be considered?*

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Solar Analytics supports Option 2 as written. AEMO has demonstrated that this option is sufficient to verify FCAS. Option 2 will reduce the barrier for entry for DER providing FCAS, therefore adding greater competition and keeping costs down.

High-speed monitor

We would also be supportive of an amended version of option 2, excluding the requirement for one high-speed monitor per 5MW.

As an alternative to 50ms intervals of power on one device, the accumulated energy, at 1-second intervals, measured on all devices, would be a more accurate representation of the FCAS delivery, since it captures everything that happens in between the 1s intervals. This could easily be compared to AEMO frequency data in order to analyse response in the case of under-delivery.

Providing options on this point allows each participant to find the lowest cost solution for their technology, rather than favouring any particular type.

We understand that there may be an argument for requiring one high-speed monitor for each technology type (each combination of battery/inverter/other hardware). We believe this would result in a prohibitive barrier to entry to smaller third-party providers aggregating systems with a range of technology types. This would embed an advantage to large OEMs providing single-technology DUIDs. We believe that diversity in technology reduces the system reliability risk associated with systematic technology failure and that the rules that encourage diversity should be favoured. Further, we believe that the benefit of excessive investigation of multiple different technologies within a small DUID would outweigh the benefits and that frequency injection tests are a sufficient source of detailed verification.

Should a compromise be sought on this point, we would support a requirement for one high-speed monitor on *each* individual technology type that contributes more than 5 MW capacity on its own within a DUID.

Measurement location

We support the requirement of monitoring the enabled device rather than the power flow at the connection point alone. This provides the most precise measurement of delivery and is most consistent with the conditions of the frequency injection test. We support the requirement to *also* monitor the grid power flow in order to ensure that FCAS delivery is not systematically undermined by an opposing response of

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other devices.

We do not see the need to also measure other generating units behind the connection point since this will be captured by the total power flow. However, we are not greatly opposed to this requirement.

We believe that in the future, greater participation in FCAS could be delivered by allowing a number of devices behind one connection point to contribute simultaneously - including PV generation and various loads, with measurement at grid flow being the primary determinant of delivery. An aggregation of many such connection points should allow the overall delivery requirement to be met, despite diversity in individual responses. However, we understand that this is outside the scope of the current review and that a further program of testing would be necessary to consider such an option.

2. *Which option do you think is more consistent with the NEO, and why?*

   The NEO refers to "price, quality, safety and reliability and security of supply of electricity" and
   "the reliability, safety and security of the national electricity system."

   In our view, option 2 will result in more participants providing contingency FCAS. The greater volume of FCAS available in the market will improve the reliability of the system responding to contingency events and the increased competition will reduce the cost of providing this reliability.

3. *Should AEMO consider any principles other than those described in Section 2.4 to guide its assessment?*

   At the centre of the energy system are consumers. The AEMC guide to Applying the energy market objectives highlights that "Consumers should have options in the way they use energy" (section 1.4).

   This should include the option to increase participation in the energy system and be rewarded for it. Option 2 lowers the barrier to achieving this.

   Facilitating a greater contribution of DER to FCAS is also expected to increase the return on investment for distributed energy storage, encouraging greater deployment. This not only supports the choice of consumers to become more self-sufficient in their energy supply, but also increases the availability of flexible

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demand in the system, providing greater opportunity to meet the NEO through energy arbitrage, wholesale demand response, network support etc.

4. *What is the difference in implementation costs, such as updating the communication links or installing additional equipment, for capturing data at a resolution of either 50 ms or 1 second for every NMI for different VPP facility types? Do you consider the cost difference to be prohibitive for participating in the Contingency FCAS markets? Please provide examples or analysis if possible.*

   Solar Analytics has an existing option to capture data at 1 second resolution as outlined in option 2. Meeting a resolution of <=50ms at low cost of deployment could not be achieved with our existing hardware and would need to be developed either in-house or by partnering with another provider. The costs are not currently known, but the uncertainty and the effort of such a development/integration would almost certainly cause Solar Analytics not to pursue FCAS markets in our offering. We anticipate that providing a solution for 1 system per 5MW will also be expensive, but manageable if it is only for 1 system per 5MW.

5. *Do you think that either of the options presented will result in more or less competition in the Contingency FCAS markets?*

   Option 2 will result in more competition, as outlined in response to Q1&2

6. *Are there any technical risks that you envisage if the Option 2 measurement requirements are allowed? How material do you consider those risks and how could they be efficiently mitigated?*

   There is a risk of failure of any element of the 1 system per 5MW with high-speed monitoring. Failure of the inverter, battery, communications or monitor could impact how representative the system is.

   A mitigation of requiring high-speed monitoring on all systems (as per option 1) would be prohibitively expensive.

   Since the high-speed monitor is required only in the case of determining causes of under-delivery, a reasonable mitigation against failure of this system would be to require renewed frequency injection testing and/or fleet-wide response test in order to identify systematic errors. An alternative mitigation is to rely on 1s sample of accumulated energy rather than power, with the former containing much more information (as discussed in Q2 response). Alternatively, it may be sufficient to rely on appropriate penalties/payment claw-back to incentivise providers to identify and fix any issues.

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7. *Does the sampling rate of one second rather than 50 ms for Fast Contingency FCAS under Option 2 and the determination of the FCAS delivery at the inverter/controllable device level create market distortion or negatively impact the FCAS markets?*

   No.

8. *If Option 2 was adopted, should the changes to the measurement requirements of the MASS be limited to small-scale DER (under 1 MW per NMI), or should a different threshold apply, such as 5 MW? For example, what do you see as the risks and benefits of expanding these measurement requirements to other FCAS providers and in what circumstances might that be appropriate?*

   Higher data resolution is always better if it can be achieved at a reasonable price by a reasonable number of participants. The cost of monitoring with respect to capacity of FCAS should be considered. For a single 1MW device, the cost of monitoring is much lower than it is for 200 x 5kW devices. Therefore, we believe a 1MW threshold is appropriate, but we are not opposed to increasing the threshold if AEMO is satisfied in its ability to verify FCAS delivery.

Regards,

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