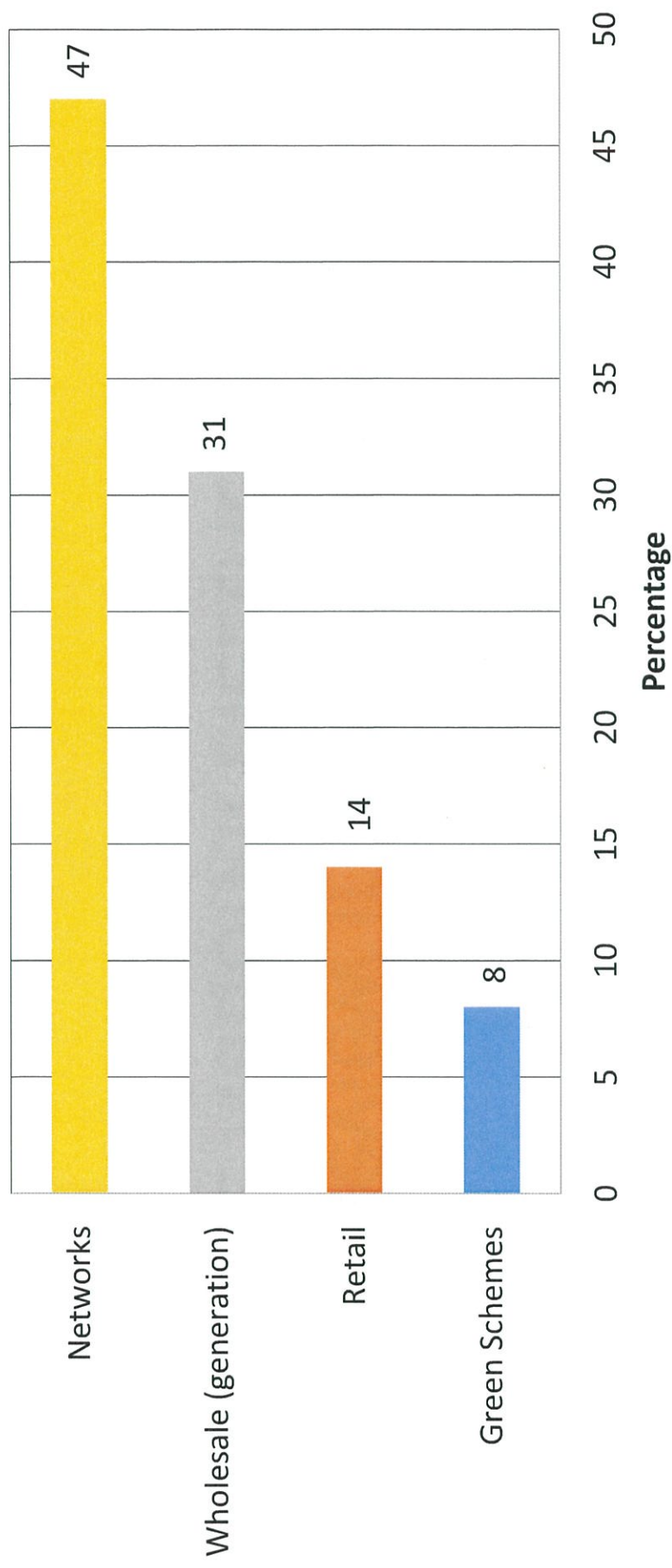


Finkel Review into the Future Security of the National Electricity Market

Electricity prices

Australian Electricity Bill Cost Components (2016/17)*

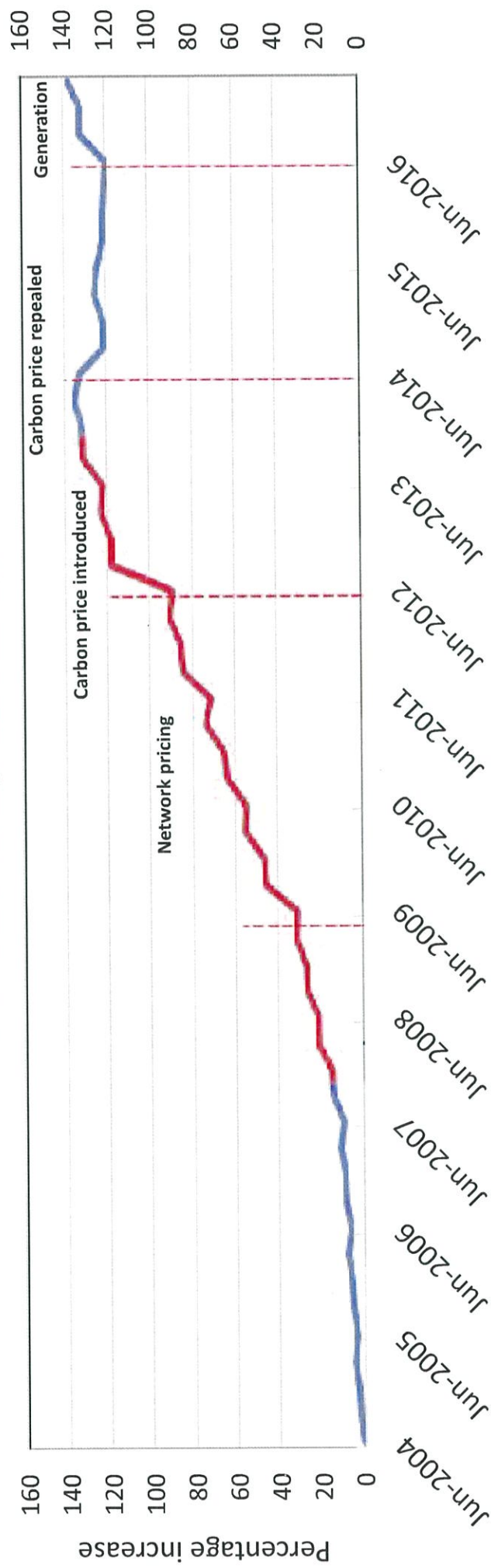


* Based on Australian Energy Market Commission estimates

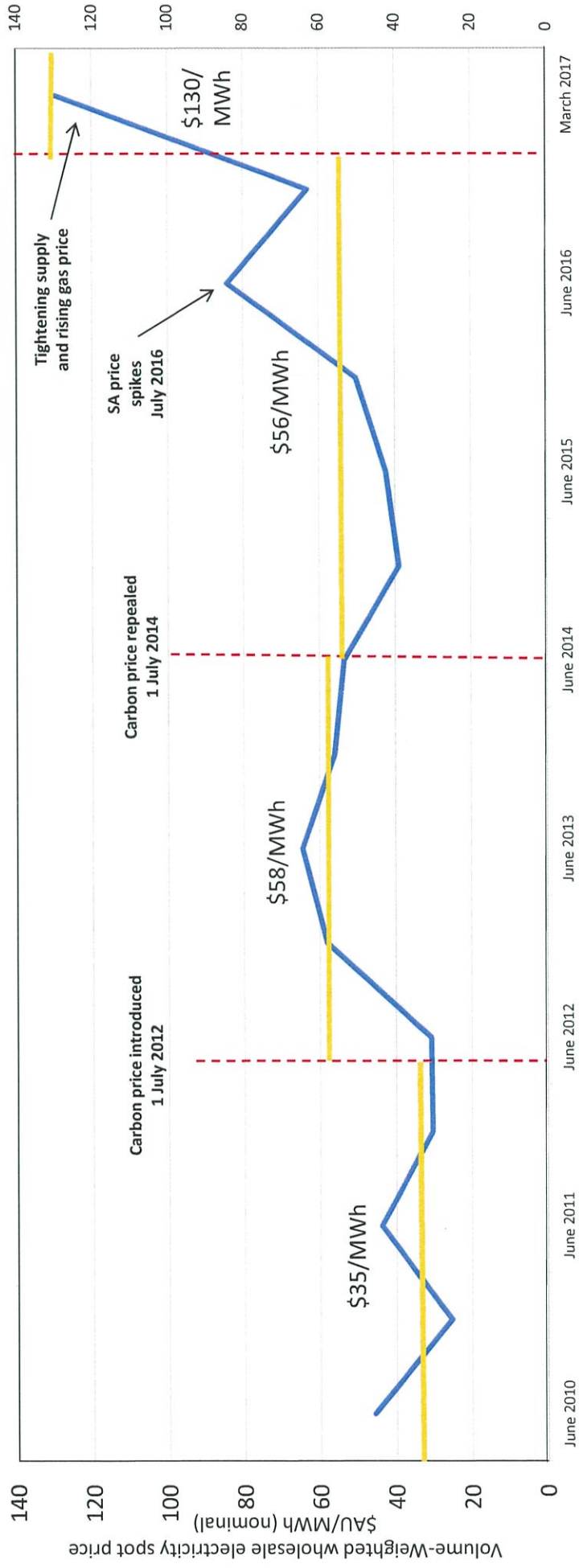
Where are we - prices

- National average retail prices have doubled in the past ten years, driven by a range of factors

