Meeting the System Strength Standard in Tasmania from December 2025 onward.

Project Assessment Conclusions Report

Official

12 June 2025

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TasNetworks acknowledges the palawa (Tasmanian Aboriginal community) as the original owners and custodians of lutruwita (Tasmania). TasNetworks, acknowledges the palawa have maintained their spiritual and cultural connection to the land and water. We pay respect to Elders past and present and all Aboriginal and Torres Strait Islander peoples.

Executive Summary

TasNetworks is the Transmission Network Service Provider (**TNSP**), System Strength Service Provider (**SSSP**) for the Tasmanian region of the National Electricity Market (**NEM**). The Project Assessment Conclusions Report (**PACR**) is the third stage of the Regulatory Investment Test for Transmission (**RIT-T**) that is being applied by TasNetworks to meet our system strength obligations under the National Electricity Rules (**NER**).

This document confirms the preferred option to meet TasNetworks' obligations to plan for and procure system strength as the SSSP in Tasmania. Publication of this report follows the release of a Project Specification Consultation Report (**PSCR**) in August 2023 and the publication of a Project Assessment Draft Report (**PADR**) in November 2024.

Identified need: Meeting system strength requirements

In response to the increasing reliance on inverter-based resources (**IBR**) and the importance of maintaining system strength, the Australian Energy Market Commission (**AEMC**) introduced changes to the NER that require TasNetworks to plan for and pre-emptively procure sufficient system strength services to support the Tasmanian power system. Consistent with the NER and the PSCR and PADR published by TasNetworks, the identified need for this RIT-T is:

*to provide, from 2 December 2025, sufficient system strength at each System Strength Node (**SSN**) to satisfy minimum fault level requirements, as well as provide an efficient level of system strength, so as to maintain power system security while facilitating forecast developments of IBR in Tasmania.*

This RIT-T identifies the preferred solution to meet system strength obligations until 2029. TasNetworks will consider solutions for providing system strength beyond 2029 in a future RIT-T, when there is less uncertainty regarding the volume of new connecting IBR.

System strength requirements for the forward planning period

TasNetworks has used the Australian Energy Market Operator's (**AEMO**) System Strength Report, and applied our own forecasts based on known connection enquiries to determine equivalent three-phase fault levels to host the forecast additional capacity. This represents the 'efficient level of system strength' required at each system strength node to maintain a stable voltage waveform operationally. This is provided in Table 1.

Table 1 Efficient level of system strength

System strength node	Efficient level of system strength [MVA]					
	2024	2025	2026	2027	2028	2029
Burnie 110 kV	850	750	750	1,050	1,050	1,050
George Town 220 kV	1,450	1,600	1,600	2,000	2,000	2,000
Risdon 110 kV	1,330	1,330	1,330	1,450	1,450	1,450
Waddamana 220 kV	1,400	1,400	1,400	2,000	2,000	2,050

Identification of the preferred option

TasNetworks evaluated four options to address system strength needs, considering their technical, economic feasibility, and ability to meet timelines:

1. **Option 1**: Install synchronous condensers (network solution) — deemed non-credible due to procurement and installation time constraints, and higher costs compared to non-network solutions.
2. **Option 2**: Contract with existing owners of synchronous condensers and generation assets (non-network solution) — considered credible as it met system strength requirements efficiently and cost-effectively.
3. **Option 3**: Use battery energy storage systems (**BESS**) — ruled out as technically infeasible to meet all system strength needs within required timeframes.
4. **Option 4**: Hybrid solution combining BESS and existing assets — rejected due to higher costs and insufficient benefits compared to relying solely on existing assets.

Conclusion: **Option 2**, contracting with existing owners of synchronous condenser assets, was the only credible option, as it was technically and commercially feasible and could be implemented in time to meet the identified need.

TasNetworks acknowledges that this decision is driven by limiting consideration of system strength requirements up to 2029. A future RIT-T will be initiated for the post-2029 period when forecasts become more certain, to avoid inefficient investments.

While a RIT-T is not mandatory under the NER, as the investment does not meet the $8 million threshold, TasNetworks chose to proceed with it for transparency in determining the preferred option.

Next Steps

Under the NER and the RIT–T application guidelines[1] published by the AER, any party that has the potential to suffer a material adverse NEM impact as a result of the investment in system strength identified by TasNetworks as the preferred option can dispute a conclusion made in this PACR. The disputing party can only dispute conclusions that TasNetworks made in this report regarding:

- The application of the RIT-T;
- The basis on which TasNetworks classified the preferred option as being for reliability corrective action; or
- TasNetworks' assessment about if the preferred option will have a material inter-network impact.

Disputes must be lodged, in writing, with the AER within 30 days of the publication of this report. At the same time, the party lodging the dispute must also provide a copy of the dispute notice to TasNetworks.

If a dispute is received, the AER must either reject the dispute or make and publish a determination in relation to the dispute within 40 days of receiving the dispute notice, or within a period of up to an additional 60 days if the AER assesses that more time is required to make a determination, due to the complexity or difficulty of the issues involved.

