Ms Merryn York, Acting Chair

Australian Energy Market Commission

Level 15, 60 Castlereagh Street

Sydney, NSW, 2000

Email: merryn.york@aemc.gov.au

16 September 2020

Dear Ms York

**Re: Rule change request – Governance of Distributed Energy Resources (DER) technical standards**

Please find attached a rule change request proposing new governance arrangements for DER technical standards under the National Electricity Rules (NER). The request includes changes to create 'DER Technical Standards' in the Rules or subordinate instrument, provide for the compliance enforcement of those standards and establish the Australian Energy Market Commission (AEMC) as the responsible decision maker for creating DER technical standards.

In addition to changes to the NER, the request asks the AEMC to consider whether any changes to the National Energy Retail Rules (NERR) are required to give effect to the changes outlined.

Yours sincerely

Kerry Schott AO

Chair, Energy Security Board

# 1. Name and address of rule change request proponent

Kerry Schott
Chair
Energy Security Board
Level 26, 1 Bligh Street
Sydney, NSW, 2000

# 2. Description of the proposed rule

This rule change request seeks to update the National Electricity Rules (NER) to take into account relevant technical standards for Distributed Energy Resources (DER). The request seeks to amend the NER:

1. To create 'DER Technical Standards' either in the NER or in a subordinate instrument under the NER.
2. That the NER provide for the enforcement of any National Electricity Market (NEM) DER technical standards as well as relevant Australian Standards for distribution connected inverters.
3. To establish the Australian Energy Market Commission (AEMC) as the responsible body for setting DER technical standards, including the related procedures for AEMC to:
    a. monitor, review, develop, consult on and set a vision and work program for DER technical standards for the national electricity system (updated annually);
    b. update or develop new DER technical standards as needed
    c. carry out public consultation in relation to a and b above which may be the same or similar to the current AEMC rule change processes or be a bespoke process.

In addition to changes to the NER, the AEMC should also consider whether any change to the National Energy Retail Rules (NERR) may be required to give effect to the above.

## 2.1 Background

Australians are investing in DER systems at unprecedented rates, with rooftop solar installations exceeding 10 gigawatts of installed capacity in 2019 and another 350,000 rooftop systems and 3 gigawatts expected to be added in 2020. While DER can deliver benefits to many parts of the electricity system, without appropriate technical standards, widespread uptake of some forms of DER could also impact on the secure operation of the electricity system and distribution networks.

DER technical standards should assist in mitigating system security and distribution level challenges by providing for a minimum level of predictable performance under network constraints or during power system disturbances. While the NER contain provisions for performance standards for large generation due their impact on the operation of the electricity system and markets, no equivalent provisions exist for small scale generators such as rooftop solar systems. Instead, there are currently a number of many different organisations currently involved in developing DER standards. These range from standards setting bodies such as Standards Australia to technical requirements imposed through state-based incentive schemes for DER.

Recognising the need for an efficient and timely development of DER technical standards, the Energy Security Board (ESB) commissioned consultants Sapere and CutlerMerz jointly to review the

governance arrangement for DER technical standards The Sapere/CutlerMerz review (the Review) found that current lack of coordination, planning, and resourcing, and slow pace of decision making within the various governance arrangements for DER technical standards in place across Australia, together mean that DER systems deployed today are unlikely to be able to deliver the performance levels and service levels required. The Review also considered that as DER uptake continues to accelerate in Australia, there is an urgent need to reform governance of technical standards to ensure that all new systems installed can meet the required technical performance levels, both now and even more so in the future

The Review identified a number of key gaps and weaknesses in the current governance framework for DER technical standards. This rule change request aims to address some issues through solutions that can be implemented through the regulatory framework. These issues are discussed further in section 3 below.

# 3. Statement of issues with current governance arrangements for DER technical standards

## 3.1 Inability to implement consistent technical standards across the NEM

**Many different processes, but only one that could provide a partial solution**

DER technical standards could assist in the management or mitigation of system security and distribution level challenges. However, the current process does not provide a straight-forward means to implement and require compliance with consistent standards across the NEM.