Nominal increase in average retail electricity prices since 2004



Wholesale prices at record levels

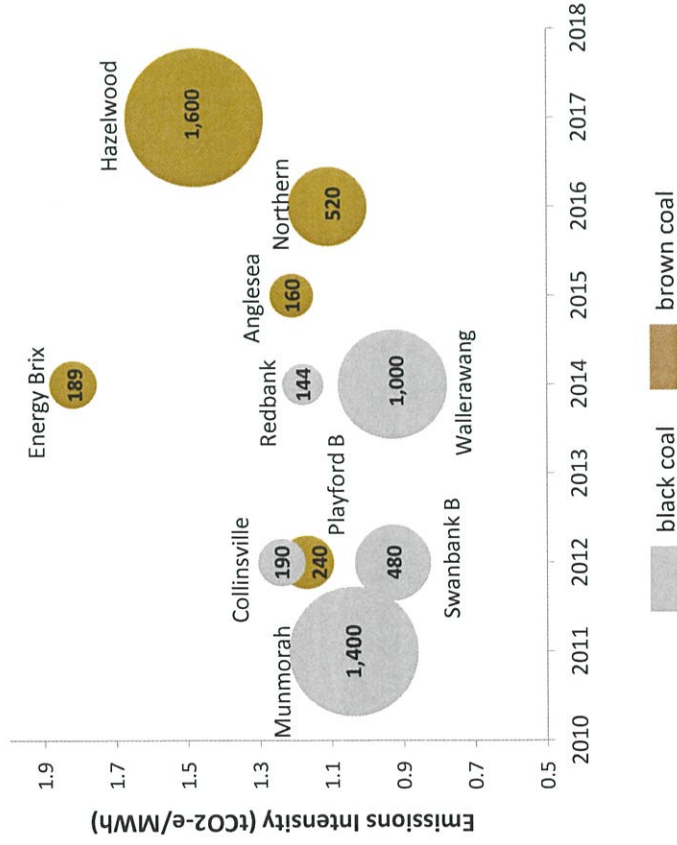


How did we get here?

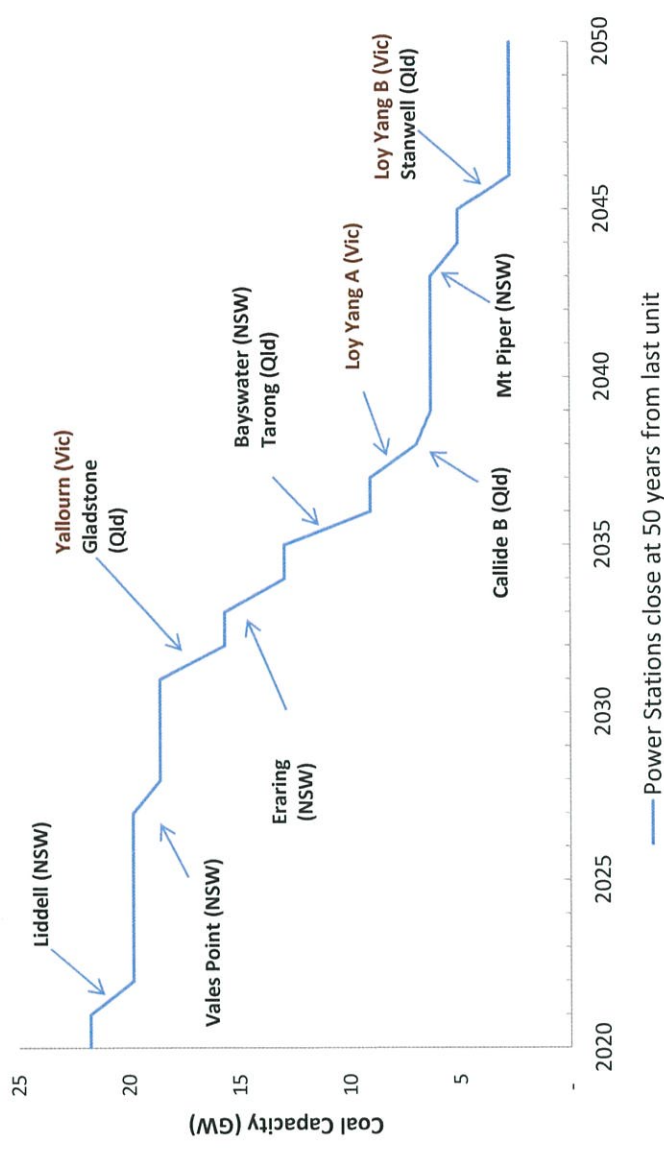
- Electricity supply has been tightening as existing, fully depreciated coal fired power stations close
- Policy uncertainty holding back new investment
- This has resulted in higher-cost, gas-fired generation setting the price more often

When will coal power stations close?

