AEMC

RULE

Australian Energy Market Commission

CONSULTATION PAPER

NATIONAL ELECTRICITY AMENDMENT (GOVERNANCE OF DISTRIBUTED ENERGY RESOURCES TECHNICAL STANDARDS) RULE 2022

NATIONAL ENERGY RETAIL AMENDMENT (GOVERNANCE OF DISTRIBUTED ENERGY RESOURCES TECHNICAL STANDARDS) RULE 2022

PROPONENT
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INQUIRIES

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ABOUT THE AEMC

The AEMC reports to the Council of Australian Governments (COAG) through the COAG Energy Council. We have two functions. We make and amend the national electricity, gas and energy retail rules and conduct independent reviews for the COAG Energy Council.

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1 INTRODUCTION

On 21 September 2020, the Australian Energy Market Commission (Commission or AEMC) received a rule change request from Dr Kerry Schott AO. The rule change request seeks to amend the National Electricity Rules (NER) to:

- create "Distributed Energy Resources (DER) Technical Standards" either in the NER or in a subordinate instrument under 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
- establish the AEMC as the responsible body for setting DER technical standards.

The rule change request also asked the AEMC to consider if any changes to the National Energy Retail Rules (NERR) are necessary to give effect to the changes outlined above.

In the remainder of this paper:

- Chapter 2 provides further background on the rule change request
- Chapter 3 provides an overview of the request itself, including the solutions proposed by the rule change request
- Chapter 4 proposes an assessment framework for determining the most appropriate response to the problems identified by the rule change request
- Chapter 5 sets out issues for stakeholder consideration and feedback.

The table below summarises project milestones.

Table 1.1: Project milestones

MILESTONE	DATE
Submissions due on consultation paper	7 October 2021
Draft determination published	16 December 2021
Submissions due on draft determination	3 February 2022
Final determination published	17 March 2022

1.1 Lodging a submission

Written submissions on the rule change request must be lodged by 7 October 2021 online via the AEMC's website, www.aemc.gov.au, using the "lodge a submission" function and selecting the project reference code ERC0319/RRC0040.

The submission must be on letterhead (if submitted on behalf of an organisation), signed and dated.

Where practicable, submissions should be prepared in accordance with the AEMC's guidelines for making written submissions on rule change requests.[1] The AEMC publishes all submissions on its website, subject to a claim of confidentiality.

All enquiries on this project should be addressed to Andrew Swanson on (02) 8296 7800 or andrew.swanson@aemc.gov.au.

1 This guideline is available on the AEMC's website www.aemc.gov.au.

2 BACKGROUND

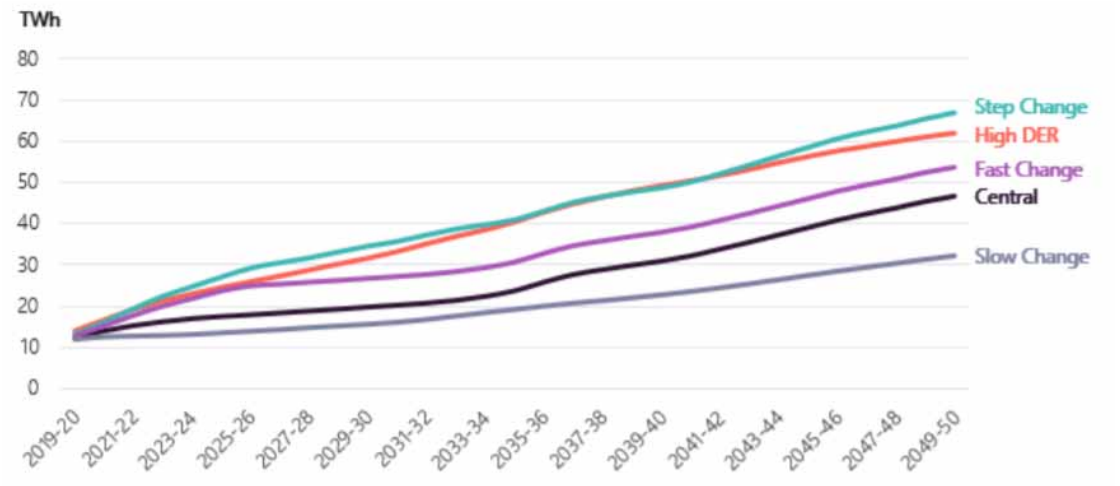
The background to this rule change request includes:

- increasing DER uptake in the NEM
- the AEMC's recent rule change on DER technical standards
- complexity of governance arrangements for DER technical standards.

2.1 Increasing DER uptake

DER investment is part of the overall energy transition toward greater reliance on decentralised, variable generation resources and 'active load' – that is, devices giving customers greater control over when they withdraw power from the grid. For example, Australia now has more than 14,500 MW of installed rooftop solar capacity.[2] Consumers have also installed more than 33,000 small-scale batteries since 2014, giving those customers greater control over when they can withdraw power from, or inject power into, distribution networks.[3] By 2040, the Australian Energy Market Operator (AEMO) forecasts between 13 and 22 percent of total underlying energy consumption in the NEM each year will be met by DER. As Figure 2.1 below illustrates, AEMO expects this increase to be driven primarily by continuous installation of distributed PV on domestic and commercial premises.[4]

Figure 2.1: Forecast distributed PV generation to 2050



Source: AEMO, *Integrated System Plan*, 2020, p. 41.
Note: Includes PV non-scheduled generation (PVNSG)

2 Calculation based on figures published by the Clean Energy Regulator, *Quarterly Carbon Market Report: March Report*, 2021.

3 Calculation based on figures published by the Clean Energy Regulator, *State data for battery installations with small-scale systems*, 2021.

4 AEMO, *Integrated System Plan for the NEM*, 2020, p. 41.

The market is also experiencing a rapid increase in the amount of DER being installed by consumers. Nationally, 792 MW of rooftop PV alone was installed in the first quarter of 2021.[5] With the Clean Energy Regulator forecasting between 3,500 and 4,000 MW new rooftop PV capacity being installed in Australia in 2021 this rapid pace of new DER capacity being installed by consumers is set to continue. A significant share of Australia's new DER capacity is being installed in the NEM.

