



Melbourne  
Energy  
Institute



## MEIxAEMO Seminar Series

# Quarterly Energy Dynamics report: Q3 2023

Presenter: **Kevin Ly**, Group Manager-Reform  
Development & Insights, **AEMO**

Moderator: **Prof Michael Brear**  
Director, **Melbourne Energy Institute**

@MEIunimelb #MEInetwork23  
#MEIxAEMOSeminar



We acknowledge the Traditional Owners of country throughout Australia and recognise their continuing connection to land, waters and culture.

**We pay respect to Elders past and present.**

# Agenda



## Introduction

- East coast electricity and gas highlights

## Wholesale electricity prices

- Demand changes
- Quarterly price trends
- Regional prices
- Price setting dynamics and drivers
- Negative prices

## Electricity demand & generation

- Generation supply mix changes
- Black coal-fired generation
- Gas-fired generation
- Variable Renewable Energy (VRE) changes

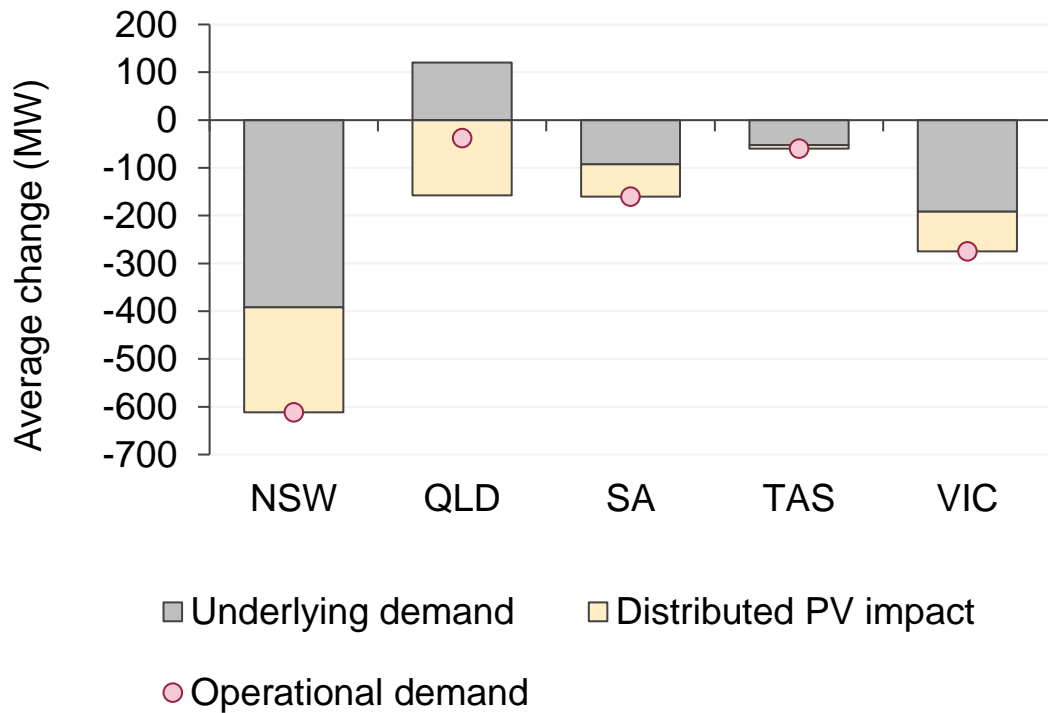
## East coast gas markets

- East coast gas prices
- Gas demand
- LNG changes
- Gas storage

# Demand Changes

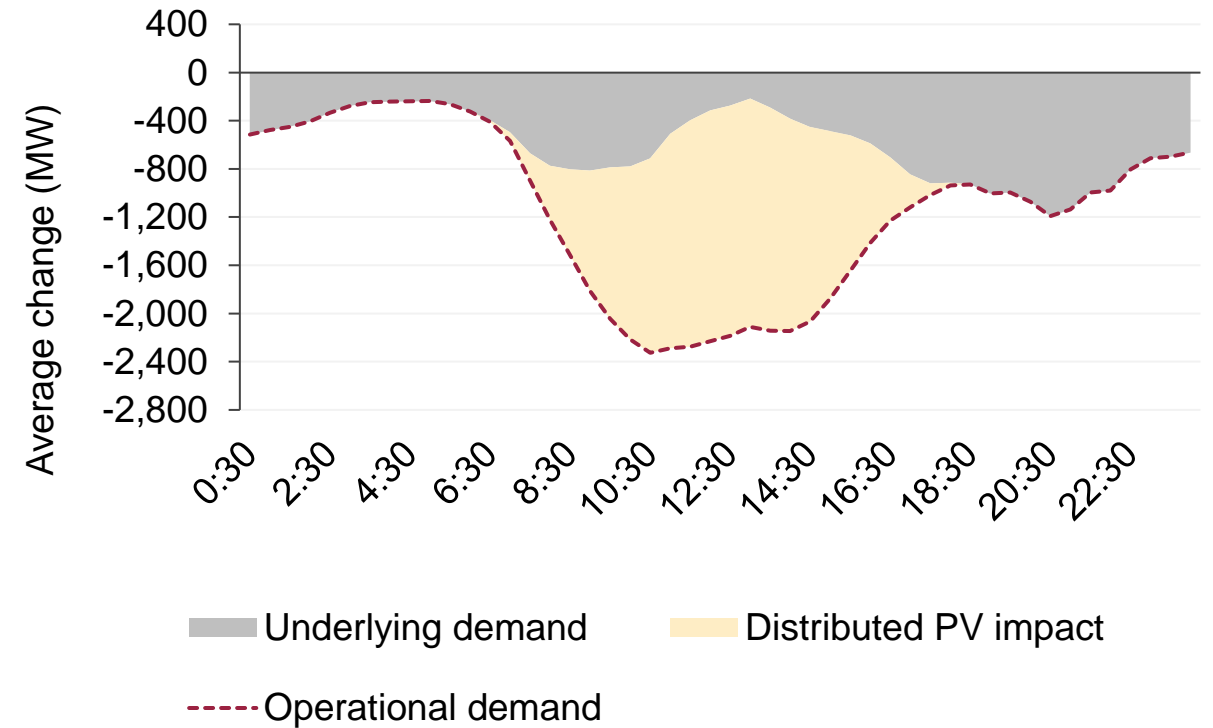
Operational demand down in all regions, Queensland recorded a small underlying demand increase

Changes in average demand components by region – Q3 2023 vs Q3 2022



Underlying and operational demands down in all hours

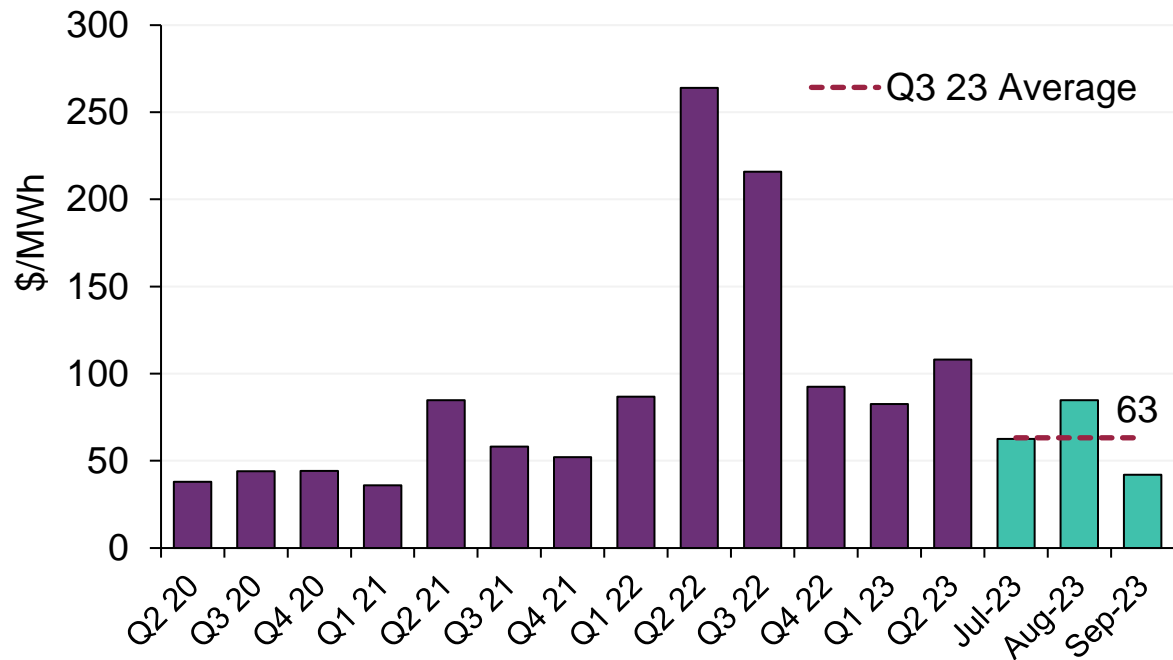
Changes in operational demand components – Q3 2023 vs Q3 2022



# Wholesale Electricity Prices

Average NEM spot prices down 71% on Q3 2022, but slightly up on two prior Q3s

NEM average wholesale electricity prices – quarterly since Q2 2020



All regions saw price declines on Q3 2022 – with minimal cap returns outside South Australia