In the event that no dispute notices are lodged in relation to this report, publication of this PACR concludes the RIT-T process in relation to system strength to support the Tasmanian power system for the period from 2 December 2025 to 30 June 2029.

[1] *Application guidelines – Regulatory investment test for transmission*, Australian Energy Regulator, November 2024

Contents

Glossary

AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
AFL	Available Fault Level (methodology)
BESS	Battery Energy Storage System
EMT	Electro-Magnetic Transients
EOI	Expression of Interest
FID	Final Investment Decision
GWh	Gigawatt Hours
HVDC	High Voltage Direct Current
IBR	Inverter Based Resources
ISF	Improving Security Frameworks for the Energy Transition
ISP	Integrated System Plan
MVA	Megavolt-Ampere
NEM	National Electricity Market
NER	National Electricity Rules (Version 216 referenced throughout this document)
PACR	Project Assessment Conclusions Report
PADR	Project Assessment Draft Report
PSCR	Project Specification Consultation Report
RIT-T	Regulatory Investment Test for Transmission
SSN	System Strength Node
SCR	Short circuit ratio
SSSP	System Strength Service Provider
TRET	Tasmanian Renewable Energy Target
TNSP	Transmission Network Service Provider
WAM	Wide Area Model

Introduction

TasNetworks owns, operates and maintains the electricity transmission and distribution networks in Tasmania. As the TNSP and Jurisdictional Planner for the Tasmanian region of the NEM, we are also the SSSP and Inertia Service Provider as defined by the NER.

System strength is a broad term encapsulating a number of specific technical issues. In the context of the NER requirements, system strength addresses the minimum three phase fault levels which are necessary to ensure power system security, including maintaining the stability of voltage waveforms. The latter issue can be significantly impacted by the connection of grid-following IBR technology in Tasmania, which is the typical solution implemented by wind and solar generators. Maintaining the security of the power system is especially challenging whenever the need to run traditional synchronous generators is diminished, for example when the output of IBR meets a significant portion of the total demand for electricity.

While Tasmania's generation is vastly different to the rest of Australia, with little to no reliance on thermal generation given our significant hydroelectric generation assets, the management of system strength and inertia remains critically important as new on-island renewable energy developments occur. Achieving the increase in renewable generation envisaged in the Tasmanian Renewable Energy Target (**TRET**) legislation suggests that a minimum of 2,500 MW of new wind generation will need to be constructed. Such capacity will at times be well in excess of Tasmania's needs, creating a situation where hydroelectric units will not be dispatched. Ensuring that power system security and reliability are not compromised during such operating conditions, that may become increasingly commonplace, is of paramount importance to TasNetworks.

TasNetworks is considering the investment needed to meet our system strength obligations at the lowest cost to consumers through this RIT-T. The RIT-T requires a robust, transparent cost-benefit analysis and ensures that stakeholders understand the need for expenditure and are able to actively participate in helping identify potential solutions. This PACR is the final step in the RIT-T process.

TasNetworks published the first step in the RIT-T process, the PSCR, in August 2023. As part of the PSCR, TasNetworks invited proponents of system strength services to respond to an Expression of Interest (**EOI**) outlining how they could contribute to meeting the identified need. TasNetworks received three responses to this EOI.

TasNetworks published a PADR in November 2024, the purpose of which was to:

- reiterate why action needs to be taken to maintain system strength in Tasmania;
- with reference to the submissions received in response to the EOI, describe the credible options capable of addressing the identified need; and
- present the reasoning for choosing the preferred option.

As part of the PADR, TasNetworks invited interested parties to comment on the analysis and information provided in the PADR. TasNetworks received one stakeholder submission.

TasNetworks encourages stakeholders to visit our system strength project page[2], which includes copies of the PSCR and PADR for more information.

As the final step in the RIT-T process for the provision of system strength from 2 December 2025 to 30 June 2029, this PACR updates the analysis presented in the PADR with any new information that has

[2] TasNetworks, Meeting System Strength Requirements, https://www.tasnetworks.com.au/Poles-and-wires/Planning-and-developments/Our-current-projects/Meeting-System-Strength-Requirements.

emerged since the PADR was published, including any relevant information received through representations from interested parties in response to the PADR.

Identified need

In response to the increasing reliance on IBR and the importance of maintaining system strength, the Australian Energy Market Commission (**AEMC**) introduced changes to the NER that require TasNetworks to plan for and pre-emptively procure sufficient system strength services to support the Tasmanian power system.

Consistent with the PSCR and PADR, the identified need is to provide, from 2 December 2025, sufficient system strength at each SSN to satisfy minimum fault level requirements, as well as provide an efficient level of system strength, so as to maintain power system security while facilitating forecast developments of IBR in Tasmania. In doing so, TasNetworks will satisfy its obligations under NER S5.1.14(b) to make system strength services available to AEMO and maintain system strength for each SSN on its transmission network. This specifically includes a requirement to provide the system strength needed to achieve stable voltage waveforms for the level and type of IBR and market network service facilities projected by AEMO for each SSN.

The new rule requires TasNetworks to not only meet the requirements of the existing power system (i.e. the minimum fault level requirements), but also the efficient level of system strength required to support the forecast connection of IBR in the future. AEMO publishes a 10-year forecast of the minimum fault level and forecast IBR connections at each SSN in its annual System Strength Report.