Historic power station closures



NEM coal capacity and closures



Source: Jacobs Modelling for Finkel Review 2017

When coal generators reach 50 years

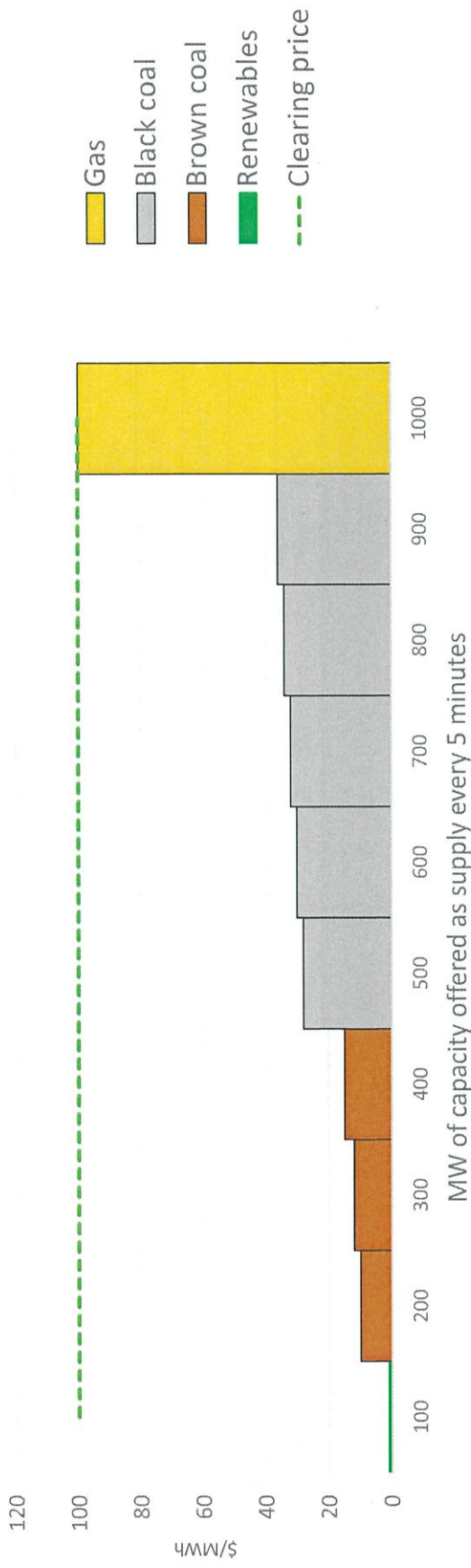
Generator	Closure Date by last generating unit	Owner	State	Capacity (MW)
Liddell	2022	AGL	NSW	1,936
Vales Point	2028	Delta Electricity	NSW	1,241
Gladstone	2032	Rio Tinto	Queensland	1,579
Yallourn	2032	EnergyAustralia	Victoria	1,362
Eraring	2034	Origin	NSW	2,707
Tarong	2036	Stanwell	Queensland	1,316
Loy Yang A	2036	AGL	Victoria	2,088
Bayswater	2038	AGL	NSW	2,593
Callide B	2039	CS Energy	Queensland	658
Loy Yang B	2044	Engie	Victoria	966
Mt Piper	2046	EnergyAustralia	NSW	1,260
Stanwell	2046	Stanwell	Queensland	1,372
Millmerran	Does not close before 2050	Intergen	NSW	788
Tarong North	Does not close before 2050	Stanwell	Queensland	416
Kogan Creek	Does not close before 2050	CS Energy	Queensland	699
Callide C	Does not close before 2050	CS Energy	Queensland	761

Source: Capacity figures from Jacobs Modelling for Finkel Review 2017

Gas is setting the electricity price more often

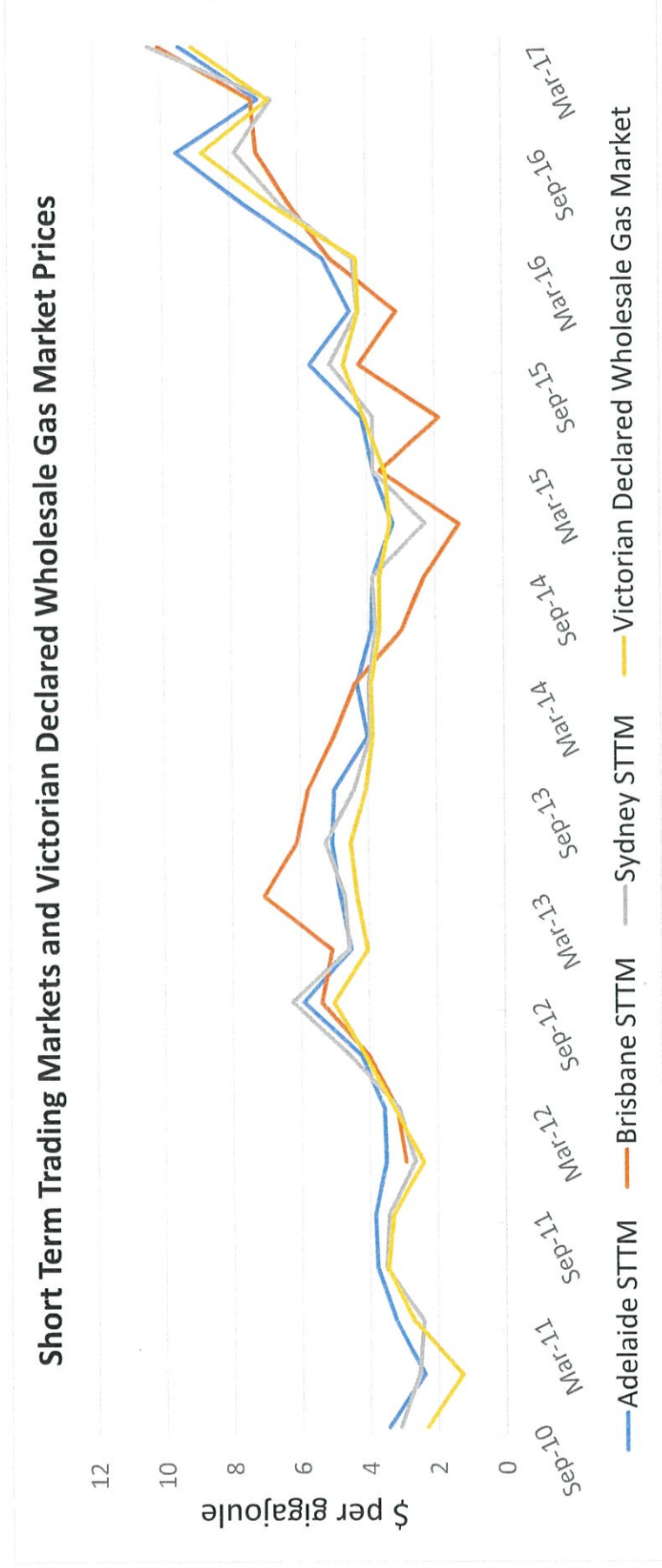
- In May 2017, across the NEM, gas set the electricity price 24 per cent of the time, compared to 9 per cent in May 2014