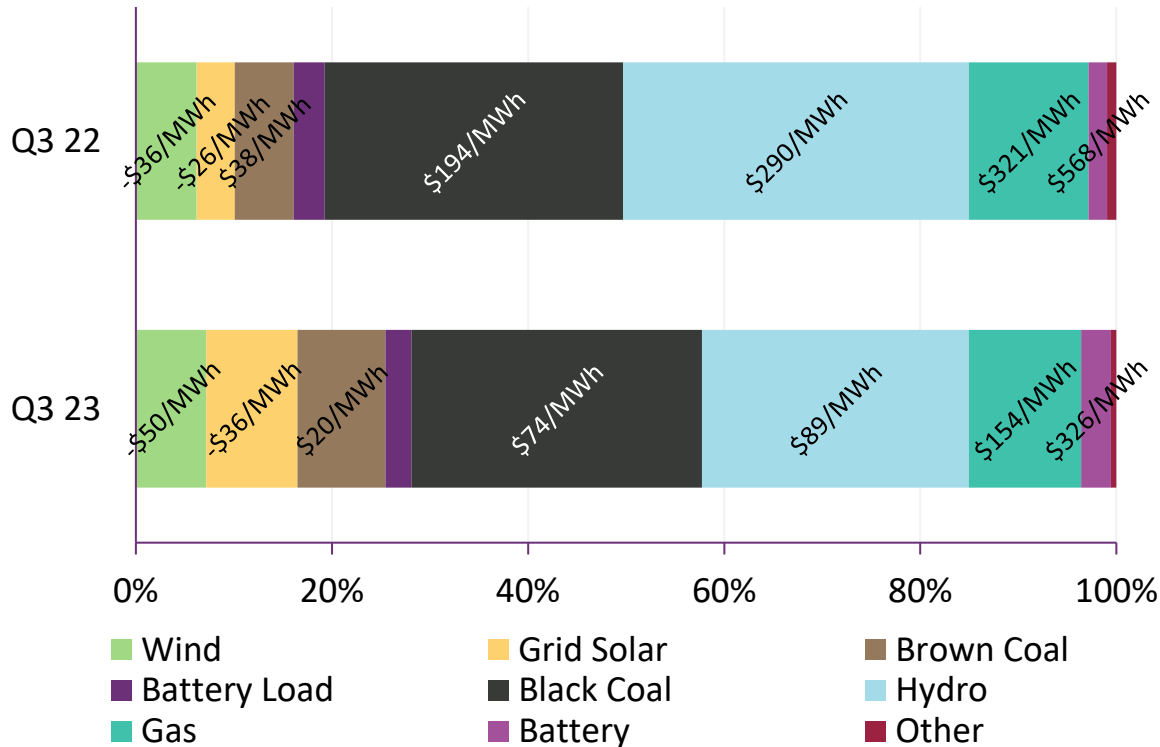
Average wholesale electricity spot price by region – energy and cap return components for selected quarters



# Price setting dynamics

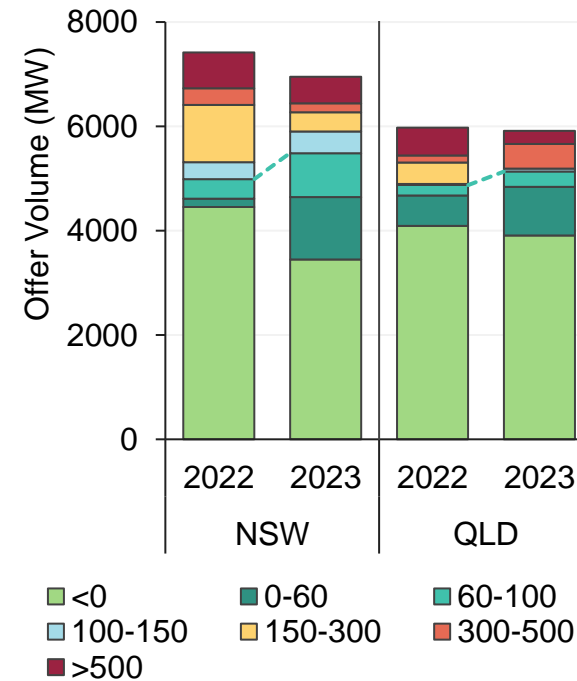
Average NEM spot prices down 71% on Q3 2022, but slightly up on two prior Q3s

NEM average wholesale electricity prices – quarterly since Q2 2020



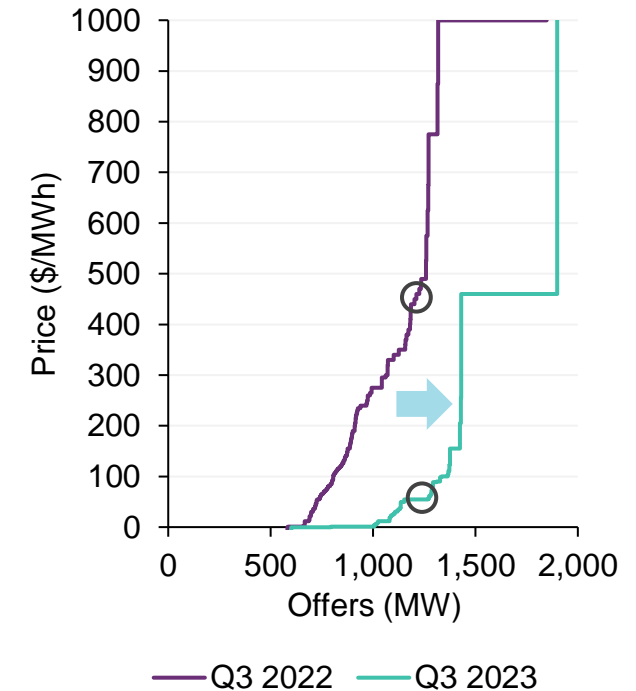
More black coal volume offered at lower prices

Black coal offer volumes by price range – Q3 2022 - 2023



Hydro offer prices in Tasmania significantly reduced

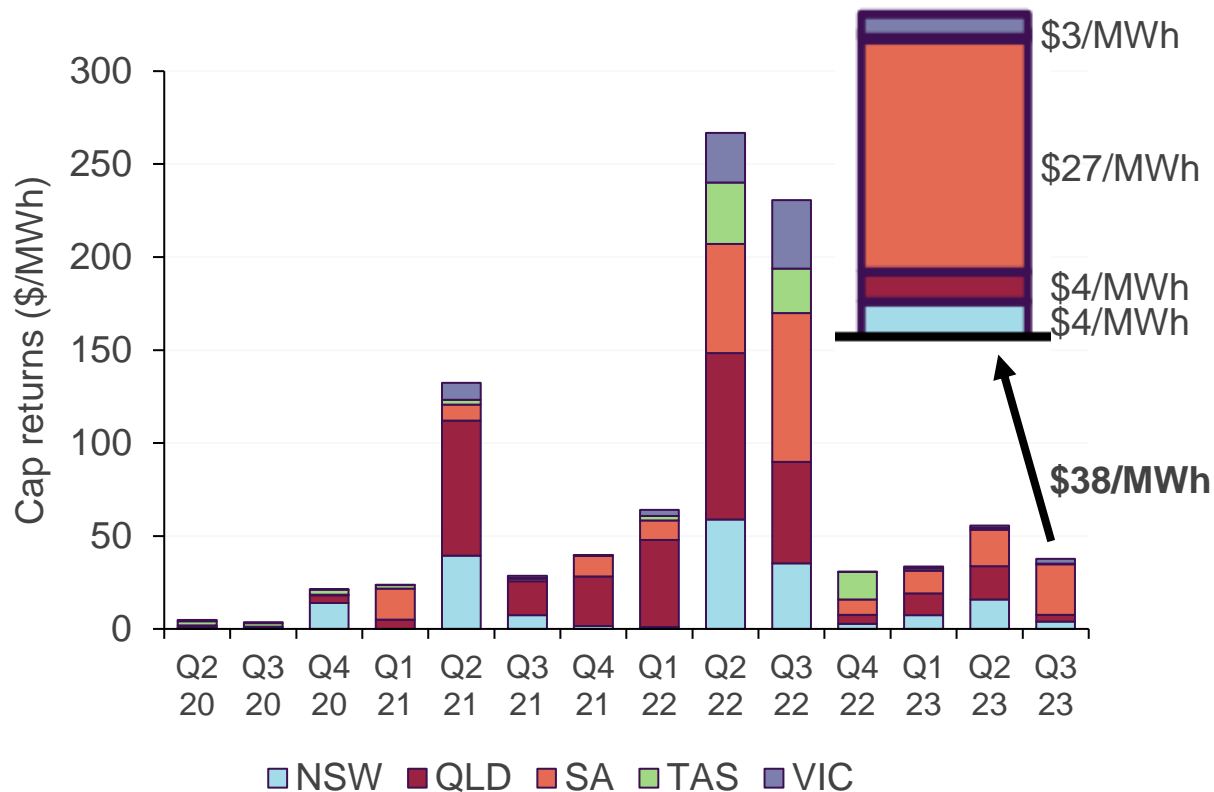
Hydro bid supply curve (Tasmania) – Q3 2022 – 2023



# Price Volatility

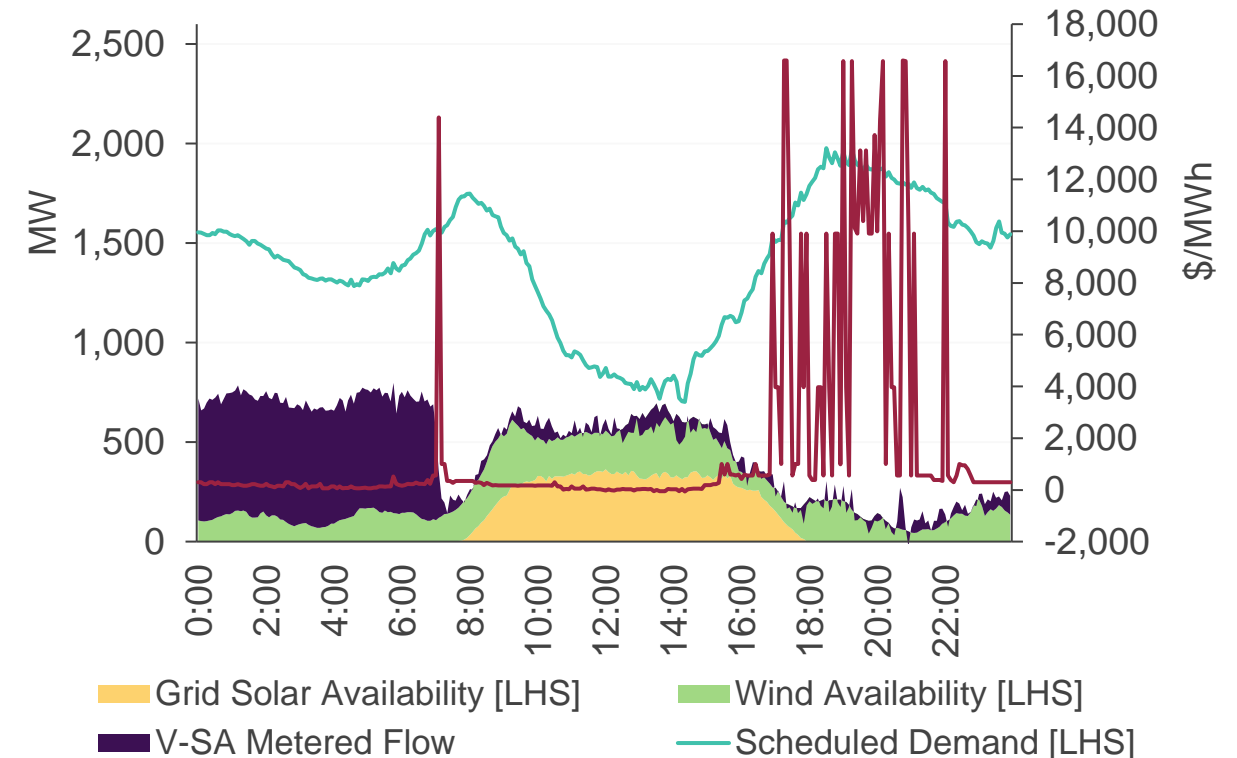
Sharp drop in cap returns in all regions from Q3 2022, South Australia up on Q2 2023

