AUSTRALIAN ENERGY MARKET COMMISSION

RULE

Draft rule determination

National Electricity Amendment (Enhancing investment certainty in the R1 process) Rule 2024

Proponent

Clean Energy Council

7 March 2024

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About the AEMC

The AEMC reports to the energy ministers. We have two functions. We make and amend the national electricity, gas and energy retail rules and conduct independent reviews for the energy ministers.

Acknowledgement of Country

The AEMC acknowledges and shows respect for the traditional custodians of the many different lands across Australia on which we all live and work. We pay respect to all Elders past and present and the continuing connection of Aboriginal and Torres Strait Islander peoples to Country. The AEMC office is located on the land traditionally owned by the Gadigal people of the Eora nation.

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Summary

1 The decarbonisation of the National Electricity Market (NEM) requires a significant amount of new generation and storage capacity to be connected at an unprecedented rate. The Australian Energy Market Operator's (AEMO's) Draft 2024 Integrated System Plan (ISP) expects that approximately 6 GW of new capacity needs to be added every year to replace retiring thermal plants and achieve emissions reduction targets.[1]

2 This growth in new generation and storage capacity is accompanied by a large increase in the number of projects in the connection queue: from 389 projects in July 2022, to 524 projects in May 2023 and to 583 projects in December 2023.[2]

3 To address the increasing size of the connections queue, the Australian Energy Market Commission (AEMC or Commission) has made a more preferable draft rule (hereafter 'draft rule') that aims to achieve faster connections and improve investment certainty in the pre-connection registered data (R1) process by addressing several gaps and hindrances to timely connections.

4 This is in response to the Clean Energy Council's (CEC's) rule change request that identified several issues with the R1 process and proposed solutions to these issues. The CEC's rule change request arose from the Connections Reform Initiative (CRI), through which the CEC extensively collaborated with generators, renewable energy developers, network service providers (NSPs) and market bodies to establish workable solutions to the challenges involved with the connections and registration processes.

5 The Commission published a consultation paper on 17 August 2023 and received 28 submissions from stakeholders comprising a diverse range of views. We hosted technical working groups to hone in the key issues and collaboratively explored alternative solutions to those presented by the CEC in its rule change request. The alternative solutions arrived at were developed closely with stakeholders, including the members of the technical working group, the CEC, NSPs and AEMO, and balances improving the speed and clarity of the process with the importance of maintaining power system due diligence. Given the scale of the transition underway and the amount of generation that we need to connect, the draft rule recognises that we need to shift some of the risk associated with connections from connecting parties to networks.

6 The draft rule would:

- provide generators with the ability to request written justification from NSPs and AEMO for additional modelling requests, on the condition that generators have submitted adequate data and information and complied with other NER obligations
- remove a barrier to agreeing on reasonable and pragmatic revisions to the Generator Performance Standards (GPS) during renegotiation in the R1 process, and
- formalise the commencement and conclusion of the R1 process through timely notifications by NSPs and AEMO.

7 The Commission also recommends that AEMO produce new or update its existing guidelines to promote transparency and clarity in the R1 process. This recommendation is in line with various reform initiatives that are already being progressed by AEMO and through the CRI.

8 Our draft rule proposes the final rule (if made) would commence two weeks after the publication of our final determination, currently scheduled for 6 June 2024.

1 AEMO, Draft 2024 Integrated System Plan, p. 10.

2 This includes projects across the connection process from enquiry to commissioning. See AEMO's NEM Connection Scorecard Dec 2023.

9 We are seeking feedback on our draft determination and rule by **18 April 2024**.

The draft rule would improve the speed and clarity of the R1 process while promoting power system security, safety and reliability

10 The R1 process occurs during the period between the execution of a connecting generator's connection agreement and the completion of market registration. It involves the connecting party preparing a detailed engineering design of their plant, a suite of technical models, a commissioning plan and other documentation to demonstrate to the NSP and to AEMO that the plant meets the GPS. The GPS is agreed to before the start of the R1 process as part of the connection agreement between the generator and the NSP.

11 During the R1 process, generators liaise with both the NSP and AEMO to ensure that the connecting plant will meet the GPS and not have any adverse power system impacts. The NSP or AEMO may request additional modelling to confirm:

- if and how the plant's design has changed between the R1 stage and earlier confirmation of the plant's GPS
- whether the proponent has taken into account any changes in the external network conditions that have emerged since the execution of the connection agreement, such as other new connecting generators or generator retirements.

12 The draft rule would improve the R1 process by addressing the issues that contribute to delays and help to ensure that engineering effort at the R1 due diligence process is appropriately targeted. It also recognises that given the scale of transition underway, and the amount of generation that is needed to connect, shifting some of the risk associated with connections from connecting parties to networks (while still preserving system security) is appropriate.

The Commission has considered the issues and solutions proposed by the CEC and other stakeholders

13 In its rule change request, the CEC and its members considered that the R1 process has several issues that are contributing to increased uncertainty and long delays. It noted that:

- a lack of NER obligations on parties in the R1 process is contributing to poor engagement and process delays
- the timeframes for how and when AEMO and NSPs should communicate, provide their assessment and request clarifications, are not clear
- generators are often held responsible for changes outside of their control, which can lead to excessive rework and remodelling for marginal or inconsequential improvements
- during renegotiation of the plant's GPS, minor but pragmatic reductions in the level of performance standard capability between the GPS agreement and registration are not accepted by NSPs or AEMO due to a restrictive clause in the NER
- the decisions made by NSPs and AEMO are not reviewable, with the existing dispute resolution processes being insufficient.

14 To address these issues, the CEC proposed changes to the NER to introduce:

- **A self-assessment process:** connecting generators would initiate the R1 process by performing an initial self-assessment to determine the quality and circumstances of their connection.[3]
- **Classification into types:** the CEC suggested five 'types' that a connecting applicant's can be self-assessed as, with each type representing a different pathway to registration.[4]
- **A materiality framework:** to define a 'material' deviation in plant capability, a new materiality guideline would be developed by AEMO with close cooperation with connecting parties and NSPs.[5]
- **New timeframes:** to govern how long assessments should take and how long AEMO or NSPs have to respond to the submission of an R1 package, which is the set of models that the applicant provides.[6]
- **Facilitated reviews:** to resolve engineering disputes between parties instead of triggering the existing formal dispute resolution framework available in the NER.[7]

Stakeholder input and technical working group meetings shaped our draft rule

15 In the consultation paper, we sought feedback on the CEC's characterisation of the R1 process's issues, the current practices undertaken by generators and NSPs during the process, and stakeholders' views on the viability of the CEC's proposed solution. We received 28 submissions to our paper, with a diverse range of views represented by generators, NSPs, AEMO and other industry bodies.

16 Following the close of submissions, the Commission held two technical working group (TWG) meetings. At these meetings, we aimed to collaborate with stakeholders to devise a draft rule that:

- ensures the engineering and technical work undertaken during the R1 process is focused on the right aspects to avoid wasted work, time and money for all parties involved
- shifts some of the risk from generators onto NSPs to AEMO, which the Commission considers necessary to enable the rapid transition that the NEM is undergoing.

17 We also sought feedback on a revised problem statement and on various proposed solutions to address key issues raised in submissions. This close collaboration with stakeholders was extremely valuable in shaping and developing our policy positions in this draft determination.

Providing more certainty in the R1 process is inherently challenging due to its nature

18 Stakeholder discussions illuminated the difficulties involved in providing more certainty in the R1 process. It is inherently difficult to prescribe a process that is by nature iterative because assessing a generator's R1 package involves a three-way dialogue. This collaborative process necessitates a flexible framework, rather than detailed prescription which may restrict the dialogue that is vital for effective due diligence.

19 Additionally, providing certainty is challenging because the R1 process can vary significantly from project to project, with the type, location, network, size, capabilities and other unique technical parameters affecting the type of models and engineering analyses that need to be prepared for the NSP's and AEMO's assessment. Renegotiation of the access standard previously agreed to between generators and NSPs is also frequent and may take many forms, further requiring a

3 CEC, rule change request, p. 35.
4 CEC, rule change request, p. 38.
5 CEC, rule change request, p. 39.
6 CEC, rule change request, p. 36.
7 CEC, rule change request, p. 51.

flexible framework rather than an overly prescriptive process.

20 Furthermore, there also exists some information asymmetry between parties, and the extent of information that is divulged and shared between them often varies. For example, there is often commercially sensitive information contained in NSP's or AEMO's network models that cannot be shared with generators to allow them to remediate technical issues during the R1 process. Moreover, the network models held by the NSP and AEMO may differ, making it difficult for a generator to verify whether the models concur.

21 Despite these inherent difficulties, the Commission considers that there are opportunities for improvement. The draft rule provides parties with more certainty on NSPs' and AEMO's roles and obligations, timeframes and relaxes GPS renegotiation requirements in the R1 process.

Our draft rule addresses issues in the R1 process differently to the solution in the rule change request

22 In response to the issues raised by the CEC in its rule change request and the feedback from stakeholders, the Commission has developed a draft rule that seeks to address the problems raised, but which consists of alternative solutions. These solutions were developed closely with stakeholders, including the members of the technical working group, the CEC, NSPs and AEMO, and balances improving the speed and clarity of the process with the importance of maintaining power system due diligence. The draft rule adopts an alternative solution to that proposed in the rule change request for a few reasons:

- a self-assessment framework is likely to lead to further delays as it introduces an additional step whereby the NSPs must first evaluate whether the self-assessment is appropriate
- the classification of applications into 'types' precludes the bespoke assessment necessary in the R1 process — prescribing types into the NER may add confusion to how issues with particular connections are identified and how the best way to resolve them
- implementing a materiality framework is likely to be incredibly challenging to agree across the industry — given the constantly shifting nature of the power system, the framework would need to be continually updated
- overly prescriptive timeframes during assessment may hinder the R1 process and cause unintended consequences — to comply with certain timeframes, NSPs and AEMO may reduce the quality of their due diligence, risking power system security and potentially causing wider issues
- a new facilitated review process would increase costs with limited benefits — as decisions would not be binding, there may not be any meaningful improvements over current discussions between parties.

23 While the draft rule sets out a different solution that seeks to address the issues raised in the rule change request, it is likely to be more practical and easier to implement than the CEC's solution. It also seeks to complement broader reform through the CRI and AEMO's ongoing work to improve its processes. Figure 1 shows a diagrammatic overview of our draft rule, the R1 process and the connection application phase.

24 The draft rule addresses the information asymmetry that is inherent in the R1 process by enabling generators to request written justification from NSPs or AEMO when it has been asked to provide further information or perform additional modelling. However, it may only request justification if it has satisfied the appropriate R1 submission and information provision obligations (see section 3.1 for more information).

25 The Commission also recommends that AEMO should produce new (or update existing) guidelines related to the connections process to clarify how AEMO and NSPs should assess the risk of adverse power system security or power quality impacts (see section 3.2 for more information).

26 To better codify the timelines and obligations related to the R1 process, the draft rule introduces requirements on NSPs and AEMO to formally respond to the receipt of an R1 submission (initiating the R1 process) and to provide notice that its assessment is complete (completing the R1 process). NSPs and AEMO would have five business days to formally notify generators for both of these requirements. This avoids any open-ended delays that may currently occur due to a lack of clear obligations, while also informing generators of when the R1 process has officially commenced or concluded (see section 5.2 for more information).

27 The draft rule also updates a clause that was identified by stakeholders to be hampering practical renegotiation of the GPS. Specifically, NER clause 5.3.4A(b)(1A), also known as the 'no less onerous' clause, prevented pragmatic engineering judgement to be applied to performance standards when there are non-material differences. As plant designs often change between the connection agreement and the R1 stage, updating this clause to allow pragmatic revisions of a GPS would remove a key source of engineering overwork and connection delays (see section 4.3 for more information).

We assessed our draft rule against five assessment criteria using regulatory impact analysis and stakeholder feedback

28 The Commission has considered the National Electricity Objective[8] (NEO) and the issues raised in the rule change request and has assessed the draft rule against five assessment criteria outlined below. We gathered stakeholder feedback and undertook regulatory impact analysis in relation to these criteria.

29 The more preferable draft rule would contribute to achieving the NEO by:

- **Enabling more transparent analysis of risks to power system security:** The draft rule would provide generators a better understanding of AEMO/NSPs minimum expectations for an R1 submission, provide generators a way to seek written justification for additional analyses where they've met all their obligations, and make it easier to agree pragmatic changes to the GPS. These changes will retain the flexibility that all parties need in the connections due diligence process to exercise engineering judgement when evaluating generators' power system models.
- **Advancing emissions reduction:** The draft rule would enable the better allocation of scarce engineering hours to generator activities that meaningfully improve power system performance. These engineering hours would be better allocated to helping other generator projects proceed through the connections due diligence process more swiftly.
- **Balancing the need for flexibility while encouraging innovation:** The draft rule would provide two principal benefits that support flexibility and innovation. First, flexibility that meets generators need to agree small, pragmatic amendments to the GPS that are often unavoidable at the R1 stage that is balanced by disincentivising large GPS changes that trigger extensive remodelling for other nearby generators at an earlier stage of the connection process. Second, by providing generators who are upgrading an existing site with grid-forming (GFM)

8 Section 7 of the NEL.

technology a way to agree large GPS amendments given the benefits GFM devices offer relative to grid following inverters.

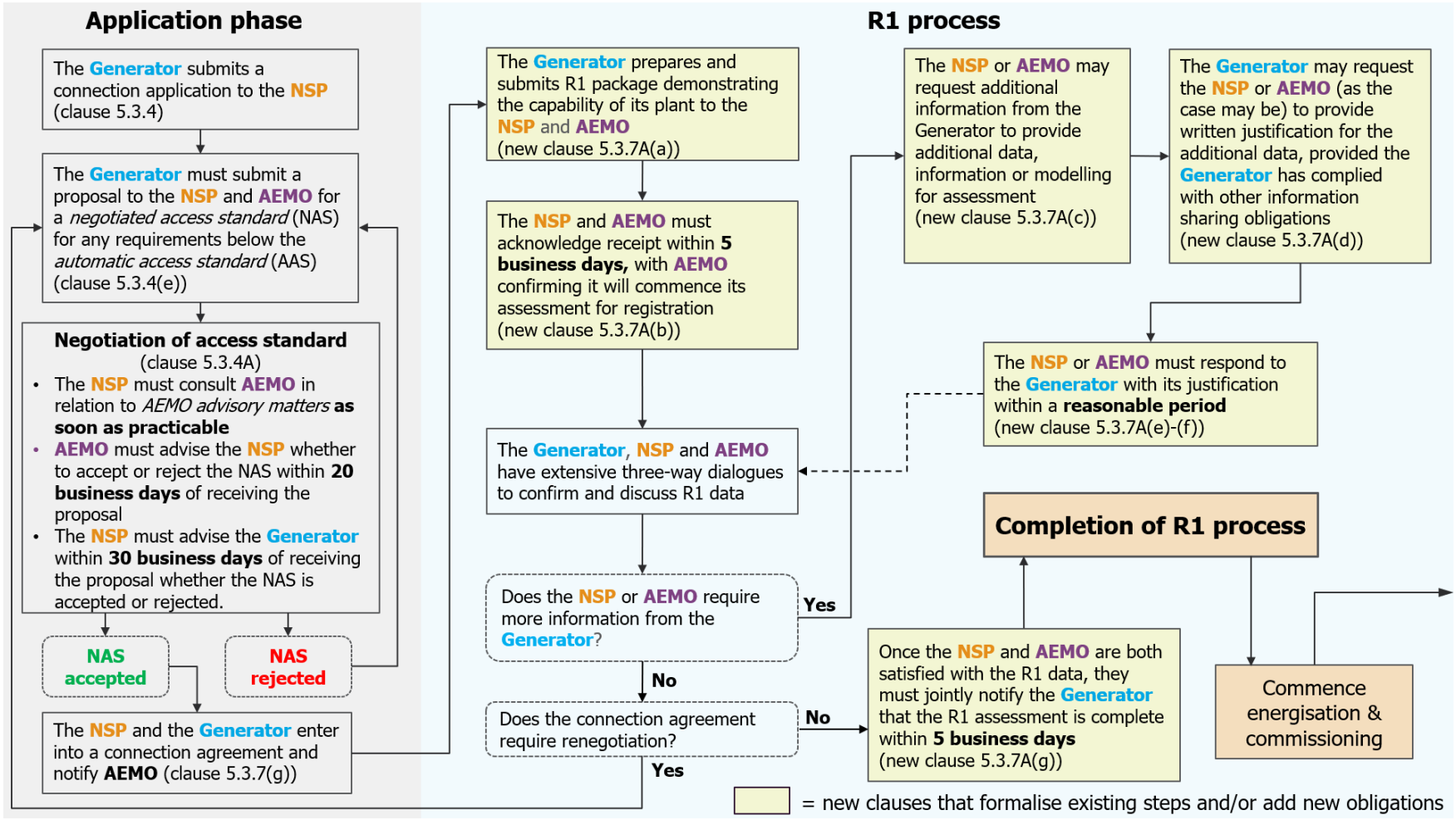
- **Codifying a gap in the regulatory process consistent with good regulatory practice:** The draft rule would codify the start and end of the R1 due diligence process by requiring AEMO and NSPs to acknowledge that in writing to the generator. The draft rule is consistent with good regulatory practice because it does not prescribe how the R1 due diligence assessments would be conducted given NSPs, generators and AEMO have advised the Commission that flexibility to exercise engineering judgement is essential to the process.
- **Creating policy that can be implemented quickly and easily:** The draft rule would, if made, come into effect immediately (that is, two weeks after the publication of the final determination). In comparison, the materiality guidelines and the type pathways that the CEC proposed would have been far more challenging to implement, given the technical uncertainties inherent in connecting a large amount of inverter-based generation to the power system.