The Review identified seven different existing governance arrangements for DER technical standards which are largely independent from one another and vary from voluntary to incentivised to mandatory:

1. Australian and international standards – developed under a formal process of expert sub-committees and stakeholder consultation but voluntary unless invoked in legislation, regulation or contracts;
2. Infrastructure providers – Distribution Network Service Providers (DNSPs) – connection agreements which vary to meet local network conditions;
3. State based incentive/rebate schemes for DER – which include technical requirements;
4. Commonwealth incentive/rebate schemes, especially the Small-Scale Renewable Energy Scheme;
5. State based legislated requirements – State based electrical safety requiring mandatory compliance to Australian Standards;
6. Commonwealth based legislated requirements – Greenhouse and Energy Minimum Standards (GEMS) for product energy efficiency and efficiency labelling which includes recent requirements for mandatory AS/NZS 4755 compliance for active loads, and
7. Requirements for market participation - Virtual Power Plants (VPP) that aggregate and control DER are required to satisfy technical requirements to participate in the wholesale market.

The Review considered that with the exception of the Australian and International Standards process, no other processes currently enable the Australian Energy Market Operator (AEMO) to impose technical standards that will assist in mitigating emerging system security challenges.

**Publication of Australian or international standards does not mean automatic adoption**

The Review also found that the publication of an Australian or International Standard on its own, does not place any obligations on participants in the NEM. In the absence of a NEM-wide instrument, the requirement to comply with standards is only made mandatory through incorporation into legislation or regulation, or through specification in contractual documents. The Review provided an example where the mandating of the AS 4777 series for Grid connection of energy systems via inverters is done through a critical safety standard (AS/NZS 3000), which is directly referenced in in legislation and/or regulation in every state and territory.

**Network technical connection standards provide coverage, but lack of coordination is a concern**

Network technical connection standards refers to the technical requirements set by distributors in order for DER systems to connect to distribution networks. These standards are generally set out in guideline documents and only become mandatory once they form part of a network connection agreement (the contractual document between the DER proponent and the network).

While a national guideline recently developed and introduced by Energy Networks Australia (ENA) helps to improve the level of consistency across the network connection standards, it is voluntary for network businesses to adopt the requirements of the guideline. The Review notes that there are currently varying degrees of compliance with the guidelines across the 14 Australian distributors. This lack of consistency is creating challenges for DER manufacturers and potentially leading to non-compliance.

**AEMO rule change request on minimum technical standards provides an initial solution, but an enduring solution is needed**

On 5 May 2020, AEMO submitted a rule change request to the AEMC seeking to create a subordinate instrument for an initial technical standard for DER in the NER. In parallel to the AEMC rule change process, AEMO is consulting on the content of the initial technical standards. In the consultation paper published on 24 August 2020, AEMO recommends that it include inverter undervoltage disturbance ride-through conformance test procedure, as well as the entirety of the AS/NZS 4777.2.

The above processes were intended as part of a staged process where the AEMO rule change request sought to address the immediate system security challenges. This subsequent rule change request is intended to provide a solution for an enduring arrangement where DER technical standards can be consistently applied across NEM jurisdictions.

## 3.2 A need for a fast, flexible and transparent standards setting process

Standards Australia is one of the key standards development bodies in Australia. While Australian standards in relation to DER are often made mandatory through referencing in legislation/regulation or contractual arrangements, there are concerns about the processes used to set the standards.

The key concern with the overall Standards Australia process is that it is often slow. This means it is not fit for purpose given the fast-changing nature of DER technology and markets. Critically, as DER uptake continues to grow and technology development in the DER space continues to speed up, the current process does not provide the ability for crucial standards that may assist in mitigating emerging system security or network operation challenges to be implemented as promptly as needed to meet the needs of parties operating in the NEM.

Other concerns identified by the Review include:

- the technical committee is dominated by network businesses, market and regulatory bodies who have the ability to dedicate personnel to the process;
- the consultation process is too short and opaque in terms of how feedback had been considered by the committee (this was contrasted with the AEMC's rule change process where stakeholder submissions are documented and rationale for the decision is provided), and
- the lack of clarity and transparency in the objectives in the development of Australian Standards.