Electricity generator offers into the wholesale electricity spot market

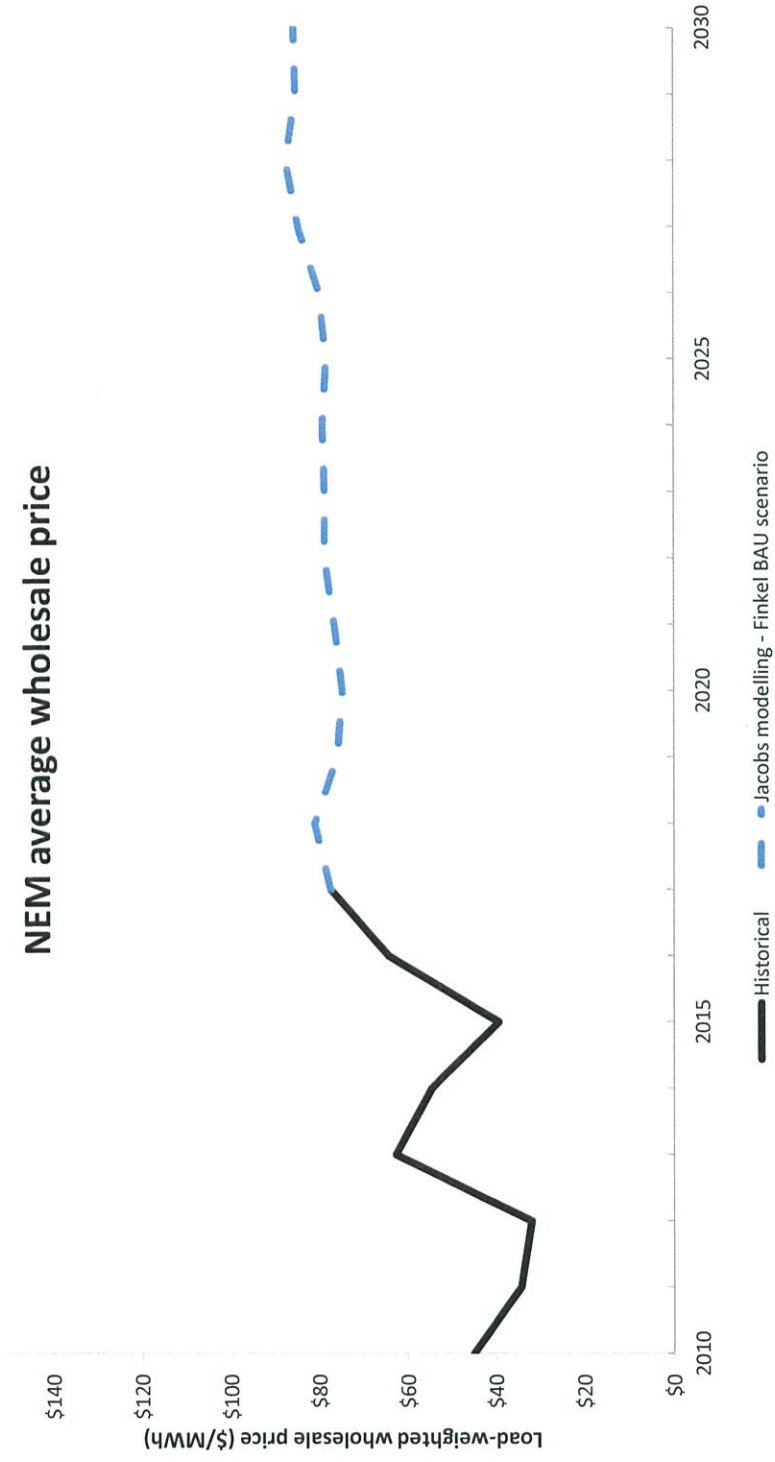


Gas prices are pushing up electricity prices

- Every \$1/gigajoule increase in gas prices leads to an increase of around \$10/MWh in the cost of gas fired electricity generation

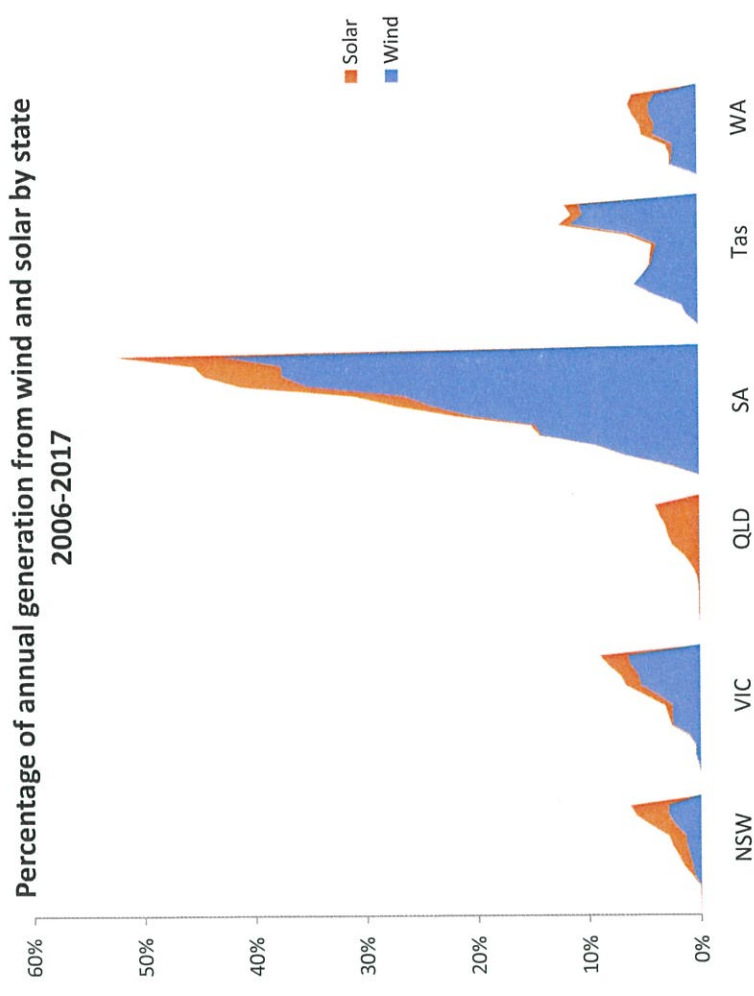


Where are wholesale electricity prices going?



System security and reliability: How did we get here?

- Renewables were pushed into the system without:
 - a focus on where they were located
 - a plan to replace inertia and frequency response lost as coal closed
 - a plan to deal with intermittency
- Investment uncertainty outside of renewables
- Lack of planning and sufficient notice of major closures

