Powerlink Queensland

Project Specification Consultation Report

Addressing system strength requirements in Queensland from December 2025

March 2023

Document purpose

For the benefit of those not familiar with the National Electricity Rules (the Rules) and the National Electricity Market (NEM), Powerlink offers the following clarifications on the purpose and intent of this document:

1. The Rules require Powerlink to carry out forward planning to identify future reliability of supply requirements[1] and consult with interested parties on the proposed solution as part of the Regulatory Investment Test for Transmission (RIT-T). This includes replacement of network assets, augmentations of the transmission network and providing for power system security services such as system strength and inertia. More information on the RIT-T process and how it is applied to ensure that safe, reliable and cost effective solutions are implemented to deliver better outcomes to customers is available on Powerlink's website.
2. Powerlink must identify, evaluate and compare network and non-network options (including, but not limited to, generation and demand side management) to identify the preferred option which can address future network requirements at the lowest net cost to electricity customers.
3. The main purpose of this document is to provide details of the identified need, credible options, technical characteristics of non-network options, and categories of market benefits likely to impact selection of the preferred option. In particular, it encourages submissions from potential proponents of feasible non-network options to address the identified need.

[1] Such requirements include, but are not limited to:
1. addressing any emerging reliability of supply issues or relevant *ISP actionable projects* identified in the Australian Energy Market Operator's (AEMO) latest Integrated System Plan and
2. providing the services required to meet the system strength and inertia requirements and/or declared shortfalls identified in AEMO's latest System Strength and Inertia Reports

for which Powerlink has responsibility as the relevant Transmission Network Service Provider and System Strength and Inertia Service Provider in Queensland.

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Executive Summary

The power system is transforming to support decarbonisation

The pace and scale of change in the decarbonisation of Australia's energy system (made up of both generation and power systems), is one of the fastest in the world. Moving the energy system to much greater levels of Variable Renewable Energy (VRE) generation brings technical challenges to the transmission network, such as the need to ensure system strength is maintained,

Powerlink, as the Transmission Network Service Provider (TNSP) and System Strength Service Provider (SSSP) in Queensland, has obligations to ensure customers continue to receive a safe, reliable and secure supply of electricity.

Powerlink is committed to providing transmission network services that are valued by customers.

System strength is a critical component of the power system

System strength is a measure of the ability of the power system to remain stable by maintaining the voltage waveform, at any given location, both with and without the occurrence of an event or disturbance or fluctuations in supply or demand.

System strength has traditionally been provided by the electrical characteristics of coal, gas-fired and hydro-electric power generation (synchronous generation) which are electrically coupled to the power system. However, many non-synchronous generation technologies, such as large scale solar and wind, do not inherently provide system strength because the majority currently use grid-following inverter technology and power electronics to generate electricity. These are known as grid-following Inverter-Based Resources (IBR).

Given the scale of the energy transformation, rapid uptake of VRE resources and signalled retirement of much of the existing fleet of synchronous generators, it is critical to find alternate solutions to address system strength needs.

Powerlink is required to apply the RIT-T to procure system strength services

In October 2021, the Australian Energy Market Commission (AEMC) introduced the *Efficient management of system strength on the power system* Rule with a number of sequenced obligations as part of an evolved framework for the supply, coordination and demand sides of the power system. As a result and from 2 December 2022, Powerlink, as the SSSP in Queensland, is required to take action to plan, procure and make available system strength services as set out in the 10-year forecast provided in the Australian Energy Market Operator's (AEMO's) most recent System Strength Report.

In December 2022, AEMO published the first System Strength Report under the evolved framework that defines the system strength requirements for Queensland over a 10-year outlook period.

Given the estimated capital cost of the most expensive credible option to address the identified need for system strength services meets the minimum cost threshold to apply the Regulatory Investment Test for Transmission (RIT-T), Powerlink must take action to ensure ongoing compliance with the National Electricity Rules (NER).

As the identified need for the proposed investment is to meet reliability and service standards specified within Powerlink's Transmission Authority, guidelines and standards published by AEMO, and Powerlink's ongoing compliance with Schedule 5.1.14 of the NER, it is classified as a 'reliability corrective action'.[2.]

While system strength is an important component in the development of the AEMO's Integrated System Plan (ISP), the identified need to provide system strength services is subject to the application and consultation process for RIT-T projects that are not *actionable ISP projects*[3].

[2] Refer to NER Clause 5.10.2, Definitions, reliability corrective action.
[3] Refer to NER Clause 5.16.2.

Consistent with the Australian Energy Regulator's (AER's) RIT-T Application Guidelines for non-ISP projects, the assessment undertaken in subsequent reports under this RIT-T will compare and rank the net present value (NPV) of credible options designed to address the emerging risks, relative to a non-credible base case[4].

Powerlink is seeking a portfolio of system strength services to meet both the forecast minimum and efficient requirements

It is expected that non-network solutions will materially contribute to the provision of the minimum and efficient system strength services required through a portfolio of solutions such as, but not limited to existing or anticipated:

- synchronous generation plants operating as generator and/or with the potential for full or hybrid conversion to allow operation as synchronous condensers
- dedicated synchronous condensers
- various grid-forming plant, and/or
- any other technology that can support stable voltage waveform.

In addition, given the

- potential suite of non-network alternatives available
- varying contributions to system strength offered by different technologies and
- locational and availability factors to be considered on a case-by-case basis

Powerlink expects that there will not be a direct one-to-one relationship between the number of alternatives required and the number of synchronous plant identified in this PSCR. Rather, it is anticipated that a portfolio of system strength services will be required.

The minimum system strength requirement to be procured

To deliver the **minimum** system strength requirements identified by AEMO, Powerlink is seeking:

- Seven synchronous machines or equivalent plant online in Central Queensland in the order of 350MVA each,
- Two hydro-electric machines or equivalent plant in North Queensland in the order of 20MVA each, and
- Four synchronous machines or equivalent plant online in Southern Queensland in the order of 400MVA each.

AEMO's 2022 System Strength Report forecasts normal dispatch of existing units will reduce dramatically in the 10-year outlook period, with system strength shortfalls at the Gin Gin node forecast to occur almost 30% of the time in 2027/28.

In the interests of transparency, and a realistic assessment of the pace of change that can be achieved while maintaining the reliability and security of the power system, Powerlink expects that the initial suite of services is likely to include existing synchronous plant and/or modifications thereof, subject to the submissions received and cost-benefit analysis undertaken as part of this RIT-T.

The efficient system strength requirement to be procured

To deliver the **efficient** system strength requirements, further to the minimum requirements above, Powerlink has estimated that eight synchronous machines or equivalent plant are required within the 10-year outlook period of AEMO's 2022 System Strength Report (refer to Table 1) to support the forecast levels of IBR (known as efficient level of system strength).

[4] AER, *Application guidelines, Regulatory Investment Test for Transmission*, August 2020, page 21.

Table 1: Description of the requirement for efficient system strength services

Year/s	Number of additional Units	Cumulative number of additional Units	Required Efficient System Strength
2025	1	1	One additional approximately 200MVA synchronous machine **or equivalent plant** online in North Queensland
2025 - 2030	3	4	Three additional approximately 200MVA each synchronous machines **or equivalent plant** online in Central and North Queensland are required to support additional IBR connections between 2025 and 2030. The required timing for the additional units is likely closer to 2025 than 2030.
2030 - 2033	4	8	Four additional approximately 200MVA each synchronous machines **or equivalent plant** online, possibly in Central and Southern Queensland. The required timing for the additional units is likely closer to 2030 than 2033.

System strength services required to be made available beyond 2030 will guided by AEMO's annual System Strength Report forecasts as the energy transformation continues to gain momentum.

Powerlink is seeking to procure system strength services that will be available from 2025. Consistent with the National Electricity Objective[5], Powerlink also recognises the desirability of longer term contracts to promote efficient investment in electricity services, protecting the long-term interests of consumers.

Two credible options are proposed to address the identified need

A credible option is defined in the Rules as an option, or group of options, that addresses the identified need, is commercially and technically feasible, and can be implemented in sufficient time to meet the identified need.