In relation to network technical connection standards, the Review also cited similar stakeholder concerns on the lack of transparency in the development of the connection standards, varying level of consultation and the difficulty in accessing the published standards.

# 4. Proposed governance arrangements

## 4.1 Overarching objectives

The objectives of the proposed arrangements are to promote the long-term interests of consumers of electricity by establishing that:

- Relevant DER technical standards sit under or as part of the NER and so be required to meet the National Electricity Objective (NEO), especially to support better outcomes for electricity consumers through system security, distribution network management and the sale of DER services;
- DER technical standards are able to be developed and adopted in the NER transparently, efficiently and effectively to meet the rapid deployment of DER and the changing needs of consumers, the electricity system and electricity market, and
- NEM DER technical standards would enable new requirements and obligations to take effect in the NEM prior to Standards Australia finalising any relevant standard updates. This is intended to be an enduring capability in recognition that Australian Standards processes may not meet the needs of the NEM at all times.

## 4.2 Establishing DER technical standards under the Rules or a subordinate instrument

**'Uplifting' technical standards into the national regulatory framework**

It is proposed that 'DER Technical Standards' be created in the Rules or a subordinate instrument under the Rules.

Should any initial DER technical standards exist in the Rules or a subordinate instrument under the Rules by the time this rule is made, these will be the DER technical standards, amended and added to as appropriate. If there are no DER technical standards in the Rules, the Rules will be amended to define a new term, 'DER technical standards'.

**AEMC as the decision maker**

'DER Technical Standards' could be created in the Rules or a subordinate instrument under the Rules.

Regardless of whether DER technical standards are located in the Rules or in a subordinate instrument into the NER:

- AEMC will be the body responsible for the setting of DER technical standards.

- The AEMC may consider implementing NEM-wide standards where these will improve overall outcomes for consumers; including in areas such as connections and data protocols.
- It is proposed is that AEMC be the decision maker and will have responsibility for making the final determination on any new or updated standard in the DER technical standard.
- In undertaking its responsibility in developing and updating the DER technical standards, the AEMC:
    - Will collaborate with AEMO and Australian Energy Regulator (AER); and
    - May obtain expert advice:
        - from an advisory committee established as a standing committee or an ad hoc committee under the Rules; and/or
        - from consultants; and
    - Will develop and maintain a technical standards work program (updated annually).

**Establishment of committees and working groups**

Under section 39 of the National Electricity Law, the AEMC may establish committees, panels and working groups to provide advice on specified aspects of its function or undertake any other activity in relation to the AEMC's functions as is specified by the AEMC.

The AEMC should give consideration to whether advisory committees (standing or ad-hoc) or working groups should be established to provide advice on DER technical standards. Should an advisory committee be established, it is recommended the AEMC gives consideration to the following:

- Committee members should be selected on the basis of their expertise in technical standards and be drawn from the following areas:
    - Market bodies
    - Consumers/consumer representatives with DER experience
    - DNSPs
    - Original Equipment Manufacturers (OEMs)
    - Jurisdictional safety regulators
    - Aggregators, and
    - Standards Australia.
- Members should be appointed by AEMC following a nomination and merit-based selection process.
- Members would not represent particular interests but would rather be selected for their expertise and experience in different dimensions of the DER supply and use chain.
- Balancing Committee membership representation according to:
    - geographical location and participating jurisdictions;
    - to cover for NEM networks, non-NEM networks and Stand-alone Power System (SAPS) standards considerations;
    - ensure an appropriate mix of commercial, legal and technical expertise is represented within the members, and
    - for diversity of members backgrounds.
- That any Committee be required to publish minutes of its meetings.

## 4.3 Implementation of Standards

It is proposed that the DER technical standards be implemented for customer connections through the following requirements:

- For NEM connections, they must be incorporated via minimum content requirements of relevant Chapter 5A connection contracts, negotiation frameworks and model standing

offers, and into the model standing terms and conditions for deemed standard connection contracts prescribed in Schedule 2 to the National Energy Retail Rules.

