

19 August 2022

Dear AEMO,

Amendment of the Market Ancillary Service Specification - Very Fast FCAS 2022

Evergen Pty Limited (Evergen) welcomes the opportunity to provide the Australian Energy Market Operator (AEMO) with feedback on the draft determination for the *Amendment of the Market Ancillary Service Specification - Very Fast FCAS*.

AEMO's approach of creating specific considerations (e.g., a lower sampling rate requirement for eligible Aggregated FCAS facilities), in recognition of the verification advantages arising from multiple data streams is justified and welcome.

Evergen is mostly supportive of AEMO's proposed design for VFFCAS market specification, however, our view remains that the verification advantages for Aggregated FCAS facilities arising from having many data streams may as yet be insufficiently recognised. We firmly believe discussion over verification accuracy and data requirements for Aggregated FCAS facilities should continue. We understand and accept AEMO's conservative approach to these issues in the establishment of this new, more challenging market.

In this submission, we wish to highlight:

- Specific concerns with the draft MASS, driven by the inclusion in the draft MASS of new specifications that are not exclusively related to the establishment of very-fast FCAS requirements; and
- Observations that speak to principles for the ongoing evolution of the MASS, and specifically DER participation in FCAS, throughout the energy transition taking place across the NEM.

1. Behind-the-meter DER and the MASS

Behind-the-meter DER such as residential batteries are able to respond quickly to frequency disturbances with both raise and lower capability. Therefore they can play a useful role in the fast and very-fast contingency markets.

Evergen is supportive of the DER-enabling changes made to the MASS last year, and also proposed in the current draft determination, specifically:



- Alternative verification measurement sampling period requirements for Aggregated FCAS Facilities; and
- A discounting approach based on the number of facilities in the Aggregated FCAS Facility to ensure a satisfactory level of verification accuracy *given the existing verification methodology*.

Evergen's view is that the above are appropriate incremental changes to accommodate DER into the contingency FCAS markets within the narrow scope of these MASS consultation processes. They recognise the verification advantages arising from providing many data streams for Aggregated FCAS Facilities, while remaining mindful of the principle that robust verification is essential.

However, in a sense, these changes have the appearance of being exceptions to the core specification. It is perhaps unsurprising such changes have then generated at times heated debate. Exceptions to the rule are by nature controversial, because they impact consensus on what the key principles guiding development of the MASS are meant to be. These principles obviously focus on adherence to the National Electricity Objective, but can also include notions of technological neutrality, avoiding market distortion, favouring a conservative approach to specification changes, or a recognition that regulation should move quickly to guide the transition currently taking place across the NEM.

Without clear and agreed principles, the possibility remains of further amendments to the MASS continuing to entrench intrinsic biases or create polarisation. Below we will suggest that some changes proposed in the current draft MASS are exemplary of this.

2. Meter certification requirements and interaction with Power flow measurement requirements

The draft determination proposes to adopt certification of compliance with IEC-61157-12 type tests as a requirement under the MASS. The proposed certification process would be based on the measurement requirements set out in Table 5 of the draft MASS.

For the *Measurement Range of Power Flow Measurements* specification in Table 5, the wording includes "As appropriate to the FCAS Facility...".

However, Table 1 of the draft MASS defines an FCAS Facility as "An ancillary service generating unit or ancillary service load used to deliver FCAS, and includes an Aggregated FCAS Facility unless the context otherwise requires". The definition of an FCAS Facility seems to class an Aggregated FCAS Facility as an FCAS Facility.

This wording creates ambiguity as to whether the "...Intrinsic Uncertainty of $\leq 2\%$, and resolution of $\leq 0.2\%$ " are meant to apply only to the aggregated power flow measurements at the DUID level for

an Aggregated FCAS Facility, or whether these requirements are intended to apply to measurements for each and every ancillary service generating/load unit comprising an Aggregated FCAS Facility.

Evergen suggests that this ambiguity in the draft MASS is not a trivial definitional fix, there are challenges to either interpretation.

