

2020 System Strength, Inertia, and NSCAS Reports Planning for operability over the next five years

AEMO is planning for the energy transition in Australia. As the power system changes and operates closer to its limits, AEMO will declare the need for services to ensure a secure and operable system over the next five years.

Network Support and Control Ancillary Services (NSCAS)

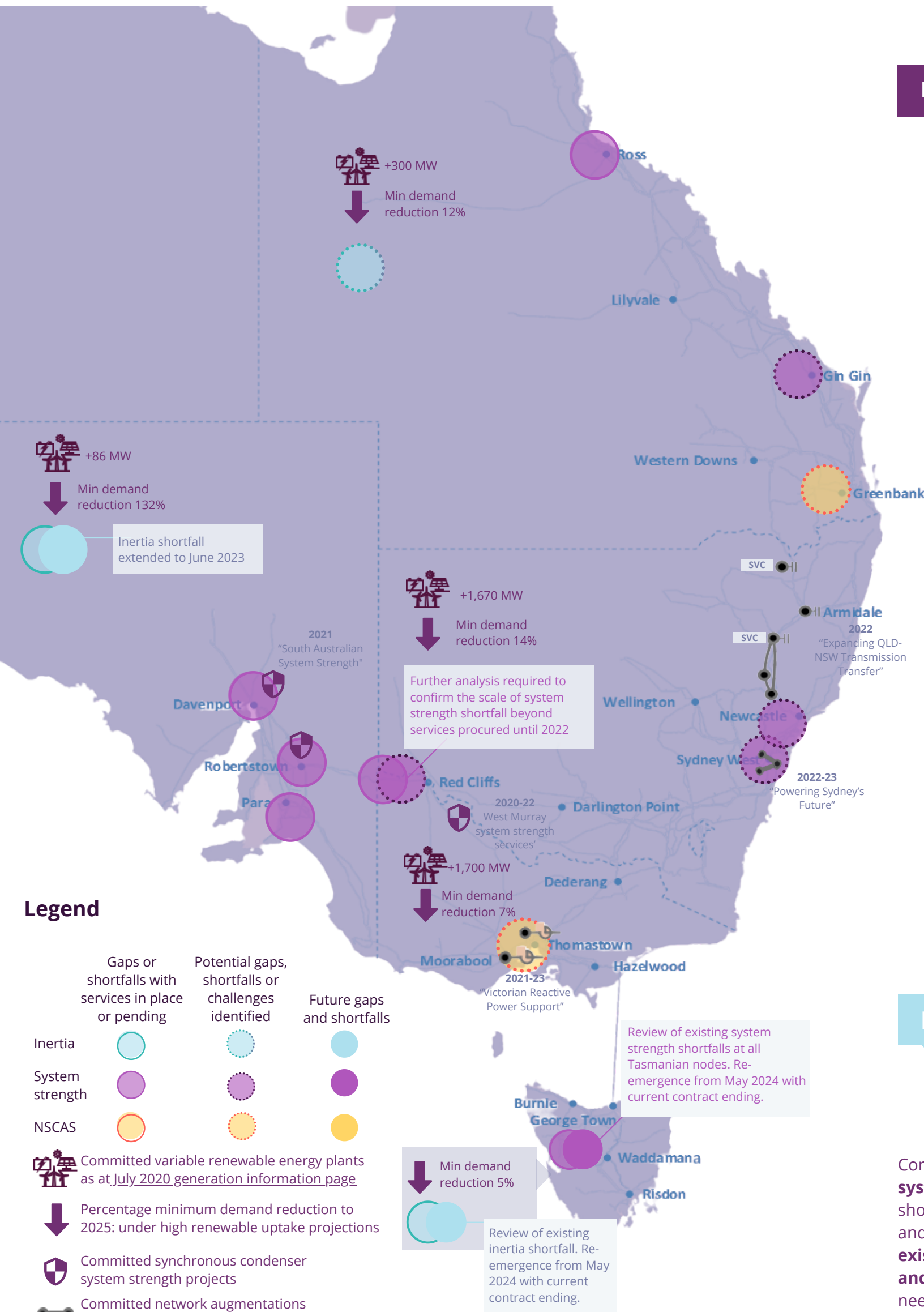
Non-market ancillary services that may be delivered to maintain power system security and reliability, or to maintain or increase the power transfer capability of the transmission network.
[Click here to view the 2020 NSCAS Review Report.](#)

