CEC RESPONSE TO DER TECHNOLOGY INTEGRATION FRAMEWORK

Executive Summary

The Clean Energy Council (CEC) welcomes the opportunity to provide feedback on the initial draft of the Farrierswier and GridWise Energy Solutions *DER Technology Integration Functional Framework*, which was commissioned by the Australian Renewable Energy Agency (ARENA).

The CEC is the peak body for the clean energy industry in Australia. We represent and work with hundreds of leading businesses operating in solar, wind, hydro, bioenergy, geothermal energy, energy storage and energy efficiency along with more than 6,900 solar installers. We are committed to accelerating the transformation of Australia's energy system to one that is smarter and cleaner. We have a co-regulatory role, managing voluntary industry codes in conjunction with the Clean Energy Regulator (CER), the Australian Competition and Consumer Commission (ACCC) and various state and territory government agencies.

We note that at the request of Farrierswier and GridWise Energy Solutions, the CEC Executive has not consulted with its membership regarding the draft report and our response. We look forward to being able to share the draft report with CEC members.

The initial draft is an excellent beginning. However, it appears to be premised on an assumption that the challenge of integrating distributed energy resources (DER) primarily requires improved functionality from inverter energy systems, more standards and regulations to mandate the improved functionality and a stricter compliance regime to ensure that the additional regulations are met. While this is one important aspect of DER integration, there are other important aspects that the report overlooks. These include:

- Voltage management by distribution network service providers (DNSPs),
- Metering,
- Distribution grid connection rules, and
- The capability of DNSPs to utilise the advanced functionality of inverters.

These issues are explored in more detail in the body of this submission.

We would be very happy to discuss these issues in further detail. We look forward to contributing further to the development of the DER Technology Integration Framework.

Voltage management

The initial draft refers to the potential impact of DER on network voltage, noting that "excess DER generation can increase voltage above allowed thresholds". It should also mention the impact of high network voltage on DER generation and on consumers more broadly.

A report commissioned by the Energy Security Board (ESB) has revealed a significant level of high voltage across all distribution networks in all National Electricity Market (NEM) states. More than 95% of readings were found to be higher than the 230V standard.

The high voltages are due to a range of factors, including air conditioning loads and the fact that networks are still transitioning from the old 240V standard. While output from solar PV does slightly increase voltages on most networks, many sites experience higher voltages during the night when solar PV is not operating and cannot be blamed.

High voltages affect all customers, not just those with solar. When voltages are higher than they should be, that increases electricity consumption making electricity bills higher than they should be.

The high network voltages could affect DER integration, particularly as new inverter standards are likely to require tighter voltage bands for power quality responses. For the integration to work, distribution networks will need to honour their end of the bargain by ensuring that their network voltages are maintained within the requirements of standards and regulations. The research commissioned by the ESB indicates that has not been the case to date.

The initial draft suggests that problems with high voltages on the network are caused by DER. The ESB report demonstrates that issues with high voltages are primarily a network management issue and cannot be blamed on solar generation. Please correct the draft report to acknowledge the detailed analysis of this issues that was commissioned by the ESB and undertaken by UNSW.

Metering

Advanced metering infrastructure will play a key role in enabling tariff reform and improving the visibility of the low voltage network. It is surprising to note that the initial draft omits any mention of metering and the problems that have been experienced. Even though the initial draft refers to tariff reform, it does not refer to one of the main barriers to tariff reform, which is the absence of advanced metering infrastructure. In jurisdictions other than Victoria the ability to utilise smart meter data to assist with DER integration is limited by the glacial pace of the smart meter rollout under the 'Power of Choice' policy framework. A key area for reform should be to address the disappointing pace of smart meter rollout in the NEM jurisdictions other than Victoria.

Advanced metering infrastructure will also play a key role in improving the visibility of low voltage networks. The UNSW report on network voltages relies of data obtained from customers who purchased their own metering equipment as part of their DER investment. Some customers and their third-party service providers know more about network voltages than the DNSPs that are expected to manage network voltage. The lack of DNSP knowledge regarding their own networks is a key barrier to improving DER hosting capacity in a cost-effective manner.

We strongly urge that the DER integration framework consider the important role of metering.

Distribution grid connection rules

The initial draft refers to the fact that a significant proportion of the inverter fleet has capabilities that are not used because “they have not been set up correctly during installation or have been changed during ongoing operations”. We do not dispute that there are issues to be addressed regarding installation and set up of inverters. However, the initial draft fails to acknowledge that the situation whereby a large proportion of inverter fleet has latent and unused capabilities has arisen due to distribution network connection rules, rather than inverter manufacturers or installers.

For example, in mid-2019 the CEC and Clean Energy Regulator worked together to analyse the capabilities of inverters being installed. We found more than 96 percent of all inverters being installed had Volt-Watt and Volt-var capability. Unfortunately, Australian Standards require default disablement of Volt-var capability unless the DNSP grid connection rules specify otherwise. As recently as January 2020, there were only ten DNSPs that required enablement of Volt-var response and in more than 30% of households it was mandatory to disable Volt-var capability. There are many thousands of installed inverters that incorporate ‘smart’ capability that was turned off in order to comply with grid connection rules.

Capability of DNSPs to utilise advanced functionality

The initial draft recommends various forms of advanced functionality that could be mandated for inverter manufacturers but does not consider whether DNSPs are able to utilise that functionality. Inverter manufacturers have reason to be sceptical when they are required to incorporate all manner of new functions. For example, the 2015 version of the AS 4777.2 inverter standard required inverter manufacturers to incorporate eight different demand response modes. To our knowledge seven of those eight modes have never been used by a DNSP in the NEM.

Mandating new inverter functionality adds costs to manufacturers and, ultimately, to customers. New functionalities for inverters should only be mandated if we can be confident that DNSPs are willing and able to utilise the advanced capabilities desired by some policy makers.

The initial draft recommends various inverter functionalities that will only be useful if DNSPs have the capability to use them.

In future drafts of integration framework whenever there is a recommendation for another new inverter capability there should also be an assessment of whether this can be utilised by DNSPs and if they plan to do so. We do not want a repeat of AS 4777.2:2015, with seven demand response modes that have never been used in the NEM and might be made obsolete by the 2020 revisions to AS 4777.2. It would only add unnecessary costs to consumers if manufacturers are required to add features to inverters that DNSPs are unable or unwilling to use.