



—
Melbourne
Energy
Institute



Quarterly Energy Dynamics report Q4 2022

—
Presenter: **Dr Shaun Hooper, Manager - Market Insights, AEMO**

Moderator: **Professor Pierluigi Mancarella**



@MEIunimelb #MEInetwork23 #MEIxAEMOSeminar



Q4 2022 Overview

The NEM in Q4 2022 saw;

- Record high Q4 prices at \$93/MWh
- Record low Q4 operational demand
- Record low coal generation (-798 MW from Q4 2021) displaced by increasing renewables (+1054 MW).
- New instantaneous record of renewable penetration at 68.7% (+4.6% on Q3 2022)

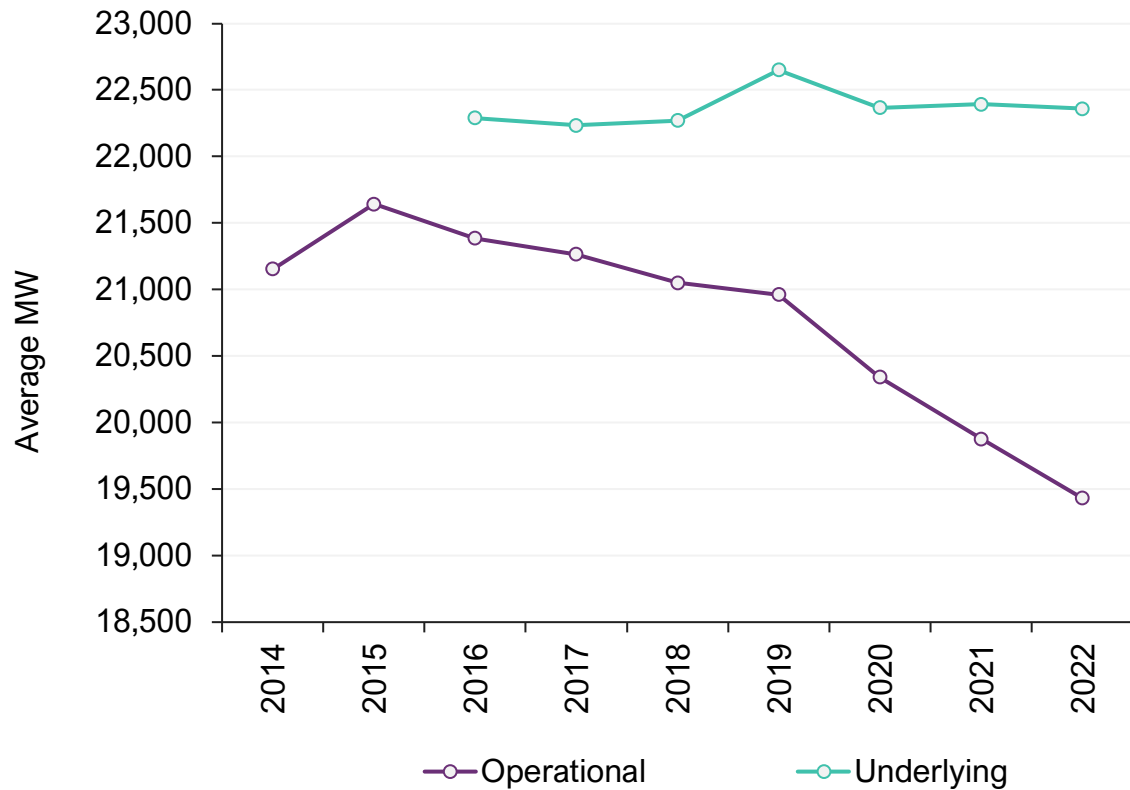
East Coast Gas Markets in Q4 2022 was described by;

- Declining prices from Q3 2022 (-31.5%); averaging \$17.8/GJ (up +74% from Q4 21)
- Decreased demand (-7% from Q4 21), with QLD export LNG demand decline (-29.1 PJ)

Operational Demand

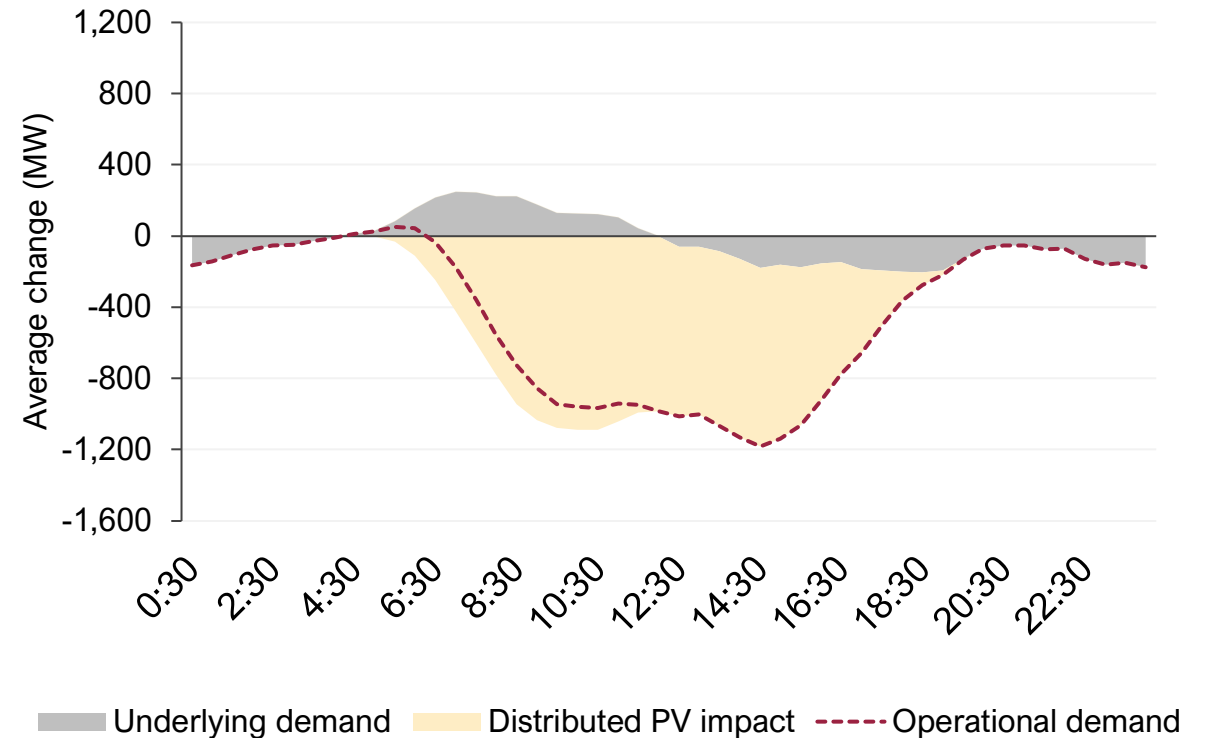
The gap between underlying and operational demand widens.

Q4 demand 2014-2022



Distributed PV increase the largest contributor to decline in operational demand

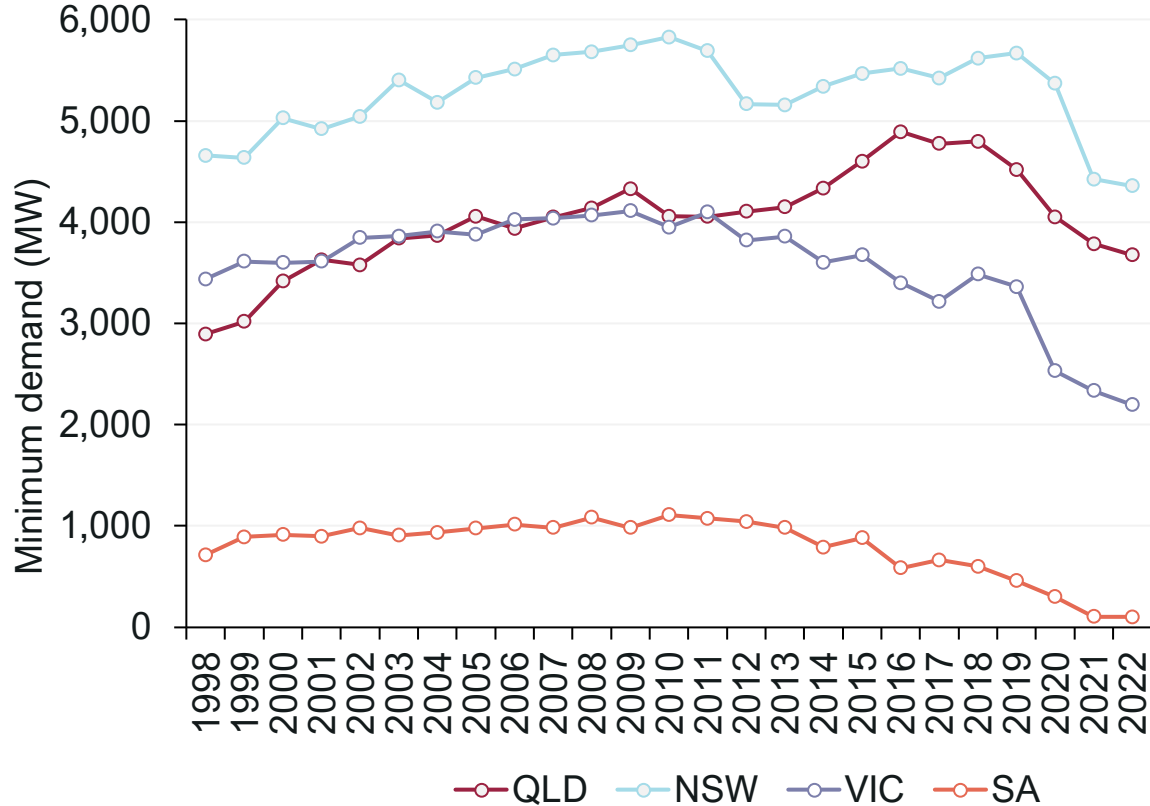
Average Time of Day demand change from Q4 2021 to Q4 2022