Cap returns by region - quarterly



High South Australian prices due to Heywood interconnector limits and low wind

South Australia scheduled demand, Heywood flows, available wind and solar, and spot price during 11 August 2023

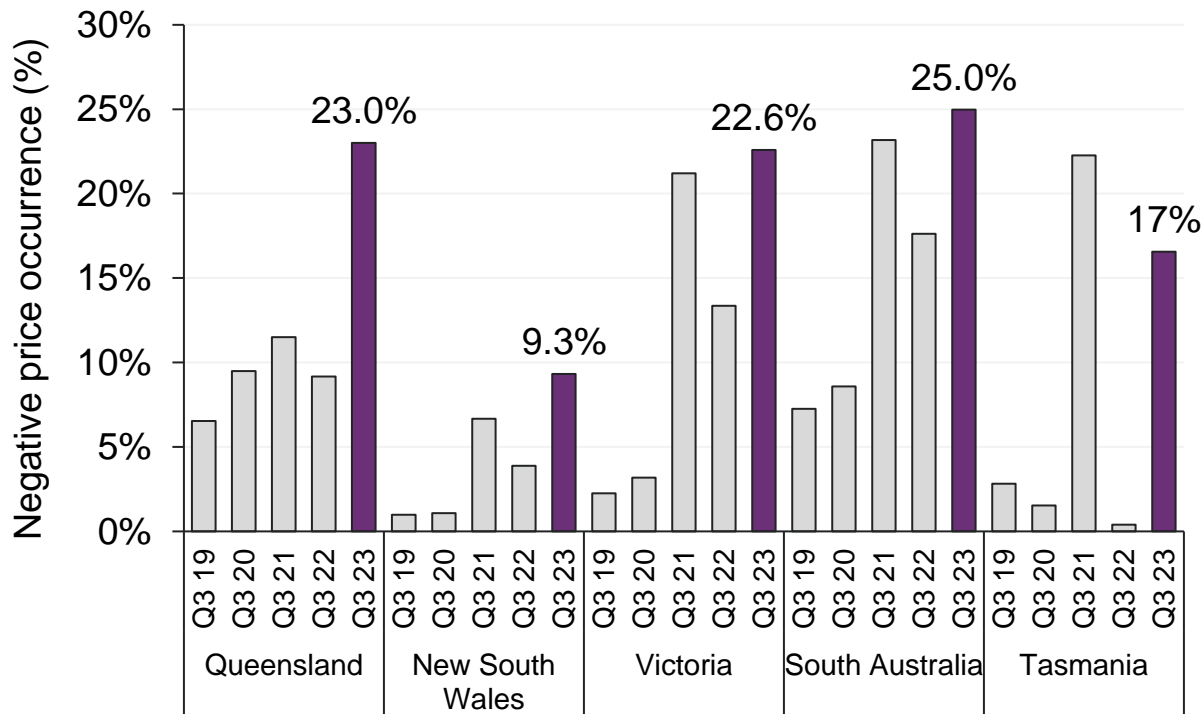




# Negative Prices

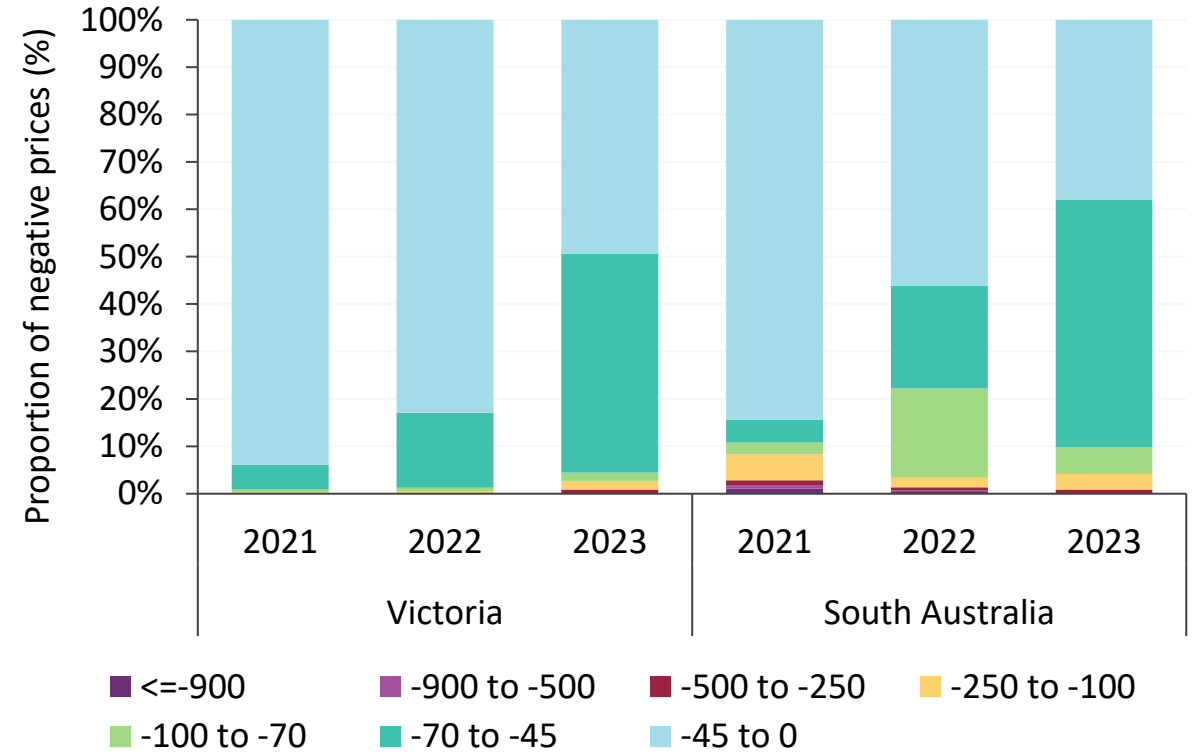
High Q3 negative price occurrence in all NEM regions

Negative price occurrence in NEM regions – Q3s



Q3 negatives spot prices

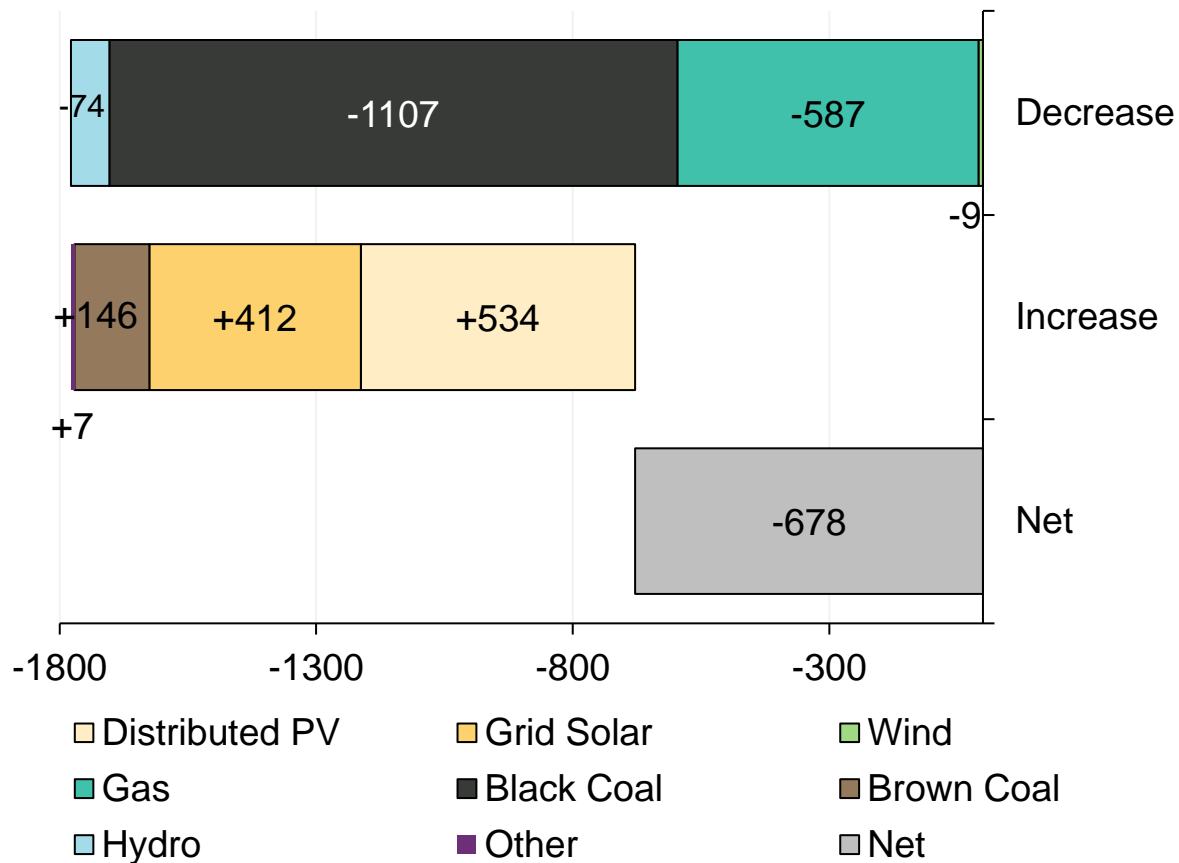
Proportion of negative price intervals by price range for Victoria and South Australia – Q3s 2021-2023



