EnergyCo

energyco.nsw.gov.au

New England Renewable Energy Zone

System Strength Model Position Paper

August 2026

Acknowledgement of Country

The Energy Corporation of New South Wales acknowledges that it stands on Aboriginal land. We acknowledge the Traditional Custodians of the land and we show our respect for Elders past and present through thoughtful and collaborative approaches to our work, seeking to demonstrate our ongoing commitment to providing places in which Aboriginal people are included socially, culturally and economically.

Published by the Energy Corporation of New South Wales

energyco.nsw.gov.au

New England Renewable Energy Zone System Strength Model Position Paper

First published: August 2026

Department reference number: DOC26/479956

Copyright and disclaimer

© State of New South Wales through the Energy Corporation of New South Wales. Information contained in this publication is based on knowledge and understanding at the time of writing, July 2026, and is subject to change. For more information, please visit energy.nsw.gov.au/copyright

TMP-MC-R-DC-V1.2

Contents

1. Introduction 4

1.1 Purpose of this position paper 4

1.2 Providing your feedback 4

2. Approach to system strength in the New England REZ 5

2.1 Executive summary 5

2.2 System strength model in the New England REZ 8

2.3 Key design elements of the demand side system strength model 8

2.4 Exemptions from system strength model 10

2.5 Policy rationale 11

3. Next steps 13

Glossary 14

1. Introduction

1.1 Purpose of this position paper

An Access Scheme is proposed for the New England Renewable Energy Zone (REZ). The *Draft Renewable Energy Zone (New England) Access Scheme Order 2026* (draft New England REZ Access Scheme Declaration) has been released for public consultation and can be found at energyco.nsw.gov.au/industry/access-schemes/new-england-rez-access-scheme. The draft New England REZ Access Scheme Declaration reflects the key design elements of the New England REZ Access Scheme.

EnergyCo is proposing to apply a tailored demand side system strength model to all projects that receive Access Rights under the New England REZ Access Scheme, unless an exemption applies.

The purpose of this position paper is to provide details of the proposed demand side system strength model for the New England REZ. The demand side system strength model refers to a project's obligation to be technically capable of operating at specified grid conditions and to be accountable for how much system strength it consumes.

EnergyCo is seeking feedback on this proposed demand side system strength model for managing system strength in the New England REZ.

1.2 Providing your feedback

You are invited to provide feedback on the proposed demand side system strength model in the New England REZ via free form submission. Please submit your response to the newengland.access@energyco.nsw.gov.au mailbox with **'Your Name – Demand Side System Strength Model'** in the subject line.

Please note that providing a submission is voluntary, is not assessable, and does not in any way include, exclude, advance or diminish any entity from any future procurement or competitive process on REZ's and/or the long-term energy service agreement (LTESA) under the NSW Government's Electricity Infrastructure Roadmap, or any other NSW Government program.

2. Approach to system strength in the New England REZ

2.1 Executive summary

System strength in the New England REZ

The New England REZ is a critical component of the NSW Government's Electricity Infrastructure Roadmap and will host a significant amount of inverter-based resources, in the form of wind, solar and battery energy storage systems (BESS).

System strength is the ability of the power system to maintain stable voltage waveforms under both normal operating conditions and following disturbances. System strength management is becoming increasingly complex with the prevalence of inverter-based resources across the grid and is a fundamental requirement for the secure and reliable operation of electricity networks. System strength must therefore be appropriately managed within the New England REZ to support the reliable operation of connecting projects and to maintain the security of the broader power system.

The system strength framework must recognise the different tiers of system strength requirements:

A. The minimum level of system strength, or the minimum three-phase fault level for a system strength node, is the system-wide level required for power system security. The minimum level of system strength is agnostic to the projects connecting within the New England REZ.
B. The efficient level of system strength is the level required to enable stable voltage waveforms at a project's connection point and the stable operation of new projects.
C. There may be requirements for additional system strength to ensure the stable operation of the grid even if projects were to remediate their system strength quantity[1]. This additional system strength requirement is considered as part of the efficient level of system strength and is referred to as the residual level in this paper.

EnergyCo has considered the provision of each of these tiers of system strength in the New England REZ. This paper outlines the proposed demand side model, which focuses on how projects will contribute towards meeting the efficient level of system strength (described under B above).

EnergyCo is progressing a separate workstream with the relevant stakeholders to address the minimum and residual levels of system strength through joint planning with Transgrid as the existing Network Service Provider (NSP) in the New England region and System Strength Service Provider (SSSP) for NSW.

