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Consultation Report – Technical Requirements for 200 kW to 5 MW DER connections

AGL Energy (**AGL**) welcomes the opportunity to provide responses to the consultation questions posed by the Australian Energy Market Operator (**AEMO**) in response to the abovementioned Consultation Report.

AGL is making a significant investment in flexibility and has been making strong progress against our grid-scale battery and distributed energy resources (DER) targets. As of FY24 AGL had 1.25 GW of decentralised assets under orchestration, with a FY27 target of 1.6 GW. Most of these assets are installed behind the connection point, and include residential batteries and solar, as well as flexible loads and backup generation systems at commercial and industrial customer sites.

AGL is broadly supportive of the intent of this review. We agree that aligning the technical requirements for 200 kW to 5 MW DER connections across all distribution networks in the National Electricity Market (NEM) has the potential to minimise the costs and implementation complexity of these installations. However, our support of the proposal is subject to these technical requirements being clearly defined in the guideline and consistently applied by distribution network service providers (DNSPs). There is a material risk that the proposed guideline could be implemented differently across networks, exacerbating existing complexities and effectively negating the benefits of this process. Therefore, we encourage AEMO and DNSPs to meaningfully engage with industry in the development of the guideline and to provide confidence that there would be no material deviations between the requirements and its actual implementation.

AGL is also of the view that the following requirements pose important implementation challenges:

- The proposed 20% ramp rate limitation for battery energy storage systems (BESS) would challenge the operation and economics of these assets which operate as part of a portfolio – we encourage AEMO to consider this requirement carefully and ideally pause its implementation until the volume of unscheduled BESS has been deemed significant to materially impact power system operation.
- The recommendation to set additional remote active power monitoring, active power ramp rates, and primary frequency droop requirements for systems above 200 kW would be time and cost prohibitive for systems between 200 kW and 1 MW – we therefore encourage AEMO to consider specifying this requirement applies to systems larger than 1 MW.
- The report notes that performance requirements for legacy plant would be agreed with DNSPs – we are unclear from the report on the intended treatment of these assets and are of the view that there should be no retroactive application of the guideline.

Appendix A includes detailed responses to the consultation report's questions. We are also seeking clarification on certain aspects of the report – and have provided our views subject to our current understanding.

If you have any queries about this submission, please contact Andrea Espinosa on 0422 165 705 or aespinosa2@agl.com.au.