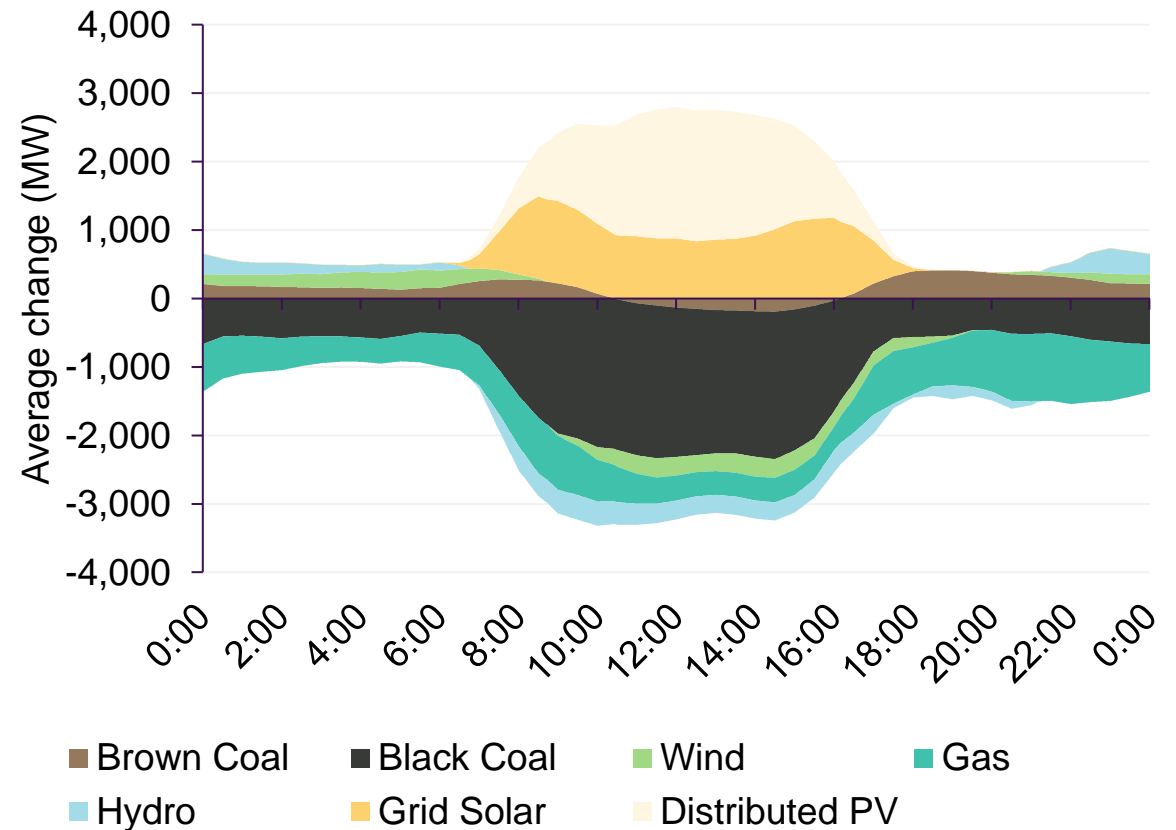


# Generation changes

Increased renewable output displaces coal and gas-fired generation  
Change in NEM supply by fuel source – Q3 2023 versus Q3 2022



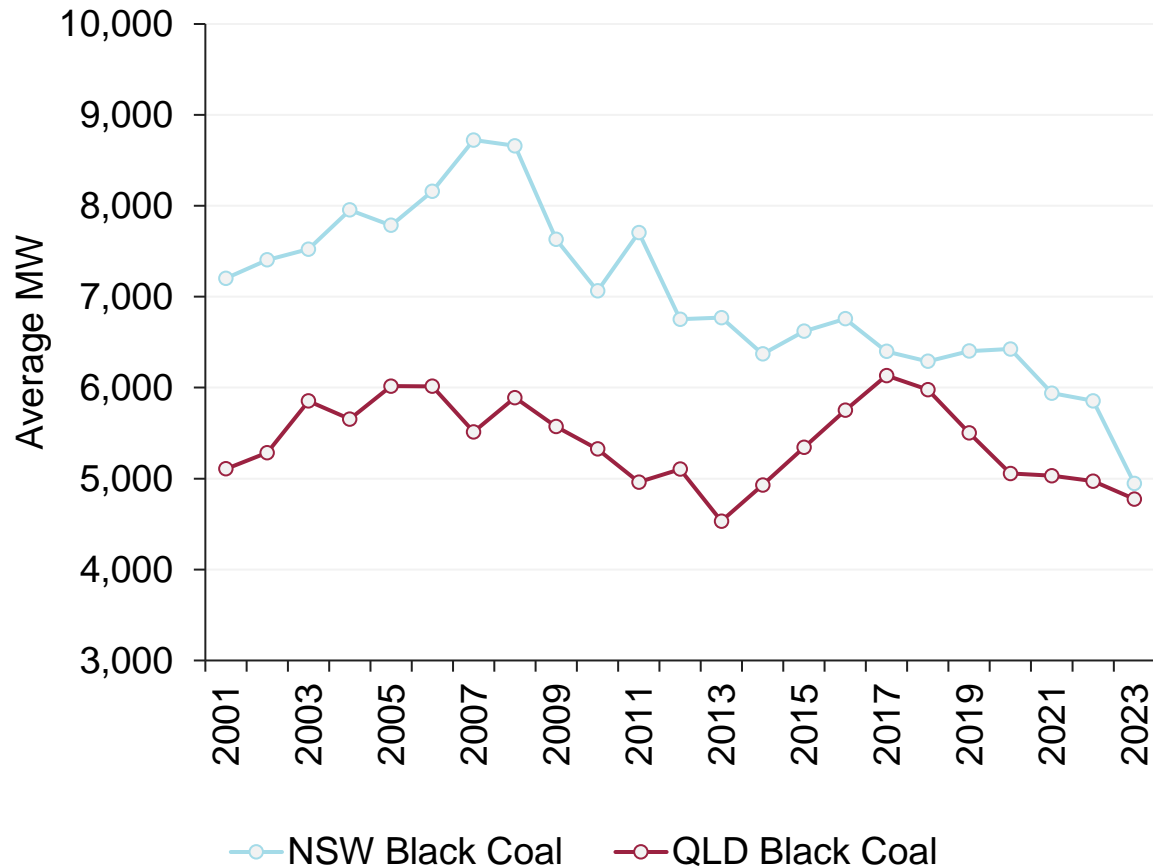
Large daytime drops in gas and black coal generation as VRE output increased  
NEM generation changes by time of day – Q3 2023 vs Q3 2022



# Black coal output

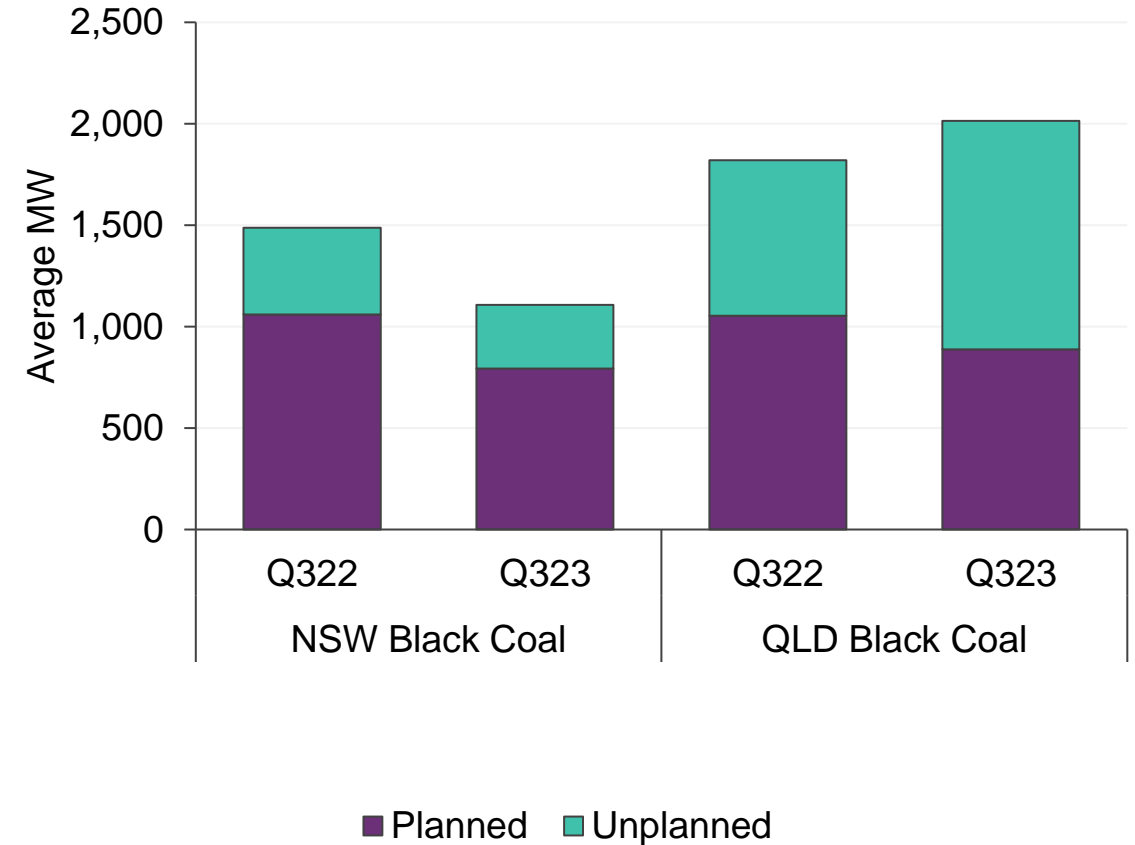
Lowest Q3 black coal-fired generation output on record

