

System Strength Project

SYNCHRONOUS CONDENSERS

Powerlink will install four synchronous condensers at three substations in Central Queensland to stabilise and strengthen the power system.

About Powerlink

Powerlink Queensland is a leading Australian provider of electricity transmission services, focused on delivering a safe, cost-effective and reliable network for our customers. Our network extends 1,700 kilometres (km) from Cairns to the New South Wales border and comprises 15,559 circuit km of transmission lines and 154 substations. Our purpose is to connect Queenslanders to a world-class energy future, providing electricity to more than five million Queenslanders and 241,000 businesses.

What is the System Strength Project?

System strength is the transmission network's ability to maintain stable voltage during normal operation and when there is a disturbance, like a sudden change in generation or load, or an unexpected electrical fault.

Under the National Electricity Rules, Powerlink is required to maintain system strength in Queensland's transmission network. This will be achieved through the System Strength Project, involving the installation of four synchronous condenser machines in Central Queensland.

Why is this project needed?

Queensland's electricity has historically been generated by large coal-fired, gas-fired and hydroelectric power stations. These power stations use rotating generators to produce energy and stabilise the electricity network, providing system strength.

With the increasing diversity of Queensland's power system, the System Strength Project will be critical to maintaining a strong and reliable supply of electricity well into the future.

Powerlink's program of work to upgrade, strengthen and enable new generation in Central Queensland will benefit industries, local communities and Queensland's economy for generations to come.



Powerlink acknowledges the Traditional Owners and their custodianship of the lands and waters of Queensland and in particular, the lands on which we operate. We pay our respect to their Ancestors, Elders and knowledge holders and recognise their deep history and ongoing connection to Country.

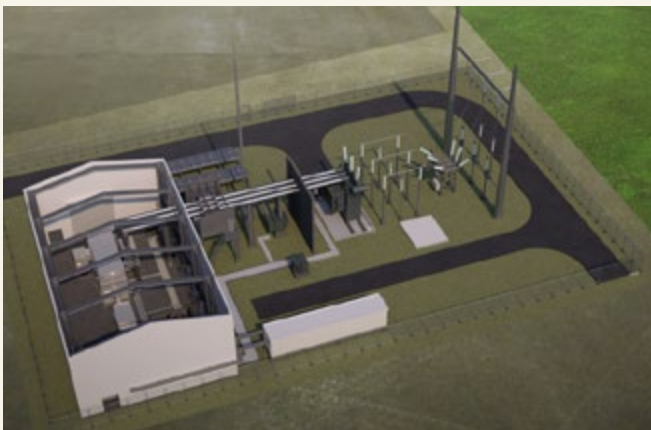
What is a synchronous condenser?

A synchronous condenser is a large rotating machine that acts like a shock absorber to smooth out fluctuations in the electricity grid to maintain system strength.

Synchronous condensers are typically installed at or near high voltage substations.

Each machine will be installed inside a shed alongside supporting infrastructure including transformers, a control room and cooling systems.

The machine will be connected to a new bay within the substation by a short single-circuit 275kV transmission line.



Visualisation of a synchronous condenser

How many synchronous condensers are needed?

System strength services can be provided by a range of technologies including synchronous condensers, batteries and gas turbines.

Powerlink has identified an initial need for four synchronous condensers in Central Queensland to meet system strength requirements.

Powerlink is constantly engaging with the private sector, including battery and gas turbine proponents, to ensure the most cost-effective system strength solutions are available for Queensland.

Where will the synchronous condensers be located?

Powerlink has identified the four synchronous condensers will be installed at the following locations:

- two machines at the Calliope River Substation
- one machine at the Nebo Substation
- one machine at the Stanwell Substation.

These locations were selected following detailed network analysis and consideration of social, environmental and economic factors.



Locations of the Central Queensland synchronous condensers

When will the synchronous condensers be installed?

- 2026 – Planning, approvals and procurement
- 2027 – Site preparation works commence
- 2028 – Synchronous condensers installed
- 2029 – Synchronous condensers commissioned and operational

How do I find out more?

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(Monday to Friday, 7.30am – 5pm)