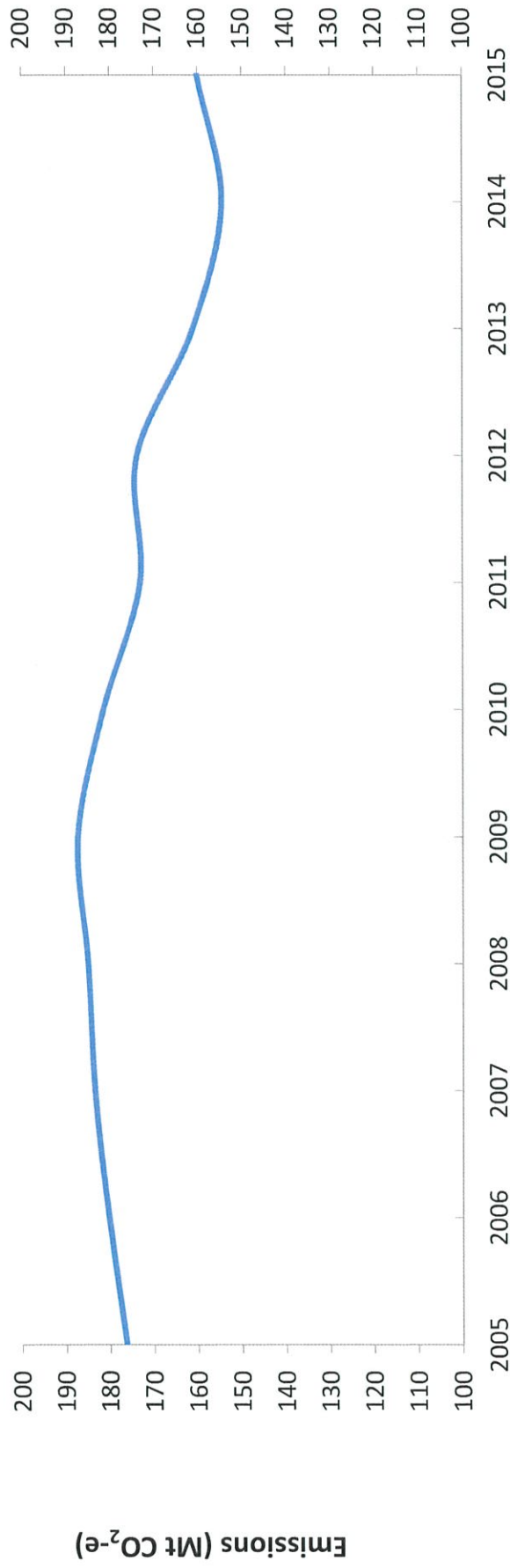


Source: 2009-2016: Office of the Chief Economist, Australian Energy Statistics, 2006-2008 and 2017: AEMO data through the NEMReview tool 2017

Note: this includes large-scale and rooftop solar.

Where are we - emissions

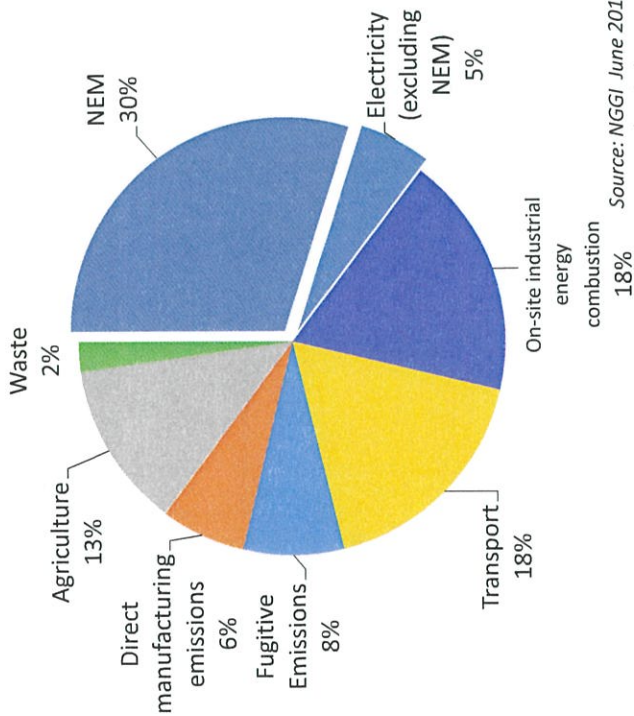
Historic NEM Emissions (Mt CO₂-e)



Source: Department of Environment and Energy
– National Greenhouse Gas Inventory June 2016

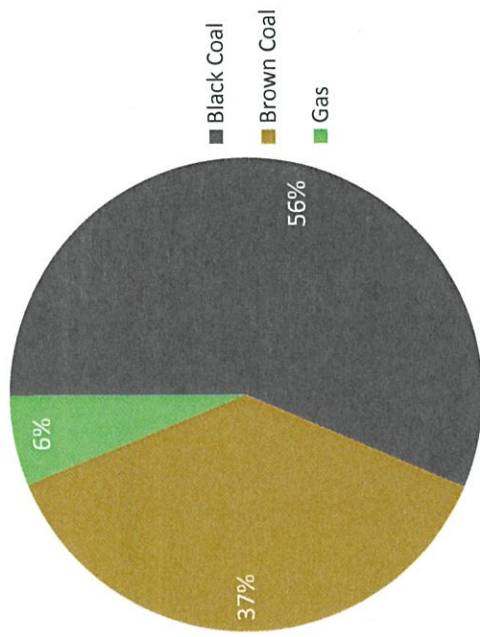
Breakdown of emissions

Australia's emissions by sector 2015-16



Source: NGGI June 2016, National emissions excluding LULUCF, unadjusted

Percentage of NEM 2016 emissions by fuel type

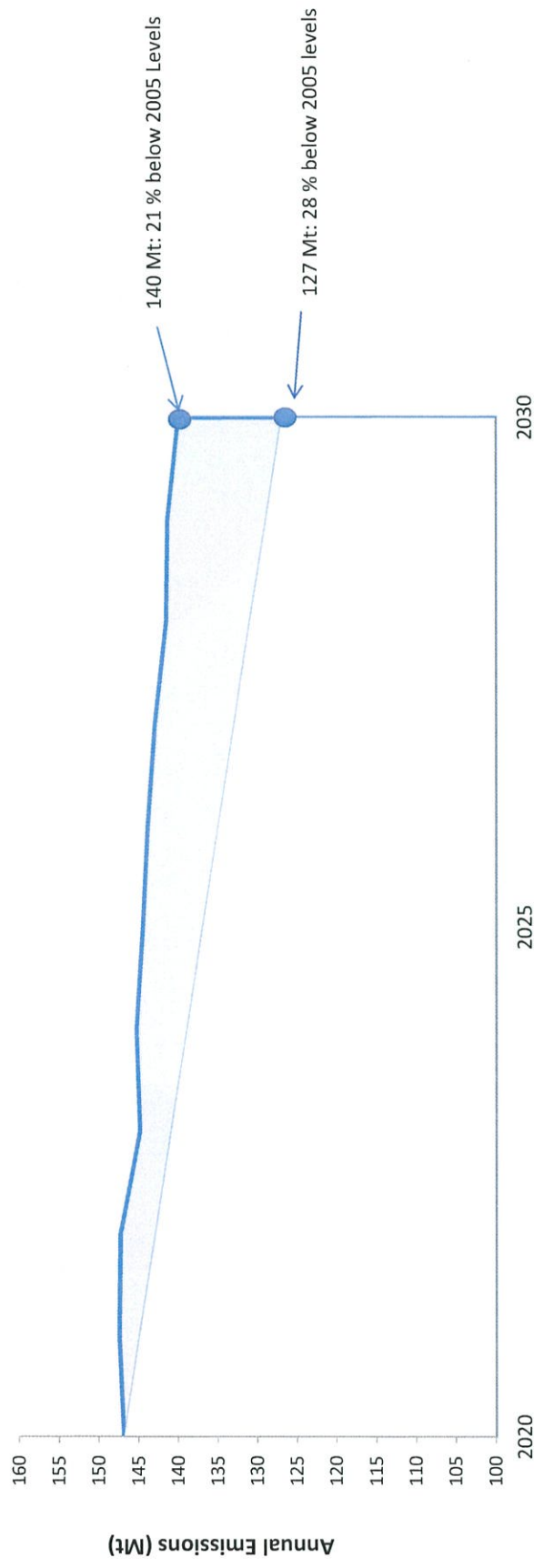


Source: NGERs 2016

Where are emissions going?