Yours sincerely,

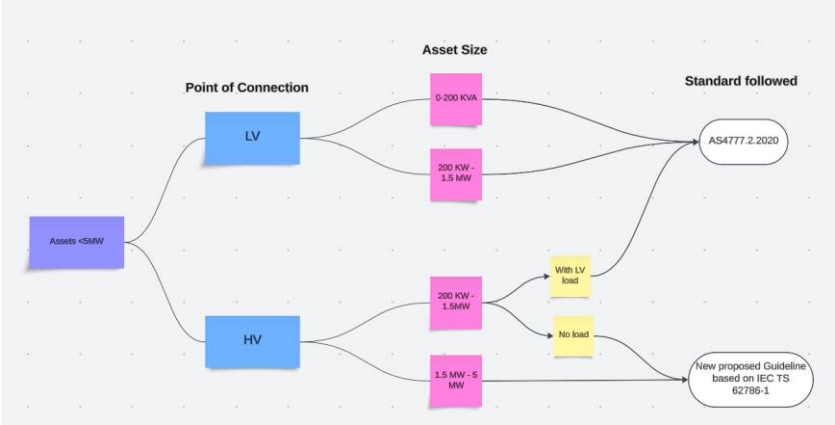
Kyle Auret

Senior Manager Policy and Market Regulation

Appendix A – Response to consultation questions

Section	Question	Response
2 - Scope of technical requirements	Has the scope of prospective requirements for sub-5 MW DER been clearly defined?	The purpose of the review is clear, but we propose changes to some of the requirements. 1. The 20% ramp rate limitation would challenge the operation and economics of unscheduled assets such as BESS. We understand extreme ramping capabilities could introduce mismatches between supply and demand, increasing the variability of power system frequency. However, this requirement could be revisited once the volume of unscheduled BESS has been deemed significant to materially impact power system operation. The draft Integrating Price Responsive Resources (IPRR) Rule change is proposing to create new monitoring and reporting obligations for AEMO to evaluate the effect of price-responsive resources on the accuracy of AEMO's short-demand forecasts. The evidence collected through this process could be used to inform a later introduction of this requirement, as required. Alternatively, we would be open to having discussion with AEMO and DNSPs to insert further flexibility into the proposed requirements. We are also seeking further clarification about this requirement in Section 4. 2. The report suggests additional requirements for Micro-DER above 200kW, including remote active power monitoring and curtailment capability by DNSPs. • Our view is that 1MW and above would be a more suitable limit for remote power monitoring and curtailment by DNSPs. ○ A 200kW and above limit would be excessive and significantly cost/time impactful on our customers. ○ We currently face significant costs and time delays from some DNSPs for implementing SCADA and other NEM-grade metering setups for this purpose, particularly in the C&I market of 100kW - 1MW. ○ Some DNSPs are requiring NEM-grade metering setups for DER monitoring. This requires extra CT chambers, metering panels, 24/7 access to DNSPs. This has created barriers for some C&I customers as they are unable to provide this kind of access to DNSPs within their property where the DER is located. ○ We are also unclear about the ongoing obligations related to this proposal – who would be responsible for ensuring compliance, testing of functionality during operation, etc? • If the 200kW and above limit for power monitoring and curtailment is deemed necessary by AEMO, then we think it's necessary to ensure it's consistent across all DNSPs. To achieve this, AEMO / DNSPs could consider extending the CSIP-Aus capabilities that are being built for emergency backstop requirements. ○ We are already seeing some DNSPs undertaking power monitoring and curtailment functions below 200kW via IEEE 2030.5 CSIP-AUS systems (e.g. flexible export schemes, emergency backstop mechanisms, etc.). ○ AEMO and DNSPs could consider extending this requirement further and standardising this as a common solution for systems up to 1 MW. This would help reduce costs and complexities and allow DER installations to continue. ○ Inverter manufacturers are already getting their products certified with DNSPs for CSIP-AUS compliant communications channels, and this would be a much simpler and standardised solution for larger DER systems. 3. The report specifies that one of the objectives is to avoid modelling requirements and therefore reduce cost and time for grid connections. However, the report also states that "DNSPs may impose their own requirements for modelling". We are seeking more clarity on these requirements. We also note AGL's preference would be for no modelling to be required for sub-5MW DER systems. However, if modelling is deemed necessary then our view is that the guideline should specify that steady-state RMS modelling requirements apply only to HV-connected DER without LV loads over 1 MW, and that dynamic modelling should not be required for any DER system under 5 MW. 4. The paper notes that the proposed performance requirements in Appendix A1 are applicable to solutions intended to be operated and managed independently and aggregated DER need to be considered on a case-by-case basis. While we understand the intent, we are unsure if this could practically be enforced. We are also unclear how this would interact with the draft IPRR Rule change and technical requirements for Voluntary Scheduled Resources. We are also seeking further clarification about this requirement in Section 4.
	Is the reasoning behind including those focus areas for AEMO to consider specifying technical	The reasoning is clear. However, it is unclear how the following requirements would be implemented across DNSPs: • Active power curtailment, by remote signal • Remote monitoring • Protection settings.