Under the NER, TasNetworks must use reasonable endeavours to satisfy the expected system requirements three years in advance of the latest System Strength Report published by AEMO. Following release of the 2024 System Strength Report in December 2024, TasNetworks must plan to meet the forecast requirements for 2 December 2025, 2026, and 2027. Given AEMO publishes a 10-year forecast, TasNetworks can plan for longer-term solutions where it is efficient and prudent to do so.

The role of system strength in the power system

System strength is a key attribute in a secure and resilient power system. System strength refers to several technical capabilities such as fault current and stable voltage levels.

To incorporate high penetration of IBR in Tasmania, which coincides with lower penetration of synchronous generation which provides system strength, alternative mechanisms will be required to ensure the security of the power system.

For further information on the role of system strength in the power system, refer to page 12 of the PADR.

System Strength in Tasmania

Tasmania has the potential to play an important role in contributing to the decarbonisation of the NEM, through the connection of significant renewable energy resources, along with the flexible firming capacity and deep storage provided by the State's existing and new hydro generation assets. Additional transmission interconnector capacity in the form of Marinus Link[3] and associated North West Transmission Developments[4] will enable Tasmania to contribute more significantly to the future needs of the NEM, as well as encourage local generation and customer developments.

[3] Project Marinus website https://marinuslink.com.au/
[4] North West Transmission Developments website https://www.tasnetworks.com.au/poles-and-wires/planning-and-developments/north-west-transmission-developments

Tasmania's energy future is described by State Government legislation which targets an increase in renewable generation from an existing baseline of 10,500 GWh to 21,000 GWh by 2040. The TRET translates to the installation of at least 2,500 MW of new wind generation, which will increase the total installed wind capacity in Tasmania to over 3,000 MW. The most recent Integrated System Plan (**ISP**) published by AEMO forecasts that most of this generation will be installed within the next ten years, aligned with the expected completion of both stages of Marinus Link (i.e. two 750 MW undersea and underground electricity interconnectors between North West Tasmania and the Latrobe Valley in Victoria).

A near five-fold increase in Tasmania's IBR generation capacity will not only allow the State's electricity demands to be fully satisfied at times by the power produced by IBR, but will also be sufficient to support significant levels of export to the mainland via Basslink and Marinus Link. The role of synchronous hydroelectric generation in such a future will be very different, with the provision of flexible, dispatchable firming capacity expected to become more critical (and valuable) than in today's market.

Importantly, many forms of IBR currently rely on other grid forming technologies to remain stable, operate in a predictable manner and provide the levels of fault current required to satisfy protection requirements. As the installed capacity of IBR in Tasmania continues to grow to meet the TRET, there will increasingly be periods where little, if any, synchronous generation will be required to be online to satisfy on-island demand for electricity. In the context of the Tasmanian power system, any power imported across high voltage direct current (**HVDC**) interconnectors also reduces the need for synchronous generation, exacerbating the deterioration of system strength due to the increasing contribution from IBR.

An important follow-on observation which differentiates Tasmania from virtually all other regions of the NEM is that while the role of the State's hydroelectric synchronous generators will evolve, there is no expectation of mass withdrawal of capacity from the network. Having a power system which, to date, has been dominated by hydroelectric generation, Tasmania is not exposed to the same challenges associated with the retirement of large-scale thermal generation (coal and gas fired) that is occurring in other parts of the country. Nonetheless, the future need to procure, install and actively manage system security services like system strength and inertia in Tasmania will in part be a product of the concentrated IBR capacity proposed to be built in Tasmania as a means of contributing to broader NEM goals, including a transition away from fossil fuelled generation.

System strength planning obligations

TasNetworks' planning obligations requires us to ensure that the transmission network:

a) Maintain the minimum three phase fault level specified by AEMO, and
b) Achieve stable voltage waveforms for the level and type of inverter-based resources and market network service facilities projected by AEMO.

For further information on TasNetworks system strength planning obligations, refer to page 13 of the PADR.

Timing and duration of identified need

During the RIT-T process, TasNetworks has had to plan to meet the forecast requirements for system strength between 2 December 2025 and 2026. However, with AEMO's forecasts having been updated in December 2024, at the time of writing the obligation on TasNetworks to provide system strength now extends to 2 December 2027.

For the reasons stipulated in the PADR, TasNetworks is considering the system strength requirements of the Tasmanian power system for the period from 2 December 2025 (i.e. the commencement date of our

obligation) to 30 June 2029. TasNetworks has chosen to contract beyond our obliged system strength provision timeframe based on current IBR forecasts and known requirements to provide a level of certainty to the market and involved parties.

TasNetworks will commence another RIT-T to address its post 2029 system strength obligations, once IBR forecasts have become more certain, noting the long regulatory approval and procurement / construction timeframes for some potential system strength solutions.

We believe that this approach remains consistent with the requirements of the NER, while managing our obligations to promote efficient investment in the long-term interest of customers.

Minimum three phase fault levels

The intent of the minimum fault level requirement is described in Clause S5.1a.9 of the NER.