Historically, the NEM has facilitated one-way power transfers from a relatively small number of coal, gas, and hydro generators to passive energy consumers. But with the rapid rise of DER, distribution networks are increasingly facilitating two-way power transfers. This involves distributing power to, and from, household and commercial consumers that both generate and consume energy.[6]

With increasing two-way power transfers, the NEM will require technical standards that allow DER and its associated devices to both contribute to grid security and reliability, and minimise any negative impacts from DER on the security and reliability of power supply. Any delay implementing new DER technical standards as the market and technology evolves may lead to significant amounts of new DER capacity in the NEM that is not fully capable of supporting security and reliability objectives.

This rule change request therefore requires the AEMC to consider optimal governance arrangements to support the timely implementation of DER technical standards necessary to meet long-term consumer interests such as the security, reliability and affordability of power supply in an increasingly decentralised NEM. This rule change process will complement the Commission's broader work on DER integration, such as the recent rule change on DER access, pricing, and incentive arrangements.[7]

2.2 Recent rule change on DER technical standards

When Dr Schott submitted the rule change request, the AEMC was part way through assessing a rule change request from AEMO on DER technical standards. In response to AEMO's request, the Commission made a more preferable final rule to introduce DER technical standards in the NER on 25 February 2021. This rule:

- created DER Technical Standards for embedded generating units connecting to a distribution network through a micro EG connection service
- defined DER Technical Standards as the requirements set out in Australian Standard AS 4777.2:2020 as in force from time to time
- required embedded generating units the subject of model standing offers for basic micro EG connection services to comply with DER Technical Standards
- obliged Distribution Network Service Providers to inform connection applicants about the need to comply with DER Technical Standards, if the connection applicant is proposing to

5 Clean Energy Regulator, *Quarterly carbon market report: March 2021*, p. 33.
6 AEMC, *DER Access, pricing and incentive arrangements*, rule determination, 12 August 2021.
7 For more see AEMC, *DER Access, pricing and incentive arrangements*, rule determination, 12 August 2021.

connect a new or replacement embedded generating unit through a basic micro EG connection service

- included a requirement in the minimum content requirements of connection offers for connection applicants connecting a new or replacement embedded generating unit to comply with the DER Technical Standards
- applied DER Technical Standards to new connections or replacement inverters and connection alterations.[8]

The final rule commences on 18 December 2021 and includes transitional provisions to clarify the compliance obligations of parties involved in a connection process when the final rule comes into effect.[9]

2.3 Complexity of governance arrangements

The rule change request is concerned there is no DER equivalent to the NER's performance obligations for large-scale generation. Instead, the request notes DER technical standards are determined by multiple organisations with disparate objectives.[10] These arrangements include Standards Australia's processes and the technical standards included in state-based incentive schemes promoting the continued uptake of DER by customers.[11]

As Figure 2.2 below demonstrates, there is diverse range of governance arrangements that directly or indirectly impact the development of DER technical standards in the NEM.

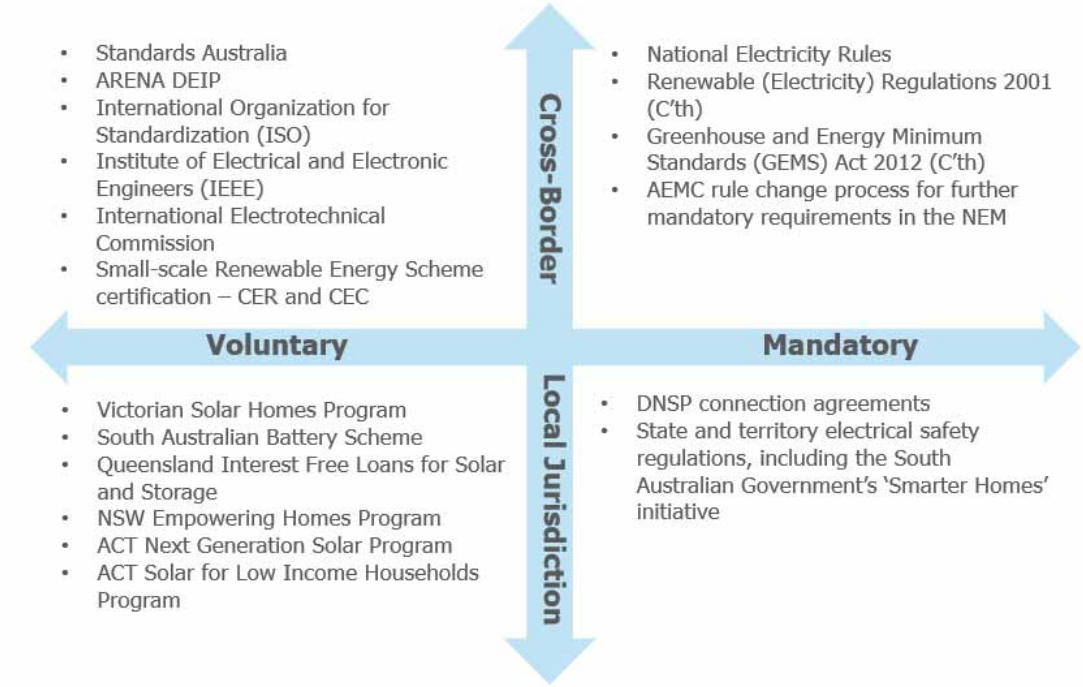
8 Schedules 1 and 2 of the National Electricity Amendment (Technical standards for distributed energy resources) Rule 2021 No. 1.

9 Clause 2 of the National Electricity Amendment (Technical standards for distributed energy resources) Rule 2021 No. 1; Part ZZZZK, Clause 11.135.1 of the NER.

10 Rule change request, p. 1.

11 Rule change request, p. 1.

Figure 2.2: Overview of existing governance arrangements impacting DER technical standards



Source: AEMC

Under the existing governance arrangements for DER technical standards in the NEM:

- Standards Australia reviews and, where necessary, updates technical standards for DER devices on a nationally consistent basis.
- The AEMC reviews and, where necessary, updates regulatory arrangements in response to rule change requests. There is no special responsibility for the AEMC to monitor the ongoing evolution of DER technical standards to ensure they meet NEM policy objectives.
- A range of state-based institutions and incentive programs impose minimum technical standards on DER devices. However, there is no national framework for harmonising these decentralised approaches to local issues such as electrical safety and program requirements for DER incentive schemes.

