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Melbourne  
Energy  
Institute



# Quarterly Energy Dynamics report Q3 2021

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Australian Energy Market Operator

@MEIunimelb #MEIxAEMOSeminar



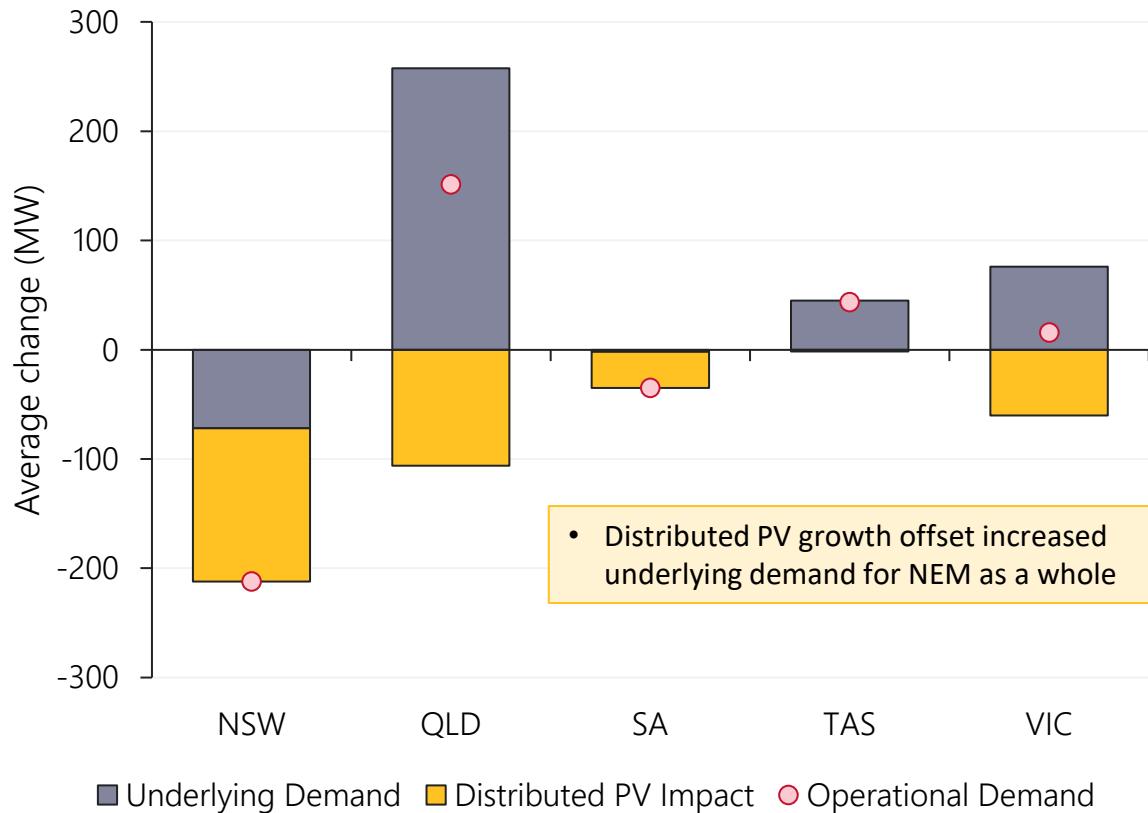
# Key highlights of Q3

1. May/June volatility continued into July but then energy prices returned to lower levels.
2. In contrast, international energy prices surged throughout the quarter.
3. Strong growth in renewables with new records in the NEM and WEM.
4. Records for min demand and occurrence of negative prices.

# NEM demand outcomes were mixed

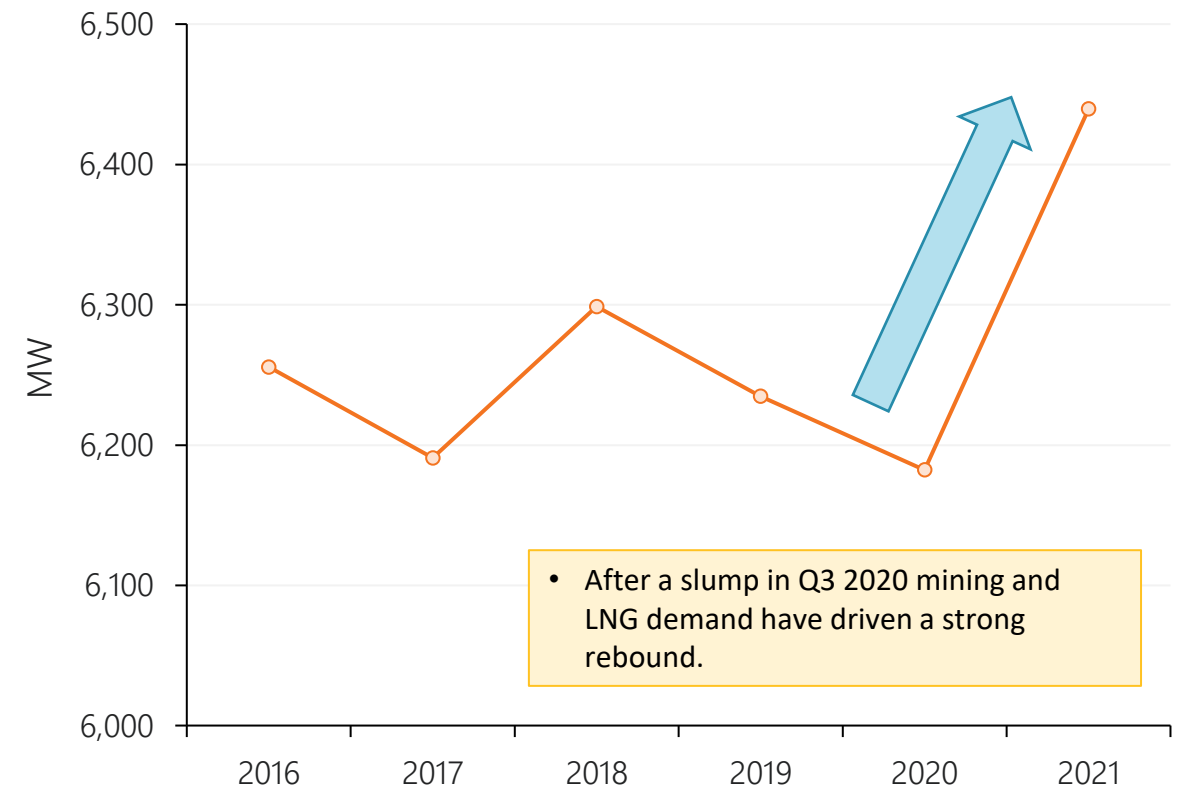
## Warm August and COVID-19 cut NSW demand