- Finkel modelling shows emissions decline

NEM BAU Emissions 2020-2030



Finkel Review

- Commissioned on 7 October 2016, through the COAG Energy Council, after the state-wide blackout in South Australia
- 392 submissions
- 50 recommendations covering
 - Increased security
 - Future reliability
 - More affordable power
 - Greater gas supply
 - Stronger governance with new Energy Security Board

Stakeholder views

“Australia hasn’t a moment to lose now that we have a comprehensive, independent blueprint to restore the security, reliability and affordability of our electricity system”

Business Council of Australia



National Farmers'
FEDERATION



EnergyAustralia



apepa
the voice of australia's
oil and gas industry

National Farmers'
FEDERATION



bhpbilliton



BLUESCOPE



ELUAA
ENERGY USERS
ASSOCIATION
OF AUSTRALIA



AUSTRALIAN
ENERGY
COUNCIL



origin

RioTinto

GLENCORE



Stakeholder views

“This is not a plan to make our power sector cleaner or our climate safer. It’s a short term political fix to deal with the fact that the people who are apparently responsible for running the country have an ideological attachment to dirty fuels.”

Australian Conservation Foundation and GetUp!



**AUSTRALIAN
CONSERVATION
FOUNDATION**



**Friends of
the Earth**



**Lock the Gate
Alliance**

Finkel package – Increased security & reliability

- **Generator Security Obligation**
 - All new generators will be required to contribute fast frequency response and system strength
- **Generator Reliability Obligation**
 - All new intermittent generator will be required to put in place storage and backup, at a level to be determined by AEMO and AEMC.
- **Three Years Notice**
 - All major generators will be required to give three years notice of closure.

Finkel package – Generator reliability obligation

- Wind generates around 40% of the time and solar generates 20-30% of the time
- Finkel recommends mandatory storage and backup for new intermittent renewables
- This levels the playing field – renewables now required to pay for intermittency



* Illustrative: Storage costs are based on 4 hour storage at 25% capacity.

Finkel package - Three year notice period

- **The last five closures** were Hazelwood, Northern, Anglesea, Redbank and Energy Brix. They **provided an average of five months notice** before closing
- Finkel recommends all large generators (coal, gas, wind, solar, hydro) be required to provide three years notice ahead of closure, which could be written into the National Electricity Rules as part of their licence to operate.

Clean Energy Target - First proposed by John Howard

- Howard Government proposed a Clean Energy Target in the 2007 election campaign:
 - required 30,000 GWh each year from low emissions sources by 2020
 - low emission sources were technologies emitting less than 200kg CO₂e/MWh i.e. renewables and fossil fuels with carbon capture and storage
 - intended to replace existing and proposed state and territory schemes with a single national scheme

Finkel package - Clean Energy Target

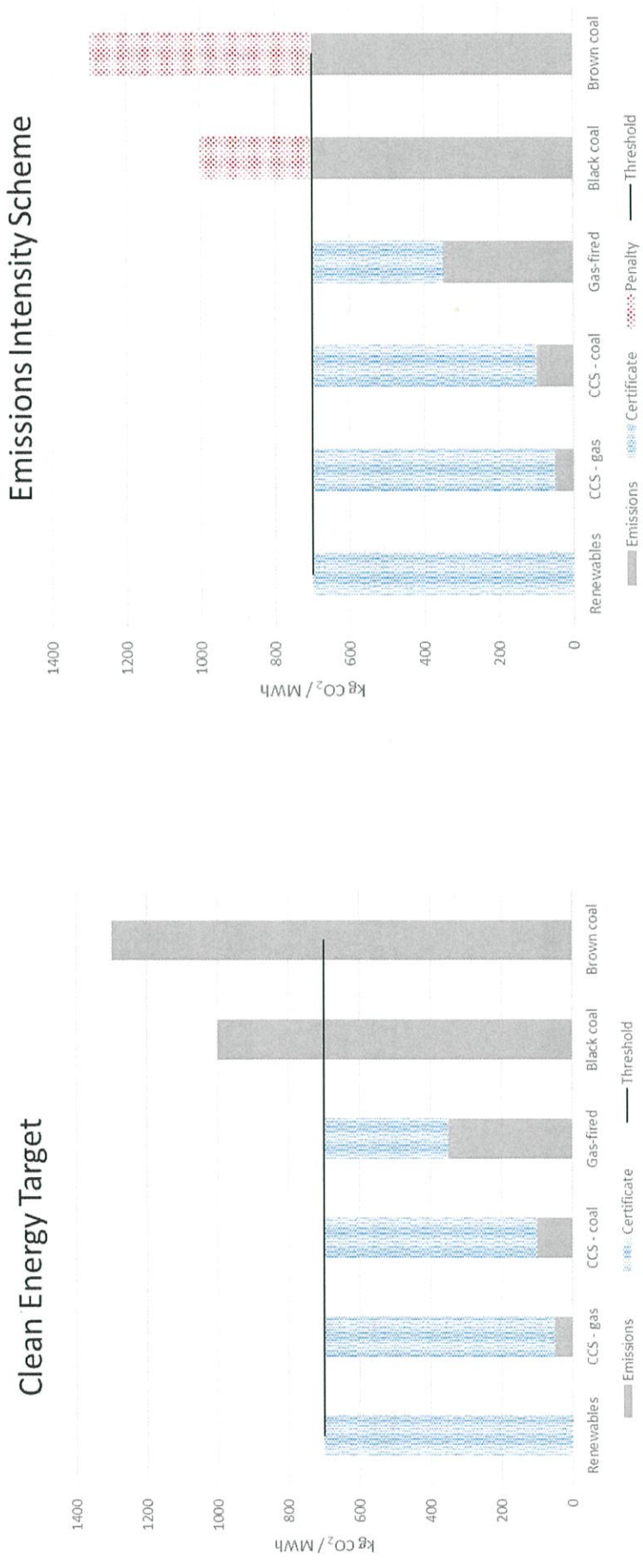
- Why Finkel concludes an investment mechanism needed?
 - Investment freeze outside of renewables as energy market is operating with a risk premium for policy uncertainty
 - Market needs certainty to invest in fossil fuel generation (existing and new)
 - Investment uncertainty is affecting system reliability and security and causing higher prices
 - Current mechanism (RET) is not technology neutral

Finkel package - Clean Energy Target

- Generators that produce power below a baseline of CO₂-e/MWh would create a certificate
 - Finkel leaves setting the baseline to government
- The size of the certificate would be proportionate to the amount their emissions are below the baseline
- Retailers would need to buy certificates from generators and the price would be determined by the market