In addition, from December 2021, Distribution Network Service Providers (DNSPs) will be required under the NER to ensure devices meet minimum DER technical standards when prospective customers seek to connect embedded generating (EG) units through a micro EG connection service. In addition, the Australian Energy Regulator (AER) will be responsible for enforcing DNSP compliance with NER requirements for DER technical standards.[12]

12 See above for a description of the Amending Rule in response to AEMO's rule change request on DER technical standards.

3 OVERVIEW OF THE RULE CHANGE REQUEST

This chapter sets out the:

- reasons for the rule change request
- proposed solution.

3.1 Reasons for the rule change request

The rule change request identified two main reasons for introducing new governance arrangements for DER technical standards:

- the inability to implement consistent technical standards across the NEM
- a need for a fast, flexible and transparent standards setting process.

3.1.1 Inability to implement consistent technical standards across the NEM

According to the proponent, DER technical standards "could help manage or mitigate system security and distribution level challenges" as DER uptake increases.[13] However, despite many processes being in place under the existing governance arrangements, each process is only capable of providing partial solutions to these challenges.[14]

According to the ESB, existing governance processes are largely independent of each other.[15] Functions under each process vary from voluntary, to incentive-based, to mandatory. As a result, apart from the standards setting processes undertaken by Standards Australia and international bodies, "no other processes currently enable AEMO to impose technical standards that will assist in mitigating emerging system security challenges."[16]

The ESB's review found three other problems with existing governance arrangements:

- the publication of Australian or international standards does not mean automatic adoption by manufacturers or jurisdictions
- network technical connection standards provide for minimum DER technical standards, but there is a lack of coordination across the NEM
- while the rule change request lodged by AEMO on minimum DER technical standards sought to implement an initial solution, an enduring solution is needed.[17]

3.1.2 Need for a fast, flexible and transparent standards setting process

As the rule change request explains, Standards Australia is "one of the key standards development bodies in Australia." While Standards Australia does not directly enforce compliance with DER standards, its determinations are often made mandatory through

13 Rule change request, p. 1.
14 Rule change request, p. 1.
15 Energy Security Board, *Governance of DER technical standards: consultation paper*, 2020, p. 4.
16 Rule change request, p. 2.
17 Rule change request, p. 3.

legislative, regulatory, or contractual references to the standard in a range of contexts, including the NER.

According to Dr Schott:[18]

> 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.

Dr Schott is also concerned that Standards Australia:

- relies on a technical committee dominated by network service providers, and market and regulatory bodies
- relies on a consultation process that is too short and opaque compared with the AEMC stakeholder consultation process
- lacks clarity and transparency in its objectives when developing Australian Standards.[19]

3.2 Proposed solution

The rule change request has proposed a suite of reforms to address the problems summarised above. The overarching objectives of the proposed new governance arrangements are that:

- relevant DER technical standards sit in the NER or in a separate instrument under the NER. In this way, standards will be required to meet the NEO with respect to system security, distribution network management, and the sale of DER services
- DER technical standards are 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 the overall NEM
- NEM DER technical standards enable new requirements and obligations taking effect in the NEM before Standards Australia finalises any relevant standard update, on an ongoing basis, in recognition that the Australian Standards process may not meet NEM needs at all times.[20]

To achieve these objectives, the rule change request proposed that the AEMC be responsible for the ongoing governance of DER technical standards in the NEM. The AEMC would undertake these governance functions in two main ways:

- establishing DER technical standards as part of the NER or a subordinate instrument under the NER

18 Rule change request, p. 3.
19 Rule change request, p. 4.
20 Rule change request, p. 4.

- implementing standards through customer connections.[21]

3.2.1 Establish DER technical standards under the NER or a subordinate instrument

The rule change request proposed the following:

- the AEMC be the decision-maker for new and updated DER technical standards in the NEM
- the AEMC may consider new standards "where these will improve overall outcomes for consumers; including in areas such as connections and data protocols"[22]
- new technical standards be amended and added to the NER or to a subordinate instrument under the NER
- the AEMC collaborate with AEMO and the AER in developing and updating DER technical standards
- the AEMC obtain expert advice to support its standard setting functions by either
  - an advisory committee established as a standing or ad hoc committee under s. 39 of the National Electricity Law (NEL), or
  - consultants
- the AEMC be required to develop and maintain a technical standards work program.

The rule change request also considered the structure and functions of any committee the AEMC may want to establish to support its role as decision maker. These considerations are set out in below in Table 3.1.

Table 3.1: Considerations for a committee on DER technical standards

Membership	Members should be drawn from: • Market bodies • Consumers/consumer representatives with DER experience • DNSPs • Original equipment manufacturers (OEMs) • Jurisdictional safety regulators • Aggregators • Standards Australia.
Appointment	Members should be appointed by the AEMC based on their expertise in technical standards. Appointment should follow a nomination and merit-based selection process.
Expertise	Members should be selected based on expertise and experience in different dimensions of the DER supply and use chain, rather than representing particular interests.

21 Rule change request, pp. 4-5.
22 Rule change request, p. 6.

Balance	Membership should be balanced to account for: • Geographical location and participating jurisdictions • Covering NEM networks, non-NEM networks, and stand-alone power system standards considerations • Appropriate mix of commercial, legal, and technical expertise • Diversity of members' backgrounds.
Required output	Committee should be required to publish minutes of its meetings

Source: Rule change request, p. 5.

3.2.2 Implement standards through customer connections

The rule change request proposed implementing DER technical standards through customer connections in accordance with the process for:

- NEM connections by incorporating DER technical standards via the minimum content requirements of relevant NER Chapter 5A connection contracts, negotiation frameworks, and model standing offers
- deemed standard connection contracts through the model terms and conditions prescribed in Schedule 2 to the NERL.

The proponent also suggested agreements require "the connection application meet DER technical standards as made and updated from time-to-time".[23] Such a requirement would avoid the AER needing to continually approve agreements over time as DER technical standards change.