The final rule would come into effect two weeks after the publication of the final determination

30 The Commission considers that the implementation of our rule would not require significant work or time. Through conversations with various stakeholders, we understand that the required changes to relevant processes are minor or administrative in nature.

31 The Commission considers that two weeks post the publication of the final determination is sufficient for AEMO and NSPs to notify relevant parties of the changes to the NER and to modify any existing or in train processes.

Figure 1: Overview of the draft rule and the R1 process



Source: AEMC

How to make a submission

We encourage you to make a submission

Stakeholders can help shape the solution by participating in the rule change process. Engaging with stakeholders helps us understand the potential impacts of our decisions and contributes to well-informed, high quality rule changes.

How to make a written submission

Format: We have published a template for submissions with this report but you can also use your own format (for example a letter).

Due date: Written submissions responding to this draft determination and rule must be lodged with Commission by **18 April 2024**.

How to make a submission: Go to the Commission's website, www.aemc.gov.au, find the "lodge a submission" function under the "Contact Us" tab, and select the project reference code **ERC0363.**[9]

Tips for making submissions on rule change requests are available on our website.[10]

Publication: The Commission publishes submissions on its website. However, we will not publish parts of a submission that we agree are confidential, or that we consider inappropriate (for example offensive or defamatory content, or content that is likely to infringe intellectual property rights).[11]

Next steps and opportunities for engagement

There are other opportunities for you to engage with us, such as one-on-one discussions or industry briefing sessions. The AEMC also welcomes individual meetings with interested stakeholders.

You can also request the Commission to hold a public hearing in relation to this draft rule determination.[12]

Due date: Requests for a hearing must be lodged with the Commission by 21 March 2024.

How to request a hearing: Go to the Commission's website, www.aemc.gov.au, find the "lodge a submission" function under the "Contact Us" tab, and select the project reference code **ERC0363.** Specify in the comment field that you are requesting a hearing rather than making a submission.[13]

For more information, you can contact us

Please contact the project leader with questions or feedback at any stage.

Project leader: Tiffany O'Keefe

Email: tiffany.okeefe@aemc.gov.au

Telephone: (02) 8296 7800

9 If you are not able to lodge a submission online, please contact us and we will provide instructions for alternative methods to lodge the submission.

10 See: https://www.aemc.gov.au/our-work/changing-energy-rules-unique-process/making-rule-change-request/our-work-3.

11 Further information about publication of submissions and our privacy policy can be found here: https://www.aemc.gov.au/contact-us/lodge-submission.

12 NEL s 101(1a).

13 If you are not able to lodge a request online, please contact us and we will provide instructions for alternative methods to lodge the request.

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1 The Commission has made a more preferable draft rule

This draft determination is to make a more preferable draft rule (hereafter 'the draft rule') in response to a rule change request submitted by the Clean Energy Council (CEC) to improve the pre-connection registered data (R1) connections process for connecting new generation into the power system. We are seeking feedback on this draft rule by 18 April 2024.

1.1 Connections reform continues to be a key priority for the transition

In recent years, there has been a significant increase in the number of connection applications compared to previous decades as the generation mix changes and we transition to net zero.[14] In 2022, an agreement established a new National Energy Transformation Partnership for the Commonwealth, state and territory governments to work together to achieve net zero by 2050.[15]

Given the scale of the transition underway, and the amount of generation and storage that we need to connect, in order to achieve Australia's emission reduction targets, the Commission recognises the importance of mitigating some of the risks associated with the current connection process for connecting parties.[16]

1.1.1 This rule change emerged as an initiative from the Connections Reform Initiative

The Connections Reform Initiative (CRI)[17] was formed in 2021 by AEMO and the CEC to address connection concerns. In particular the amount of time to achieve successful connection and the amount of analysis and rework required by connecting parties to address AEMO and network service provider (NSP) concerns about a plant's impact on the system. The CRI plays an important role in accelerating the energy transition, working to develop solutions to address the most pressing systemic concerns with the NEM's connections process. Concerns about connection issues are driving initiatives across the connection process from enquiry to commissioning.

This rule change relates to the R1 process that occurs before registration and prior to commissioning. It has been one of the key focus areas of the CRI and has emerged from review and consultation with developers, investors, original equipment manufacturers (OEMs), networks and AEMO.

To develop this rule change, the CRI held a series of workshops with their members and other stakeholders. This includes sessions with AEMO, Energy Networks Australia (ENA), the CEC's members, CRI leadership and delivery groups. This culminated in the submission of this rule change request to the Commission.

14 For more information, see: https://aemo.com.au/en/energy-systems/electricity/national-electricity-market-nem/participate-in-the-market/network-connections/connections-scorecard.

15 For more information see https://www.dcceew.gov.au/energy/strategies-and-frameworks/national-energy-transformation-partnership#:~:text=The%20National%20Energy%20Transformation%20Partnership,achieve%20net%20zero%20by%202050.

16 In December 2023, the capacity at application and pre-registration was 78% and 93% more respectively than December 2022. For more information, see: https://aemo.com.au/-/media/files/electricity/nem/network_connections/connections-scorecard/december-2023.pdf?la=en.

17 For more information, see: https://aemo.com.au/en/consultations/industry-forums-and-working-groups/list-of-industry-forums-and-working-groups/connections-reform-initiative.

1.2 The R1 stage is a critical step in achieving registration

The National Electricity Market (NEM) currently operates under a regime that allows parties that want to connect to negotiate a connection to any part of the NEM at any time provided the system security requirements of doing so are met.[18]

The NEM connection process begins with a connecting applicant making an enquiry with its basic design to the NSPs, although some projects engage the NSP earlier to assess feasibility.[19] The connecting applicant then will undertake negotiation of their performance standards and connection agreement [20] with the NSP. Following this, detailed design and modelling that constitutes the R1 package is submitted to the NSP and AEMO for assessment prior to registration.[21] This part of the connections process prior to registration is colloquially called the R1 process where the NSPs and AEMO seek to satisfy themselves that the connection applicant's plant design will not create system security issues and that it can meet the previously agreed performance standards. The "R1 package" comprises a set of models that the applicant provides to be assessed by NSPs and AEMO.

1.3 The Commission considered the issues and solution proposed by the CEC

1.3.1 The CEC's rule change request

The CEC's rule change request received in May 2023 suggests that the R1 part of the connection process takes too long and is too costly.[22]

The rule change request makes the following commentary on six issues at the R1 stage:[23]

- There is a lack of clear obligations on parties:
  - Despite the importance of the R1 process in achieving registration, there is not a NER prescribed process or specific set of guidelines for it. AEMO and NSPs are not subject to NER obligations to provide reasons if they are not satisfied with the applicant's performance standards. This is creating uncertainty as to which party is responsible for assessing performance.[24]
- The R1 framework is inflexible:
  - Currently the R1 process consists of inefficiencies that include the inability to receive conditional approvals and to accept minor reductions in performance. This is leading to increased costs via additional modelling which often provide limited or no benefit.[25]
- Connecting parties are held responsible for changes outside of their control:
  - If there are external changes to the power system, it will impact the applicant's ability to complete its R1 assessment. Applicants are being held responsible for making changes to accommodate wider external changes to the power system. This represents risks that cannot be managed by the developer, increasing investment risk premiums. [26]
- There is a lack of clear timeframes:

18 This also includes obligations under the system strength framework.
19 See NER clauses 5.3.2 to 5.3.4.
20 NER clause 5.3.4A.
21 NER clause 2.2.1(e).
22 CEC, rule change request, p. 3.
23 CEC, rule change request, pp. 21-29.
24 CEC, rule change request, pp. 21-22.
25 CEC, rule change request, pp. 23-24.
26 CEC, rule change request, pp. 24-25.

    - Unlike other sections of the connection process, if AEMO is unsatisfied with the performance standards, the registration application is deemed incomplete (and NER clause 2.9.2 has not begun). The lack of timeframes for R1 represents a large risk to applicants which generally have contractually time-bound commitments for energisation.[27]
- Decisions are not reviewable:
    - The NER currently has three dispute resolution processes relevant to connections — however, it is unclear which ones apply to the R1 stage and if it is usable. This uncertainty discourages their use due to any risks of further delays to the connection process. [28]
- Uncertainty and risks remain in the R1 process despite AEMO initiatives:
    - Despite AEMO's work on improving the connections process, prescription in the NER would demonstrate market body commitment to ongoing improvement [29]

The CEC's rule change request proposed a set of solutions focused on getting more certainty and predictability into the process. The rule change request sets out the following proposed solutions:[30]

- Self-assessment:
    - Applicants would conduct a self-assessment where they would consider whether there are issues with the connection, impacts on the power system, the urgency of any solutions, and whether issues are caused by the applicant. Accordingly, the applicant then classifies their connection into a Type pathway (see below).[31]
- Type pathways:
    - There would be five Types a connection may fall under:
        - Type 0: No issues
        - Type 1: Minor issues within a materiality threshold
        - Type 2: Material discrepancies due to external changes to the power system
        - Type 3: Discrepancies which can be resolved at a later point in time
        - Type 4: Discrepancies which will require a plant redesign
    - The connection applicant would undertake a specific R1 process for the relevant Type they end up classified as.[32]
- Materiality guidelines:
    - A set of guidelines would be developed in cooperation between connection applicants, NSPs and AEMO. These guidelines would set out how to determine whether a material difference exists between the R1 submission and negotiated performance standards. It would inform the materiality threshold governing the assessment of Type pathways.[33]
- Timeframes to assess R1:
    - A new framework would be implemented that would clarify the R1 process. It would include prescription around AEMO and NSP responsibilities to assess the R1 submission.

27 CEC, rule change request, pp. 25-26.
28 CEC, rule change request, pp. 26-29.
29 CEC, rule change request, p. 29.
30 CEC, rule change request, pp.32-52.
31 CEC, rule change request, p. 35.
32 CEC, rule change request, pp. 38 – 51.
33 CEC, rule change request, pp. 39 – 43.

These relate to a time-limited process to identify and assess discrepancies in modelled behaviour compared to the negotiated performance standards.[34]

- Facilitated reviews:
  - Facilitated review would represent the first step to a dispute resolution in the event of R1 issues. Under this process, parties may engage a third party to facilitate discussions to reach a workable solution although this third party would not have authority to make binding resolutions. This process would also provide a mechanism to escalate internally within the applicant, NSPs and AEMO as well as obligate them to engage in the process. [35]

1.3.2 The consultation paper

The Commission published a consultation paper on 17 August 2023[36] that sought stakeholder feedback on the issues and solutions proposed in the rule change request. The Commission received 28 submissions to the consultation paper, with feedback from generators being generally supportive of the intent behind the CEC's rule change request. While supportive of the intent, generators did not support elements of the rule change request's solutions most often citing concerns with implementation. Conversely, NSPs were generally not supportive of the rule change request and expressed concern about whether the right issues had been identified. They also had concern that the solutions proposed would likely add costs and delays to the overall connection process. AEMO's feedback supported certain elements, but similarly raised concerns with the proposals in the rule change request and noted some issues may not be best addressed through regulatory measures.[37]

Stakeholders raised the following concerns with the elements of the solution proposed in the CEC's rule change request:

- a materiality threshold framework would be difficult to define and implement as it would be strongly dependent on the technology used, locational factors and the size of the connection[38]
- the proposed self-assessment framework would introduce an additional layer of process and defined pathways, which may cause inflexibility and lengthen the connection process, particularly where disputes arise from the interpretation of materiality[39]
- prescription around set timeframes for the assessment of the R1 submission does not appropriately recognise the iterative nature of the assessment procedure[40]
- facilitated review may provide little additional value, as dialogue between NSPs, AEMO and applicants currently happens, and there may not be meaningful improvements over the current dialogue if there is no authority for binding resolutions given to the third party.[41]

The R1 project team has also held two Technical Working Group (TWG) meetings in November 2023 and January 2024 which focused on the issues raised with the R1 process and the potential solutions to address the problem. Stakeholder discussions in the TWG elaborated on and reached a general consensus on the issues and how best to address them..

34 CEC, rule change request, pp. 36-38.

35 CEC, rule change request, pp. 51 – 52.

36 See https://www.aemc.gov.au/sites/default/files/2023-08/Enhancing%20investment%20certainty%20in%20the%20R1%20process%20-%20Consultation%20paper%20-%20rule%20change%20-%2017%20Aug%202023.pdf.

37 AEMO, submission to the consultation paper, p. 1.

38 Submissions to the consultation paper: ENA, p. 5; AGL, p. 3; AusNet, p.8; Essential Energy, p. 5; Acciona, p. 9.

39 Submissions to the consultation paper: Tesla, p. 2; Transgrid, p. 2; Stanwell, p. 3, AusNet, p. 8.

40 Submissions to the consultation paper: Origin, p. 4; AEMO, p. 6; AusNet, p. 9.

41 Submissions to the consultation paper: AEMO, p. 12, Transgrid, p. 11; AER, p. 3; Acciona, p. 6.

Stakeholders also described issues contributing to delays in connections that exist outside the scope of this rule change process: for example, the power systems' skills shortages, issues as we learn how to implement a high penetration of inverter-based resources (IBR), supply chain delays and social license challenges. The Commission recognises these issues as important to the transition and has considered this context when deliberating on the design of the draft rule. For instance, making sure the work undertaken at the R1 stage of the connections process is appropriately targeted to make the best use of limited resources.

1.4 The Commission has made a draft preferable rule that has taken into account stakeholder feedback

In response to the issues raised by the CEC in its rule change request and the feedback from stakeholders, the Commission has developed a draft rule that seeks to address the problems raised, but which consists of alternative solutions. These solutions were developed closely with stakeholders, including the members of the technical working group, the CEC, NSPs and AEMO, and balances improving the speed and clarity of the process with the importance of maintaining power system due diligence. Given the scale of transition underway, and the amount of generation that we need to connect, in order to achieve this the draft rule recognises that we need to shift some of the risk associated with connections from connecting parties to networks.

The draft rule consists of the following three key components:

- Section 1.4.1 — Requesting written justification to address gaps in the R1 process relating to information provision and guidance
- Section 1.4.2 — Removing barriers to pragmatic revisions of the generator performance standards (GPS)
- Section 1.4.3 — Codifying obligations for NSP responsiveness, and the start and end of R1 technical due diligence

1.4.1 Requests for written justification

The CEC's rule change request and stakeholder feedback identified an information asymmetry between connecting applicants on the one hand, and NSPs and AEMO on the other. The more preferable draft rule would provide the ability for applicants to request AEMO and NSPs to provide written justification when they have requested additional engineering work.

The Commission considers the role of NSPs and AEMO in the connection process as important to the healthy operation of the NEM and their obligations to maintain a secure power system. While NSPs and AEMO would maintain their roles and responsibilities in the connection process, this new clause would introduce additional accountability in decision-making. It would also help to guide the industry's learning around the issues AEMO and NSPs are facing around the operability of low carbon power systems.

To further address knowledge gaps about how AEMO and NSPs assess system security risks, the Commission has included a recommendation that AEMO continue its work to provide more guidance at the R1 stage of the connection process.

Further information is provided in chapter 3.

1.4.2 Removal of prescriptive barriers to renegotiating performance standards

The CEC's rule change request suggests that there is an inability to adjust performance standards downwards during renegotiation of the GPS through clause 5.3.9 of the NER, which frequently

occurs at the R1 stage of connection. The rule change request and stakeholders express this is due to NER clause 5.3.4A(b)(1A) being unclear.

The Commission considers there to be an opportunity to update the clause to allow for pragmatic revisions to the GPS given it is as close as practicable to the negotiated performance standard. The Commission considers the following principles of the negotiated access standards would still apply:

- it be set at a level that will not adversely affect power system security
- it be set at a level that will not adversely affect the quality of supply for other Network Users
- it in respect of generating plant, meet the requirements applicable to a negotiated access standard in Schedule 5.2

The Commission notes that the original intent of clause 5.3.4A(b)(1A) was not to hamper renegotiation of performance standards and the more preferable draft rule would seek to improve the regulatory process, encouraging more innovative and cost effective solutions at the R1 stage of the connection process.

Further information is provided in chapter 4.

1.4.3 Codification of the R1 process

Currently, there is little prescription in the NER to guide the R1 assessment process for connecting generators. This gap is understood to be causing a degree of uncertainty that has been brought to light in the context of the rising number of connections to the NEM. The change the Commission is proposing is to provide some more clarity about the process and more formality around reaching milestones (such as when the process starts and finishes).

The Commission is seeking to close this gap by establishing a formalisation of the process in the NER to require the NSP:

- and AEMO to provide notice to the applicant at completion of the R1 assessment
- to provide notice to AEMO and the applicant following receipt of a complete R1 submission
- to respond to a request for written justification from the applicant.