	requirements (summarised in Section 2.4) clear and reasonable?	For active power curtailment by remote signal and remote monitoring we would encourage working towards consistent requirements across DNSPs, as this would likely require additional investment by connecting parties to meet the communication requirements (e.g., SCADA / API). The requirements could be segmented by connection type (HV or LV) or segmented by size (MW). 'Protection Settings to Maximize Plant Capability' would be subject to DNSP requirements – again, we encourage AEMO and DNSPs to work towards a consistent implementation where possible.
	Should AEMO also consider any or all of the requirements outlined in Section 2.5 (identified of interest to DNSPs only)?	Our view is that AEMO should specify the required reactive power capability of the plant under normal operation as well as the linear curves for Volt-VAR limits and Volt-Watt limits as a standard practice.
	Should AEMO consider other requirements not outlined here?	As noted earlier, our preference would be for the guideline to state clear requirements around steady-state RMS and explicitly state that dynamic modelling is not required.
4 – Proposed performance requirements	Have the proposed performance requirements for sub-5 MW DER been clearly outlined?	The performance requirements in Appendix-A1 are generally clear, but we seek further clarification on the items listed below. Ramp rate limits - Section 2.3.2 states a higher ramp rate may be allowed to 'provide frequency response for large frequency excursions.' In Appendix A1 (Ramp rate limit) there is a comment that notes permitted exceptions for the ramp rate limit include 'PFR response outside deadband'. Are these terms equivalent to the providing frequency response (with a deadband) in Appendix A1? If so, we suggest being consistent in the use of this terminology. If not, we seek further clarity on this requirement and where exceptions apply. - The report notes that for battery energy storage systems (BESS) the ramp rate limit is 20% of (rated import + rated export). Is this the rated import or export in the BESS datasheet or as per the limits specified in DNSPs' operational specifications? For example, if a BESS were rated as 1MW/2MWh with a nameplate rated import and export capacity of 1 MW each, but a DNSP's operational specification was that the BESS can export a maximum of 1 MW and import a maximum of 0.5 MW, would the ramp rate limit be 20%(1+1)MW or 20%(1+0.5)MW? Aggregated assets - We would also appreciate more clarity regarding the aggregation of sub 5 MW assets. If this approach were to apply, we would also seek transparency in the rationale and application across DNSPs. For instance – to be considered an aggregated resource, would systems need to **both** behave in a 'co-ordinated manner' and be connected to the same sub-station busbar? Has AEMO formed a view of what behaving in a 'co-ordinated manner' entails? Can the proponent access network topology to determine whether systems are connected to the same sub-station independently and in advance of connecting DER? Are there further geographical restrictions? Legacy plant - The consultation report includes performance requirements for legacy plant (which we understand to be legacy synchronous generation that is connected to the distribution network). These requirements would be agreed upon with DNSPs. If these requirements were to be retroactive, were also unclear whether legacy connection agreements would need to be amended to apply the guideline requirements. We would not support this approach. Our view is that this guideline should only apply to new installations (and should not be retroactive) and seek clarification on AEMO's proposed treatment of legacy plant. HV-connected - We propose updating references to *HV-connected LV inverter-based systems* so they instead refer to *HV Connection Points with LV inverter-based systems*.
	What are stakeholder perspectives on the application of the proposed settings within the	We agree with the idea of adopting an international standard for sub-5 MW HV-connected DER as this could provide further clarity to support compliance and consistency of implementation.

	framework of IEC TS 62786-1 technical specification for sub-5 MW HV-connected DER?	
	What are stakeholder perspectives on the application of AS/NZS 4777.1 and AS/NZS 4777.2 region-based requirements, for 230/400 V ac IES, less than 1.5 MW aggregate rated capacity, connected to the HV distribution network with LV load?	The categorisation of assets based on HV and LV connection, size (MW), and the presence of LV loads needs to be clearly defined. At the moment it is not fully clear how / when different guidelines and standards would apply. We have schematised our understanding of AEMO's proposed categorisation below – and would welcome clarification on whether this is correct.  Nonetheless, our view is that AS/NZS 4777 should apply to all micro-DER. In our view micro-DER would encompass: • Sites with LV Connection Points (and hence LV inverter-based DER systems). • Sites with HV Connection Points but that have LV loads (e.g., airports, hospitals, large C&I consumers) and/or LV inverter-based DER systems (up to 5 MW). This grouping would avoid having DNSP-specific blended rules for systems up to 5 MW and would also imply that there are no modelling requirements for these installations, as AS4777 settings would apply at the inverter terminals.
	Should AEMO consider other references for its technical performance settings? For example, EN 50549-2:2019, which specifies the technical requirements for the protection functions and the operational capabilities for generating plant intended to operate in parallel with medium voltage distribution networks.	Referring to further standards could be onerous. However, if there are critical performance requirements which are not covered in IEC TS 62786-1 our preference is for these to be included and standardised within the proposed guideline rather than implemented differently across DNSPs.
5- Options for implementation	Is initially introducing the proposed recommended settings via a guideline with DNSPs the most effective approach?	Yes, we agree that recommending settings via a guideline (based on Appendix A1) is the most effective and fastest approach for implementation. The adoption of IEC TS 62786-1 can also happen in the background. Importantly, we think the guideline process should be used to ensure DNSPs and AEMO agree on consistent requirements across networks to the fullest extent possible.

	Should the recommended settings be established as an Australian Standard?	Yes. Eventual standardisation would provide improve clarity of the requirements and support compliance and consistency of implementation.