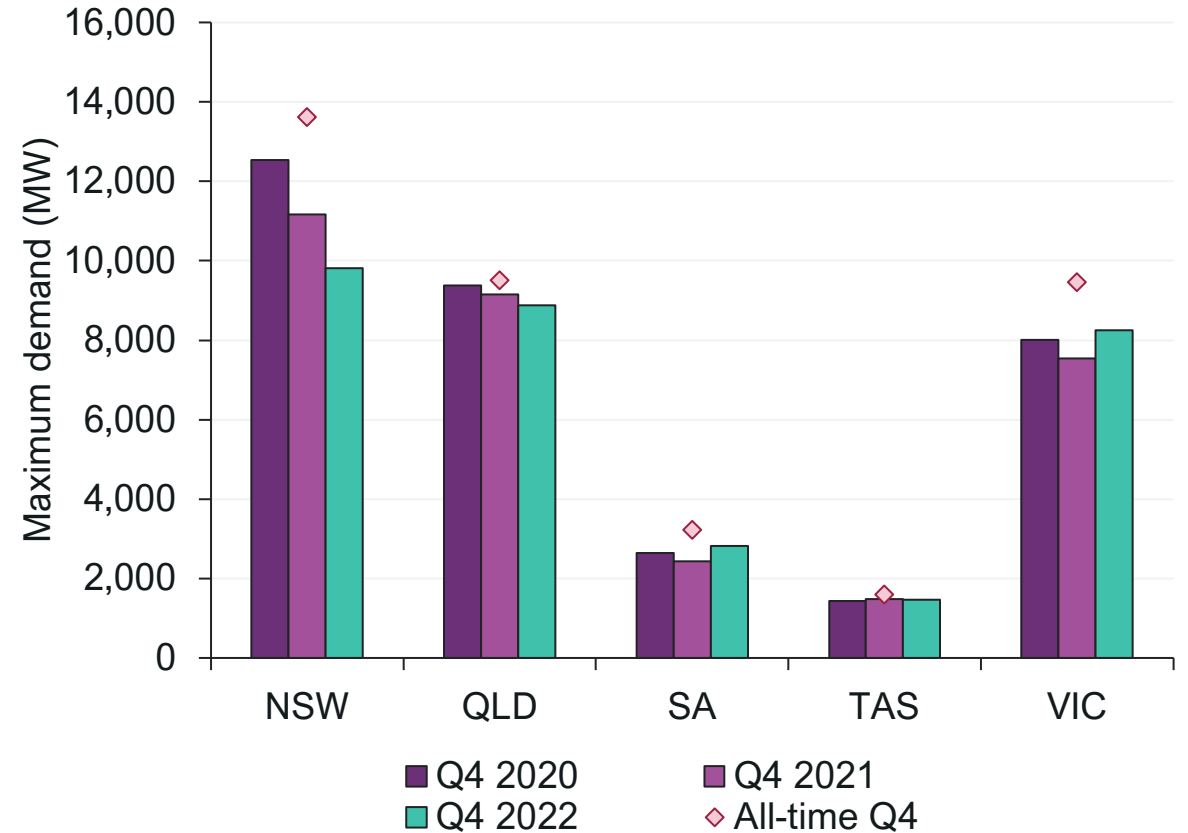
Minimum and Maximum demand

Minimum operational demand reached a NEM wide record Q4 low

Q4 minimum operational demand from 1998 -2022

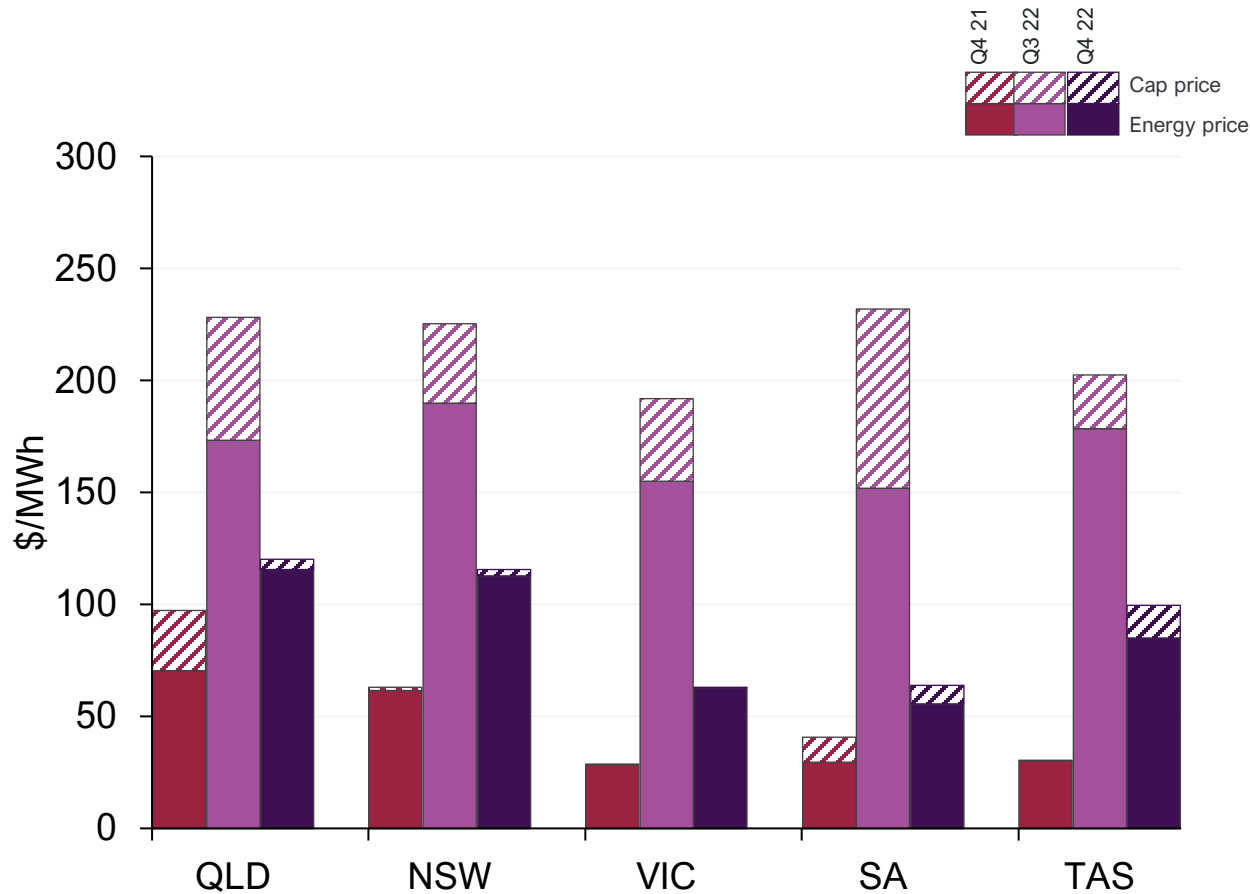


Maximum demand drops in the northern regions



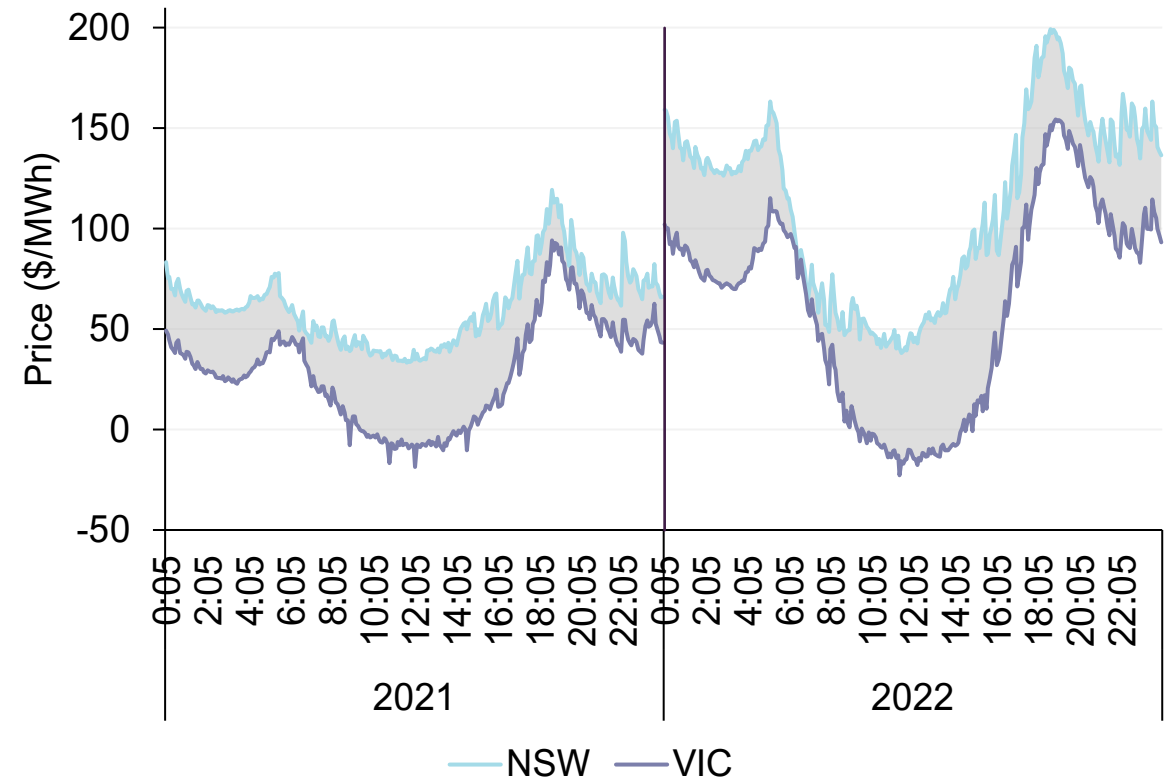
Electricity Prices

Declines from Q3 2022, though uptick from Q4 2021



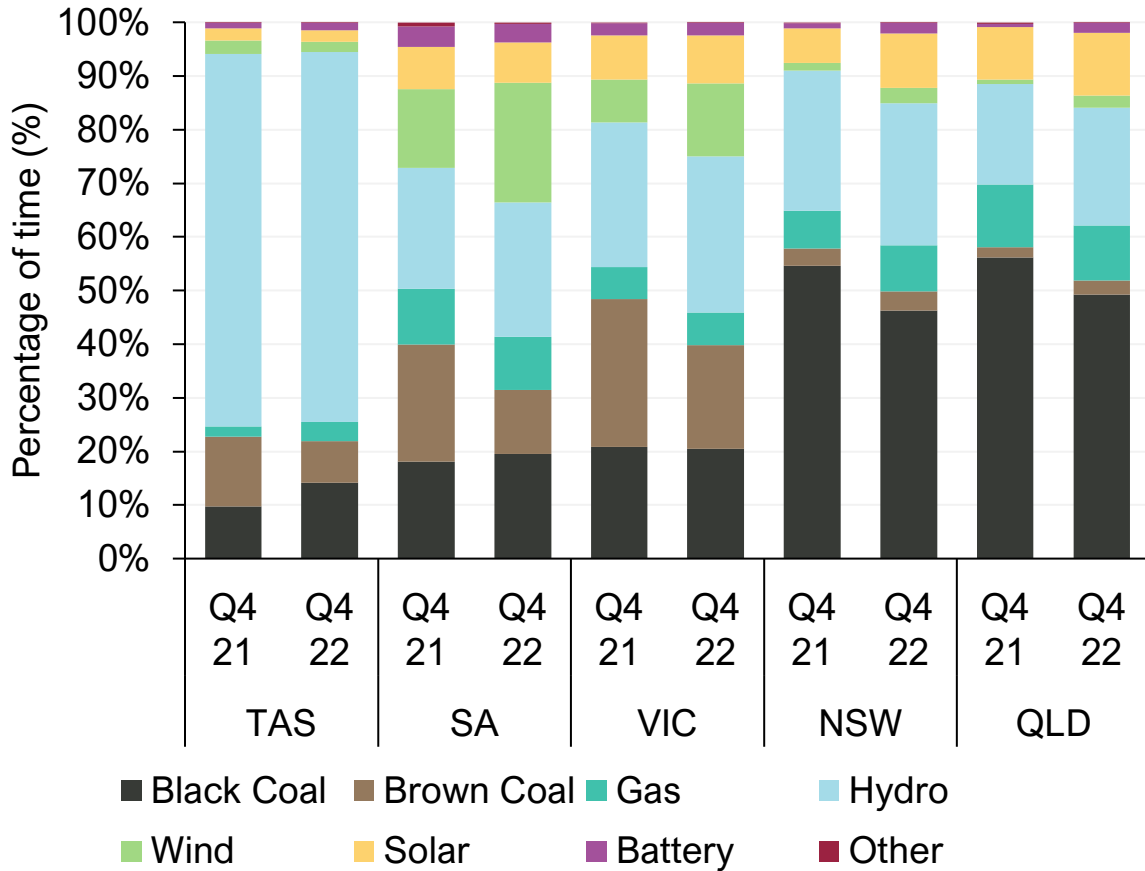
Northern and Southern Price Divide widens over daytime hours