- In order to allow for the DER technical standards (and any subsequent updates) to be incorporated into connection agreement model standing offers, without triggering the need for further AER approval of those agreements when the DER technical standards are updated, it is proposed a requirement be included that the connection application meet the DER technical standards as made and updated from time-to-time.

Unique regulatory arrangements are in place in Victoria and the Victorian Government and Essential Services Commission of Victoria may need to consider how best to design the regulatory framework to implement the DER technical standards in Victoria.

The obligations set out rule change request are imposed on AEMO and the DNSPs. However, by including a requirement to meet the DER technical standards within connection agreements, connection applicants (or their representatives), manufacturers and installers of DER and DER devices will all be obligated to meet the requirements of the standards. The result will be nationally consistent technical requirements and settings.

**Compliance and enforcement**

In keeping with the implementation information above, for NEM connections, the AER will have enforcement capabilities for compliance to the DER technical standards. As appropriate, for other standards, responsibility and/or guidance for compliance and enforcement will be set out on a case-by-case basis. AEMC would identify gaps in compliance and enforcement and develop new processes to fill them as appropriate.

# 5. Assessment against the National Electricity Objective (NEO)

The rule making test in s. 88 of the National Electricity Law (NEL) requires that the AEMC may only make a rule if it is satisfied that the rule will or is likely to contribute to the achievement of the national electricity objective (NEO). The NEO, set out in s. 7 of the NEL, is to:

*"promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to:*

*(a) price, quality, safety, reliability and security of supply of electricity; and*

*(b) the reliability, safety and security of the national electricity system."*

The rule change request is intended to support the efficient and effective integration of DER into the NEM.

This request would likely contribute to the NEO in the following ways:

- Provide support for system security and reliability at efficient costs;
- Improved outcomes for consumers through the provision of a greater range of DER services;
- Improved outcomes through improved coordination, compliance and enforcement; and
- Stimulate innovation and the development of new products and services.

## 5.1 Support security and reliability at efficient costs

- Appropriate DER technical standards in the Rules can substantially lower the costs of providing system security and reliability for all electricity consumers. In several reports AEMO has highlighted the importance of DER performance and communication standards and protocols for system security and reliability.

- Many, if not most of the services offered by standards (voltage disturbance ride-through, for example) would be very expensive if not impossible to achieve by other means. For example; creating markets for low voltage power factor support, voltage services, and frequency services are simply not possible with today's technologies. It may be possible in the future for markets to develop in these areas, but a standard remains as the most effective means to deliver these services at the present time.
- The review of existing and introduction of new DER technical standards offers the opportunity to increase the overall hosting capacities of DER technologies on distribution networks whilst maintaining overall grid system security and reliability. Changes to device performance settings, protection settings and power quality performance settings provide inexpensive adjustments to firmware for manufactures.
- Integrating performance requirements for system security requirement into DER technical standards for DER devices enables pathways for compliance testing to verify performance, reducing risks to security of supply.

## 5.2 Improved outcomes for consumers through the sale of DER services

- In addition, DER technical standards can provide part of the infrastructure to enable the sale of DER services – for network services, essential system services or in the wholesale market through Virtual Power Plants or other means in future.
- Communications and interoperability standards in particular are needed to allow for dynamic operating envelopes which will maximise the potential sale of DER exports by time and location. Greater value for DER owners through the sale of supply, demand response and system services will increase the benefits of that privately-owned DER for all electricity system users.

## 5.3 Improved outcomes through improved coordination, compliance and enforcement

- Currently the lack of harmonisation of DER standards adds to the cost of DER, especially the installed cost with installers having to comply with different requirements for different DER, by location and by subsidy type, if available.
- Nationally coordinated DER technical standards provide for the consultation and delivery of new DER technical standards in Australia faster and aligned with the needs of the national electricity system, to keep pace with the rapidly growing connection of DER in the NEM.
- By working to coordinate the standards, industry may be able to reduce efforts associated with variations in jurisdictional or subsidy-based scheme standards.
- With consistency in national standards, compliance should be improved. Enforcement efforts should also be able to be more streamlined.

