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Submitted by email to: DERProgram@aemo.com.au;
Cc: matthew.hyde@aemo.com.au

17 May 2019

Dear Matthew

AEMO Technical Integration of Distributed Energy Resources, Consultation Paper, April 2019

Thank you for the opportunity to respond to the Australian Energy Market Operator's (**AEMO**) Consultation Paper, Technical Integration of Distributed Energy Resources: Improving DER capabilities to benefit consumers and the power system, April 2019 (**Consultation Paper**).

AGL Energy (**AGL**) welcomes AEMO's focus on the technical aspects of integrating distributed energy resources (**DER**) into the grid and its interest in supporting the development of improved DER technical performance standards in partnership with industry. In our view, appropriate technical performance standards will play a crucial role in enabling the effective participation of DER in the energy system.

AGL considers that a broad range of innovative product and service offerings that draw upon the proliferation of DER will play an increasingly important role in Australia's evolving energy markets. AGL's behind-the-meter (**BTM**) solutions provide customers access to a range of value streams including improved solar self-consumption, network services revenue and wholesale market participation, allowing the 'stacking' of values for customers' benefit. AGL has considerable experience through a range of programs, most notably our South Australia Virtual Power Plant (**SA VPP**) and ARENA Demand Response programs.

AGL has been involved in the development of a range of technical standards applicable to DER and currently represents the Australian Energy Council membership on a range of relevant Standards Australia Committees, including:

- EL-42 (Renewable Energy Power Supply Systems and Equipment);
- EL-54 (Remote demand management of electrical products); and
- EL-64 (Decentralised electrical energy and grid integration of renewable energy system).

We are also a member of the Australian Battery Performance Standard Stakeholder Reference Group, that is supporting the work of DNV GL, CSIRO, Deakin University and Smart Energy Council in developing a new draft Australian Battery Performance Standard.



The role of AEMO in establishing technical performance standards for DER

AGL supports AEMO's important responsibility in operating Australia's electricity markets and power systems and we acknowledge that with the increasing penetration of DER, the bi-directional nature of energy flows presents a new set of requirements that need to be considered in managing system security and reliability. We agree with AEMO that ensuring appropriate technical capabilities are important for DER, as they are for large scale generation assets connected to the electricity system, and if we get them right will enable households and businesses to realise the full value of their DER investments.

Therefore, we support AEMO's role in contributing towards the development of appropriate technical performance standards for DER with insights on system security and market operation.

However, DER will not always be interacting with the grid as is the case with traditional large-scale grid connected generation assets. While DER presents opportunities to provide energy, FCAS and other services with the assistance of an aggregator/ retailer, for the majority of the time, customer owned DER is likely to be employed directly for meeting customers' consumption needs. In some instances, DER may also be engaged in bilateral agreements outside of the NEM to sell DER services outside of the market, including network support, services to AEMO and peer-to-peer energy trading.

As such, we believe Standards Australia as an independent body, is best placed to develop and adopt technical performance standards that reflect international best practice through robust stakeholder engagement and with the support of relevant industry expertise. While system security and market operations are crucial considerations in the development of applicable technical performance standards for DER, it is also important that standards development considers other key considerations, including safety, economic efficiency, innovation and customer impact.

AGL recommends that Standards Australia continue to lead the development and adoption of technical performance standards. AEMO will play an important role in supporting Standards Australia by providing advice and input with respect to system security and reliability.

Guiding principles for establishing technical performance standards

To deliver the full value stack from BTM energy solutions to consumers and the broader energy system, we consider that technical performance standards for DER should adhere to the following guiding principles:

- be technology agnostic and remain future-proofed for future technological developments;
- enable consumers to connect new DER consistently, under a standardised connections process across distribution zones; and
- empower consumers to utilise DER assets for their own comfort and to participate in competitive market services which address broader energy system needs through innovative aggregator models such as virtual power plants.

We have also used these guiding principles to assess AEMO's analysis on DER behavior and its proposed approach to developing DER technical performance standards and modelling DER and load as contained in the Consultation Paper. We elaborate on these aspects of the Consultation Paper in the **Attachment**.



