6/8/2021

To: AEMO MASS Consultation

Re: Second-round response to AEMO's DER MASS review

Empower Energy broadly supports AEMO's determination to maintain current MASS measurement requirements pertaining to Fast FCAS delivery. This support is offered as a function of options promulgated through the MASS review process rather than what our view might be following a holistic review of all possibilities associated with DER integration into the NEM. In particular:

- AEMO has determined not to accept options outside the metering status quo principally on grounds of system security. Empower Energy supports AEMO's contention that system security is a real and present concern, the importance of which is duly guided by the intent of the National Energy Objectives (NEO).
- At the present time it has not been adequately demonstrated that a reduction in metering performance requirements – given the inherent possibility that quality of response within relevant frequency response services may degrade – would not adversely impact system security.
- We also support AEMO's contention that connection point metering is essential to system management. As recent incidents have indicated, the quality and volume of net frequency response across the NEM is essential to power system security. Whilst metering arrangements at DER device may have some scope under certain conditions to serve as indications of some elements of frequency response, it has (at the present time) not been adequately demonstrated that these provide a sufficiently complete indication of response as to fairly and competitively attribute value (or to adequately negate gaming potential), particularly in a competitive DER market that, by virtue of the NEO, should not adversely favour one particular technological approach (e.g. DER behind-meter topology) over another.
- We are satisfied with AEMO's intention to not pursue market approaches requiring check metering per unique DER type. Aside from some questionable reliability in characterising DER unit response with this approach, the potential for this approach to limit market access to market-dominant solution vendors and favoured DER integration topologies is anti-competitive and, accordingly, inconsistent with the NEO.

We note that AEMO has undertaken some significant and positive steps to understand the value potential of DER and potential adjacent issues. The VPP Demonstrations Project and The University of Melbourne's (UoM) report on metering accuracy are strong pieces of work that should serve to help shape and define future MASS reviews and any adjacent regulation. With a subsequent MASS review likely to commence (per discussions with AEMO) in 2022 – and seeking to incorporate Fast Frequency Response (FFR) – these recent work pieces should be front-of-mind in helping shape future MASS considerations. It is noted that if UoM's contribution had taken place earlier in the MASS review process it may have proven more impactful in shaping MASS outcomes, and we would urge AEMO to consider earlier contributions of this nature in future MASS reviews.

We also note that MASS review forum discussions often concerned notions of averaging in digital signal processing and metering costs. Signal processing is a well-established science and the cost of MASS-compliant metering, once researched, is established in the literature. Accordingly neither matter should be continually treated in open forum as subjective in nature. We respectfully suggest in future that AEMO undertake to guide stakeholder discussions to effective and factual ends such that key matters may be discussed as effectively as possible.

Follow-up discussions with AEMO indicated some acknowledgement that certain vendors had achieved metering solutions under $500 (per six channels) as part of DER gateway solutions (less than half of this for the metering infrastructure costs alone) whilst meeting existing MASS requirements for time resolution and accuracy. Importantly, AEMO indicated that even at that relatively *low cost*, a compliant solution *may not be affordable* in a value context.

Leaving aside the fact that no DER device evaluated in the VPP Demonstrations Project offered a zero-marginal-cost approach to FCAS participation (whether complying to the MASS or to the draft option presented), the latter point is important. Ideally, DER participation seeks maximum value generation, minimal cost, and maximum value transfer to customers. In practice DER participation typically bears platform costs by way of third-party DER management solutions – however packaged (e.g. bundled as capital costs, sold as subscription, etc) – per the NEO it is, arguably, incumbent on AEMO to minimise costs and maximise affordability where possible.

DER integration in the NEM will ultimately require market access constructs that are sufficiently flexible as to be able to incorporate devices with varying degrees of metering performance, triggering capabilities and measurement capabilities.

Systems complying with the existing MASS are designed for a clear performance paradigm that has existed with good stability for some time; market directions have, for various reasons, similarly made clear that these performance requirements are not broadly and reasonably able to be made inherent to DERs by device manufacturers without dedicated, market-specific investments in technology development. FCAS participation is a subset of the Australian market for DERs offering little certainty about uptake rates, market value and no secondary markets – these and other factors contribute to DER technology vendors being unlikely to invest in solutions able to meet the existing MASS. These notions are duly reflected in the current market state: solutions for MASS compliance exist from a few specialist vendors, and DER vendors seeking MASS participation have instead chosen to advocate for change to the MASS.

There are limits. The current MASS review has established that 1Hz metering is not sufficient for adequately-accurate characterisation of frequency response. The advent of AS/NZS 4777.2:2020 – implementing a 10Hz standard (albeit at lesser total accuracy than the MASS, were the MASS reduced to 10Hz sampling rate) allows a more rigorous minimum condition for participation – at negligible marginal cost – that is worthy of evaluation in future MASS reviews. As mentioned in our original submission, these developments are consistent with development and market directions for frequency response market participation from significant classes of DER in overseas markets, which will ultimately impact the availability and prevalence of such solutions in the Australian market.

The emergence of solutions at lesser performance than the current MASS should not displace devices complying to the current MASS; an ideal future scenario respecting relevant tenants of the NEO (favouring technology agnosticism) may incorporate e.g. discount rates for devices contributing at lesser rates of overall accuracy. We believe the transitional arrangements for VPP Demonstrations Project participants are, in principal, directionally-correct.

DER participation in established markets is a complex and wide-ranging matter that raises a number of questions which at the present are not completely or sufficiently answered. Some matters raised throughout this MASS review and VPP Demonstrations Project that remain open include:

- What sampling frequency and accuracy specifications are adequate minimum requirements to characterise quality of response to FCAS market participation (particularly with inverter-based devices),
- The degree of trust that can be placed in RoCoF-based triggering schemes (particularly where e.g. internal PLL circuitry is used to sense RoCoF events as opposed to higher-accuracy instruments used to measure response) and what effects imperfect responses may have at high DER penetration,

- Whether assets complying to metering specifications less than the current MASS can adequately respond in manners addressing power system security issues, and if so (or not) from what perspectives can these responses be judged to be competitive,
- What appropriate compliance mechanisms should be for response and measurement, particularly given that the MASS was originally implicitly written for specialist power quality measurement instrumentation – typically being calibrated in a traceable manner pre-use – and cost-effective DER necessitates (despite significant cost reduction since the advent of the NEM) inherently lower-cost approaches.

The above are a limited selection of open issues requiring resolution prior to a structural review of the MASS allowing DER integration at performance standards below those currently in place, some of which may shift in magnitude and relevance pending the inclusion of FFR in the MASS and whatever access requirements may be enacted for participation in relevant markets.

Empower Energy remains committed to working with AEMO towards a future where DER is better integrated into the NEM in ways realising its ultimate potential in an ever-more-distributed, more intelligent and resilient power system offering customers lower cost and greater value. We embrace the notion that access barriers better reflecting the state and potential of DER industry are worthy of consideration, particularly where adjacent issues essential to power system operation can be met. Whilst an adequacy of outcomes was not met in the current process to justify structural change to the MASS, we look forward to working with AEMO in future processes leveraging knowledge recently gained in the current MASS review and other concurrent activities.

Kind regards

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