



# Quarterly Energy Dynamics Q2 2018

Hosted by the Melbourne Energy Institute

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# Quarterly Energy Dynamics

## Q2 2018

Market Insights

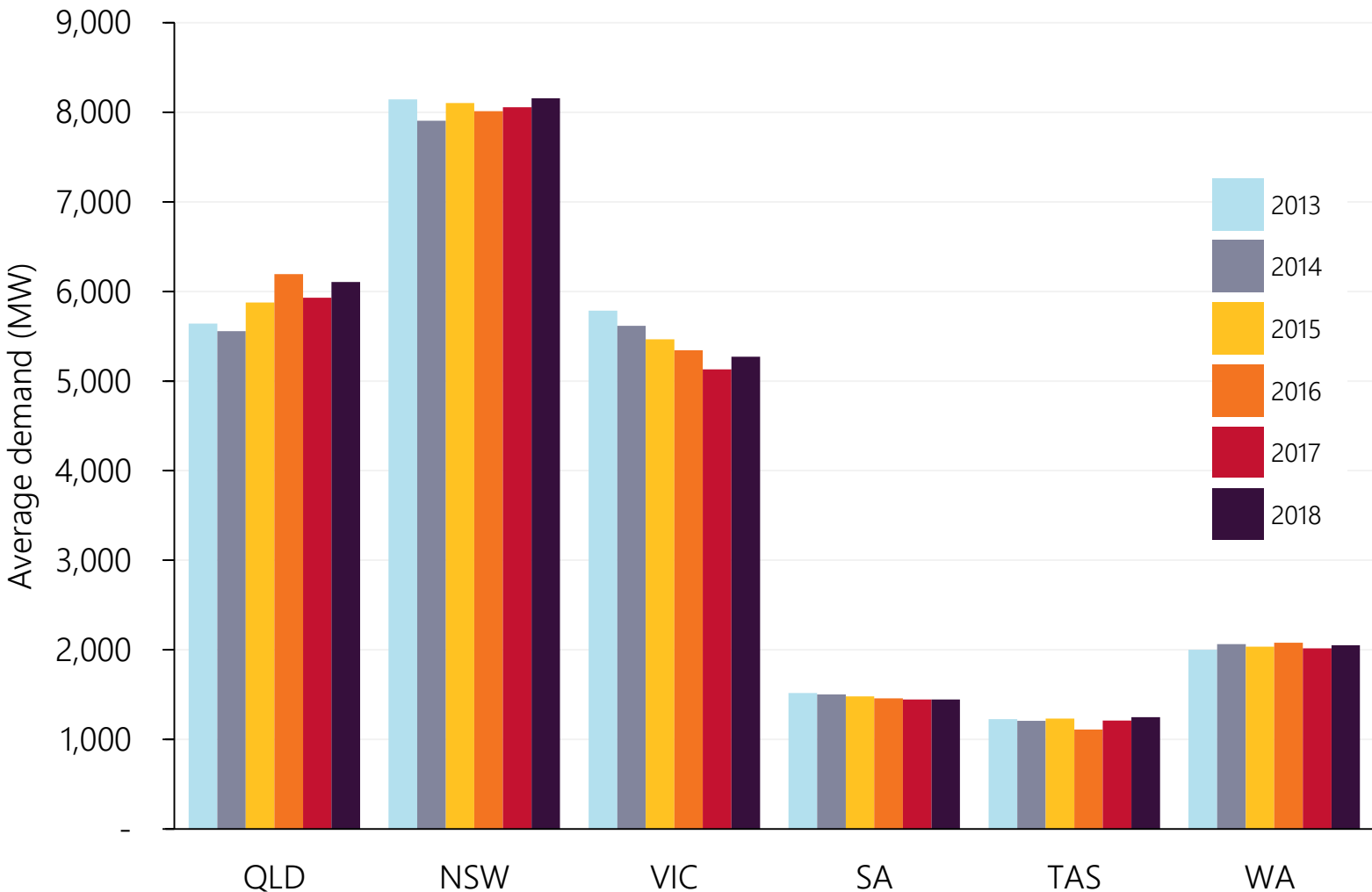
# Summary

Highlights for Q2 2018 include:

1. Wholesale electricity and gas prices decreased across most regions and markets compared to Q1 2018
  - Electricity price reductions were driven by reduced volatility and increased hydro generation, while lower gas-powered generation (GPG) contributed to the gas price reductions
2. Electricity generation – average hydro output increased to ~2,200 MW, the highest Q2 on record in the NEM
  - GPG decreased to its lowest quarterly average level since Q4 2016 – it was displaced by higher renewable output
3. SA system strength directions were in place for ~65% of time during April and May driven by high wind, low operational demand and generator outages
4. Planned maintenance reduced gas pipeline flows to Curtis Island and LNG exports to their lowest levels in almost 2 years (since Q3 2016)

