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Energy Networks Australia
Submitted by email to: sjohnston@energynetworks.com.au

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Dear Stuart

Energy Networks Australia National Distributed Energy Resources Grid Connection Guidelines

Thank you for the opportunity to provide feedback on Energy Networks Australia's (**ENA**) Draft National Distributed Energy Resources Grid Connection Guidelines, Basic and Low Voltage Connections (**Draft Connection Guidelines**).

AGL Energy (**AGL**) welcomes ENA's focus on the connections framework for distributed energy resources (**DER**)**.** We consider 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 considers that network connections settings for DER will be critical to enabling the participation of DER in the broader energy system. In our experience in BTM solutions, the 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.

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

- enable consumers to connect new DER consistently, under a standardised connections process across distribution zones;
- 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;
- align with current Australian Standards to ensure consistent technology practice and allow for technology advancements into the future;
- provide independent oversight of network businesses' compliance with the standardised connections application process; and

- improve adjudication avenues for consumers and market participants to challenge network connection settings that would result in sub-optimal customer outcomes.

We have assessed the ENA's Draft Connection Guidelines based on these guiding principles and provide our detailed commentary in the **Attachment**. We consider that additional clarity, particularly in relation to battery energy storage systems (**ESS**), would ensure better outcomes for customers seeking to realise the full benefit of their DER.

Establishing an effective national connections framework

More broadly, we consider that an independently developed national connections framework would be best placed to deliver on these guiding principles and ensure that the network connections framework for DER aligns with the National Electricity Objective. Empowering an independent authority, such as the Australian Energy Regulator (**AER**), to develop national connection guidelines in consultation with industry stakeholders, and assess network connection applications, utilising these technical documents, would ensure a balanced approach to maintaining network stability and valuing consumer investments.

The ENA's Draft Connection Guidelines highlight some of the risks associated with establishing a national connections framework for DER through an industry body. These include that:

- The impetus to ensure consistency risks establishing guidelines that reflect lowest common denominator requirements of certain network businesses that do not necessarily result in optimal customer outcomes. This is apparent in several provisions in the Draft Connection Guidelines which do not appropriately reflect technology best practice, particularly the treatment of and value provided by ESS. In the absence of guidelines that appropriately address ESS connections, consumers will continue to be detrimentally impacted due to inconsistent network requirements.

- Compliance with the Connection Guidelines is not legally required by network businesses. Unless appropriately implemented into the National Electricity Rules 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 and risks undermining the primary objective of the Connection Guidelines.

To mitigate these risks, we recommend the ENA request that an independent authority, such as the AER, be empowered to develop and administer the national connections framework into the future.

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

Con Hristodoulidis

Senior Regulatory Strategy Manager

ATTACHMENT

We consider that additional clarity in the Connection Guidelines, particularly in relation to ESS, would ensure better outcomes for customers seeking to realise the full benefit of their DER both in terms of self-consumption and by enabling them to participate in competitive market services which address broader energy system needs through models such as virtual power plants. The latest Draft Connections Guidelines seek to exclude ESS to be treated potentially in an additional stand-alone guide. We consider that it would be more appropriate to address ESS in the current Connection Guideline. This approach would significantly reduce complexity and improve readers' understanding of the document's application across all DER.

Draft Technical Guidelines for Basic Micro EG Connections

4.2 Maximum System Capacity

This section sets maximum site capacity limits for single-phase basic micro EG connections (excluding ESS), three-phase basic micro EG connections (excluding ESS) and non-standard basic micro EG connections.

Given the advances in inverter technologies that typically include export limiting capability, we consider that export limits are a more appropriate means of managing the interaction of DER in the grid. In our view, maximum system capacity limitations penalise customers with existing solar PV and restrict their choice in terms of available products to augment their existing assets. Rather than eroding upon customers' potential cost savings through total inverter capacity limitations, we consider that grid stability could be achieved through a limitation on site exports. This approach would also ensure that customers are able to participate in competitive market services which address broader energy system needs through models such as virtual power plants.

