

Fact sheet: System Strength



Our role

TasNetworks is the Transmission Network Service Provider (**TNSP**) and Jurisdictional Planner for the Tasmanian region of the National Electricity Market (**NEM**). As a result, we are also the System Strength Service Provider (**SSSP**) and Inertia Service Provider for Tasmania. The National Electricity Rules (**NER**) define each of these roles and associated responsibilities.

TasNetworks is resolute in its commitment to power system security which underpins the delivery of safe and reliable services for our customers.

What is system strength?

System strength is a broad term encompassing a number of specific technical elements, however the fundamental components include:

- (a) Ensuring that adequate short circuit current is always available to facilitate the correct operation of network protection systems.
- (b) Ensuring that stable voltage control can be maintained across the network, both before, during and after network contingency events.
- (c) Ensuring that the voltage at the connection point of grid-following inverter based resources (**IBR**) is sufficiently robust to allow for their continuous, uninterrupted operation, even when subjected to network faults and other credible disturbances.

Ensuring that adequate levels of system strength are available across the network is important for managing power system security, especially when high levels of IBR need to be integrated into the system.

What is an Inverter Based Resource (IBR)?

Examples of IBR include wind generation, solar photovoltaics (**PV**), battery energy storage systems (**BESS**), hybrid power plants, high voltage direct current (**HVDC**) networks¹ and any other equipment that is interfaced to the power system through a power electronic converter.

While the specific implementation can vary, how IBR interacts with and supports the power system is fundamentally different to that of synchronous

machines like hydro. These differences need to be properly accounted for in the planning and operation of our future power system.

For the Tasmanian network now and looking forward, the impacts of wind, solar PV and HVDC will be most relevant, especially as we move towards achieving the Tasmanian Renewable Energy Target (**TRET**) and increasing our HVDC interconnection capacity with the mainland via Marinus Link.

What is changing in the power system?

The traditional source of system strength has been synchronous generation (e.g. hydro) which is inherently capable of addressing the core elements outlined above, as well as providing inertia (which assists with the management of network frequency control). When the sun is shining and the wind is blowing, IBR can increasingly meet the electrical demands of customers, often resulting in synchronous generation disconnecting from the network. As the number of synchronous generators remaining online progressively reduces, issues related to low system strength become more prevalent and require deliberate management. Undoubtedly, technological advancements will help address such issues in the future, however system security and reliability must continue to be adequately managed in the meantime.

How is the change being managed?

The energy transition is occurring rapidly, in line with various State and Federal Government renewable energy policies, and IBR is replacing synchronous generators right across the National Electricity Market (**NEM**). As a result, the Australian Energy Market Commission (**AEMC**) introduced changes to the NER on 21 October 2021 which require SSSPs to proactively plan for and pre-emptively provide sufficient system strength services right across their networks. The new rules address not only the requirements of the existing power system, but also what is required to support the forecast connection of future IBR, predominantly wind and solar PV generation.

The new Rules come into full effect on 2 December 2025, with SSSP planning obligations having already commenced on 1 December 2022.

¹ Such as Basslink and the future Marinus Link interconnectors.