[1] This is an estimate of the magnitude of the general system strength impact of a connection, as defined in AEMO's SSIAG.

Demand side approach to meet the efficient level

Proactive approaches to meeting system strength requirements in the National Electricity Market (NEM) have tended to include a high degree of system strength from centrally procured assets, usually in the form of synchronous condensers. Using this approach for the New England REZ is likely to present some challenges, particularly given the long lead times for asset delivery, and uncertainty in project characteristics (i.e. foresight of which projects will secure Access Rights, and the quantity of system strength needed for this portfolio of projects).

At the same time, with technology developments, increased understanding of remediation methods, and evolving system strength provision strategies, many proponents are now selecting plant configurations that fully or partially remediate their own system strength requirements.

Achieving the right balance between centrally procured system strength and project-led remediation is critical to delivering efficient outcomes in the New England REZ.

EnergyCo is proposing a tailored approach to the planning and management of system strength in the New England REZ, reflecting recommendations from the recent Transmission Planning Review and developments in relevant technology. EnergyCo proposes to adopt the hybrid system strength model for New England REZ as outlined in the New England REZ Generation and Storage Consultation Paper (the Consultation Paper) in August 2025.

EnergyCo proposes to apply the below system strength model to all projects that receive Access Rights under the New England REZ Access Scheme, unless an exemption applies (including projects connected to both the New REZ Network Infrastructure and parts of Transgrid's network in the REZ which is subject to the Access Rights Regime):

- require all projects to prove they are capable of a withstand Short Circuit Ratio (SCR) of 2.2 at their point of connection. This is intended to be a requirement in the New England REZ Access Standards
- require that all projects reduce or are deemed to reduce their system strength quantity to zero, by meeting a withstand SCR of 1.2
- allow projects to achieve the withstand SCR of 1.2 through:
    - providing their own source of system strength remediation, either behind the meter or with another source of system strength in front of the meter (e.g. a grid-forming BESS project) which is located within the New England REZ geographical area, or
    - procuring system strength services directly from the connecting NSP as a negotiated transmission service.

Given projects will be required to meet a withstand SCR of 1.2, they will not be required to pay the National Electricity Rules (NER) system strength service charge or access fee for centralised system strength.

This tailored approach has been developed specifically for New England REZ following extensive stakeholder consultation, including with AEMO, as the transmission planner responsible for determining system strength requirements under the NER, and Transgrid as the System Strength Service Provider in NSW.

How is demand side system strength typically managed in the NEM?

Under the existing NER framework, after a preliminary assessment by the connecting NSP (in consultation with AEMO), a Connection Applicant must elect one of the following remediation pathways:

1. **Pay the system strength charge (SSC)**

- Submit a connection application and elect to pay the SSC.
- The Connection Applicant pays the SSC. The SSC is determined based on a formula that reflects the project's system strength quantity. Projects that can withstand SCR 1.2 have a zero SSC.
- The SSSP procures system strength to meet the requirements for efficient level of system strength determined by AEMO. This is intended to ensure that the SSSP provides sufficient centrally procured system strength to meet the required quantity from projects electing to pay the SSC.

2. **Propose a system strength remediation scheme (SSRS)**

- Submit a connection application and propose to implement a SSRS (e.g. grid-forming capability or synchronous condenser) to fully remediate the project's system strength impact.
- The Connection Applicant can also seek **system strength connection works (SSCW)** from the connecting NSP as a negotiated transmission service. Costs for the SSCW are borne by the Connection Applicant.

2.2 System strength model in the New England REZ

EnergyCo considered a broad range of options for the New England REZ system strength model. These options reflected varying allocations of responsibility for the provision of system strength between central and project-led remediation.

Positions reflected in this paper, represent more than 18 months of consultation, expert advice, stakeholder workshops and valuable feedback. Stakeholder engagement directly informed the technical requirements, SCR thresholds and remediation pathways that underpin the proposed system strength model. This engagement was supplemented by the release of the Consultation Paper, which sought early feedback on the proposed system strength model outlined in this position paper.

EnergyCo proposes to adopt a hybrid system strength model for the New England REZ. Projects connecting to the Access Rights Network will hold primary responsibility for remediating their own system strength impacts. The model allows projects to provide their own system strength remediation, either behind the meter or with a source of system strength in front of the meter (e.g. with a grid-forming BESS project) within the New England REZ (on the New REZ Network Infrastructure or Transgrid's network). Projects will also be allowed to negotiate system strength works directly from the connecting NSP as a negotiated transmission service.