# Demand increases across the NEM

Average Q2 demand



Average NEM demand increased by 2% compared to Q2 2017

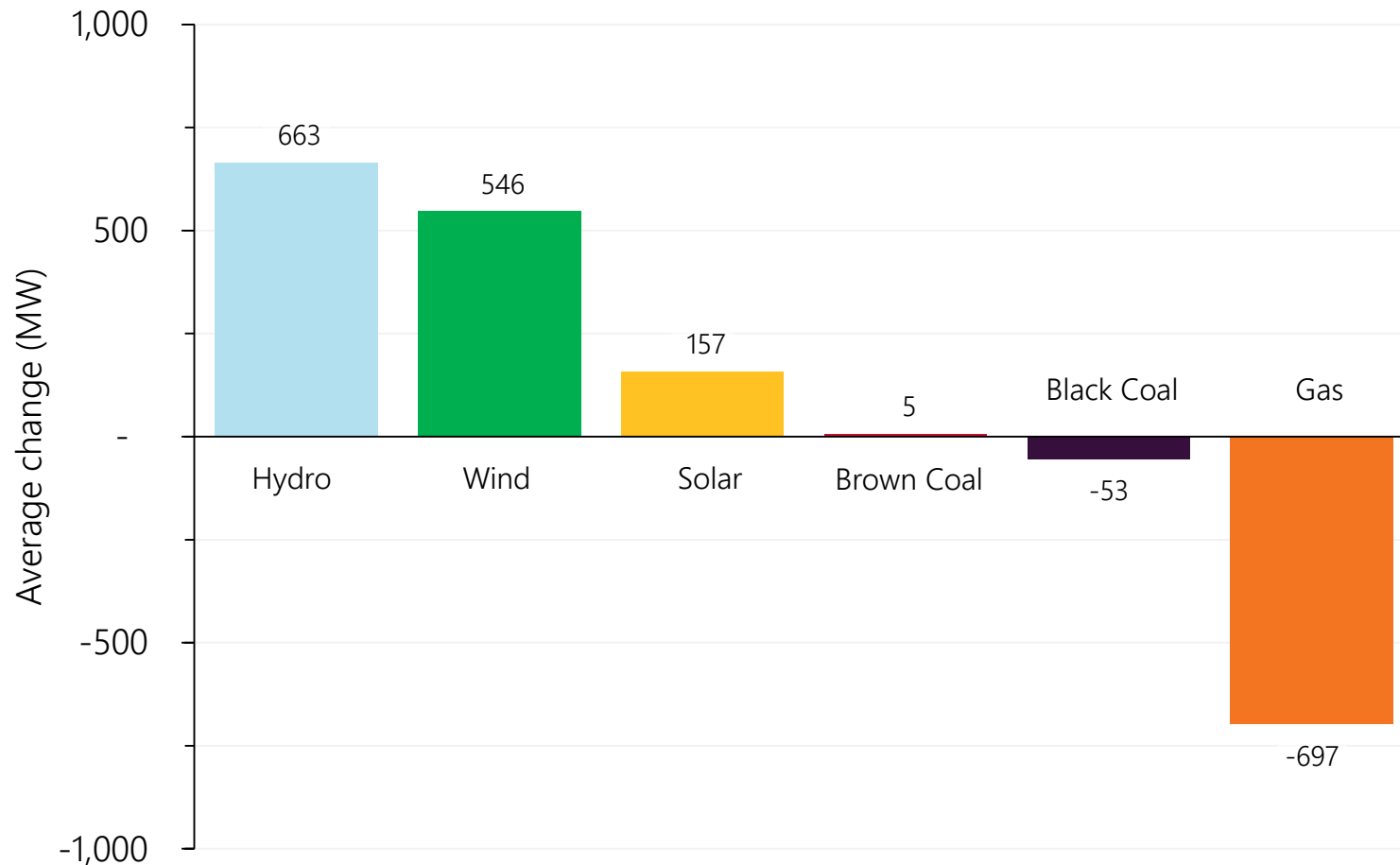
**QLD & NSW** Warm April increased the cooling load

**VIC & TAS** Increased industrial load offset by mild June conditions

**WA** Slight demand increase largely due to cooler June conditions

# Generation mix continues to evolve

Supply mix change (Q2 18 v Q2 17)



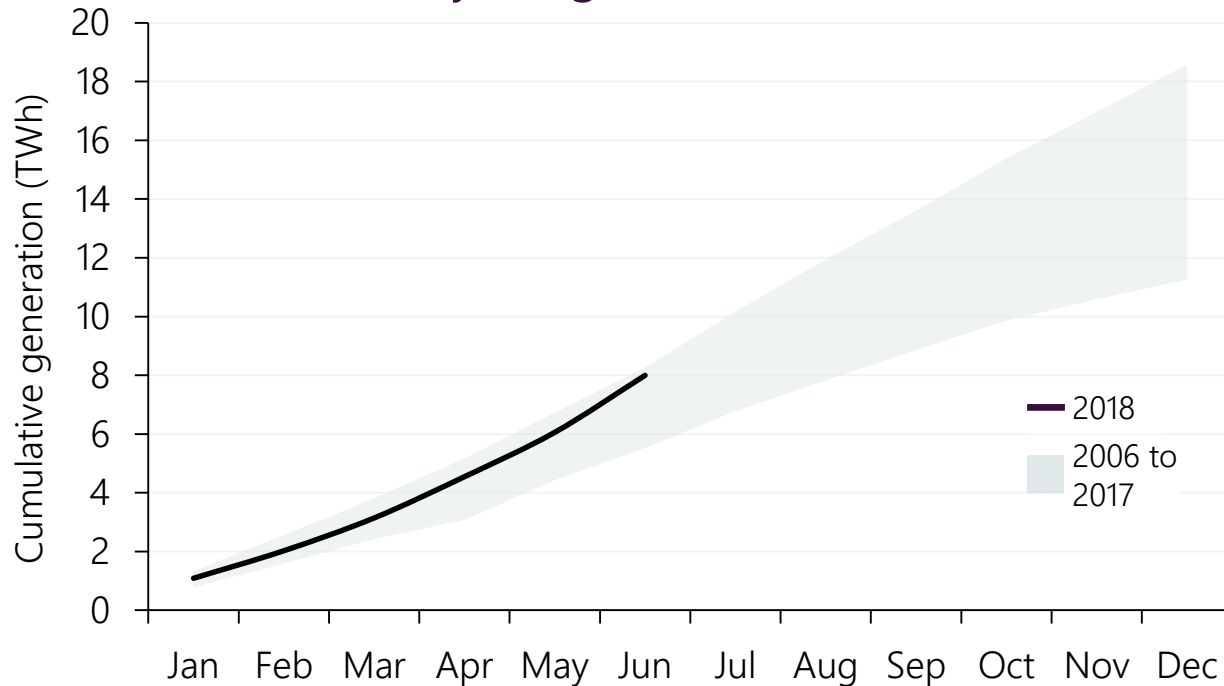
## Generation dynamics

- A Hydro generation increased across the NEM by ~650 MW: highest Q2 on record
- B Wind and solar increased by ~700 MW reflecting windier conditions (Q2 17 was a very low wind quarter) and new solar PV capacity
  - New wind and large-scale solar capacity (in the last 12 months) contributed to ~200 MW of this increase
- C GPG continued downward trend in 2018, with Q2 18 the lowest quarter since Q4 16