Q4 average time of day spot prices NSW and Vic 2021 - 2022

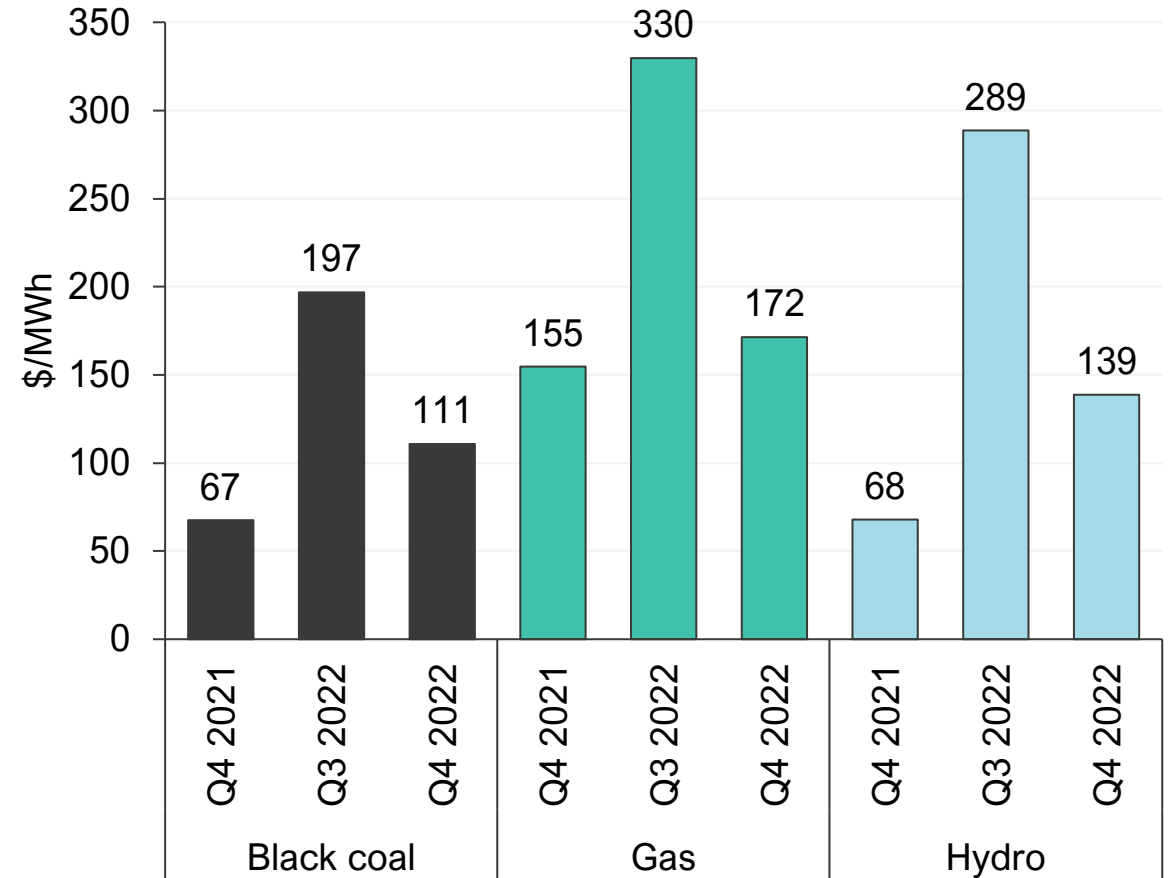


Price Setting Dynamics

Renewables offset high price units more often in southern states



Average price setting levels well above Q4 2021 for Hydro, Gas and Coal



Marginal Offers Increase

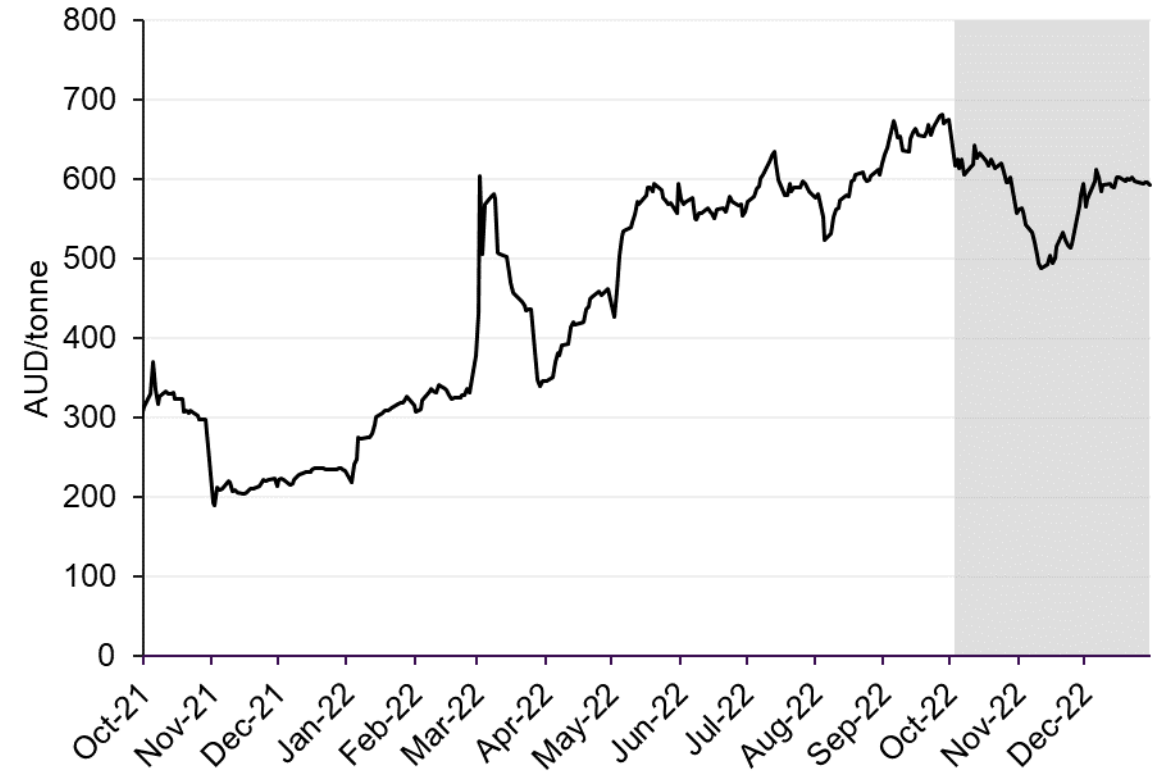
Reduced Black Coal offers below \$100/MWh

New South Wales and Queensland black coal unit supply offer prices - average Q4 2021 and Q4 2022



Thermal coal prices remain high through the quarter

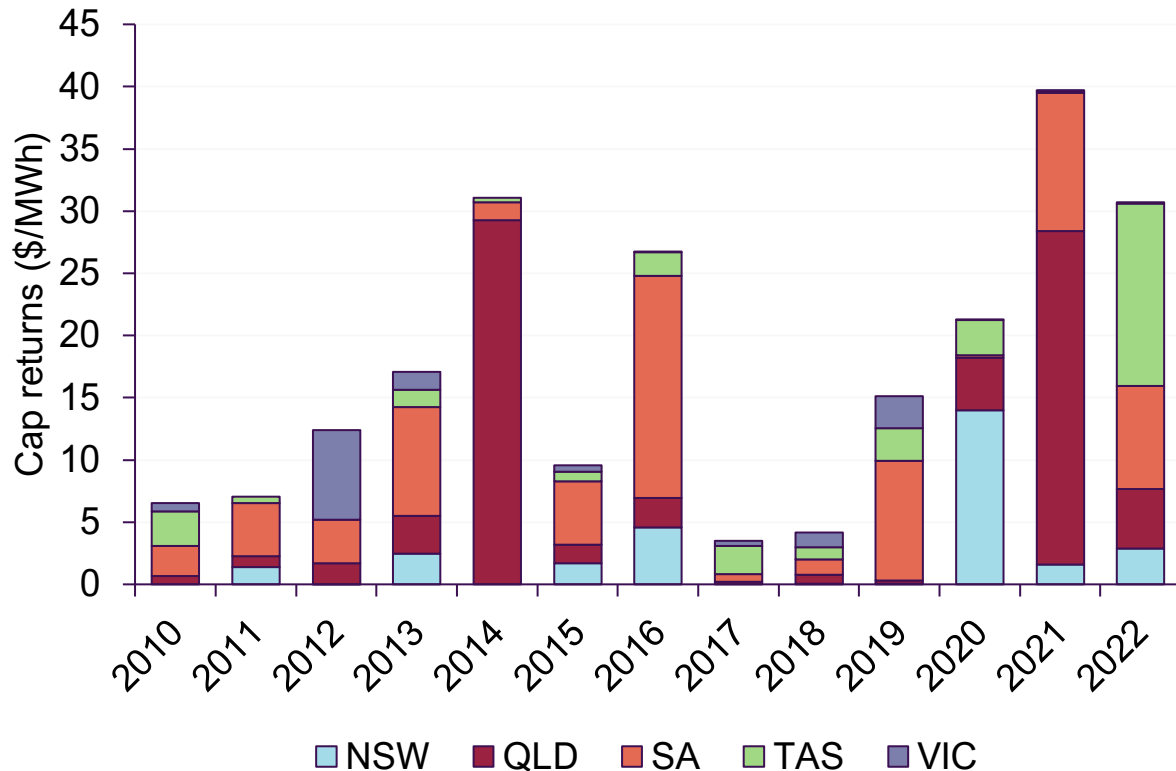
Newcastle export thermal coal AUD/tonne daily



Price volatility

NEM cap returns were dominated by Tasmania and South Australia

Quarterly cap returns (excess of spot prices above \$300/MWh) – Q4s, stacked by region



Tasmanian price volatility

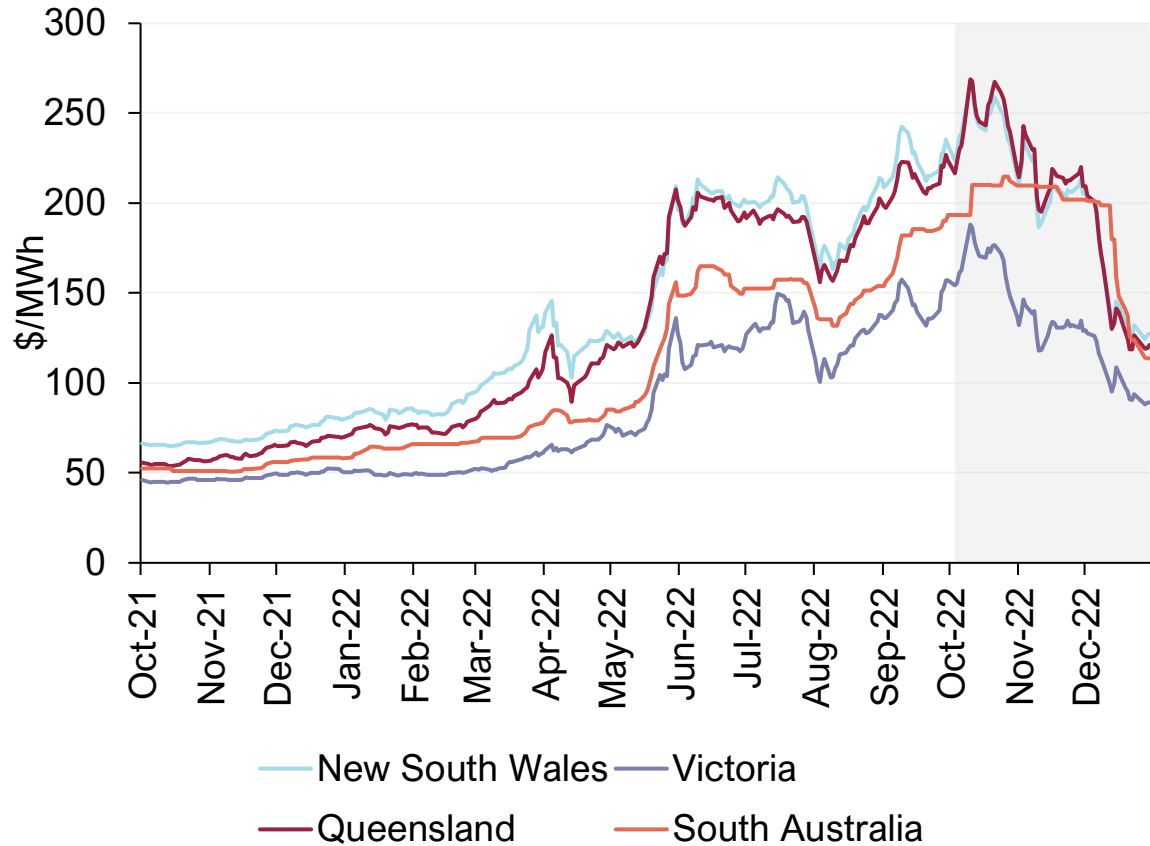
Time period	Cap Contribution	Cause
14 October	\$2.05/MWh	Major transmission outage connecting North/South of state. Loss of local generation, interconnector support and load.
14 November	\$10.55	Forced flow north to Victoria under SA island, with limit on Tas flows North <> South