Quarterly average black coal-fired generation – Q3s



Coal-fired capacity on outage declined in New South Wales

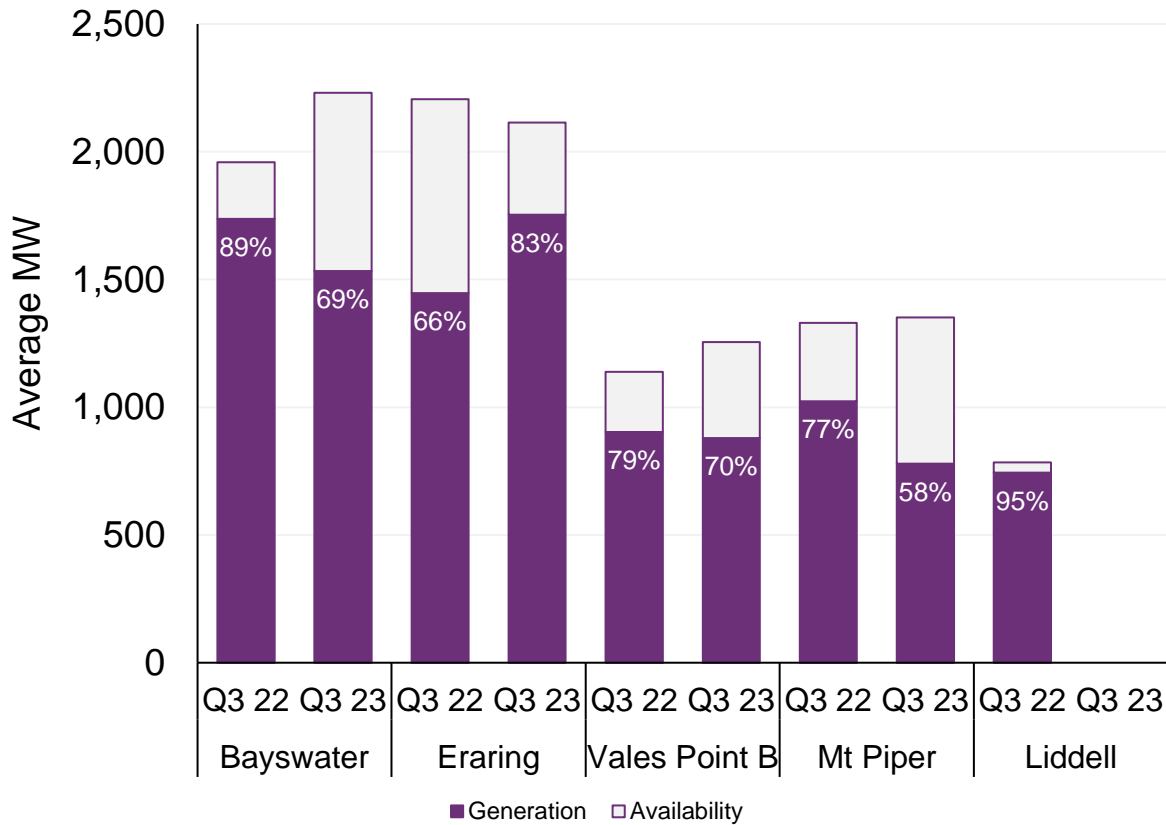
Average coal-fired capacity on outages – Q3 22 vs Q3 23



# Black coal-fired generation

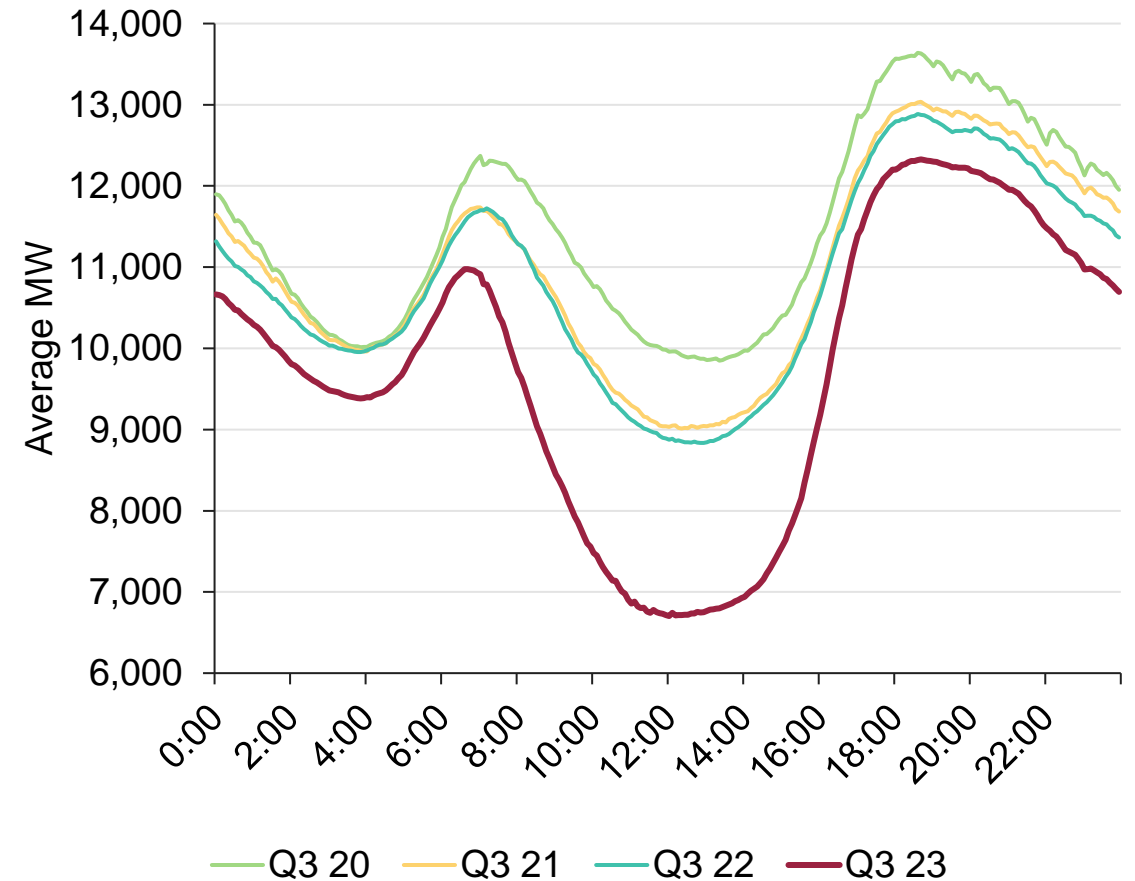
Bayswater, Vales Point B and Mt Piper increased availability, offsetting Liddell closure

Average quarterly availability and generation – Q3 2023 vs Q3 2022



Daytime black coal-fired generation continued to decline

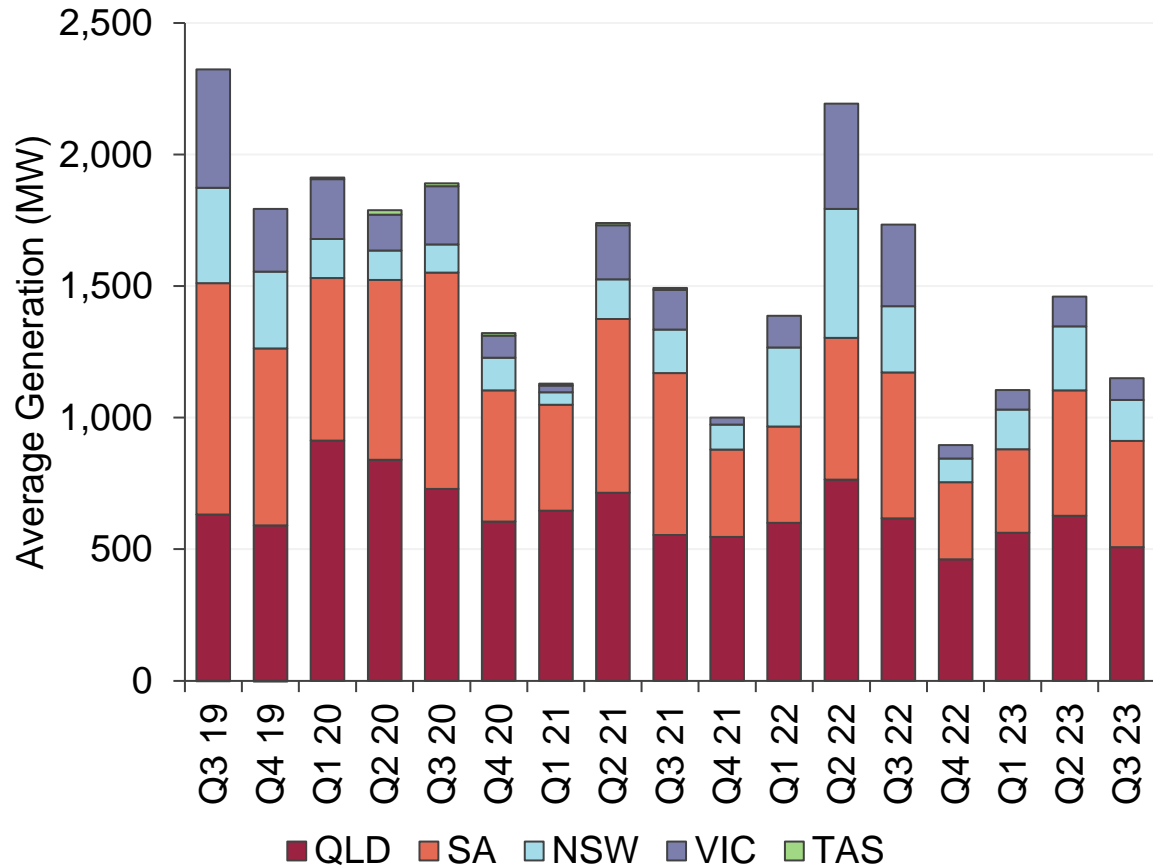
NEM black coal-fired output by time of day – Q3s from 2020 to 2023