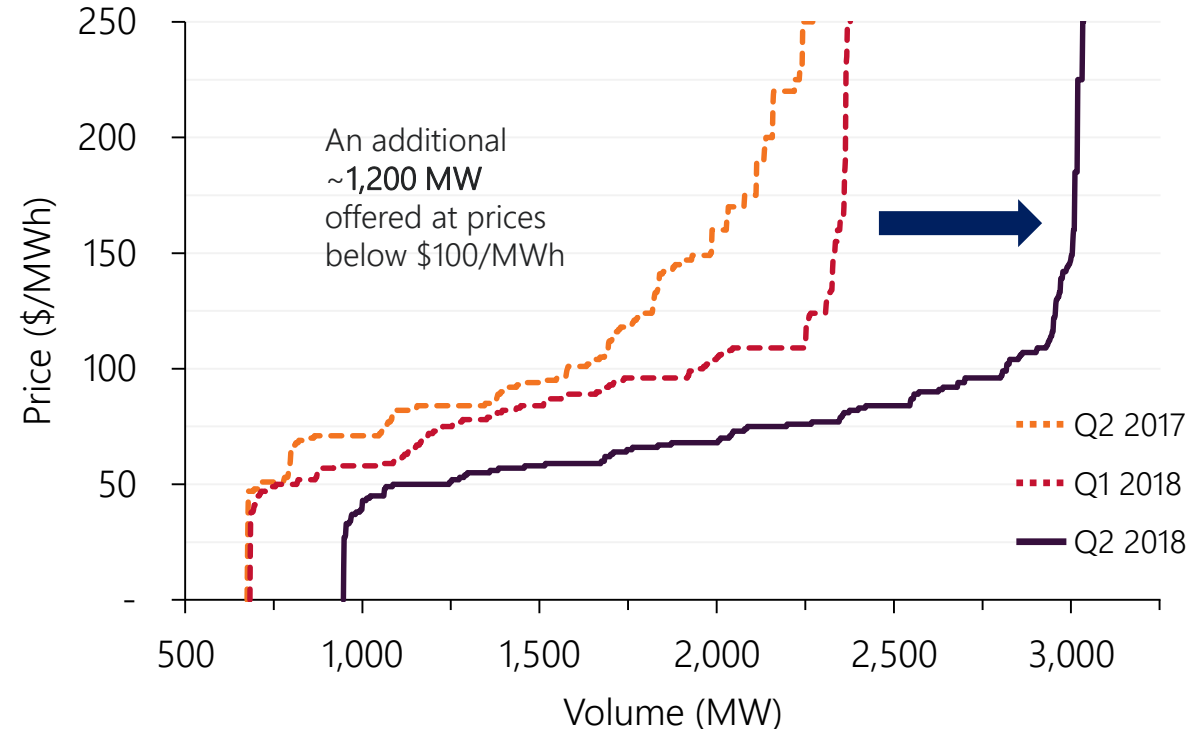
Note: Solar includes rooftop PV

# Hydro output at near record levels

NEM hydro generation - YTD



NEM hydro bid supply curve



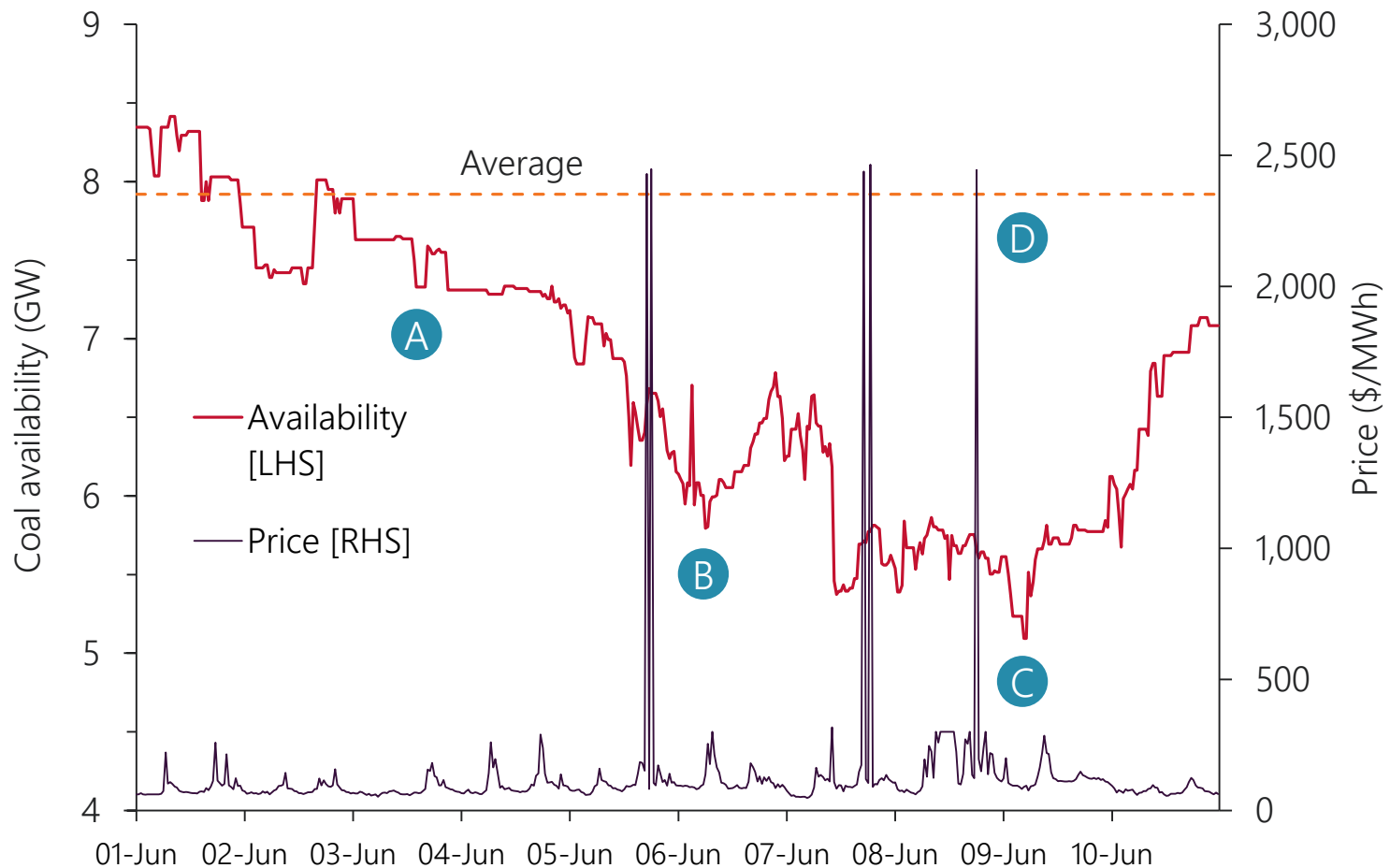
## Drivers

**TAS** Basslink outage increased TAS reliance on local hydro generation. High May rainfall enabled increased output without depleting dam levels

**NSW & VIC** YTD generation from Snowy is only slightly behind 2016 levels – a year of record generation from Snowy where they created 1.9 million LGCs. 2018 is the third highest YTD generation on record despite relatively dry conditions

# NSW coal generation outages during June 4-10

Tight week: NSW availability and prices (June 4-10)