Further information is provided in chapter 5.

1.5 The industry is progressing workstreams to address issues in the R1 framework

As highlighted in the rule change request, there are ongoing reforms in the connections space. The Commission has sought to align the draft determination and more preferable draft rule with these ongoing and upcoming reforms.

The Commission notes the following work by AEMO to assist in the connections process:

- AEMO has updated its connection scorecard to provide participants a new level of useful project details.[42]
- AEMO has completed Access Standards Review under NER clause 5.2.6A, and will shortly be submitting rule change requests to action its recommendations to the AEMC for consideration.[43]

42 See AEMO's Connections Scorecards.

43 See AEMO review of technical requirements for connection (NER clause 5.2.6A).

- AEMO notes in its Q2 2023 QED report that is making proactive efforts to engage early with developers, OEMs and NSPs to collaborate across the connection process.[44]
- AEMO has plans to update guidance documents (including the access standard assessment guidelines) to reflect outcomes of connections reform initiatives including the CRI's NER 5.3.9 review.

AEMO and the CEC, with industry, are also collaborating through the Connections Reform Initiative (CRI)[45] with the following workstreams:

- OEM Data and Modelling explores opportunities to improve the quality of data and models provided by OEMs to fast-track repeat use.
- Guidance on the use of root-mean-square (RMS) and electromagnetic transience (EMT) tools seek to clarify the appropriateness of the use of RMS and EMT tools to assess performance.
- The Streamlined Connection Process (SCP) is a collection of works that seeks to improve the connection process. It includes batching and a program of trials for connecting participants. It is expected that work under the SCP will produce valuable learnings for broader connections.
- Review of the 5.3.9 Rule that looks to identify improvements that will address stakeholder concerns. The rule change request notes that these provisions for collective generator retuning are reforms still being considered under the CRI.

The Commission has also received a rule change request submitted by the AER to expand the transmission ring-fencing framework and published a draft determination on 22 February 2024.[46] The draft rule for the transmission ring-fencing framework seeks to empower the AER to impose ring-fencing obligations on TNSPs in respect of negotiated transmission services through its Transmission Ring-fencing Guidelines. This would support effective competition in the market for contestable connection services to meet the substantial increase in demand for connection services from renewable and storage developments, driven by the energy transition. Feedback on that draft rule is due 4 April 2024.

The Commission considers that the draft rule set out in this determination aligns with these broader reforms.

44 See Quarterly Energy Dynamics Q2 2023.
45 See AEMO's page on the Connections Reform Initiative.
46 See the *Expanding the transmission ring-fencing framework* project page.

2 The draft preferable rule would contribute to the national energy objectives

The draft rule would promote the NEO because it would clarify the obligations of parties in the R1 connection process and promote transparency around decision-making. It would promote power system security through principles of good regulatory practice and contribute to the timely decarbonisation of the energy market.

This chapter explains why the Commission has made its draft determination and the accompanying draft rule. It comprises the following sections:

- Section 2.2 — The Commission must act in the long-term interests of energy consumers
- Section 2.3 — We must also take these factors into account
- Section 2.3 — How we have applied the legal framework to our decision
- Section 2.4 — How the more preferable draft rule will better contribute to the NEO than the solution proposed by the CEC

2.1 The Commission must act in the long-term interests of energy consumers

The Commission can only make a rule if it is satisfied that the rule will or is likely to contribute to the achievement of the relevant energy objectives.[47] For this rule change, the relevant energy objective(s) is the NEO.

The NEO is:[48]

> 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; and
>
> (c) the achievement of targets set by a participating jurisdiction—
>
> (i) for reducing Australia's greenhouse gas emissions; or
>
> (ii) that are likely to contribute to reducing Australia's greenhouse gas emissions.

The targets statement, available on the AEMC website, lists the emissions reduction targets to be considered, as a minimum, in having regard to the NEO.[49]

2.2 We must also take these factors into account

2.2.1 We have considered whether to make a more preferable rule

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

47 Section 88(1) of the NEL.
48 Section 7 of the NEL.
49 Section 32A(5) of the NEL.

rule change request, the more preferable rule is likely to better contribute to the achievement of the NEO.[50]

For this rule change, the Commission has made a more preferable draft rule. The reasons are set out in section 2.4 below.

2.2.2 We have considered how the rule would apply in the Northern Territory

In developing the draft rule, the Commission has considered how it should apply to the Northern Territory according to the following questions:

- Should the NEO test include the Northern Territory electricity systems? For this rule change request, the Commission has determined that the reference to the "national electricity system" in the NEO includes the local electricity systems in the Northern Territory and the national electricity system.
- Should the rule be different in the Northern Territory?

The Commission has determined that the rules will not apply to the Northern Territory, as the relevant clauses in the NT Rules are not in effect.

See appendix C for more detail on the legal requirements for our decision.

2.3 How we have applied the framework to our decision

The Commission must consider how to address deficiencies in the NER regarding how the R1 package is defined, assessed and determined against the legal framework. The Commission has undertaken a comparative evaluation of the proposals in the CEC's rule change request and those put forth by the Commission in the more preferable draft rule.

We identified the following criteria to assess whether the draft rule is likely to better contribute to achieving the NEO:[51]

- **Safety, security and reliability** — the operational security of the power system depends on whether connecting plant and equipment would be able to operate with the agreed technical limits, operate safely and not present significant system security risks. This criterion was selected to consider the safe, reliable, and secure operation of the power system at least cost (see section 2.4.1).
- **Emissions reduction** — the market and regulatory arrangements for grid connections should efficiently contribute to the achievement of government targets for reducing Australia's greenhouse gas emissions. This criterion was selected as the efficiency of the connections process can have an impact on timely connection of renewable energy generation and storage to the power system (see section 2.4.2).
- **Innovation and flexibility** — we selected this criterion as we consider innovation and flexibility important principles for resolving delays in the R1 process. This is both from the perspective of process innovations and innovations in finding solutions to system security issues uncovered through the R1 process (see section 2.4.2).
- **Principles of good regulatory practice** — the market and regulatory arrangements for grid connections should promote transparency and be predictable, so that market participants can make informed and efficient investment and operational decisions. We selected this criterion to assess how the more preferable draft rule would impact stakeholders (see section 2.4.4).

50 Section 91A of the NEL.

51 This NEO assessment criteria expands on those identified in our consultation paper.

- **Implementation considerations** — the cost and complexity of implementation and ongoing regulatory and administrative costs to all market participants, consumers and market bodies must be balanced. This criterion was selected as we want to assess how the draft rule would impact simplicity, transparency and predictability in the R1 due diligence negotiations process (section 2.4.5).

These assessment criteria reflect the key potential impacts of the more preferable draft rule within the scope of the NEO.

The Commission has undertaken a regulatory impact analysis to evaluate the impacts of the various policy options against the assessment criteria. Appendix B outlines the methodology of the regulatory impact analysis.

The rest of this section explains why the more preferable draft rule best promotes the long-term interest of consumers when compared to other options and assessed against the criteria.

2.4 How the more preferable draft rule will better contribute to the NEO

The CEC's rule change request identified a series of issues experienced in the R1 connection process, and proposed several solutions to address these issues. We received valuable feedback from stakeholders in response to our consultation paper, which led to the Commission proposing alternative solutions through the draft rule that both addresses the issues raised by the CEC and better advances the NEO than the proposed solutions in the rule change. Our alternative solutions:

- address gaps in the R1 process relating to information provision and guidance
- remove barriers to pragmatic revisions of generator performance standards
- promote greater transparency and responsiveness in connections negotiations
- seek to address the issues raised by stakeholders.

This section sets out how the draft rule promotes the NEO assessment criteria set out above in section 2.3.

2.4.1 Enabling more transparent analyses of risks to power system security

The R1 due diligence process is an essential step that NSP's and AEMO undertake to ensure connecting parties deliver technical performance that is consistent with their connection agreement. NSPs and AEMO work collaboratively with connecting parties to complete these due diligence assessments within broadly predictable timeframes.[52] This R1 due diligence process ends with AEMO determining that the plant can meet or exceed its performance standards, and subsequently registering the generator.

The R1 models, which form part of the R1 package, are typically prepared as connecting parties finalise their plant design and begin construction. The R1 models that are submitted at this stage generally indicate are different to the performance standards that were agreed in the connection agreement. In most instances, these discrepancies are managed through additional inverter tuning or modelling clarifications discussed with the NSP and/or AEMO.

Occasionally, there are disagreements between NSPs and/or AEMO on the one hand and connecting parties on the other, regarding how material a discrepancy will be for power system stability, and whether that issue needs to be resolved before the plant is registered.[53] The Commission has heard that getting agreement on materiality and resolving NSPs and AEMO's

52 For more information, see the AEMC consultation paper, pp. 17-20.

53 Acciona Energia, submission to the consultation paper, p. 4.

concerns would be time-consuming and require extensive engineering hours for what is considered to be marginal benefit.[54]

The CEC's rule change request aimed to address all three issues by requiring AEMO to develop materiality guidelines. The CEC proposed that these materiality guidelines would help establish consensus across the industry on the types of discrepancies that are likely to have a 'material' impact on power system security or power quality for other users. Depending on the materiality of the issue identified in the R1 model), generators and NSPs would agree on a Type pathway that would determine how quickly the plant would be registered or what additional steps NSPs or generators would need to complete. Where NSPs and generators are not able to agree on a Type pathway or materiality, the CEC proposed a facilitated review mechanism led by an independent third party, whose decisions would not be binding on the connecting parties.

The Commission's consultation has revealed that disagreements at the R1 stage are driven by three factors:

- the experience of the connecting engineers
- the quality of the R1 package (which includes modelling data and information) and
- generators not being able to interrogate NSP power system models.

The draft rule would support faster system security analyses by supporting better quality R1 submissions and providing generators a way to interrogate why additional analyses are required to address a system security risk.

The Commission considers that given the above the CEC's proposed materiality guideline is likely to be difficult to agree, and the Type pathways would constrain the flexibility all connecting parties need to collaboratively negotiate a solution at the lowest cost.

In addition, the facilitated review mechanism is also unlikely to support faster of disputes in the connections process given the existing Independent Engineer framework already provides this service but is scarcely used. The Commission considers that the third party facilitated review model proposed by the CEC is unlikely to provide faster dispute resolution as it would be very challenging to identify a reviewer with the system design expertise needed to lead such a review, and for that person to understand, within a reasonable time period, all the issues that have been discussed between connecting parties over a lengthy negotiations process.

Instead, the draft rule would allow generators to gain a better understanding of the system security risks AEMO and NSPs are focusing on. It would achieve this by:

- requiring NSPs and AEMO to communicate to the generator when it has provided enough information to enable the commencement of their R1 due diligence activities, thereby clarifying what constitutes the minimum requirements for a complete R1 submission[55]
- introducing a new clause that would enable generators to request additional justification on the power system security risks AEMO and NSPs would like addressed through requests for additional modelling or inverter tuning.[56]

The changes in the draft rule would be supported by the work AEMO is doing to update its guidelines to provide industry more clarity on how they evaluate the risks to power system security through the connections process. Together, these changes would facilitate more transparency in

54 Goldwind, submission to the consultation paper, p. 3. This was also made clear by stakeholders during our technical working groups.
55 Clause 5.3.7A(a)-(c) of the draft rule.
56 Clause 5.3.7A(d) of the draft rule.

the identification of risks to power system security from a generator's technical performance and the best solutions to address those risks.

Further details on the Commission's view on the security benefits of the draft rule are available in chapter 3 *titled 'Addressing gaps in the R1 process relating to information provision and guidance.'*

While this draft rule seeks to respond to the issues raised by the CEC by promoting flexibility, the Commission has been conscious of ensuring power system security risks can still be appropriately managed by AEMO and NSPs. The draft rule would make it easier for parties to agree pragmatic changes to performance standards. However, the Commission has sought to design the amendments in a way that will not have any adverse power system security risks.

Further details on the Commission's view on the security benefits of the draft rule are available in chapter 4 *titled 'Removing barriers to pragmatic revisions of GPS.'*

2.4.2 Promoting emissions reduction and the secure decarbonisation of the generation fleet

Our draft rule would help achieve Commonwealth and state government greenhouse gas emissions reduction and renewable energy targets, for example, the Commonwealth's 2030 target of 43% below 2005 levels, by supporting the timely delivery of new inverter-based renewable generation and storage by seeking to shift risks of connecting parties in the connection process and promoting clarity and transparency of arrangements.

The draft rule operates to improve transparency on issues identification and resolution in the R1 process and provide generators more clarity on when AEMO and NSPs due diligence will start and conclude. This will be critical to promoting investor confidence regarding when the project enters a new phase of construction and project delivery.

Further, by providing generators the option to request additional justification if they have already met their obligations to provide a reasonable negotiated access standard, the draft rule would reduce the number of engineering hours that are allocated to the R1 due diligence process, especially where the benefits of this effort is marginal. The ability to request justifications would introduce more accountability in decision-making and information requests made by AEMO and NSPs. This could reduce the circumstances that the Commission has heard about where engineering hours are being dedicated to achieving plant optimisation for no or only marginal benefit.[57]

By reducing the number of engineering hours that are allocated to optimisation of plant performance at the R1 due diligence phase, the draft rule would help ensure scarce engineering time can be allocated to other projects that are already in the connection phase. This in turn would promote the faster connection of renewables by enabling generators to get to the revenue generation and energisation stage faster, and also promote the efficiency of connection due diligence for other projects. Given the scale of transition underway, and the amount of generation that we need to connect, in order to achieve this there needs to be a shift of the risk associated with connections from connecting parties to networks.

We consider this approach would better achieve emissions reduction objectives by supporting speedier grid connections whilst maintaining system security, as compared to the approach outlined in the rule change request. As we heard in feedback from stakeholders, introducing the proposed Type pathways or materiality guidelines could lead to cascading issues throughout other connection phases, and be difficult to agree upon. Similarly, developing a third-party facilitated review process as proposed in the rule change request could be overly time-consuming,

57 Goldwind submission to consultation paper, p. 2.

expend significant engineering hours, and provide little benefit given there are three existing dispute resolution mechanisms contained within the NER.[58] Given these factors, the Commission considers these proposed solutions would delay the march toward emissions reduction, as they would have the effect of delaying connection of renewable plant to the grid.

Further details on the Commission's view on the benefits of the draft rule for decarbonisation are available in chapter 5 *titled 'New notifications and timeframes to promote clarity on the R1 process.'*

2.4.3 Maintaining flexibility and enabling innovation in resolving risks identified in the connections process

The Commission has found that flexibility and collaboration are critical to the success of the R1 due diligence process. This process aims to provide all parties confidence that the power system will perform in the way generators expect, that generators are able to provide a beneficial response that helps maintain system stability and generators can provide a response to return the system to a secure operating state after a disturbance. The R1 stage is a phase of the generator design phase that sees generators, NSPs and AEMO proactively address known risks and identify new issues emerging from the rapid developments of inverter technologies and the evolving dynamics of the power system. While the Commission has sought to introduce more accountability and clarity about the process, it has not wanted to jeopardise the benefits of the iterative process, by prescribing how the due diligence should be undertaken.

The Commission considered a proposal for more flexibility in the rule change request in the form of conditional approvals. Conditional approvals would have allowed registration to proceed, subject to minor issues being addressed after the plant is registered. The Commission decided not to pursue that proposal because the rules do not currently preclude NSPs from providing conditional approval. The Commission has also found that it will be difficult to be definitive about what issues are sufficiently minor and should be subject to conditional approval, for the same reasons that it is difficult to be definitive about the concept of materiality as set out in the CEC's proposal.

The Commission's draft rule makes an amendment to the no less onerous clause in NER 5.3.4A(b)(1A). The proposed change balances three needs. These are to:

1. provide a way for generators to more easily and quickly agree small, pragmatic amendments to GPS that are often unavoidable
2. reduce the average length of the connections process overall by protecting nearby generators at the connection application stage from having to redo their modelling, because a generator at the R1 stage has made a large GPS change
3. provide an incentive to employ grid forming technologies at an existing site, as these investments are sometimes impeded because they require large GPS changes that take a long time to negotiate.

The Commission has found that GPS changes at the R1 stage are often unavoidable. This is because certain aspects of a plant's detailed design are unknowable at the application stage — that is, before construction has started.[59] These GPS changes often do not have any power system security or power quality impact, but we understand consume a large amount of engineering hours because the rules currently strictly prohibit any changes below the standard executed in the generator's connection agreement.

58 Submissions to the consultation paper: AGL, p. 3; Transgrid, p. 11; AEMO, p. 6.

59 For example, reticulation impedance is only revealed after site works.

The current rule does not allow any GPS amendment below the standard that has been executed in the generator's connection agreement. Changing one clause often requires generators to renegotiate all of the GPS clauses in their connection agreement. The draft rule would amend the no less onerous clause and promote more innovation and flexibility by allowing GPS amendments below the existing standard, as long as the amendment is 'as close as practicable' to the existing standard, 'unless otherwise agreed'.[60]

The draft rule would require changes to GPS to be as close as practicable to the existing standard to protect other nearby generators at earlier stages of connection negotiations from having to redo their modelling analyses, because a nearby generator at the R1 stage has made large GPS changes that they had not accounted for. As such, this draft rule would create a necessary disincentive for a generator from seeking large GPS changes, unless that generator is changing their inverter type from grid-following (GFL) to grid-forming (GFM).

