System Strength Project Fact Sheet

DECEMBER 2025

Transgrid will install synchronous condensers at five substations to stabilise and strengthen the power system as NSW coal generators retire, and we transition to renewables

About Transgrid

Transgrid operates and manages the high-voltage network in NSW and the ACT. We operate a safe, reliable and efficient high-voltage grid that connects electricity generators to one in three Australians. We are building the future grid to enable greater renewable integration and drive down wholesale electricity prices.

What is system strength?

System strength is the ability of the power system to maintain and control the voltage of the network. A network without adequate system strength cannot maintain stability which may cause equipment and generators to not operate correctly. This can lead to disruptions to electricity consumers.

What does a synchronous condenser do?

The electricity grid needs a strong heartbeat to keep everything running smoothly - from connected generators to the protection systems that operate in the blink of an eye to keep us safe.
For 70 years, coal generators have provided the strong heartbeat as a byproduct of creating electricity. Now that our large coal generators are retiring, we must put in place new ways to keep the heartbeat in NSW's grid strong.

Synchronous condensers have been used to stabilise power systems for more than a hundred years. They are large machines which rotate freely and can produce reactive power to stabilise and strengthen a power system. Synchronous condensers make the network robust to disturbances such as a sudden loss of a generating unit or transmission lines, without other generators or equipment 'tripping' incorrectly. Synchronous condensers are a tried and tested technology for providing system strength, inertia and voltage support.

Project benefits:

- a safe, secure and reliable power system
- improved reliability by strengthening and reinforcing the grid
- local jobs and business opportunities during construction
- lower emissions by supporting a stable grid for new wind and solar projects.

Why do we need to accelerate synchronous condensers?

The retirement of NSW's coal generators in the coming decade is driving an urgent need to add new sources of system strength to the power system. Due to a timing mismatch between the retirement of coal generators and the length of time required for the full regulatory processes and the procurement of synchronous condensers, 'acceleration' to deliver them faster, is required to ensure a safe and reliable power system as coal generators retire.

Synchronous condensers like this one will be installed to maintain power flow.

This is a Priority Network Infrastructure Project

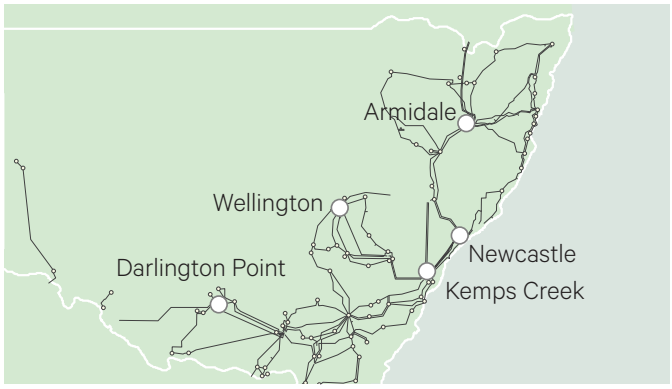
The 'System Strength Project' was deemed a Priority Network Infrastructure Project (PNIP) by the NSW Energy Minister in September 2025. A Priority Network Infrastructure Project is a project designated under the Electricity Infrastructure Investment Act 2020 that allows the Minister for Energy to fast-track critical network projects. Directing a project gives the state more control over how and when a project is delivered and helps streamline the cost recovery process.

What are we building?

This project will consist of the design, manufacture, construction, installation and commissioning of synchronous condensers and associated substation yard works at five Transgrid substations in NSW.

The proposed locations for the synchronous condensers are:

- Kemps Creek 500kV substation
- Newcastle (Killingworth) 330kV substation
- Armidale 330kV substation
- Wellington 330kV substation
- Darlington Point 330kV substation.



Further information

For more information about the project please visit www.transgrid.com.au

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Project works

- Civil works to extend the substation yard, and install new foundations, drainage, earthing grid and fencing.
- Modifications and upgrades to local roads for transportation access where required.
- Electrical works, including busbar extensions to integrate the synchronous condenser into the existing substation, and installation of associated protection and control equipment.
- The installation and commissioning of the synchronous condenser plant and associated infrastructure.

Getting the synchronous condensers to site

The synchronous condensers will be custom-built overseas. Once delivered to an Australian port they will be transported as 'oversized' deliveries to each site, which will be made along local and federal roads. Transgrid and its delivery partners will coordinate with the relevant road authorities and the relevant local council authorities to obtain the required permits to deliver the oversized equipment.

Project timeframes

The timeframes for the project are shown below:

December 2022
Commencement of system strength project

June 2024
Consultation on draft report to meet system strength requirements

July 2025
Publication of final report on project to meet system strength requirements

September 2025
Minister declares PNIP for synchronous condensers at five locations

Late 2025
Environmental Approvals (Summary Environmental Report)

March 2026
Regulatory submitted to Australian Energy Regulator

Mid 2026
Enabling works and construction begins

Connect with us

Transgrid is committed to working with landowners and communities as we deliver on the Government's energy transition. We want to find solutions that work for everyone. **Please contact us for more information.**

Transgrid

Emergencies 1800 027 253
Community Enquiries 1800 222 537

Our business hours are 8:30am – 5:00pm
Find out more at: transgrid.com.au