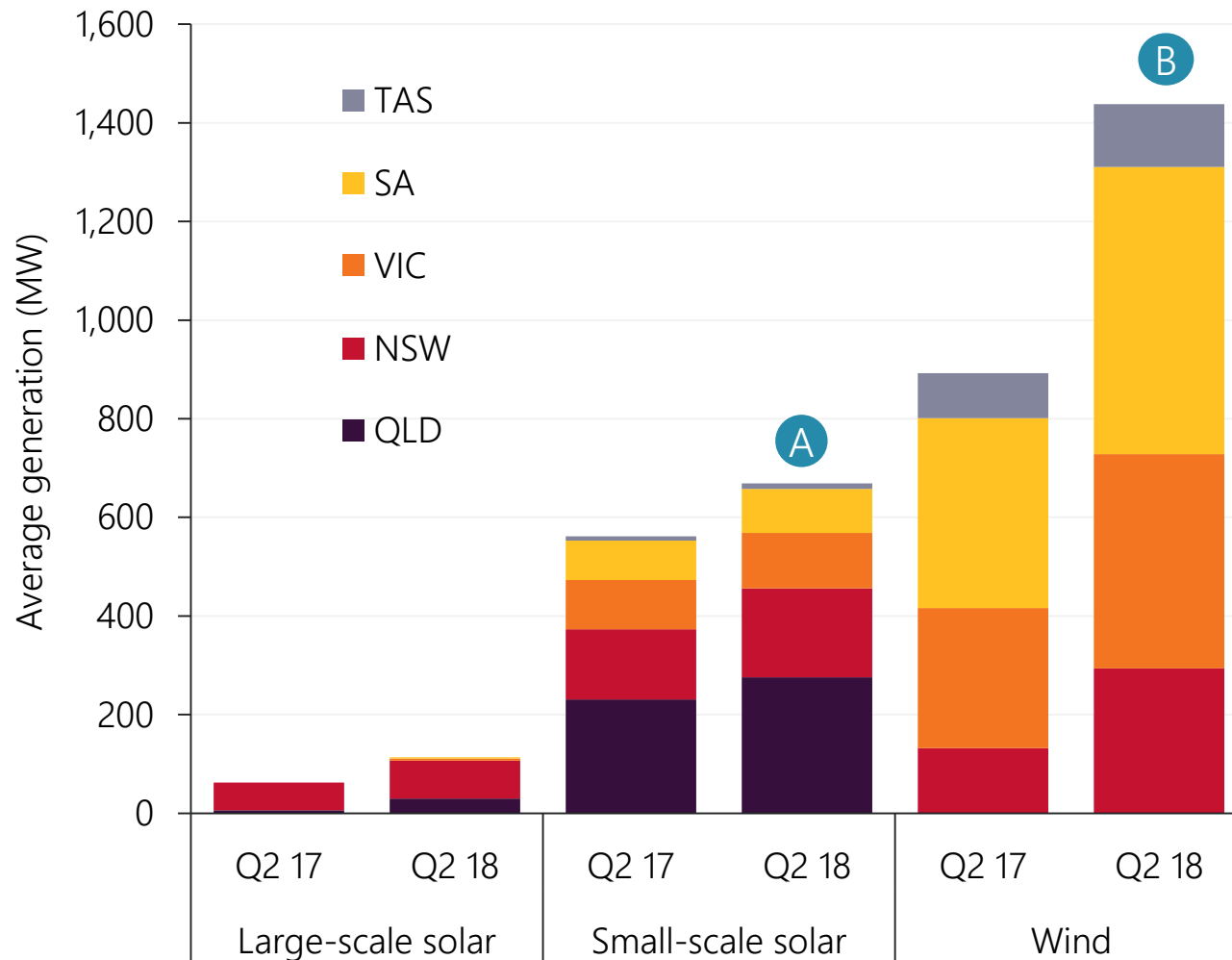


## Summary

- A** Series of planned and unplanned coal-fired power station outages led to tight supply conditions
- B** LOR1 and LOR2 conditions frequently called during the week - reserves on 5 Jun 18 lowest since 10 Feb 17
- C** 12<sup>th</sup> lowest daily min availability of black coal since 2007
- D** Tight supply conditions contributed to electricity price volatility and higher NSW prices over the quarter compared to Q1

# Renewable generation steps up

NEM – Average wind and solar generation



## Renewable generation continues to grow

- A** Q2 2018 small-scale solar avg generation up 19% compared to Q2 2017
- B** Wind generation up an avg of 546 MW (+61%)
- C** ~830 MW of utility-scale renewable capacity commenced generating in Q2 2018

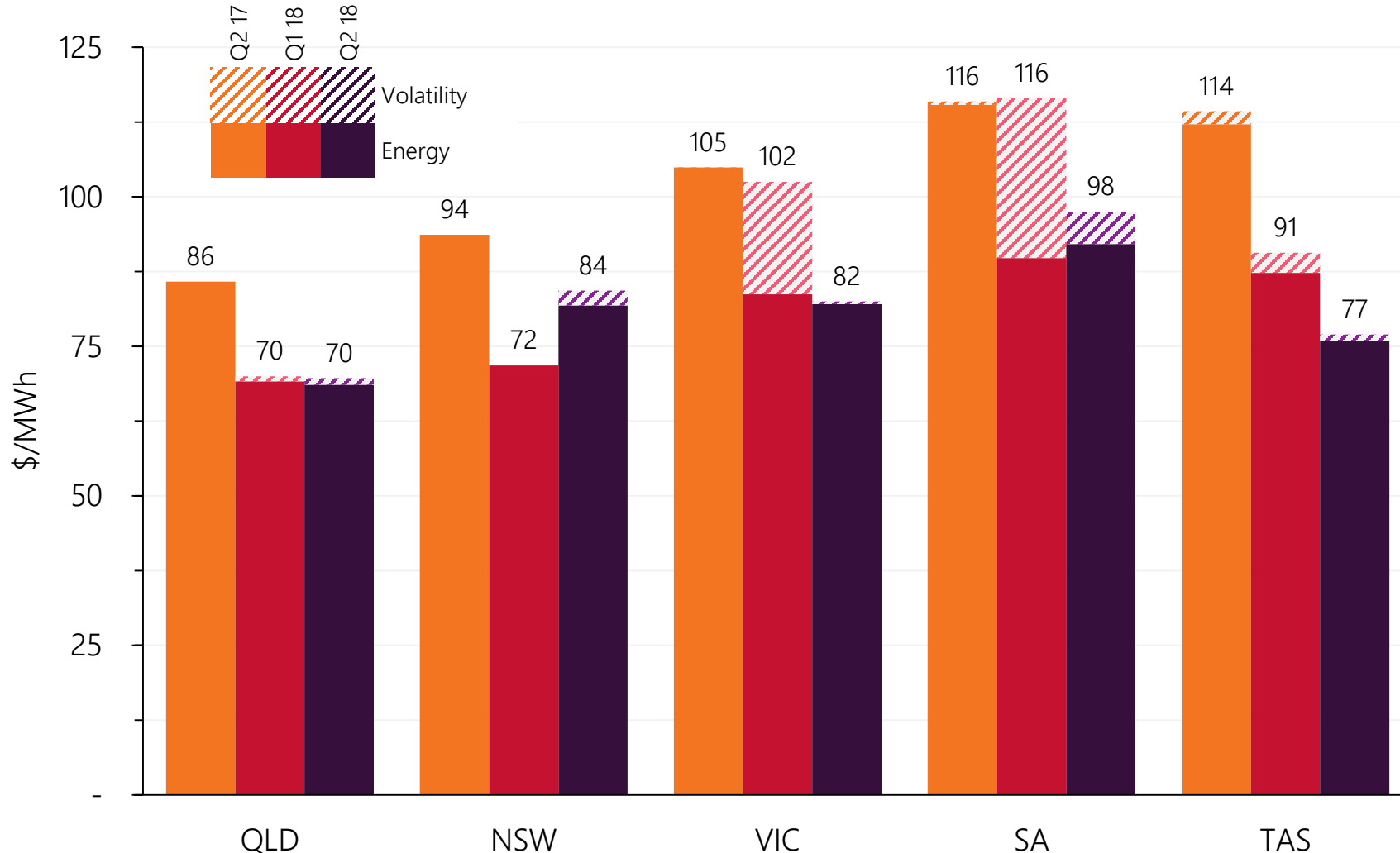
### **C** New entrants in the NEM over Q2