By including these new requirements in connection agreements, the proponent argued an obligation to meet DER technical standards would extend to:

- connection applicants (or their representatives)
- manufacturers
- installers of DER and DER devices.[24]

Under the proposed solution, the AER would be responsible for enforcing compliance, with the AEMC responsible for identifying any gaps in compliance and enforcement and developing new processes, as required. The effect, according to the rule change request, would be "nationally consistent technical requirements and settings" for DER and DER devices.[25]

The request acknowledged the unique regulatory arrangements in place in Victoria compared with other NEM jurisdictions. Accordingly, Dr Schott suggested the Victorian Government and the Essential Services Commission may need to consider how to implement new governance arrangements for DER technical standards in Victoria.[26]

23 Rule change request, p. 7.
24 Rule change request, p. 6.
25 Rule change request, p. 7.
26 Rule change request, p. 6.

4 ASSESSMENT FRAMEWORK

This chapter sets out the requirements under the NEL and the National Energy Retail Law (NERL) the AEMC must satisfy in considering the rule change request. It also provides detail of the proposed approach for assessing the rule change request. The framework may be refined during the rule change process.

4.1 Achieving the NEO and the NERO

Under the NEL the Commission 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).[27]

The NEO is:[28]

> 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.

Further, with respect to the NERL, the Commission may only make a rule if it is satisfied that the rule will, or is likely to, contribute to the achievement of the national energy retail objective (NERO).[29]

The NERO is:[30]

> to promote efficient investment in, and efficient operation and use of, energy services for the long term interests of consumers of energy with respect to price, quality, safety, reliability and security of supply of energy.

The Commission must also, where relevant, satisfy itself that the rule is "compatible with the development and application of consumer protections for small customers, including (but not limited to) protections relating to hardship customers" (the "consumer protections test").[31]

Where the consumer protections test is relevant in the making of a rule, the Commission must be satisfied that both the NERO test and the consumer protections test have been met.[32] If the Commission is satisfied that one test, but not the other, has been met, the rule cannot be made.

There may be some overlap in the application of the two tests. For example, a rule that provides a new protection for small customers may also, but will not necessarily, promote the NERO.

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27 Section 88 of the NEL.
28 Section 7 of the NEL.
29 Section 236(1) of the NERL.
30 Section 13 of the NERL.
31 Section 236(2)(b) of the NERL.
32 That is, the legal tests set out in s. 236(1) and (2)(b) of the NERL.

4.1.1 Making a more preferable rule

Under ss. 91A of the NEL and 244 of NERL, the Commission may make a rule that is different (including materially different) to a proposed rule (a more preferable rule) if it is satisfied that, having regard to the issue or issues raised in the rule change request, the more preferable rule will or is likely to better contribute to the achievement of the NEO and the NERO.

4.1.2 Making a differential rule

Under the Northern Territory legislation adopting the NEL, the Commission may make a differential rule if, having regard to any relevant MCE statement of policy principles, a different rule will, or is likely to, better contribute to the achievement of the NEO than a uniform rule. A differential rule is a rule that:

- varies in its term as between:
  - the national electricity system, and
  - one or more, or all, of the local electricity systems, or
- does not have effect with respect to one or more of those systems

but is not a jurisdictional derogation, participant derogation or rule that has effect with respect to an adoptive jurisdiction for the purpose of s. 91(8) of the NEL.

As the proposed rule related to parts of the NER that currently do not apply in the Northern Territory, the Commission has not assessed the proposed rule against additional elements required by the Northern Territory legislation.[33]

4.2 Proposed assessment framework

In assessing this rule change request, the Commission is not required to determine the content of DER technical standards. Rather, it will focus on the governance arrangements for DER technical standards in the NEM. While this may require considering the efficacy of existing standards, such issues are only relevant to the extent they show how existing governance arrangements are (or are not) working for NEM participants.

Based on a preliminary assessment of the rule change request, the Commission considers that the most relevant aspects of the NEO and NERO for this rule change request are the efficient investment in, and operation of, electricity services with respect to the price, quality and security of supply of electricity.

Accordingly, the Commission will focus on the considerations in Table 4.1 below.

33 From 1 July 2016, the NER, as amended from time to time, apply in the NT, subject to derogations set out in regulations made under the NT legislation adopting the NEL. Under those regulations, only certain parts of the NER have been adopted in the NT. (See the AEMC website for the NER that applies in the NT.) National Electricity (Northern Territory) (National Uniform Legislation) Act 2015.

Table 4.1: **Proposed assessment framework**

OBJECTIVE	DESCRIPTION
Security and reliability	• Maximising DER's potential contribution while maintaining grid security and reliability, particularly as the energy transition results in increased DER installation and grid-scale VRE • Accounting for differences in DER installation rates between and within NEM regions • Timeliness of DER technical standards setting for the NEM given the rapid pace of new DER capacity being installed by consumers
Price	• Complexity, cost and timeliness of standard setting and compliance under any new governance arrangements are no more than necessary to achieve security, reliability, and safety objectives (including internal opportunity costs for the AEMC from appropriately resourcing any new governance activities) • Parties responsible for meeting the costs of any new governance arrangements are those best able to manage and mitigate those costs
Safety	• Promote and maintain approved industry safety standards for the owners of DER and across the power system more broadly

If the above criteria lead to conflicting objectives at any stage during the rule change request, the Commission will seek to balance each objective in the overall long-term interests of consumers.

The Commission is seeking stakeholder feedback on its proposed assessment framework. This includes stakeholder views on the extent to which the proposed framework will enable the Commission to analyse the problems outlined in the rule change request and assess the potential solutions to the issues identified.

QUESTION 1: ASSESSMENT FRAMEWORK

1. Do you agree with the proposed assessment framework?
2. Should the assessment framework include any additional considerations? If so, what are they and why?

5 ISSUES FOR CONSULTATION

In this chapter the AEMC sets out the issues it considers particularly relevant to the rule change request and invites stakeholders to provide their insights. Issues include:

- Is there a problem with the governance of DER technical standards in the NEM?
- What is the market impact of identified problems?
- What are potential solutions to address these issues?

Stakeholders may also raise any other matters they consider relevant to the Commission's consideration of this rule change request.

5.1 Identifying governance problems

As discussed in section 3.1, the rule change request identified two main problems with the governance of DER technical standards for the NEM:

- inability to implement consistent technical standards across the NEM
- need for a fast, flexible and transparent standards setting process.

According to the proponent, further governance problems include:

- the publication of Australian or international standards does not mean automatic adoption by manufacturers or jurisdictions
- network technical connection standards provide for minimum DER technical standards, but there is a lack of coordination across the NEM
- while the rule change request lodged by AEMO on minimum DER technical standards sought to implement an initial solution, an enduring solution is needed.