Changes in operational demand by state – Q3 2021 vs Q3 2020



## Strong growth in Qld underlying demand

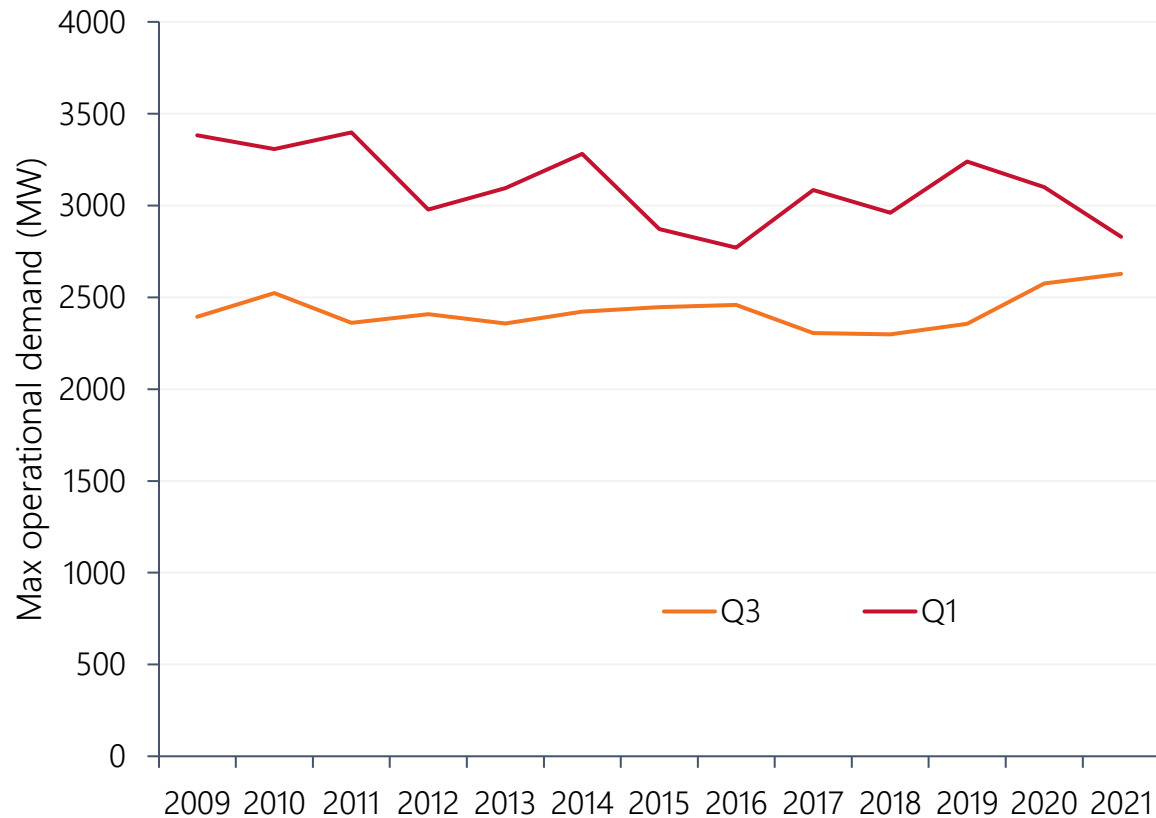
Q3 underlying demands



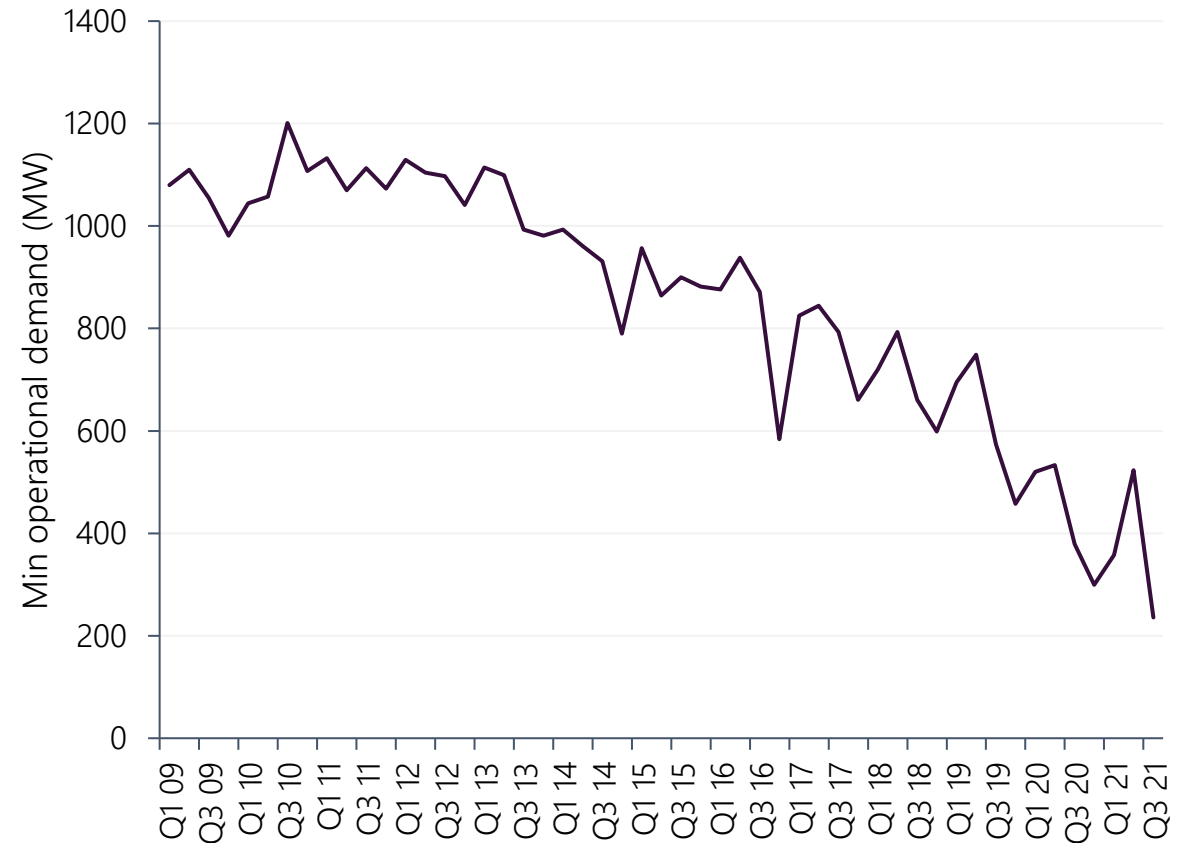
# SA max and min demand trends

## Summer-winter max demands are converging

SA max demands for Q3 and Q1



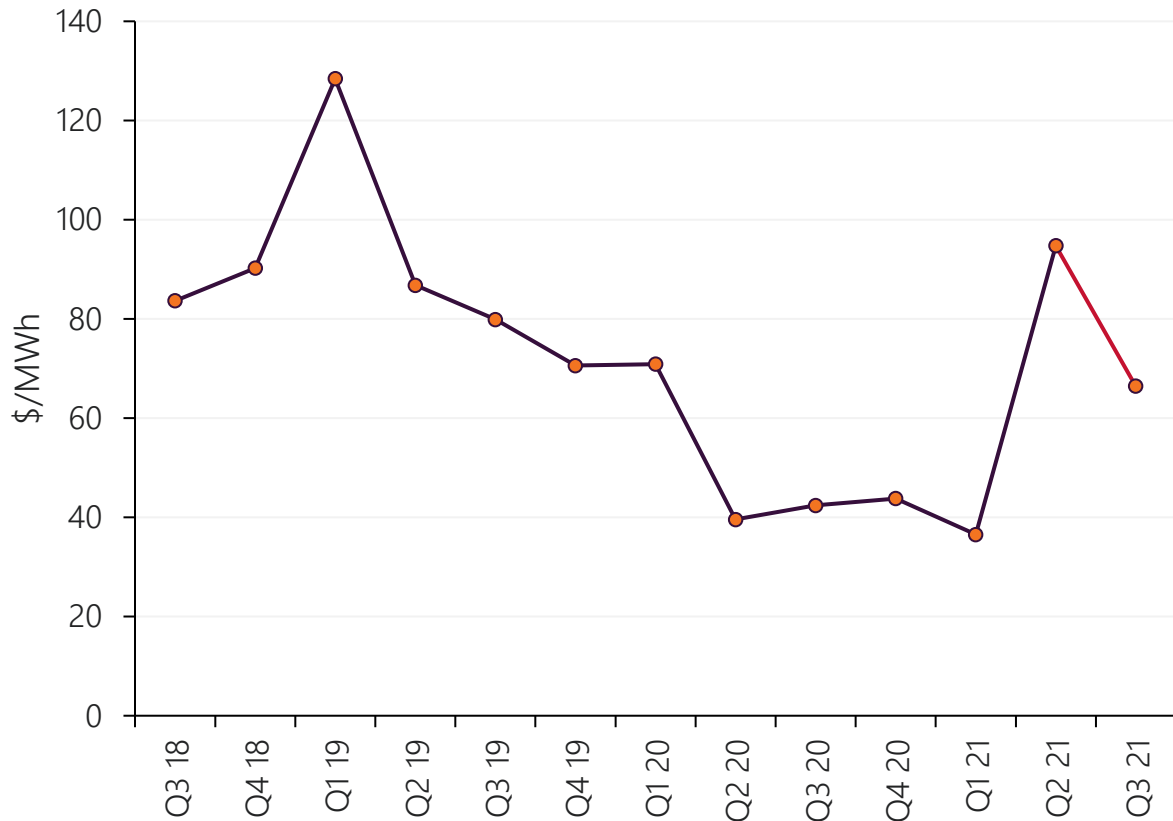
## Min demands continue to fall rapidly



# After a volatile start electricity prices retreated

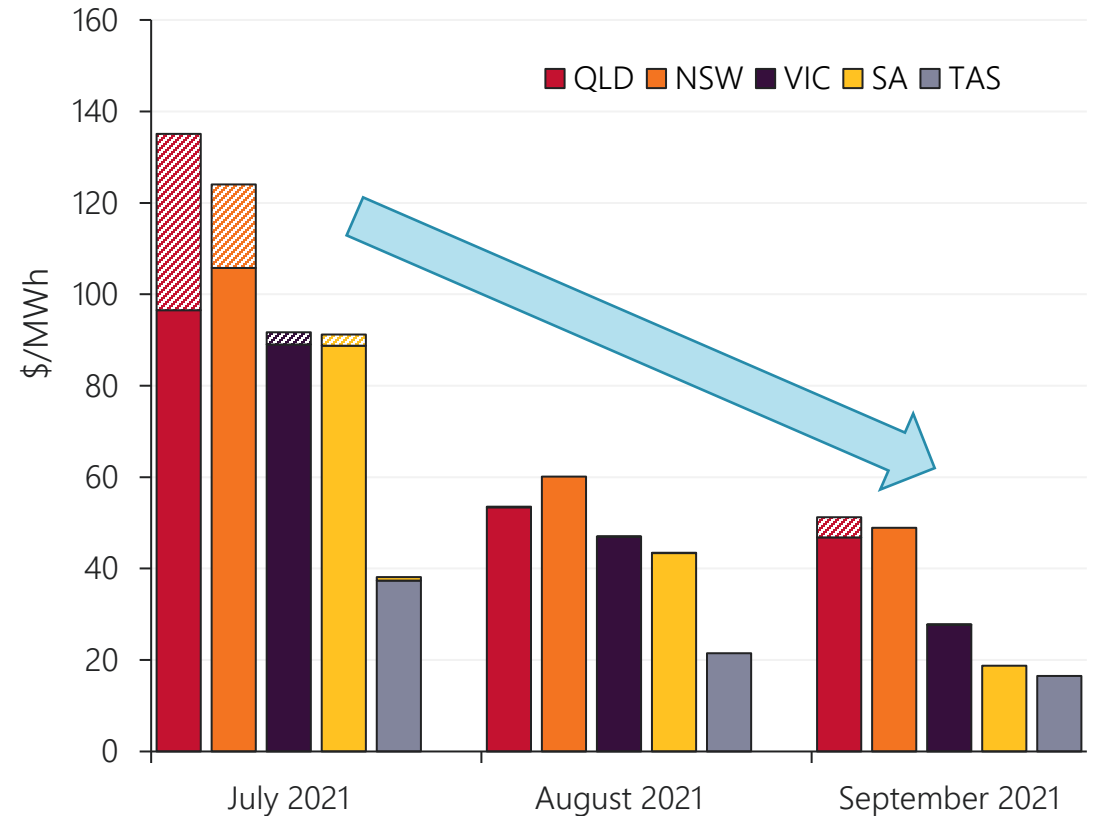
## Mainland NEM prices down from Q2 highs