Region	New entrant	Capacity (MW)	Fuel Source
NSW	Manildra Solar Farm	47	Solar PV
	Silverton Wind Farm	193	Wind
	Griffith Solar Farm	27	Solar PV
QLD	Clare Solar Farm	100	Solar PV
	Sun Metals Solar Farm	107	Solar PV
	Longreach Solar Farm	14	Solar PV
SA	Bungala One Solar Farm	110	Solar PV
VIC	Gannawarra Solar Farm	50	Solar PV
	Salt Creek Wind Farm	132	Wind
	Mt Gellibrand Wind Farm	50	Solar PV



# Wholesale electricity prices decrease across the NEM

Wholesale electricity prices by region

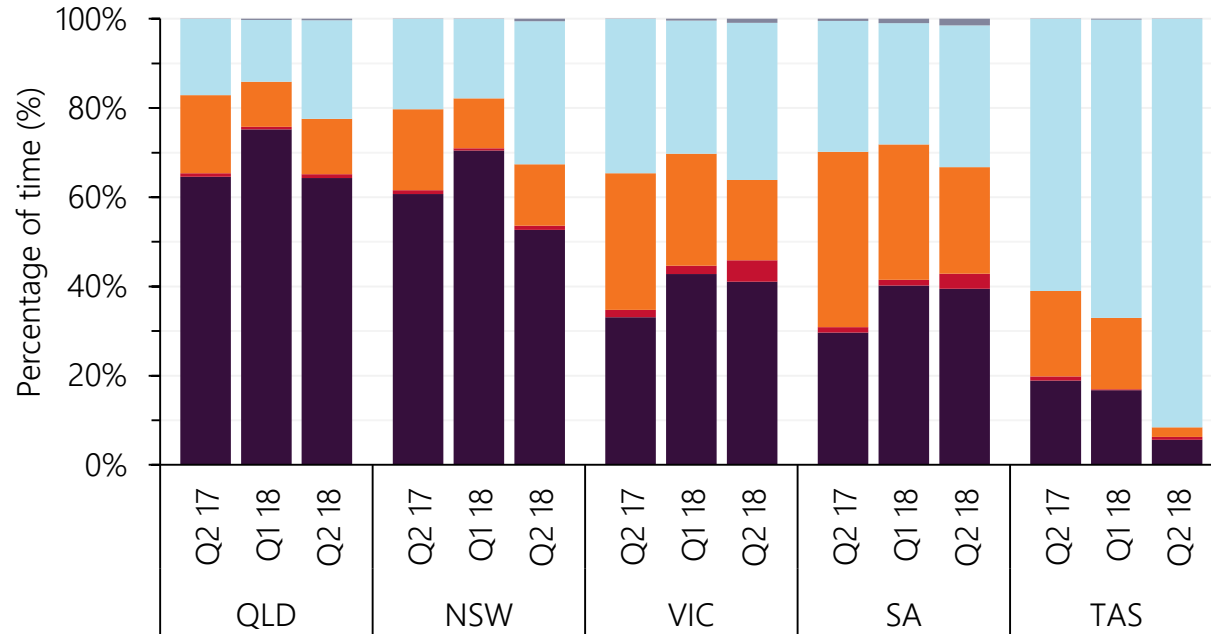


Prices reduce across most markets compared to Q1 2018

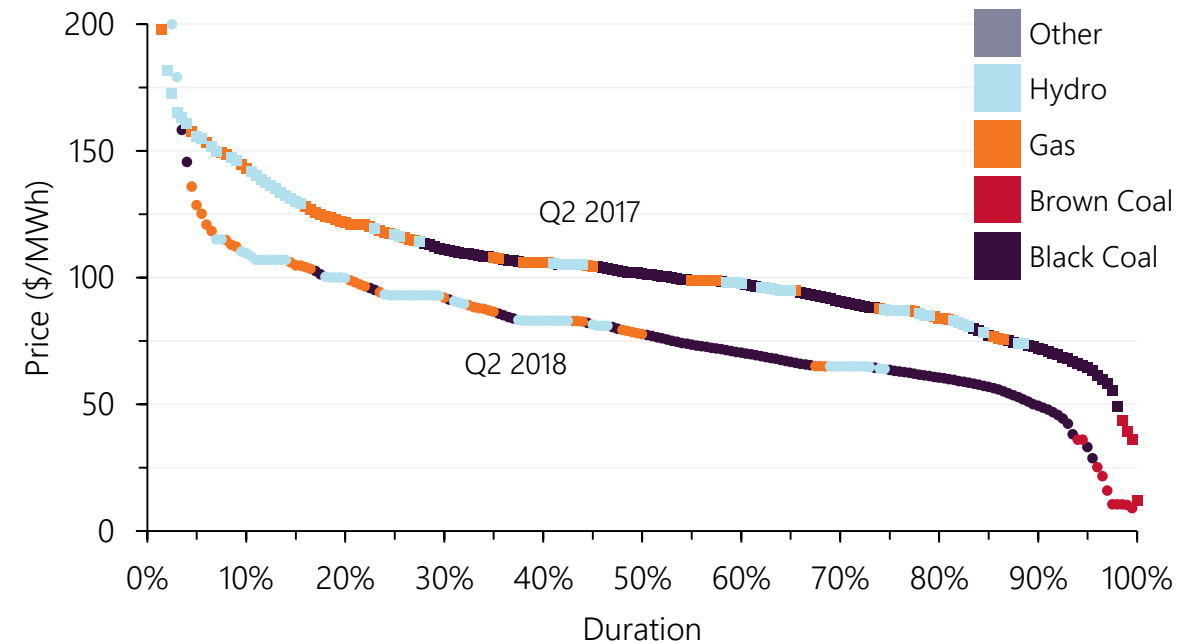
- A Mostly small movements in underlying energy prices – large reductions in price volatility in the southern regions
- B Increased hydro – an additional ~900 MW offered at prices below \$100/MWh
- C NSW: prices increased by \$10/MWh influenced by a ~1,250 MW reduction in average black coal generator availability and resulting price volatility