Any additional system strength required for the stable operation of the network in the New England REZ (i.e. minimum level and residual efficient level) will be planned for and procured by EnergyCo, the Network Operator and Transgrid. The cost of this will be recovered through a separate mechanism and will not be borne by projects. This is consistent with the existing NER framework.

2.3 Key design elements of the demand side system strength model

Minimum withstand SCR requirement at point of connection

Projects connecting to the Access Rights Network in New England REZ may be required to meet REZ Access Standards, a defined set of technical requirements as a condition of the Access Rights tender process. This includes withstand SCR requirements at the point of connection. Separately, projects will also be required to reduce their deemed system strength quantity to zero (equivalent to meeting a withstand SCR of 1.2) through an elected remediation pathway. In December 2025, EnergyCo released the *Indicative Technical Requirements for generation and storage connections in New England REZ,* which details our early thinking on technical requirements for projects connecting to the Access Rights Network in New England REZ.

EnergyCo is proposing that all projects will be required to meet a minimum withstand SCR of 2.2 at the point of connection. This establishes a clear and consistent baseline level of technical resilience for entry to the REZ, while remaining grounded in demonstrated market capability and generating plant performance. The minimum threshold is intended to ensure that connecting projects are sufficiently capable of operating stably under credible network conditions. Importantly, setting the requirement at this level is based on market engagement, reduces the level of central procurement that would be required if all projects were to rely on the connecting NSP as a last resort, and aims to avoid the risk of creating a barrier to entry that would exclude otherwise viable projects.

What is Short Circuit Ratio?

SCR is a measure of the strength of the grid at a project's connection point relative to the size of the project. A higher SCR indicates a stronger grid, with a more stable voltage reference that can better support the project's operation. A lower SCR indicates a weaker grid, where the project's output is more likely to cause voltage fluctuations, control system instability, or other adverse interactions.

In the context of the system strength model, the **withstand SCR** refers to the minimum grid strength a project must be able to operate stably within. In other words, this threshold dictates how weak of a grid the project can tolerate before its controls would begin to cause operational or stability issues.

System strength remediation requirement

Access Rights Holders will be required to remediate their system strength impact such that they achieve, or are deemed to achieve, a withstand SCR of 1.2. Meeting this requirement reflects the point at which projects that opt to remediate their system strength impact by paying the SSC, are treated as having a system strength quantity of zero and therefore pay a zero SSC under the NER framework and AEMO's SSIAG. Under the New England REZ model:

- Projects will be required to indicate a preferred pathway for meeting a withstand SCR of 1.2 as part of the Access Right tender submission
- Access Rights Holders will be required to elect a remediation pathway, and their proposed remediation scheme will be assessed by the connecting NSP, as part of the grid connection application process.

Pathways to remediate system strength impact

The proposed model will deviate from the NER in the pathways available for projects to remediate their system strength impact. Access Rights Holders in the New England REZ will not have access to a centrally procured system strength option either through payment of a Centralised System Strength Fee (as required of current Access Right Holders under the Central-West Orana REZ access scheme) or by electing to pay the NER SSC.

EnergyCo's proposed model for New England REZ would allow the following pathways for projects to remediate their system strength impact (i.e. achieve a withstand SCR of 1.2):

1. System strength remediation behind the meter

A project that can demonstrate that its plant meets or exceeds a withstand SCR of 1.2 behind the meter will be taken to remediate their system strength impact in this model.

2. System strength remediation in front of the meter

Projects may implement arrangements in front of the meter (at or away from the connection point) that are deemed to reduce their system strength quantity to zero. This may include providing system strength at

another connection point or contracting with a third-party provider of system strength, for example through contracting for services from a grid-forming BESS.

The operational arrangements set out in the agreements between separate projects for this purpose must be agreed with connecting NSP and AEMO, and will be required to be detailed in the Generator Performance Standards of the two generating systems or integrated resource systems to ensure that system strength requirements can be met operationally. EnergyCo recommend that projects discuss the contractual arrangements of their proposed approach with the connecting NSP as soon as practicable, as the connecting NSP has an important role in ensuring that the approach is fit-for-purpose.

Assets must also be considered electrically close, meaning the distance between them is unlikely to have a significant change in network configuration in the future. EnergyCo expects all assets within the New England REZ geographical area to meet this requirement, however, this will be at the discretion of the connecting NSP and AEMO as to whether the proposed arrangement is appropriate.

