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Australian Energy Market Commission
Submitted via website: www.aemc.gov.au

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Dear Andrew

Governance of distributed energy resources technical standards, Consultation Paper, September 2021

AGL Energy (**AGL**) welcomes the opportunity to respond to the Australian Energy Market Commission's (**AEMC**) Consultation Paper on Governance of distributed energy resources technical standards, September 2021 (**Consultation Paper**).

As a leader in DER products and services, AGL has actively participated in bringing the consumers' view and interests into the development of a range of policies, regulations, and technical standards applicable to distributed energy resources (**DER**).

We currently represent the Australian Energy Council (**AEC**) 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 engaged in a range of industry forums focused on the development of appropriate technical standards and protocols to support DER integration, including the Distributed Energy Integration Program, API Technical Working Group, South Australian Office of the Technical Regulator Dynamic Exports Committee, and the Energy Security Board's DER Maturity Plan Pilot Stakeholder Steering Cohort. We have consistently advocated in these forums for technical standards and protocols governing DER to empower consumers with choice to utilise and optimise DER assets for their own comfort and to participate in competitive market services which address broader energy system needs.

Our feedback on the Consultation Paper is based on our operational experience with DER products and services and ongoing involvement in technical standards development.

Strategic direction

AGL supports the strategic intent of the Energy Security Board's (**ESB**) rule change request to improve governance arrangements for DER technical standards, given the current inability to implement consistent technical standards across the NEM and the need for a fast, flexible, and transparent standards setting process.



We acknowledge the important role that Standards Australia plays as an independent body skilled in standards setting.

Nevertheless, as we observed in our response to the ESB's 2020 review of governance arrangements for DER technical standards and to Standards Australia's own governance review in 2017, improvements to the technical standards governance arrangements are required to ensure standards development remains technical, customer-focused and evidence-based.

AGL therefore supports establishing a DER Standards Governance Committee under the NER, provided its functions and powers complement and enhance the current standards making process and do not introduce additional complexity or duplication.

Key recommendations

In assessing the ESB's rule change proposal, AGL recommends the AEMC consider the following:

1. The assessment framework should contemplate a customer outcomes objective to ensure alignment with the National Electricity Objective (**NEO**).
2. In characterising the current governance problems in DER technical standards, attention be given to:
 - The current lack of an overarching strategic direction to inform DER standards proposals; and
 - The current lack of a formal cost benefit analysis framework both in the Standards Australia development process and in the AEMC's incorporation of AS 4777.2:2020 into the National Electricity Rules (**NER**), to ensure reform proposals are in the long-term interest of consumers.
3. In assessing market impacts if new governance arrangements are not established, consider:
 - The current lack of a nationally harmonised approach to DER technical standards in the NEM increases the compliance cost and complexity for businesses operating across Australia's energy markets market participants; and
 - The current lack of a formal cost-benefit analysis framework for the development of DER technical standards risks disproportionately impacting customer value that could be realised from customers' investment in DER assets.
4. The NER should articulate a definition of DER Technical Standards and establish the AEMC as the responsible body for any necessary updates to those rules, as was partially addressed through the rule change submitted by AEMO on minimum DER standards¹.
5. A DER Standards Governance Committee should be established under the NER, to provide a key strategic and advisory function in the incorporation of DER technical standards into the NER and to assess distribution networks' grid connection standards and ongoing obligations to manage voltage levels on the network.

¹ See AGL Submission to the AEMC's Draft rule determination for the rule change request submitted by AEMO on the creation of a subordinate instrument for a minimum technical standard for distributed energy resources (14 January 2021), Available at https://thehub.agl.com.au/-/media/thehub/documents-and-submissions/2021/210115_agl-submission_-_aemc-technical-standards-for-der-rule-change_draft-rule-determination-final.pdf?la=en&hash=A375C7F0A8336852AC035D536BC6882F.



6. Standards Australia should continue to develop DER technical standards and the DER Standards Governance Committee be sufficiently resourced to support the initiation of proposals to Standards Australia.

We have carefully considered the questions raised in the Consultation Paper and elaborate our feedback in the **Attachment**.

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 'C. Hristodoulidis', written over a faint, light blue horizontal line.