In addition to the technical issues described in the rules, the minimum fault levels defined in Tasmania have also considered the system strength requirements for existing IBR connections, i.e. network users who have established connections pre-dating the rule requirements and who are exempt from system strength charges under the new framework. For clarity, satisfaction of the minimum fault levels as currently defined will be adequate to achieve secure operation of the intact network with the IBR connections already present.

It follows that the minimum fault level requirements for each existing SSN are forecast to remain unchanged over the forward planning period. The minimum three phase fault currents across Tasmania's SSNs have remained largely unchanged over the various iterations of the annual System Strength Report. There are currently four SSNs defined across the Tasmanian power system. The existing minimum fault level defined for each node to maintain secure operation is presented in Table 2.

Table 2 Minimum three phase fault current at Tasmania's declared SSNs

System Strength Node	Minimum three phase fault current [MVA]
Burnie	750
George Town	1,450
Risdon	1,330
Waddamana	1,400

The Burnie 110 kV minimum fault level requirement was reduced from 850 MVA to 750 MVA in the 2024 System Strength Report. TasNetworks is nearing completion of two STATCOMS installed at Port Latta addressing wind farm fault ride through issues dictating the revised requirements at the Burnie SSN.

The incremental increases in system strength requirements needed to support future IBR connections are captured by the efficient level of system strength discussed below.

Efficient level of system strength

The efficient level of system strength required in the future will be a function of installed IBR capacity and its performance characteristics. The rule requirement in this regard is that TasNetworks must provide sufficient system strength to ensure stable voltage waveforms both in steady state conditions and following any credible contingency event or protected event. The underlying intent is to support the operation of future IBR connections while maintaining power system security and reliability.

TasNetworks is not strictly bound to forecast the efficient level of system strength using only the latest inputs published by AEMO. TasNetworks can use different inputs where better information is available. The final inputs chosen by TasNetworks for the final analysis underpinning this PACR are described below.

AEMO IBR forecasts

As described in the PADR, several IBR forecasts have been updated and considered throughout the RIT-T process.

In December 2024, AEMO published the 2024 System Strength Report. IBR forecasts in the report up until 2029 are largely consistent with IBR forecasts in the 2024 ISP and preceding 2023 System Strength report where some of the power system modelling inputs were drawn from.

Table 3 Forecast IBR as per 2024 System Strength Report

System strength node	Tech.	Existing IBR [MW]	Forecast IBR [MW]										
			2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Burnie	Wind	250	0	0	6	6	15	15	15	134	142	142	387
George Town	Solar	0	0	0	0	0	0	0	0	0	0	0	0
	Wind	168	0	0	112	112	242	242	242	400	400	400	400
Risdon	Wind	0	0	0	0	0	0	0	0	0	0	0	0
Waddamana	Wind	144	0	0	599	599	641	1,304	1,304	1,383	1,392	1,392	1,392

TasNetworks does not consider the updated IBR forecasts has materially changed the efficient level of system strength projected for the 2025-2029 period – nor identification of the preferred option.

TasNetworks' IBR forecasts

In a practical sense, the development of IBR in Tasmania is unlikely to follow the exact trajectory forecast by AEMO. TasNetworks has applied judgement in determining the appropriate use of AEMO's forecast in meeting our system strength obligations. Where known IBR based projects have a proposed capacity and connection date that generally aligns with the forecasts presented in the AEMO System Strength Report, those project(s) have been applied for modelling purposes. Specifically, the IBR forecasts TasNetworks has adopted largely reflect the 2024 System Strength Report. One minor exception in IBR forecasts used in power system modelling is that TasNetworks has maintained the 2025 forecast from the 2022 System Strength Report for solar, despite it being removed in more recent forecasts. TasNetworks considers this a reasonable approach given progress of specific connections towards committed project status. This results in an overall IBR forecast which still remains relatively consistent until 2029.

Furthermore, where future network topology changes are already known and have been communicated to AEMO and the broader industry, we have included those network developments in our modelling activities for the year when in-service operation can be reasonably expected. Reinforcement of the transmission network can have a notable impact on system strength requirements, depending on the location of IBR connection points relative to support mechanisms, including synchronous machines. This is consistent with the requirements of Step 1 in the AEMO available fault level (**AFL**) methodology[5].

TasNetworks has also considered the potential for new IBR proponents to self-remediate their system strength impact rather than use the TasNetworks provided service. Where an IBR connection elects to self-

[5] AEMO System Strength Impact Assessment Guidelines, Version 2.2, 1 July 2024, section 3.4.4

remediate its impact, this could reduce the size of a network solution or amount of system strength services that TasNetworks needs to install or procure. Based on the most recent connection information available, TasNetworks is not aware of any new IBR proponents that are captured in AEMO's forecasts and choosing to self-remediate.

Although the 2024 System Strength Report has provided more recent IBR projections as shown in Table 3, TasNetworks does not consider these will materially change the equivalent fault current requirements (efficient level of system strength) in the 2025 to 2029 period – nor identification of the preferred option. TasNetworks considers the IBR forecast presented in Table 4 to be suitable for the purposes of this RIT-T.

