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Coordinating coal plant closures: transient strategic reserves in transitioning energy-only markets

Paul Simshauser

This article examines how to manage scheduled coal plant closures in Australia's National Electricity Market (NEM) without triggering price shocks, reliability breaches, or a stall in new renewable investment. Recent government interventions to delay scheduled coal plant closures resolves short term reliability concerns, but risk creating a damaging cycle of closure delay, falling prices in forward markets, stalled investment in new plant, and rising renewable curtailment rates (and negative pricing) due to coal inflexibility. A pattern of interventions leads investors in new plant to wait, making it harder to build replacement capacity, and prompting further delays to coal closures.

This shift from "firm closure commitments" to "quasi closure commitments" produces winners. Investors face heightened uncertainty and weaker price signals to enter, consumers face growing risk of future equipment failures and sharp price spikes from an aging coal-fired generation fleet, and governments face harder-to-meet policy targets and escalating political risk.

Europe has encountered analogous circumstances and responded with strategic reserves. In the Australian context, a transient strategic reserve or "waiting room" is analysed – a deliberately temporary, out of market portfolio of dispatchable capacity (modelled primarily as open cycle gas turbines) procured and underwritten ahead of scheduled coal closures with a revenue floor. The reserve is held outside normal dispatch and intended to be called only under scarcity events when the market fleet is exhausted. Once coal closures occur, the transient reserve exits the waiting room and transitions into the market, with underwriting ending, thus preserving the energy only market design (cf. institutionalising permanent capacity market).

Using a security constrained unit commitment model and drawing on data from the NEM's Queensland region, four scenarios are examined including (1) exit before entry, (2) accelerated

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renewables via CfDs (without adequate firming), (3) delayed coal closure, and (4) the transient strategic reserve. Results show:

- Scenario 1 produces major volatility and may breach the reliability standard (with a high tail risk vis-a-vis prices).
- Scenario 2 lowers and tightens the price distribution but does not eliminate reliability risks because intermittency remains without sufficient dispatchable supply.
- Scenario 3 (delay closures) compresses prices and avoids near term reliability breaches, but introduces an undefined "x years" of extension that worsens investment uncertainty and can impose large losses across generators—reinforcing the delay/stall cycle.
- Scenario 4 (waiting room) delivers a more orderly pathway: it reduces volatility and reliability risk while narrowing the gap between system costs and prices, improving investment incentives. In the Queensland modelling, the incremental cost of the reserve is small—illustrated as under $2/MWh on average.

Given the political economy of electricity prices and reliability, governments will tend to delay closures when risks appear unacceptable. However, repeated delays amplify long run risk as the coal fleet ages. A transient strategic reserve presents as a low intrusion policy option to support "entry before exit," maintain confidence in post closure adequacy, and stabilise outcomes without shifting the NEM to a permanent capacity market.

Contact Paul Simshauser p.simshauser@griffith.edu.au

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Financial Support Centre for Applied Energy Economics & Policy Research, Griffith University.

Energy Policy Research Group, University of Cambridge.