As a result, the proponent is concerned the NEM's governance arrangements are not sufficient for the significant increase in DER installations expected in coming years and the resulting increase in two-way power transfers on distribution networks.

QUESTION 2: IDENTIFYING GOVERNANCE PROBLEMS

1. Do you agree with the problems identified by the rule change request? Why?
2. Do you agree with the rule change request on the causes of identified problems? Why?
3. To what extent has the Commission's recent rule change on DER technical standards resolved or likely resolve the identified governance issues?
4. When do longer term issues such as interoperability and cyber security need to be addressed? Can existing governance arrangements and the recent rule change address these issues in a timely manner or is further governance reform required?
5. Are there any other governance problems not identified by the rule change request? If so, why does the AEMC need to consider these issues?

5.2 Assessing the market impact of identified problems

To determine the significance of the problems identified by the rule change request (and stakeholders in response to this consultation paper) the Commission needs to understand the costs and impacts faced or observed by individual market participants, jurisdictions, and market bodies.

In particular, the Commission is seeking stakeholder views on the:

- impact of governance arrangements on the security and reliability of power supply in the grid, particularly at the distribution level
- impact of governance arrangements on the range of DER devices and services available to NEM consumers
- potential impact of the recent rule change on DER technical standards when it commences in December 2021, in the near and long term future
- cost of participating in existing governance arrangements, and any expected costs from complying with the new DER technical standards rule when it commences
- degree of certainty about any forecast future costs.

QUESTION 3: ASSESSING THE MARKET IMPACT OF IDENTIFIED PROBLEMS

1. Do you face any costs from governance arrangements in place prior to the commencement of the new DER technical standards rule change on 18 December 2021? Can you quantify these costs?
2. Alternatively, how would you be impacted if the Commission does not establish new governance arrangements for DER technical standards?
3. How certain are you about any forecast future costs?

5.3 Potential solutions

To inform its response to the rule change request, the Commission is seeking stakeholder views on three main questions:

- Should DER technical standards be included in the NER?
- If so, who should develop and maintain DER technical standards?
- What are the AEMC's options for implementing new governance arrangements?

5.3.1 Should DER technical standards be included in the NER?

The rule change request proposed DER technical standards be included in the NER or an instrument subordinate to it.

According to the rule change request, including DER technical standards in the NER would involve:

- the AEMC setting DER technical standards for the NEM

- including DER technical standards in the NER, NERR, or a subordinate instrument
- collaboration between the AEMC, AEMO, and the AER to inform the AEMC's standard setting activities
- the AEMC obtaining expert advice from an advisory committee and/or consultants
- the AEMC developing and maintaining a work program on technical standards.[34]

If standards are included in the NER, the AEMC would necessarily need to be responsible for determining DER technical standards for the NEM. This is due to the AEMC's unique role as rule-maker for the NEM and is consistent with the rule change request.

The AEMC's recent rule change on DER technical standards may partly address this aspect of the rule change request. In its capacity as rule-maker, the AEMC included the relevant Australian Standard AS 4777.2 in the NER (see chapter 2). The new rule will also require DNSPs and relevant parties to micro EG connections to comply with AS 4777.2. In addition, the AEMC will be able to consider applying technical requirements in addition to those set out in AS 4777.2 if it receives a rule change request on such an issue.

The Commission is therefore interested in stakeholder views on the interaction between proposed governance arrangements, existing governance arrangements and the recent rule change in response to AEMO's request.

QUESTION 4: DER TECHNICAL STANDARDS IN THE RULES

1. Should DER technical standards relevant to the NEM be included in the NER, or a subordinate instrument?
2. How could any new governance arrangements interact with Standards Australia existing processes in a way which avoids duplication, while ensuring standards are developed in a timely manner?
3. What would be the main benefits from including DER technical standards in the NER, NERR, or a subordinate instrument? Are there any risks?
4. Did the recent rule change on DER technical standards partly address problems identified by Dr Schott's rule change request?
5. If so, does the recent rule change on DER technical standards reduce the need to adopt the new governance arrangements proposed by the rule change request?

5.3.2 Who should develop and maintain DER technical standards applicable in the NEM?

Under the rule made in February 2021, Australian Standard AS 4777.2 will be relevant in the NEM for parties from 18 December 2021 that use connection offers for embedded generating units that are the subject of a basic micro EG connection service. New technical requirements relevant to these connections may arise by changes made to AS 4777.2 by Standards

34 For more on the governance arrangements proposed by the rule change request, see Chapter 3.

Australia. In addition, the AEMC will be able to consider applying technical requirements in addition to those set out in AS 4777.2 if it receives a rule change request on such an issue.

If the Commission decides to introduce new governance arrangements in the NER, it will need to decide who is responsible for developing and maintaining DER technical standards in the NEM.[35] As discussed above, including standards in the NER will necessarily require the AEMC to determine standards for the NEM. However, the rule change request further suggests the AEMC forming a new advisory committee on DER technical standards. Creating such an entity would require the AEMC to resolve a range of governance issues such as:

- **Who** should be part of any new governance arrangements such as industry, consumer, regulatory, and government representatives
- **How** members should be appointed. For example, should industry elect representatives or would a central entity like the AEMC appoint representative members?
- **What** should the new body be responsible for doing. For example, should it determine technical standards or advise a decision-maker (like the AEMC)?
- **What are the resources** required to support the new governance arrangements which need to be funded by industry or jurisdictions
- **Accountability** including transparency and reporting responsibilities on the new body.

The AEMC would need to recommend the appropriate resourcing for such a committee or body and gain jurisdictional support for that increase in funding. Any new and ongoing resourcing would need to be proportionate to the market impact of the problems identified by the rule change request and assessed through this rule change process.

Another consideration is the timeliness of determining and implementing new DER technical standards for the NEM. As discussed in section 2.1, new DER capacity is being installed at a rapid pace. If the governance arrangements for determining DER technical standards are not timely and responsive to evolving technologies, there is a risk this new capacity will not be fully capable of providing the grid services necessary to maintain the security and reliability of power supply in an increasingly decentralised NEM. This rule change process will therefore consider whether it is possible to form a more effective and efficient process for setting DER technical standards in the NEM.

For examples of how other technical bodies are structured, and the functions they undertake, see the case studies summarised at appendix A.[36]

QUESTION 5: WHO DEVELOPS AND MAINTAINS DER TECHNICAL STANDARDS

1. Should a new committee be responsible for determining or advising on DER technical standards in the NEM?

35 Noting that existing standard setting processes and regulations, for example by Standards Australia and at the jurisdictional level, will likely continue regardless of the outcome of this rule change process.