Con Hristodoulidis

A/GM Policy and Markets Regulation



ATTACHMENT

1. AEMC's assessment framework

In addition to the proposed objectives, we would recommend the AEMC include a customer outcomes objective to ensure the assessment framework aligns with the NEO. This should encompass considerations of the following:

- Facilitating access to an open and competitive market to empower customers with choice and enable them to realise value from their investment in DER;
- Ensure alignment with internationally accepted standards, where consistent with Australian energy market structures; and
- Support standard setting that is technology agnostic and remains future-proofed for future technological developments.

We also consider that the price objective should be reframed as a cost objective to more accurately reflect the description provided.

2. Identifying governance problems

AGL agrees with the governance problems identified in the rule change request, including that:

- The publication of Australian or international standards does not mean automatic adoption by manufacturers or jurisdictions;
- Technical connection standards provide for minimum DER technical standards, but there is a lack of coordination across the NEM; and
- While the rule change request lodged by the Australian Energy Market Operator (**AEMO**) on minimum DER technical standards sought to implement an initial solution, an enduring solution is needed.

Beyond these identified problems, we recommend the AEMC also consider the following shortcomings associated with the initiation and development of DER technical standards through Standards Australia:

- There is no overarching strategic direction to inform DER standards proposals;
- There is no established cost benefit analysis process to ensure proposals are in the long-term interest of consumers; and
- The incorporation of Australian Standards directly into the NER, without a formal cost benefit analysis, as was the case with the incorporation of AS 4777.2:2020 risks impacting customer value.

We consider these additional considerations important to ensure that the incorporation of DER technical standards into the NER aligns with the NEO and long-term interests of consumers.

3. Assessing market impacts

We would recommend the AEMC consider the following matters in assessing the market impacts if new governance arrangements are not established:



- The current lack of a nationally harmonised approach to DER technical standards in the NEM increases the compliance cost and complexity for businesses operating across Australia's energy markets market participants.

By way of example, the South Australian Government's implementation of its Smarter Homes Reforms in 2020 established unique regulatory arrangements in South Australia that do not reflect the national energy market regulatory framework.

- The current lack of a formal cost-benefit analysis framework for the development of DER technical standards risks disproportionately impacting customer value that could be realised from customers' investment in DER assets.

The AS 4777.2:2020 inverter standard amendment that was incorporated into the NER through the AEMO minimum DER technical standards rule change did not include analysis of customer impacts associated with proposed power quality response modes or assess its potential impact in light of current grid voltage conditions. Whilst AGL raised the need for such analysis to inform the Standards Australia process for the AS4777.2 revision and to the AEMC in the context of its rule change determination, to date no such analysis has been undertaken or provided to broader industry for consideration.

Through AGL's SA VPP, we have been able to draw upon operational data to develop a range of important insights into the interaction of DER with the low voltage distribution network, including on voltage management.²

With a view to understanding whether regulating inverter power quality response modes is the right approach to addressing overvoltage issues, AGL undertook some preliminary analysis of the effect of Volt-VAR on our SA VPP battery fleet in 2019-20. Our analysis revealed the following key insights:

- The voltage reduction impact of the Volt-VAR power quality response mode at individual sites was minimal across a range of network types. This finding aligns with reactive power theory and academic literature which indicates that the impact of these modes is highly variable and depends on their location within the LV network, the overall network topology, the conductor materials and characteristics. While there may be a greater impact in aggregate, we are not aware that this has yet been demonstrated at scale or proven through academic literature.
- At the same time, the ability of that asset to provide real power is curtailed. This reduces the value of a customer's investment for self-consumption and limits their ability to transact in the value of that asset.
- Power quality response modes materially impact customer value. Applying the draft updated AS4777.2 Volt-Var set points, our analysis revealed that there is an equity risk in the way uniform power quality response modes impact customers, with some customers experiencing material value losses due to network locational characteristics.

AGL recently partnered with the University of New South Wales alongside SAPN, Solar Analytics and the Australian PV Institute (APVI) in a Fast-Track Project through the Racefor2030³ that, among other things,

² For further information regarding AGL's ARENA SA VPP program, including the two milestone reports published to date, please refer to <https://arena.gov.au/projects/agl-virtual-power-plant/>.

