ABN 70 250 995 390
180 Thomas Street, Sydney
PO Box A1000 Sydney South
NSW 1235 Australia
T (02) 9284 3000
F (02) 9284 3456

Thursday, 7 August 2025

Ms Anna Collyer
Chair
Australian Energy Market Commission

Lodged online: www.aemc.gov.au

Project Ref: ERC0339

Dear Anna,

AEMC's Efficient provision of inertia

Transgrid welcomes the opportunity to respond to the Australian Energy Market Commission's (**AEMC**) Efficient provision of inertia draft decision. The AEMC's draft decision outlines the AEMC's decision not to make a rule and therefore not to implement operational procurement of inertia at this time. This is due to the fact that there would not be material net benefits under the current assumptions.

Transgrid is responsible for ensuring the power system in NSW remains secure and safe, by maintaining specified levels of key system security services including system strength, inertia, and voltage control. For these key system security services, we are seeking a portfolio of solutions to best meet power system requirements at the lowest costs to consumers.

Transgrid strongly supports the AEMC's draft decision not to make a rule as we do not believe there is a need and therefore it will unlikely provide material benefits. Given inertia and system strength are not independent of each other, our preliminary view is that the most efficient way to address declining system inertia is utilising the system strength framework.

In addition, we support:

- Continued work by the Australian Energy Market Operator (**AEMO**) to progress technical work on inertia such as:
    - Assessment/validation of synthetic inertia capabilities,
    - real-time inertia measurement,
    - locational visibility of inertia needs and,
    - better integration of inertia requirements into scheduling tools.

- Testing and trialling of innovative sources of inertia on the power system through AEMO's use of Type 2 Non Market Ancillary Services (**NMAS**) contracts.

Inertia trends

The AEMC has stated that foreseeable minimum inertia needs are likely to be met through solutions provided by TNSPs to address system strength requirements, hence why there are currently no active RIT-Ts being conducted to meet TNSP inertia obligations.

Inertia, which has historically been provided by synchronous generating units such as coal and gas generators, is expected to decline as coal generators progressively retire from the energy market and the renewable energy share of dispatched energy increases.

The current planning arrangements place the responsibility for assessing inertia requirements with AEMO and meeting these requirements with the Transmission Network Service Provider (**TNSP**).

AEMO's 2024 Inertia Report outlines the projected inertia shortfalls for each region in the NEM [1]. NSW, like several other states, does not have inertia shortfalls identified over the three-year assessment horizon. Regardless of whether a shortfall has been declared, all TNSPs must ensure sufficient inertia is available to meet their full inertia sub-network allocation for their respective region from 1 December 2027.

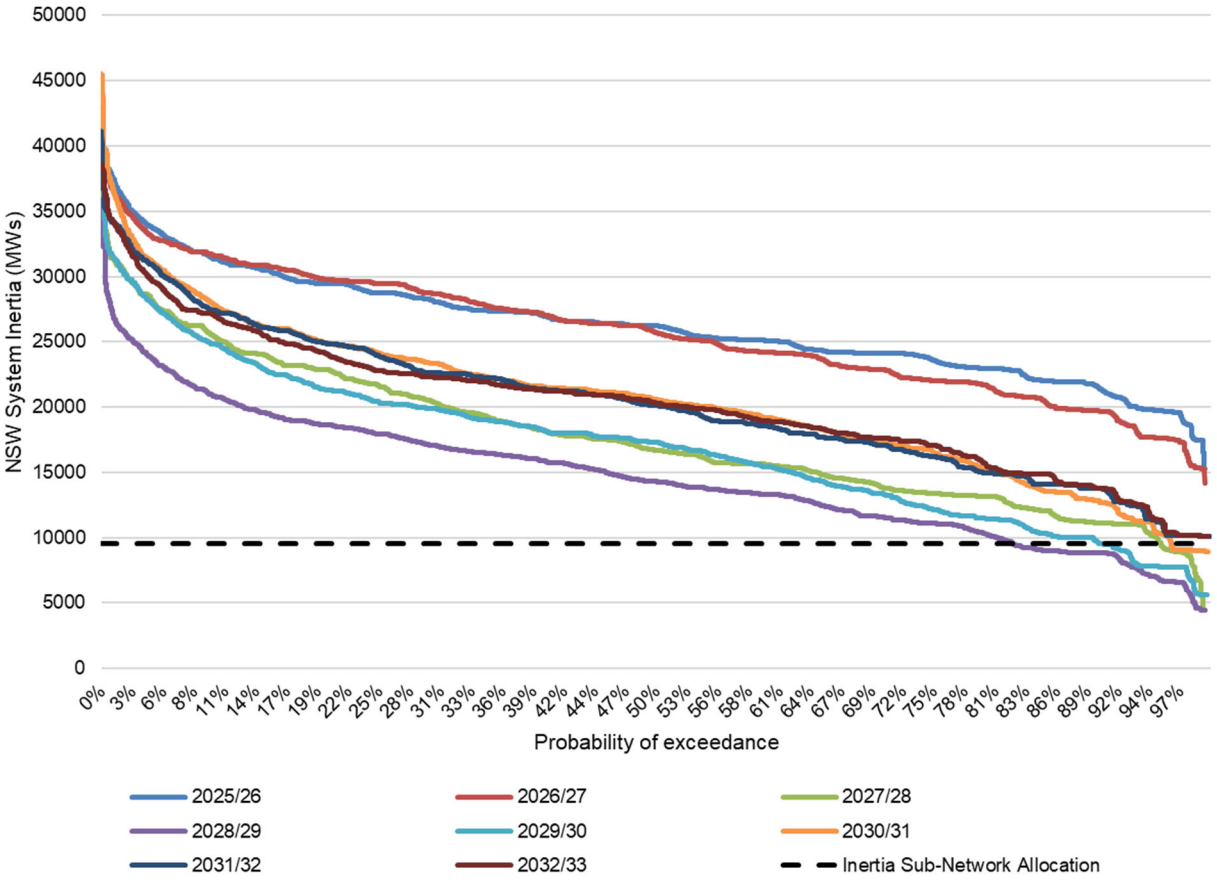
Transgrid, as the System Strength Service Provider (**SSSP**) for NSW, is responsible for ensuring sufficient system strength is available to maintain power system stability in NSW. The retirement of NSW's coal generators and the growth in inverter-based resources in the coming decade is driving an urgent need to add new sources of system strength to the power system.

