

## New rules to stabilise power grid



South Australia's push into renewables has left it vulnerable on the energy security front. Supplied AFR, Mark Ludlow, 16 Dec 2016

The Australian Energy Market Commission will require power generators to boost their ability to provide a more stable electricity supply into the National Electricity Market to avoid a repeat of the South Australian statewide blackout in September.

With states divided over much-needed energy reforms after Wednesday's Council of Australian Governments energy council meeting, the regulator's interim report has recommended a suite of technical reforms to allow the NEM to adapt faster to issues caused by the introduction of intermittent renewable energy sources such as wind or solar.

The AEMC, which sets the national electricity rules, said it was working on five rule changes that address immediate concerns on emergency protection in relation to SA's current frequency issues as well as new mechanisms to allow security to be maintained across the entire NEM. "This review puts an umbrella over many issues being raised by stakeholders in relation to the power system's ability to keep the lights on while maintaining its frequency at a constant level," AEMC chairman Jim Pierce said. "The review will consider both policy mechanisms that are in place now, and analyse how many of the feasible emissions reduction policies may impact the future power system."

The review, which will deliver its final report in June next year, focused on the ability to maintain control over power system frequency after a major event such as the loss of a large generator, load or a transmission line.

The grid requires a steady supply of electricity close to the frequency of 50 hertz. This has been traditionally provided by synchronous generators like coal and gas, with intermittent generators like wind and solar unable to provide the same reliable service because sometimes they are not producing electricity when the wind is not blowing or the sun not shining. Large deviations from the 50 hertz frequency can lead to instability in the grid and cause the disconnection of generation or

load. This is what happened in SA in late September when wind farms reduced their output by 456 megawatts following three transmission lines being brought down by strong storms. This caused a surge of power as the Heywood Interconnector from Victoria tried to fill the void. It quickly "tripped", leaving SA isolated from the NEM – known as a "black system" – and leaving 850,000 people without power.

The Australian Energy Market Operator, which runs the nation's electricity and gas markets, has already required that there are two synchronous generators running in SA at any one time to ensure the system can be stabilised if it suffers shocks from transmission lines falling down or any other cause.

Chief Scientist Alan Finkel also called for immediate action on technical solutions to help provide more system stability, as part of his initial review into energy security, which was tabled at last week's COAG meeting.

The AEMC said new renewable technologies are causing major challenges for the NEM. "Many new generation technologies, such as wind turbines and photovoltaic panels, are not synchronised to the grid, have low or no physical inertia, and are therefore currently limited in their ability to dampen rapid changes in frequency," the report found.

#### Increasing challenges

"The shift in generation mix towards non-synchronous generation consequently gives rise to increasing challenges in maintaining the system in a secure operating state."

Amid the technology solutions for the NEM, federal and state governments are also arguing over the best way to reach Australia's emission reduction target of 26 to 28 per cent of 2005 levels by 2030. The preliminary Finkel review showed AEMC/AEMO modelling which backed an emissions intensity scheme for the electricity sector as the cheapest way to reduce emissions. But the EIS was killed off by Prime Minister Malcolm Turnbull and Energy Minister Josh Frydenberg saying they would not back anything that resembled a "carbon tax".

Dr Finkel, who also briefed the COAG energy council meeting in Melbourne on Wednesday, said he was confident the Turnbull government will accept his advice when he hands down his final report next year, saying it would take a long time to overhaul the NEM. "I do have confidence that the government will accept not just my advice but the advice of the panel appointed by the taskforce and the work we're doing because we're doing it in a very objective fashion and we are going to present independent, carefully considered advice," Dr Finkel told a Grattan Institute forum on Wednesday night.