Table 4 Summary of Tasmania's IBR forecasts – following adjustments

System strength node	Tech.	Existing IBR [MW]	Forecast IBR [MW]										
			2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Burnie	Wind	250	0	0	0	5	5	181	703	703	703	703	703
George Town	Solar	0	0	288	288	288	288	288	288	288	288	288	288
	Wind	168	0	0	0	41	41	41	41	41	53	53	53
Risdon	Wind	0	0	0	0	0	0	0	0	0	0	0	0
Waddamana	Wind	144	0	0	0	603	603	612	1,362	1,362	1,370	1,370	1,370

Note that there is a considerable step change in forecast IBR from 2030 in the modelling input assumptions above, particularly at the Waddamana and Burnie SSNs. The assumed projections above exceed the AEMO forecasts in Table 3 for Burnie, are below for George Town wind and are aligned with projections at Waddamana and Risdon. Future modelling for the 2030 period and beyond will consider the most recent forecasts available when studies commence for the next System Strength RIT-T.

Conversion of IBR forecasts to planning inputs

TasNetworks must convert the forecast IBR developments (described in terms of installed capacity, MW) into an equivalent efficient level of system strength (described in terms of three phase fault level, MVA). For forward planning studies, the technical characteristics of the plant to be connected and even the network connection arrangements, may not be known.

TasNetworks has undertaken extensive technical analysis to convert the forecast IBR into an equivalent fault current amount, such that the total, efficient level of system strength for each SSN can be established in each future year to test credible options against. This is to meet the planning requirements established in schedule 5.1.14 of the NER.

TasNetworks, as the SSSP for Tasmania, must use reasonable endeavours to provide efficient/sufficient[6] system strength services to maintain the stability of the Tasmanian power system. In summary the services must:

- Achieve stable voltage waveforms in steady state conditions, and
- Not depend on disconnection of IBR to maintain post contingent stability.

As part of the connection enquiry process, TasNetworks is obliged to conduct a preliminary impact assessment (**PIA**) of system strength requirements and associated costs at the proposed connection point

[6] Note: the NER define *sufficient* fault levels, whereas AEMO's system strength report requires *efficient* System Strength Services

based on the proposed size of the new generation. This PIA then informs a planning level of AFL required, which is published in TasNetworks annual planning reports. An assumed short circuit ratio (**SCR**) of 3.0 is applied at this stage of the connection process.

TasNetworks as the SSSP has responsibility to ensure efficient system strength services are available at each SSN, for stable future operation of the power system. As the system strength service is provided on an aggregate basis, the SSSP must provide efficient system strength services for stable operation of multiple IBR connections when operating together. The NER give an SSSP flexibility in the methodology it uses to determine the efficient level of system strength services. Clause S5.1.14(b)(2) provides that an SSSP may:

- apply the AFL methodology using PSS/E loadflow and fault calculations, or
- undertake wide area model (**WAM**) studies in the electro-magnetic transients (**EMT**) environment.

The AFL methodology will deliver a secure solution but may be more costly for Tasmanian customers. All recent enquires have met the threshold requiring a full impact assessment (**FIA**). For the purposes of determining future efficient fault level requirements, TasNetworks has undertaken a range of detailed WAM EMT studies providing insight into more appropriate assumed minimum SCR levels at each of the new generator's connection points, resulting in lower system strength requirements and costs to customers.

Using these new assumed minimum SCR levels, modified AFL calculations can then be used in the short term to avoid time consuming WAM EMT studies to consider sensitivities as IBR projections are updated and planners can consider a larger range of future operating requirements.

Total planning need – the efficient level of system strength

Based on the analysis undertaken using the WAM EMT methodology, TasNetworks expects that there will be a requirement for increased system strength services at the George Town, Waddamana and Burnie SSNs, as shown in Table 5 and Figure 1. The most significant increase is expected to be at the Waddamana 220 kV node, with an increase of 600 MVA from the existing minimum fault level requirement of 1,400 MVA. A similar increase is expected at George Town.

Table 5 Fault level projections at SSNs until 2029 (MVA)

System strength node	Efficient level of system strength [MVA]					
	2024	2025	2026	2027	2028	2029
Burnie 110 kV	850	750	750	1,050	1,050	1,050
George Town 220 kV	1,450	1,600	1,600	2,000	2,000	2,000
Risdon 110 kV	1,330	1,330	1,330	1,450	1,450	1,450
Waddamana 220 kV	1,400	1,400	1,400	2,000	2,000	2,050