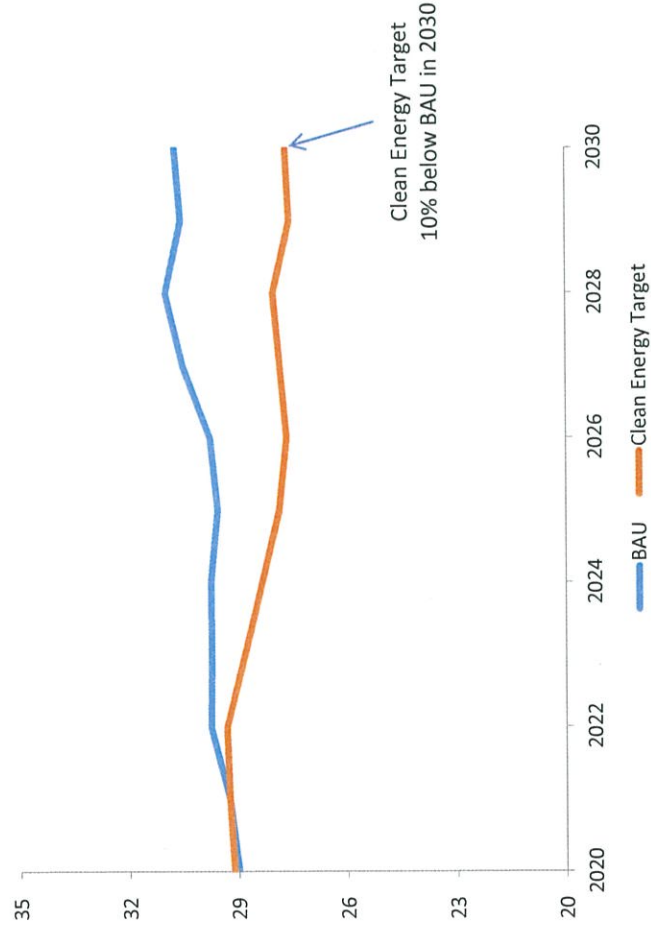
Difference between CET and an EIS

- A CET only has incentives, no penalties on existing coal. No prohibitions or penalties on new coal being built
- Unlike CET, an EIS penalises new and existing coal

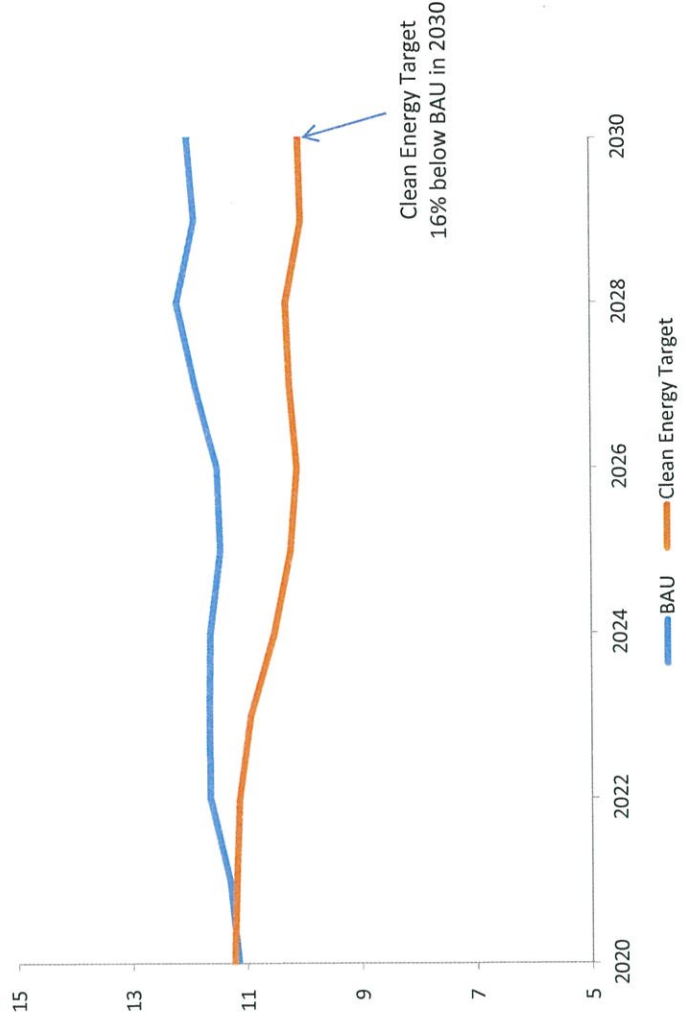


Clean Energy Target lowers prices

Residential Retail Price (c/kWh)

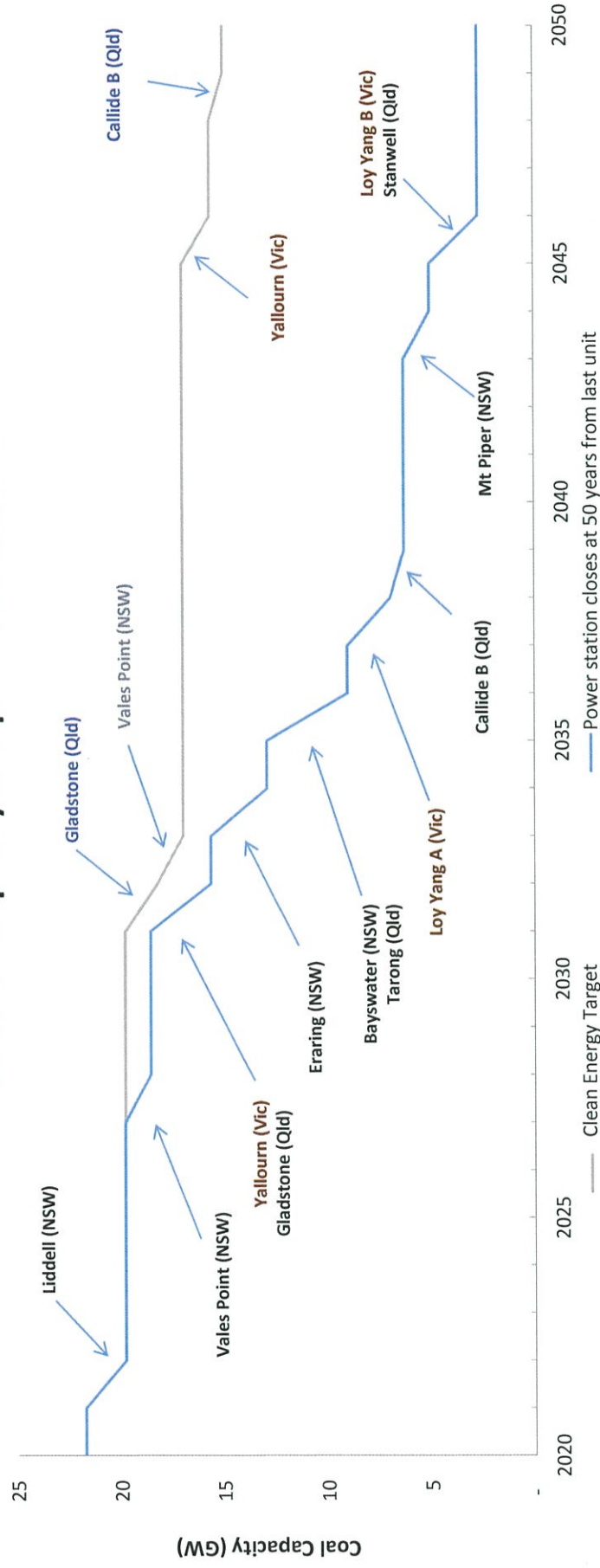


Industrial Retail Price (c/kWh)