# Gas fired generation

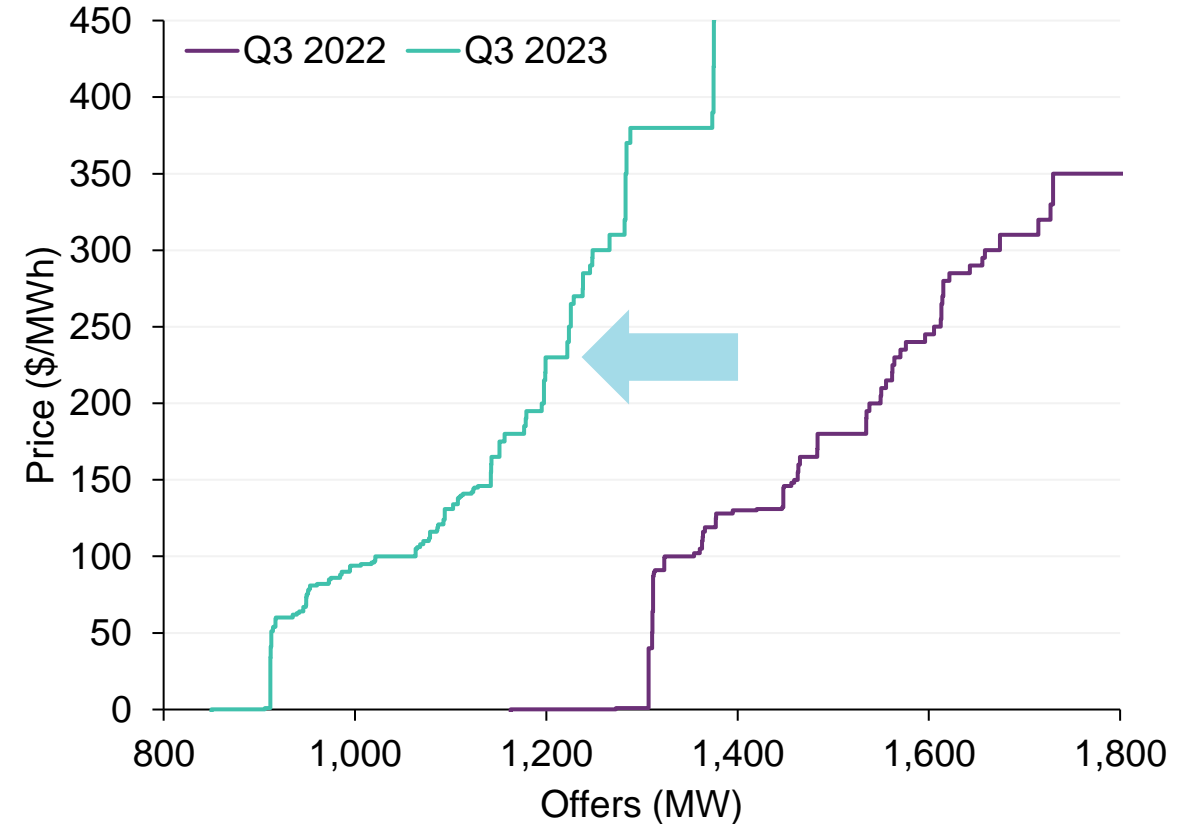
Gas-fired generation fell to lowest Q3 level since 2004

Average gas-fired generation by region – Q3s



Gas generation offer volumes decreased

Gas-fired generation bid supply curve – Q3 22 and Q3 23



# Wind and Solar output

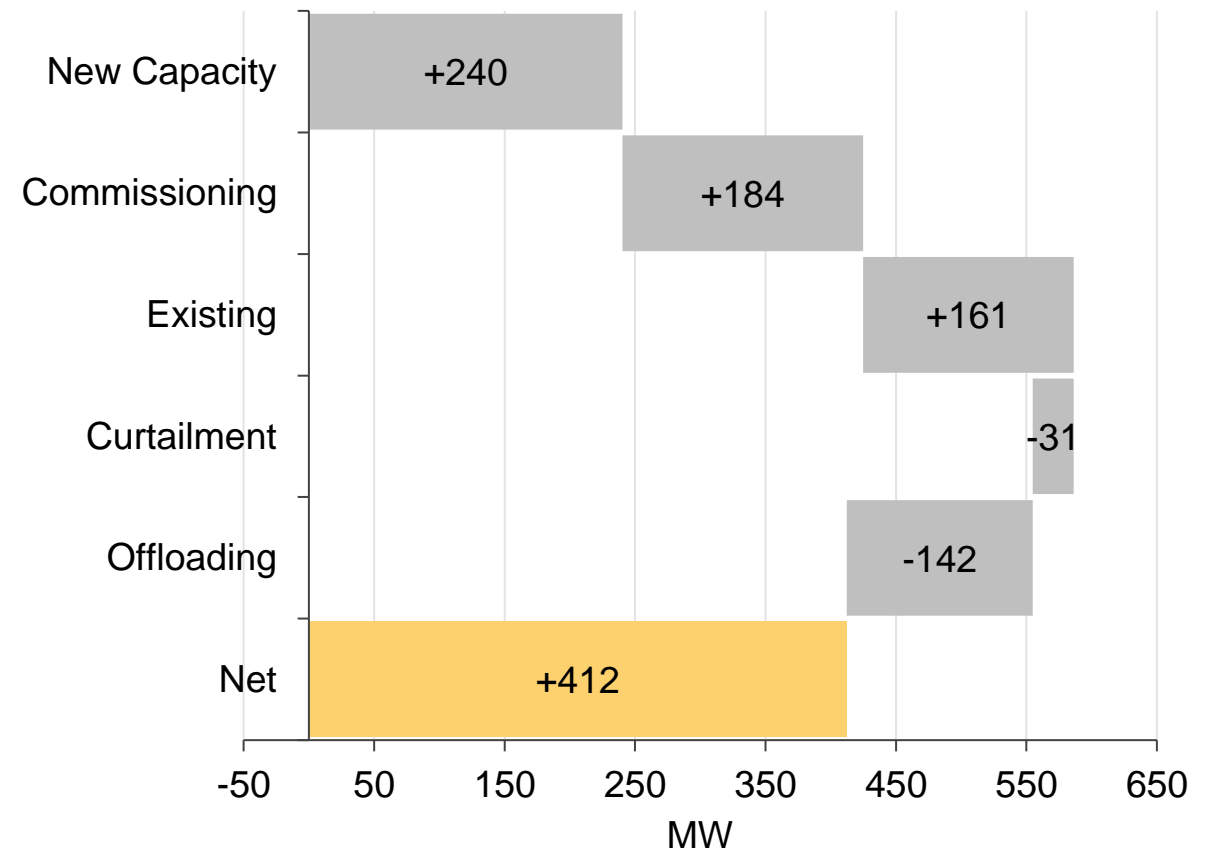
NSW and QLD grid scale solar drove VRE output growth

Average MW change in output Q3 2022 to Q3 2023



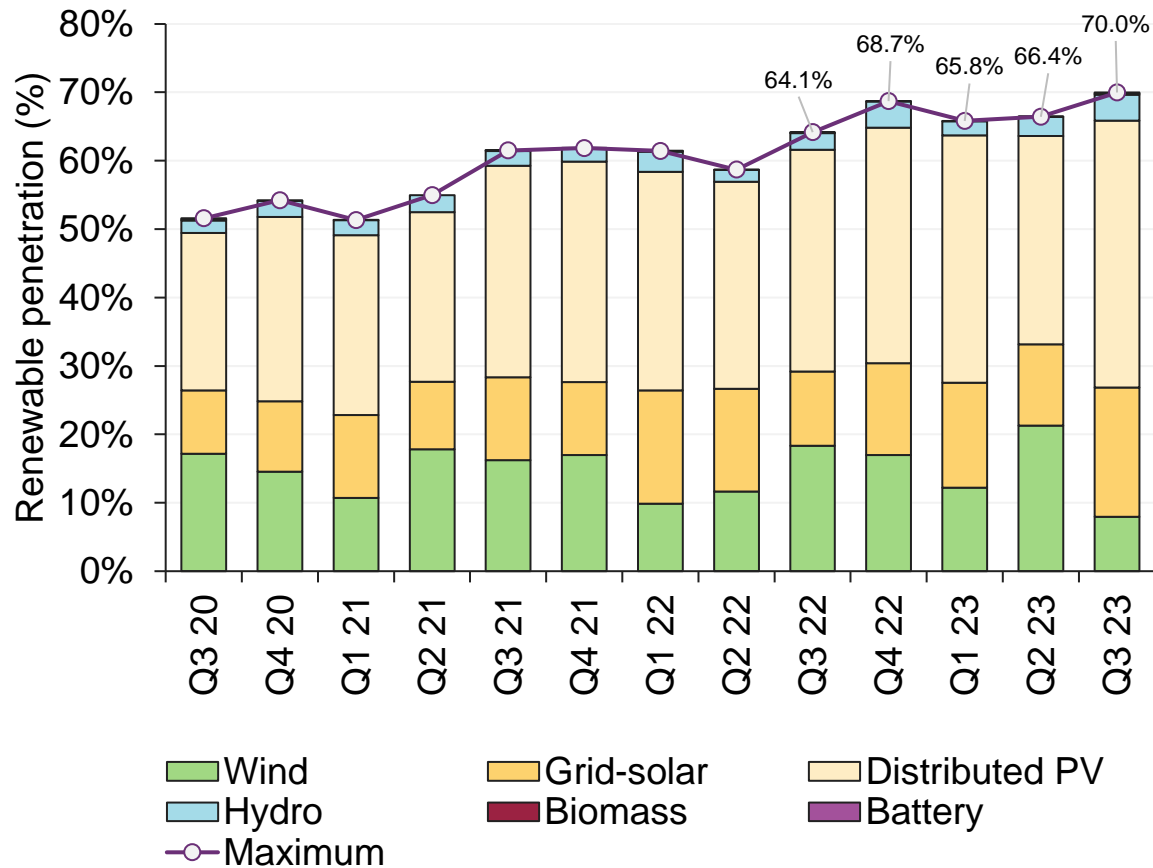
New solar farms largest contributors to grid scale solar growth