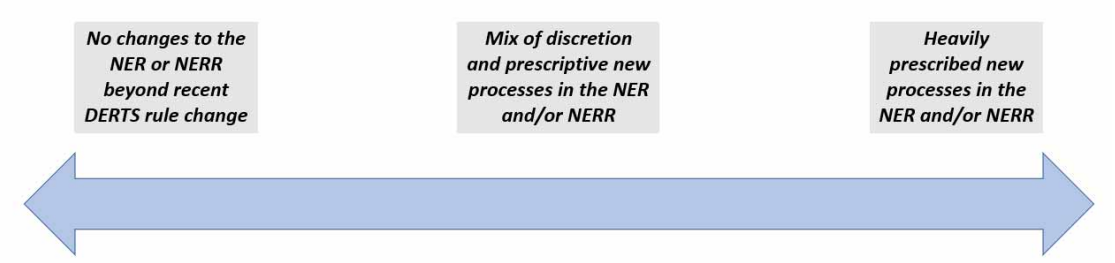
36 Case studies include the Reliability Panel, the AEMC's historical responsibility to undertake regular reviews under its Last Resort Planning Powers, and the Information Exchange Committee.

2. If so, how should members be appointed to the new committee?
3. What knowledge and experience would be needed to develop and maintain DER technical standards in the NEM?
4. Should membership of a new committee be paid or voluntary?
5. Should the committee report to the Commission as proposed by the rule change request? Or should the new committee report to another entity? If so, who?
6. How would the governance arrangements proposed by the rule change request interact with existing governance arrangements and the recent DER technical standards rule change? Are there any risks of duplication or divergence?
7. Are the proposed governance arrangements likely to reduce how long it takes to develop and implement new DER technical standards for the NEM? If not, would any alternative approaches increase the pace of setting standards for the NEM?
8. Is there a trade-off between how quickly new technical standards are developed and other NEM objectives such as the safety, security and reliability of power supply?

5.3.3 Options for implementing new governance arrangements

If the Commission introduces new governance arrangements, it will need to decide how to implement these new arrangements. Implementation options form a spectrum from very little or no new prescription in the NER to highly prescriptive new rules.

Figure 5.1: Options for prescribing new governance arrangements in the NER



Source: AEMC

Adopting the governance arrangements proposed by the rule change request could involve implementing highly prescriptive new processes in the NER. In addition to specifying that the AEMC must form a committee, the NER may also set out membership details, quorum, voting rights, secretariat role and functions and funding arrangements can also be specified in the NER.

Alternatively, stakeholders may wish to consider less prescriptive solutions to the issues identified in the rule change request in forming a view on whether any changes should be made to the governance arrangements that will commence on 18 December 2021. The alternative solutions could include:

- **Regularly reviewing the adequacy of DER technical standards:** The AEMC could make rules requiring it to regularly assesses if DER technical standards are, for example, meeting NEM priorities such as grid security, reliability, and efficiency. This approach could:
  - help stakeholders navigate the complexity of existing governance arrangements by clarifying issues and NEM policy priorities as they emerge
  - specify in the NER issues to address and stakeholders to consult
  - provide certainty to stakeholders the AEMC is assessing the NEM impact of DER technical standards on ongoing basis.

  While the AEMC would not be able to initiate a rule change, the information gathered through the review process could help stakeholders decide if and when to submit a rule change request for the purpose of amending the technical standards relevant to DER.

  Introducing a requirement in the NER to regularly undertake reviews would make DER technical standards an ongoing priority for the AEMC. Alternatively, the AEMC could self-initiate such reviews at any time. Self-initiation would provide the AEMC more flexibility to determine its future priorities as the energy transition continues.

  For an example of a periodic review undertaken by AEMC in response to a NER obligation, see the summary of the AEMC's historical Last Resort Planning Power at appendix A.
- **Complementing voluntary activities:** The Australian Renewable Energy Agency (ARENA) is bringing together industry and regulatory experts on DER technical standards, including Standards Australia, through the Distributed Energy Integration Program (DEIP).[37] The initiative is voluntary, and the AEMC cannot make rules that would bind DEIP itself. However, as a result of DEIP's work, interested stakeholders could submit rule change requests if they felt the NEO would be promoted by making a rule change.

  New governance arrangements for DER technical standards in the NEM could inadvertently duplicate DEIP activities, or preclude DEIP from gaining momentum on issues relating to technical standards. This risk is particularly acute if a new governance arrangement seeks to develop consensus policy positions on interoperability and cyber security. The rule change request cites both issues as longer-term policy concerns justifying the proposed new governance arrangements.

  However, there remain options that could address the issues of the request and complement DEIP initiatives. These may require relevant industry, government agencies and market bodies to:

  - periodically consider interactions between DER technical standards and NEM priorities
  - recommend ways to promote the NEO as DER technologies evolve and DER uptake in the NEM increases.

  Such an approach could encourage the timely and consultative development of policy positions on DER technical standards among industry and regulatory stakeholders.

37 For more on ARENA's DEIP and DER technical standards, see appendix B.1.

- **Expanding Reliability Panel responsibilities:** The rule change request highlights the Reliability Panel as a potential model for establishing a new governance body on DER technical standards. An alternative approach could be expanding the existing Panel's responsibilities to include DER technical standards. To assess this concept, the Commission would need to consider the expertise and perspectives required to address issues related to technical standards, and the extent to which the Panel's membership is suitable or may need to change.

For more information on governance options for technical policy issues, see the case studies summarised at appendix A.

QUESTION 6: HOW PRESCRIPTIVE SHOULD NEW GOVERNANCE ARRANGEMENTS BE

1. How much prescription should be included in the NER to implement the proposed new governance arrangements?
2. Should the AEMC periodically review DER technical standards to determine if further regulatory intervention is needed? What level of prescription should be included in the NER to implement this option?
3. Are there any solutions that can complement voluntary initiatives to address DER technical standards? For example, how could new governance arrangements in the NER support DEIP?
4. Is it feasible to amend the role of the Reliability Panel to cover DER technical standards? Would this be preferable to creating a new advisory committee on DER technical standards?
5. Are there other alternative solutions to address the issues identified in the rule change request? What level of prescription in the NER is required to successfully implement these solutions?