Considering the timing of the identified need from December 2025, the current challenging external environment, including supply chain disruptions, and acknowledging the risk of network project delivery delays in the immediate term, Powerlink does not consider there is a credible network option to meet the identified efficient need in its entirety as described in Table 1.

Powerlink is proposing two credible options that address both the minimum and efficient levels of system strength required. Given the scale and pace of the energy transformation, Powerlink considers this a prudent, least-regret approach to ensure the power system remains safe, reliable and secure.

- Option 1 seeks to procure system strength services to meet the identified need in its entirety for both the minimum and efficient levels of system strength. System strength services offered must be able to commence availability in the period between December 2025 and December 2030.
- Option 2 is a hybrid solution which seeks to procure system strength services together with the installation and commissioning of up to eight new 200MVA synchronous condensers (network component) for both the minimum and efficient levels of system strength required by December 2030. System strength services offered must be able to commence availability in the period between December 2025 and December 2030.

The indicative capital cost of the network component of Option 2 is up to $752 million in 2023/24 prices. Annual operating and maintenance costs are anticipated to be up to approximately $15 million (2023/24 prices).

The economic analysis in the Project Assessment Draft Report (PADR) will identify the optimal timing and combination of option/s (i.e. total non-network or varying contributions of non-network and network) which delivers the lowest overall cost to customers.

[5]Refer to the AEMC website.

The requirement for system strength services will continue to grow

This RIT-T is the first consultation to address the need for system strength services under the evolved regulatory framework.

Procuring system strength services is expected to be an iterative process moving forward, requiring future RIT-Ts as more information becomes available and there is greater certainty in the size, location and timing of new generation and retirement of existing synchronous generation.

Powerlink will likely require a comprehensive and expanding portfolio of non-network solutions on an ongoing-basis, particularly as more IBR connects to the transmission network and the requirement for system strength services continues to grow.

Powerlink welcomes non-network options to form all or part of the solution

Powerlink welcomes submissions from proponents who consider they could offer a potential non-network option that is both economically and technically feasible by 2030. If parties prefer, they may request to meet with Powerlink ahead of providing a written response.

Powerlink is seeking written submissions on this Project Specification Consultation Report, on or before Friday, 21 July 2023.

Please address submissions to:

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1. Preface

1.1 What is system strength and why is it important?

System strength is a measure of the ability of the power system to remain stable by maintaining the voltage waveform, at any given location, both with and without the occurrence of an event or disturbance or fluctuations in supply or demand.

The transformation of Australia's generation fleet from one consisting of a relatively small number of synchronous generators (predominantly made up of coal and gas technology) towards one based on a larger number of distributed non-synchronous generation (or VRE) technologies (such as wind and solar) has led to changes in the physical characteristics of the power system. One of these changes involves the characteristic of system strength.

System strength has traditionally been provided by the electrical characteristics of coal, gas-fired and hydro-electric power generation (synchronous generation). However, non-synchronous or variable renewable energy (VRE) generation technologies, such as large scale solar and wind, do not inherently provide system strength because they use grid-following inverters and power electronics, otherwise known as grid-following inverter-based resources (IBR), to generate electricity. System strength may be considered low in areas with low levels of local synchronous generation and/or electrically remote from synchronous sources and is likely to decrease further as IBR (non-synchronous) penetration increases.

Given the scale of the energy transformation and the rapid uptake of VRE resources, finding alternate, safe, reliable and least cost solutions to address system strength needs is critical to ensure the future power system, which will be underpinned by IBR, remains stable. This is particularly important if an unexpected event or disturbance occurs.

1.2 Addressing the need for medium to long-term planning for system strength

The balance in the supply of and demand for system strength is changing as new IBR generators continue to connect to the transmission network and synchronous generation signal retirements. To address this shift, in October 2021, the Australian Energy Market Commission's (AEMC) made the *Efficient management of system strength on the power system* Rule[6] with a number of sequenced obligations as part of an evolved framework for the supply, coordination and demand sides of the power system. This includes an obligation on SSSPs, being Powerlink in the case of Queensland, to provide minimum and efficient levels of system strength on a forward-looking basis[7].

2. Introduction

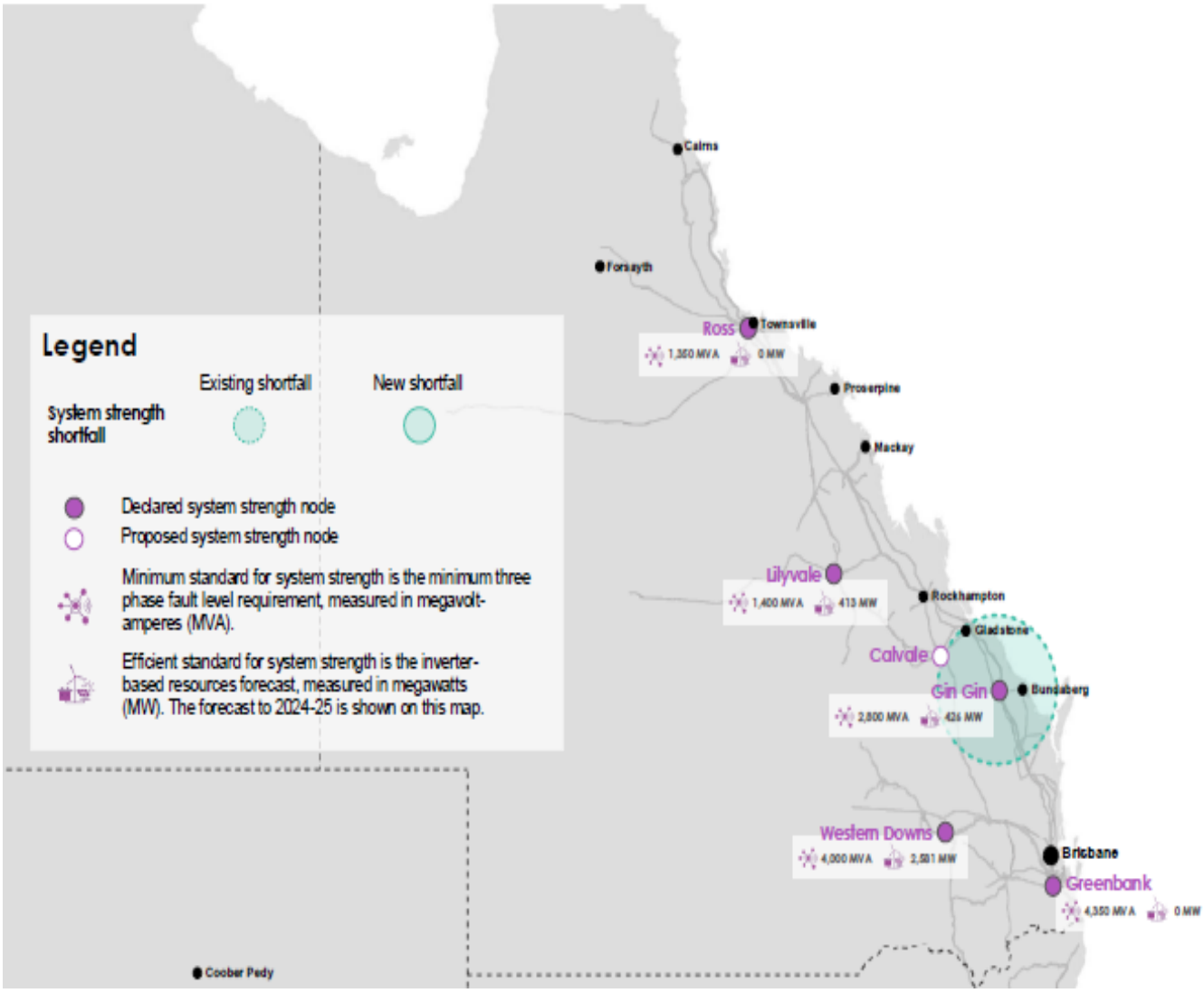
Powerlink Queensland is a TNSP in the National Electricity Market (NEM) that owns, develops, operates and maintains Queensland's high-voltage electricity transmission network. This network transfers bulk power from Queensland generators to electricity distributors Energex and Ergon Energy (part of the Energy Queensland Group), and to a range of large industrial customers.

