



Clean Energy Council submission to the Australian Energy Market Commission draft determination: Technical standards for distributed energy resources

The Clean Energy Council (CEC) welcomes the opportunity to provide feedback on the Australian Energy Market Commission (AEMC) Draft Determination on the Australian Energy Market Operator (AEMO) Distributed Energy Resources (DER) Technical Standards rule change.

The Clean Energy Council is the peak body for the clean energy industry in Australia. We represent and work with Australia's leading renewable energy and energy storage businesses, as well as rooftop solar installers, to further the development of clean energy in Australia. We are committed to accelerating the transformation of Australia's energy system to one that is smarter and cleaner.

The CEC broadly supports the approach proposed in the draft determination. We support the inclusion of DER Technical Standards in the National Electricity Rules (NER), noting that questions remain as to how that would operate in practice. We support establishing a requirement in the NER that determines the content of model standing offers for basic connection services for embedded generating units. We are committed to continuing our support for the compliance and monitoring systems of distribution network service providers (DNSPs), regulators and others through the certification of products and installers of inverter-based electricity generating systems.

We have some concerns and questions regarding the proposed implementation, in particular regarding:

- Proposed timing for the new requirements,
- Potential for conflicting regulations,
- Roles and responsibilities for DER Technical Standards,
- Absence of cost-benefit analysis or assessment of regulatory impact,
- Treatment of 'like for like' replacement under warranty,
- Proposed set points for power quality settings.

These issues are outlined in detail in this submission. We would be happy to discuss these issues in further detail with representatives of the AEMC.

Proposed timing

The AEMC should mandate the short duration undervoltage ride through (SDUVRT) test procedure earlier than the proposed six months and should mandate AS/NZS 4777.2:2020 no earlier than twelve months after publication.

The draft determination proposes that AS/NZS 4777.2:2015 and the AEMO SDUVRT test procedure should be mandatory requirements of grid connection approval commencing six months after the rule is made and that if AS/NZS 4777.2 is published before the publication of the final rule determination, then the final rule would refer to the updated version of AS/NZS 4777.2 alone rather than the 2015 standard and the SDUVRT test procedure specified in the draft rule. AS/NZS 4777.2:2020 was published on 18 December 2020.

The proposed phase in period for AS/NZS 4777.2 2020 is too short. It would be preferable for the AEMO SDUVRT test procedure to be mandated earlier than proposed and for AS/NZS 4777.2:2020 to be mandated twelve months following publication, which is the period that industry is accustomed to for the introduction of a new Australian Standard.

Inverter manufacturers want the full twelve months for implementation because AS/NZS 4777.2:2020 will require manufacturers to make substantial modifications to inverters' hardware and software, followed by testing and certification. The new standard incorporates a range of functions, including:

- Revision of sustained frequency response,
- Revised set-points and limits,
- Revision of demand response and power quality modes,
- Electrical safety requirements for non-PV energy sources, in accordance with IEC 62477-1,
- Improved withstand capabilities including multiple voltage disturbances, rate of change of frequency and voltage phase shift,
- Requirements for measurement system accuracy and functional prioritisation,
- Requirements for stand-alone inverters,
- Generation limit and export limit control functions,
- Requirements for recording of firmware and inverter settings, and
- Revised and expanded testing procedures.

In 2020 the government of South Australia (SA) mandated the AEMO SDUVRT test procedure, with independent verification of the functionality becoming a mandatory requirement in SA from 31 March 2021. Manufacturers have been working with test laboratories to verify their products' SDUVRT capabilities and the CEC has been working closely with manufacturers and SA Power Networks to ensure that systems are operating appropriately. Given that manufacturers supplying the SA market will be required to update their products' SDUVRT capability (where necessary) and provide independent verification by 31 March 2021, it would not be a significant burden on manufacturers to mandate the SDUVRT capability nationally. The CEC Approved Product List could be used as the means of ensuring that all grid-connectable inverters sold in Australia have the required SDUVRT capability.

Recommendations

Do not mandate AS/NZS 4777.2:2020 within six months of the rule being made. Instead, we propose the schedule and implementation approach outlined in Table 1, below.

Table 1 – Proposed schedule and implementation approach for AS/NZS 4777.2:2020

Date	Rule put into effect	Implementation mechanism	Cost-benefit assessment process
31 March 2021	All inverters installed in Australia must have demonstrated compliance with the AEMO short duration under voltage ride through test procedure	CEC Approved Product List in association with DNSP grid connection rules	None proposed.
Sept 2021	Cut-off date for applications for listing of inverters tested to AS/NZS 4777.2:2015	CEC Approved Product List in association with DNSP grid connection rules	None proposed.
18 Dec 2021	All inverters installed in Australia must be listed as having demonstrated compliance with AS/NZS 4777.2:2020	National Electricity Rules, and CEC Approved Product List in association with DNSP grid connection rules	Yes, especially where there is potential for significant customer impacts

Potential for conflicting regulations

AS/NZS 4777.2 gains its legal force because it is referred to by AS/NZS 3000 (the ‘wiring rules’), which are referred to by state and territory legislation. Incorporating AS/NZS 4777.2:2020 into the NER could assist with clarifying processes, harmonising across jurisdictions and resolving confusion regarding governance. However, care will need to be taken to ensure there is a smooth transition from rules enforced by state and territory Electricity Acts to rules in the NER. The worst-case scenario would be two sets of conflicting rules simultaneously in force.