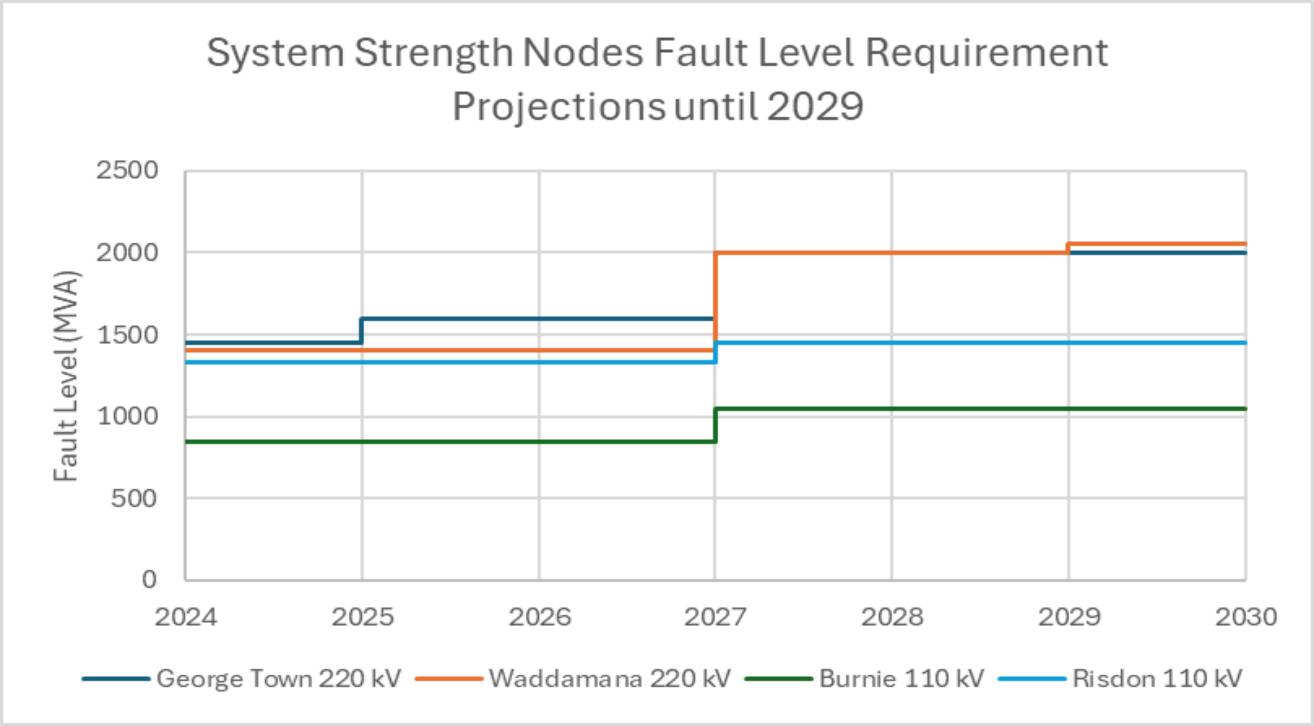

Figure 1 Fault level projections at System Strength Nodes until 2029

Analysis of the identified need within this PACR has been solely based on the minimum and efficient levels of system strength identified by AEMO and TasNetworks. On that basis, the following issues have been specifically excluded from consideration:

- Any system strength to support the operation of Marinus Link. At this stage, it is unclear if the new HVDC interconnector will have a net positive, negative or neutral impact on system strength in Tasmania.
- Any system strength requirements associated with future customer loads that utilise controllable IBR technologies, e.g. electrolysis processes. Large IBR loads have not been forecast by AEMO and would need to be considered on a case-by-case basis.
- Any system strength requirements to support future BESS which are operated as grid-following (rather than grid-forming) devices.
- Any system strength requirements associated with future dynamic reactive support devices installed as network assets. The intention would be to design such equipment to operate at the minimum three phase fault level and not materially add to the overall system strength requirement, and potentially work to reduce it as has been the case with the Burnie SSN.

Key changes since the PADR

Since the publication and consultation on the PADR, new information has been published that impacts the analysis for the RIT-T. These are commented on in the following section.

2024 System Strength Report

AEMO published the 2024 System Strength Report in December 2024[7]. As described in the previous section, these reports change the amount of forecast IBR at some SSNs.

As mentioned in the Efficient Levels of System Strength section of this RIT-T, whilst the 2024 System Strength Report has provided more recent IBR projections, TasNetworks does not consider these will materially change the equivalent fault current requirements (efficient level of system strength) in the 2025 to 2029 period – nor identification of the preferred option.

AER System Strength Guidance Note

In December 2024, the AER published the Efficient Management of System Strength Guidance Note[8] (**the Guidance Note**). The Guidance Note provides background and information on issues that relate to how SSSPs can interpret requirements and apply the RIT-T when assessing investments and options for meeting system strength requirements. The Guidance Note itself is not binding on any party but reflects the AER's consideration of how SSSPs can best comply with their obligations at least cost and in the long-term interests of consumers of electricity.

TasNetworks' approach described in the PADR and confirmed in this PACR is consistent with the Guidance Note.

[7] Australian Energy Market Operator, 2024 System Strength Report, December 2024
[8] Australian Energy Regulator, Efficient Management of System Strength Framework – Guidance Note, December 2024

Responses to the PADR

Interested parties were invited to lodge written submissions with TasNetworks regarding the analysis and information contained in the PADR for this RIT-T. Submissions were able to be lodged for a period of eight weeks, from 8 November 2024 until 10 January 2025.

TasNetworks received one submission in response to the PADR, which focussed on network capacity to supply a proposed development in an industrial precinct, as well as a number of new residential subdivisions. The submission received does not relate to information published in the PADR and does not impact the outcome of the RIT-T.