As the TNSP and Jurisdictional Planning Body for Queensland, Powerlink is the designated Inertia and System Strength Service Provider[8] for the Queensland region. Powerlink is required to plan for, procure and make available these services in accordance with AEMO's forecast specified in the most recent System Strength and Inertia Reports.[9]

[6] National Electricity Amendment (Efficient management of system strength on the power system) Rule 2021 No. 11
[7] Refer to NER Schedule 5.1.14
[8] Refer to NER clauses 5.20B.4(a) and 5.20C.3(a)
[9] Refer to NER Clause 5.20B.4(b) and Schedule 5.1.14(b)

In December 2022, AEMO published the first System Strength and Inertia Reports under the evolved framework that define the system strength and inertia requirements for Queensland over a 10-year period.

Figure 1.1: Queensland transmission network showing system strength nodes, proposed new node, existing shortfall and standards



Source: AEMO, December 2022 System Security Report, page 4

2.1 Powerlink expects the outcome of the current Expression of Interest (EOI) will form part of the solution under this RIT-T

In May 2022, Powerlink commenced an EOI to meet the system strength shortfall identified at the Gin Gin node in AEMO's 2021 System Security Reports: System Strength, Inertia and NSCAS and Update to 2021 System Security Reports. The Reports declared an immediate fault level shortfall of up to 90 megavolt-amperes (MVA) at the Gin Gin fault level node to be addressed by March 2023. AEMO's 2022 System Strength Report noted that a similar-sized shortfall remains until December 2025 when the evolved system strength framework becomes operational.

While that EOI sought additional system strength to address the identified shortfall, the evolved system strength framework requires Powerlink to procure the total quantity of system strength from late 2025. Powerlink anticipates that the least cost solution to meet the current fault level shortfall will also form part of the overall least cost solution to meet the total requirements for system strength in the future.

Powerlink has been working closely with proponents of non-network solutions and AEMO to resolve the declared shortfall and expects to publish the outcome of the EOI process in mid-2023. The recommended solution will be taken into consideration in the next stage of this RIT-T and is anticipated to form part of the cost-benefit analysis to be published in the Project Assessment Draft Report (PADR) for this RIT-T assessment.

2.2 Powerlink recognises the potential for the quantum of AEMO's inertia shortfall to change

AEMO's 2022 Inertia Report declared a shortfall ranging from 8,200 megawatt seconds (MWs) to 10,352 MWs against the secure operating level, from 1 July 2026. As the Inertia Service Provider in Queensland, Powerlink is required to act on AEMO's declaration and is currently considering several external factors that have the potential to influence and impact the consultation timing, assumptions made, and information contained in the anticipated RIT-T. These factors include:

- the impact of the implementation of the very fast FCAS market from October 2023, which could reduce the shortfall in meeting the secure operating level of inertia
- The Reliability Panel is reviewing the Frequency Operating Standard (FOS) with a view to including a rate of change of frequency (RoCoF) standard, which could either increase or decrease the required inertia
- On 2 March 2023, the AEMC commenced consultation on a rule change request for an inertia services market to facilitate the provision of inertia in the NEM, which could reduce the inertia shortfall and
- The inertia shortfall is based on the black coal generation retirements flagged in the 2022 ISP Step Change Scenario. The Queensland Energy and Jobs Plan (QEJP), released in late September 2022, proposes to convert the existing Queensland Government owned generators to synchronous condenser operation as part of the energy transition. Given the timing of the QEJP release, the 2022 Integrated System Plan (ISP) was not able to include this proposal in its analysis. Powerlink expects that not all of the inertia from these units will be lost and anticipates this will considerably delay the timing of any inertia shortfall until after the proposed Borumba and Pioneer Burdekin Pumped Hydro Energy Storage facilities are in service and any remaining synchronous generation retires.

These factors evidence that there is a reasonable case to support that the quantum of the shortfall is likely to be quite changeable. Powerlink is taking a prudent approach as to the timing of the commencement of the RIT-T consultation process and will consider the interaction between the provision of system strength services, particularly the minimum fault level requirement, and the forecast inertia shortfall.

2.3 Dispatching TNSP contracted system strength services via the proposed Operational Security Mechanism (OSM) market

The AEMC has released a draft determination proposing an OSM market that will allow AEMO to centrally schedule TNSP-led contracts, such as those entered into for system strength services under this RIT-T, to manage power system security.

The draft Rule also progresses the Energy Security Board's essential system services (ESS) recommendations from the Post-2025 Electricity Market Design project and the long-term vision for managing ESS through market-based mechanisms.

While not anticipated to be relevant to the RIT-T process, further information on the rule change request and the Draft Determination are made are available on the AEMC's website. Powerlink encourages proponents of non-network solutions to become familiar with and, if relevant, take into account these potential changes as part of their submission development.

2.4 RIT-T Overview

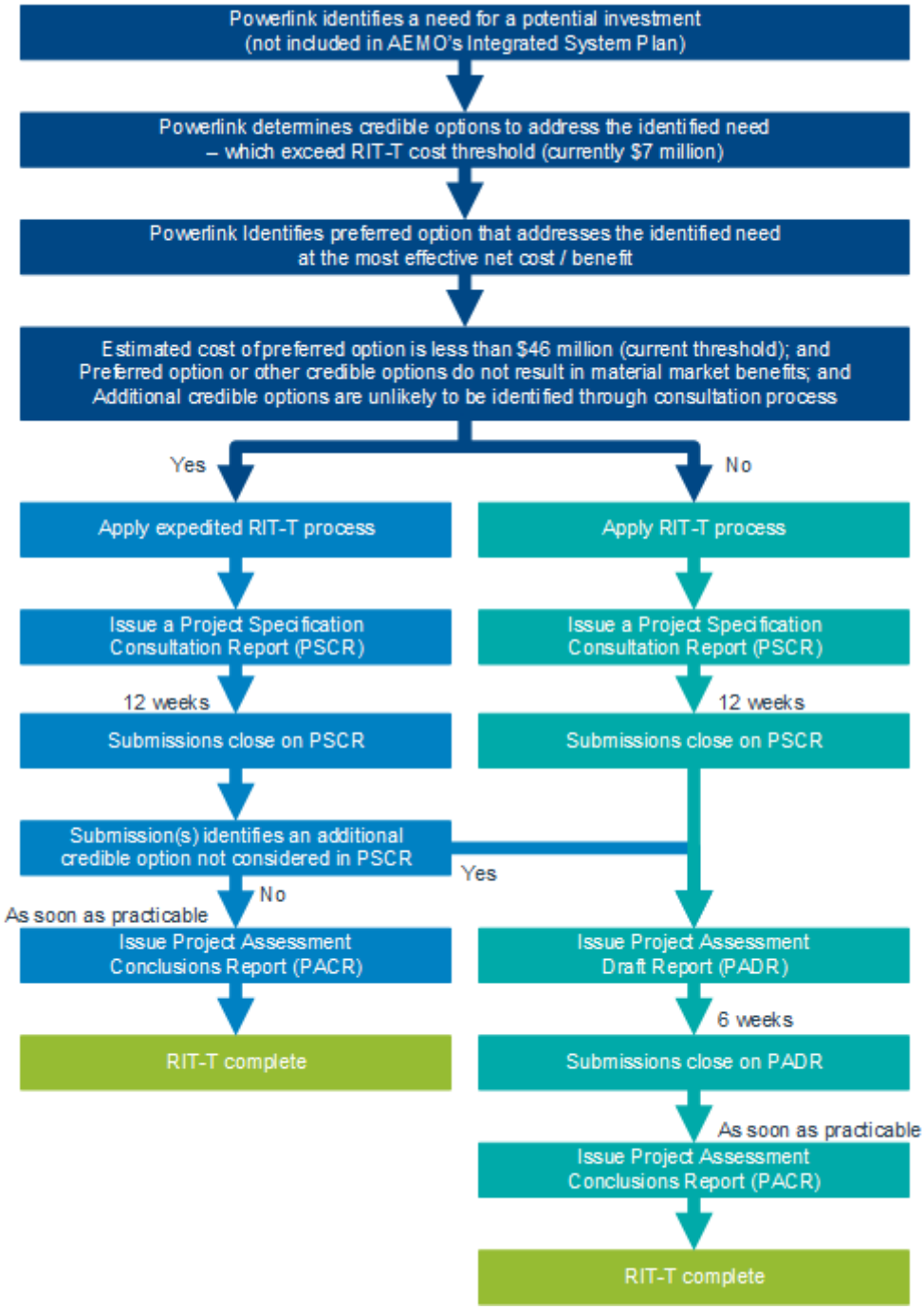
While system strength is an important component in the development of the Integrated System Plan (ISP), the identified need referred to in this RIT-T, to address system strength requirements in Queensland, is subject to the application and consultation process for RIT-T projects that are not *actionable ISP projects*[10].