*Average quarterly price excl Tas*



## Prices and volatility fell sharply after July

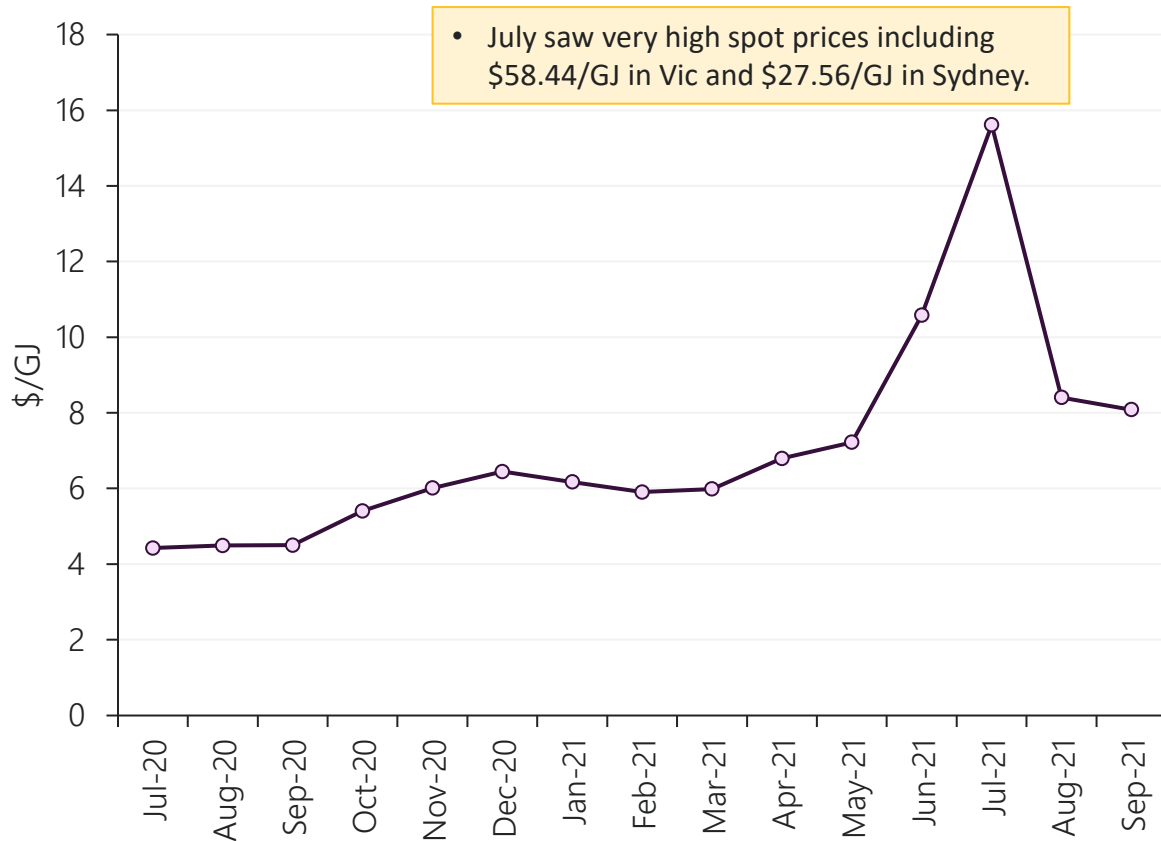
*Average monthly price*



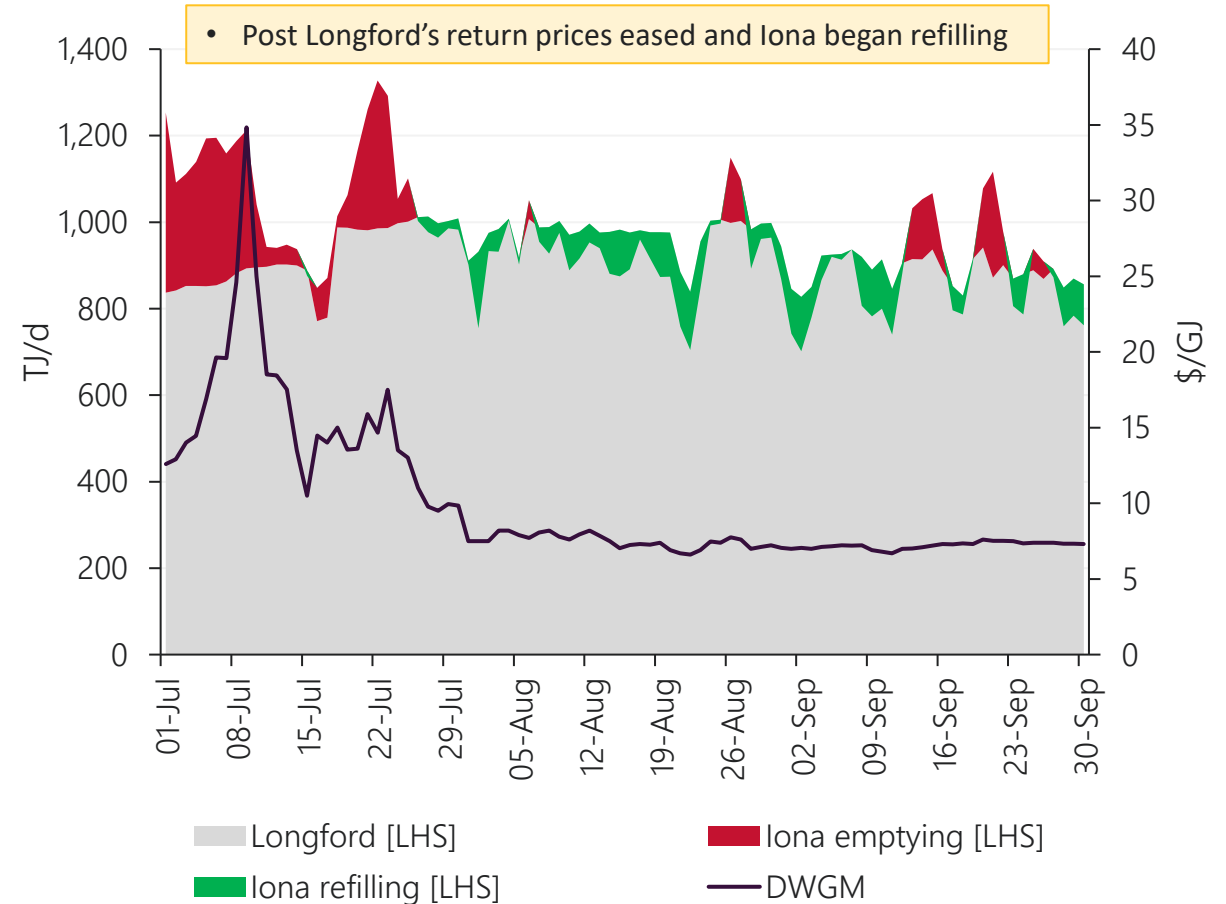
# Gas prices also spiked in early July

## East coast gas prices peaked in July

Simple average of AEMO's 5 spot markets

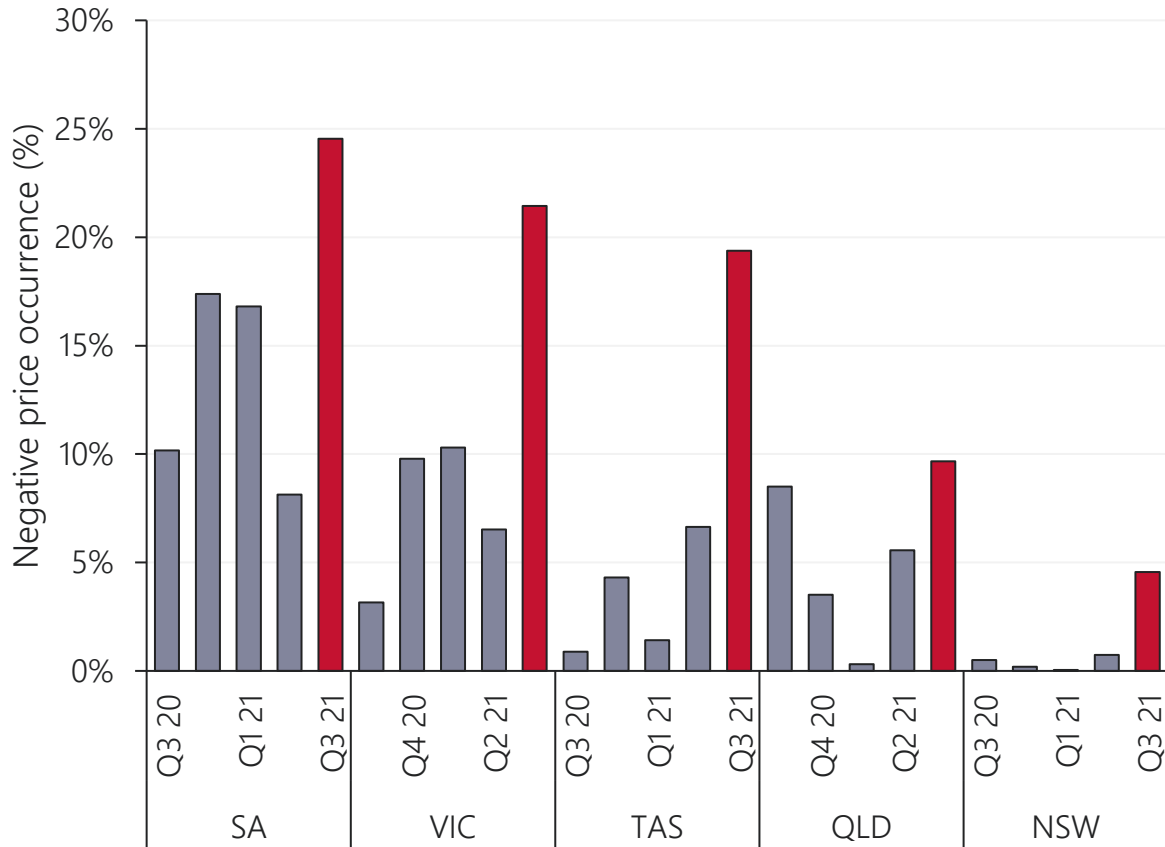


## Longford outage impacted prices and storage levels

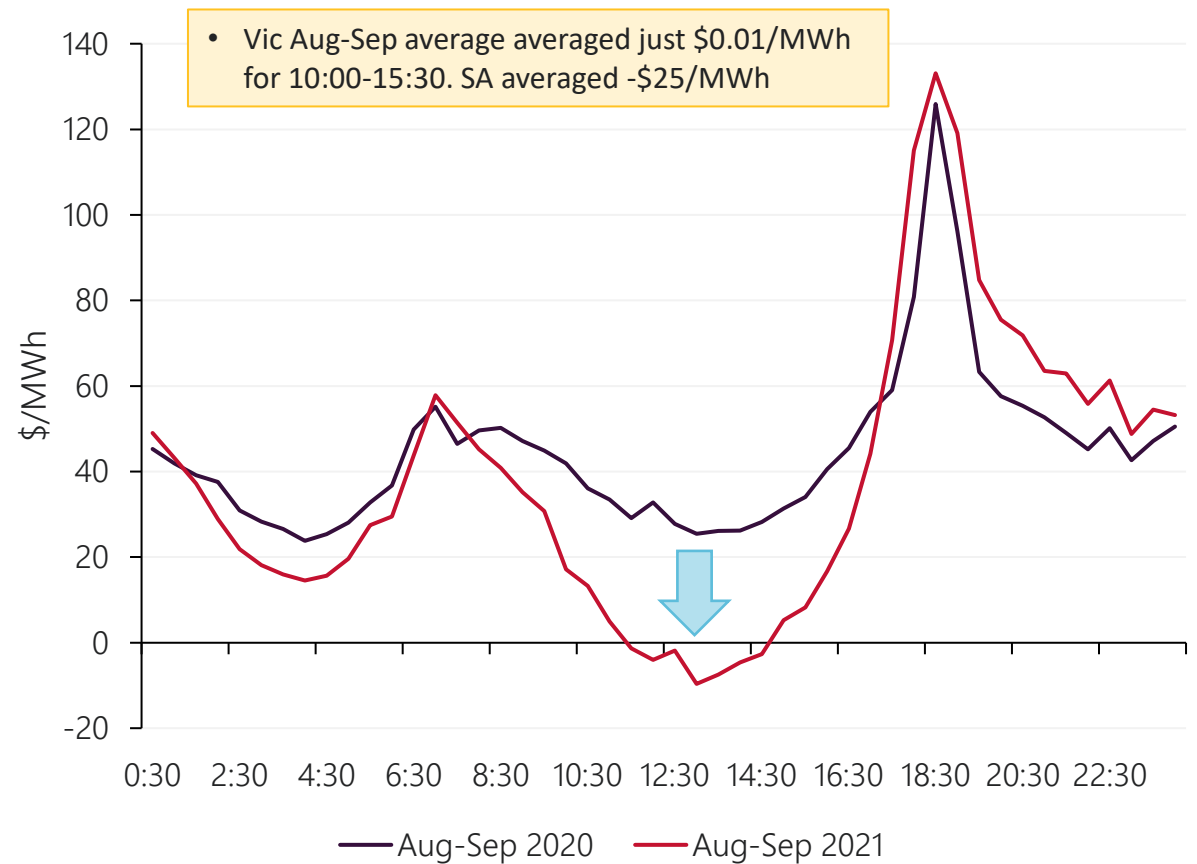


# Negative prices spread across the NEM

## Record negative price incidence



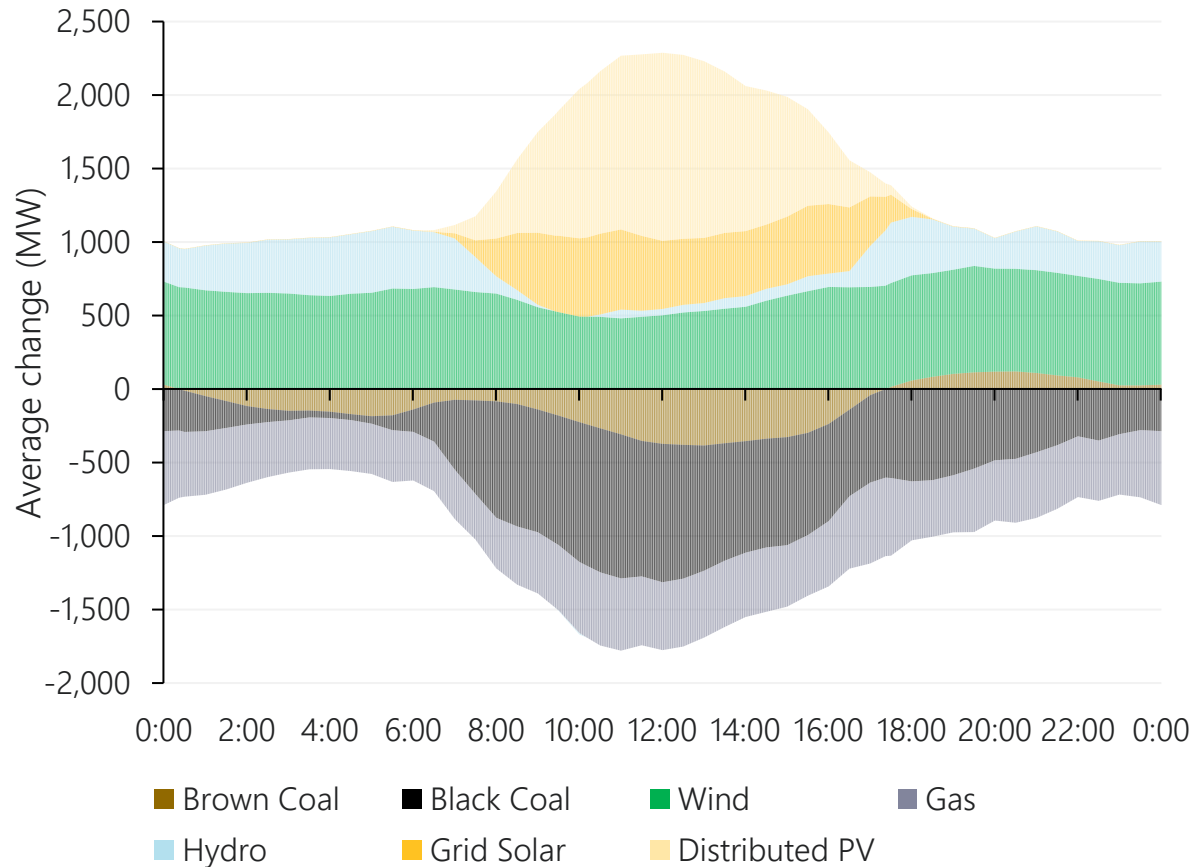
## Middle of day prices fall towards zero