TasNetworks' approach to satisfying planning obligations

As Australia progresses through the transition to a renewable energy future, Tasmania is unique amongst regions of the NEM in facing a different set of circumstances with respect to system strength. Specifically:

- existing synchronous machines in Tasmania are not exiting the market;
- there is limited IBR growth anticipated in Tasmania prior to the construction of Project Marinus in 2030; and
- TasNetworks' near-term system strength obligation is capable of being met by existing assets.

Therefore, TasNetworks' RIT-T and planning approach differs to interstate SSSPs.

Application of reasonable endeavours criteria

NER S5.1.14(b) describes the planning obligations for SSSPs in regard to the forward-looking provision of system strength. The overarching requirement is that:

> "A Transmission Network Service Provider who is a System Strength Service Provider must use ***reasonable endeavours*** to plan, design, maintain and operate its transmission network, or make system strength services available to AEMO, to meet the following requirements at system strength nodes on its transmission network in each relevant year"

The AER's Efficient Management of System Strength Guidance Note provides guidance on interpreting the reasonable endeavours obligation. The AER clarifies that reasonable endeavours means that the system strength standard does not need to be met at any cost and in all circumstances. In the context of the system strength framework, the AER considers that an assessment of whether 'reasonable endeavours' has been satisfied can only be made with reference to the total package of steps that the SSSP has taken, or is proposing to take, to meet the standard in time.

TasNetworks considers that the total package of steps it has taken to meet the system strength obligations satisfies the reasonable endeavours criteria.

For further information on TasNetworks consideration of redundancy planning please refer to page 24 of the PADR.

Options considered

Before investing in large projects to meet a need on the transmission network, TasNetworks is required to consider all of the credible options that might meet that need, before selecting the option that maximises net economic benefit. In order for a potential solution to be considered credible, an option is required[9] to:

- address the identified need;
- be commercially and technically feasible; and
- be able to be implemented in sufficient time to meet the identified need.

Further, as the provision of system strength is a reliability corrective action, the preferred option is required[10] to have a proponent.

The AER has stated in its RIT-T application guidelines[11] that:

- "An option is commercially feasible under NER clause 5.15.2(a)(2) if a reasonable and objective operator, acting rationally in accordance with the requirements of the RIT–T, would be prepared to develop or provide the option in isolation of any substitute options".
- "An option is technically feasible if there is a high likelihood that it will, if developed, provide the services that the RIT–T proponent has claimed it could provide for the purposes of the RIT–T assessment".

TasNetworks has considered the credibility of four main options to meet the identified need for system strength. Consistent with the NER, in assessing the credibility of the below options, TasNetworks considered their technical and economic feasibility and whether they could be implemented in time to address the identified need for system strength.

For further information on each of the options and TasNetworks analysis, please refer to page 26 of the PADR.

Option 1: A network solution involving the installation of synchronous condensers.

Although TasNetworks considers owning and operating synchronous condensers will provide the required amount of system strength, we do not consider them credible options for the purposes of the RIT-T because:

Cost – the annualised cost of synchronous condensers will exceed the annual cost of any non-network solution. An existing non-network solution has been in place since 2021, and it is impractical to try and replace the existing capacity provided by existing installed synchronous condenser assets.

Timing – TasNetworks cannot procure, install and commission synchronous condensers to meet the immediate minimum and projected future system strength requirements.

While not included in this RIT-T, synchronous condensers may be needed post-2029 to support increased IBR connections following the Marinus Link commissioning.

[9] NER clause 5.15.2(a)
[10] NER clause 5.16.4(l)
[11] Australian Energy Regulator, *Regulatory investment test for transmission Application guidelines*, November 2024

Option 2: A non-network solution involving contracting with an existing owner of synchronous condenser and generation assets.

TasNetworks received an EOI from an asset owner offering system strength services via a distributed portfolio of synchronous condensers and generators. Power system analysis demonstrates that this option is capable of meeting all of TasNetworks' system strength requirements within the assessment period.

Option 3: A non-network solution involving the installation of a new BESS.

TasNetworks considered an option to address system strength requirements by contracting with owners and operators of BESS. The BESS proposed through the EOI process are not capable of providing sufficient system strength to meet TasNetworks' entire system strength requirements. Therefore, a BESS can only be considered as part of a hybrid solution with existing synchronous machines.

Option 4: A hybrid solution based on options 2 and 3.

This option was also not considered credible as Option 2 can provide the required system strength on a standalone basis for a lower economic cost.

As described in the PADR, neither BESS proposal meets the criteria for a 'committed' or 'anticipated' project. This means the full capital cost of the BESS must be considered in assessing economic feasibility. As Option 2 assets are already built and operating, the capital cost is considered 'sunk' for the purpose of the economic assessment.

For the hybrid solution to be preferred it must be capable of providing greater market benefits than option 2. TasNetworks does not consider the hybrid solution would provide sufficient additional benefits above option 2 to justify the higher economic cost.

For further information on each of the options and TasNetworks analysis, please refer to page 26 of the PADR.