South Australian Price Volatility

Time period	Cap Contribution	Cause
12 Nov – 19 Nov	\$5.40/MWh	Tower failure TB – SE 275 kV Tx lines connecting SE SA from the rest of the state, with occasional volatility without support from mainland

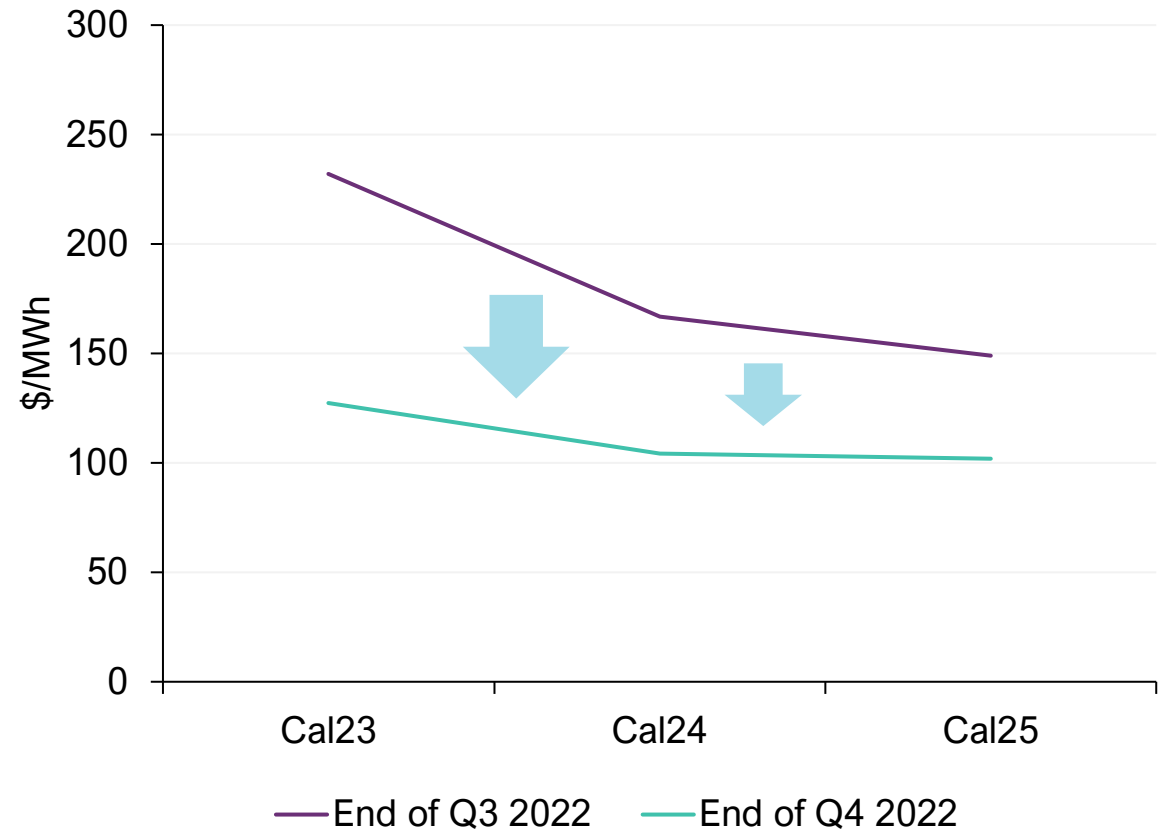
ASX Forward Prices

Cal23 Futures trended upwards through October, then declined rapidly from November



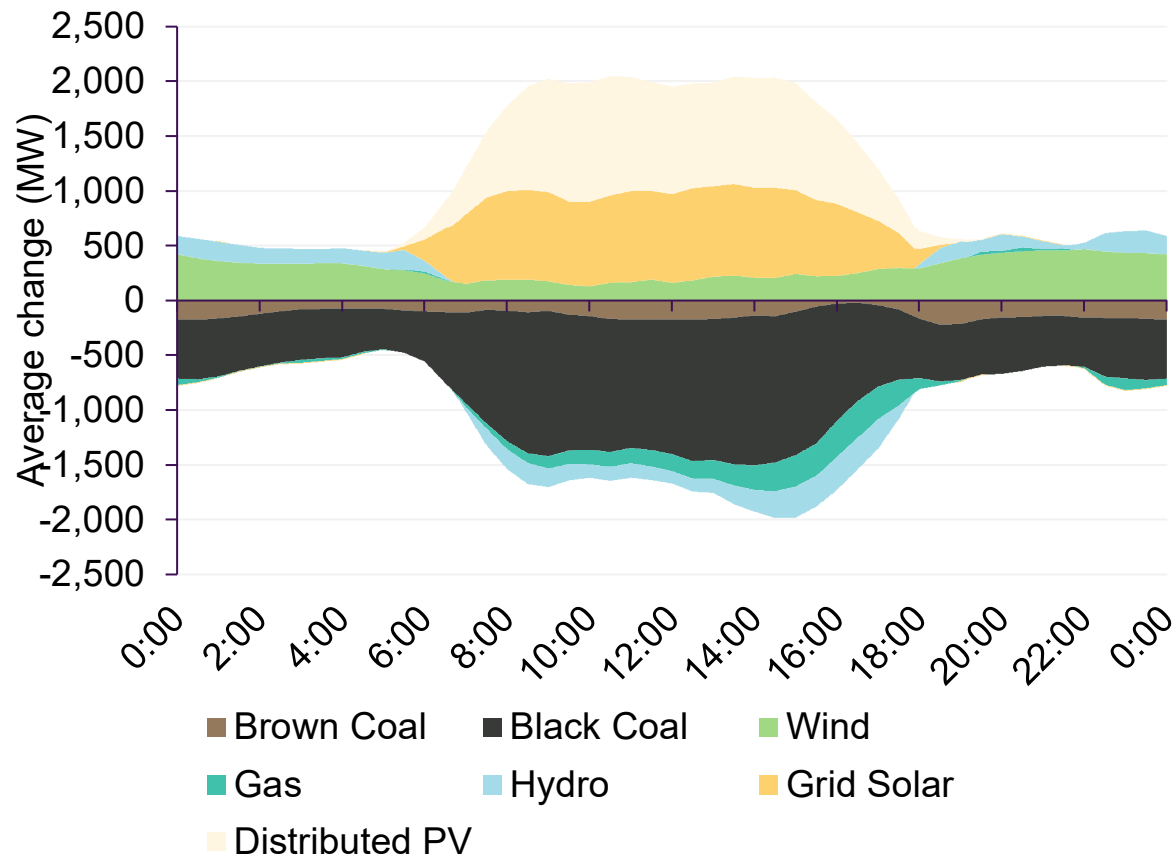
Cal 23-25 futures prices fell across Q4 2022