# Renewables growth displaced thermal generation

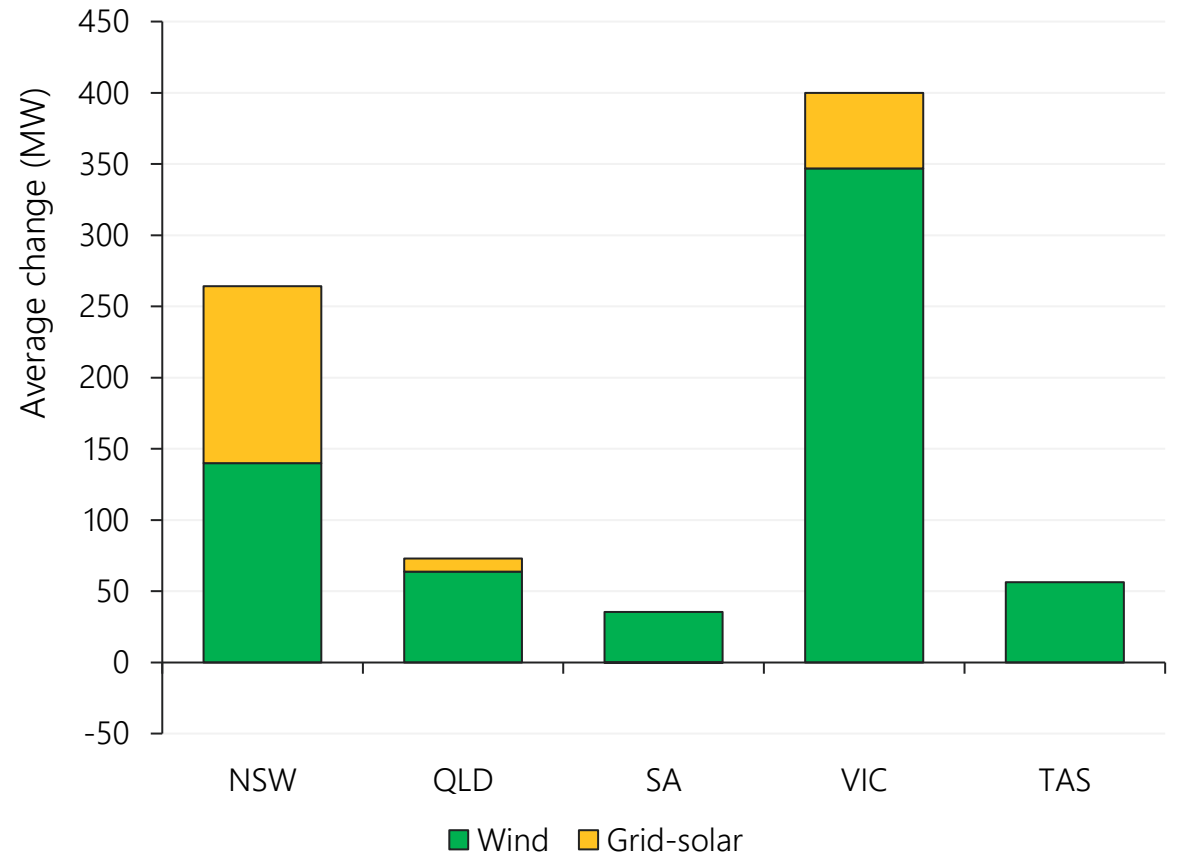
## Renewables up across all periods

Q3 2021 vs Q3 2020



## Victoria drives strong VRE increase particularly wind

Q3 2021 vs Q3 2020

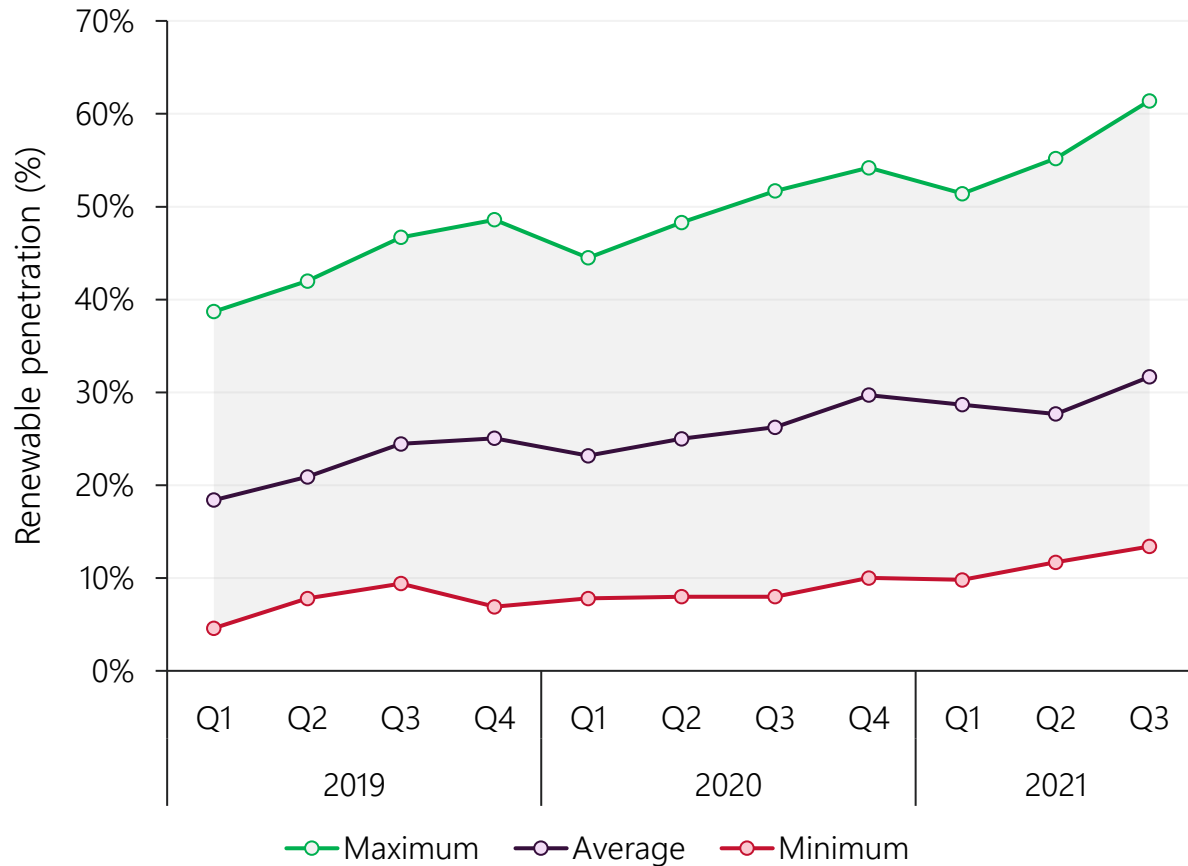




# Renewable record-setting continued

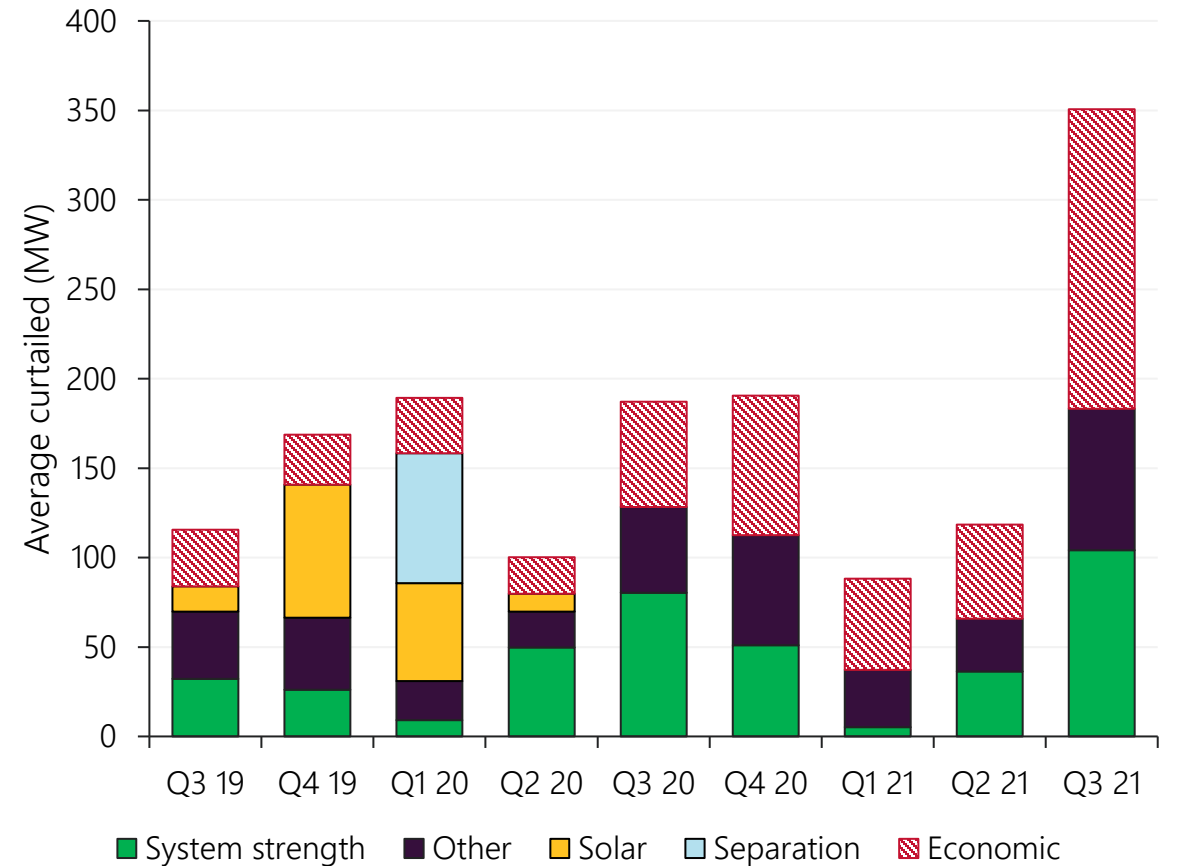
## Instantaneous penetration reaches 61.4%