Finally, the draft rule would provide generators the flexibility to seek larger GPS changes when they are replacing, upgrading or installing a GFM device in place of a GFL. Grid forming inverters often have technical characteristics that are closer to the minimum access standard rather than the automatic. As the rules currently require generators to explain why they cannot meet the automatic access standard (AAS), agreeing GPS changes to install a GFM inverter can be lengthy and inefficiently consume a large number of scarce engineering hours. The draft rule would promote innovation by allowing a connecting generator to seek an NSPs agreement to make larger GPS changes if they are installing a GFM inverter at an existing generation facility.

In comparison, the proposals in the rule change request, particularly the Type pathways, would likely not support the flexibility that all connecting parties need to identify the lowest cost ways of resolving system security issues. For instance, the rule change proposed that NSPs should receive regulatory approval for a cost pass through from the AER to progress collective retuning.[61] This approach may crowd out more efficient, generator-led solutions to resolve system security issues. Another example involves the proposed Type pathways. If implemented, Type pathways could limit flexibility and innovation as each Type category would require industry to standardise the R1 assessment process within a matrix of technical and non-technical solutions. We understand this would be a complex process, as indicated during AEMO's recent review of technical requirements.[62] Further, such standardisation would likely become too rigid and inflexible, and end up being discarded as a result of the nuances within each connection project rendering a limited set of standards as unusable.[63]

Further details on the Commission's view on how the draft rule would support flexibility and innovation are available in chapter 4 *titled 'Removing barriers to pragmatic revisions of the GPS.'*

2.4.4 Aligning with the principles of good regulatory practice

The Commission has determined that the risks that NSPs, AEMO and generators try to identify and resolve collaboratively through the R1 process are highly uncertain. This means that they are not easy to codify as was proposed in the rule change request by the CEC.

Based on the feedback from stakeholders, the Commission considers that implementing the rule change request's proposed materiality guidelines, type pathways and the statutory timeframe for

60 Clause 5.3.4A(1A) of the draft rule.
61 CEC rule change request, p. 47.
62 See AEMO's review of technical requirements for connection (NER clause 5.2.6A) here.
63 AusNet submission to the consultation paper, p. 2.

delivering an outcome for R1 due diligence in the rules, would not be consistent with good regulatory practice. There are four reasons for this view:

1. the rapidly evolving physics that underpin the operation of the power system means that any guideline seeking to define material issues will not be robust or durable to changing conditions,
2. the commercially sensitive nature of OEM technologies prevents third parties from completely understanding why a certain inverter technology behaves as it does under given power system conditions,
3. it is very difficult to definitively attribute a power system security risk identified in modelling analyses is most efficiently resolved through an NSP or a generator investment. Moreover, where a network investment is needed it is not practical for a connecting generator to be held up until the network investment is made,
4. the highly variable quality of R1 packages that is submitted to NSPs for consideration, has a large impact on the overall time taken for completing due diligence assessments.

The Commission accepts that the R1 phase of connections negotiations needs to be codified in the rules to provide investors certainty regarding when the R1 due diligence phase begins and when it ends. However, the draft rule would not prescriptively define how the R1 due diligence assessments should be undertaken, as the Commission concludes that the rules should support engineering judgement.

The draft rule would address the codification gap that exists in the Rules now by requiring AEMO and NSPs to acknowledge receipt of the R1 package, and jointly inform the generator that they have completed their due diligence assessment. Currently, the rules only require AEMO to endorse that the generator can meet or exceed its performance standards, despite NSPs playing a significant role in this due diligence process. The draft rule change is consistent with good regulatory practice because it seeks a balanced outcome between prescription for clarity on the process, and enabling greater flexibility to maintain collaboration and innovation through the R1 due diligence process.

Further details on the Commission's view on how the draft rule promotes good regulatory practice is in chapter 5 *titled 'New notifications and timeframes to promote clarity on the R1 process.'*

2.4.5 Rule would come into effect immediately to promote faster, easier and more transparent connections process

The Commission proposes that the draft rule, if made, should come into effect immediately after the final determination (that is, within two weeks of publishing the final rule and determination). The solution we have proposed would address the issues raised by the CEC in its rule change request more quickly and more simply in comparison with the time that it would take to agree the details of the CEC's proposal.

The draft rule amendments would do so by easing the most pressing regulatory burdens facing industry. It would also reduce the engineering effort at the connections due diligence phase for generators, especially where the marginal benefits of additional effort is low, or not adequately justified by NSPs and/or AEMO.

3 Addressing gaps in the R1 process relating to information provision and guidance

In its rule change request, the CEC raised concern about an information gap in the existing guidance about the connections process. Through our stakeholder discussions, we have heard that connecting parties would like to have more clarity about:

- the assumptions and study methods that AEMO and NSPs expect to see in GPS submissions, and
- how AEMO and NSPs assess risks of 'adverse power system security' impacts and 'adverse power quality impacts on other network users'.

The CEC and various other stakeholders raised further concerns about an information asymmetry that may exist between connecting applicants on the one hand, and NSPs and AEMO on the other.[64]

Addressing this asymmetry is important to connecting parties because they consider that requests for continual improvements in plant performance without explanation can sometimes lead to delays and large design and plant layout changes at great cost and provide minimal system security benefits.[65]

Additional clarity would also benefit NSPs and AEMO as it would lead to better quality connection applications[66] and would support them in achieving their system security obligations under the NER.

The draft rule is seeking to address this aspect of the issue raised by the CEC in two ways:

- First, the draft rule amends the NER so that generators can request written justification from NSPs for additional modelling analyses required by NSPs or AEMO during the R1 process (see the right-hand side of Figure 1 for where this fits into the R1 process).
- Second, the Commission recommends that AEMO update its existing guidelines or produce new guidelines, to provide greater transparency and certainty for parties involved in the R1 stage of the connections process. The Commission is not including this in the draft rule because AEMO is already working with industry on new guidance to address the information gap in the R1 process. Given the work already being progressed, we consider that AEMO is best placed to consider how to do this whilst having regard to its existing documentation, without it being a formal rules requirement.[67]

Collectively, these changes aim to enhance collaboration between connecting parties through adding clarity and transparency around the R1 process, in turn reducing project delays. It also seeks to appropriately target resources at the R1 stage of the process, recognising that given the scale of transition underway, and the amount of generation that we need to connect, in order to achieve this risks associated with connections from connecting parties to networks.

This chapter comprises the following sections:

- Section 3.1 — The more preferable draft rule allows generators to request written justification from NSPs and AEMO for additional remodelling requests

64 CEC, rule change request, pp. 27, 35; AGL, submission to the consultation paper, p. 3.
65 CEC, rule change request, p. 3.
66 This includes the initial NER clause 5.3.4A stage.
67 See Table 3.1.

- Section 3.1.1 — Stakeholders identified an information asymmetry in the R1 process, leading to additional remodelling for marginal system security improvements
- Section 3.1.2 — The more preferable draft rule introduces obligations around the provision of information during the R1 process to promote principles of good regulatory practice
- Section 3.1.3 — Connecting parties expressed support for this more preferable draft rule and we have worked to address concerns from NSPs

- Section 3.2 — The Commission recommends that AEMO produce or update guidelines to promote transparency and clarity in the R1 process
  - Section 3.2.1 — The CEC's rule change request proposed a self-assessment and evaluation process supported by 'materiality' guidelines and conditional approval
  - Section 3.2.2 — There were diverse stakeholder views on the CEC's proposal to introduce self-assessment, Type pathways, materiality guidelines, and conditional approval
  - Section 3.2.3 — In addressing stakeholder feedback, AEMO's updated or new guidelines should clarify how adverse system security risks are assessed in the R1 process

3.1 The more preferable draft rule allows generators to request written justification from NSPs and AEMO for additional remodelling requests

Box 1: Summary of this section

The CEC and industry have identified there is an information asymmetry during the R1 process between connecting applicants on the one hand and NSPs and AEMO on the other, which the Commission agrees with.

The information asymmetry is discussed in the context of AEMO and NSPs' assessments being informed by commercially sensitive information. Further, it is discussed in the context of repeated remodelling requests that do not always lead to substantively improved system security or power quality outcomes.

The Commission has made a draft rule to address these concerns. The draft rule:

- codifies commencement of the R1 process following execution of the connection agreement
- enables NSPs to request additional data and information from a generator applicant when the R1 package has been received
- enables connection applicants to request written justification from the NSP for this additional data or information request, provided certain conditions are met
- requires NSPs to respond to this request for written justification or notify the NSP it has not met the conditions for requesting written justification, and
- requires the NSP to collaborate with AEMO and notify the applicant if the additional data or information has been requested by AEMO.

The draft rule amends the NER so that connecting parties can request written justification from NSPs for additional modelling analyses required by NSPs or AEMO during the R1 process, provided they have reasonably met all information provision obligations in the NER. While the CEC's rule change request did not specifically recommend this change to the NER, it did propose introducing a new NER clause for non-acceptance of an R1 model as follows:[68]

68 CEC, rule change request, p. 62.

If additional information is requested from the applicant, the NSP should outline in its report the expected cost and time delay, justified against potential security risk identified by the applicant remodelling performance.

This draft rule operates to address the point in the R1 process whereby an applicant has submitted its R1 package that includes modelling data and information, and is being assessed by the NSP and AEMO to determine whether market registration should be approved.[69] It is during this stage that there are typically two key concerns:

- first, there is an information asymmetry experienced during this process as network data held by NSPs and AEMO can be commercially sensitive, thus presenting a barrier to proponents when attempting to meaningfully discern potential remedies to system security issues identified at this stage, and
- second, when applicants are required to provide additional modelling analyses during this stage, this often leads to minimal or no system security improvements. As a consequence, applicants incur significant costs in producing this remodelling and purchasing additional equipment to remedy the system security risk.

The Commission agrees that these issues cloud transparency in the R1 process and can contribute to delays in the speed of grid connections. Therefore, this draft rule aims to provide clarity and transparency to proponents by allowing them to request written justification for remodelling requests that pinpoint the system security issues required to be addressed. The Commission has balanced this more preferable draft rule against the system security responsibilities held by AEMO and NSPs to advance the NEO components of safety, security and reliability.

3.1.1 Stakeholders identified an information asymmetry in the R1 process, leading to additional remodelling for marginal system security improvements

The CEC's rule change request noted that during the R1 process, connecting generators are often required to produce additional modelling packages or engage in retuning exercises to address potential security or power quality issues identified by NSPs or AEMO.[70] This issue was supported by stakeholders in submissions to our consultation paper, where it was stated that renegotiating performance standards is not in itself the key issue. Rather, the issue stems from an information asymmetry as data and authority on network and system security analysis are held by NSPs and AEMO that are commercially sensitive. This in turn presents a barrier for the proponent to meaningfully discern any remedies to system security risks.[71]

NSPs' and AEMO's R1 assessment is informed by commercially sensitive information

To inform their assessment of a generator's R1 package, NSPs and maintain wide-area network models (in PSSE and PSCAD) that incorporate the design and technical performance of one generator's plant and other electrically proximate generating plant. AEMO and NSPs maintain separate wide-area network models that inform their due diligence assessment at the R1 stage, but connecting parties do not have transparency on whether these models concur with each other or otherwise.[72]

69 NER clause 2.2.1(e)(3); 5.3.4A. See also section 1.2 of this draft determination, which provides a summary of what constitutes the R1 package.
70 CEC, rule change request, p. 39.
71 AGL submission to the consultation paper, p. 2; Vestas submission to the consultation paper, p. 3.
72 See AEMO's Access Standard Assessment Guide.

More generally, these models are not made available to connecting parties at any stage of the connection or post-registration process. This is because these models contain commercially sensitive information on the design of inverter-based technologies that connecting parties do not want disclosed to third parties.[73] AGL and Origin have advised us that this lack of transparency leads to parties not being able to identify the root causes of system security issues, which in turn leads to these parties not being able to efficiently identify remedies.[74]

Connecting parties have generally accepted that it may not be appropriate for NSPs and AEMO to provide access to these commercially sensitive models.[75] To that end, the draft rule does not operate to require AEMO or NSPs to provide access to such modelling or data. AEMO and NSPs such as Transgrid have noted that AEMO's Connection Simulator Tool can help a connecting party understand the issues arising from interactions between their plant and other existing or committed, and electrically proximate generators or storage.[76] However, we have heard from proponents during our technical working groups that AEMO's Connection Simulation Tool, while useful, is in its nascent phase and does not currently go far enough in providing clarity on system security issues to be resolved. Further, given the NER is silent on what information ought to be provided when requesting additional remodelling, clarity is needed to support AEMO and NSPs in meeting their system security obligations while approving modelling and market registration.

Remodelling does not always lead to substantively improved system security or power quality outcomes

According to many connection applicants and as identified in the CEC's rule change request, another key issue in the current R1 process is that applicants are responsible for external changes to system security that are beyond their control.[77] Remodelling in response to these external changes causes significant project delays and can lead to large costs being incurred by proponents who are subsequently required to purchase additional equipment to satisfy NSPs and AEMO that system security requirements are being met.[78] Further, the CEC considers that such remodelling often leads to minimal or no system security improvements.[79]

3.1.2 The more preferable draft rule introduces obligations around the provision of information during the R1 process to promote principles of good regulatory practice

Considering the issues identified above, the Commission has developed the draft rule. NER clauses 5.3.4A(g) and 5.3.4B(m) are existing clauses that specify NSPs must provide reasons to applicants for a rejection of a negotiated performance or system strength remediation scheme. This draft rule recognises a similar dialogue occurs at R1 and should therefore similarly require justification to be provided. As such, it amends the NER to codify:

- the commencement of the R1 process following execution of the connection agreement[80]
- the ability for NSPs to request additional data and information from a generator applicant when the R1 package has been received.[81] This enables NSPs and AEMO to assess and

73 Submissions to the consultation paper: AusNet, p. 1; AGL, p. 2; ASMC, p. 4.
74 Submissions to consultation paper: AGL, p. 3; Origin, p. 2; Shell Energy, p. 2.
75 Submissions to consultation paper: Origin, p. 3; Vestas, p. 3.
76 Submissions to consultation paper: Transgrid, p 7; AEMO, p. 1. See also AEMO's Connections Simulation Tool.
77 CEC, rule change request, p 18; Consultation paper, p 24; Shell Energy submission to the consultation paper p 4; AGL submission to the consultation paper, p 3.
78 Submissions to the consultation paper: Shell Energy, p. 4; Enel Green Energy Power, p. 2.
79 CEC, rule change request, p. 39.
80 See clause 5.3.7A(a) of the draft rule. See also Chapter 5, which provides further detail on this draft rule.
81 See clause 5.3.7A(c) of the draft rule.

determine whether the generator plant meets the relevant performance standards and satisfies network security obligations.

When an NSP or AEMO requests this additional information or data during this R1 process, generator applicants may request that the NSP or AEMO provides written justification to clarify the system security issue(s) identified. An applicant may only make this request when it has:

- provided the NSP with adequate data and information to enable the NSP or AEMO to assess the capability of the generating system to meet or exceed its performance standards
- where the applicant has submitted a proposal for a negotiated access standard in accordance with clause 5.3.4A(b1), provided to the NSP reasons and evidence for the proposed NAS in accordance with clause 5.3.4A(b2)
- otherwise complied with its obligations under rules 5.2A, 5.3 and 5.3A to provide data and information.[82]

Within a reasonable period after having received a request for written justification, the NSP or AEMO would be required to:

- notify the applicant if it has not complied with the requirements under draft NER clause 5.3.7A(d)(1)-(3), and provide details about the non-compliance, and
- if the applicant has complied with the requirements within draft NER clause 5.3.7A(d)(1)-(3), the NSP must provide the applicant with reasons for the request in writing, with reference to NER schedules 5.2, 5.3 or 5.3a.[83]

We have not specified in the draft rule the form in which written justification must be provided by the NSP or AEMO to the applicant. We acknowledge that this detail may be provided in various written forms, such as through a letter or issues tracker recorded in an Excel document.[84] Further, we have not prescribed a time limit for the NSP or AEMO to provide written justification upon request from an applicant as this may interfere with the iterative and collaborative R1 process.

The Commission intends that this draft rule would foster specificity from NSPs and AEMO on system security issues, while ensuring applicants are equipped to design better solutions for system security risks at least cost.

3.1.3 Generators expressed support for this more preferable draft rule and we have worked to address concerns from NSPs

Connecting parties supported this proposal when it was discussed in the technical working group as it adds clarity to remodelling requests, especially when these have substantial impacts on plant design and layout. Some of the feedback noted that this solution would help connecting parties focus on key system security risks, clarify the required remediation if needed, and offer transparency around this iterative process.