## 5.4 Stimulate innovation and the development of new products and services

- With the AEMC to set a vision and a forward work program for DER technical standards development, this will give the industry certainty and provide the opportunity for manufacturers and third parties to innovate in line with this vision.
- By being assured that standards will change rapidly and flexibly with technological innovation, industry will be able to reduce the costs associated with uncertainty.
- National DER technical standards for communication and interoperability will stimulate new product and services markets as well. Having a range of vendor or other standards and protocols being used for products creates challenges with compatibility of products and systems. While converting between standards and protocols is possible, not all devices will allow this, there can be additional costs, additional time delays for sending and receiving data and a reduction in available data.

- When all devices share the same standard for communication and interoperability devices, overall solutions will become more 'plug and play' and certain barriers to entry are removed increasing the potential for innovation in the development of DER products and services.

## 6. Expected cost, benefits and impacts of the proposed rule

**Costs**

- The Sapere/CutlerMerz Review identified seven different existing governance arrangements for DER technical standards. As such, there is currently significant duplication in governance costs, standards development, compliance and enforcement activities that will be reduced through the transition to a coordinated governance model for DER technical standards. While having the coordinated function will not remove all of these other seven governance arrangements, there is likely to be some consolidation and therefore cost savings throughout the supply chain. Nevertheless, some duplication (particularly with Standards Australia) is likely to remain and so this will be some cost borne by industry.
- The estimated costs of AEMC developing and supporting the standards will be outweighed by the benefits, especially the lower costs from harmonised standards, improved compliance and enforcement and greater use of DER for system security, distribution network management and in wholesale and essential system services (ESS) markets.

**End use customers, including DER owners**

DER technical standards being placed in the Rules will have the following benefits for DER owners:

- Nationally consistent devices, communication and data requirements should reduce the cost of DER solutions for DER owners and increase international participation in our market which should expand consumer options.
- Product standardisation should increase safety and reliability and support the ability of AEMO to forecast and manage system security.
- Standardisation provides certainty which allows consumers to make better informed decisions about their purchases.
- Standards will be assessed against the NEO, taking into account the long-term interests of consumers while balancing the technical needs to keep the electricity system stable and reliable.

A DER technical standard will have the following impacts for DER owners:

- Potential increases of costs due to higher standards, but offset against expected benefits, including from the sale of DER services.

**DNSPs**

DER technical standard being placed in the Rules will have the following benefits for DNSPs:

- Reduced duplication and effort in standards development across jurisdictions.
- Reduction in the provision of technical support on standards to industry due to alignment and guidance being provided by AEMC and AER for compliance and enforcement.
- Increased compliance by industry due to visibility and alignment of standards and the potential for improved enforcement capability.
- Nationally coordinated standards integrated to the NEL will enable the fast track the standardisation of communication and interoperability standards which are required for DER participation in markets. These markets will allow for DNSPs the most cost-effective solutions for the uptake of high penetrations of DER, particularly low voltage (LV)-connected DER systems.
- Will support the development of functionality for DNSPs to contract with customers for network services through using new standards.

DER technical standard being placed in the Rules will have the following impacts for DNSPs:

- Will require updates to incorporate the DER technical standards into connection contracts. DNSPs may also include the DER technical standards in their DER technical guidelines and services and installation manuals.
- Support and align to any standards and guidelines associated with the DER technical standards through implementation, engaging with stakeholders including electrical contractors and where relevant, compliance and enforcement.
- There is a risk that with future technical standards the DNSP could have operational, performance, systems or other impacts which could have a negative impact on localised reliability, costs and life of existing assets due to jurisdictional variation or other impacts. For example, the introduction of the AEMO DER Register with standardised information sharing requirement introduced system changes for many DNSPs with associated costs. However, these impacts would be taken into account in the AEMC's standard setting process.

**Original Equipment Manufacturers (OEMs)**

DER technical standards will have the following benefits for OEMs:

- National consistency and clarity of standards under the rules will reduce uncertainty for Original Equipment Manufacturers.