Clean Energy Target helps keep baseload in the system

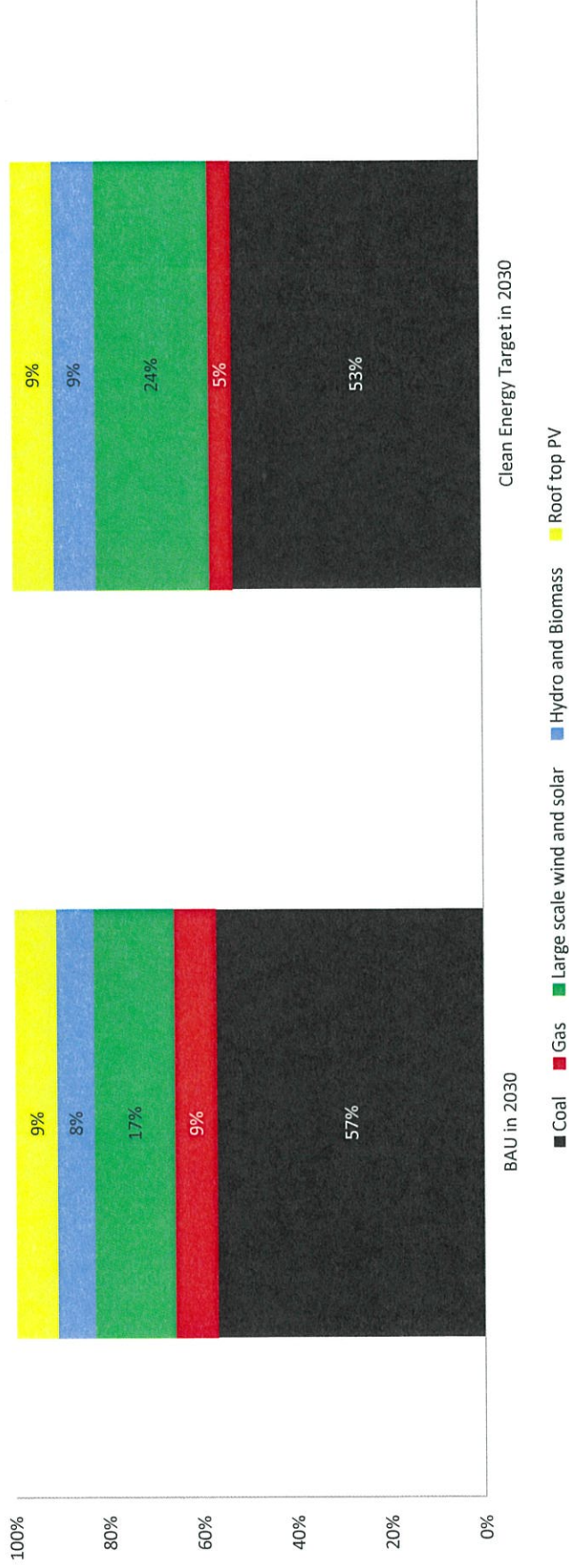
NEM coal capacity and potential closures



Source: Jacobs Modelling for Finkel Review 2017

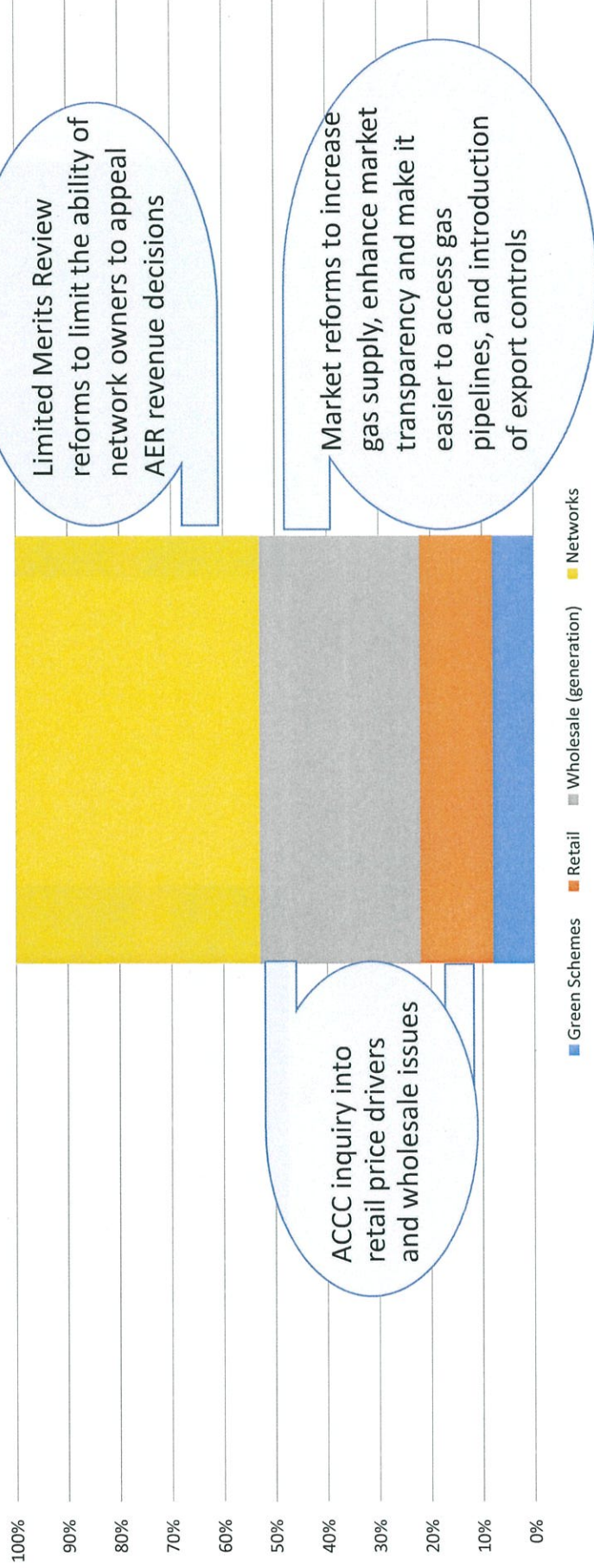
Clean Energy Target

NEM Generation mix



Lowering electricity prices

Australian Electricity Bill Cost Components



Labor's alternative

- No future for coal and fast tracking closure
- 45 per cent emission reduction target
- 50 per cent RET
- Emissions Intensity Scheme (EIS)
- No energy security plan