ABBREVIATIONS

AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
Commission	See AEMC
DER	Distributed Energy Resources
NEL	National Electricity Law
NEO	National electricity objective
NERL	National Energy Retail Law
NERO	National energy retail objective

A POTENTIAL CASE STUDIES FOR GOVERNANCE MODELS

Below, the Commission summarises five potential case studies for governance models addressing technical policy issues:

- Reliability Panel
- Last Resort Planning Power
- Information Exchange Committee
- WA Economic Regulation Authority Technical Rules Committee
- NSW Independent Water Advisory Panel

A.1 Case study one: Reliability Panel

Table A.1: **Reliability Panel**

CHARACTERISTIC	DESCRIPTION
Establishment	Established by the AEMC under the NEL
Determine or advise	Both
Membership	Appointed by the AEMC, the Panel must consist of: • Chair (an AEMC Commissioner) • AEMO CEO (or delegate) • a representative from each of: generators, market customers, Transmission Network Service Providers (TNSPs), DNSPs and end-use customers. Up to three additional members representing interests not otherwise represented on the panel, in order to achieve broad representation of those persons with direct interests in the reliability and safety of electricity supply under the market arrangements and in power system security.
Functions	Determine • determine system restart standard (on AEMO's advice) • develop and publish principles determining how AEMO should maintain power system security • determine and publish generator compliance templates • determine which non-credible contingency events are protected event (on AEMO's advice) • if necessary, determine guidelines for power system frequency reviews undertaken by AEMO • determine policies and guidelines for AEMO entering contracts for reserves

CHARACTERISTIC	DESCRIPTION
	• if necessary, determine if an existing Australian or international standard is to be adopted in the NEM as a plant standard for a particular class of plant Advise • monitor, review, and report on power system reliability • review and make recommendations on system restart standard • report to the AEMC and participating jurisdictions on overall power system reliability matters and recommend any necessary rule changes
Legal authority	NEL and NER

A.2 Case study two: Last resort planning power

Table A.2: Last resort planning power

CHARACTERISTIC	DESCRIPTION
Establishment	AEMC
Determine or advise	Both
Membership	The LRPP was undertaken by the AEMC as a review. Commissioners made decisions following consideration of staff advice.
Functions	Annual responsibility to determine if TNSPs needed to be directed, as a last resort, to undertake transmission investment to meet the long term interests of consumers with respect to the security, safety, reliability, and affordability of electricity supply. The AEMC could only exercise this power after considering certain criteria specified in the NER, including if: • there was a problem relating to constrained national transmission flow paths between regional reference nodes or a potential transmission projects • there were no other options, strategies, or solutions that would address the problem in a timely manner • but for the AEMC exercising its LRPP powers, the problem was unlikely to be addressed. In addition, the AEMC was required to annually advise the market on the matters it had considered that year when determining whether to exercise its last resort planning power.
Legal authority	NEL and NER (historical)

A.3 Case study three: Information Exchange Committee

Table A.3: Information Exchange Committee

CHARACTERISTIC	DESCRIPTION
Establishment	AEMO
Determine or advise	Both
Membership	The Information Exchange Committee (IEC) consists of a: • Chair (an AEMO director) • DNSP member (elected by DNSPs) • retailer member (elected by retailers and local retailers) • metering member (elected by metering coordinators, metering providers, and metering data providers) • third-party B2B participant member (elected by third-party B2B participants) • consumer member (appointed by AEMO). In addition, AEMO is required to appoint between two and four discretionary members of the IEC.
Functions	The IEC is responsible for developing, consulting on, and making recommendations to AEMO on B2B procedures. AEMO must consider a recommendation from the IEC and must approve that recommendation unless it concludes that the recommendation would conflict with the Market Settlement and Transfer Solution (MSATS) Procedures. The IEC's other functions include: • establishing working groups to assist its program • reviewing and consider work done by working groups • developing proposed amendments to the IEC's own procedures and operating manual.
Legal authority	NER

A.4 Case study four: WA Economic Regulation Authority Technical Rules Committee

Table A.4: WA Economic Regulation Authority Technical Rules Committee

CHARACTERISTIC	
Establishment	Western Australian Government
Determine and advise	Advise
Membership	The Economic Regulation Authority (ERA) is required to appoint to

CHARACTERISTIC	
	the Committee at least one representative of: • WA Government Coordinator of Energy (Chair) • covered network or interconnected system for which the ERA is developing technical rules • network users • AEMO. The ERA may also appoint to the Committee any other person it considers appropriate.
Functions	Convened at the direction of the ERA to provide technical advice when it is assessing proposed amendments to the Electricity Networks Access Code. The ERA is required to have regard to any advice from the Committee in: • deciding whether or not to approve proposed new or amended technical rules for a network • drafting its own technical rules for a network.
Legal authority	WA Electricity Networks Access Code

A.5 Case study five: NSW Independent Water Advisory Panel

Table A.5: NSW Independent Water Advisory Panel

CHARACTERISTIC	DESCRIPTION
Establishment	NSW Government
Determine or advise	Advise
Membership	The Panel consists of seven members. Each member is appointed by the Minister for Water. Panel members are collectively expected to have diverse experience and expertise in a range of fields including urban water planning, conservation, environmental issues, climate science, Aboriginal values of water, groundwater ecosystems, and any other fields that might be determined relevant by the NSW Department of Planning, Industry, and Environment (DPIE)
Functions	The Panel advises the NSW Government's water sector leadership group (departmental level officials) on the science and decision-making processes associated with developing water plans for the Lower Hunter Valley and Greater Sydney regions. The Panel's advice includes: • applying the most up to date knowledge and practices to developing and implementing water plans

CHARACTERISTIC	DESCRIPTION
	• strategic issues related to water plans as required through the planning process • reviewing specific issues as requested by DPIE and providing other advice on technical and process matters
Legal authority	Constituted at DIPE's discretion

B RELATED WORK ON DER TECHNICAL STANDARDS

In addition to recent work on DER technical standards by the AEMC and the Energy Security Board (ESB), other related work includes:

- ARENA Distributed Energy Integration Program
- South Australian Government 'Smarter Homes' initiative
- Western Australia DER Roadmap.