While costs might be increased in some circumstances, there will be net benefits for consumers and there may be advantages for manufacturers who operate nationally and internationally because they will have the opportunity to 'upgrade' to standards suitable for a high DER system which may later be adopted in other jurisdictions.

## 7. Summary of consultations to date

Consultation undertaken through the Sapere/CutlerMerz Review found broad stakeholder support for reform. 79 per cent of stakeholders surveyed agreed or strongly agreed to the question, 'Do you consider there is a case for changing the governance of DER technical standards to align with the needs of the current and future DER product and energy services markets?'.

The ESB released a Consultation Paper on the governance of DER technical standards on 17 July. This paper proposed new coordinating governance arrangements through the creation of a DER Standards Governance Committee under the NER, convened under the AEMC. It was proposed that the DER Standards Governance Committee would be responsible for:

1. setting a vision for DER technical standards;
2. developing a technical standards work program;
3. monitoring, reviewing and setting DER technical standards;
4. considering issues related to compliance and enforcement of standards in their development; and
5. providing advice on standards and undertaking related reviews.

A webinar outlining the contents of the Consultation Paper was held on 21 July with 81 registrations and 70 attendees. The ESB then held nine focused discussions with key stakeholders following the webinar (these included peak industry and consumer bodies, Standards Australia, the Clean Energy Regulator and the Senior Committee of Officials).

ESB received 32 submissions, the vast majority supportive of the proposal to establish a DER Standards Governance Committee and put standards in a subordinate instrument under the Rules:

- 28 are in full support

- 1 wants greater statutory control for the committee
- 1 will support with their involvement
- 1 supports the committee but only as advisory

Of the supportive submissions:

- All supported the AEMC being the convening body
- All supported the proposal for an independent chair
- The majority of responses supported a Committee with determining or hybrid capability related to the setting of standards (that is the standards being set by the Committee but with the AEMC having a final approval role).
- There was a fair split between whether standards should be in the Rules themselves or in a subordinate instrument under the Rules
- The proposed membership composition was generally supported with many responses calling for not just technical DER expertise, but also a focus on skills to be highlighted for committee members. There was also commentary provided on how diversity could be effectively balanced on the Committee.
- There were mixed opinions as to what extent the Committee should have compliance and enforcement as part of its responsibilities.

Suggested changes to the proposal included:

- Many minor suggested improvements to the membership including:
    - With regard to the balance between market bodies and consumer-based representation.
    - Many responses called for DER expertise for the consumer representative
    - It was suggested that having one OEM representative could be difficult across the range of technologies, also across technical and commercial expertise.
    - The Market Aggregator member role was questioned as to whether it could be expanded to be broader to include retailers with experience in VPPs or to smaller non-registered parties with VPP experience.
- A committee governance/code of conduct has been suggested.

Further detail was sought on:

- The relationship with Standards Australia and how this will impact standards creation
- How the committee will be selected would be appreciated
- The funding of the committee and possibly even sub-committees.

## 8. Rationale for the change in proposal

The ESB considered how best to establish DER technical standards under the National Electricity Rules, following the feedback provided by stakeholders in submissions.

It was considered that the AEMC is best placed to be the decision maker on DER technical standards, in line with its role as rule maker in the NEM and that the AEMC was best placed to decide how these standards are to be set. That is, it will draw on expert advice in the form of consultants and/or a standing committee and/or ad hoc committees to set standards. Standards Australia working groups could provide specific input, for example. In making standards, the AEMC must consult stakeholders.

Rather than proposing a Committee of experts therefore, this rule change proposal focuses on establishing the AEMC as the responsible body for setting DER technical standards. High level details of how standards will be set are included in this proposal and expect to be refined through the rule change proposal process.