NSW Cal base futures

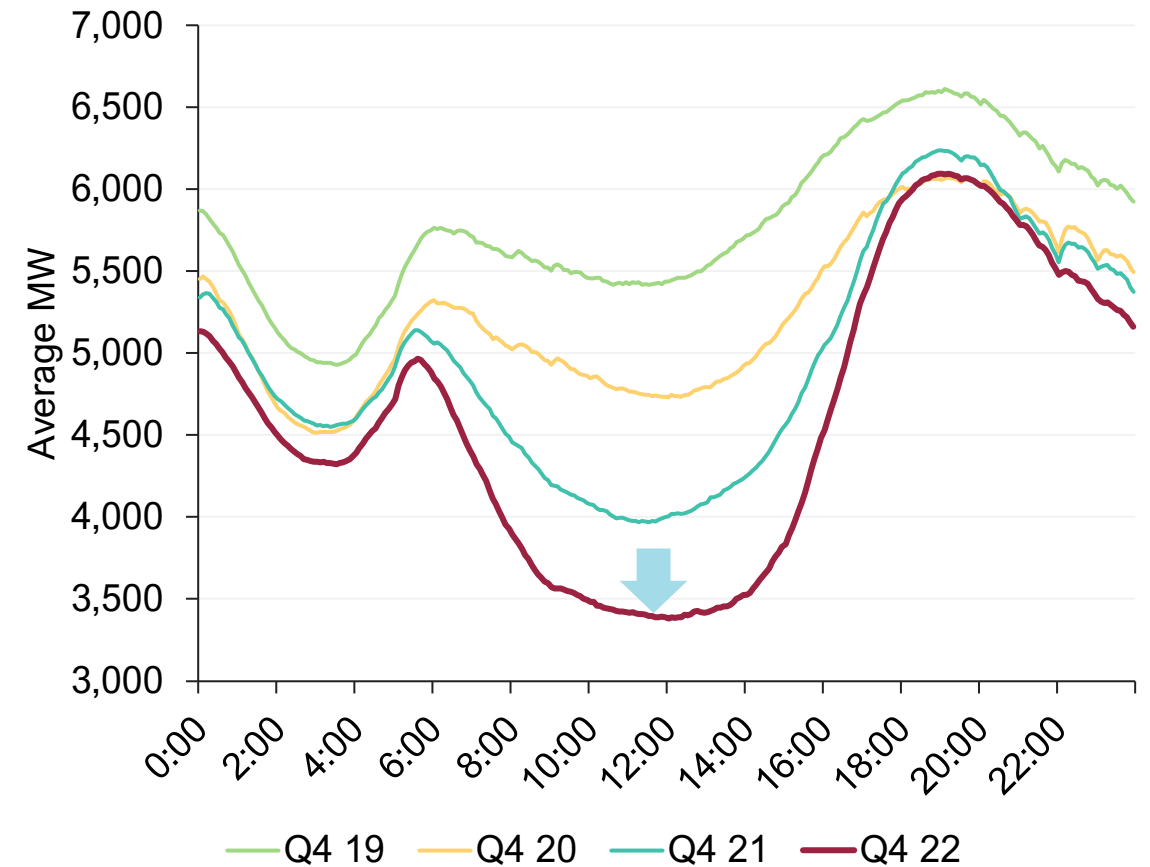


Supply mix changes

High solar output displacing coal through the middle of the day

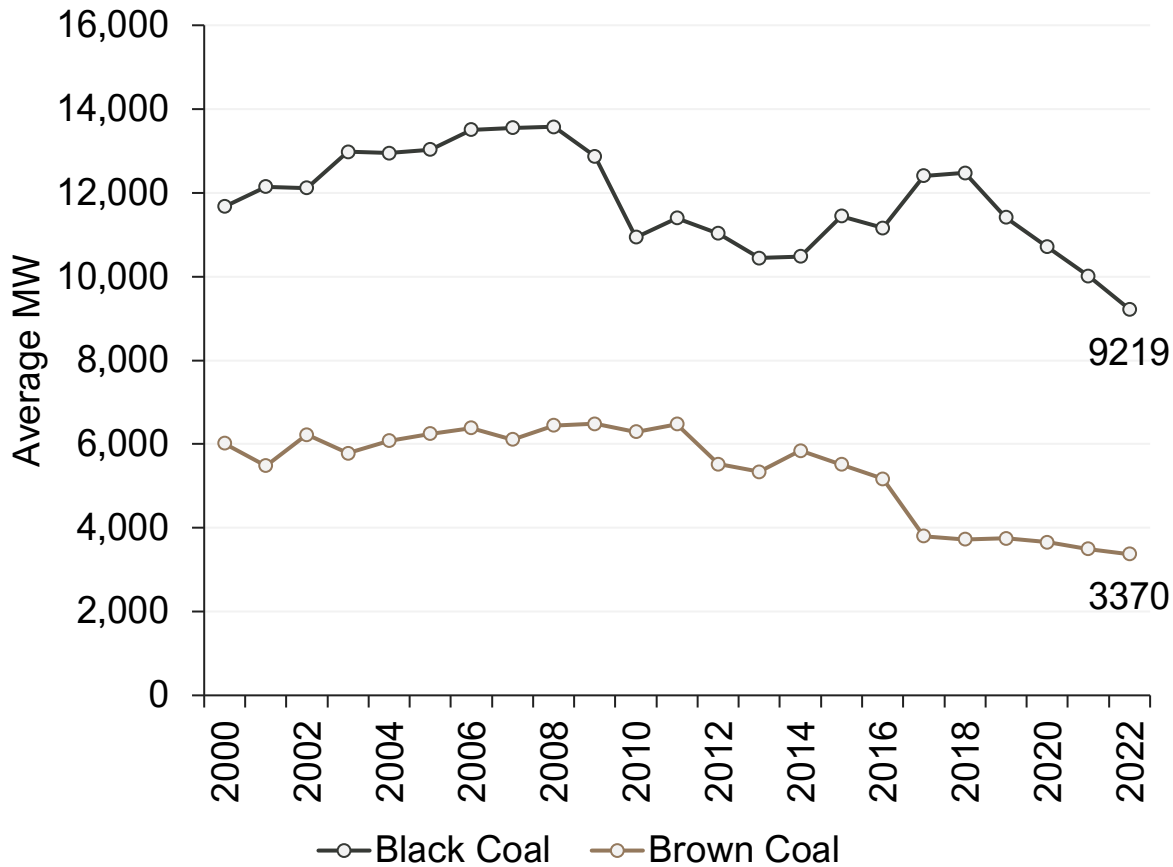


NSW black coal-fired generation decreases

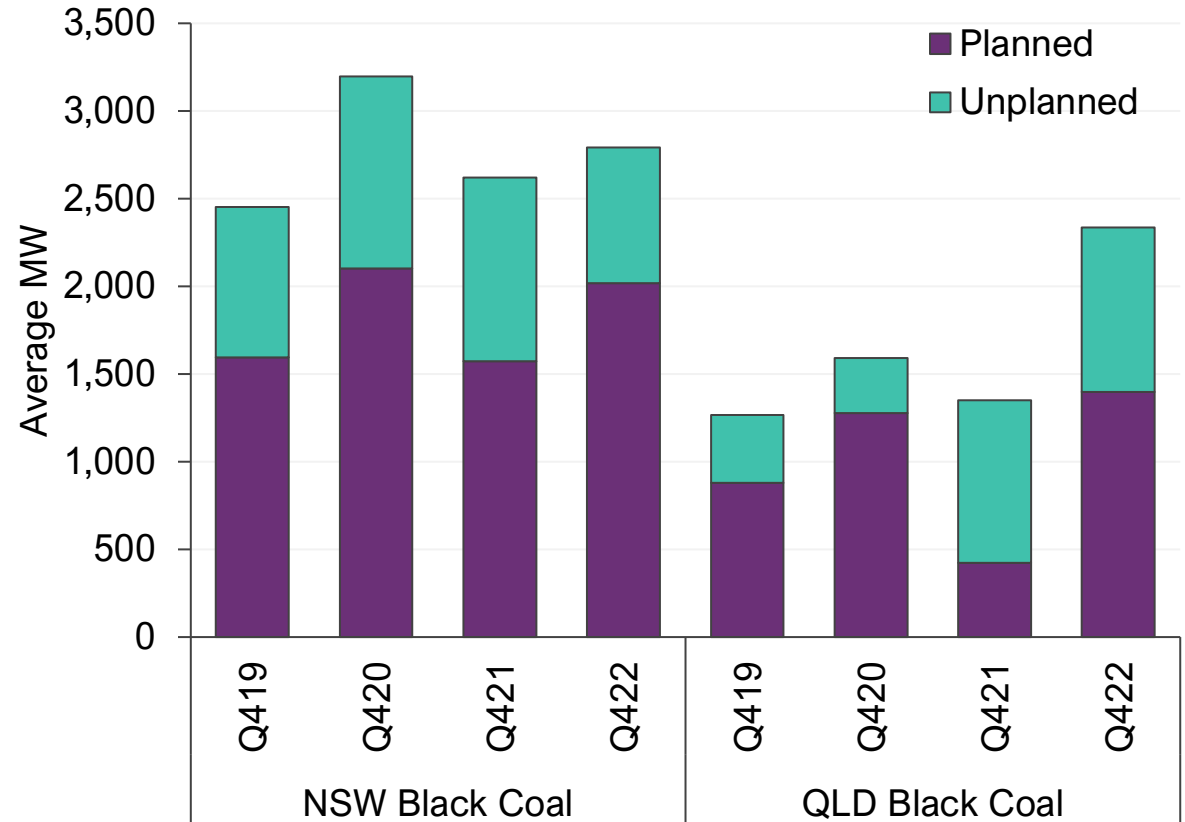


Coal output

NEM coal-fired generation recorded lowest average output since NEM start

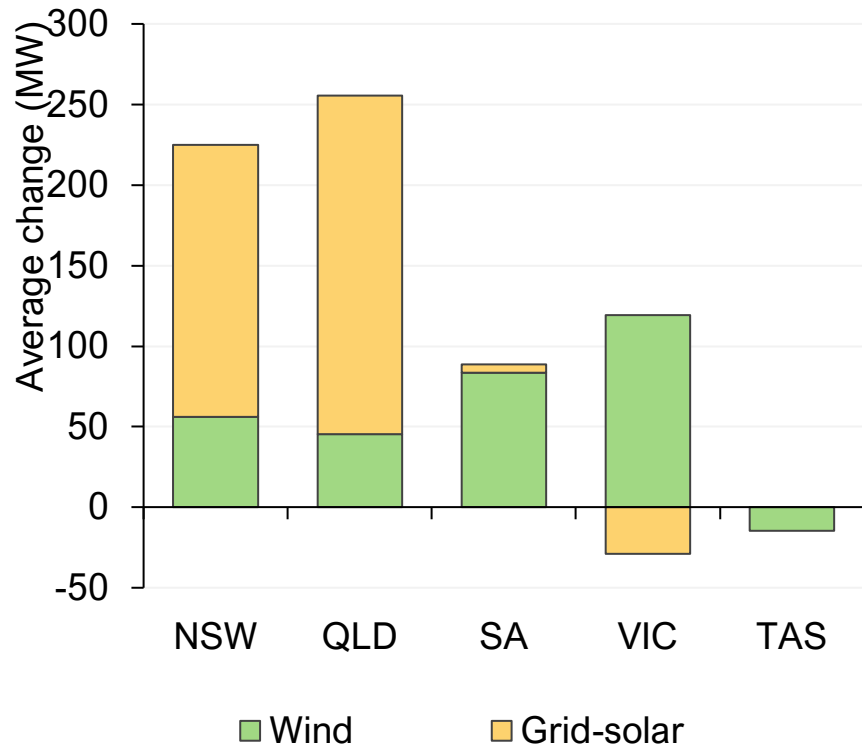


Increased black coal-fired generation outages

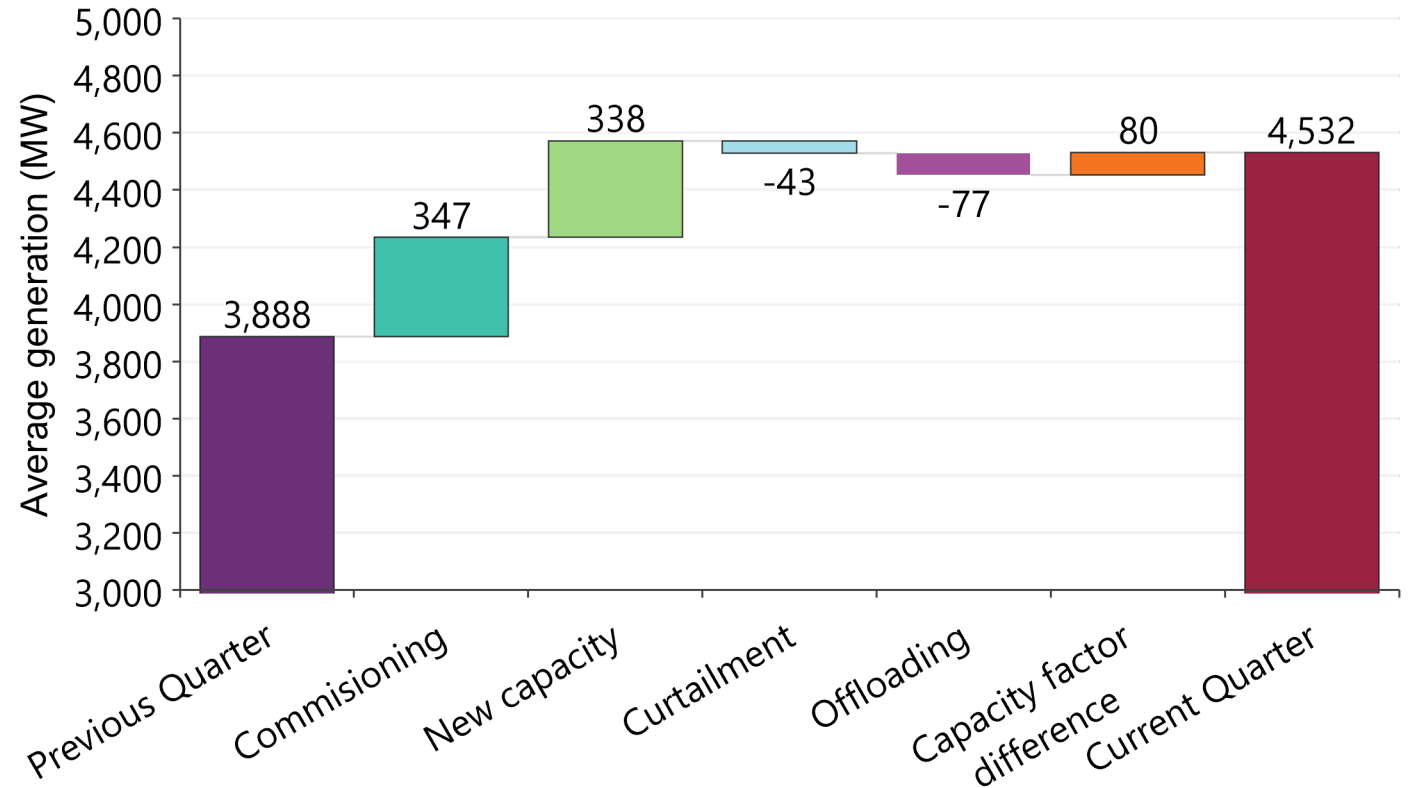


Wind and solar output

Increased grid-scale solar in NSW and QLD, increased wind

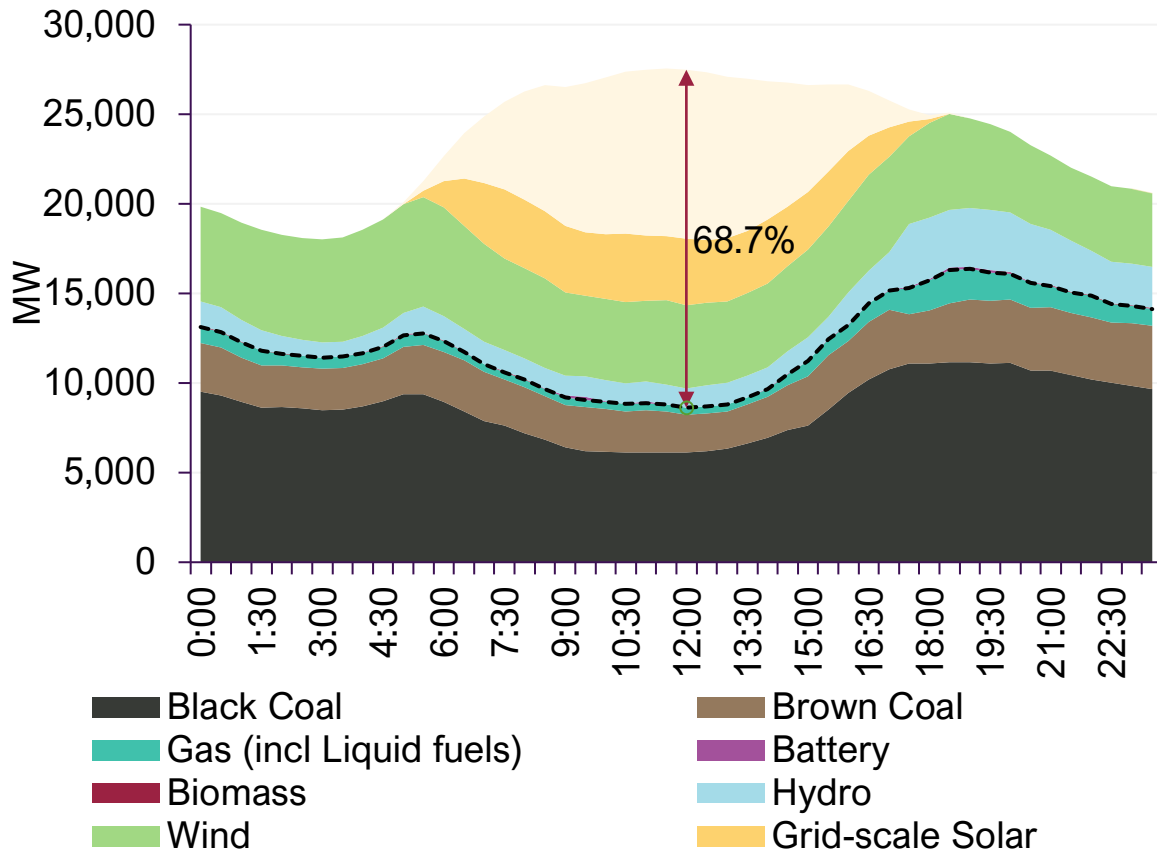


Ramping up and new capacity additions continue to be major contributor to increasing VRE