In July 2025, we published the Project Assessment Conclusions Report (**PACR**) for Meeting System Strength Requirements in NSW[2]. The PACR has been prepared as the final step in the RIT-T process. The analysis undertaken to produce this PACR has determined that NSW will have sufficient inertia to meet our sub-network allocation requirements as defined by AEMO's 2024 Inertia Report[3] once synchronous condensers are deployed.

Figure 1 below illustrates declining levels of inertia projected over time in NSW as traditional synchronous units progressively retire from the energy market and in the absence of new sources of system strength. In the absence of new system strength sources, breaches to the NSW inertia sub-network allocation would be expected from 2027/28.

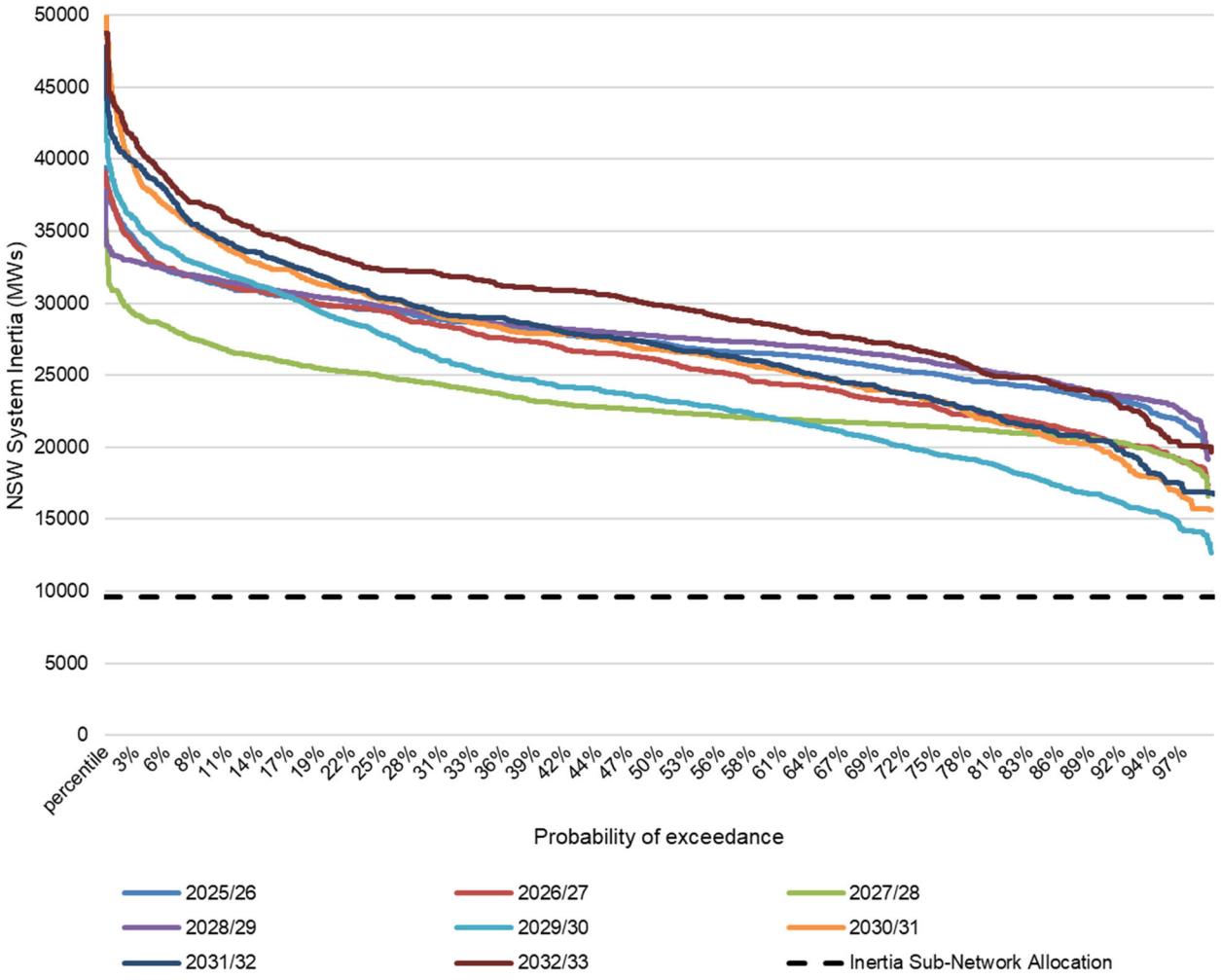
[1] See AEMO 2024 Inertia Report - 2024-inertia-report
[2] Can be viewed on Meeting system strength requirements in NSW
[3] See AEMO 2024 Inertia Report - 2024-inertia-report