# Proposed rule drafting instructions

**Overarching objectives**

The objectives of the proposed arrangements are to promote the long-term interests of consumers of electricity by establishing that:

- Relevant DER technical standards sit under the NER and so be required to meet the National Electricity Objective (NEO), especially to support system security, distribution network management and the sale of DER services;
- There is a clear vision and forward work program for DER technical standards to provide leadership, coordination and clarity for stakeholders;
- DER technical standards that are able to be developed and adopted in the NER transparently, efficiently and effectively to meet the rapid deployment of DER and the changing needs of consumers, the electricity system and electricity market;
- NEM DER technical standards which would enable new requirements and obligations to take effect in the NEM prior to Standards Australia finalising any relevant standard updates. This is intended to be an enduring capability in recognition that Australian Standards processes may not meet the needs of the NEM at all times.
- AER compliance provisions that will apply to the enforcement of any NEM DER technical standards as well as relevant Australian Standards for distribution connected inverters. Stakeholders are comprehensively engaged in the development of DER technical standards to be incorporated into either the Rules or a subordinate instrument under the NER; and
- DER technical standards that need to be included in the NEM arrangements to meet it's the Energy Security Board's DER integration objective, to 'optimise the benefits of DER investment for all energy system users'.

| **New rules** | **Scope** |
|---|---|
| Distributed Energy Resources (DER) technical standards | • To create 'DER Technical Standards' either in the National Electricity Rules (NER) or in a subordinate instrument under the NER.<br>• That the Australian Energy Market Commission (AEMC) is responsible for the development, maintenance and setting of the maintain the *DER technical standards*.<br>• The AEMC must decide on and set specific DER technical standards for the National Electricity Market (NEM).<br>• The *DER technical standards* must:<br>  ○ Meet the National Electricity Objective (NEO)<br>  ○ support system security, distribution network management and affordability for consumers, including through the sale of DER services<br>  ○ provide minimum DER technical standards requirements for the NEM with adequate consideration of other electrical systems eg. Stand-alone Power Systems (SAPS) and microgrids.<br>• Either establishing of the DER technical standards in the Rules or a subordinate instrument should also create a mechanism for establishing DER guidelines for the trial of new standards and to prevent lock-in of existing approaches as technologies, markets and international standards develop. |

| | |
|---|---|
| Requirements on the AEMC | That the AEMC is to be required to:<br>a. develop and maintain a technical standards work program (updated annually)<br>b. update or develop new DER technical standards as needed<br>c. carry out public consultation in relation to a and b above which may be the same or similar to the current AECM rule change processes or be a bespoke process. |
| The making of standards | In undertaking its responsibility in developing and updating the DER technical standards, the AEMC:<br>• Must collaborate with Australian Energy Market Operator (AEMO) and Australian Energy Regulator (AER; and<br>• May obtain expert advice:<br>o from an advisory committee established as a standing committee or an ad hoc committee under the Rules; and/or<br>o from consultants; and<br>• Must carry out a public consultation process for the DER technical standard. |
| Implementation of standards | The DER technical standards are to be implemented for customer connections through the following requirements:<br>• For NEM connections, they must be incorporated via minimum content requirements of relevant Chapter 5A connection contracts, negotiation frameworks and model standing offers, and into the model standing terms and conditions for deemed standard connection contracts prescribed in Schedule 2 to the National Energy Retail Rules.<br>• The DER technical standards should be included in load and generating system connection contracts. |
| Compliance and enforcement | • For NEM connections, the AER will have enforcement capabilities for compliance to the DER technical standards.<br>• As appropriate, for other standards, responsibility and/or guidance for compliance and enforcement will be set out on a case-by-case basis.<br>• AEMC would identify gaps in compliance and enforcement and develop new processes to fill them as appropriate. |

## Abbreviations and defined terms

| | |
|---|---|
| AEMC | Australian Energy Market Commission |
| AEMO | Australian Energy Market Operator |
| AER | Australian Energy Regulator |
| DER | Distributed Energy Resources |
| DNSP | Distribution Network Service Provider |
| ENA | Energy Networks Australia |
| ESB | Energy Security Board |
| GEMS | Greenhouse and Energy Minimum Standards |
| NEL | National Electricity Law |
| NEM | National Electricity Market |
| NEO | National Electricity Objective |
| NER | National Electricity Rules |
| NERR | National Energy Retail Rules |
| OEM | Original Equipment Manufacturer |
| SAPS | Stand-alone Power Systems |
| VPP | Virtual Power Plant |

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