B.1 ARENA Distributed Energy Integration Program

Convened by ARENA, DEIP is a collaboration of government agencies, market authorities, industry and consumer associations. Standards Australia is among the group's participants. DEIP aims to maximise the value of DER for all energy users. Led by a steering group, of which the AEMC is a member, the initiative is driven by the premise that collaborating on DER issues will more efficiently identify knowledge gaps and priorities and accelerate reforms to benefit consumers. The AEMC recently worked closely with DEIP and its members to develop DER access and pricing reforms.[38]

While DEIP consists of several workstreams, two are most relevant to DER technical standards: interoperability, and dynamic operating envelopes. More detail on each is provided below.

B.1.1 DEIP's interoperability workstream

DEIP's interoperability workstream has the potential to bring together industry and regulatory expertise to partly address some longer-term outcomes from DER in the NEM that underlies Dr Schott's rule change request for new governance arrangements.

According to AEMO, interoperability describes the ability of different information technology systems, devices, and software applications to enable two-way communication, use, and exchange of data. By achieving interoperability, such data exchanges can occur accurately, effectively, and consistently.[39]

As DER uptake continues across the NEM, AEMO sees three main benefits from interoperability:

- consumers getting more value by providing them with greater flexibility in how they utilise their assets and access services
- grid flexibility services can be made to work if interoperable systems can communicate with each other
- system costs may be reduced by using existing infrastructure in smarter ways.[40]

38 For more, see AEMC, *DER Access, Pricing and Incentive Arrangements,* rule determination, 12 August 2021.

39 AEMO 2021, AEMO, Melbourne, viewed 27 June 2021, https://aemo.com.au/consultations/industry-forums-and-working-groups/list-of-industry-forums-and-working-groups/deip-isc.

40 AEMO 2021, AEMO, Melbourne, viewed 27 June 2021, https://aemo.com.au/consultations/industry-forums-and-working-groups/list-of-industry-forums-and-working-groups/deip-isc.

DEIP's interoperability workstream is pursuing these objectives through a work program to:

- prioritise, coordinate and steer the required activities to establish uniform interoperability and cyber standards to better enable DER integration
- provide governance and direction on these activities within the broader DEIP initiative
- communicate and highlight key outcomes and priorities regarding interoperability and cyber for DER integration to industry and broader stakeholders
- provide an avenue for sharing lessons, achievements and challenges of the Interoperability and cyber workstreams, including how they interact with other related DEIP working groups and broader DER reforms.[41]

The workstream's plan includes consulting with Standards Australia and the Institute of Electrical and Electronics Engineers (IEEE) to promote the incorporation of interoperability objectives in national and international standards.

B.1.2 DEIP's dynamic operating envelopes workstream

According to ARENA, 'operating envelopes' are the limits on an electricity customer's ability to import and export power to the grid. These limits are agreed between networks, customers, and the AER as part of the customer connection or regulatory process. Under 'dynamic operating envelopes', a customer's import and export limits vary over time and location. By contrast, 'static operating envelopes' are fixed as conservative levels regardless of the distribution network's hosting capacity at a given time. Implementing dynamic rather than static operating envelopes could therefore support higher levels of energy exports from DER at times when distribution networks have more hosting capacity.[42]

The Commission understands DEIP's workstream on dynamic operating envelopes aims to:

- build a shared understanding of the opportunities and challenges
- share insights on approaches currently under investigation
- identify reforms that could be implemented to establish dynamic operating envelopes.[43]

The workstreams membership includes all three energy market bodies, consumer representatives, and network service provider representatives.[44]

B.2 South Australian Government's 'Smarter Homes' initiative

In June 2020 the South Australian Department for Energy and Mining consulted on a proposed package of regulatory changes introducing new technical standards. The package sought to support an orderly energy transition by providing incentive structures for customers to be rewarded for managing their energy use.

41 AEMO 2021, AEMO, Melbourne, viewed 27 June 2021, https://aemo.com.au/consultations/industry-forums-and-working-groups/list-of-industry-forums-and-working-groups/deip-isc.

42 ARENA 2021, ARENA, Canberra, viewed 27 June 2021, https://arena.gov.au/knowledge-innovation/distributed-energy-integration-program/dynamic-operating-envelopes-workstream/.

43 ARENA 2021, ARENA, Canberra, viewed 27 June 2021, https://arena.gov.au/knowledge-innovation/distributed-energy-integration-program/dynamic-operating-envelopes-workstream/.

44 ARENA 2021, ARENA, Canberra, viewed 27 June 2021, https://arena.gov.au/knowledge-innovation/distributed-energy-integration-program/dynamic-operating-envelopes-workstream/.

This consultation resulted in a number of new technical standards and requirements for new and replacement smaller generating systems, such as rooftop solar, that were made effective on 28 September 2020. New standards and requirements included:

- voltage ride-through standards for generating systems connected via an inverter
- remote disconnection and reconnection requirements
- export limit requirements
- smart meter minimum technical standards
- tariffs to incentivise energy use in low demand periods.

The South Australian Government implemented the new standards through regulations issued by the Office of the Technical Regulator.[45]

B.3 Western Australian Government's DER Roadmap

The Western Australian Government established the Energy Transformation Taskforce from 2019 to 2021 to provide advice on the transition to renewable, decentralised electricity generation and supply in the South West Interconnected System (SWIS). One of the Taskforce's recommendations was a strategy for better managing the contribution of inverters to distribution networks with the increased uptake of DER by consumers.[46]

The Taskforce consisted of an independent chair, Mr Steven Edwell, the Western Australian Energy Minister and senior officials from the Department of Premier and Cabinet and the Department of the Treasury.[47] Its advisory functions were supported by a departmental implementation unit, and the taskforce consulted AEMO, Western Power, government energy businesses, private sector energy businesses, and other stakeholders. Its recommendations are now being implemented by Energy Policy WA.[48]

45 South Australian Government, Department for Energy and Mining, 2020, Adelaide, viewed 17 August 2021, https://www.energymining.sa.gov.au/energy_and_technical_regulation/energy_resources_and_supply/regulatory_changes_for_smarter_homes.

46 Western Australian Government, *Energy Transformation Taskforce: DER Roadmap*, December 2019, p.4.

47 Western Australian Government, *Energy Transformation Taskforce: Terms of Reference*, March 2019.

48 Western Australian Government, *Media statement: Energy Transformation Taskforce successfully concludes*, May 2021.