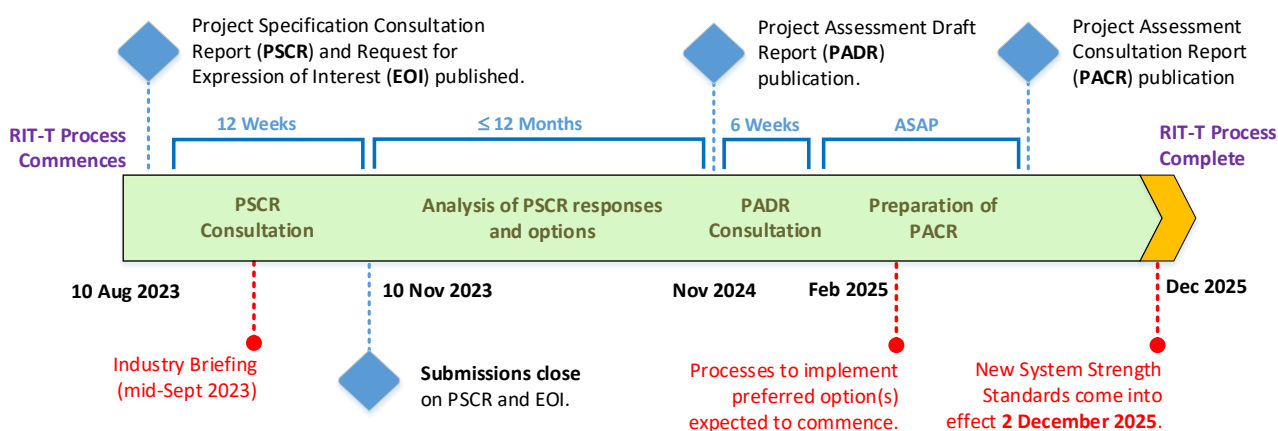
What is TasNetworks doing to address its planning obligations?

We are undertaking a Regulatory Investment Test for Transmission (RIT-T) to examine all technical possibilities and identify the preferred solution to meet forecast system strength requirements in Tasmania. The RIT-T process enforces rigour in the cost benefit analysis and provides transparency for consumers. It also provides an opportunity for network users to have input through consultation processes, including the ability to propose and offer non-network solutions to help address system strength in Tasmania. A non-network solution would typically involve a third party providing services to TasNetworks under a commercial

arrangement, thereby reducing or eliminating the need for additional network owned assets to be constructed.

In August 2023, TasNetworks commenced the RIT-T process with the publication of a Project Specification Consultation Report and calling for non-network options to help meet Tasmania's system strength need. In November 2024, TasNetworks published a Project Assessment Draft Report outlining TasNetworks' assessment of options and identifying a preferred solution from 2 December 2025 to 2029.

TasNetworks will publish a Project Assessment Conclusions Report in 2025 which will confirm the preferred solution from 2 December 2025 to 2029.



What might a future solution look like?

The Project Assessment Draft Report identified contracting with an existing owner of synchronous condensers and generation assets in Tasmania as the most efficient and prudent way to meet Tasmania's system strength needs to 2029.

Beyond 2029, it is anticipated that further solutions will be needed to meet the increased system strength need forecast by the Australian Energy Market Operator (AEMO). A RIT-T for the post 2029 period will be undertaken when AEMO's forecasts for the post 2029 period become more certain.

Who is paying for the provision of these new services?

The AEMC Rule Determination describes in detail how the costs involved with providing system strength are to be allocated going forward. The new framework introduces a 'user-pays principle' for any new connecting parties that are reliant on a particular level of system strength being available at their connection point.

In short:

- New generators or network customers (loads) that are connecting IBR technologies will have the option to purchase centrally provided services (from TasNetworks) or self-mitigate their impacts on the network (i.e. supply their own).
- The revenue generated by TasNetworks from the 'sale' of system strength services will help offset the costs of providing the solutions in a pre-emptive manner.
- Any costs not recouped from new IBR connections will be passed through to Tasmanian consumers. For this reason, TasNetworks is heavily focused on identifying 'the right solutions' so as to minimise the potential cost impacts for all stakeholders.

We recommend that anyone interested in these matters familiarise themselves with the Final Rule Determination which is available online at:

www.aemc.gov.au/rule-changes/efficient-management-system-strength-power-system

What are we seeking from you?

TasNetworks is seeking written submissions to our recently published PADR by **Friday 10 January 2025**.

All documentation, including further reference material, is available from our System Strength RIT-T webpage which is located at:

<https://www.tasnetworks.com.au/systemstrength>

For further information, please contact:

Chris Noye, Leader Regulation - TasNetworks.

Email submissions or queries in relation to our System Strength RIT-T can be sent directly to:

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