This Project Specification Consultation Report (PSCR) is the first step in the RIT-T process[11]. The report:

- describes the reasons why Powerlink has determined that investment is necessary (the 'identified need'), together with the assumptions used in identifying this need
- provides potential proponents of non-network options with information on the technical characteristics that a non-network solution would need to deliver, in order to assist proponents in considering whether they could offer an alternative solution
- describes the credible options that Powerlink currently considers may address the identified need
- provides stakeholders with the opportunity to make submissions and comment on the proposed RIT-T assumptions

[10] NER Rule 5.16.
[11] This RIT-T consultation has been prepared based on the following documents: National Electricity Rules, Version 194, 20 January 2023, AER, *Regulatory Investment Test for Transmission*, August 2020 and AER, *Application guidelines, Regulatory Investment Test for Transmission*, August 2020.

Figure 2.1: RIT-T process overview: Need not defined as an *actionable ISP project*



3. Consumer and non-network engagement

With almost five million Queenslanders and 236,000 Queensland businesses depending on Powerlink's performance, Powerlink recognises the importance of engaging with a diverse range of customers and stakeholders who have the potential to affect, or be affected by, Powerlink activities and/or investments. Together with our industry counterparts from across the electricity and gas supply chain, Powerlink has committed to The Energy Charter.

Powerlink takes a proactive approach to engagement

Powerlink regularly hosts a range of engagement forums and webinars, sharing effective, timely and transparent information with customers and stakeholders within the broader community.

Powerlink's annual Transmission Network Forum (TNF) is a primary vehicle used to engage with the community, understand broader customer and industry views, and obtain feedback on key topics. It also provides Powerlink with an opportunity to further inform its business network and non-network planning objectives. TNF participants include customers, landholders, environmental groups, Traditional Owners, government agencies, and industry bodies.

Engagement activities such as the TNF help inform the future development of the transmission network and assist Powerlink in providing services that align with the long-term interests of customers. Feedback from these activities is also incorporated into a number of publicly available reports.

3.2 Working collaboratively with Powerlink's Customer Panel

Powerlink's Customer Panel provides a face-to-face opportunity for customers and consumer representative bodies to give their input and feedback about Powerlink's decision making, processes and methodologies. It also provides Powerlink with a valuable avenue to keep customers and stakeholders better informed, and to receive feedback about topics of relevance, including RIT-Ts.

The Customer Panel is regularly advised on the publication of Powerlink's RIT-T documents and briefed quarterly on the status of current RIT-T consultations, as well as upcoming RIT-Ts. This provides an ongoing opportunity for the Customer Panel to ask questions and provide feedback to further inform RIT-Ts, and for Powerlink to better understand the views of customers when undertaking the RIT-T consultation process.

Powerlink will continue providing updates to and request input from the Customer Panel throughout the RIT-T consultation process.

3.3 Transparency on future system strength requirements

The Transmission Annual Planning Report (TAPR) plays an important part in planning Queensland's transmission network by sharing annual planning reviewing findings and helping to ensure it continues to meet the needs of Queensland electricity customers and participants in the NEM. The TAPR provides early information and technical data on potential transmission network needs over a 10-year outlook period. As an outcome of the *Efficient management of system strength on the power system* Rule, from 31 October 2023, Powerlink's TAPR will also share new technical information in relation to system strength nodes and discuss the activities undertaken or planned to be undertaken (such as RIT-Ts) in relation to system strength requirements (and where applicable inertia shortfalls).[12]

Powerlink also undertakes engagement activities at the annual TNF, to share with customers and stakeholders the most recent TAPR findings and respond to any questions that may arise.

3.4 Powerlink applies a consistent approach to the RIT-T stakeholder engagement process

Powerlink undertakes a considered and consistent approach to ensure an appropriate level of stakeholder engagement is undertaken for each individual RIT-T. Please visit Powerlink's website for detailed information on the types of engagement activities that may be undertaken during the consultation process.

[12] NER clauses 5.20B.4(i), NER Clause 5.20C.3(f) and 5.20C.3(g)

These activities focus on enhancing the value and outcomes of the RIT-T process for customers, stakeholders and non-network providers. Powerlink welcomes feedback from all stakeholders to help improve the RIT-T stakeholder engagement process.

3.5 The transmission component of electricity bills

Powerlink's contribution to electricity bills comprises approximately 9% of the total cost of the residential electricity bill (refer to Figure 3.1).

Figure 3.1:

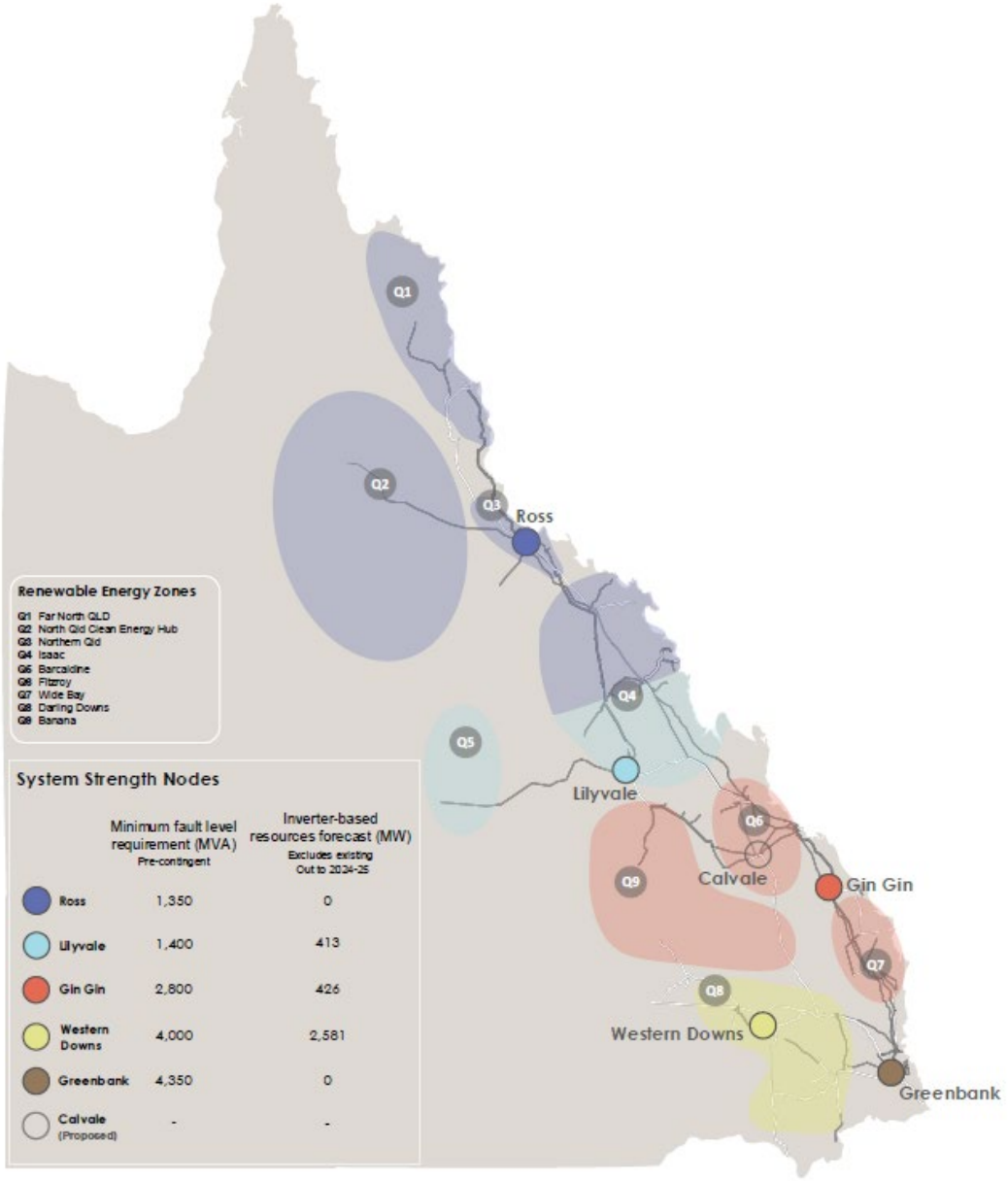
Detailed information on transmission pricing, including discussion on how Powerlink is actively engaging with customers and stakeholders on transmission pricing concerns, is available on Powerlink's website.