On Sept 24 with Vic on a public holiday



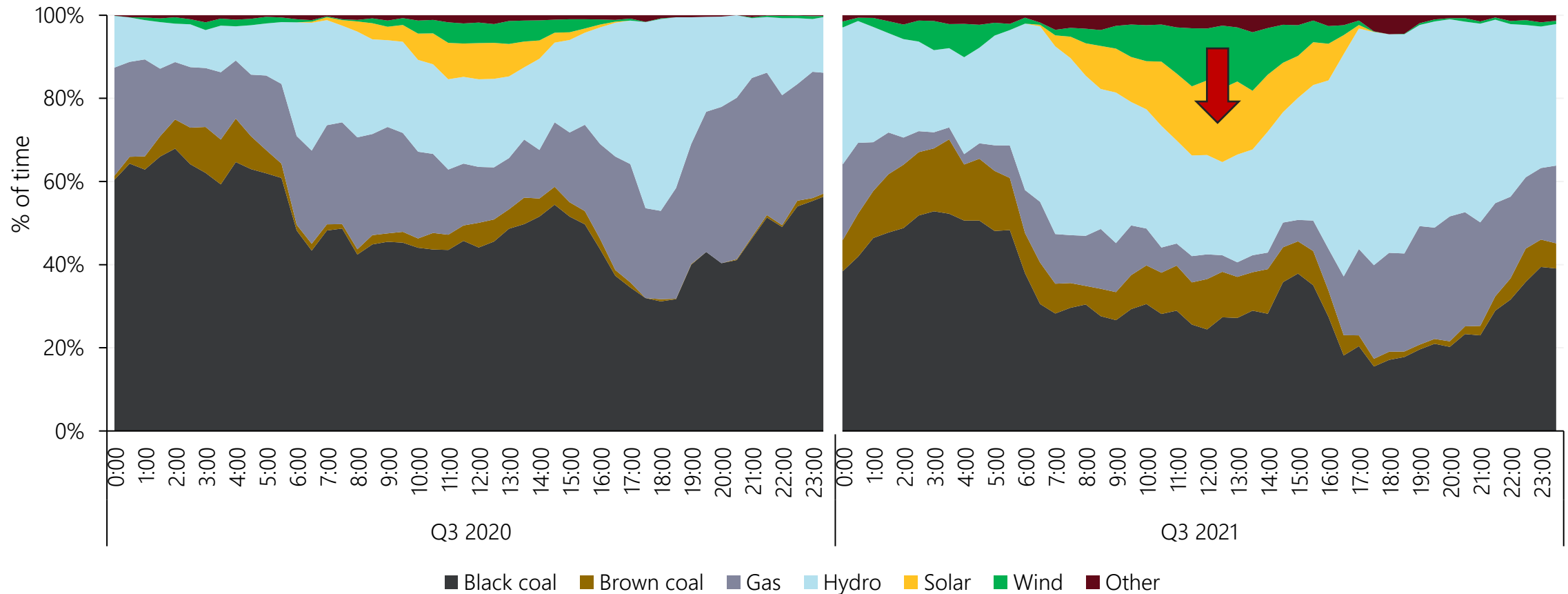
## Curtailment also increasing particularly economic

