

# Paris Session 2022



## Seeking a smooth transition in the Australian NEM

Study Committee C5  
PS 3 Question 4:

What is the impact of the current energy transition on reliability and cost? What market structures should be put in place to ensure a smoother transition to the market of the future to support a fully decarbonised grid?

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# Australian National Electricity Market: Experience of transition to date

1. The Australian NEM was highly dependent on coal fired power stations for the provision of energy, capacity and system services
2. Over the last decade, there has been strong growth of wind and solar generation at utility scale and distributed rooftop solar.
  - The NEM has reached instantaneous levels of variable renewable generation in excess of 60%
3. The growth of these variable renewable resources has lowered emissions and lowered spot market prices in many dispatch periods but we have seen raised priced at other times.
4. The transition has not, however, been smooth and has had negative impacts at times on incumbent generators, new generators, and customers.
5. Key impacts have been:
  - Wholesale market price spikes
  - Inadequacy of network capacity and the availability of system services
  - Deterioration in the performance of thermal generators



# Price impacts and early exit of thermal generators

1. The injection of a growing portion of zero marginal cost generation into the NEM in some periods has forced the coal fired power stations into a different mode of operation; needing to remain online during periods of high VRE with low or even negative prices, to be available at other times when they are needed and prices are higher.
2. These generators are not well suited to such a role, technically or economically. This has seen generators exiting earlier than expected with continuing announcements bringing forward retirement dates.
3. One of the early generators to leave was Hazelwood brown coal power station in Victoria. The power station closed with less than 6 months notice in March 2017.
4. Outcomes:
  - Prices in all regions of the NEM increased sharply - in Victoria, the average wholesale spot market price rose 85 per cent from 2016 to 2017. Reliability was maintained.
  - Added fire to the energy and climate policy debate and led to the imposition of a minimum notice period for closure of generators
  - Earlier coal retirement dates have been announced by a number of parties since including the announcement that Australia's largest coal fired generator would retire 7 years earlier than previously planned
5. In its 2022 'Integrated System Plan', AEMO now expects that two thirds of the coal fired generation will retire by 2030. The central scenario in the 2020 ISP expected only 19% of coal capacity to retire in that time.



# Inadequate provision of system services and network capacity

1. The utility scale wind and solar generation is located away from the load and existing generation resources in weak areas of the current system
2. The development of the network has been slower than the building of the new renewable generation leading to increased network congestion
3. Some areas with a higher concentration of renewable generation have had deficiencies in system services and technical issues with maintaining stability
4. Constraints on operation and delays in commissioning have resulted in increased costs for some projects
5. Action has been taken to:
  - Strengthen the planning regime and process for developing an integrated system plan (ISP)
  - Providing improvements in the regulatory regime to streamline approvals and support implementation of priority projects identified in the ISP.
  - Take a more pro-active approach to the provision of system strength
6. Timely development of the grid remains a concern especially in gaining the social licence required to build



# Performance of ageing thermal generators

1. Thermal generators remain important within the NEM, currently supplying around two thirds of the energy
2. The winter of 2022 has seen a number of complex issues impact the market including international drivers on coal and gas prices, supply chain issues due to Covid and floods in key areas of the NEM.
3. While not playing down the importance of those factors, an additional factor has been the unavailability of nearly two-thirds of the coal generation at high load times in the NEM due to extended planned maintenance or forced outages.
4. The combination of the issues has led to the market operator having to intervene on a number of occasions, including the unprecedented suspension of the market for a period, to prevent loss of load
5. The uncertain economic life of the coal fired generators and their poor profitability does appear to have been a driver in this deteriorating performance