4. Identified need

4.1 Background

Under the evolved system strength framework set out in the *Efficient management of System Strength on the Power System* Rule, AEMO is required to determine and declare the system strength requirements for each system strength node by 1 December each year. AEMO's declared system strength nodes and system strength standards in Queensland in the 2022 report are shown in Figure 4.1.

Figure 4.1 Queensland system strength node location and system strength standard



Source: AEMO, December 2022 System Security Report, page 34.

Commencing 2 December 2022, the system strength requirements for each system strength node include

- the minimum three phase fault level requirements at each system strength node for 2023 and
- AEMO's 10-year forecast of the
    - minimum three phase fault level applicable at the system strength node
    - the level and type of inverter based resources and market network service facilities for the system strength node.

4.2 Description of identified need

Commencing 2 December 2022, as the SSSP for Queensland, there is a need for Powerlink to address system strength requirements in Queensland to ensure compliance with Schedule 5.1.14 of the NER. This requires Powerlink to make system strength services available to AEMO to meet the declared requirements at the system strength nodes on its transmission network in each relevant year by

- maintaining the minimum three phase fault level specified by AEMO for the system strength node in the system strength standard specification for the relevant year and
- achieving stable voltage waveforms for the level and type of inverter based resources and market network service facilities projected by AEMO in the system strength standard specification for the system strength node for the relevant year.

The proposed investment is to meet reliability and service standards arising from Powerlink's Transmission Authority and to ensure Powerlink's compliance with Schedule 5.1.14 of the NER which are designed to ensure customers continue to receive safe, reliable and cost effective electricity services, and is therefore 'reliability corrective action' under the NER[13].

A reliability corrective action differs from that of an increase in producer and consumer surplus (market benefit) driven need in that the preferred option may have a negative net economic outcome because it is required to meet an externally imposed obligation on the network business.

4.2.1 Assumptions and requirements underpinning the identified need

4.2.1.1 Minimum three phase fault level

Seven synchronous machines online in Central Queensland in the order of 350MVA each, two hydro-electric machines in North Queensland in the order of 20MVA each and four synchronous machines online in Southern Queensland in the order of 400MVA each currently deliver sufficient system strength to meet the minimum system strength requirements identified by AEMO

Minimum fault level requirements at each system strength node in the NEM are determined as per AEMO's System Strength Requirements Methodology[14]. The minimum fault level in Queensland is currently provided by base load generation in Central and Southern Queensland and hydro-electric generation in North Queensland.

The pre- and post-contingent minimum fault level projections for the 10-year period commencing 2 December 2022 are shown in Table 4.1. As the SSSP in Queensland, Powerlink is required to have solutions in place that meet the minimum fault level requirements at each node from 2 December 2025.

[13] The Rules clause 5.10.2, Definitions, reliability corrective action
[14] AEMO's System Strength Requirements Methodology v2.0 published on 30 September 2022 came into effect from 1 December 2022.

Powerlink modelling has identified the following dispatch has historically met the AEMO minimum fault level requirements. To replicate this and deliver sufficient system strength to meet the **minimum** system strength requirements identified by AEMO, Powerlink is seeking:

- Seven synchronous machines or equivalent plant online in Central Queensland in the order of 350MVA each,
- Two hydro-electric machines or equivalent plant in North Queensland in the order of 20MVA each, and
- Four synchronous machines or equivalent plant online in Southern Queensland in the order of 400MVA each.

Table 4.1: Pre- and post-contingent minimum fault level projections for the decade ahead (MVA)[15]

Fault Level Node	Pre/Post-contingent	Minimum Fault Level (MVA)
Gin Gin 275kV	Pre-contingent	2,800
	Post-contingent	2,250
Greenbank 275kV	Pre-contingent	4,350
	Post-contingent	3,750
Lilyvale 275kV	Pre-contingent	1,400
	Post-contingent	1,150
Ross 275kV	Pre-contingent	1,350
	Post-contingent	1,175
Western Downs 275kV	Pre-contingent	4,000
	Post-contingent	2,550

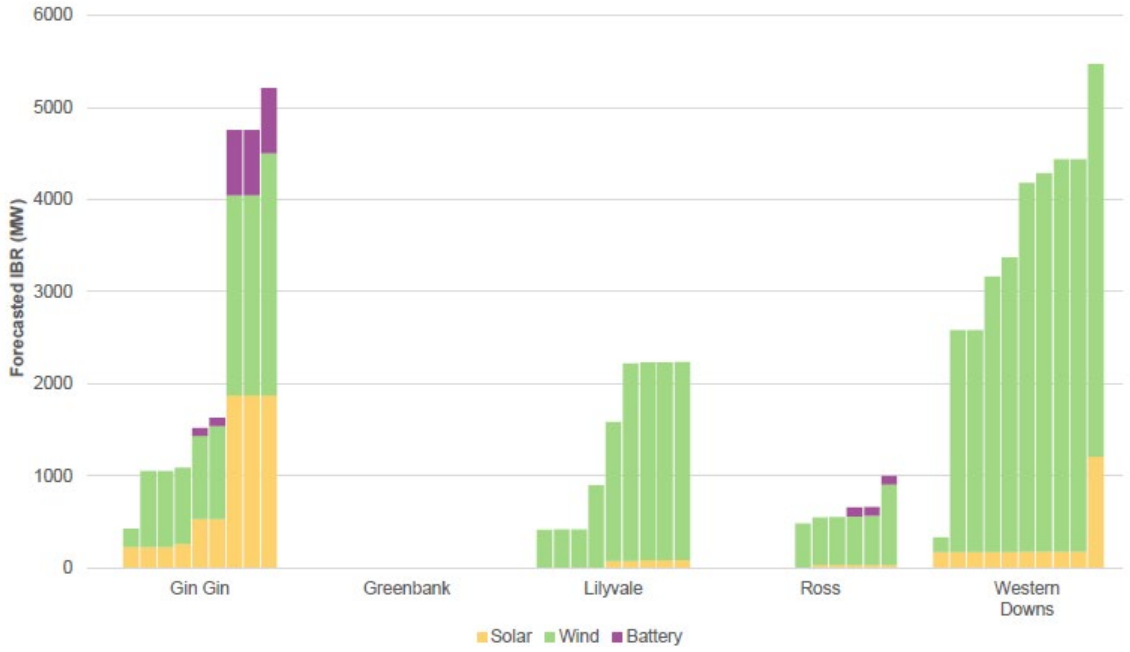
Note: the minimum requirements are unchanged across the 10-year forecast

[15] Refer to AEMO, December 2022 System Security Report, page 37.

4.2.1.2 Efficient level of system strength

AEMO forecasts for the level and type of IBR and market network service facilities (MNSF) at each system strength node over the 10-year period are presented in Figure 4.2 and Table 4.2.

Figure 4.2 10-year forecast level and type of IBR and MNSF[A] by system strength node[B]



A. No MNSFs have been included in this forecast.

B. The near-term years of the forecast may require adjustment by the SSSP when preparing system strength services, as more information becomes available about newly-committed IBR and MNSF.

Source: AEMO, December 2022 System Security Report, page 39.