Renewable generators avoiding negative prices



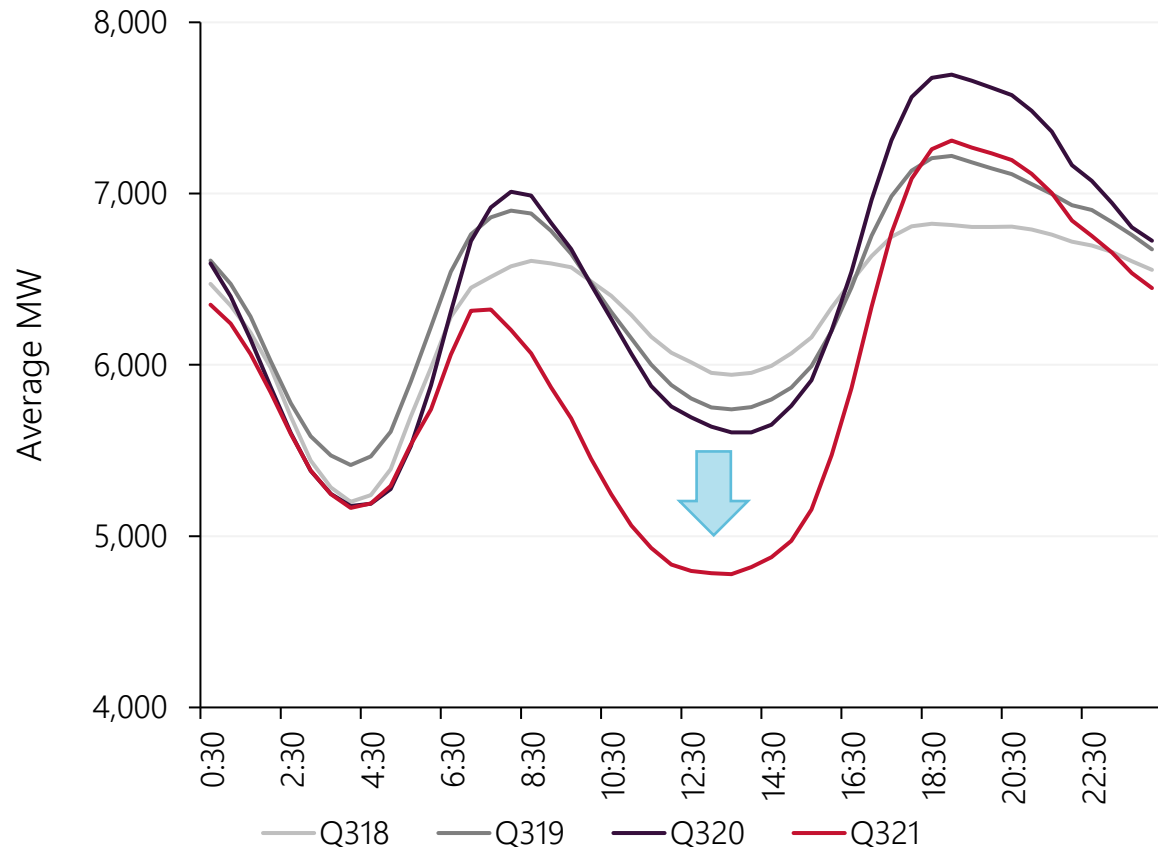
# Renewables bid more strategically

## Growing role in middle-of-day price-setting

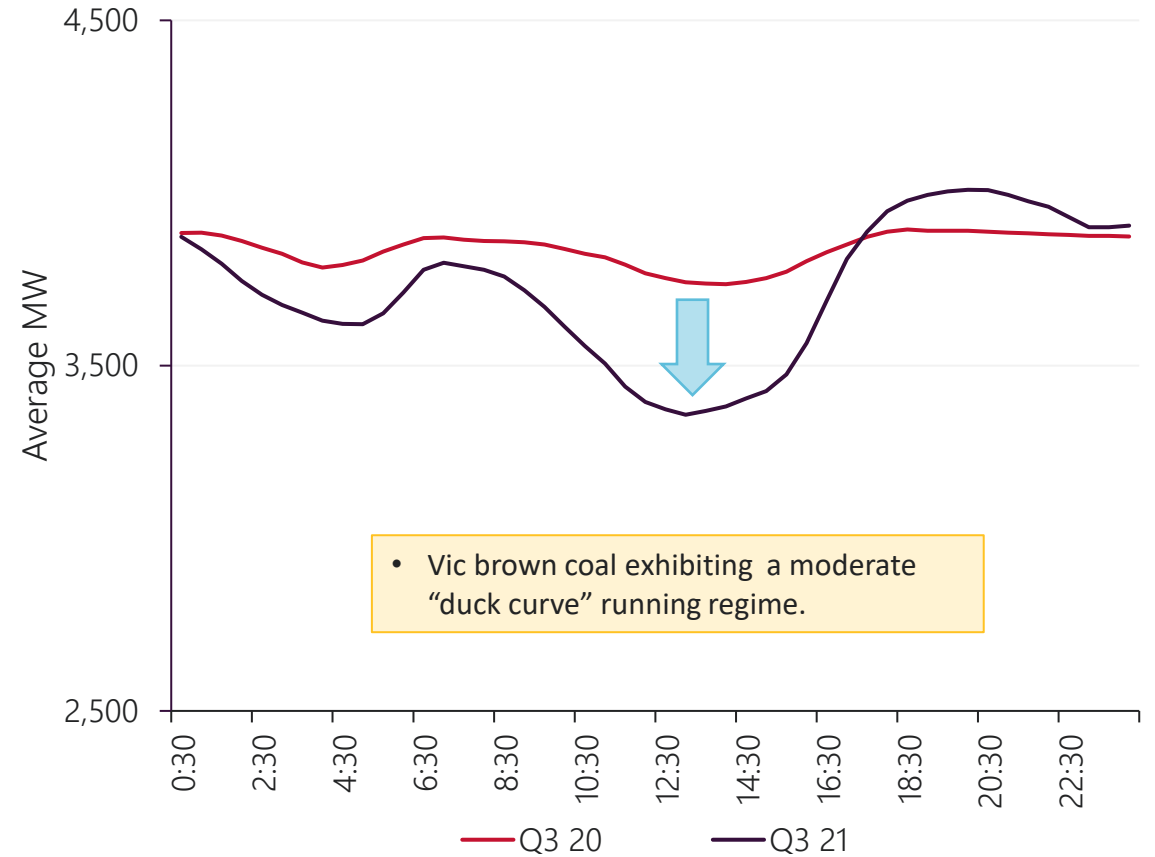


# Coal responds to lower daytime prices

## NSW black coal reduces daytime output

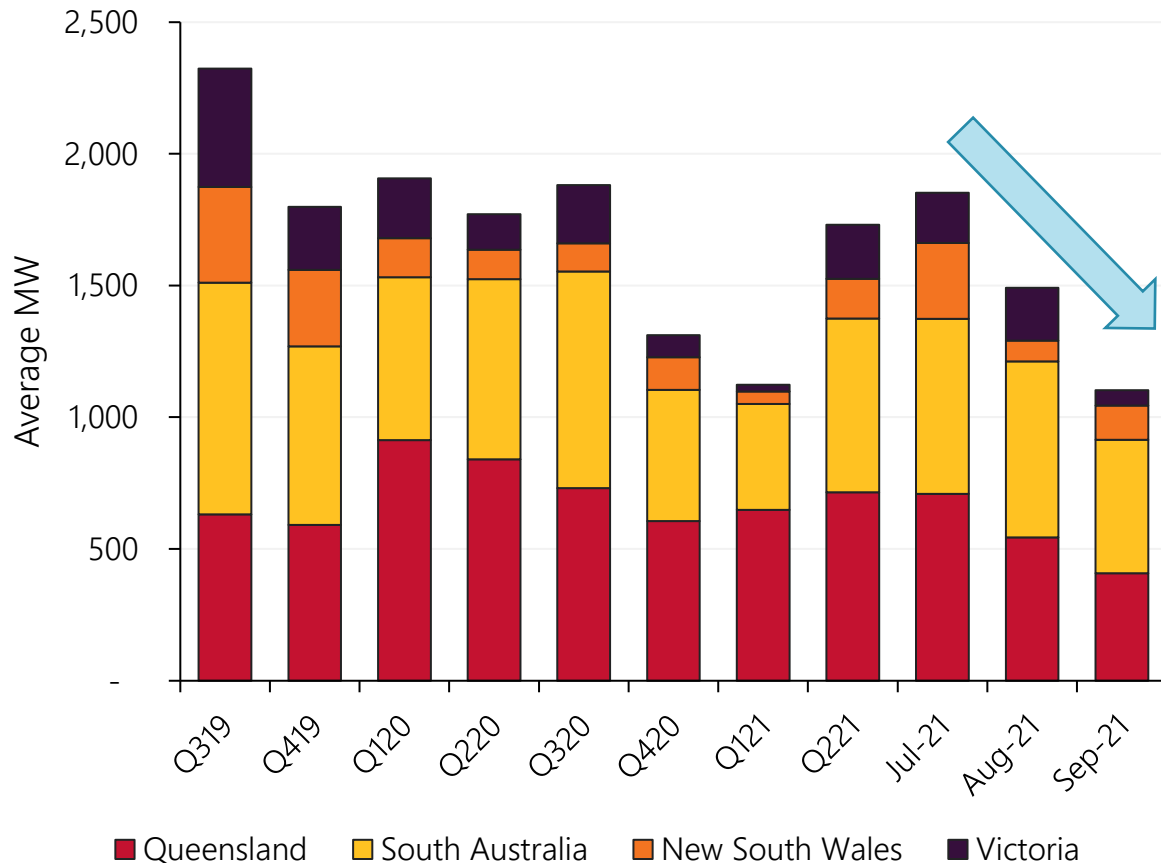


## Brown coal also flexing



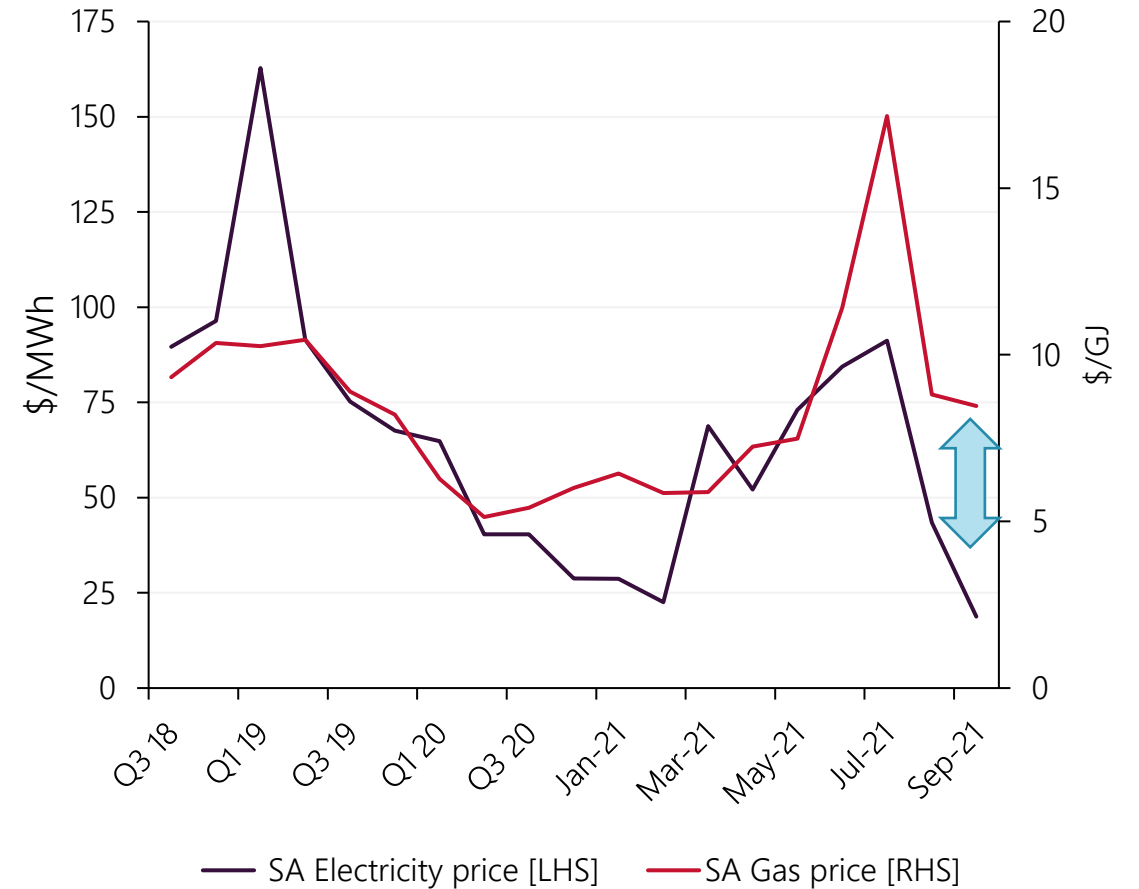
# Gas generation squeezed

## GPG falling through Q3



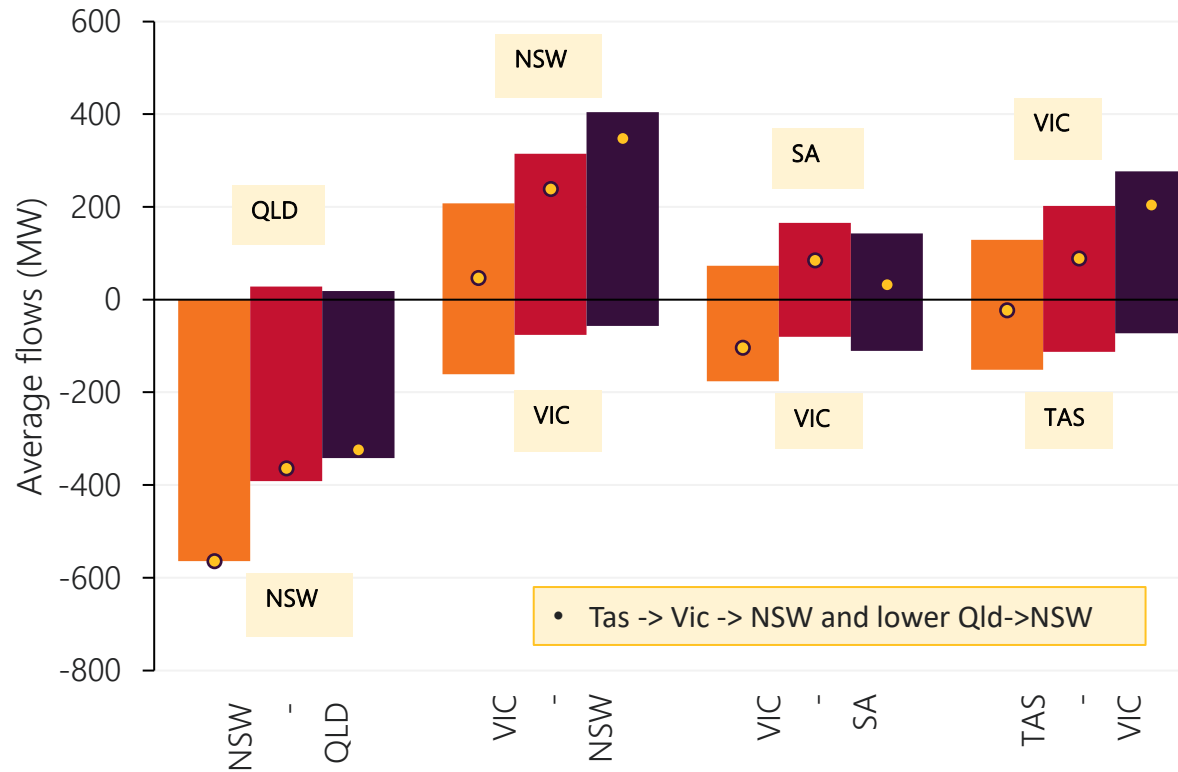