Increase in grid-scale solar generation – Q3 2022 vs Q3 2023

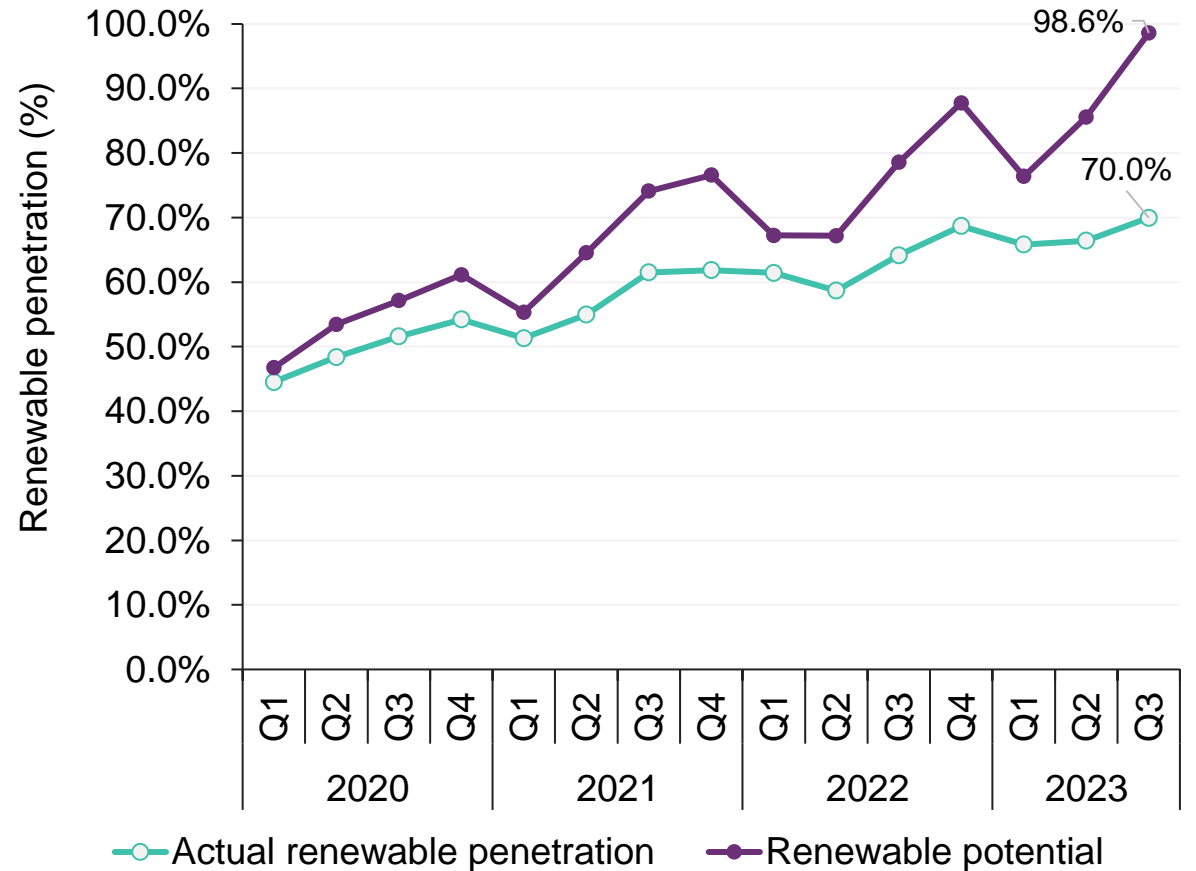


# Wind and Solar output

Instantaneous renewable penetration rose to an all-time high  
Peak instantaneous renewable energy output



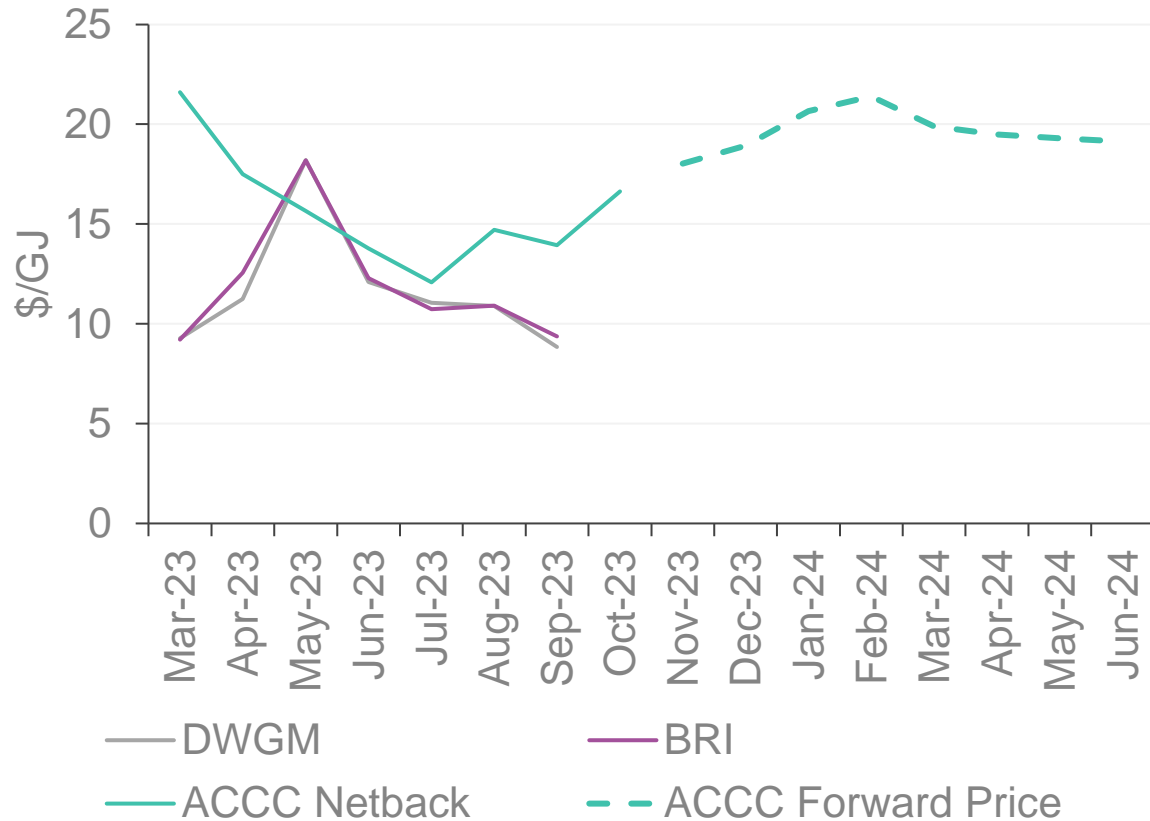
Record high actual and potential renewable penetration  
Quarterly maximum instantaneous renewable potential



# East coast gas prices and demand

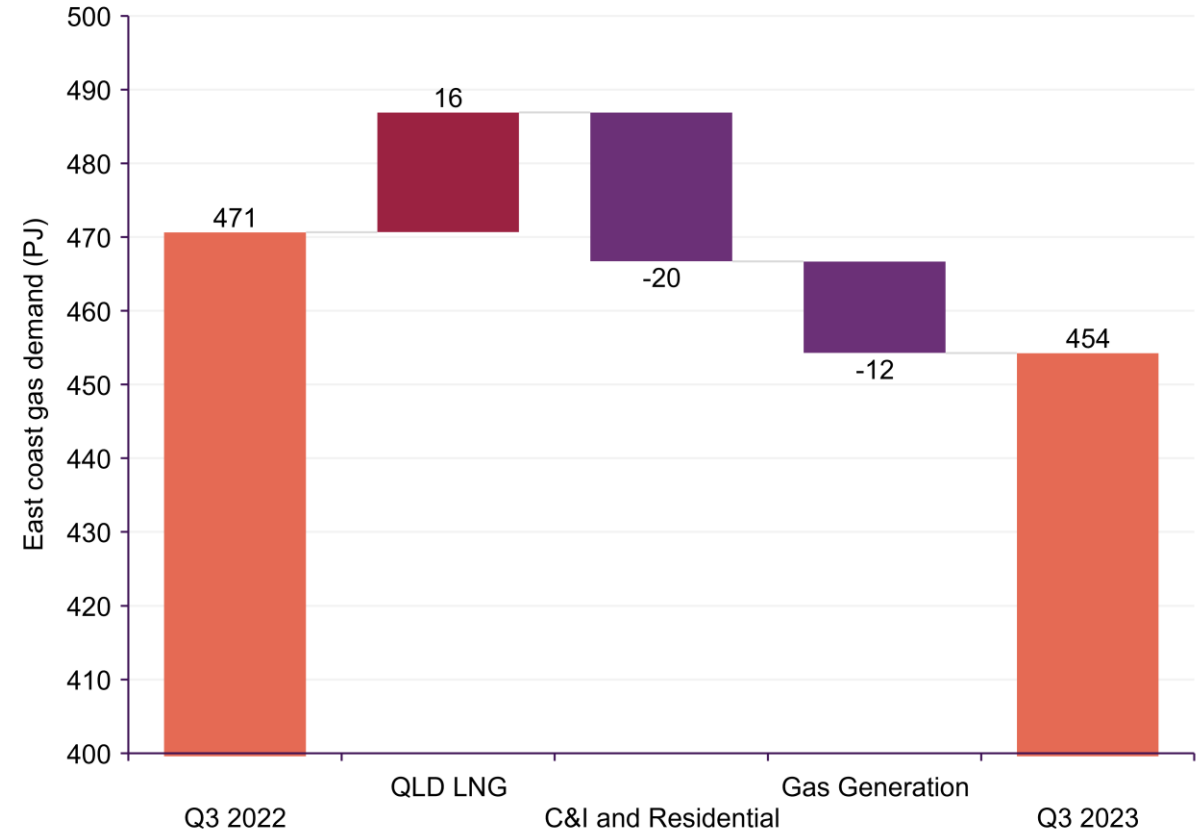
## Increase in divergence between domestic gas price and ACCC netback price