Table 4.2 10-year forecast level and type of IBR and MNSF

System strength node	Technology	Existing IBR	Forecast IBR (MW) [B]										
			Financial year ending										
			2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Gin Gin	Solar	385	0	4	225	225	225	260	533	533	1875	1875	1875
	Wind	0	0	0	201	827	827	827	900	1008	2173	2173	2628
	Battery		0	0	0	0	0	0	89	89	708	708	708
	Total IBR	**385**	**0**	**4**	**426**	**1053**	**1053**	**1087**	**1522**	**1629**	**4756**	**4756**	**5212**
Greenbank	Solar	0	0	0	0	0	0	0	0	0	0	0	0
	Wind	0	0	0	0	0	0	0	0	0	0	0	0
	Battery	0	0	0	0	0	0	0	0	0	0	0	0
	Total IBR	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Lilyvale	Solar	319	0	0	0	0	0	0	75	75	86	86	89
	Wind	0	0	0	413	416	416	898	1510	2146	2146	2146	2146
	Battery	0	0	0	0	0	0	0	0	0	0	0	0
	Total IBR	**319**	**0**	**0**	**413**	**416**	**416**	**898**	**1585**	**2221**	**2232**	**2232**	**2235**
Ross	Solar	841	0	0	0	0	0	0	30	30	30	30	30
	Wind	362	0	0	0	0	0	482	518	523	531	537	875
	Battery	0	0	0	0	0	0	0	0	0	95	95	95
	Total IBR	**1204**	**0**	**0**	**0**	**0**	**0**	**482**	**548**	**553**	**656**	**662**	**1000**
Western Downs	Solar	1310	0	173	173	173	173	173	175	175	175	175	1207
	Wind	428	0	159	2408	2408	2992	3198	4007	4112	4265	4265	4265
	Battery	100	0	0	0	0	0	0	0	0	0	0	0
	Total IBR	**1839**	**0**	**331**	**2581**	**2581**	**3165**	**3370**	**4182**	**4287**	**4440**	**4440**	**5472**

A. No MNSFs have been included in this forecast.

B. The near-term years of the forecast may require adjustment by the SSSP when preparing system strength services, as more information becomes available about newly-committed IBR and MNSF.

Source: AEMO, December 2022 System Security Report, page 40.

4.2.1.3 Description of requirement for efficient system strength services

As the SSSP for Queensland, we are required to have solutions in place that provide sufficient system strength services to provide a stable voltage waveform and support connection of the IBR forecast in Table 4.2. AEMO's System Strength Requirements Methodology provides a description of stable voltage waveform in terms of four criteria voltage magnitude, change in voltage phase angle, voltage waveform distortion and voltage oscillations[16].

Powerlink has estimated the timing and amount of system strength needed to host the IBR projected by AEMO[17] over time. Refer to Table 4.3 for the efficient requirements which are in addition to the minimum requirements described in Section 4.2.1.1.

To deliver sufficient system strength to meet the **efficient** system strength requirements, Powerlink has estimated that a further eight synchronous machines or equivalent plant are required within the 10-year outlook period of AEMO's 2022 System Strength Report (refer to Table 1) to support AEMO's forecast levels of IBR (known as efficient level of system strength).

[16] Refer to Section 5.1
[17] Clause 5.20C.3(e) of the NER.

Table 4.3: Description of the requirement for system strength services

Year/s	Number of additional Units	Cumulative number of additional Units	Required Efficient System Strength
2025	1	1	One additional approximately 200MVA synchronous machine **or equivalent plant** online in North Queensland
2025 - 2030	3	4	Three additional approximately 200MVA each synchronous machines **or equivalent plant** online in Central and North Queensland are required to support additional IBR connections between 2025 and 2030. The required timing for the additional three units is likely closer to 2025 than 2030.
2030 - 2033	4	8	Four additional approximately 200MVA each synchronous machines **or equivalent plant** online, possibly in Central and Southern Queensland. The required timing for the additional four units is likely closer to 2030 than 2033. This will also be dependent on the IBR technology development in next three to five years.

In the interests of transparency, and a realistic assessment of the pace of change that can achieved while maintaining the reliability and security of the power system, Powerlink expects that the initial suite of services is likely to include existing synchronous plant and/or modifications thereof, subject to the submissions received and cost-benefit analysis undertaken as part of this RIT-T.

4.2.1.4 Powerlink will use reasonable endeavours to meet the SSSP requirements

Powerlink is obligated to use reasonable endeavours[18] to provide system services sufficient to deliver both minimum and efficient levels of system strength.

AEMO currently declares a fault level shortfall when dispatch intervals with less than the required number of synchronous generators are forecast to occur more than 1% of a year. Powerlink considers this threshold is aligned with the reasonable endeavours clause of the NER and will apply the same consideration to this RIT-T, in addition to the minimum and efficient requirements discussed in sections 4.2.1.1 to 4.2.1.3.

The threshold and number of plant required to deliver this service may vary based on timing, system strength contribution, reliability/availability, any outages required to enable system strength services, any operational constraints, and the cost of availability and operation of each unit as provided in submissions received.

5. Non-network options, system strength service requirements and assessment criteria

Potential non-network options submitted or identified through this RIT-T must

- meet the requirements of AEMO's System Strength Requirements Methodology in order to be assessed as suitable to contribute to AEMO's declared requirements at the system strength nodes
- be commercially and technically feasible.

[18] Refer to NER Schedule 5.1.14(b).

Proponents of potential system strength services must be market participants registered with AEMO (or intending participants) and must provide information suitable for assessment against the requirements and assessment criteria set out in this section.

It is expected that non-network solutions will materially contribute to the provision of the system strength services required through a suite of solutions such as, but not limited to,

- existing synchronous generation plants operating as generator or with the potential for full or hybrid conversion to allow operation as synchronous condensers
- dedicated synchronous condensers
- various grid-forming plant, and/or
- any other technology that can support stable voltage waveforms.

Powerlink expects that there will not be a direct one-to-one relationship between the number of alternatives required and the number of synchronous plant identified in this PSCR. Rather, we anticipate a portfolio of system strength services will be required.

5.1 Powerlink encourages proponents of non-network solutions to become familiar with the anticipated introduction of the Operational Security Mechanism (OSM)

In addition, proponents of non-network solutions are encouraged to become familiar with the Australian Energy Market Commission's (AEMC) current consultation and draft determination for the introduction of an Operational Security Mechanism (OSM) in the National Electricity Market. The proposed Rule change, which recommends operationalising services contracted under the evolved system strength framework, may be in effect from as early as October 2025. Powerlink will work with proponents of non-network solutions if and as required during the Rule change process, which will occur in parallel to the call for submissions to this PSCR and/or PADR analysis.

6. Common criteria for proposed network support services

To meet the minimum fault level, non-network solutions would need to replicate, in part or full, on a cost effective basis, the support described in Section 4.

The exact requirements depend on the location, nature of the potential non-network options offered, and the ability of the offered network support to respond to and operate in accordance with power system security requirements. Common criteria include:

Location and size

- Proposed solutions must be large enough, individually or collectively, to meet power system security requirements. However, the level of support depends on the location and type of network support offered.
- Proposed solutions must be large enough to contribute system strength equivalent to system strength services provided by an approximately 200MVA synchronous machine.
- Notwithstanding the location of any solution, each proposal would require assessment in relation to technical constraints or other issues pertinent to the network connection to meet power system security requirements.

Operation and Availability

- A non-network option would need to be capable of operating for extended periods (including consecutive days/weeks) and be available over the anticipated contract period.
- If a generation service is proposed (either standalone or in conjunction with other services), the power system security services will be required to operate "on demand" at certain times to satisfy

Powerlink's power system security requirements. Such operation will be required regardless of the spot price at the time[19].

- Proponents of generation services are advised that network support payments are intended for output that can be demonstrated to be additional to the plant's normal operation in the National Electricity Market.
- Where there are network costs associated with a proposed non-network option, these costs will form part of the option's economic assessment.

Reliability

- Powerlink has obligations under the National Electricity Rules, its Transmission Authority and connection agreements to ensure supply reliability and power system security is maintained to its customers. This will be assessed using a proportionate approach based on the size and type of system strength services offered and in the course of any contractual negotiations undertaken as a result of this RIT-T. The annual availability of the overall solution to meet the system strength requirements should be at least 99%. To be clear, this does not necessarily require that any individual solution achieve 99% annual availability

Timeframe and certainty

- The AEMO 2022 System Strength Report and 2022 Update identified the minimum and efficient level of system strength requirements and Powerlink has regulatory obligations to make services available to address these requirements. Proposed services should:
    - be able to be implemented in sufficient time to meet the identified requirements at the lowest overall cost to electricity consumers (Powerlink is seeking services available by 2030);
    - use proven technology, however, on balance, prudent and cost-effective novel services may be considered if the contribution to system strength can be demonstrated; and
    - where not already in operation, provide information in relation to development status, such as funding and development timelines, to support delivery within the required timeframe.