## Prices for fuel and output diverge

*Directed GPG lodging more compensation claims*

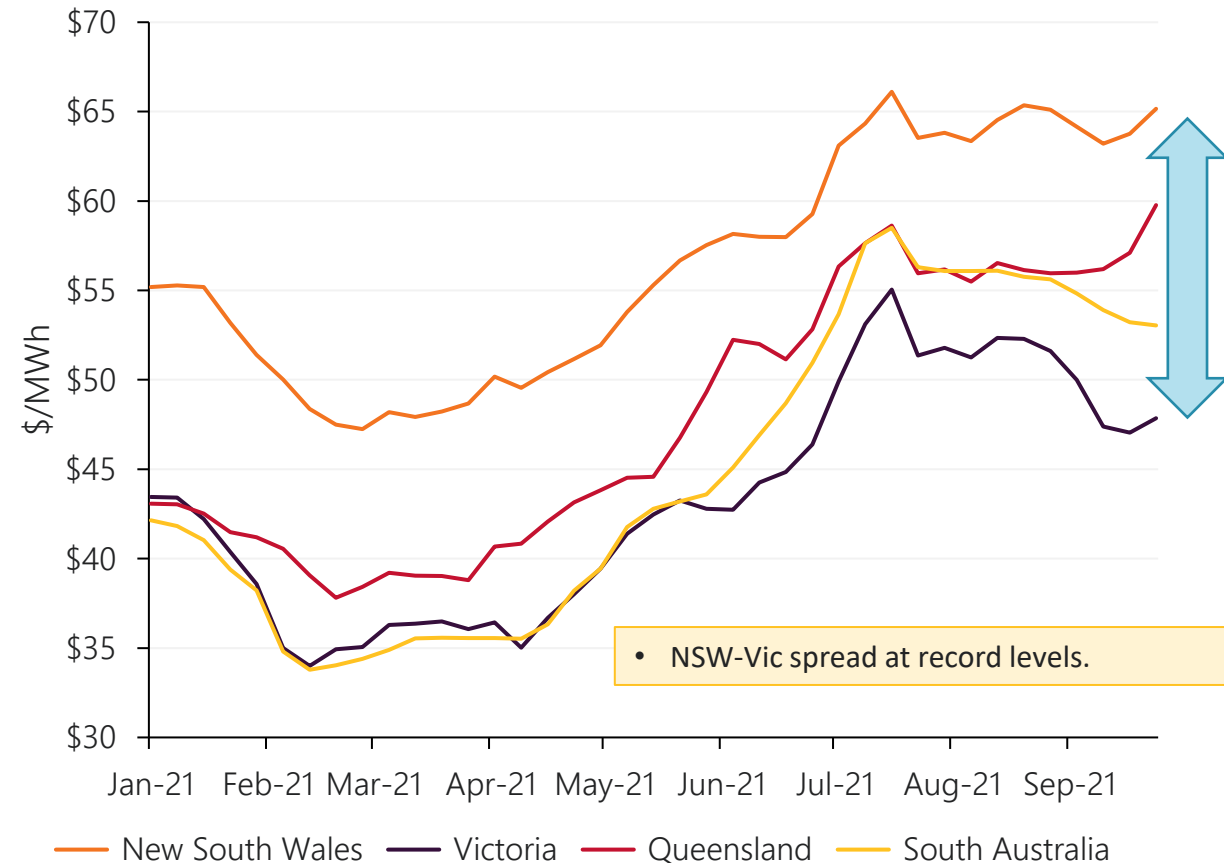


# Northward shift in NEM flows

## Increased Tas Hydro output flows north

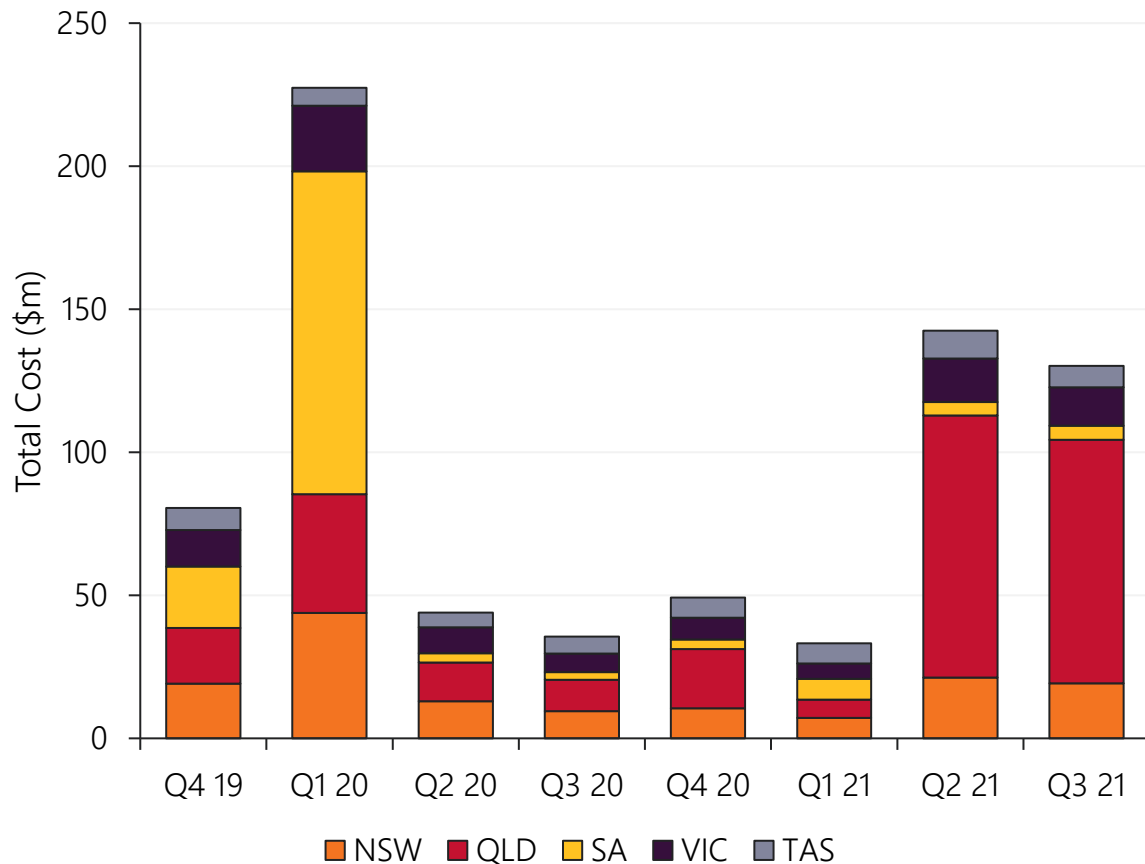


## North-south futures prices diverge



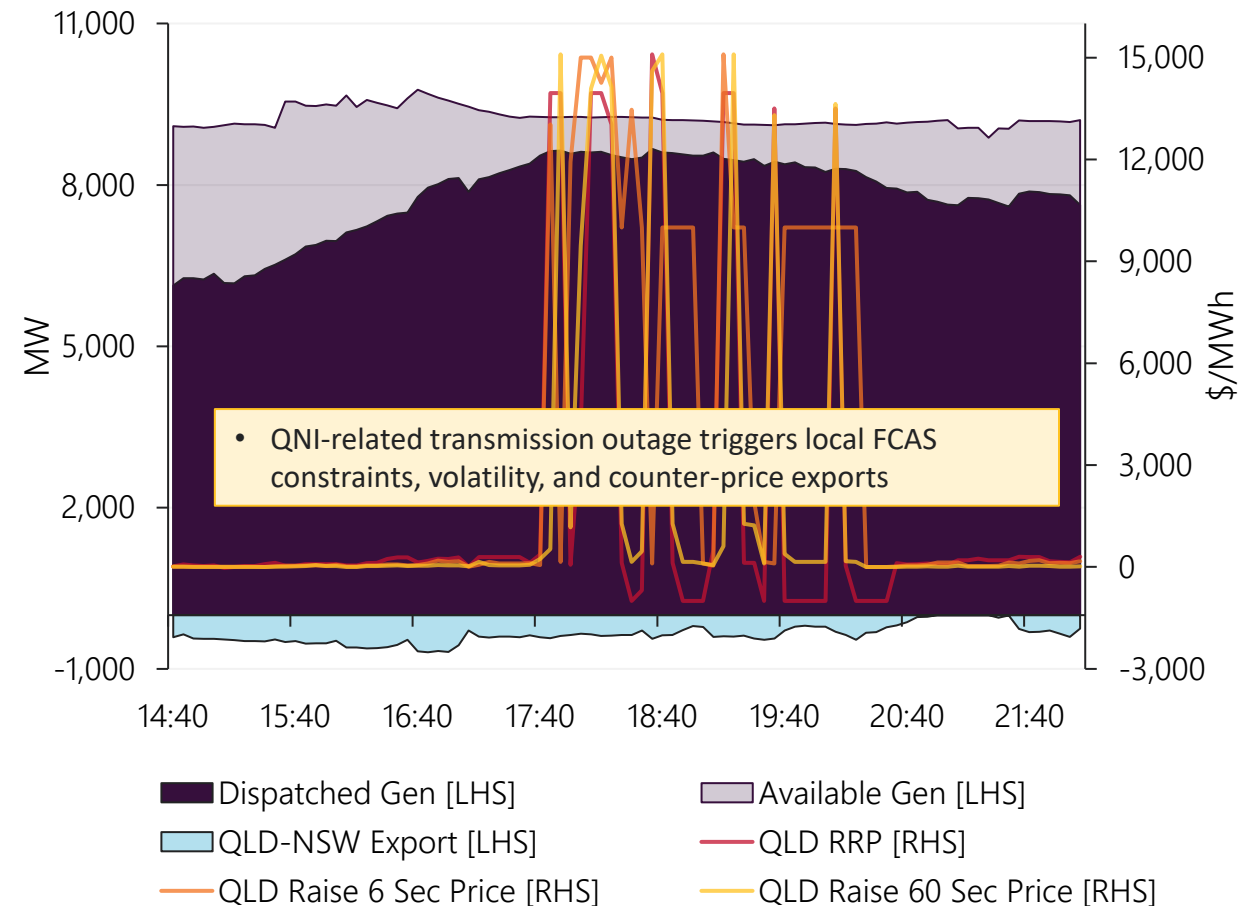
# FCAS costs stayed high

## Queensland costs the major driver



## Constraints drove FCAS & energy volatility

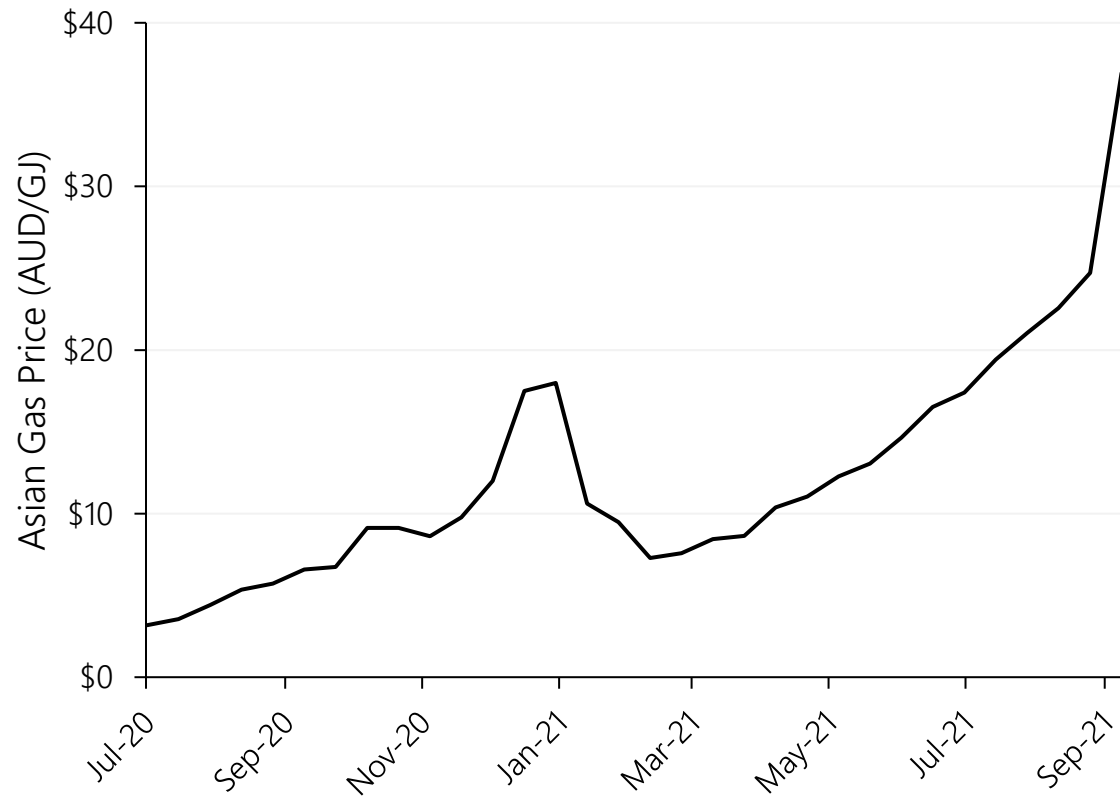
Queensland dispatch on 21 July 2021 14:40 – 22:00