We acknowledge that the Draft Determination states “the text and content of AS 4777.2:2015 will not be replicated in the NER or otherwise in a subordinate instrument. Instead, the Commission will create an obligation for compliance with the standard by way of reference in the NER. This approach has the benefit of preventing divergence between the requirements relevant in the NEM and the industry standard set out in AS 4777.2”. This is a sensible approach to avoiding conflicting regulations. However, there might be a need in future to amend aspects of the DER Technical Standard, as referenced in the NER, prior to revision of the AS/NZS 4777.2 standard. The Draft Determination appears to acknowledge this when it states that, “small, minor amendments which do not have a significant impact on the NEM may satisfy the criteria to be considered as an expedited rule change request”.

Recommendation

The AEMC should:

- Ensure that the amended rule in the NER is written in a way that ensures there is never a conflict between the DER Technical Standard required by the NER and the DER Technical Standard required by state and territory legislation,
- Work with state and territory regulators to ensure there is no possibility of a conflict between what is required by the NER and what state and territory legislation requires, and
- Where there is a possibility of a conflict, delay changes to the NER for that jurisdiction until the relevant legislation has been amended.

Roles and responsibilities for DER Technical Standards

There are many unanswered questions regarding governance of DER Technical Standards, and we hope that they can be addressed in the AEMC response to the ESB Governance of DER Technical Standards rule change.

For example, interpretation of standards is an important area requiring resolution. Under the current arrangements, it is unclear which body has the authority to making binding interpretations of how DER Technical Standards should be applied. The lack of clarity in roles and responsibilities leads to decisions and disputes being pushed down to a low level, down to the level of electrical inspectors. There needs to be a way for genuine disagreements in interpretation to be resolved in a way that has legal force and sets an ongoing precedent.

The CEC supports the recommendation to utilise existing compliance and monitoring systems under the CEC and the Clean Energy Regulator (CER), relating to the certification of products and installers of electricity generating systems.

Responsibility of DNSPs for compliance and enforcement under the proposed new framework would benefit from further clarification. The Draft Determination notes that, "DNSPs should be obliged to ensure that connection applicants in relation to micro embedded generators should comply with DER Technical Standards as defined in the NER". It would be helpful if the AEMC could publish an outline of how it expects this will change the responsibilities of DNSPs with respect to compliance and enforcement. This is particularly relevant in relation to monitoring compliance by installers. It will be important to ensure there is no overlap with the roles and responsibilities of Licensed Electrical Inspectors.

The Final Determination should clarify whether DNSPs are obliged only to ensure that applications for new connections and connection alterations comply with the DER Technical Standard, or if they are also obliged to ensure that new connections and connection alterations are installed correctly and in accordance with the application. For example, will DNSPs be responsible for verifying power quality settings? Responsibility for inspection following installation currently varies by jurisdiction. The Clean Energy Regulator inspects a representative sample of installations. Licenced electrical inspectors check installations in some jurisdictions and to varying degrees. Solar Victoria has its own inspection regime. DNSPs are responsible for grid connection approval and AEMO requires verification of device compliance post-installation, which is undertaken by DNSPs in most states except for NSW where installers are responsible. Rules also differ in Western Australia and the Northern Territory. The AEMC's Final Determination is an opportunity to clarify and consolidate roles and responsibilities for inspection and verification of compliance of DER systems with relevant rules and standards.

Safety regulations should be enforced by Licensed Electrical Inspectors who operate with the force of state legislation. Technical requirements, such as power quality settings and export limitation settings, are not part of safety regulations. DNSPs will be well placed to monitor compliance of these and other technical settings communications protocols, such as IEEE 2030.5, are adopted to enable communication by and to DNSPs. This will enable DNSPs to inspect settings over the internet, without any need for site visits.

Recommendations

The AEMC should clarify who is responsible for making legally binding interpretations of DER Technical Standards and the process for seeking interpretations.

The AEMC should clarify how the responsibility of DNSPs for compliance and enforcement of installation requirements is expected to change (if at all) under the proposed new framework.

Absence of cost-benefit analysis or assessment of regulatory impact

Electrical regulation appears to be one of the few areas where new regulations are introduced without assessment of costs and benefits, impacts on business, and impacts on customers. This is due to a convoluted regulatory system where state and territory legislation refers to the AS/NZS 3000 standard (also known as 'the wiring rules'), and AS/NZS 3000 refers to other standards, such as AS/NZS 4777 and AS/NZS 5139. This means that when Standards Australia modifies standards, the new standard has the force of legislation behind it and does not need to be assessed for its costs and benefits. This is poor regulatory practice.