Duration

- The System Strength Services Agreement (agreement) duration for any proposed service will provide sufficient flexibility to ensure Powerlink is pursuing the lowest cost investment to address the power system security requirements.

Subject to negotiation and as an outcome of the RIT-T process, the duration of an agreement is expected to be in the range of three to five years. To promote efficient investment in electricity services, longer agreement durations will be considered where a lower overall cost to consumers can be demonstrated and assessed as part of the cost-benefit analysis undertaken in this RIT-T.

Although the planning horizon for this RIT-T concludes in 2033 (and the need is expected to continue growing beyond 2033), this consultation seeks system strength services available from December 2025 and as late as 2030 in the first instance.

Based on AEMO-s 10-year forecast, Powerlink's planning analysis has identified, in addition to the existing synchronous generation in Queensland, the requirement for the installation of a further eight synchronous machines or the equivalent plant is likely to be closer to 2030 than 2033. Powerlink is seeking services that will be available to commence within the 2025-2030 timeframe. Consistent with the National Electricity Objective[20], Powerlink also recognises the desirability of longer term contracts to promote efficient investment in electricity services, protecting the long-term interests of consumers.

Powerlink welcomes submissions from non-network solution providers who consider that they could offer a non-network option that can provide the required system strength described in Section 4 and that include:

- Contact details

[19] The National Electricity Rules prevent a generator that is providing network support from setting the market price.
[20] Refer to the AEMC website.

- Type of technology
- Size and Location
- Annual and daily availability
- Start-up time (if applicable)
- Maintenance duration
- Unavailability periods
- Service start date
- Service end date
- Capital cost
- Project status (committed[21] /under construction/existing);
- External contributions
- Fixed operating cost and
- Variable operating cost.

7. Potential credible options to address the identified need

A credible option is defined as an option (or group of options) that addresses the identified need, is commercially and technically feasible, and can be implemented in sufficient time to meet the identified need.[22]

7.1 Powerlink has proposed two credible options

Given the timing of the identified need from December 2025, the current challenging external environment, including supply chain disruptions, and acknowledging the risk of network project delivery delays in the immediate term, Powerlink does not consider there is a credible network option to install a synchronous condenser by 2025.

Powerlink is proposing two credible options that address both the minimum and efficient levels of system strength required. Given the scale and pace of the energy transformation, Powerlink considers this a prudent, least-regret approach to ensure the power system remains stable.

- Option 1 seeks to procure system strength services to meet the identified need in its entirety for both the minimum and efficient levels of system strength. System strength services offered must be able to commence availability in the period between December 2025 and December 2030.
- Option 2 is a hybrid solution which seeks to procure system strength services together with the installation and commissioning of up to eight 200MVA synchronous condensers (network component) for both the minimum and efficient levels of system strength required by December 2030. On balance, the number of synchronous condensers required will be dependent on the submissions received to this PSCR. System strength services offered must be able to commence availability in the period between December 2025 and December 2030.

  The indicative capital cost of the network component of this option is up to $752 million in 2023/24 prices. Annual operating and maintenance costs are anticipated to be up to approximately $15 million (2023/24 prices).

[21] Refer to AER, Regulatory investment test for transmission – 25 August 2020.
[22] Clause 5.15.2(a) of the NER.

Both credible options address AEMO's 2022 System Strength Report system strength service requirements to allow Powerlink to meet its obligations under its Transmission Authority, the Electricity Act 1994 and Schedule 5.1.14 of the Rules.

7.2 Options considered but not progressed

A credible option is defined as an option (or group of options) that addresses the identified need, is commercially and technically feasible and can be implemented in sufficient time to meet the identified need. In addition to the two credible options proposed in this PSCR, Powerlink has identified two potential network options to meet the identified need. These options have been assessed as not credible and as such, have not been progressed.

7.2.1 Network option to meet the identified need in its entirety between December 2025 and December 2030

Given the timing of the identified need from December 2025, the current challenging external environment, including supply chain disruptions, and acknowledging the risk of network project delivery delays in the immediate term, Powerlink does not consider there is a credible network option to install the first synchronous condenser as required in North Queensland by 2025 (refer to Table 4.3). As a result, Powerlink has not considered a network option comprised solely of network assets to meet the identified need.

7.2.2 Sub-option to Option 2 non-network solutions and the installation of multiple, small network synchronous condensers

Smaller synchronous condensers to those proposed under the network component in Option 2 are not considered as efficient as larger synchronous condensers, providing much less system strength for a similar cost. Given this, Powerlink has assessed that the installation of multiple small network synchronous condensers across the transmission network is not commercially feasible.

8. Material inter-network impact

The NER define a 'material inter-network impact' as

"A material impact on another Transmission Network Service Provider's network, which impact may include (without limitation):

(a) the imposition of power transfer constraints within another Transmission Network Service Provider's network; or

(b) an adverse impact on the quality of supply in another Transmission Network Service Provider's network."

In order to gauge whether a proposed transmission network augmentation has no material inter-network impact, AEMO's screening process [23] refers to consideration of the following factors

- decrease in power transfer capability between transmission networks or in another TNSP's network of no more than the minimum of 3 per cent of the maximum transfer capability and 50MW
- an increase in power transfer capability between transmission networks or in another TNSP's network of no more than the minimum of 3 per cent of the maximum transfer capability and 50MW
- an increase in fault level by less than 10MVA at any substation in another TNSP's network and
- the investment does not involve either a series capacitor or modification in the vicinity of an existing series capacitor.

[23] Criterial for Assessing Material Inter-Network of Transmission Augmentations : Final Determination (aemo.com.au)

Powerlink considers that the credible options being considered under this RIT-T may have a material inter-network impact, based on AEMO's screening criteria[24], with the potential to increase the fault level by at least 10MVA on the Queensland-New South Wales Interconnector.

However, the size of any potential fault level increase in Powerlink's transmission network will depend on the submissions received to this PSCR and the location, size, mix of technologies and/or number of additional plant identified in the credible options in the PADR. If necessary Powerlink will request an augmentation technical report[25] from AEMO in relation to the options being considered under this RIT-T.

9. Materiality of market benefits

The NER require that all categories of market benefits identified in relation to a RIT-T be quantified, unless the TNSP can demonstrate that a specific category is unlikely to be material[26].

9.1 Market benefits that may be material for this RIT-T assessment

Powerlink anticipates that the following categories of market benefits may be material to the outcomes of this RIT-T assessment:

- changes in patterns of generation dispatch
- changes in voluntary load curtailment
- changes in costs for other parties
- differences in the timing of expenditure
- changes in network losses.

Where Powerlink assesses that these classes of market benefits are material in the outcome of this RIT-T, and that the cost of undertaking the analysis to quantify the market benefits is proportionate to the scale, size and potential benefits of credible options, then these will be quantified and incorporated within the RIT-T assessment.

9.2 Market benefits not considered material for this RIT-T assessment

9.2.1 Change in ancillary services costs

It is possible that the market benefits associated with market ancillary services (i.e. Frequency Control Ancillary Services or FCAS) may differ depending on the credible option. However Powerlink considers that these market benefits are not likely to be materially different between options and hence unlikely to materially affect the outcome of this RIT-T assessment.

Similarly, Powerlink considers the market benefits associated with non-market ancillary services (i.e. Network Control Ancillary Services (NCAS) and System Restart Ancillary Services (SRAS)) are also unlikely to be materially different between options and hence unlikely to materially affect the outcome of this RIT-T assessment.

However this will be further assessed as part of the PADR assessment subject to submissions received to this PSCR.

9.2.2 Competition benefits

Competition benefits under the RIT-T relate to net changes in market benefits arising from the impact of the credible option on the bidding behaviour of market participants in the wholesale market.