Conclusion

Based on the assessment in the PADR, TasNetworks considers that the only credible option in this RIT-T is Option 2.

Materiality of market benefits

The NER requires that RIT-T proponents consider a number of different classes of market benefits that could be delivered by a credible option. Furthermore, the NER requires that a RIT-T proponent consider all classes of market benefits as material unless it can provide reasons why:

- A particular class of market benefit is likely not to materially affect the outcome of the assessment of the credible options under the RIT-T, or
- The estimated cost of undertaking the analysis to quantify the market benefit is likely to be disproportionate to the scale, size and potential benefits of each credible option being considered.

Market benefits not considered material

TasNetworks does not consider any of the relevant market benefits categories to be material for the purposes of this RIT-T.

Specifically, TasNetworks does not consider quantifying any class of market benefit will affect the outcome of the assessment. This is because TasNetworks has only identified a single credible option capable of addressing the identified need. Furthermore, as the solution is for a reliability correct action, there is no merit in quantifying the benefits because TasNetworks must implement the solution to meet a rule-based obligation. As such, a negative net present value would not change the outcome of the RIT-T.

TasNetworks also notes that given there is no change to the power system (in terms of new assets) between Option 2 and the base case (as Option 2 only includes existing assets), none of the benefits associated with Option 2 are material.

Materiality of inter-network impacts

As Tasmania is coupled to Victoria via an HVDC interconnector, there will be no material inter-network impacts from the preferred option. The benefits of any solutions implemented for the provision of system strength are limited to the Tasmanian region of the NEM, with the counterfactual being that Tasmania cannot rely on support from other NEM regions and must be self-sufficient in terms of providing the necessary system strength services.

Overview of the option assessment approach

TasNetworks assessment approach utilises a base case, scenario planning and sensitivity analysis to determine the preferred option.

The following sensitivities were conducted in the PADR:

- BESS becomes anticipated or committed
- Changes in provision of system strength from existing sources
- Change in generation mix in Tasmania.

Based on this analysis, TasNetworks does not consider changing any key variable would materially impact the outcome of the RIT-T.

For further information on the options assessment approach, please refer to page 33 of the PADR.

Preferred option

Based on the analysis in the previous sections, TasNetworks has concluded that a non-network solution involving contracting with an existing owner of synchronous condenser and generation assets in Tasmania is the preferred option to meet our system strength obligations to 30 June 2029. This is on the basis that there are no other options capable of providing the required volume of system strength services in time or at a sufficiently lower cost.

Following conclusion of the RIT-T, TasNetworks will ensure the preferred option is operational by 2 December 2025.

Regulatory compliance

This appendix sets out a checklist which demonstrates the compliance of this PACR with the requirements of the National Electricity Rules version 223. As per NER 5.16.4(v)(1), the PACR must set out the matters detailed in the PADR as required under NER 5.16.4(k), and a summary of submissions received on the PADR. The below table sets out the summary of requirements and the corresponding PACR sections.

Rules clause	Summary of requirements	Relevant section(s) in PACR
5.16.4(k)	A RIT-T proponent must prepare a report (the assessment draft report), which must include:	
	1) a description of each credible option assessed.	*Options considered* Pages 17-18
	2) a summary of, and commentary on, the submissions to the PADR (modified to refer to NER 5.16.4(v)(2)	*Responses to the PADR* Page 15
	3) a quantification of the costs, including a breakdown of operating and capital expenditure, and classes of material market benefit for each credible option.	As per the PADR (Page 30), there is no capital expenditure associated with the investment. As per the PADR (Page 35), forecast operational expenditure is based on confidential information provided by proponent. These sections have not been included in the PACR. However, costs are discussed in the Options considered section.
	4) a detailed description of the methodologies used in quantifying each class of material market benefit and cost.	As per *Market benefits not considered material* (Page 19), there are no material market benefits.

Rules clause	Summary of requirements	Relevant section(s) in PACR
	5) reasons why the RIT-T proponent has determined that a class or classes of market benefit are not material.	*Materiality of market benefits* Page 19
	6) the identification of any class of market benefit estimated to arise outside the region of the Transmission Network Service Provider affected by the RIT-T project, and quantification of the value of such market benefits (in aggregate across all regions).	*Materiality of inter-network impacts* Page 19
	7) the results of a net present value analysis of each credible option and accompanying explanatory statements regarding the results.	As per PADR (Page 30) and *Market benefits not considered material* (Page 19), there are no economic costs or benefits as the assets utilised through the preferred option are also in the base case.
	8) the identification of the proposed preferred option.	*Preferred option* Page 21
	9) for the proposed preferred option identified under subparagraph (8), the RIT T proponent must provide: a) Details of the technical characteristics. b) The estimated construction timetable and commissioning date. c) If the proposed preferred option is likely to have a material inter-network impact and if the Transmission Network Service Provider affected by the RIT-T project has received an augmentation technical report, that report. d) A statement and the accompanying detailed analysis that the preferred option satisfies the regulatory investment test for transmission.	a) *Options considered* Pages 17-18 b) As per *Preferred option* (Page 21), the option will be operationalised by 2 December 2025. c) N/A d) *Preferred option* Page 21

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