Figure 1. Forecast inertia levels in NSW as coal generators retire and without new system strength support or re-dispatch (except for Central West Orana REZ synchronous condensers, which have been included as they are committed assets)



As new system strength solutions are deployed to meet system strength requirements in NSW, or prior to this, sufficient levels of inertia are projected to be available in NSW across the modelled horizon (up to 2032/33). This is demonstrated in Figure 2 below.

Figure 2. Forecast inertia levels in NSW under PACR portfolio option 2, where new sources of system strength are added and where synchronous machines are re-dispatched to provide system strength support as required



The analysis provided in the PACR support's the AEMC's position that foreseeable minimum inertia needs are likely to be met through solutions provided to address system strength issues, including the installation of synchronous condensers. While Transgrid has not co-optimised system strength and inertia requirements, modelling indicates that the addition of flywheels to each network synchronous condenser (for the explicit purpose of stable voltage waveform support[4]) will enable inertia requirements in NSW to be met without additional capital investment.

[4] A core component of stable voltage waveform support is the ability to adequately damp voltage oscillations. Transgrid has concluded that inertia is integral to adequately damp voltage oscillations and therefore is integral to providing stable voltage waveform support. Studies assessing the inertia required from synchronous condensers for stable voltage waveform support were performed – these studies identified an optimum inertia value of 1500 MWs required from each network (Transgrid) synchronous condenser. We understand that most, but possibly not all synchronous condensers will need a flywheel to achieve 1500 MWs, with flywheels adding only a 2.5 percent increase to project costs (approximately, based on Transgrid's market sounding across multiple synchronous condenser manufacturers and internal Option Feasibility Studies)

Furthermore, we note that the AER has provided guidance[5] that including a flywheel where a synchronous condenser has been found to be the preferred option (or part of a portfolio of solutions that together form the preferred option) would be expected to be prudent and efficient expenditure given the marginal cost of addressing inertia is typically relatively low. Therefore, coordination of network and/or non-network solutions to meet both inertia and system strength needs will be the most prudent and efficient way to lower the total cost to consumers of managing power system security issues requirements, even if there is an incremental cost. As such, an inertia spot market is not necessary and will only increase costs to consumers.

Application of the RIT-T framework

The AEMC states that it considers that greater clarity in how TNSPs evaluate and justify procurement decisions could help address the transparency, efficiency and contestability concerns.

We encourage the AEMC to provide greater clarity on this proposal. The RIT-T process is undertaken prior to any procurement decision by the TNSP. This raises the question of how a TNSP can provide more clarity on procurement decisions prior to procurement starting. The RIT-T is a formal consultation process designed to:

- inform stakeholders of the investment need and proposed options to address it,
- test the market for alternative and more efficient solutions and,
- explain to stakeholders the basis on which the preferred option has been selected.

A RIT-T does not include a procurement decision but outlines the intention to procure the modelled requirement as outlined in the RIT-T. Given the procurement process is a business decision, the proposal for the AER to provide greater clarity in how TNSPs evaluate and justify procurement decisions falls outside the scope of a RIT-T.

We welcome the AEMC draft decision as we believe this is in the best interest of consumers. If you or your staff require any further information or clarification on this submission, please contact Zainab Dirani, Policy and Advocacy Manager, at zainab.dirani@transgrid.com.au.

Yours faithfully

Monika Moutos

[5] See section 5.1.3 of AER - Efficient management of system strength framework - Guidance Note - 16 December 2024.pdf