Conversely, NSPs were concerned that this would work against the iterative nature of the R1 due diligence process, and thereby further lengthen the negotiation process. NSPs were concerned they would be required to provide written justification to a connecting applicant in circumstances where they receive a sub-standard proposal. We have worked to address these concerns by ensuring the draft rule would require the applicant to have provided NSPs and AEMO with

82 See clause 5.3.7A(d)(1)-(3) of the draft rule.
83 See clause 5.3.7A(e)-(f) of the draft rule.
84 Citipower, submission to the consultation paper, p. 3.

adequate data and information (including when the applicant has submitted a proposal for a NAS), and otherwise complied with its Chapter 5 NER obligations.[85]

The Commission further identifies that where any information gaps may persist following these changes, this can be addressed in AEMO's updated or new guidelines on the R1 process.[86]

The draft rule has been developed in this way to give effect to the NEO principles of good regulatory practice and to improve transparency around the R1 process for generator proponents, NSPs and AEMO. Further, this draft rule promotes timely emissions reduction through better-informed plant optimisation so that NSPs can manage system security at least cost.

3.2 The Commission recommends that AEMO produce or update guidelines to promote transparency and clarity in the R1 process

Box 2: Summary of this section

We have recommended that AEMO should continue its work to update or produce new guidelines to provide greater transparency and certainty for parties involved in the R1 stage of the connections process.

The Commission has made this recommendation to address the issue raised by the CEC and other stakeholders that there is a lack of clarity surrounding how AEMO and NSPs assess risks of 'adverse power system security' impacts and 'adverse power quality impacts on other network users'. This recommendation is an alternative to the CEC's proposal for materiality guidelines, which we consider would better balance flexibility and transparency in the R1 process, while being simpler to implement by building on existing processes.

The Commission understands that AEMO's intention is for these guidelines to clarify assumptions and study methods that AEMO and NSPs expect to see in GPS submissions, and provide more clarity on how AEMO and NSPs assess risks of 'adverse power system security' impacts and 'adverse power quality impacts on other network users' having regard to existing documentation. The Commission welcomes these continued improvements that are being achieved in collaboration with industry.

While, stakeholders generally acknowledge the need for the GPS and provisions that support the reliability and security of the network, the Commission has heard that they would like to have more certainty in the R1 process. This is primarily because, during the R1 process, connecting parties can form differing opinions on whether a deviation between the performance agreed under the negotiated access standard and the R1 stage is likely to have a 'material' impact on the power system.[87] For example, stakeholders have expressed views about:

- the existing approach engaged in by connecting parties being inadequate for dealing with the connection process that is subject to a range of scenarios and variations[88]

85 See clause 5.3.7A(d)(1)-(3) of the draft rule.
86 This is explored in section 3.2.3 below.
87 Consultation paper, p. 20; AGL, submission to the consultation paper, p. 1.
88 AGL submission to the consultation paper, p 4.

- proponents being required to demonstrate their GPS is compliant, rather than the NSP or AEMO having to establish that the GPS can actually adversely impact the reliability or security of the network[89]
- NSPs and AEMO's conservative interpretations of power system impacts that are generally regarded by those generators to be immaterial[90]
- inappropriate technical solutions being often required to resolve issues identified by NSPs or AEMO, leading to expensive technical solutions being implemented that have little or no benefit to the operation of the network[91]
- that the NER provides a barrier for AEMO to provide a generator with conditional approval, which involves approving an application to be registered subject to terms and conditions.[92]

In considering how best to address these concerns, the Commission reflected on the R1 process and how it is inherently challenging to prescribe and codify aspects of the process to reduce uncertainty. This is due to a number of reasons.

One reason is the nature of the R1 process itself which falls between the application and completion phases, whereby market registration is sought from the relevant NSP and AEMO.[93] However, we have heard from stakeholders that the precise point at which the R1 stage commences is subject to uncertainty. For instance, EnergyAustralia indicated that the NER does not specify the point in the connections process when the applicant should submit its R1 package to then be evaluated by the NSP and AEMO.[94]

Another reason for difficulties in providing certainty is due to the fact that the R1 stage involves detailed models and analyses from generator applicants that can vary from project to project. Each project can result in unique sets of issues being identified following AEMO and an NSP's assessment of R1 model data packages, against the modelling previously agreed to in the negotiated access standards (NAS).[95]

A further reason why the process is difficult to prescribe and provide certainty around is that the assessment process of the R1 modelling package depends on a three-way dialogue between applicants, NSPs and AEMO. This is an iterative and collaborative process that requires a flexible framework rather than detailed prescription.

Despite the inherent difficulties in providing detailed prescription of the process, the Commission considers that there are still opportunities to make improvements. For example, some prescription could be introduced to address uncertainties about roles and responsibilities. While the NER specifies that AEMO should be provided with registered planning data that conforms to Power System Model Guidelines and Data Sheet requirements.[96] This process is not codified, and as such, stakeholders are unclear about the obligations of parties responsible for evaluating connection applications, and how these obligations are carried out in practice.[97] For instance, there is confusion regarding who has the primary responsibility at this stage, given that AEMO has overarching responsibility for system security (and agreeing to the performance standards, which

89 ASMC submission to the consultation paper, 4.
90 For example, see Shell Energy submission to the consultation paper, p 5.
91 Shell Energy submission to the consultation paper, p 3.
92 CEC, rule change request, p 23.
93 See AEMO's NSP connection process diagram here.
94 EnergyAustralia, submission to the consultation paper, p. 2.
95 This assessment is completed to determine whether market registration should be approved: NER clause 2.2.1(e)(3); 5.3.4A.
96 NER cl. 2.2.1(e)(3) and S5.2.4(b). The CEC has advised us that sometimes the applicants submit their R1 model alongside their commissioning program, which includes test procedures, equipment that will be used in commissioning and when that information that will be submitted.
97 Enel Green Power, submission to the consultation paper, p. 1. Stakeholders noted that this often leads to experienced connecting parties having to rely on previous experience of the process to manage uncertainty. See APA Group's submission to the consultation paper, p. 6.

is part of AEMO's advisory functions), but NSPs have primary responsibility for negotiating performance standards in the connection agreement.[98]

3.2.1 The CEC's rule change request proposed a self-assessment and evaluation process supported by 'materiality' guidelines and conditional approval

In its rule change request, the CEC proposed a revision of the R1 process to address the above issues. Specifically, the CEC proposed that the R1 process would begin with the applicant performing a self-assessment accompanied by an 'R1 assessment report'. Self-assessment would involve selecting one of five Type pathways to identify any possible system security risks (see Box 3 on the CEC's proposed Type pathways).

The applicant's recommended Type pathway and relevant action (if needed) are intended to identify whether there is a discrepancy between the R1 modelling performance and the previously agreed negotiated access standard.[99] It would also identify whether this discrepancy would have a 'material' impact on the power system. 'Materiality', which the CEC recommends should be defined by AEMO, would be a critical new element of the R1 assessment process.[100]

Box 3: Type pathways proposed in the CEC's rule change request

To start the R1 process, the CEC proposed that applicants should perform a self-assessment that would be accompanied by an 'R1 assessment report'. The report would be supported by a suite of R1 modelling and design information and require:

- all parties to hold discussions and collaborate before the applicant's R1 self-assessment is submitted, and
- the applicant to provide advance notification informing NSPs and AEMO when its application and R1 self-assessment report will be submitted.

The CEC proposed that self-assessment would require proponents to compare the plant's performance against the negotiated access standard defined in NER clause 5.3.4A and recommend an action pathway to registration. The proposed pathways to registration would fall within one of five Type categories, aimed to clarify who is responsible for addressing any potential system issues:

- Type 0: all obligations under the negotiated access standard are met, requiring no action
- Type 1: there are non-material deviations between the R1 model and negotiated access standard and the R1 modelled plant capability should replace the original GPS.
- Type 2: there are material issues due to changes in the external network environment that should be addressed by NSPs.
- Type 3: there are minor issues and registration should be approved with conditions and a defined plan for meeting those conditions.
- Type 4: there are major issues that need to be rectified before registration.

These requirements were proposed by the CEC to promote thorough collaboration between the applicant, NSPs and AEMO, consequently allowing alignment on the necessary Type pathway.

98 CEC, rule change request, p. 22; submissions to the consultation paper: AGL, p. 1; ASMC, p. 4. See also chapter 4, which provides greater detail on negotiating performance standards pursuant to NER clause 5.3.4A.

99 NER clause 5.3.4A.

100 For further information on the CEC's proposed materiality guidelines, see our Consultation paper.

Source: CEC, rule change request, pp. 5-6.
Note: For more detailed information on the CEC's proposed Type pathways, see pages 21-26 of our consultation paper.

The next step proposed by the CEC involved requiring NSPs, in collaboration with AEMO, to evaluate the applicant's self-assessment to confirm whether they agree with the Type and action proposed. Should the NSP or AEMO not agree, they would be required to recommend reclassification of the R1 package based on the Type pathways with accompanying evidence. Following this, AEMO would be required to confirm the terms under which the applicant's plant is registered or reject the application.[101]

The purpose of this process and the guidelines would be to resolve issues associated with the applicant, the NSP and AEMO making different assumptions based on a changing power system.

Further, the CEC proposed that the NER should be amended to allow generation project proponents to be able to receive conditional approval from NSPs or AEMO, without resolution of all issues identified. This would be subject to the proponent satisfying both NSPs and AEMO that they have a clear plan for satisfactory resolution of issues identified in the conditional approval. Conditional approval would introduce flexibility when issues arise at the R1 stage, and such conditions under the CEC's proposal would be enforceable under the NER.[102] Further, in response to concerns raised by AEMO, the CEC indicated it does not consider that conditional approval should become the default approach for all parties.[103]

3.2.2 There were diverse stakeholder views on the CEC's proposal to introduce self-assessment, Type pathways, materiality guidelines, and conditional approval

Feedback in stakeholder submissions to the consultation paper were diverse. Most generators generally supported the intent behind the CEC's proposals for self-assessment, Type pathways, materiality guidelines and conditional approval, suggesting it could improve transparency.[104] However, several were concerned by certain details or the feasibility of these changes in practice. Conversely, while AEMO, NSPs and some generators acknowledged there are issues to be addressed, they tended to not support the CEC's proposals.[105] For instance, they thought that materiality would not be workable because the CEC's proposal depends on industry-wide agreement on what system security issues identified by modelling analyses are material, how these issues should be resolved, and who should face the costs of resolving that issue. It could also cause further delays in the connections process, given the difficulty in achieving consensus.[106] The section below details some of the concerns expressed in submissions to our consultation paper.

Materiality guidelines

- AEMO considers that guidelines would be useful, but noted that it would not be possible to define materiality in a way that applies across all connection points.[107] Similarly, AusNet noted that AEMO's recent review of technical requirements highlighted the complexity of reaching a consensus on the materiality of a generator's performance impact on the power system.[108]

101 AEMC, consultation paper, p. 27.
102 AEMC, consultation paper, p. iv; CEC, rule change request, p. 23.
103 See the CEC's submission to the consultation paper, p. 8, where they note AEMO's concerns regarding processes for ensuring compliance with the CEC's proposed conditional approval remediation plan.
104 Submission to the consultation paper: AGL, p. 3; APA, p. 5; Goldwind, p. 1.
105 For example, see Powerlink submission to the consultation paper, p. 1; Transgrid submission to the consultation paper, p 1; Citipower submission to the consultation paper, p. 1.
106 Enel Green Power submission to the consultation paper, p 3; Energy Networks Australia submission to the consultation paper, p. 5.
107 AEMO submission to consultation paper, p. 2.
108 AusNet submission to the consultation paper, p. 2.

- Definitively attributing the cause of a 'material' issue to one of the connecting parties will be difficult. As the applicant does not have access to wide-area network model, there is a possibility that AEMO/NSP's assessments would lead to different results and type characterisation.[109]
- Materiality guidelines may unduly interfere with an NSP's engineering assessments.[110]

Self-assessment and evaluation according to Type pathways

- Some stakeholders expressed concern that the categories were unduly complicated and overly prescriptive as it adds another step into the registration process and will require greater resources.[111]
- Requiring applicants to conduct a self-assessment without access to the necessary information and models presents significant challenges, as modelling packages contain commercially sensitive data and its not ordinarily provided.[112]
- The proposed self-assessment process implies that the complete R1 package should be submitted, which would require a self-assessment report, adding time and costs to the connection application.[113]
- The proposal limits or compromises the ability for NSPs to uphold their system security obligations under NER Chapters 4 and 5.[114]

Conditional approval

- Transgrid does not agree that the NER precludes conditional registration. Under the existing rules, Transgrid, in consultation with AEMO, already allows conditional registration with conditions to be met at defined timeframes during both commissioning or post-commissioning, where the circumstances are appropriate.[115]
- Conditional approvals can sometimes result in poor outcomes, such as 'non-functional R2 models', and may only defer resolution and therefore serve no real benefit. Further, codifying the ad hoc practice of conditional approvals could give rise to enforceability issues and adversely impact the power system or nearby IBR facilities.[116]
- Generators, AEMO and industry members generally supported the CEC's proposal.[117] For example, the Clean Energy Investment Group expressed that conditional approvals, where minor issues can be resolved post-approval, would significantly reduce delays and financial risks for both generators and investors.[118]
- Powerlink broadly supported the CEC's proposal to provide a flexible approach enabling proponents to receive conditional approval during the R1 modelling process, provided any outstanding issues would not prevent NSPs or AEMO from meeting system security requirements.[119]

109 Acciona Energia, submission to the consultation paper, p. 9.
110 Energy Queensland, p 5.
111 Submissions to the consultation paper: Shell Energy, p. 5; Essential Energy, p. 1; Transgrid, p. 3.
112 AusNet, submission to the consultation paper, p. 1.
113 Acciona Energia, submission to the consultation paper, p. 9.
114 Submissions to the consultation paper, AusNet, p. 2; CitiPower, p. 4.
115 Transgrid, submission to the consultation paper, pp. 6, 10.
116 Submissions to the consultation paper: AusNet, p. 9; Essential Energy, p. 6.
117 Tesla submission to the consultation paper, p 2; AEMO submission to the consultation paper, p 24 (who also expressed concerns to be addressed); APA Group submission to the consultation paper, p. 11.
118 Clean Energy Investment Group, submission to the consultation paper, p. 2.
119 Powerlink, submission to the consultation paper, p. 3.

3.2.3 In addressing stakeholder feedback, AEMO's updated or new guidelines should clarify how adverse system security risks are assessed in the R1 process

In light of the feedback received in submissions to our consultation paper, the Commission agrees that there is a gap in existing guidance that needs to be addressed.[120] While we support action to address this gap, we do not support the rule change proponent's suggestion for materiality guidelines and Type pathways for the following reasons:

- AEMO and the CRI are currently doing work that we consider will form part of the solution to the issues raised in the CEC's rule change request and by other stakeholders[121]
- prescribing materiality guidelines and Type pathways in the NER may crowd out outcomes from AEMO's Access Standards Review and unintentionally limit the flexibility and scope of existing guidelines[122]
- prescribing in the NER what materiality guidelines, or other AEMO guidelines on the connections process, should contain may require lengthy deliberation without consensus being achieved, and cause further delays within the connections queue.[123]

In addition, the Commission has considered the proposal for conditional approval and does not consider there is a barrier to addressing this in the NER. We have determined through our consultation process that:

- conditional registration can still continue as a discretionary practice, as is supported by AEMO and some NSPs[124]
- prescribing conditional registration in the rules would require providing a definition of what constitutes 'minor' compliance issues to be remedied at a later stage. These 'minor' issues would be difficult to define and be specific to locational circumstances and the changing nature of the grid. Further, this proposal replicates the issues that would be faced in defining 'materiality', such as being difficult to agree, and could be a time-intensive endeavour, further delaying the connections queue. We would also need to consider whether timeframes would be needed for resolution of issues remaining after receiving conditional approval, and it would be difficult to achieve consensus on these timeframes[125]

Based on these factors, the Commission considers that materiality guidelines, Type pathways and conditional approvals are not best placed to advance NEO principles. This is because the cost and complexity of implementation could further exacerbate the connections queue. Further, rigid prescription in this way could interfere with principles of good regulatory practice and introduce further uncertainty, subsequently compromising power system security.

120 For instance, AGL said in its submission to the consultation paper at pages 2-3 that 'it is imperative to establish a well-defined guideline that assesses the repercussions of alterations in the balance of plant and generating system components, such as inverters and Power Plant Controllers (PPC), on the overall system security. This guideline should encompass comprehensive procedures for evaluating and addressing these impacts to ensure the robustness of the system's security measures.'