As AEMO develops its approach to the technical considerations elaborated in the Consultation Paper, we would welcome the opportunity to meet with AEMO to discuss some of our observations based on our operational experience with DER and ongoing involvement in standards development.

Should you have any questions in relation to this submission, please contact Kurt Winter, Regulatory Strategy Manager, on 03 8633 7204 or KWinter@agl.com.au.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'K. Winter', enclosed in a light blue oval.

Con Hristodoulidis

Senior Regulatory Strategy Manager



ATTACHMENT

1. DER behavioural analysis

AGL welcomes AEMO's analysis on DER behaviour during voltage and frequency disturbance and phase angle jump based on its collaborative projects. We note AEMO's commentary on voltage behaviour in the SA Power Networks distribution zone, where AGL's SA VPP has been operating since December 2016.

We acknowledge that improving voltage disturbance withstand capabilities of inverters will assist in reducing the degree of lost DER generation during voltage disturbance events, thereby improving system security.

In addition to focusing on DER technical performance standards, we consider that complementary efforts should also be made by regulators and distribution network businesses to proactively manage voltage levels at the network level to accommodate greater reverse power flows.

In recent experience with our SA VPP, high voltage levels in many parts of the distribution network regularly affect a wide range of customers by limiting the energy storage system and associated solar system output. Our analysis revealed that grid voltage levels across the grid were generally too high regardless of whether customers were exporting solar.¹

2. Developing DER technical performance standards

AGL supports AEMO's view on the areas where DER technical performance standards may require revision, and the prioritisation of each requirement, as elaborated in Table 6 of the Consultation Paper.

As far as possible, we would encourage industry to develop technical performance standards through Standards Australia that align with international standards, to ensure an open and competitive technology market.

AEMO has referenced IEEE Standard 1547-2018 in the context of disturbance withstand capability phase angle jump. We consider that this international standard along with other relevant international standards should be considered throughout AEMO's analysis and consultation to assess whether existing technologies can meet any proposed changes to Australia's technical requirements.

We note that grid support in terms of voltage and reactive power control has been given first order priority by AEMO and is intended to be progressed through a revision to AS/NZS 4777.2. We consider that the proposal for default enablement of Volt-Var functionality, supported by Volt-Watt, should only be used at the extreme ends of the statutory voltage range. Requiring that both modes be made available reduces a customers' value each time it is required, for the network to gain a network service.

AGL commends AEMO in prioritising a review of mechanisms for promoting compliance with relevant standards and installation practices. We consider that there may be value in requiring sampling and audit to ensure appropriate compliance with existing standards. We also consider that developing capabilities for coordination and interoperability, remote querying of device setting and remote changes to device settings

¹ See further AGL (2018) ARENA Stage 2 report – Virtual Power Plant in South Australia, Available at <https://arena.gov.au/assets/2017/02/virtual-power-plants-in-south-australia-stage-2-public-report.pdf>; AGL's findings are consistent with the broader industry's understanding of the issues associated with network voltage. See further Naomi Stringer et al (2017), 'Data driven exploration of voltage conditions in the Low Voltage network for sites with distributed solar PV', available at <http://apvi.org.au/solar-research-conference/wp-content/uploads/2018/12/APSRC-2017-Data-driven-exploration-of-voltage-conditions-in-the-LV-network-High-resolution.pdf>.



could support more widespread and cost-effective compliance across the industry as it would assist in detecting and rectifying non-compliant assets.

3. Modelling DER and load

In our view, it is important that AEMO develops a clear objective to any DER modelling that clearly articulates its intended application. While we understand AEMO intends to deliver this workstream through its existing collaborative projects with UNSW-ARENA, Energy Queensland and Solar Analytics, we would also encourage AEMO to undertake ongoing engagement with industry to test key insights and develop an appropriate modelling methodology and approach that is agreed with industry. In this regard, we would recommend that AEMO establish a standing industry technical working group to facilitate regular information sharing and discussion.