³ See UNSW project investigates how rooftop solar can support the electric power system (1 April 2021), Available at [UNSW project investigates how rooftop solar can support the electric power system | UNSW Newsroom](#).



assessed DER curtailment, impact of different inverter power quality response modes on energy-user's revenues, and fairness of curtailment from the energy-user's perspective. To obtain a complete picture, analysis should include a broader customer asset base, assessing impact to solar and V/Watt mode in concurrent operation. This would reveal a potentially far greater impact across a more material portion of the fleet.

4. DER technical standards in the rules

As we stated in response to the AEMC's Draft rule determination on the rule change submitted by AEMO on minimum DER standards⁴, AGL supports the NER articulating a definition of DER Technical Standards and establishing the AEMC as the responsible body for any necessary updates to those rules.

5. Who develops and maintains technical standards?

In summary, our preferred approach is:

- Establishing a DER Standards Governance Committee under the NER, to provide a key strategic and advisory function in the incorporation of DER technical standards into the NER and assessment of distribution networks' grid connection standards and ongoing obligations to manage voltage levels on the network; and
- Standards Australia continues to develop DER technical standards and the DER Standards Governance Committee be sufficiently resourced to support the initiation of proposals to Standards Australia with respect to DER technical standards to ensure that they remain fit-for-purpose.

AGL supports establishing a DER Standards Governance Committee under the NER, provided its functions and powers complement and enhance the current standards making process and do not introduce additional complexity or duplication.

AGL believes that Standards Australia as an independent body skilled in standards setting, is best placed to develop and adopt technical standards that reflect international best practice through broad stakeholder engagement and with the support of relevant industry expertise.

Nevertheless, as we observed in our response to the Energy Security Board's 2020 review of governance arrangements for DER technical standards and to Standards Australia's own governance review in 2017, improvements to the technical standards governance arrangements are required to ensure standards development remains technical, customer-focused and evidence-based.

Functions of the DER Standard Governance Committee

We believe the DER Standards Governance Committee should be responsible for:

- Setting a strategic direction with respect to DER technical standards.
- Considering issues related to compliance and enforcement of standards in their development.
- Providing advice on standards and undertaking related reviews.

⁴ See AGL Submission to the AEMC's Draft rule determination for the rule change request submitted by AEMO on the creation of a subordinate instrument for a minimum technical standard for distributed energy resources (14 January 2021), Available at https://thehub.agl.com.au/-/media/thehub/documents-and-submissions/2021/210115_agl-submission_-_aemc-technical-standards-for-der-rule-change_draft-rule-determination-final.pdf?la=en&hash=A375C7F0A8336852AC035D536BC6882F.

- Assessing distribution networks' grid connection standards and ongoing obligations to manage voltage levels on the network to ensure transparency and alignment to support consistent consumer outcomes.

In our experience with the development of DER technical standards through Standards Australia, we have observed that proposals often do not reflect a coordinated cross-industry view on the desirability of changes. Rather, proposals reflect proponents' individual strategic priorities, for example improved system security and reliability or enhanced interoperability for customers. While Standards Australia committees undertake an initial assessment of proposals before commencing a formal development process, we consider that the Committee could fulfil a broader strategy function that includes:

- Assessing whether proposals align with broader policy objectives, for example stemming from AEMC market review recommendations, prior to proponents submitting proposals to Standards Australia.
- Commissioning specific research or studies to determine if new or revised technical standards are needed.
- Overseeing relevant technical modelling and cost benefit analysis to validate proposed changes and inform more robust decision-making in Standards Australia committees.

In our view, this would support standards development proposals that are evidence-based and accurately reflects industry's broader strategic priorities, as identified through broader market reviews. While the Distributed Energy Integration Program has begun to engage industry in some strategic planning with respect to standards development, through its working groups and taskforces, to date this has been *ad hoc* and has tended to be driven by the strategic objectives of individual organisations such as AEMO rather than as the result of AEMC market reviews with robust stakeholder engagement.

We would also recommend the Committee have remit to consider distribution networks' grid connection standards and ongoing obligations to manage quality of supply on the network to ensure transparency and alignment to support consistent consumer outcomes.