121 See Figure 3.1.

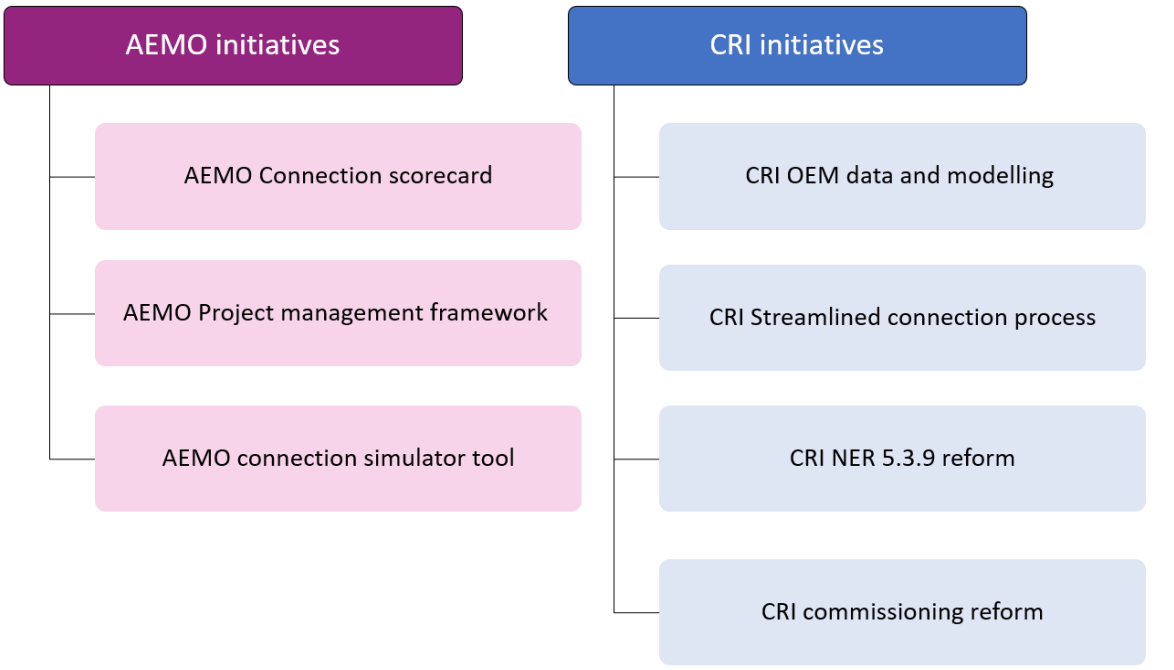
122 See: AEMO's submission to the consultation paper, p. 2; AEMO review of technical requirements for connection — National Electricity Rules Schedules 5.2,5.3 and 5.3a.

123 Submissions to the consultation paper: Enel Green Power, p. 3; Energy Networks Australia, p. 5.

124 See AEMO's submission to the consultation paper, p. 8; Powerlink submission to the consultation paper, p. 1.

125 Submissions to the consultation paper: Transgrid, p. 3; AusNet, p. 9 ; Essential Energy, p. 6.

Figure 3.1: Reform initiatives driven by AEMO and the CRI



Source: Illustration provided by AEMO

While current AEMO guidelines detail how it evaluates potential system security risks, there is an opportunity to provide greater clarity

As an alternative to the materiality guidelines, the Commission is recommending that AEMO continue to update its existing guidelines related to the connections process or produce new guidelines.

The Commission understands that AEMO's intention is for these guidelines to clarify assumptions and study methods that AEMO and NSPs expect to see in GPS submissions, and provide more clarity on how AEMO and NSPs assess risks of 'adverse power system security' impacts and 'adverse power quality impacts on other network users' having regard to its existing documentation (see Table 3.1). There is also an opportunity for AEMO to provide further guidance on conditional approval, such as when it may be granted, and how conditions ought to be addressed.

AEMO produces several guidelines (see Table 3.1) to help generators understand how it evaluates their compliance with the generator performance standards. These guidelines specify the requirements on generators to ensure that their models can be replicated by AEMO and NSPs, reflect how the plant will operate in practice, and how AEMO operates the power system to maintain operation within its technical envelope.

The guidelines allow NSPs and AEMO to exercise considerable engineering judgement to ensure that the generator's technical performance is optimised to the needs of the connecting location.[126] How this engineering judgement is exercised by AEMO and NSPs and to what extent is often unclear. However, we have heard from the industry that this engineering judgement is typically informed by factors such as:

126 AEMO, submission to consultation paper, p. 8.

- an NSP or AEMO connecting engineers' experience, which can give rise to conservative applicants of engineering judgement[127]
- how comprehensively a generator has documented their plant design, including any changes from the planning stage and the R1 stage, and the attendant power system security or power quality impact of these changes[128]
- changes to the network arising from generators reaching committed status as a generator is completing their R1 studies. This typically requires the generator to redo their studies to reflect the change to the network environment.[129]

AEMO has the opportunity to therefore continue developing new or updating existing guidelines on the R1 and broader connections process in collaboration with industry, whilst taking into account the feedback received in submissions to our consultation paper. AEMO's updated or new guidelines would address NEO principles concerning good regulatory practice, ensuring safety, security and reliability, and support emission reduction goals.

Table 3.1: Summary of AEMO guidelines relevant to the connections process

Guidelines	Description	Rules reference
Power System Model Guidelines	Specifies the information that connection applicants need to provide to AEMO and NSPs to allow the latter entities to develop models to evaluate the impact of the connecting generator on power system security and stability impacts.	Guideline specifically required and given power under S5.5.7(a)(3) of the NER.
Dynamic Model Acceptance Type Guideline	Explains how AEMO assesses the accuracy, consistency, and robustness of computer models used for power system analysis using PSSE and PSCAD.	
Access Standard Assessment Guide	Explains AEMO's requirements for information from Applicants and NSPs to facilitate assessment of AEMO advisory matters for new generator connections, alteration of existing generating systems, and assessments of compliance of generating systems with agreed performance standards including negotiated access standards.	Outline of rule requirement under NER 5.3.4A This document from AEMO is not required under the NER
Power System Security Guidelines	Describe how AEMO seeks to operate the power system within the limits of the technical envelope, how it meets its power system security responsibilities, and what information and/or actions it requests from registered participants to restore power system security.	Required under NER cl. 4.10.1 and form part of the power system operating procedures. These also include reclassification criteria for contingency events required under NER cl. 4.2.3B
Various NSP	Summarise expectations of modelling and	

127 Submissions to the consultation paper: Goldwind, p. 3; AGL, p. 5.
128 Submissions to the consultation paper: AEMO, pp. 2, 3, 6, 8; AusNet, pp. 5-6; Essential Energy, pp. 1, 4, 6.
129 Submissions to consultation paper: Powerlink, p. 2; AusNet pp. 9; Transgrid pp 4, 6, 8; AEMO, p. 5.

Guidelines	Description	Rules reference
guidelines	connection studies needed as part of the connection application process for inverter-based resources (e.g. Powerlink Inverter Based Renewable Plant –GPS connection study process and expectations).	

4 Removing barriers to pragmatic revisions of the GPS

In its rule change request, the CEC raised that NER clause 5.3.4A(b)(1A) is having an unintended consequence of constraining renegotiation of performance standards. The CEC stated that they consider that this is preventing the appropriate application of engineering judgement to provide flexibility when there are non-material differences.[130]

Stakeholders also expressed concern with this clause. Developers, networks and AEMO spoke to this clause as occasionally preventing a change to the performance standards even when the changes are agreeable to all parties.[131]

Addressing this concern is important to connecting applicants as it would clarify the latitude that renegotiated performance standards can take. This is particularly relevant to projects at the R1 stage, as it is not uncommon for applicants to request an alteration to their plant design and performance standard, triggering renegotiation. Likewise, this is important to NSPs and AEMO as it would encourage unique solutions to balance technical standards to target pressing stability phenomena, without being prohibitively costly. However, NSPs have expressed concern that too much latitude for renegotiation may have unintended consequences for the power system.

The draft rule seeks to address these concerns by:

- updating the 'no less onerous' NER clause 5.3.4A(b)(1A) to allow revisions of performance standards below what would be the existing standard for a plant
- requiring any change to be as close as practicable to the existing standard unless otherwise agreed[132] to disincentivise significant amendments to performance standards that may have cascading impacts on other network users.

These changes would ease some frustrations with the connections process felt by connecting parties. They also aim to provide space for networks and AEMO to apply engineering judgement while disincentivising major changes that may affect other network users or power system security. In this way, the draft rule aims to prevent engineering hours being dedicated to achieving a standard of performance that is not needed, and shift some risks from connecting parties to networks. The draft rule updates the 'no less onerous' clause to towards a more flexible risk-based approach for renegotiating performance standards, which would help alleviate costs and delays to the process.

This chapter consists of the following sections:

- Section 4.1 — The 'no less onerous' clause presents a barrier to pragmatic renegotiation of the GPS at the R1 stage
- Section 4.2 — The Commission considered the option to delete the 'no less onerous' clause during our consultation process
  - Section 4.2.1 — Deleting clause 5.3.4A(b)(1A) may create potential risks
- Section 4.3 — Updating the 'no less onerous' clause is more likely to address the issues raised and advance the NEO
  - Section 4.3.1 — The Commission considers an update is more appropriate than a deletion
  - Section 4.3.2 — The more preferable draft rule will better advance the NEO

130 CEC, rule change request, p. 23.
131 Submissions to the consultation paper: Transgrid, p. 11; AEMO, p. 4.
132 Clause 5.3.4A(b)(1A)(i) of the draft rule.

- Section 4.3.3 — This change aligns with broader reform to technical requirements for connections

4.1 The 'no less onerous' clause presents a barrier to pragmatic renegotiation of the GPS at the R1 stage

When proposing a negotiated access standard, NER clause 5.3.4A(b1) requires applicants to aim for performance at the Automatic Access Standard (AAS) level, subject to three conditions:

1. local power system conditions
2. risk to damaging the power plant
3. commercial and technical feasibility of achieving the AAS.

As Goldwind noted in its submission, the GPS regularly needs to be renegotiated during the R1 part of the connection process following minor changes being made to the plant design when it is being finalised.[133]

A primary challenge to renegotiating a technical requirement in their GPS to one below the existing standard arises from NER clause 5.3.4A(b)(1A). This clause is set out as follows:

> 5.3.4A Negotiated Access Standards
>
> (b) A negotiated access standard must:
>
> (1A) with respect to a submission by a Generator under clause 5.3.9(b)(3), ... **be no less onerous** than the performance standard that corresponds to the technical requirement that is affected by the alteration to the generating system or plant (as applicable) ...

This clause requires that any request to renegotiate a technical performance standard at the R1 stage cannot be below the existing performance standard — that is, the standard executed in the generator's NER clause 5.3.7(g) connection agreement.[134]

This requirement was originally introduced to allow legacy plants that are not able to achieve performance at the Minimum Access Standard (MAS) to improve the technical performance above their existing standard.[135] An unintended effect of this clause that was noted by generators in the 2018 *Final Determination for the Generator technical performance standards* rule change was that generators would be prevented from seeking 'downward' (that is, a revision closer to the MAS rather than the AAS) revisions to their existing performance standard even where there are no adverse power system security or power quality impacts for other network users.[136] At the time, the Commission did not consider this risk to be material and did not account for it in drafting the current rule.[137]

A number of generators and NSP stakeholders have identified that this clause is now preventing pragmatic revision of the GPS at any time after the connection agreement is executed.[138] This is leading to connection applicants having to undertake a substantial amount of additional modelling and extensive engineering work, which leads to significant delays to NSPs and AEMO being comfortable endorsing that the plant can meet its performance standards.[139] Stakeholders have

133 Goldwind, submissions to the consultation paper, p. 3.
134 CEC, rule change request, p. 23.
135 AEMC, 2018, Generator technical performance standards, Final determination, p. 252.
136 NER clause 5.3.4A(b)(2)-(4).
137 AEMC, 2018, Generator technical performance standards, Final determination, p. 252-3.
138 Submission to consultation paper: Transgrid, p. 10; Tesla, p. 4; APA Energy, p. 6.

advised that this is particularly frustrating when these time-consuming and costly efforts to achieve the standard would not actually lead to better system security outcomes and may, in fact, lead to worse outcomes. For example, Goldwind notes that many engineering hours are being spent working through relatively minor discrepancies between the plant performance and the GPS.[140] Moreover, AEMO considers that application of clause 5.3.4A(b)(1A) can be problematic as it requires that a revised performance be not less onerous than the previously agreed performance standard.[141]

4.2 The Commission considered the option to delete the 'no less onerous' clause during our consultation process

Each technical performance clause in NER Schedule 5.2 have both a minimum and automatic access standard. A negotiated access standard seeks to balance optimising generator plant capability with local conditions, the risk to plant damage, and commercial technical feasibility considerations.[142] Progressing this option in the draft rule may lead to a renegotiation of negotiated access standards (NAS) at the R1 stage dependent on two criteria, like during original negotiation:

1. soundness of the justification on why the AAS can't be achieved[143]
2. whether the proposed NAS ensures no adverse power system security or power quality impacts for other network users.[144]

This option would provide connecting parties with the most latitude at the R1 stage to renegotiate their NAS away from the standard they have executed in their connection agreement. The Commission considered that this option could be particularly beneficial for plant that seeks changes to its performance standards when there is a substantial proposed change to its characteristics (for example, when a battery is co-located with an existing plant).

4.2.1 Deleting clause 5.3.4A(b)(1A) may create potential risks

The Commission has determined not to proceed with the option to delete NER clause 5.3.4A(b)(1A) in its entirety. NER clause 5.3.4A(b)(1A) provides some guidance around the requirements a renegotiated access standard must follow. We understand that deleting the clause would provide the most flexibility to participants altering their performance standards, enabling engineering judgement. However, there would also be risks associated with deleting the clause, for example:

- there may be potential risk that other network users including other generators at an earlier connection stage will have to undertake extensive remodelling or redesign to account for the changes in the design of the altered plant
- this rework could substantially extend timeframes for the generators at an earlier connection stage, in turn lengthening the average connection timeframes
- there could be a risk of developing an industry norm to allow for major changes which would increase the number of engineering hours expended, lengthen the duration of connections,

139 CEC, rule change request, p. 24.
140 Goldwind, submission to the consultation paper, p. 3,
141 AEMO, submission to the consultation paper, p. 4.
142 NER clause 5.3.4A(b1)(1)-(3).
143 NER clause 5.3.4A(b2)(1).
144 NER clause 5.3.4A(b2)(2).

and may erode the purpose of the original negotiation, reducing certainty for generators and their investors.

Due to these risks, the Commission has determined not to delete NER clause 5.3.4A(b)(1A).

4.3 Updating the 'no less onerous' clause is more likely to address the issues raised and advance the NEO

Based on stakeholder feedback and the Commission's analysis, the Commission has decided to update NER clause 5.3.4A(b)(1A) instead of deleting it. The draft rule would update clause 5.3.4A(b)(1A) to replace the 'no less onerous' wording with prescription around being as close as practicable to the negotiated performance standard for proposed reductions to the relevant performance standard.[145]

The Commission considers the following principles would still apply to the altered negotiated access standards. These are that:

- it should be set at a level that will not adversely affect power system security,[146]
- it should be set at a level that will not adversely affect the quality of supply for other Network Users, and[147]
- in respect of generating plant, it should meet the requirements applicable to a negotiated access standard in Schedule 5.2.[148]

This aspect of the draft rule aims to alleviate some constraints when renegotiating performance standards. This would benefit generators which may propose an alteration to their performance standards through clause 5.3.9 of the NER.

The Commission maintains the desire to keep the original intent of the clause for legacy generators to improve its performance standards against its existing performance instead of the minimum access standard, where the minimum access standard had been raised above its existing performance since its connection.[149] The Commission does not see this policy position as conflicting with the principles outlined above as an alteration of legacy generators' performance towards the level of the AAS would not be constrained by a requirement to meet a more onerous minimum access standard. The draft rule change does this by noting that in the case where the existing standard is below the MAS, the performance standard must be no less onerous than the existing standard.[150]

4.3.1 The Commission considers an update is more appropriate than a deletion

The Commission considers that updating clause 5.3.4A(b)(1A) is preferable to removing it from the NER for the following reasons:

- Updating the clause provides guidance around the latitude of potential change to a GPS. This would still work to address the concern by stakeholders that engineering judgement is being constricted by prescription in the clause.
- A potential change to the GPS should be as close as practicable to the existing standard, which would maintain the principles set out during the initial negotiation of the GPS or projects

145 Clause 5.3.4A(b)(1A)(i) of the draft rule.
146 NER clause 5.3.4A(b)(2).
147 NER clause 5.3.4A(b)(3).
148 NER clause 5.3.4A(b)(4).
149 For more information Section 12.5 see https://www.aemc.gov.au/sites/default/files/2018-09/Final%20Determination_0.pdf.
150 Clause 5.3.4A(b)(1A)(ii) of the draft rule.

seeking an alteration at R1.[151] The primary benefit of this is that by limiting renegotiating flexibility, the draft rule would limit the potential impact of changes at R1 on other connecting applicants.

- By maintaining prescription around the scope of renegotiation, the draft rule addresses concerns that the use of clause 5.3.9 at R1 may circumvent effective negotiation at the 5.3.4 application stage, or have negative impacts on existing connections and other committed connections.
- NSPs and AEMO are under obligations to maintain the proper operation of the power system and it is important to maintain their discretion within the R1 process. Otherwise, an alternative situation may arise where connections are allowed but adversely impact the power system and have to be constrained off or equipment has to be installed retroactively.

4.3.2 The more preferable draft rule would better advance the NEO

The Commission considers this element of the draft rule as advancing the NEO as it:

- positions stakeholders to engage collaboratively to determine more flexible solutions to issues occurring when altering the generator, including at R1
- encourages more connections and therefore improves reliability through the removal of prescriptive constraints in favour of principles to guide engineering judgement
- discourages extensive additional modelling and potential equipment procurement for minimal benefit to the system, thereby reducing the cost and complexity of the regulatory framework
- maintains system safety and security as the preference towards the existing GPS will remain and NSPs and AEMO will have final discretion over proposed change.