[24] In accordance with Rules clause 5.16.4(b)(6)(ii). AEMO has published guidelines for assessing whether a credible option is expected to have a material inter-network impact.
[25] Refer to NER Clause 5.21(d).
[26] Refer to NER Clause 5.15A.2(b)(5) and AER, Regulatory Investment Test for Transmission, August 2020, paragraph 12.

Powerlink does not intend to estimate competition benefits as part of this RIT-T as these are not likely to be materially different between options and hence unlikely to materially affect the outcome of this RIT-T assessment. The cost of undertaking the analysis to quantify competition benefits is also unlikely to be proportionate to the potential benefits of credible options.

9.2.3 Additional option value

Powerlink considers that the estimation of any option value benefit over and above that already captured via the scenario analysis in this RIT-T would require a significant modelling and analysis, and would be disproportionate to any additional option value benefit that may be identified. Accordingly, Powerlink does not propose to estimate any additional option value market benefit for this RIT-T assessment.

9.3 General approach to market modelling

The credible options considered in this PSCR may affect outcomes in the wholesale market depending on the technical operating characteristics and location of these options. Powerlink will quantify market benefits associated with these options using wholesale market modelling techniques where the category of market benefit is considered material and the cost of undertaking the modelling is proportionate to potential benefits between options. This will be further assessed as part of the PADR and subject to submissions received to this PSCR.

10. Base Case

Consistent with the RIT-T Application Guidelines, the assessment that will be undertaken in the PADR will compare the costs and benefits of credible options to address the risks arising from an identified need, with a 'do nothing' Base Case[27].

As characterised in the RIT-T Application Guidelines, the Base Case itself is not a credible option to meet the identified need. Specifically, the Base Case reflects a state of the world in which the RIT-T proponent does not take any action to address the identified need, other than through standard operational activities, with escalating safety, financial, environmental and network risks.

To develop the base case, Powerlink would include the normal market dispatch of available synchronous generators.

The Base Case acts as a benchmark and provides a clear reference point in the cost-benefit analysis to compare and rank the credible options against each other over the same timeframe.

11. General modelling parameters for the PADR

11.1 Analysis period

The RIT-T analysis will be undertaken over a 20-year period, from 2022/23 to 2041/42. A 20-year period takes into account the size and complexity of the system strength services that will be required in Queensland over the planning horizon. Where the capital components of the credible options have asset lives extending beyond the end of the assessment period, the NPV modelling includes a terminal value to capture the remaining asset life. This ensures that the capital cost of long-lived options over the assessment period is appropriately captured, and that all options have their costs and benefits assessed over a consistent period, irrespective of option type, technology or asset life.

11.2 Discount rate and sensitivity analysis

Under the RIT-T, a commercial discount rate is applied to calculate the NPV of the costs and benefits of credible options. Powerlink intends to adopt AEMO's central estimate (5.5%) of the real, pre-tax commercial discount rate from AEMO's 2021 Inputs, Assumptions and Scenarios Report (IASR) for

[27] AER, *Application guidelines, Regulatory Investment Test for Transmission*, August 2020

the NPV analysis as the central assumption in the PADR.[28] Given the central estimate in AEMO's Draft 2023 IASR is 7.0%, and AEMO will publish the Final IASR in July 2023, it is likely that the central assumption for the discount rate will be higher in the PACR than in the PADR.[29]

Powerlink will also undertake analysis to test the sensitivity of the results to changes in the discount rate assumption, and specifically the adoption of a lower bound discount rate based on the most recent Final Decision for a TNSP Revenue Determination[30], and an upper bound discount rate based on the IASR. We note that the upper bound real, pre-tax discount rate in AEMO's Draft 2023 IASR is 9.0%, compared to 7.5% in the 2021 IASR.[31]

11.3 Description of reasonable scenarios

The RIT-T analysis is required to incorporate a number of different reasonable scenarios, which are used to estimate market benefits and rank options[32]. The number and choice of reasonable scenarios must be appropriate to the credible options under consideration and reflect any variables or parameters that are likely to affect future market benefits and the ranking of the credible options, where the identified need is reliability corrective action[33]. The scenarios contained in the PADR analysis will be based on the most recent IASR and include an appropriate range of scenarios to test the robustness of potential solutions against key future uncertainties.

11.4 Option costs

The external environment in which Powerlink operates is becoming more complex with many factors such as rising inflation, increasing interest rates, the ongoing disruption to supply chains and materials shortages due to COVID-19 and geopolitical impacts, continuing to be a challenge. Cost increases occurring across labour, fuel, logistics, steel, cement, copper, aluminium, and other key commodities are affecting the supply chains across many sectors globally. While recognising these complexities, Powerlink is focused on identifying supply risks and delivering solutions to ensure customers continue to receive cost-effective and efficient services in this uncertain environment. The estimated cost of options presented in this PSCR are based on best information available at the time and may be subject to change and further refined in subsequent stages of this RIT-T.

12. Submissions requirements

Powerlink invites submissions and comments in response to this PSCR from Registered Participants, AEMO, potential non-network providers and any other interested parties. Submissions should be presented in a written form and should clearly identify the author of the submission, including contact details for subsequent follow-up if required. If parties prefer, they may request to meet with Powerlink ahead of providing a written response and/or request a copy of the proposed contract structure[34] to aid in the development of submissions.

12.1 Submissions from non-network providers

This is not a tender process – submissions are requested so that Powerlink can fulfil its regulatory obligations to analyse non-network options. In the event that a non-network option appears to be a genuine and practicable alternative that could satisfy the RIT-T, Powerlink will engage with that proponent or proponents to clarify cost inputs and commercial terms.

Submissions from potential non-network providers should contain the following information:

[28] AEMO, *2021 Inputs, Assumptions and Scenarios Report*, p. 105.
[29] AEMO, *Draft 2023 Inputs, Assumptions and Scenarios Report*, December 2022, p. 110.
[30] The most recent final determination is Powerlink's for 2022-27, which includes a pre-tax, real rate of return of 2.3%; see AER, *Powerlink Transmission Determination 2022-27 Post-tax Revenue Model*, April 2022 (WACC worksheet). The AER's final determinations for Transgrid and ElectraNet are due by 30 April 2023.
[31] AEMO, *Draft 2023 Inputs, Assumptions and Scenarios Report*, December 2022, p. 110.
[32] AER, *Regulatory investment test for transmission, August 2020,* paragraph 22
[33] AER, *Regulatory investment test for transmission, August 2020,* paragraph 23
[34] The proposed contract structure is currently under development at the time of PSCR publication.

- details of the party making the submission (or proposing the service)
- technical details of the project (capacity, proposed connection point if relevant, etc.) to allow an assessment of the likely impacts on future supply capability
- sufficient information to allow the costs and benefits of the proposed service to be incorporated in a comparison in accordance with AER RIT-T guidelines
- an assessment of the ability of the proposed service to meet the technical requirements of the Rules
- timing of the availability of the proposed service
- other material that would be relevant in the assessment of the proposed service.

As the submissions will be made public, any commercially sensitive material, or material that the party making the submission does not want to be made public, should be clearly identified. It should be noted that Powerlink is required to publish the outcomes of the RIT-T analysis. If parties making submissions elect not to provide specific project cost data for commercial-in-confidence reasons, Powerlink may rely on cost estimates from independent specialist sources.

12.2 Lodging a submission with Powerlink

Powerlink is seeking written submissions on this Project Specification Consultation Report, on or before Friday, 21 July 2023.

Please address submissions to:

Nathaniel Dunnett
Manager Portfolio Planning and Optimisation
Powerlink Queensland
PO Box 1193
VIRGINIA QLD 4014

Tel: (07) 3860 2111

Email submissions to: networkassessments@powerlink.com.au

12.3 Assessment and decision process

Powerlink intends to carry out the following process to assess what action, if any, should be taken to address future supply requirements:

Part 1	PSCR Publication	28 March 2023
	Submissions due on the PSCR Have your say on the credible options and propose potential non-network options.	21 July 2023
Part 2	Publication of the PADR Powerlink's response to the submissions received and identification of the preferred option.	February/March 2024
Part 3	Publication of the PACR Powerlink's response to any further submissions received and final recommendation on the preferred option for implementation.	June 2024

Powerlink reserves the right to amend the timetable at any time. Amendments to the timetable will be made available on the Powerlink website (www.powerlink.com.au).

Contact us

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