# Price setting dynamics

Price setting by fuel type



Price setting duration curve by fuel type (VIC)

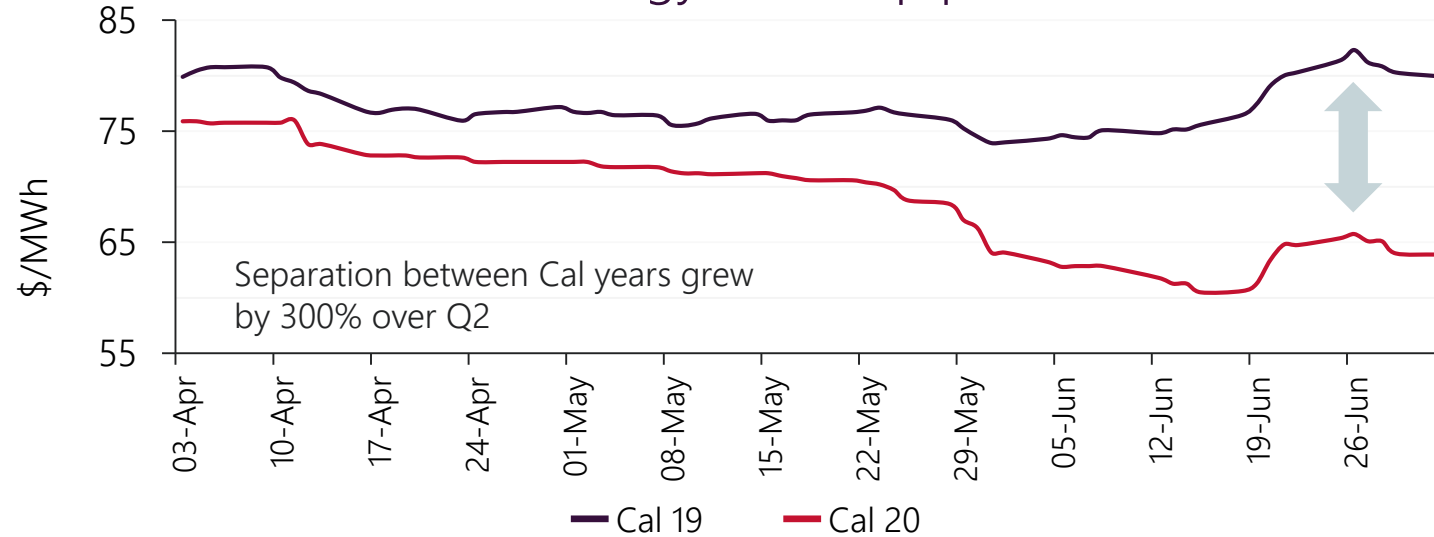


## Key trends

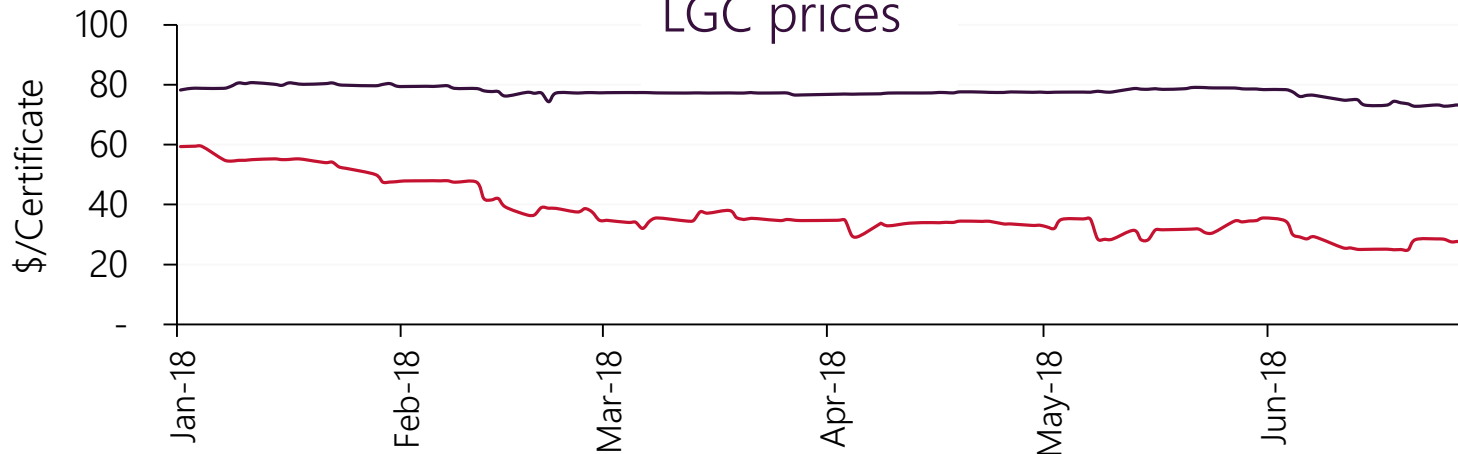
- A Large increase in price setting by hydro – a function of increased generation and availability at lower prices. In TAS local hydro setting price more than 88% of the time due to the Basslink outage
- B Decline in GPG price setting role across all regions, reflecting reduced output
- C Mixed price setting trends for coal. Some reductions in black coal's price setting role, but still set the price most often in all mainland NEM regions. Brown coal price setting increased, largely during high wind periods