3. Connecting NSP - negotiated transmission service

The connecting NSP will act as a provider of system strength where an Access Right Holder does not meet the required remediation behind the meter (option 1) or in front of the meter (option 2). Under this mechanism, at the request of an Access Right Holder, the connecting NSP would be required to negotiate with that Access Right Holder to deliver system strength works that reduce the project's deemed system strength quantity to zero.

This arrangement is intended to operate consistently with the existing NER framework, whereby a connection applicant can request a connecting NSP to provide system strength connection works on a negotiated basis instead of undertaking its own remediation scheme. As under the NER, the scope, design and delivery of these works would be agreed between the parties through a commercial negotiation under the NER framework for negotiated transmission services. The Access Right Holder would be responsible for all associated costs and managing the delivery risks associated with this process through its contractual arrangements with the connecting NSP.

Changes to a Project Characteristic

If an Access Right Holder wishes to change their indicative preferred pathway to remediation, and this change results in a change to its Project Characteristics approved under its Access Right agreements, this will require EnergyCo consent. The proponent would be required to formally notify EnergyCo of the proposed change (i.e. submit a modification request), setting out the nature of the deviation and its impacts. EnergyCo will then initiate a review alongside the connecting NSP to assess system impacts.

2.4 Exemptions from system strength model

The proposed model will apply to Access Rights Holders connecting to the New England REZ Access Rights Network except Access Right Holders who are granted Access Rights under the early access process. These early access projects, projects that are exempt from the access scheme and projects connecting to the Access Control Network under the Access Scheme will be subject to the existing NER framework in relation to managing their system strength requirements.

Please refer to the New England Renewable Energy Zone Access Scheme Design Positions Paper for more information on the proposed scope of the New England REZ Access Rights Network, exemptions and early access.

2.5 Policy rationale

EnergyCo's tailored approach to the planning and management of system strength requirements in the New England REZ reflects recommendations from the Transmission Planning Review and recent developments in inverter-based assets' ability to provide system strength. The REZ-specific system strength model has been developed following extensive stakeholder consultation.

During consultation, proponents expressed a consistent preference for a demand side model that provides greater flexibility and optionality. Consultation feedback indicated strong support for options that move away from fully centralised procurement towards a greater reliance on project-led remediation and third-party solutions, provided appropriate system-level coordination is retained.

There was broad support for models which incentivise improved project performance through cost-reflective outcomes. Proponents indicated that project-level or portfolio-level system strength solutions can often be delivered at lower overall cost than a fully centralised model, particularly with modern inverter-based technologies. Separately, developers emphasised that if a system strength charging regime is applied, clearly defined charges are critical for finalising financing and investment decisions.

Overall, the proposed model seeks to minimise the risk of over-procurement and support efficient risk allocation between parties. By requiring projects to provide their own system strength remediation, while retaining central coordination for minimum and residual system needs, this model supports innovation, delivers cost efficiencies, and maintains system security in the long-term interests of consumers. The model is also designed to align the New England REZ model, where practical, with the existing NER and AEMO's SSIAG, providing regulatory consistency and reducing uncertainty for proponents.

Minimum withstand SCR requirement at connection point

Project-led remediation was seen as a key mechanism to enable innovation and cost minimisation. With advancements in inverter-based technologies, market sounding indicated that current plant can achieve materially improved system strength performance relative to earlier assumptions. In particular, withstand SCR capability below 2 is considered achievable, with further improvements expected as grid-forming technologies mature and deploy in Australia.

Establishing a minimum withstand SCR requirement of 2.2 under the New England REZ Access Standards provides a clear and consistent baseline level of technical robustness to the REZ. This level ensures projects can operate stably under relatively weak grid conditions while preserving flexibility in technology choice. Critically, the minimum requirement has been set to reflect current capability, ensuring that it does not act as an undue barrier to entry or restrict viable technology pathways.

System strength impact remediation requirements

Beyond the minimum threshold, the use of a withstand SCR of 1.2 as the threshold for a system strength quantity of zero in the New England REZ model does not represent a new technical benchmark or a bespoke

policy position. Rather, it reflects the default threshold already embedded in the NER grid connection and system strength charging methodology. Similarly, the proposed testing and compliance arrangements are intended to align with the NER and SSIAG where possible, ensuring consistency with modelling, simulation tools and assessment processes that have been developed and validated for use across the NEM.

A withstand SCR of 1.2 at a project's point of connection was broadly accepted as the relevant requirement threshold for being deemed to have a system strength quantity of zero, consistent with the NER framework. Projects can select from a range of self-remediation pathways, reflecting the feedback from market engagement that system strength can be most efficiently managed by individual projects.