The scope of the DER minimum standards rule change frames the challenge of DER integration principally as one of developing appropriate technical standards to ensure that DER does not impact the secure operation of electricity system and distribution networks and incorporates AS 4777.2:2020 as a short-term solution. In our view, DER integration is equally about ensuring that network investment and operations facilitate the interaction of DER with the broader energy market system. Technical standards also need to support the evolution of the NEM by facilitating rather than hindering the emergence of a two-sided market, in accordance with the Energy Security Board's Post-2025 Market Design.

In our experience with distributed energy products and services, we have also observed that varying technical requirements enforced by distribution networks have limited consumers' ability to utilise their DERs to participate in services which provide broader system benefits. Agents registering customer connections also experience difficulty in understanding distribution network connections processes and technical requirements. This complicates agents' ability to design and register DER systems and adversely impacts consumers' ability to realise the full value of the DER assets.

Whilst Energy Networks Australia sought to address these discrepancies through the development of its National Distributed Energy Resources Grid Connection Guidelines in 2019, the results of that project highlighted some of the risks associated with establishing a national connections framework for DER through an industry body. These include that unless appropriately implemented into the NER and / or individual



network businesses' technical guidelines and Connection Agreements, consumers, installers and manufacturers would have limited recourse to challenge network connection settings that do not adopt or align with the Connection Guidelines. This legal ambiguity would result in less certainty for consumers.

We consider that empowering the Committee to assess distribution networks' grid connection standards and ongoing obligations to manage voltage levels would enable the Committee to provide more balanced advice on improvements to the regulatory framework to support DER integration.

Relationship between the DER Standard Governance Committee and Standards Australia

We do not consider that the Committee should be empowered to set DER technical standards per se, although the Committee should pay an advisory function in recommending changes to any technical standards incorporated into the NER, that would then be subject to a formal rule change consultation process.

As noted above, we believe that the functions and powers of the Committee should complement and enhance the current standards making process, especially through Standards Australia, and not introduce additional complexity or duplication.

Determining DER technical standards entails a range of customer market considerations that are best determined upon by a body that is independent of the energy market system. While we appreciate the Reliability Panel analogy given that DER will increasingly influence system security and reliability, determining appropriate DER standards also entails a range of customer market considerations, including that:

- Technical standards governing DER need to empower consumers with choice as to how they use their DER assets, given that the customer benefits associated with DER investment will not always be associated with grid interactions.
- Given the international commodity market for DER, technical standards need to align with internationally accepted standards, where consistent with Australian energy market structures, to enable as wide a range of innovative products and services as possible into the Australian market at least cost to consumers.

Establishing the Committee as a determining body could also lead to shortcomings in the compliance regime associated with technical standards, given the current incorporation of technical standards through state-based legislative and safety requirements. By way of example, we understand that state-based legislative and safety requirements incorporating AS/NZS3000 enable state regulator to prosecute workers for not achieving minimum wiring safety requirements. Determining technical standards outside of this regulatory framework would potentially rely upon enforcement through networks connection agreements, placing the compliance burden on networks businesses and electricity retailers who may not have direct carriage of installations. Given the policy intent to improve compliance, we recommend a preferable approach would be to leverage the existing compliance framework through state-based instruments.

Accordingly, we would recommend the AEMC consider further how the Committee's advisory function could interact and guide Standards Australia's standard setting work to ensure that the two regulatory frameworks align, including for example by resourcing the Committee to develop technical standards proposals to Standards Australia with respect to DER technical standards to ensure that they remain fit-for-purpose.



Membership composition of the DER Standard Governance Committee

AGL is generally supportive of the proposed membership composition of the Committee, as elaborated in the ESB's rule change request. We consider that the proposed composition is appropriately balanced to enable the Committee to fulfil an advisory function.

Should the AEMC decide to establish the Committee as a determining body, we would recommend that the membership require greater participation of registered participants to ensure any decisions appropriately reflect the diversity of businesses operating in DER.

AGL would also recommend the development of an appropriate Code of Conduct to manage any conflict of interest risks in the Committee membership and governance processes.

6. How prescriptive should governance arrangements be?

We consider that the Committee should be convened under the AEMC with the National Electricity Law (**NEL**), with specific Rules provided in NER to allow for its appointment, operations and functions to be prescribed and its powers set out. We consider that convening the Committee under the AEMC would provide a greater level of independence in the Committee's function. We also consider that prescribing its functions and powers in the NER would ensure its effective operation in complementing and enhancing the current standards making process, guarding against any duplication.