# Electricity futures: Price spread emerges between 2019 and 2020

ASX Energy VIC swap prices



LGC prices

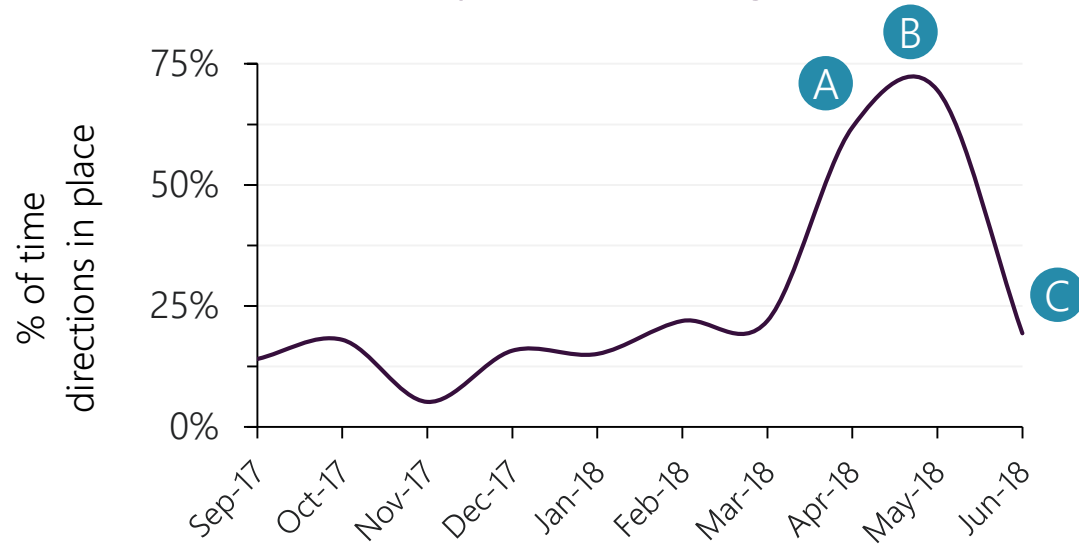


## Electricity futures and environmentals

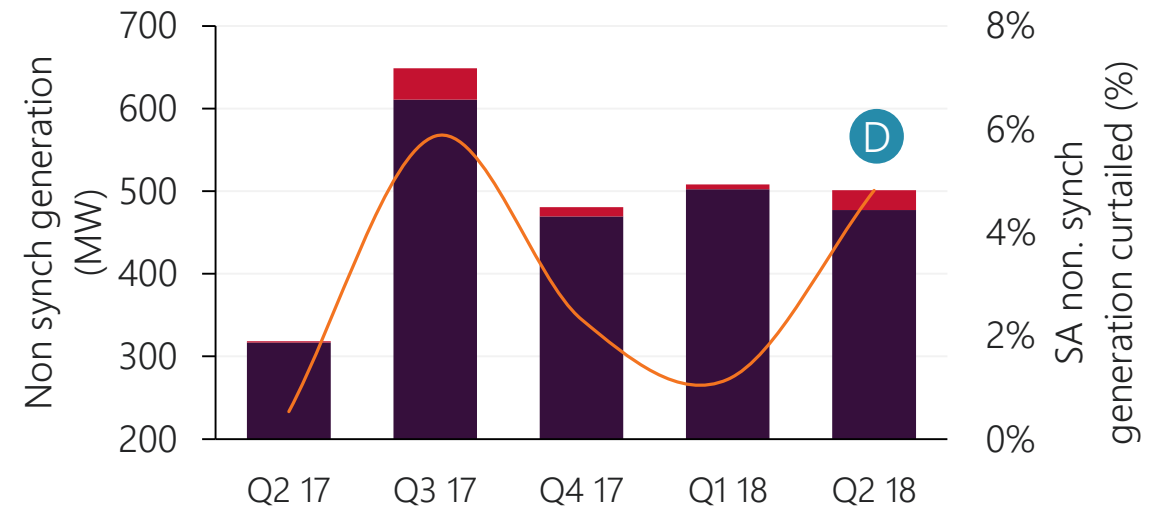
- A Swaps remain in backwardation but prices rebounded in NSW and VIC
- B Growing separation between Cal 19 and 20 swaps in NSW, QLD and VIC. The VIC 2019, 2020 price difference increased from \$4 to \$16
- C Q1 19 cap prices up an avg of 16% with the largest increases in VIC (+28%) and NSW (+22%)
- D LGC spot and forward prices continue to fall reflecting growing supply expectations from new large-scale renewable build