System Strength

The ability of the power system to maintain and control the voltage waveform at any given location in the power system, both during steady state operation and following a disturbance.
[Click here to view the 2020 System Strength and Inertia Report.](#)

Inertia

A fundamental property of power systems such that the power system can resist large changes in frequency arising from an imbalance in power supply and demand caused by a contingency event.
[Click here to view the 2020 System Strength and Inertia Report.](#)



Emerging trends

Declining minimum demand

- Accelerated uptake of distributed energy resources
- Record minimum electricity demand in 2020
- Projected shift to day-time minimum demands
- Changing reactive power profile of loads
- Coincident low demand in adjacent regions

Accelerated variable renewable energy uptake

- Continued commitment of new large scale variable renewable energy resources
- Ability for large-scale renewable generation to provide reactive power support

Changes emerging in synchronous generation operation

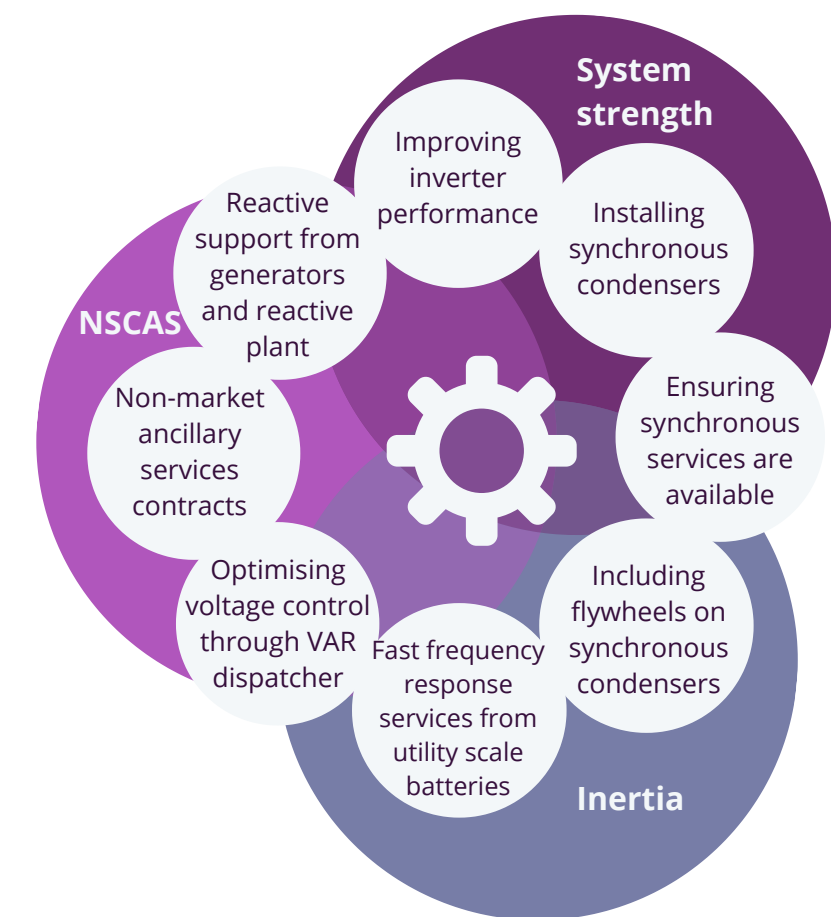
- All time low synchronous generator reliability levels recorded in 2019-20
- Decreasing number of synchronous units online, reducing system services to minimum levels in some areas, as the power system currently relies on these units for the bulk of system services
- Increasing risks of shortfalls in a range of system service needs

Resultant effects on the NEM

Power system operating closer to system security limits

- Limited reactive power reserve, particularly during low demand
- Reducing maintenance work windows
- Unique challenges in managing high voltages on the network during daytime and night-time minimum demands
- Increasing challenges in managing non-credible contingency risks, noted through the [Power System Frequency Risk Review](#)

Potential technical solutions



Planning a way forward



Continue to **review the system**, declare shortfalls as required, and seek **new and existing technologies and services** where needed.



Develop an **Engineering Framework** that bridges the gap between today's urgent operational needs and the longer-term decision-making.



Broader industry discussion to develop co-ordinated approaches to the overall improvement of system operability.



Review of energy regulation, policy and internal procedures.



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