DWGM and Brisbane average price compared to ACCC LNG Netback price



## Warm weather and lower gas-fired generation reduce domestic gas consumption

Components of east coast gas demand change – Q3 2022 to Q3 2023

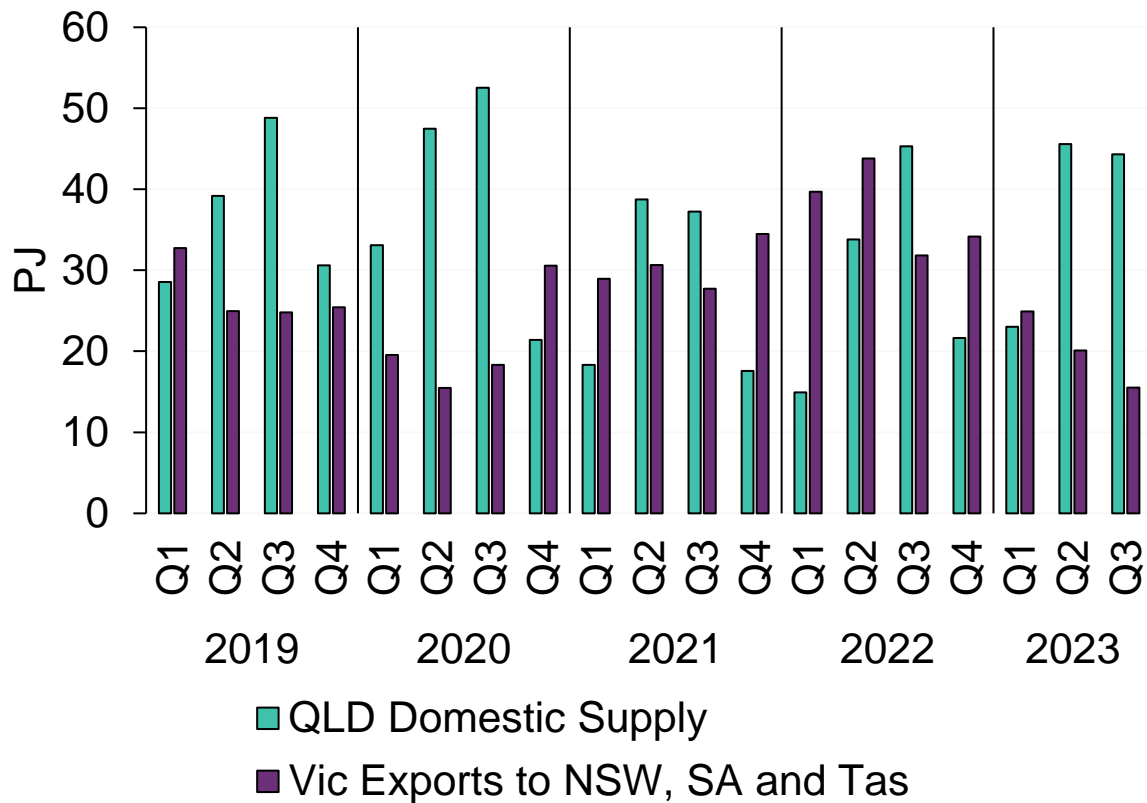




# Queensland domestic supply continues to replace Victorian exports

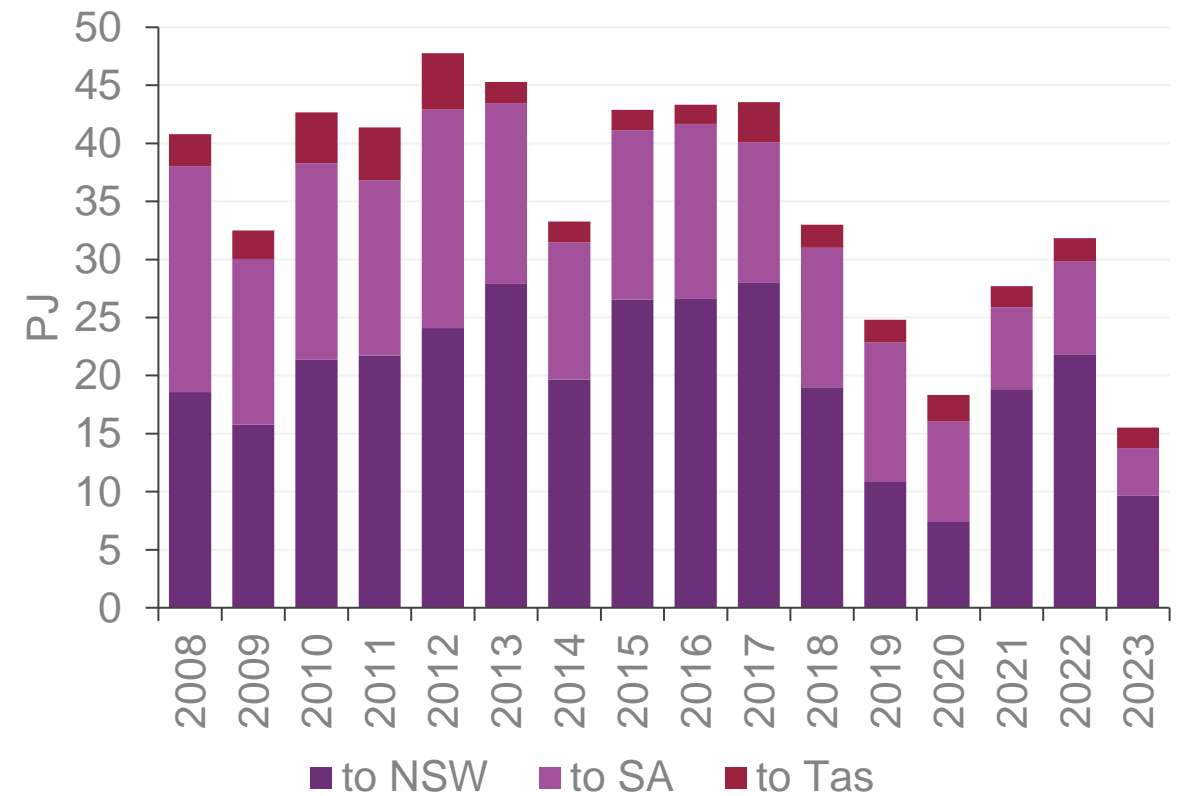
## Victorian gas exports continue to fall

Queensland domestic supply compared to Victorian gas exports by quarter



## Lowest Victorian Q3 gas exports since data reporting began

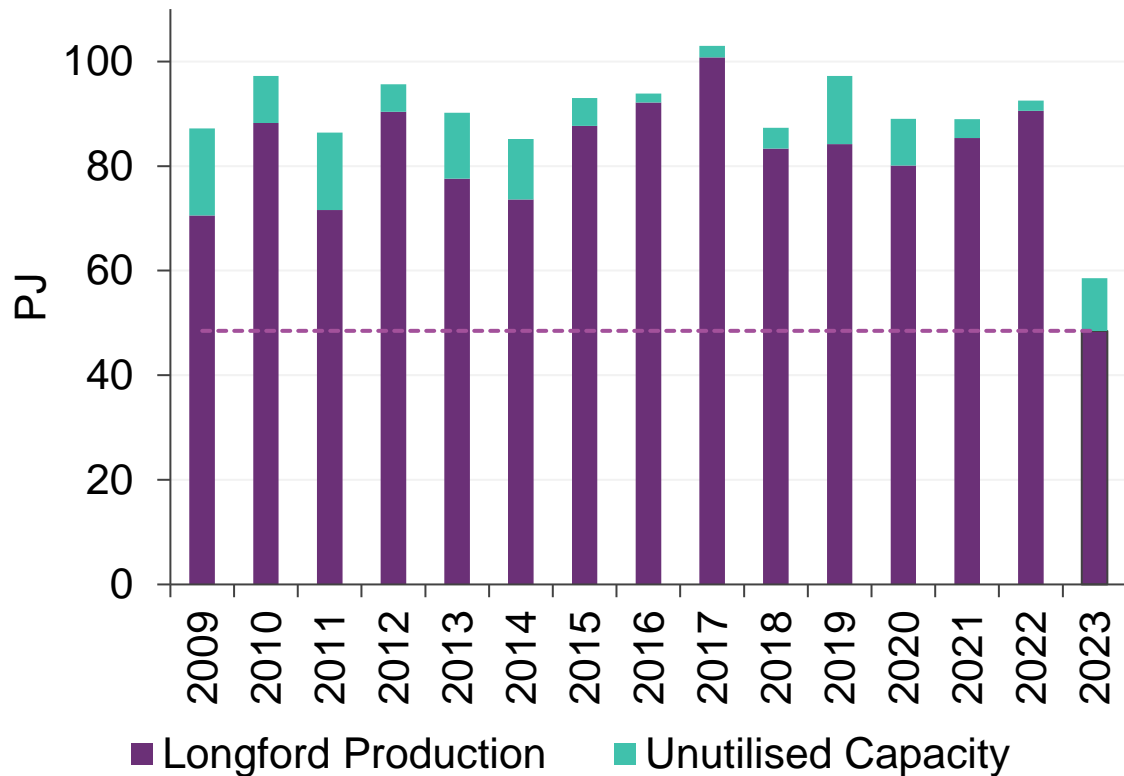
Victorian net gas transfers to other regions – Q3s



# Longford aggregate and daily production in decline

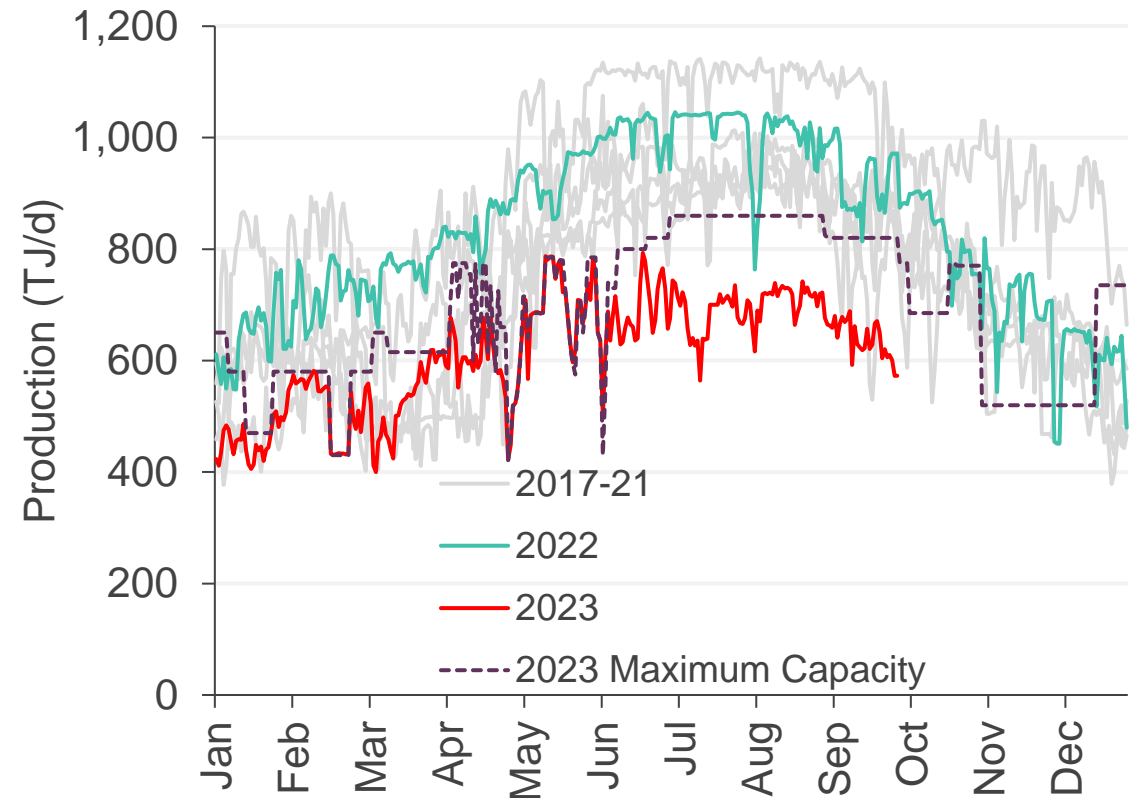
Lowest Longford Q3 production and capacity since data reporting began

*Longford Q3 production versus unutilised capacity*



Daily Longford production declining but still well below maximum capacity

*Daily Longford production 2017-2023, maximum capacity profile 2023*





For more information visit

[aemo.com.au](http://aemo.com.au)