4.3.3 This change aligns with broader reform to technical requirements for connections

Allowing for revisions of the GPS below its existing standard provides some relief to concerns around the bias towards the AAS

In making this change, the Commission has determined that changes to the rules requiring generators to aim for the AAS when negotiating a level of technical performance are outside the scope of this rule and draft determination. The CEC, in its feedback to the consultation paper, notes that developers are faced with meeting performance as close as possible to the AAS, leaving no capacity for margin.[152] This means that when connections are faced with unforeseen changes between the execution of the connection agreement and registration, there is no relief through the 5.3.9 process.[153]

The draft rule recognises this and proposes changes to the 'no less onerous' wording in clause 5.3.4A(b)(1A) of the NER to allow revision of performance below the existing standard provided that it is as close as practicable to the existing standard. However, the Commission considers that changes in the NER to adjust the bias towards the AAS are not best placed in this draft rule. Instead, the Commission notes that as part of its obligations under NER clause 5.2.6A, AEMO has performed a review of the technical requirements for connection. Rule change requests stemming from that review may revise the AAS and address stakeholder concerns towards its bias.

Removal of the 'no less onerous' will encourage the application of engineering judgement for emerging technologies

151 NER clause 5.3.4A(b)(1) and 5.3.4A(b1).

152 CEC, submission to the consultation paper, p. 7.

153 NER clause 5.3.9 specifies the procedure to be followed by a Generator proposing to alter a generating system.

The Commission recognises that the requirement that a renegotiated standard below the existing standard be as close as practicable to the existing standard will create challenges for a plant that seeks to change its performance because of a significant new plant element (for example, a new battery). Substantial changes to performance standards at the R1 stage are also sometimes required to accommodate the transition of some plant from grid-following (GFL) capability to grid-forming (GFM) capability.[154] For instance, Tesla observed that because grid-forming inverters exhibit some properties that are closer to the MAS than the AAS, any changes are perceived to be less onerous.[155] The Commission does not wish to unnecessarily restrict these technological changes and recognises that an engineering judgement will have to be applied in these scenarios.

The Commission observes that AEMO's Access Standards Review has recommended a number of changes to the NER technical standards to accommodate generators with GFM capability. In making these recommendations AEMO intends to support the integration of GFM inverters in the technical standards by amending or adapting relevant technical requirements to ensure they do not inadvertently hinder the connection of GFM technology and the beneficial capabilities it might provide.[156] AEMO also intends to undertake a further review of technical requirements to establish core requirements that support the connection of generators with grid-forming capability.[157]

154 Tesla, submission to the consultation paper, pp. 3-4.

155 Tesla submission to the consultation paper, p. 4.

156 AEMO, Review of technical requirements in Schedules 5.2, 5.3 and 5.3a, p. 3.

157 Ibid, p. 13. AEMO notes that this work will also draw on the ARENA-funded grid-forming initiative research.

5 New notifications and timeframes to promote clarity of the R1 process

The CEC's rule change proposal raises the issue that there is an absence of clear obligations and timeframes in the R1 process, leading to uncertainty around the different stages of the R1 process, including when it has commenced and is completed.[158]

We heard from industry that having certainty about the length of time it will take AEMO and NSPs to review and approve the R1 package is challenging because it depends on several factors that are outside of their control. For generators, the lengthy and iterative nature of the R1 process can mean that project milestones can be missed. These risks are generally difficult for investors to manage as they have little transparency on how AEMO and NSPs carry out their respective roles in the R1 technical due diligence process.[159]

Addressing this timeframe issue is important for stakeholders because, without this codification, generators can experience open-ended delays and procedural uncertainty.[160] We also heard from generators through our stakeholder consultation process that there is a need for greater clarity around timeframes in the R1 process to foster better collaborative practices that streamline the connections process.[161]

The draft rule aims to provide clarity around obligations and timeframes in the R1 process. This includes formal notification of when the R1 process commences and ends, as well as some other timeframes. In line with principles of good regulatory practice, the Commission has sought to avoid unnecessary prescription that could have unintended consequences. Instead, we have introduced targeted prescription that will assist in providing more clarity for the industry. As such, the draft rule would:

- codify commencement of the R1 process when an applicant has submitted its formal R1 model package and requested that the NSP and AEMO commence their assessment process[162]
- require NSPs and AEMO to each provide the connection applicant with a notification confirming the start of the R1 due diligence process[163]
- require NSPs and AEMO to jointly notify generators when their R1 assessment has concluded.[164]

See Figure 1 for a diagram of how these proposed obligations would fit into the R1 process.

This chapter comprises the following sections:

- Section 5.1 — There is a need for greater certainty of timeframes in the R1 process
  - Section 5.1.1 — The CEC proposed timeframes to apply during the R1 assessment process
  - Section 5.1.2 — Stakeholders were divided on the CEC's proposed timeframes
- Section 5.2 — The draft rule introduces new notification requirements and timeframes whilst balancing principles of good regulatory practice

158 AEMC, consultation paper, p. 17; CEC, rule change request, p. 1.
159 Origin, submission to the consultation paper, p. 2.
160 AEMC, consultation paper, p. 1; Acciona Energia, submission to the consultation paper, p. 5.
161 Submissions to the consultation paper: Goldwind, p. 2; APA Group, p. 6.
162 Clause 5.3.7A(a) of the draft rule.
163 Clause 5.3.7A(b) of the draft rule.
164 Clause 5.3.7A(g) of the draft rule.

- Section 5.2.1 — Commencement of the R1 process through submission of an R1 model package would be codified in the NER
- Section 5.2.2 — NSPs and AEMO would be required to notify generator applicants when they have received an R1 application
- Section 5.2.3 — NSPs and AEMO would be required to jointly notify generators when their R1 assessment is concluded

5.1 There is a need for greater certainty of timeframes in the R1 process

The CEC has identified there is an absence of clear timeframes for how and when AEMO and NSPs are required to communicate, provide their assessment, and request clarifications on R1 modelling packages. This creates open-ended delays in the R1 process, in turn delaying the entry of new generation and storage assets in the power system, and exacerbating investment certainty.[165]

Currently, the NER does not prescribe when NSPs are required to inform the connecting applicant or AEMO when it has received a complete R1 modelling package — nor is there any prescription in the NER for allowing an NSP to seek additional data or information when it has received an applicant's complete R1 package.[166]

According to the CEC, the NER only contains two key timeframes around certain aspects of the R1 process that apply to AEMO, which are:

1. AEMO has five business days to inform the applicant whether further clarifications are required to support the application, and
2. 15 business days to determine whether to register the generator after the date AEMO receives a valid application.[167]

Regarding the end of the R1 process, there is also no NER requirement for an NSP or AEMO to inform applicants when they have completed their due diligence assessment.[168] We understand from stakeholder feedback that NSPs often document that they are comfortable with a generator's technical performance but that they do not provide this written confirmation to the generator.[169]

This means that generators and their project financiers do not currently have clarity on whether NSPs have finalised their technical due diligence and what additional steps need to be met before AEMO confirms that the plant can be registered.[170] Having clarity about this is important because, as Origin explains in its submission, it would help connection applicants better manage risks, such as those associated with project financing. These risks are generally difficult for investors to manage as they have little transparency on the allocation of responsibilities between AEMO and NSPs.[171]

165 AEMC consultation paper, pp. 5, 10; CEC, rule change request, p. 25.

166 This is discussed further in chapter 3.

167 NER clauses 2.9.1 and 2.9.2. However, there are a few prescriptive timeframes in the NER relating to the negotiation of the access standard, which can often be triggered during the R1 process. AEMO must advise the NSP whether to accept or reject a negotiated access standard within 20 business days of receiving the generator's proposal, while NSPs have 30 business days to inform the generator whether the proposal has been accepted or rejected — see NER clause 5.3.4A and p. vii of this draft determination.

168 In the case of AEMO, this includes completion for the purposes of NER clause 2.2.1(e)(3).

169 For example, see Goldwind's submission to the consultation paper, p. 4.

170 Iberdrola, submission to the consultation paper, p. 3.

171 Origin, submission to the consultation paper, p. 2.

5.1.1 The CEC proposed timeframes to apply during the R1 assessment process

Owing to the gap identified above, the CEC proposed new time-limited processes be introduced to require AEMO and NSPs to identify and assess discrepancies in modelled behaviour between the R1 and the earlier confirmation of the GPS pursuant to NER clause 5.3.4A.[172] To that end, after an R1 package is formally submitted by an applicant, the CEC proposed that:

- AEMO would be required to advise NSPs on AEMO advisory matters within 20 business days of the submission of the R1 package, and
- at the same time, the NSP completes its review of the R1 model within 30 business days of the submission of the R1 package.[173]

The CEC proposes that the primary obligation on the NSP in this timeframe would be to determine whether to accept the applicant's self-assessed Type classification that is evidenced by its R1 model.[174]

5.1.2 Stakeholders were divided on the CEC's proposed timeframes

Stakeholder submissions in response to the CEC's proposal to implement statutory timeframes were generally divided. For instance:

- Generators were generally supportive of the CEC's timeframes proposal as it would limit delays experienced by connecting applicants and provide more certainty on how long R1 technical due diligence can take as currently applies to negotiated access standard proposals under NER cl. 5.3.4A.[175]
- Generator submissions supported the CEC's proposal for statutory timeframes on the basis that AEMO's connections scorecard does not provide sufficient granularity to allow them to manage timeline uncertainties in the R1 process.[176]
- AEMO and NSPs noted that the precise timeframes proposed by the CEC are ambitious and do not reflect the complexities involved in ensuring connecting plant does not present risks to the power system, which especially requires careful consideration when connecting large-scale generators.[177]
- AusNet said that the CEC's proposed timeframes could have the unintended consequence of shifting problems experienced in the R1 stage to other phases of the connections process, such as the connections enquiry, application phase or the commissioning phase (R2).[178] We also heard this feedback from many other stakeholders during our consultation process.

Some stakeholders also disagreed with the reasons provided by the CEC as to why timeframes are lengthened in the R1 process. For instance, Transgrid noted that extended timeframes in the registration process are driven most strongly by the number of review iterations.[179] While this can vary significantly from project to project, they are generally driven by:

- conditions that have been applied in a generator's offer-to-connect letter but not yet resolved[180]

172 AEMC, consultation paper, p. 19.
173 AEMC, consultation paper, p. 19; CEC, rule change request, p. 37.
174 See further discussion on the CEC's proposed Type pathways in chapter 3.
175 Submissions to the consultation paper: Shell Energy, p. 5; AGL, p. 3.
176 Vestas, submission to the consultation paper, p. 2. AEMO's enhanced connection scorecard published since Dec 2023 has addressed some of these concerns — see AEMO's media release.
177 Submissions to the consultation paper: CitiPower, pp. 3-4; ENA, p. 6.
178 AusNet, submission to the consultation paper, p. 7.
179 Transgrid, submission to the consultation paper, pp. 3-4.
180 For example, AEMO's connections scorecard suggests that the time for the 5.3.4A process is reducing whilst the R1 process is increasing.

- significant plant changes between the application phase of the connections process and R1[181]
- how well-resourced generators' R1 studies have been, which can vary from project to project.[182]

In light of this feedback, the Commission considers that the CEC's timeframe proposals are unlikely to increase certainty during the R1 process. NSPs and AEMO are required to ensure the stable, reliable and safe operation of the power system, and could be hamstrung in doing so should strict timeframes be imposed on them while conducting an R1 assessment. Further, the CEC's proposed timeframes could, as an unintended consequence, diminish flexibility and collaboration, or require a 'stop the clock' mechanism for when further information or data is needed, as the R1 process is highly iterative between connecting parties. A 'stop the clock' mechanism would likely create a new administrative burden for NSPs and AEMO, by forcing them to issue a formal notice each time they request a new piece of information from generators.

5.2 The more preferable draft rule introduces new notification requirements and timeframes whilst balancing principles of good regulatory practice

The draft rule[183] would:

- codify commencement of the R1 process when an applicant has submitted its formal R1 model package and requested that the NSP and AEMO commence their assessment process
- require NSPs and AEMO to each provide the connection applicant a notification confirming the start of the R1 due diligence process, and
- require NSPs and AEMO to jointly notify generators when their R1 assessment has concluded.

We received broad support for this draft rule from stakeholders during our technical working groups. The draft rule would operate to address uncertainty regarding the commencement and completion of the R1 process through the notification requirements certain timeframes. It aims to balance the need for clear prescription with flexibility, to promote principles of good regulatory practice and reduce process delay during the R1 stage.

5.2.1 Commencement of the R1 process through submission of an R1 model package would be codified in the NER

As discussed in section 3.1.2 of this draft determination, the draft rule would amend the NER to codify the commencement of the R1 process following execution of the connection agreement. This operates to make clear in the NER that the R1 process commences when an applicant has submitted its R1 model data package to the NSP and/or AEMO, and requests that the NSP or AEMO conduct and requests that they conduct their assessment.[184]

It also addresses feedback we received from stakeholders such as Energy Australia, who expressed in their submission to the consultation paper that the NER does not specify the point in the connections process when the applicant should submit its R1 package to then be evaluated by the NSP and AEMO.[185]

181 For example, internal plant layout and reticulation.

182 Submissions to consultation paper: Transgrid pp. 3-4, 12-13; Powerlink, p. 1; Energy Queensland, p. 1; TasNetworks, p. 1.

183 See clause 5.3.7A of the draft rule.

184 See clause 5.3.7A(a) of the draft rule. We note that NSPs and AEMO would manage the data and information provided by the applicant in accordance with the confidentiality requirements in the NER, such as clause 5.3.8.

185 Energy Australia, submission to the consultation paper, p. 2.

5.2.2 NSPs and AEMO would be required to notify generator applicants when they have received an R1 application

The draft rule would require the NSP and AEMO to each formally notify the applicant in writing when it has received a completed R1 package and the applicant has requested that the NSP and AEMO commence its technical assessment. This notification must be provided within five business days.[186] In the case of AEMO, they would also be required to notify the applicant that they will commence assessment under NER clause 2.2.1(e)(3).

The requirement for AEMO and the NSP to each formally notify the applicant when it has received a request for an assessment would be useful for providing clarity about the formal commencement of the assessment.

The five business day limit is consistent with other existing NER clauses. For instance, NER clause 5.3.2(b) requires an NSP to notify a connecting applicant within five business days if the information the applicant has submitted with a connection enquiry is inadequate.

The draft rule does not specify the form in which the NSP or AEMO must provide written notification, allowing it to be provided in the form of a letter or email, as appropriate.

5.2.3 NSPs and AEMO would be required to jointly notify generators when their R1 assessment is concluded

The draft rule would require AEMO and NSPs to both provide written notification to generators when they have completed their R1 due diligence and are satisfied that the generator can meet its performance standards.[187] Similar to when an R1 application is received, AEMO and the NSP would be required to provide this joint response within five business days and the written notification must also indicate whether the assessment is completed for the purposes of NER clause 2.2.1(e)(3).

The proposed option would provide certainty for generators and their financiers of when AEMO and NSPs have completed their due diligence activities. Currently, generators and financiers only become aware that the R1 due diligence is completed when AEMO registers their plant. However, the requirement for AEMO to be satisfied that the plant can meet its assessment criteria is only one requirement. The connecting party is also required to satisfy a range of other procedural requirements set out in AEMO's NEM Generator Registration Guide (e.g. black system event procedures, metering procedures).[188]

186 See clause 5.3.7A(b) of the draft rule.

187 See clause 5.3.7A(g) of the draft rule.

188 AEMO, Application Guide for Registration as a Generator in the NEM, Aug 2023.

A Rule making process

A standard rule change request includes the following stages:

- a proponent submits a rule change request
- the Commission initiates the rule change process by publishing a consultation paper and seeking stakeholder feedback
- stakeholders lodge submissions on the consultation paper and engage through other channels to make their views known to the AEMC project team
- the Commission publishes a draft determination and draft rule (if relevant)
  - stakeholders lodge submissions on the draft determination and engage through other channels to make their views known to the AEMC project team
- the Commission publishes a final determination and final rule (if relevant).