Intrinsic uncertainty decreases as the number of measurements increases. For context, the number of power measurements over a 1-second assessment window for:

- a single-plant 50MW FCAS facility with a sampling period of 50ms: 20
- a 10,000x5kW DER 50MW Aggregated FCAS Facility, sampled at 100ms: 100,000

If the power flow measurement standard applies to individual DER units

- The overall power flow measurement requirement for an Aggregated FCAS Facility will be higher than for a comparable single-plant FCAS Facility, since intrinsic uncertainty reduces when aggregating across many measurements; and
- The difference in requirement would be substantial when comparing a single-unit FCAS Facility to an Aggregated FCAS Facility comprising many thousands of units.

If specifying power flow measurement standards to the aggregated power flow across an entire Aggregated FCAS Facility

- The measurement requirements for individual DER become uncertain; and
- Certifying individual DER metering against a standard such as IEC-61157-12 given this interpretation would be fraught, given the uncertainty requirements for individual DER would vary as fleet size varies.
- It is not clear that the intrinsic uncertainty in individual measurements, and how this interacts with sampling rate and number of units being aggregated to contribute to overall error, was considered.

2.1 Consultation scope creep

Evergen also notes that inclusion of a certification process in the current draft MASS would apply to all FCAS providers regardless of the contingency markets for which they are registered. This change is beyond the original scope of the 2022 MASS consultation and its focus on introduction of very-fast FCAS markets. Affected DER hardware manufacturers in particular may not have initially engaged with or monitored the MASS consultation process this year as a result (e.g., if they regarded very fast FCAS participation as beyond their short-term capability). Such manufacturers are now confronted with certification requirements that could impact their eligibility and costs even in existing slower contingency FCAS markets, with less than 4 weeks to become aware and develop a considered response.

Being conservative is a worthy principle for AEMO to apply when making decisions, but it is not the only principle. For example, given the expectations and identified need for a big increase in coordinated DER storage in the NEM over the coming years, enabling active participation of co-ordinated DER might arguably also be a principle guiding development of the MASS.

To relate these concerns to our earlier comments regarding principles, we note that in the draft determination, AEMO suggests a preference to be conservative as justification for applying a discount, regardless of the number of ancillary generation/load units in an Aggregated FCAS Facility in the VFFCAS market. This is in contrast to the threshold of 500 units in the fast market, a threshold above which discounts no longer apply. If being conservative is a guiding principle for administration of the MASS, then the swift inclusion of metering standard compliance measures within the MASS, introduced part-way through a consultation focused on VFFCAS, but with implications for all contingency markets, seems counter to this principle.

Evergen generally supports the idea of explicitly defining a certification process for FCAS metering. However, to handle the obvious challenges presented above requires more thought and consultation than appears to have been undertaken for the inclusion of a certification methodology in this draft MASS. Completing appropriate consultation on this may jeopardise the timeframes for delivery of a specification for very-fast FCAS.

Recommendation: Section 5.7. Certification of FCAS metering equipment type should be omitted from the draft MASS. Inclusion of metering certification requirements should be subject to further consultation and a separate MASS amendment round.

3. New control system requirements

Section 6.2.2 *Control System Requirements* includes two new parts: Part (d), which specifies scan rate requirements, and Part (e), which requires an FCAS Facility to have a control system to reserve the necessary headroom or footroom required for frequency response delivery when enabled.

3.1 Headroom and footroom reservation

Part (e) is inappropriate in the draft MASS as currently worded. As with measurement and metering issues previously discussed, the wording here is ambiguous as to whether AEMO is specifying requirements at the individual generating/load unit level, or at the Aggregated FCAS Facility level. Either way, the implication that a control system must be able to “reserve” headroom/footroom implies a focus on utility-scale front-of-meter storage, and a neglect of the operational considerations for an Aggregated FCAS Facility comprising behind-the-meter DER.