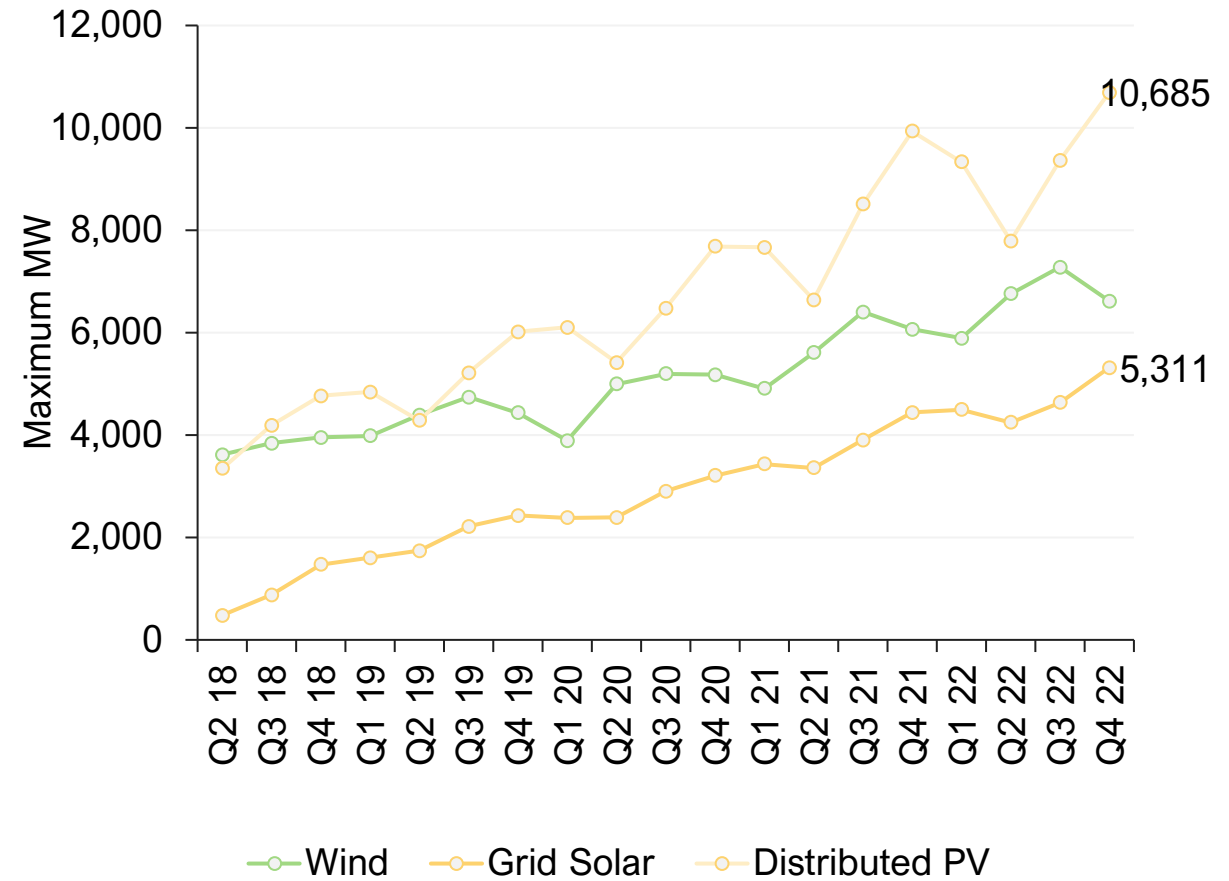


Instantaneous renewable penetration

NEM instantaneous renewable penetration reaches new highs

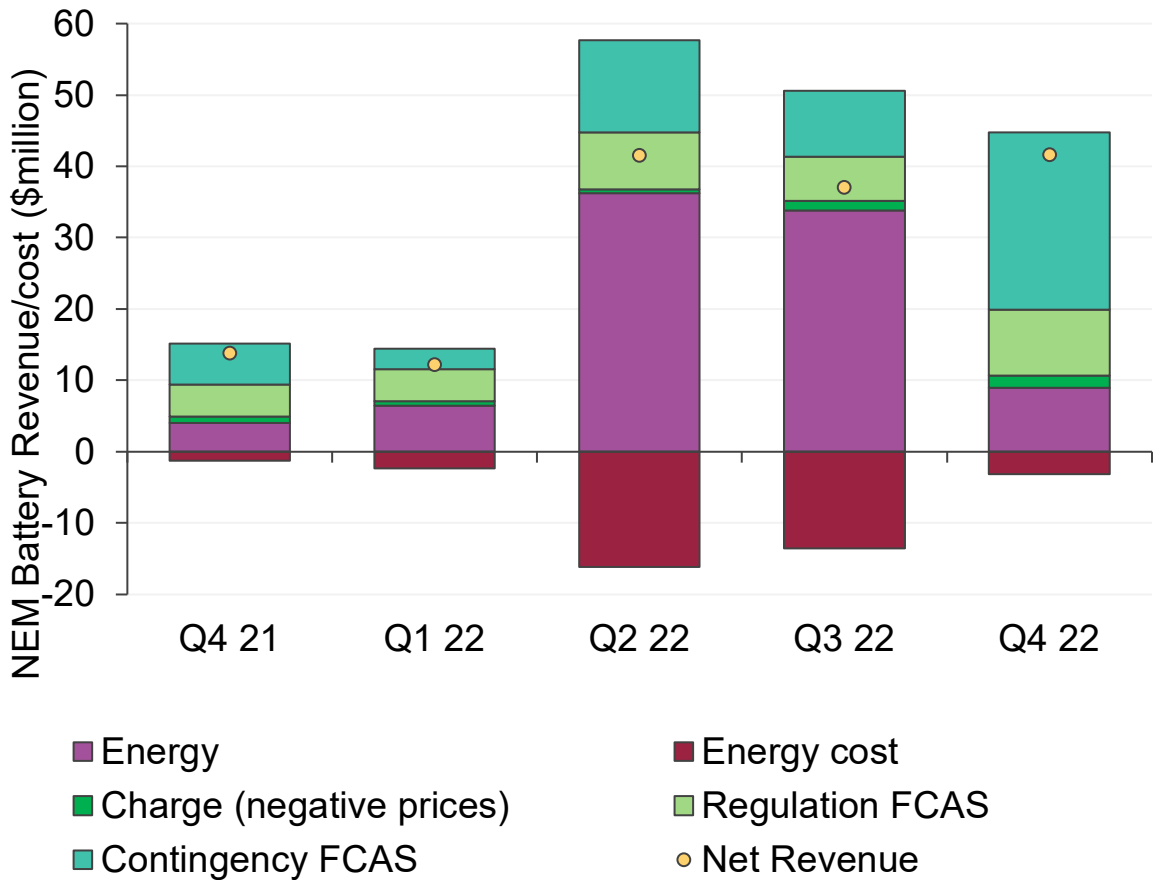


New peak grid and distributed solar instantaneous output

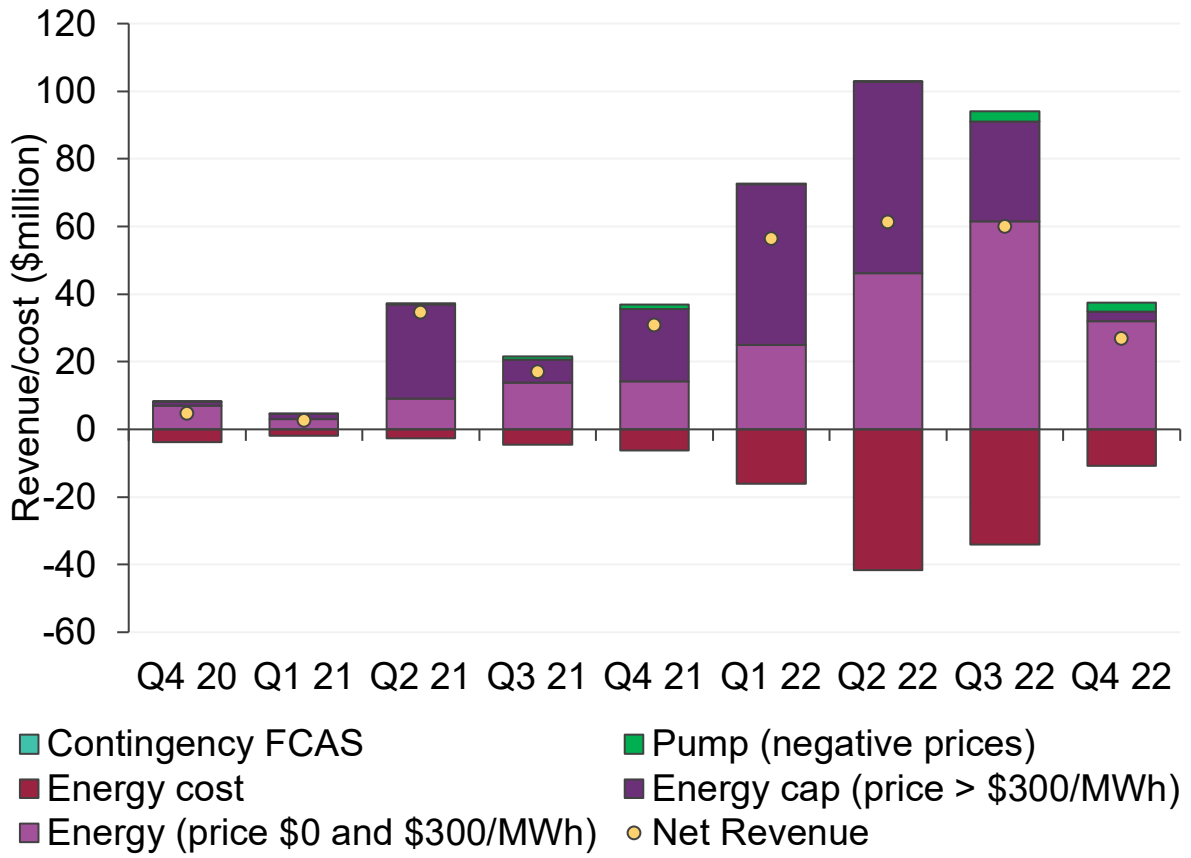


Storage Revenues

NEM battery revenue 3 times higher than Q4 2021