You can find more information on the rule change process in *The Rule change process — a guide for stakeholders.*[189]

A.1 The CEC proposed a rule to change how R1 assessments are performed

On 17 May 2023, the CEC on behalf of its members submitted a rule change request seeking to provide greater clarity in the NER on the requirements, process steps, and responsibilities associated with assessing and approving the connection of new generation to the NEM. The CEC's rule change proposes the following additions:

- Self-assessment
- Materiality guidelines
- Type pathways
- Timeframes to assess R1
- Facilitated review

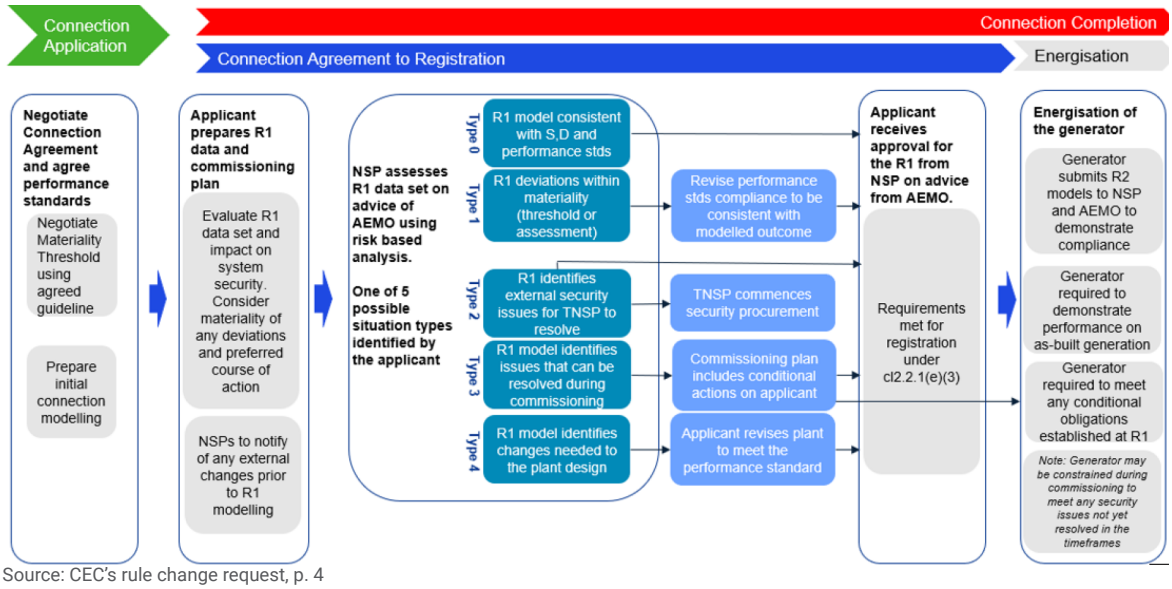
The CEC stated that its intention is to reduce the uncertainty associated with the R1 stage, lower investment costs, speed up new generation connection and clearly allocate responsibility for the management of system security and power quality issues.[190]

Figure A.1 below illustrates the new proposed R1 assessment process proposed by the rule change request.

189 AEMC, The rule change process: a guide for stakeholders, June 2017, available here: https://www.aemc.gov.au/sites/default/files/2018-09/A-guide-to-the-rule-change-process-200617.PDF.

190 CEC's rule change request, p. 1.

Figure A.1: The rule change request's overview of the proposed new R1 process



Source: CEC's rule change request, p. 4

A.2 The proposal suggests that there is a wide breadth of issues at the R1 stage

The CEC's rule change request states six main issues to be addressed. While the industry is transitioning to a higher penetration of IBR, there are issues that have been arising with the regulatory process being unfit for purpose.

- There is a lack of clear obligations on parties.
- The framework is inflexible.
- Generators are held responsible for changes outside of their control.
- There is a lack of clear timeframes.
- Decisions are not reviewable.
- AEMO's recent initiatives have improved the situation, but uncertainty and risks remain.

The request suggests that due to the issues above, there are open-ended delays and costs that are leading to risks being borne by generation investors which they cannot manage. Therefore, prospective investors in new renewable generation and storage will increase premiums on new investment to account for the risks, which can affect the cost of the transition, prices for consumers and NEM reliability.[191]

The CEC considers that the lack of prescription in the NER around the R1 process and lack of guidance represents a significant issue for industry. This implied regulatory failure could be addressed to better contribute to meeting the NEO. The CEC mentions that the reliability and price benefits to customers from reduced connection times will achieve the NEO with respect to:[192]

- price, quality, safety and reliability and security of supply of electricity
- the reliability, safety and security of the national electricity system.

191 CEC's rule change request, p.3.
192 CEC, rule change request, p. 52.

A.3 The proposal sought to improve certainty for investors around the R1 process

The rule change request proposes changes to the NER that would introduce a new framework for connections through the R1 assessment process. It outlines set pathways that a connecting applicant's R1 process may undergo. For each pathway, the request describes potential solutions for likely problems that may emerge. For example, the rule change request outlines that registration is provided for projects with only minor deviations from their negotiated performance standard, and to determine what is minor, a new materiality guideline will be created.

This new framework proposed in the rule change request is intended to have a suite of benefits including but not limited to:

- investment certainty due to a known framework
- increased reliability due to quicker replacement of retiring generation
- reduced system costs due to economies of scale and scope by NSPs to achieve lowest cost solutions
- reduced consumer costs due to lower risk premiums by investors.

The proposed approach of creating a new framework for connecting applicants to complete their R1 assessment would also facilitate increased transparency and shared learnings.

A.4 The process to date

On 17 August 2023, the Commission published a notice advising of the initiation of the rule making process and consultation in respect of the rule change request.[193] A consultation paper identifying specific issues for consultation was also published. Submissions closed on 28 September 2023. The Commission received 28 submissions as part of the first round of consultation. On 7 December 2023, the Commission published a notice extending the time for making the draft determination to 7 March 2024.[194]

In publishing this draft determination, the Commission considered all issues raised by stakeholders in submissions. Issues raised in submissions are discussed and responded to throughout this draft rule determination. A summary of the issues raised in submissions and the Commission's response to each issue is contained in appendix D.

193 This notice was published under s. 95 of the NEL.

194 This notice was published under s. 107 of the NEL.

B Regulatory impact analysis

The Commission has undertaken regulatory impact analysis to make its draft determination and the more preferable draft rule.

B.1 Our regulatory impact analysis methodology

We considered a range of policy options

The Commission compared a range of viable policy options that are within our statutory powers. The Commission analysed these options:

- the rule proposed in the rule change request;
- a business-as-usual scenario where we do not make a rule; and
- a more preferable draft rule featuring:
  - codification of the R1 process
  - creating an obligation for NSPs and AEMO to provide written justification, and
  - updating NER prescription to allow for renegotiation of the GPS subject to a range of conditions.

The policy options for the more preferable draft rule are described in Chapters 3 to 5.

The Commission also considered but has determined not to proceed with the following features as part of the more preferable draft rule:

- prescribing a requirement in the NER for AEMO and NSPs to produce more guidance to support projects at R1
- prescribing statutory timeframes for NSPs and AEMO to complete assessment of a complete R1 submission, and
- creating new reporting obligations for NSPs around their performance against a new set of regulatory timeframes for assessment.

For more information pertaining to the Commission's assessment please see Chapter 2.

We identified who would/will be affected and assessed the benefits and costs of each policy option

The Commission's regulatory impact analysis for this rule change used qualitative methodologies. It involved identifying the stakeholders impacted and assessing the benefits and costs of policy options. The depth of analysis was commensurate with the potential impacts. Due to the nature of the connection space, the Commission has not been able to accurately quantify the impacts of the policy options. Nevertheless, the Commission recognises the importance of its work in this space in achieving emissions reduction targets while maintaining power system security and reliability. The Commission focused on the types of impacts within the scope of the NEO.

Table B.1 summarises the regulatory impact analysis the Commission undertook for this rule change. Based on this regulatory impact analysis, the Commission evaluated the primary potential costs and benefits of policy options against the assessment criteria. The Commission's determination considered the benefits of the options minus the costs.

Table B.1: Regulatory impact analysis methodology

Assessment criteria	Primary costs low, medium or high	Primary benefits low, medium or high	Stakeholders affected	Methodology QT = quantitative, QL = qualitative
Safety, security, and reliability	[1/2] Connections are not fast enough to replace retiring generators (M)	[1/2] Quicker connections, faster development of renewable generation, potentially firming reliability (L) [1] Industry develops learnings of security phenomena that improve the overall operation of the grid (L)	• All generators • AEMO • NSPs • Consumers	Pre-implementation QL • Review of R1 issues for generators attempting to connect to assess the scale and nature of the risks. Post implementation QL • Request stakeholder feedback • Review of system constraints and security outcomes. QT • Monitoring of new connections rate via connections scorecard. • Monitoring of LOR notices.
Decarbonisation	N/A	[1/2] Faster connections as industry is provided more flexibility to amend technical standards	• Market participants • Consumers	Pre implementation QT • Review number of renewable connections in the queue that will be impacted by this rule change Post implementation QT

Assessment criteria	Primary costs low, medium or high	Primary benefits low, medium or high	Stakeholders affected	Methodology QT = quantitative, QL = qualitative
				• Monitoring of new connections rate via AEMO's connections scorecard. • Monitoring of renewables penetration rate via MMS / OpenNEM platforms.
Implementation considerations	[1/3] Administrative burden on NSPs and AEMO (L) [1] NSPs and AEMO have to undertake more onerous negotiation (M)	[1/3] Improves consistency in the way R1 modelling packages are assessed (M)	• NSPs • AEMO • All generators	<u>Pre implementation</u> QL • Review stakeholder feedback of current processes and practicability of policy position <u>Post implementation</u> QT • Monitor rate of connections QL • Review stakeholder feedback on process changes
Principles of good regulatory practice	N/A	[1/3] Filling gaps in the current connection process to provide clarity to industry(M) [2] Providing clarification to the intended process when altering a GPS. (L)	• All connecting applicants • AEMO • NSPs	<u>Post implementation</u> QL • Evaluate stakeholder feedback on how effective the changes have been in delivering a more efficient process.
Innovation and	N/A	[2] Potentially new unique	• All generators	

Assessment criteria	Primary costs low, medium or high	Primary benefits low, medium or high	Stakeholders affected	Methodology QT = quantitative, QL = qualitative
Flexibility		solutions to address stability risks in high renewable penetration grids.(L)	• AEMO • NSPs	QL • Review stakeholder feedback on the types and causes of power system phenomena experienced and the potential risks and mitigants as renewable penetration grows.

Note: The regulatory impact assessment considers the impact of the more preferable draft rule's policy positions as [1] Written justification, [2] Amendment to 5.3.4A(b)(1A) and [3] Codification of the R1 process.

C Legal requirements to make a rule

This appendix sets out the relevant legal requirements under the NEL for the Commission to make a draft rule determination.

C.1 Draft determination and more preferable draft rule

In accordance with section 99 of the NEL, the Commission has made this draft rule determination for a more preferable draft rule in relation to the rule proposed by the CEC.

The Commission's reasons for making this draft rule determination are set out in chapter 2.

A copy of the more preferable draft rule is attached to and published with this draft determination. Its key features are described in chapter 3, chapter 5 and chapter 4.

C.2 Power to make the rule

The Commission is satisfied that the draft rule falls within the subject matter about which the Commission may make rules.

The draft rule falls within s. 34 of the NEL as it relates to the operation of the national electricity system for the purposes of the safety, security and reliability of that system under section 34(1)(a)(ii) and the activities of persons (including Registered participants) participating in the national electricity market or involved in the operation of the national electricity system under section 34(1)(a)(iii).

C.3 Commission's considerations

In assessing the rule change request the Commission considered:

- its powers under the NEL to make the draft rule
- the rule change request
- submissions received during first round consultation
- stakeholder input received at technical working groups held on 17 November 2023 and 18 January 2024
- the Commission's analysis as to the ways in which the draft rule will or is likely to contribute to the achievement of the NEO.

There is no relevant Ministerial Council on Energy (MCE) statement of policy principles for this rule change request.[195]

C.4 Making electricity rules in the Northern Territory

The NER, as amended from time to time, apply in the Northern Territory, subject to modifications set out in regulations made under the Northern Territory legislation adopting the NEL.[196] Under those regulations, only certain parts of the NER have been adopted in the Northern Territory.

195 Under s. 33 of the NEL and s. 73 of the NGL the AEMC must have regard to any relevant MCE statement of policy principles in making a rule. The MCE is referenced in the AEMC's governing legislation and is a legally enduring body comprising the Federal, State and Territory Ministers responsible for energy. On 1 July 2011, the MCE was amalgamated with the Ministerial Council on Mineral and Petroleum Resources. In December 2013, it became known as the Council of Australian Government (COAG) Energy Council. In May 2020, the Energy National Cabinet Reform Committee and the Energy Ministers' Meeting were established to replace the former COAG Energy Council.

196 These regulations under the NT Act are the National Electricity (Northern Territory) (National Uniform Legislation) (Modifications) Regulations 2016.

The more preferable draft rule does not relate to parts of the NER that apply in the Northern Territory. As such, the Commission has not considered Northern Territory application issues.

C.5 Civil penalty provisions and conduct provisions

The Commission cannot create new civil penalty provisions or conduct provisions. However, it may recommend to the Energy Ministers' Meeting that new or existing provisions of the NER be classified as civil penalty provisions or conduct provisions.

The NEL sets out a three-tier penalty structure for civil penalty provisions in the NEL and the NER.[197] A Decision Matrix and Concepts Table,[198] approved by Energy Ministers, provide a decision-making framework that the Commission applies, in consultation with the AER, when assessing whether to recommend that provisions of the NER should be classified as civil penalty provisions, and if so, under which tier.

Subject to consulting with the AER, the Commission proposes to make a civil penalty recommendation to the Energy Ministers when making the final rule in relation to the new clause 5.3.7A(e) of the more preferable draft rule. This clause describes that if requested, the NSP must provide reasons and clarification to the Connecting Applicant when requesting additional data and information for the purposes of assessing the capability of the generating system, subject to the Connecting Applicant having reasonably provided adequate data in its submission. The Commission proposes to recommend the clause be classified as a tier two civil penalty provision. This recommendation is consistent with existing clauses such as NER clause 5.3.4A(g) and compliance with this provision would be necessary to ensure efficient market administration.

C.6 Review of operation of the rule

The more preferable draft rule does not require the Commission to conduct a formal review of the operation of the rule. The Commission may however self-initiate a review of the operation of the rule at any time if it considers such a review would be appropriate, pursuant to section 45 of the NEL.

197 Further information is available at https://www.aemc.gov.au/regulation/energy-rules/civil-penalty-tools.

198 The Decision Matrix and Concepts Table is available at: https://web.archive.org.au/awa/20210603104757mp_/https://energyministers.gov.au/sites/prod.energycouncil/files/publications/documents/Final%20-%20Civil%20Penalties%20Decision%20Matrix%20and%20Concepts%20Table_Jan%202021.pdf.

D Summary of other issues raised in submissions

Table D.1: Summary of other issues raised in submissions to the consultation paper

Stakeholder	Issue	Response
AusNet (p.2, 10), AER(p.1)	In response to some iterative modelling loop issues that are difficult to mitigate, batching may offer some relief to extensive iterations.	The Commission understands this is being developed by the CRI and Streamlined Connections Process (SCP) trials are underway. The Commission will consider a rule change if submitted.
AusNet (p. 2, 11)	There are jurisdictional governments developing separate access regimes within each region's REZ. The AEMC should explore how any future regulatory solution would integrate with these jurisdictional REZ access regimes.	The Commission notes this comment and is keeping abreast of developments in jurisdictional schemes.
AusNet (p. 2, 11)	Shortfalls in engineering resources is a challenge to the transition of the grid. Engagement with education institutions would be critical to ensure the right skill sets are being developed.	The Commission supports industry and education institutions collaborating to identify and close the skill gap.
AusNet (p. 2, 11)	OEM whitelisting that considers opportunities to improve the quality of data and models may have merit as the more familiar an NSP is with a particular model and OEM provider, the more quickly an application is likely to be approved.	The Commission understands this is being explored through the CRI. The Commission supports the CRI exploring options to improve efficiency.
Citipower, Powercor & United Energy (p. 4)	Implementation of a rule needs to consider impacts on distribution networks	With respect to distribution networks, the Commission considers the more preferable draft rule as compatible with the existing obligations for distribution network service providers.
Origin (p. 2)	There is a lack of transparency in the models used by the NSP and AEMO for power system studies. Industry recognises that there may be challenges (for example with confidentiality) sharing the models, however there may be benefits sharing its user guides.	The Commission understands that applicants are concerned with getting a singular source of truth for its models. While providing releasable user guides (RUGs) may alleviate some concerns, there are concerns regarding confidentiality of the models that would prove more useful.

Stakeholder	Issue	Response
		The Commission recognises this as a wider issue unlikely to be resolved by this rule change.
Tesla (p. 3)	The current framework is too inflexible to appropriately consider grid forming inverters including upgrading existing plant capability to become grid forming.	The Commission recognises this in [Section X]. The Commission's intent of this rule change is not to restrict technological changes and considers that part of rule change requests from AEMO's Access Standards Review will support the integration of grid forming inverters.

Abbreviations and defined terms

AAS	Automatic Access Standard
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
CEC	Clean Energy Council
Commission	See AEMC
CRI	Connections Reform Initiative
draft rule	more preferable draft rule
ENA	Energy Networks Australia
GPS	Generator Performance Standards
GW	Gigawatt
IBR	Inverter Based Resource
ISP	Integrated System Plan
NAS	Negotiated Access Standard
NEL	National Electricity Law
NEM	National Electricity Market
NEO	National Electricity Objective
NER	National Electricity Rules
NSP	Network Service Provider
Proponent	The individual/organisation who submitted the rule change request to the Commission
QED	Quarterly Energy Dynamics
R1	Refers to the process between the execution of a connecting generator's connection agreement and the completion of market registration. It involves the connecting party preparing a detailed engineering design of their plant, a suite of technical models, a commissioning plan and other documentation to demonstrate to the NSP and to AEMO that the plant meets the GPS.
R2	Post-registration commissioning