# International energy prices reached record levels

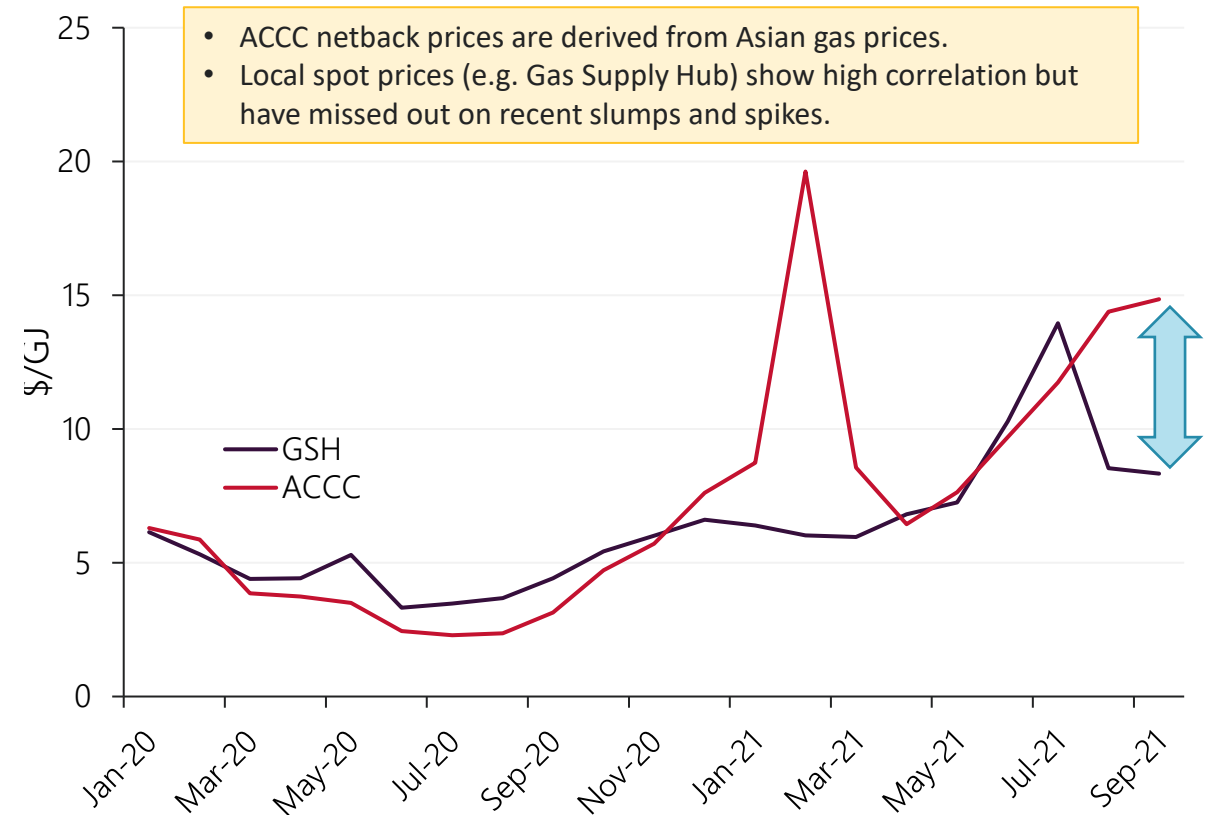
## Asian gas prices surged

*Export coal prices also reached record highs*



Source: Bloomberg data in 14-day averages

## But domestic gas prices diverged over Q3



# Appendix

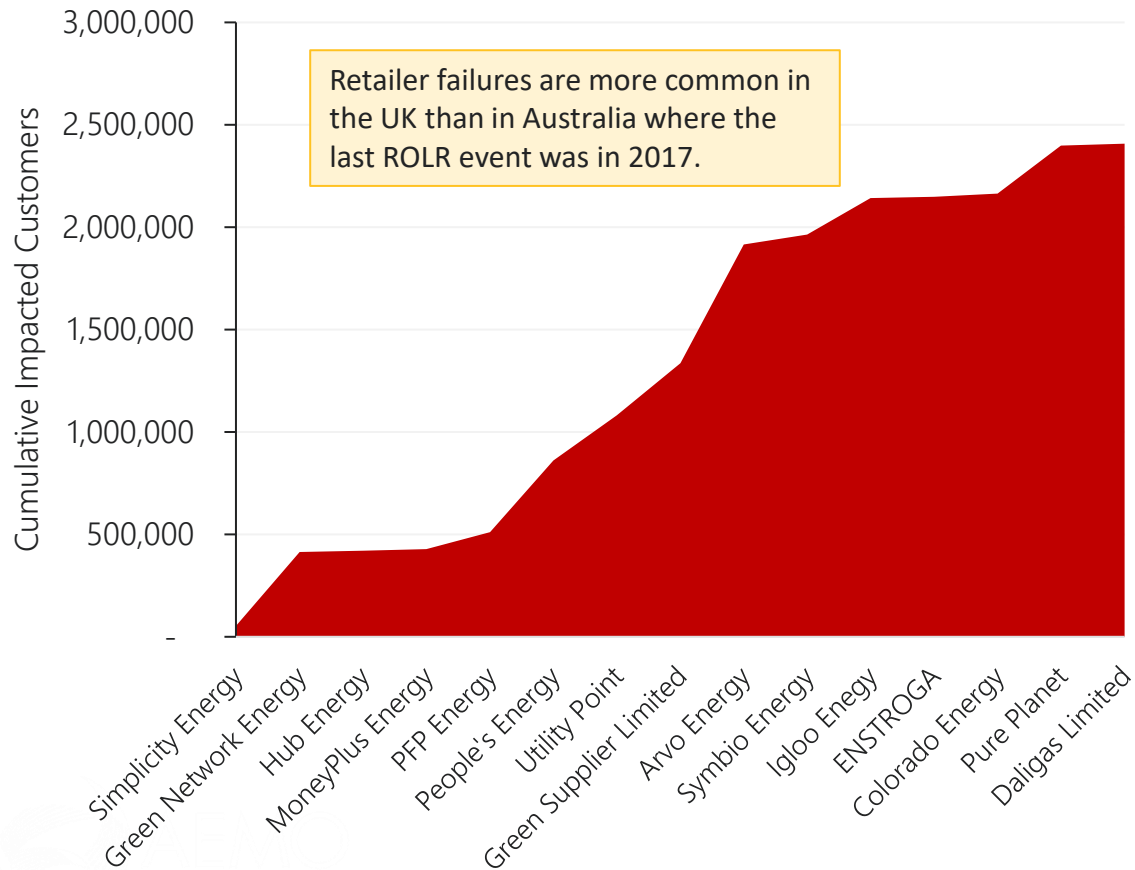


# UK Energy Crisis

Source: Ofgem

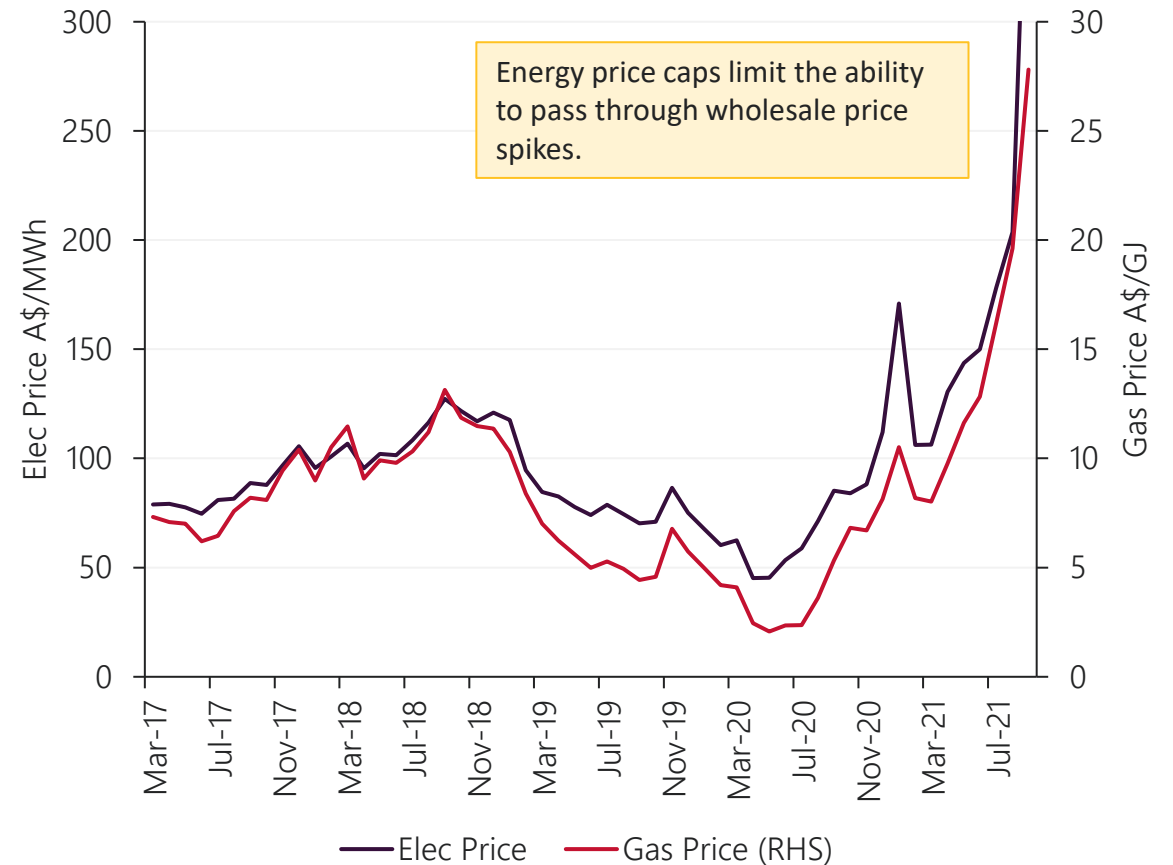
## 15 energy retailers have gone bust this year

Most in Sep/Oct and nearly 2.5 million customers impacted



## UK is vulnerable to international gas prices

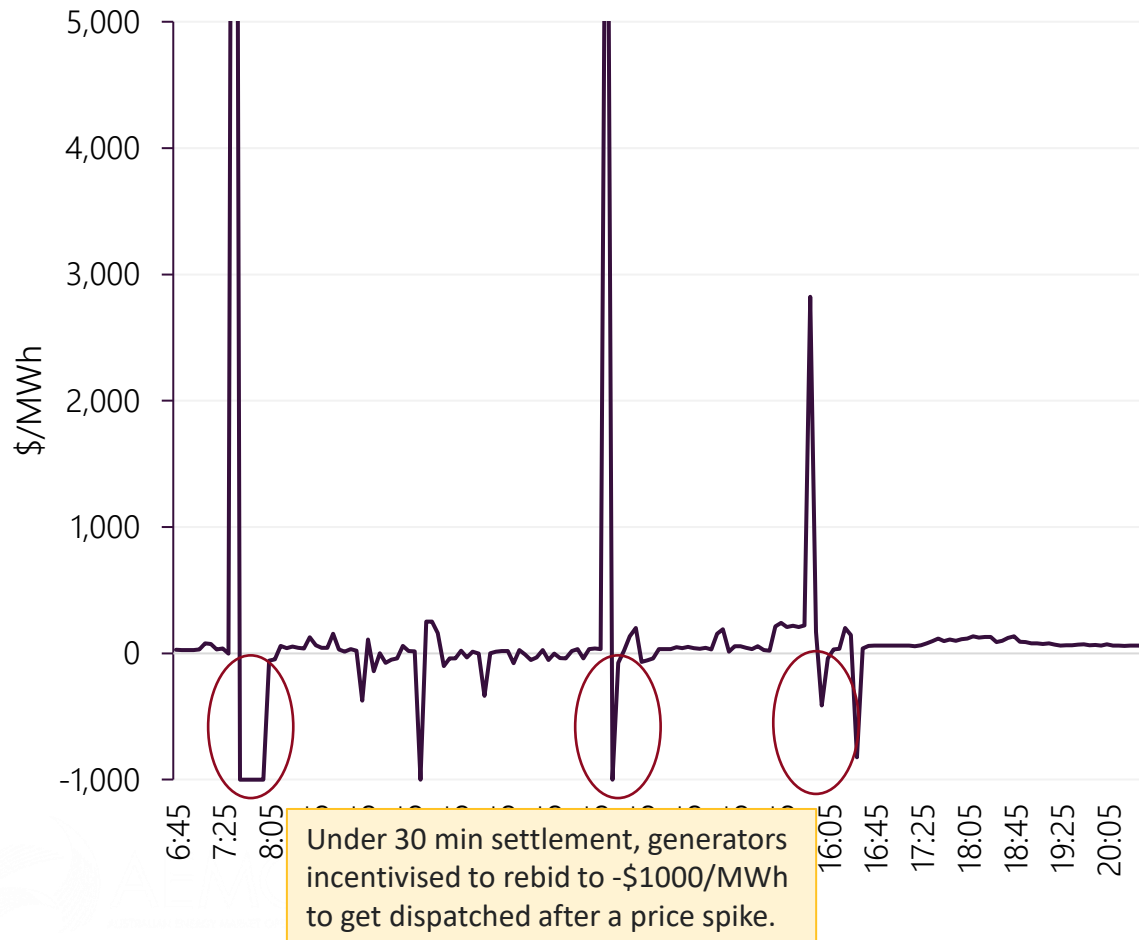
UK is a net importer of gas and GPG is ~40% of electricity generation



# Impacts of 5MS

## Pre 5MS - Rebidding after Qld price spikes

5 minute prices on 30 Sept 2021



## Post 5MS – No rebidding after price spikes

5 minute prices on 4 Oct 2021