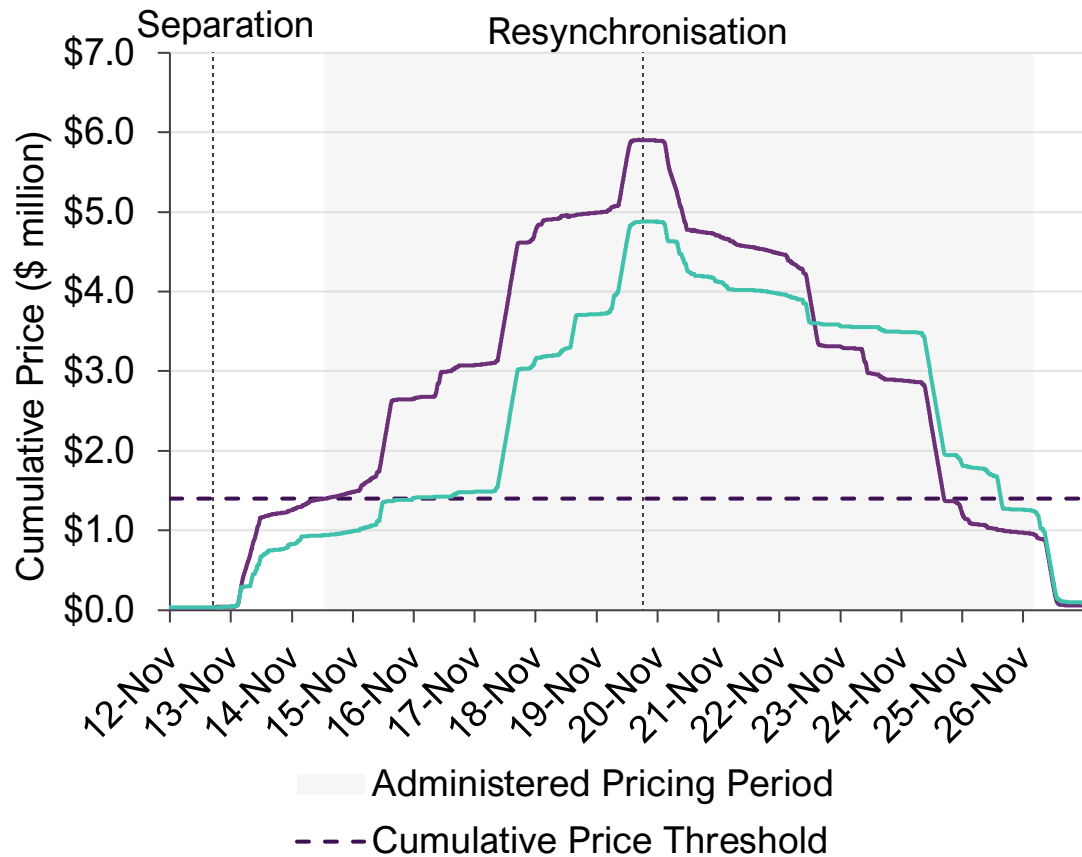


Pumped Hydro revenues down from Q4 2021

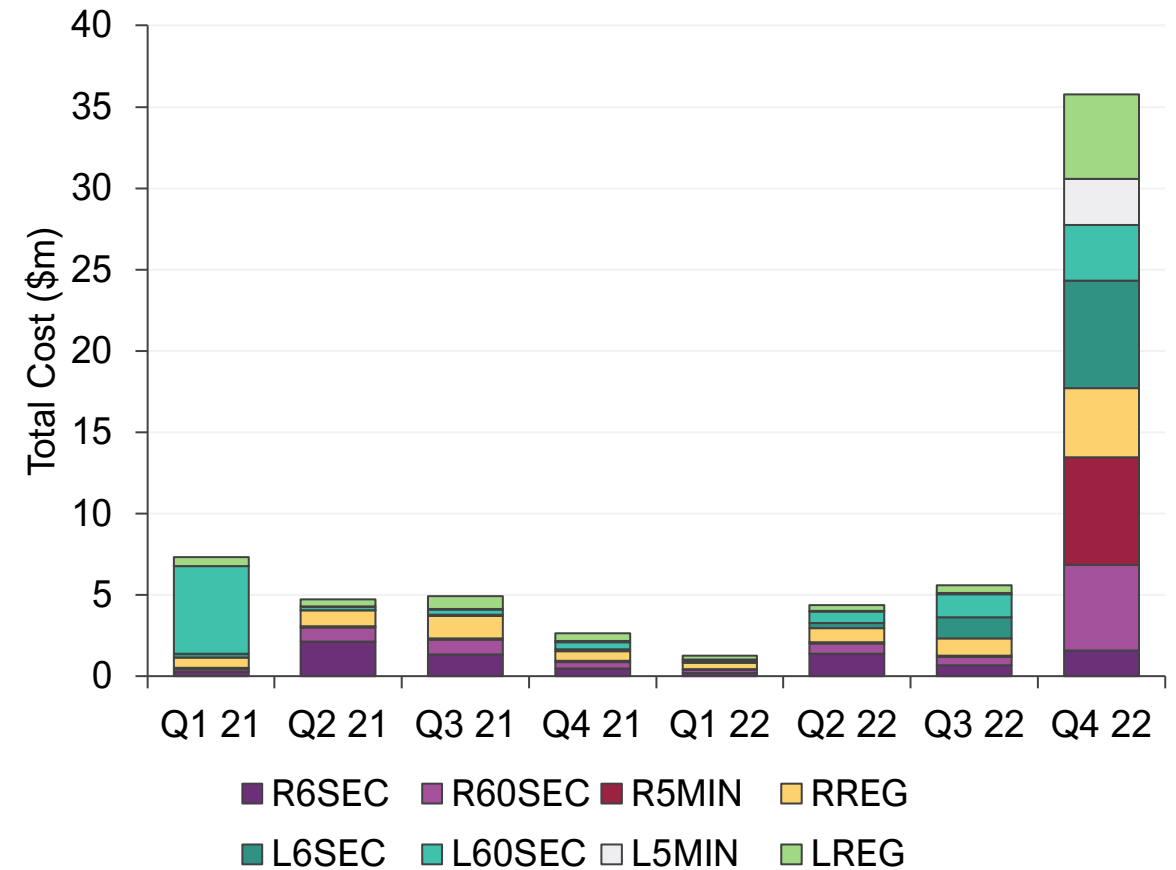


SA Island Event

High cumulative prices in Regulation services triggered administered pricing for FCAS markets in SA



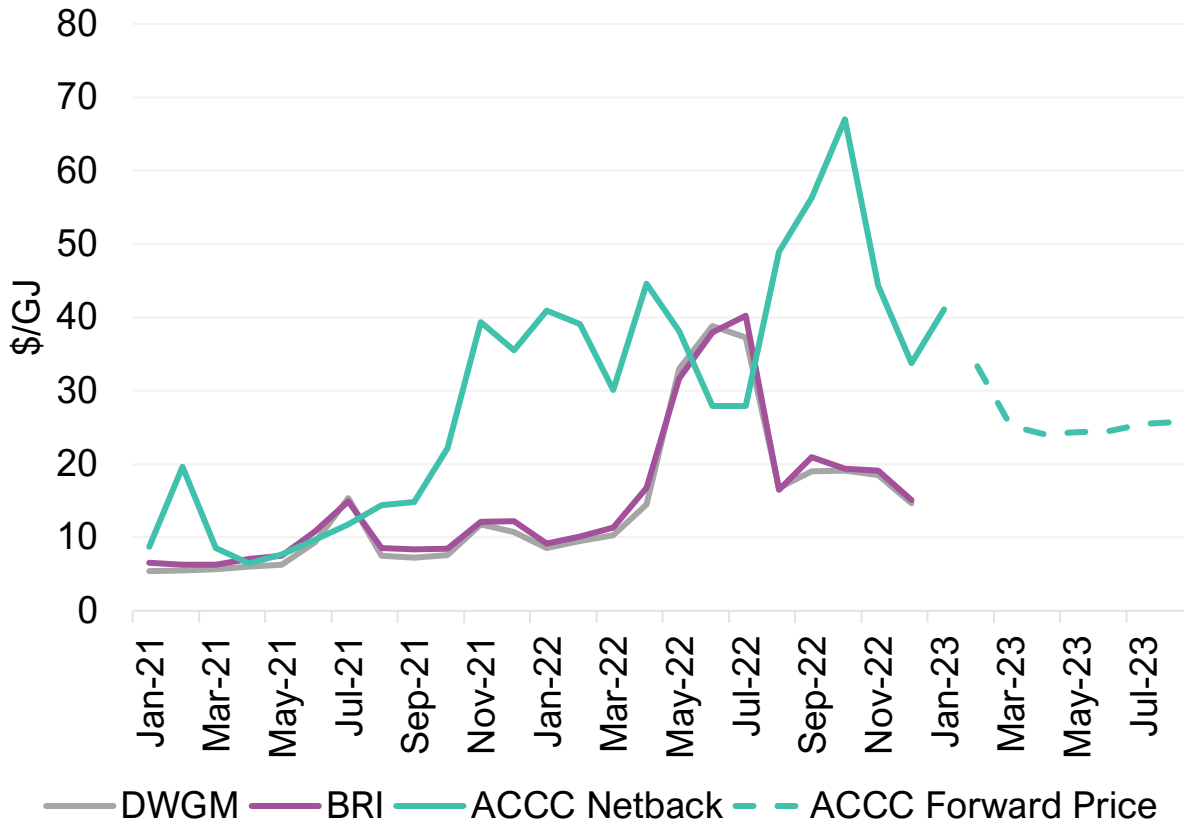
FCAS costs saw significant uptick from recent quarters following separation event.