Placing the DER Technical Standards in the NER provides an opportunity to address the poor regulatory practices of the past. We strongly recommend the AEMC clarify how the regulatory impacts of DER Technical Standards will be assessed prior to being adopted in the NER. As outlined in Table 1, our concern is regarding AS/NZS 4777.2:2020 broadly (and its interaction with DNSPs' grid connection rules), not specifically the AEMO short duration under voltage ride through test procedure. An advantage of the process proposed in Table 1 would be that there would be time for consideration of the costs and benefits of AS/NZS 4777.2:2020 broadly and this would not delay rapid implementation of the AEMO test procedure.

We agree with the observation made by the Australian Energy Regulator (AER) that, "any significant additional costs to manufacturers or in compliance and monitoring are ultimately borne by consumers, which ought to be ascertained through a regulatory impact statement".

Recommendation

The AEMC should explain how it proposes to assess the regulatory impacts of DER Technical Standards and future amendments to the DER Technical Standards prior to their adoption in the NER.

Treatment of 'like for like' replacement under warranty

The Draft determination states, "the DER Technical Standards will apply only to new connection and replacement inverters and connection alterations (including upgrade, extension, expansion or augmentation)". We urge the AEMC to clarify in its Final Determination that the requirements do not apply to 'like for like' replacement of inverters under warranty. This will be necessary to ensure customers continue to enjoy their existing rights and that no unnecessary additional costs are incurred if there is a need to replace an inverter under warranty.

Recommendation

The AEMC should clarify that DER Technical Standards will apply to new connection and replacement inverters and connection alterations (including upgrade, extension, expansion or augmentation) and will not apply to 'like for like' replacement of inverters under warranty.

Proposed set points for power quality settings

The draft rule requires inverters to be tested to the default set-points required by AS/NZS 4777.2:2015, with power quality settings set according to what the AEMC refers to as "the Energy Networks Australia recommended default power quality response modes". These settings (published [here](#)) are out of date. Power and Water now requires enablement of Volt-Watt and Volt-var response.

It is important to note that where DNSPs have set points for power quality settings at a voltage higher than the defaults proposed in AS/NZS 4777.2:2020, that is generally because the DNSP runs its network voltage higher than it should. Several DNSPs have informed the CEC that they are taking action to reduce their network voltage to meet the Australian Standard and that they hope to be able to align their set points for power quality settings with AS/NZS 4777.2:2020 in time for its entry into force.

Requiring inverters to be tested to multiple set points will increase costs for manufacturers and, ultimately, consumers for no benefit. Inverters should only be required to be tested to the power quality settings in AS/NZS 4777.2:2020.

Recommendation

Inverters should be tested to the power quality settings in AS/NZS 4777.2:2020.

There should not be any requirement to test inverters to the array of power quality settings specified by DNSPs, as summarised on an ENA web page (referred to in footnote 1 on page 5 of the [Draft National Electricity Amendment \(Technical Standards for distributed energy resources\) Rule 2021](#)).

Summary of Recommendations

1. Do not mandate AS/NZS 4777.2:2020 within six months of the rule being made. Instead, we propose the schedule and implementation approach outlined in Table 1, below.

Table 1 – Proposed schedule and implementation approach for AS/NZS 4777.2:2020

Date	Rule put into effect	Implementation mechanism
31 March 2021	All inverters installed in Australia must have demonstrated compliance with the AEMO short duration under voltage ride through test procedure	CEC Approved Product List in association with DNSP grid connection rules
Sept 2021	Cut-off date for applications for listing of inverters tested to AS/NZS 4777.2:2015	CEC Approved Product List in association with DNSP grid connection rules
18 Dec 2021	All inverters installed in Australia must be listed as having demonstrated compliance with AS/NZS 4777.2:2020	National Electricity Rules, and CEC Approved Product List in association with DNSP grid connection rules

2. The AEMC should:
 - Ensure that the amended rule in the NER is written in a way that ensures there is never a conflict between the DER Technical Standard required by the NER and the DER Technical Standard required by state and territory legislation,
 - Work with state and territory regulators to ensure there is no possibility of a conflict between what is required by the NER and what state and territory legislation requires, and
 - Where there is a possibility of a conflict, delay changes to the NER for that jurisdiction until the relevant legislation has been amended.
3. The AEMC should clarify who is responsible for making legally binding interpretations of DER Technical Standards and the process for seeking interpretations.
4. The AEMC should clarify how the responsibility of DNSPs for compliance and enforcement of installation requirements is expected to change (if at all) under the proposed new framework.
5. The AEMC should explain how it proposes to assess the regulatory impacts of DER Technical Standards and future amendments to the DER Technical Standards prior to their adoption in the NER.
6. The AEMC should clarify that DER Technical Standards will apply to new connection and replacement inverters and connection alterations (including upgrade, extension, expansion or augmentation) and will not apply to 'like for like' replacement of inverters under warranty.
7. Inverters should be tested to the power quality settings in AS/NZS 4777.2:2020.
8. There should not be any requirement to test inverters to the array of power quality settings specified by DNSPs, as summarised on an ENA web page (referred to in footnote 1 on page 5 of the [Draft National Electricity Amendment \(Technical Standards for distributed energy resources\) Rule 2021](#)).