Energy Networks Australia – Nationally Consistent Framework for Connection (Basic Connections)

Overview

Increasing transparency and consistency for customers looking to connect distributed solar and storage assets can create a number of benefits. The Energy Networks Australia (ENA) Guide for Basic Micro Embedded Generation (EG) Connections (the Guide) and Low Voltage (LV) EG Connections can achieve this if developed in the right way.

While we think that the ENA Guide is moving in the right direction, there are a number of sections of the Guide that would benefit from additional clarity. Our comments below provide suggestions for areas where additional clarity would be beneficial, particularly in respect of battery energy storage systems (ESS) installed behind the meter. In addition we reiterate some general principles in respect of the Guide that we think are important.

For further information on any of the content included in the below submission please contact Emma Fagan (efagan@tesla.com) or Kenneth Hee (khee@tesla.com).

General comments

We support a Guide that follows the following broad principles:

- **One Single Guide** – the Guide does not require an additional Guide to be released specifically on ESS installations. The Guide should provide additional clarity on sections which apply to ESS installations. Tesla has suggested clarifying text below.
- **Respects customer choice -** meets network requirements without limiting customer choice, particularly in a retrospective manner.
- **Does not prevent innovation –** will not impact on any other programs that are currently underway, or limit customer ability to participate in these DER programs that are being developed.

Benefits of having a single guide

As a general rule, Tesla believes that the suggestions for clarification made above should negate the need for developing a separate ESS specific guide. The Guide aims to promote consistency and transparency. Developing a separate guide at a later date would have the opposite effect, and result in less certainty for market entrants.

Respect for customer choice

Provided that there are no network export concerns, we believe that customers should be provided a choice with the solar and storage systems they install to meet their own energy needs. This includes the ability to install solar and storage systems to meet their household loads. It also includes the ability to retroactively install appropriately sized ESS assets without being impacted by cumulative static connection limits.

Alignment with innovation

We understand that Guide will evolve over time, as work in the DER space continues – however it is critical that it does not stifle innovation, or prevent work currently underway.

For instance NSPs that are already working closely with distributed energy resource (DER) providers to develop distribution system operator (DSO) platforms, APIs to better integrate DER resources, exploring

dynamic export approach, or any combination of the above, should not be prevented or dissuaded from doing do.

In addition, it's important that the Guide complements the Open Energy Networks (OpEN) work and any transition to a DSO model, as well as complementing the Australian Energy Market Operator (AEMO) NEM Virtual Power Plant (VPP) Demonstration work program; distributed energy resource (DER) trials for new services such as demand response.

Technical feedback on the Guide

We note the approach currently proposed by ENA in respect of connection, export and generation limits is as follows:

- Maximum system capacity:
    - Single-phase basic micro EG connection – For single-phase basic micro EG connections of IES (excluding ESS), the maximum system capacity shall be set to greater than or equal to 5 kVA.
    - Three-phase basic micro EG connection – For three-phase basic micro EG connections of IES (excluding ESS), the maximum system capacity at the same connection point shall be set to less than or equal to 10 kVA per phase
    - Some discretion allowed for non-standard connections.
- Export limit at connection point:
    - 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
    - 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.
    - Some discretion allowed for non-standard connections.
- Site generation limit downstream of connection point:
    - For single-phase basic micro EG connections, the site generation limit of the IES (or IES with ESS) shall be set at 5kVA
    - 2. For three-phase basic EG connections, the site generation limit of the IES (or IES with ESS) shall be set at 15kVA with a balanced output with respect to its rating and a tolerance of no more than 5kVA unbalance between any phases as per AS/NZS 4777.1

Tesla has some concerns about the generation limit, but we are generally supportive of the current approach taken for connection and export limits. Our comments on these three areas are outlined below with suggested additional clarifying text for the Guide italicized in red.

1. **Connection Limitation – Maximum system capacity**

As a general rule, Tesla believes that the focus should be supporting the relevant export limits, rather than the total capacity installed behind the connection point. However we understand that there are some network configurations where it will be important to limit the total solar capacity installed for equity reasons.

The critical point to note in respect of the current requirements for a minimum 5 kVA connection limit for single phase IES connections (excluding ESS) is that it may result in DNSPs adopting lower connection limits than currently exist.

Tesla suggests that the following language would be a valuable inclusion in section 4.2 of the Guide to encourage transparency:

- ***Where DNSPs use this section 4.2 of the Guide to reduce the single phase basic micro EG connection from an existing standard to 5kVA, that DNSP should provide justification as to the reason for this reduction.***
- ***Where a DNSP uses section 4.2 of this Guide to reduce the single phase basic micro EG connection, year on year, the DNSP should provide justification as to the reason for this reduction.***

We support the approach suggested by ENA in respect of not limiting the size of the ESS installed behind the meter as it enables customer choice more than the 10kVA hard limit included in the previous draft of the Guide would. Similarly it is also more aligned with the system sizing and approach taken under the AEMO NEM VPP Demonstration program and the NSW 200MW Smart Energy Homes and Business' VPP.

The major risk associated with the current wording in this section 4.2 of the Guide, is that it can still leave it open to the discretion of DNSPs regarding how they want to treat ESS connections.

To mitigate this risk, ENA may wish to include the following clarifying wording in the Guide:

- ***Connection of ESS assets will be subject to compliance with the export limitation section below.***

2. Export limitation at the connection point

Tesla supports the inclusion of the proposed export limits included within the Guide, subject to the comments above regarding not preventing innovation. We also note that these static limits will be subject to change over time as the AEMO VPP trials, and the OpEN work progresses, as well as the work that individual DNSPs are currently undertaking to explore a more dynamic export approach.

As with the connection limitations outlined above, the major risk regarding the wording in section 4.3.1 is that it may leave the treatment of ESS export open to the discretion of an individual DNSP. To mitigate this risk, Tesla would encourage ENA to include the following clarifying text in section 4.3.1 of the Guide, 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 must not exceed 5kVA.***

We also think it would be worth clarifying that DNSPs that are already exploring a dynamic approach to export would be able to continue to do so – provided the approach is clearly articulated in technical guidelines.

3. Site generation limits downstream of connection point

This section and the subsequent interpretation by individual DNSPs creates significant risks for end-use customers. Tesla is concerned that even with the explicit exclusion of ESS within section 4.3.2 of the Guide, if DNSPs adopt generation limits, this will still diminish the use case of behind the meter ESS assets.

While under the current interpretation of the Guide, a customer would be able to install a 5kW solar system and a 5kW ESS system, a strict interpretation of the generation limitation would mean that the customer would not be able to use both the solar system and the ESS to meet their load, downstream of the connection point, where that load is greater than 5kW.

Currently the only DNSP that imposes a generation limit is Western Power. In the majority of instances, we would suggest that downstream generation limits pose no additional benefits for DNSPs beyond the export limits at the connection point outlined in section 4.3.1 of the Guide.

Based on this we suggest that ENA considers removing this option or including a strong caveat that requires DNSPs to justify the benefits of imposing a generation limit downstream of the connection point, in addition to (or as an alternative to) export limitations.