East coast gas prices

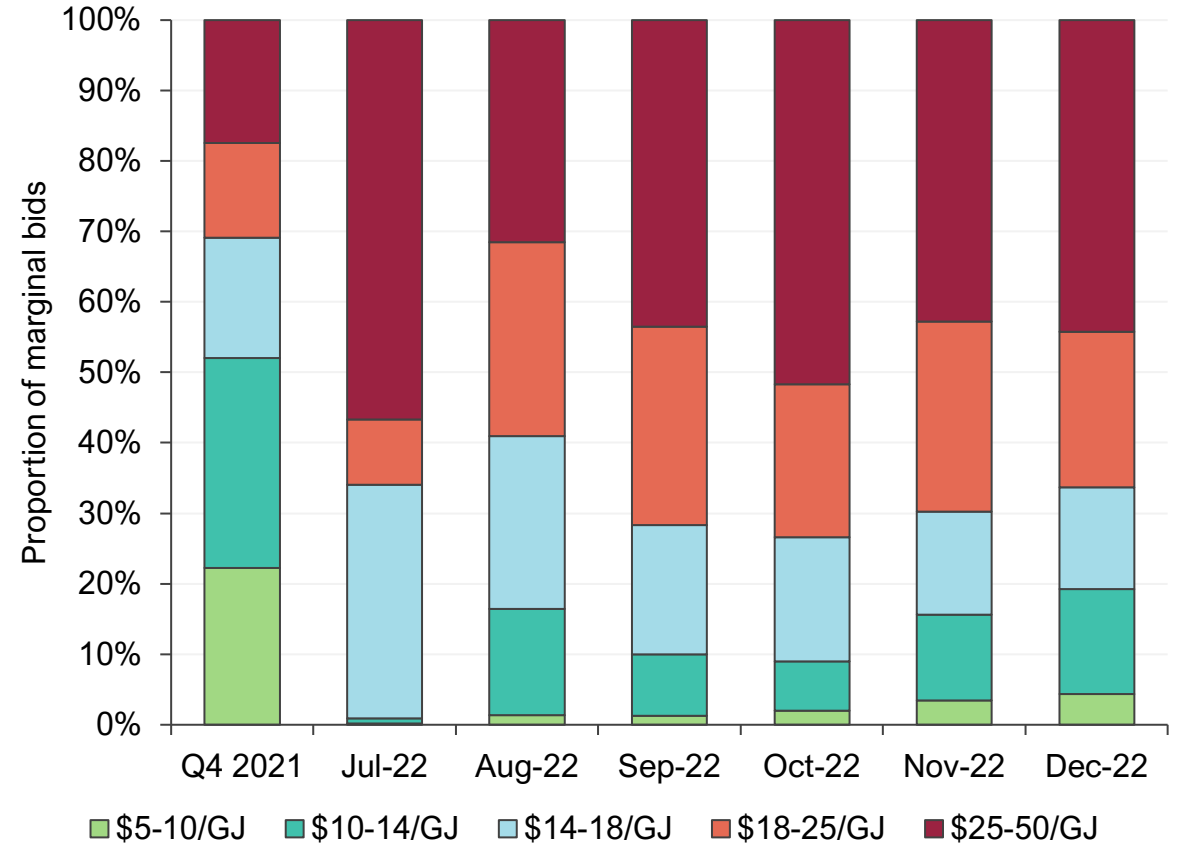
East coast gas prices up 68% from Q4 2021

DWGM and Brisbane average price compared to ACCC LNG Netback price



DWGM bids reflecting lower prices

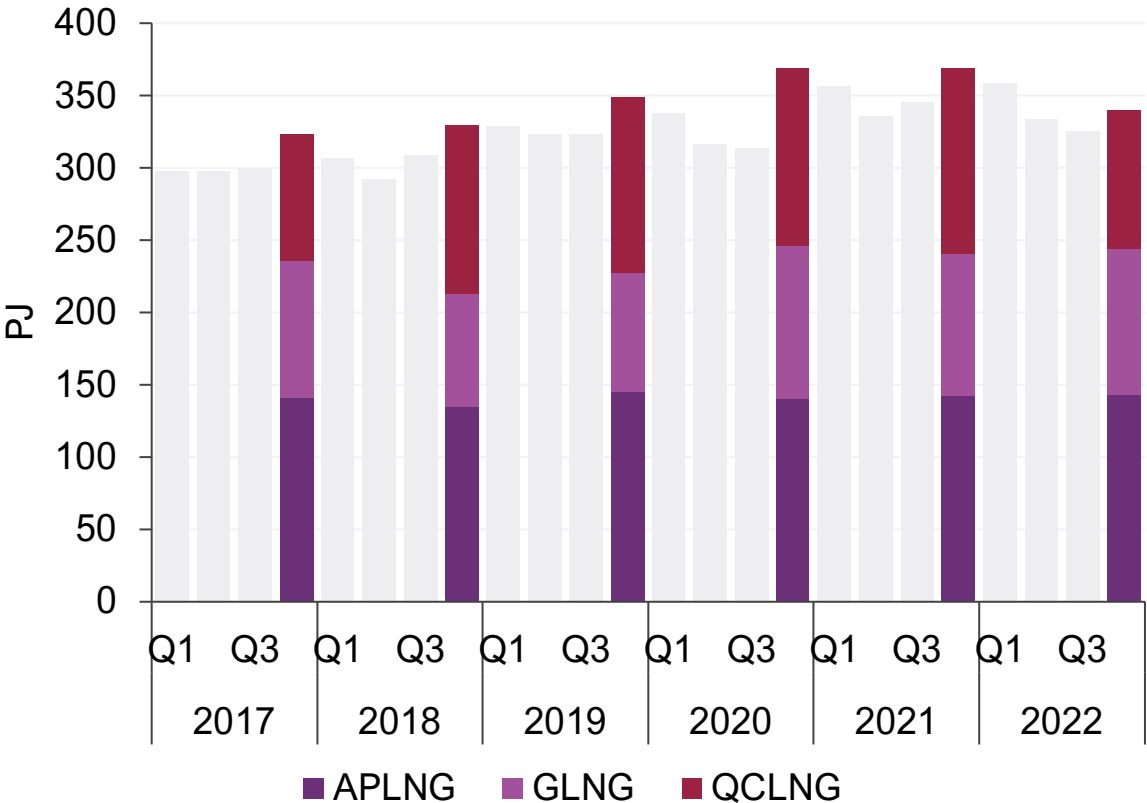
DWGM – proportion of marginal bids by price band



LNG demand lower, leading to increased flows to Moomba

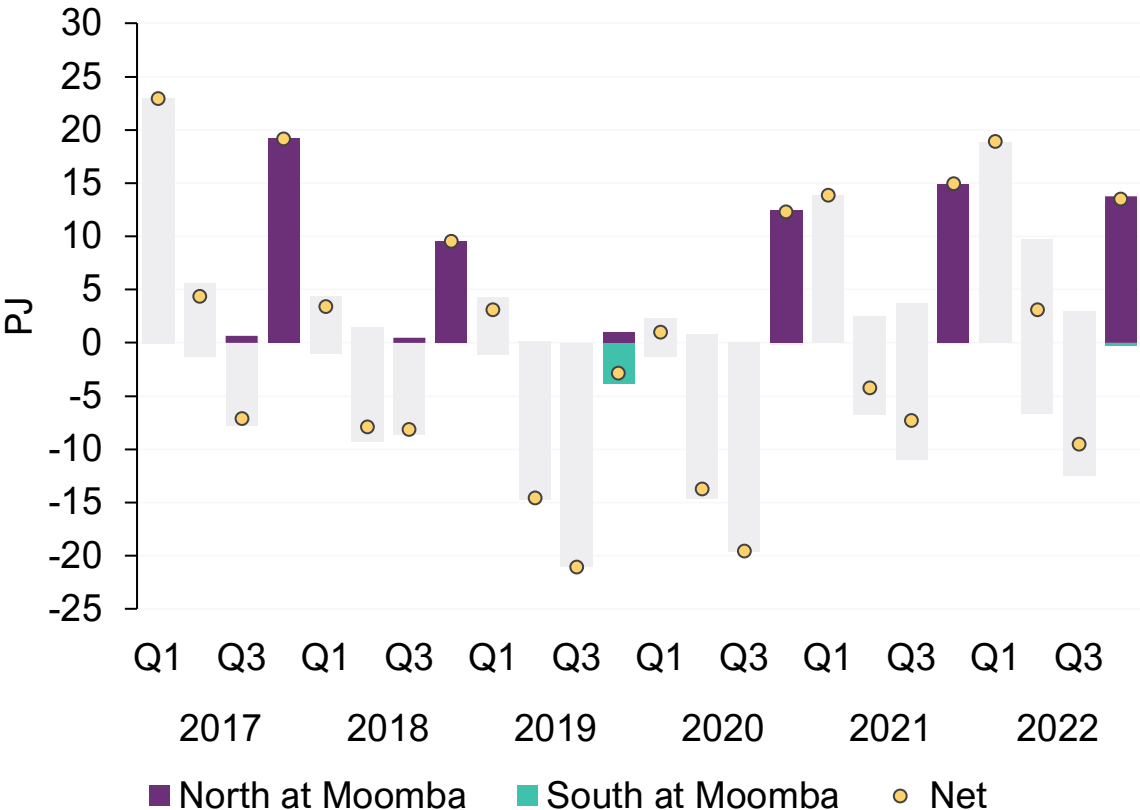
Curtis Island flows for LNG lowest for Q4 since 2018

Total quarterly pipeline flows to Curtis Island



Net Q4 flows north on SWQP decrease

Flows on the South West Queensland Pipeline at Moomba



Increase in Queensland domestic supply

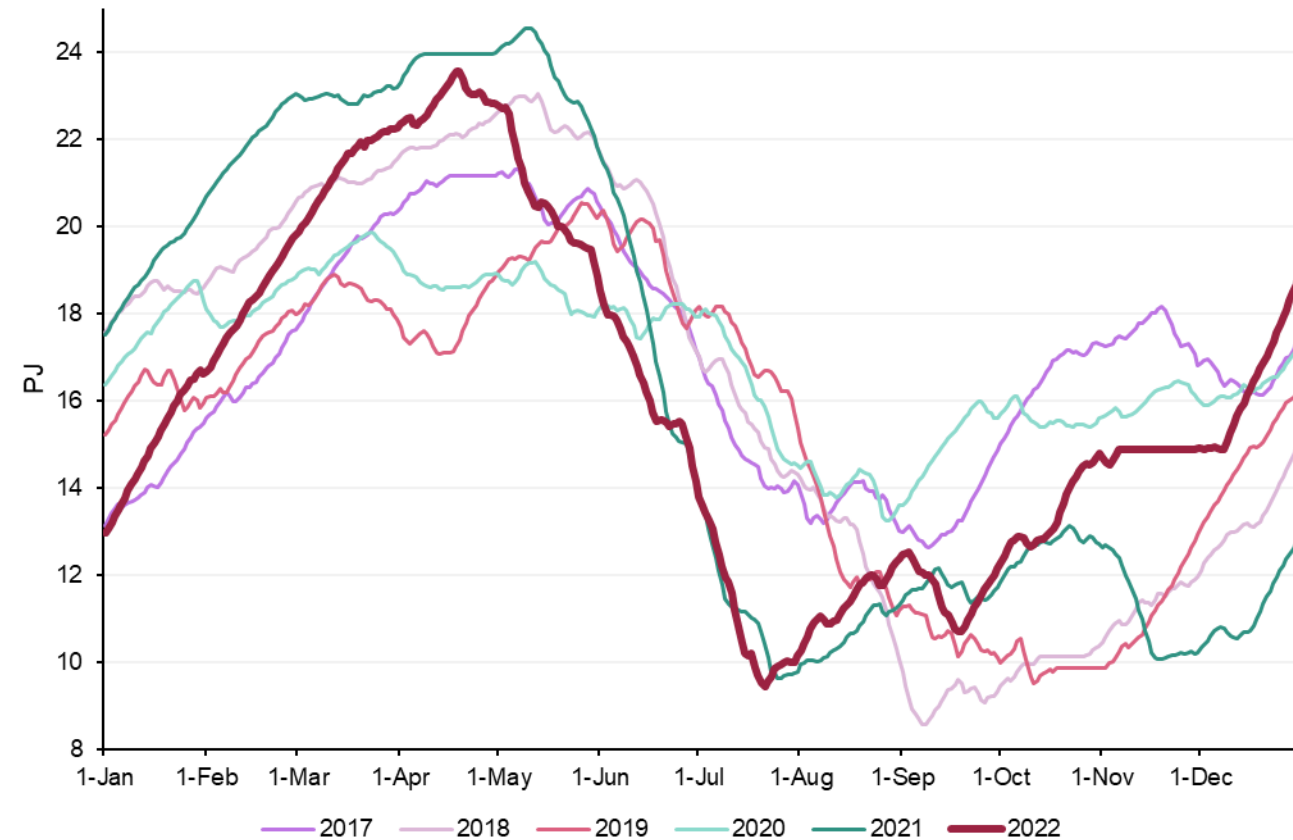
Queensland domestic supply increases to highest Q4 level since 2019

Queensland domestic supply compared to Victorian gas exports by quarter



Iona storage levels ended 2022 at highest level since storage levels began reporting

Iona storage levels





For more information visit

aemo.com.au