Behind-the-meter DER participating in FCAS are not simply participating in the wider energy market. First and foremost, they are appliances servicing the immediate needs of end-user consumers. For example, a residential battery typically has the primary function of maximising the end-user’s self

consumption of rooftop PV generation, and minimising grid imports. It is entirely possible - even likely - that a majority of end-users' preferred FCAS participation strategy is to continue using their own battery as they normally would without constraint, and only contribute to an Aggregated FCAS Facility frequency response at those times when they just happened to have sufficient headroom or footroom. For an end-user to reserve headroom/footroom within their own battery reduces the capacity of that battery for preferred or more valuable purposes such as load shifting and time-of-use tariff arbitrage. Residential end-users with small-capacity batteries (e.g., 5kWh or less) would find that actively reserving capacity for FCAS may deprive them use of the majority of their battery.

Offering capability only when it happens to be available omits the need for a reserve control mechanism to deliver adequate frequency response.

Of course, an Aggregated FCAS Facility operator will need an appropriate mechanism to constantly assess and forecast aggregate capacity. This is crucial for ensuring the Aggregated FCAS Facility is only bid into the ancillary services market when aggregate capacity is forecast to be available. Aggregated FCAS Facilities may still make compliant bids even when some of the DER in the facility lack headroom or footroom to individually respond, provided the Aggregated Facility as a whole can still deliver against its enablement commitment. Assessing capability and ensuring compliant bidding is a fleet-level consideration, not an individual DER consideration.

Again though, compliance at the aggregated facility level does not amount to a mechanism to "reserve" headroom or footroom, since enablement of the Aggregated FCAS facility can be targeted to periods where the facility happens to be capable based on the aggregation of individual behaviours. This can occur, without ever reserving headroom or footroom at the aggregated facility level.

Headroom and footroom considerations seem more relevant to front-of-meter facilities with no behind-the-meter loads, where the only considerations are the tradeoff between trading energy vs FCAS enablement. The inclusion of this requirement and its wording again implies a narrow focus on utility-scale front-of-meter plant, without proper consideration of the unique and still relatively novel circumstances of Aggregated FCAS Facilities comprising behind-the-meter DER.

Recommendation: AEMO should omit Section 6.2.2 (e) from the draft MASS.

3.2 Scan rate requirements

Evergen supports the inclusion of Part (d) on scan rate requirements. We noted the concern expressed by one respondent to the first stage issues paper over whether there was any confusion between recording sampling periods and scan rates to drive response. In discussing FCAS response with our hardware partners we have not held nor observed any great uncertainty over this



distinction, and believe that the possibility of confusion is somewhat overstated. Nevertheless, it is sensible to be explicit in specifying scan rate requirements within the MASS.

4. Active participation and coordinated DER are central to the future of the NEM

AEMO's Integrated System Plan 2022 (ISP) Step Change scenario was regarded by stakeholders as the most likely scenario of those considered. It projects that by 2050, most domestic PV will include an energy storage system, and that approximately half of all dispatchable capacity in the NEM by 2050 will be delivered by co-ordinated DER. In the ISP, AEMO stated:

The emergence of VPPs across the NEM is expected to assist in maintaining grid reliability and provide further benefits for consumers. However, full integration requires a step change in engagement to ensure consumers, retailers, networks and other market participants increase the orchestration of new technologies and resources, to increase benefits to consumers and enable the grid to maintain security and reliability at lower cost.

If, as an industry, we are serious about fostering two-way markets with active participation from consumers, and if the projected key role of coordinated DER storage in providing dispatchable capacity and grid services is to be realised, the visionary plan laid out in the ISP step change scenario needs to be backed up with commitment and careful implementation. Evolution of the MASS should be no exception, and incremental changes to the MASS may not be able to achieve this.

Recommendation: AEMO and industry to adopt a key principle that VPPs comprising coordinated, behind-the-meter DER are not an afterthought in the fundamental architecture of the MASS and verification tool.

Recommendation: AEMO to consider a more in-depth overhaul of the MASS and verification tool to ensure that behind-the-meter DER Aggregated FCAS Facilities are a first class citizen on the same level as traditional utility-scale FCAS facilities.

Yours sincerely



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