Centralised coordination

Stakeholders noted the importance of retaining a degree of central coordination for the provision of the minimum and residual efficient level of system strength.

In particular, they agreed that projects remediating their system strength impacts may not contribute to strengthening the system, such that residual system strength requirements at the network level will remain, and that this is more suitably a centrally procured amount. This is aligned with EnergyCo's approach for the supply of the minimum level of system strength for reliable grid operations, and any residual efficient level with all projects meeting their requirements.

The retention of a negotiated, last-resort pathway through the connecting NSP further strengthens the model by ensuring that viable projects are not excluded where alternative remediation options are not feasible. This mechanism mirrors existing NER arrangements for negotiated system strength works, providing a clear fallback consistent with established regulatory practice while maintaining the principle that costs are borne by the benefiting proponent.

3. Next steps

You are invited to provide feedback on the proposed demand side system strength model in the New England REZ via free form submission. Please submit your response to the newengland.access@energyco.nsw.gov.au mailbox with '**Your Name – Demand Side System Strength Model**' in the subject line.

Submissions will be accepted until 28 September 2026.

EnergyCo will consider submissions to help finalise the model to managing system strength in New England REZ.

What feedback are we looking for?

EnergyCo is particularly interested in hearing feedback on the proposed system strength model from proponents considering connection within the REZ, such as:

- the extent to which the proposed withstand SCR requirements align with potential project design and technology capability
- proposed remediation strategies for system strength impacts under the model (e.g. technology choices, co-location strategies, or portfolio approaches)
- the availability and viability of third-party solutions as a remediation pathway
- the timing at which it is feasible for projects to commit to and elect a remediation pathway
- any risks, uncertainties or barriers to implementation that should be further addressed.

Glossary

Terms used in this paper have the meaning given in the draft New England Renewable Energy Zone Access Scheme Declaration and *Electricity Infrastructure Investment Act 2020 (NSW).* Key definitions are summarised below for readability.

Term/phrase	**Definition**
Access Right	Has the meaning given to it in the draft New England Access Scheme Declaration
Access Right Holder	The entity who holds an Access Right granted under the Access Scheme Declaration.
Access Rights Network	Access Rights Network means the electricity network described in Schedule 2 (Access rights network) of the draft New England REZ Access Scheme Declaration.
Access Rights Regime	Regime which applies to network specified as Access Rights Network, whereby projects must hold an Access Right to connect to the Access Rights Network.
Access Scheme	Access Schemes coordinate investment in energy infrastructure by managing the access to and use of specific network, generation and storage operators.
Access Scheme Declaration	An Order made by the Minister declaring an Access Scheme in accordance with the EII Act, s24(1)
AEMO	Australian Energy Market Operator Limited
BESS	Battery energy storage system
Centralised System Strength Fee	A component of access fees under access fee determinations for existing Access Right Holders under the Central West Orana REZ Access Scheme
EII Act	*Electricity Infrastructure Investment Act 2020* (NSW)
EII Regulation	Electricity Infrastructure Investment Regulation 2021 (NSW)
EnergyCo	Energy Corporation of New South Wales
Infrastructure Planner	A person authorised to exercise the functions of an Infrastructure Planner under section 63 of the EII Act. EnergyCo has been appointed as the Infrastructure Planner for the New England REZ. EnergyCo has been appointed the Infrastructure Planner for the New England REZ.
NEM	National Electricity Market

Term/phrase	**Definition**
National Electricity Rules	National Electricity Rules, as defined in the National Electricity (NSW) Law, as it applies in NSW
New REZ Network Infrastructure	The proposed new network infrastructure in New England REZ that forms part of the Access Rights Network and, subject to authorisation under the EII Act, will support the delivery of the intended REZ capacity of 8 GW
Network Service Provider	Network Service Provider has the meaning given in the National Electricity Rules
Project	Project means a generation or storage plant or a co-located hybrid infrastructure project
Project Characteristics	Project Characteristics means a project's plant type and location and any other technical specifications which are specified as a project characteristic in a relevant agreement a project is required to enter into prior to being granted an Access Right.
REZ	Renewable Energy Zone
REZ Access Standards	REZ Access Standards means technical requirements for projects connecting to the Access Rights Network.
Short Circuit Ratio	Short Circuit Ratio has the meaning given in the National Electricity Rules
SSIAG	AEMO's System Strength Impact Assessment Guidelines
System Strength Charge	Fee paid by a project which elects this pathway under the NER
SSSP	System Strength Service Provider as designated under the NER