4.3 Generation Control

4.3.1 Export Limits at Connection Point

This section sets export limits for basic micro EG connections for subcategory, as follows:

> *1. Single-phase basic micro EG connection – For single-phase basic micro EG connections of IES (excluding ESS), the export limit shall be set to equal 5 kVA*
>
> *2. Three-phase basic micro EG connection – For three-phase basic micro EG connections of IES (excluding ESS), the export limit shall be set to equal 5 kVA per phase with a balanced output with respect to its rating and a tolerance of no more than 5 kVA unbalance between any phases as per AS/NZS 4777.1*
>
> *3. Non-standard basic micro EG connection – For non-standard basic micro EG connections, a lower export limit or an option that avoids network augmentation may be specified. The lower export limit which applies to each type of non-standard network shall then be specified in this section. This section may also specify additional generation control requirements.*
>
> *The export limit is to be interpreted as "soft", consistent with the definition of soft export limits within AS/NZS 4777.1.*
>
> *This section shall specify that the export limit is to be interpreted by the proponent as a maximum. The ability of the proponent's basic micro EG system to export at the export limit is not guaranteed, but rather, it will depend upon network characteristics which change over time. This section shall*

describe those scenarios where output may need to be constrained including, but not limited to inverter power output where power quality response modes are in operation.

Consistent with our guiding principles elaborated above, we do not consider that network businesses should have discretion to impose site generation limits in some distribution zones that would not equally apply in other distribution zones. This would create an unequal operating environment for customers that is not necessarily justified on the basis of technical constraints.

We support the use of export limits to manage the interaction of DER in the grid. However, we consider that the export limit should include ESS, to provide customers with a consistent guideline with respect to their DER assets. This would mitigate the risk that individual network businesses would treat ESS inconsistently to the detriment of customers. We also consider that the maximum export allowance should be by reference to AS4777 rather than prescribing a specific limitation in the Connection Guidelines themselves. This would ensure that the Connection Guidelines reflect consistency of technology practice and are able to adapt to technology advances should industry look to revise AS4777 into the future. [1]

Accordingly, we would encourage the inclusion of the following wording in section 4.3.1, within the first dot point:

> For single-phase basic micro EG connections of IES (including ESS), total cumulative export from installed IES and the ESS should align with the export allowance under AS4777 at any point in time.

4.4 Inverter Energy System

This section sets requirements that apply to IES, including that:

> *5. IES shall comprise of inverters that have both volt-var and volt-watt response modes available.*

We support that inverter energy systems should comply with all applicable Standards, including AS/NZS 4777.1 and AS/NZS 4777.2 and IEC 62116. Nevertheless, we do not consider that requiring the availability of both volt-var and volt-watt is consistent with AS4777, which recommends that volt-watt and volt-var modes be available but does not mandate their availability. Requiring that both modes be made available reduces a customers' value each time it is required, in order for the network to gain a network service (Note our comments in footnote 1 regarding AS4777).

4.10 Power Quality

4.10.1 IES Power Quality Response Modes

This section specifies the inverter power quality response modes requires as per AS/NZA 477.2 including that:

> *2. Fixed power factor mode and/or volt-var response modes specified in Clause 6.3.3 and Clause 6.3.2.3 of AS/NZS 4777.2 shall be enabled. If applicable, this section shall also specify the circumstances under which power factor mode and/or reactive power mode shall be required.*

We do not consider that fixed power factor mode should apply. In our view, volt var is a more appropriate response to voltages being in a particular range. The fixed power factor mode entails undue impact on

[1] We note that AS4777 may require further review to ensure that it reflects technology best practice and remains fit-for-purpose in balancing system security and customer benefits. AGL intends to constructively engage with industry to ensure that the standard continues to facilitate optimal outcomes in this regard.

customer value even in circumstances where there is no associated network benefit with injecting/absorbing reactive power/vars. When a volt-var response is set, injecting/absorbing vars is only undertaken when the voltages exceed or fall below a specified threshold, thereby only constraining customer value some of the time when voltages are within this abnormal operating range. The customer loses value every time the power factor is set to below unity. Under a fixed power factor setting, a constant amount of vars is being injected/absorbed even when voltages are within the normal operating band.

In our view, the outcome of a fixed power factor correction setting for the customer is that the amount of real power that the customer is able to utilise for export or self-consumption is reduced.