# SA directions continue to increase

Directions for systems strength in SA



Non-synchronous generation curtailed in SA

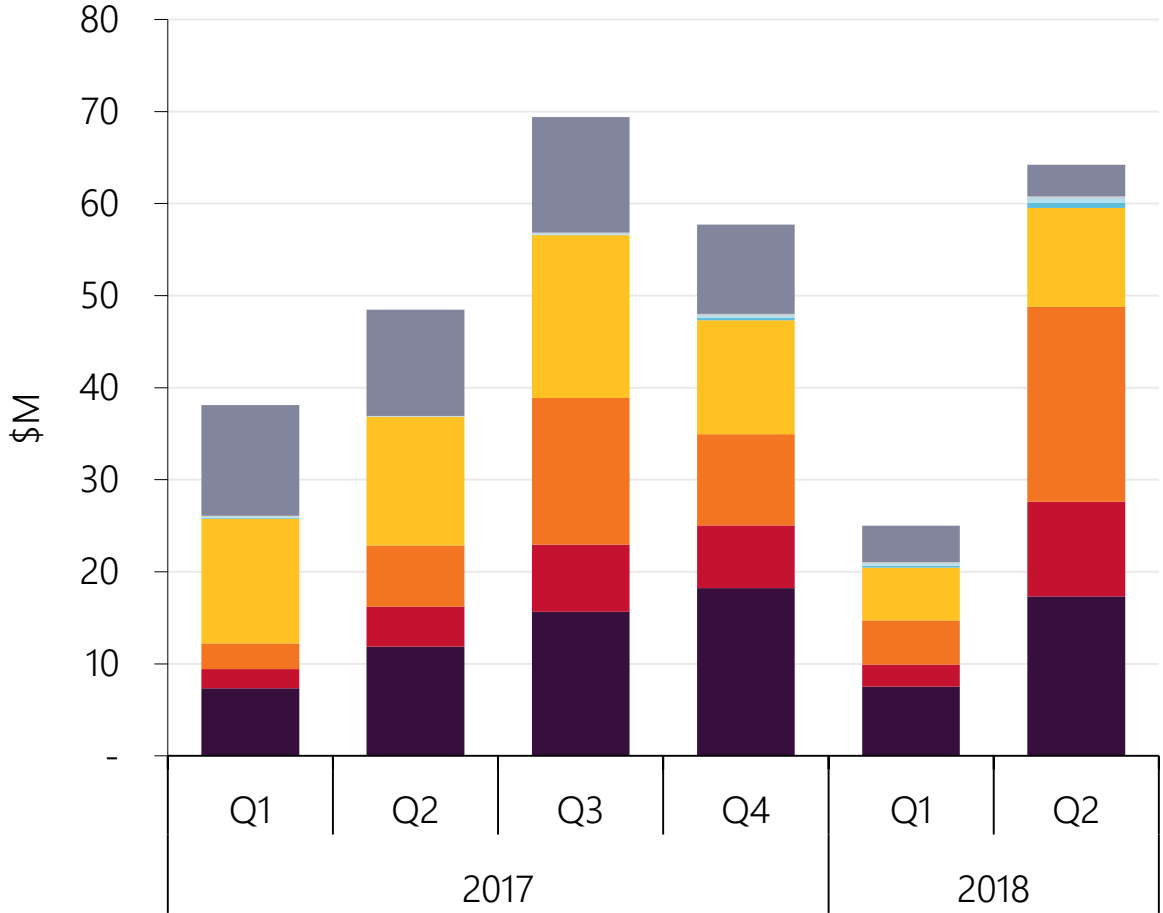


## Directions and curtailments for system strength

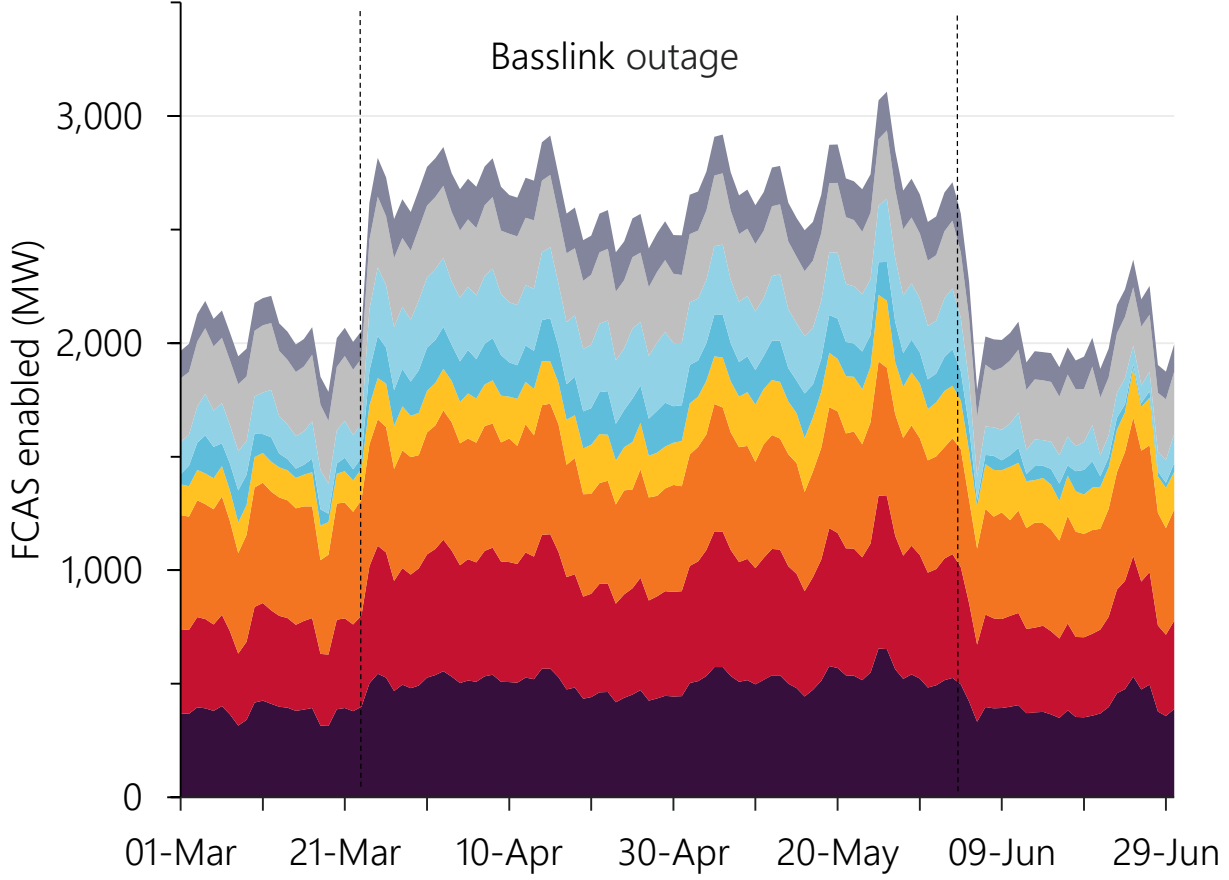
- A** Directions in place for ~65% of time during April and May driven by high wind, low operational demand and generator outages (including Pelican Point CCGT)
- B** Largest continuous direction on record ~502 hours from 23 April to 14 May
- C** Return to service of Pelican Point and higher availability from TIPSA and TIPSB
- D** Increase in curtailments of non-synchronous generation in South Australia

# Basslink outage drives FCAS price rebound

Quarterly FCAS costs increase by 157%



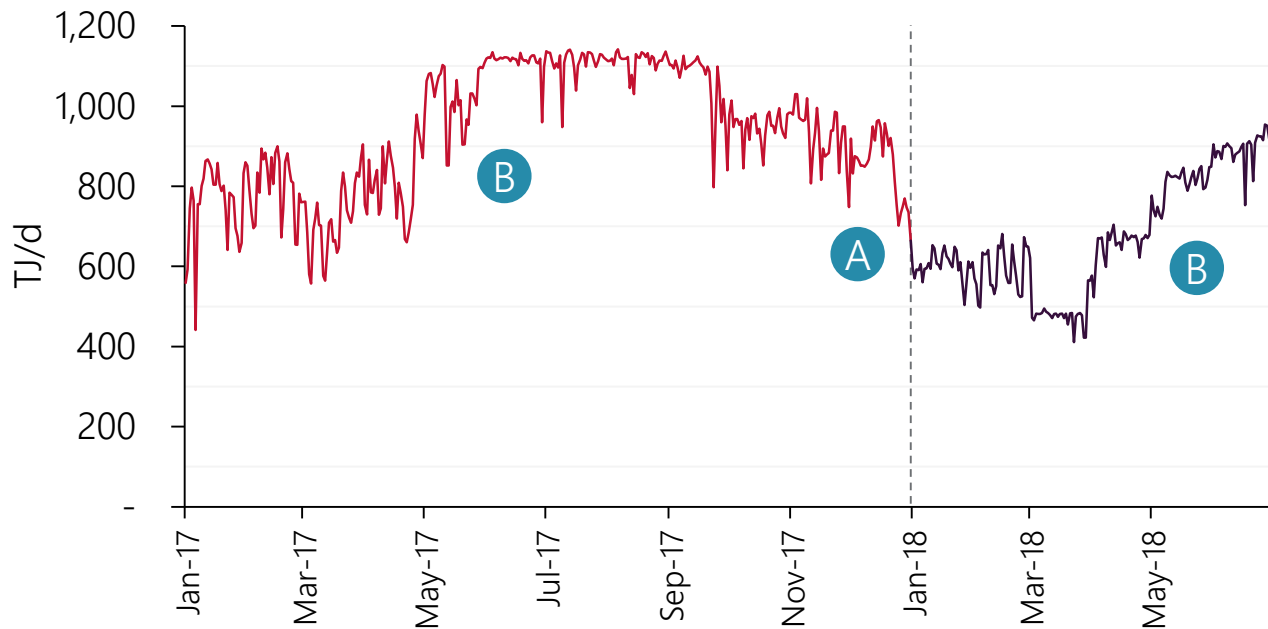
Basslink outage: FCAS demand increases by 23%



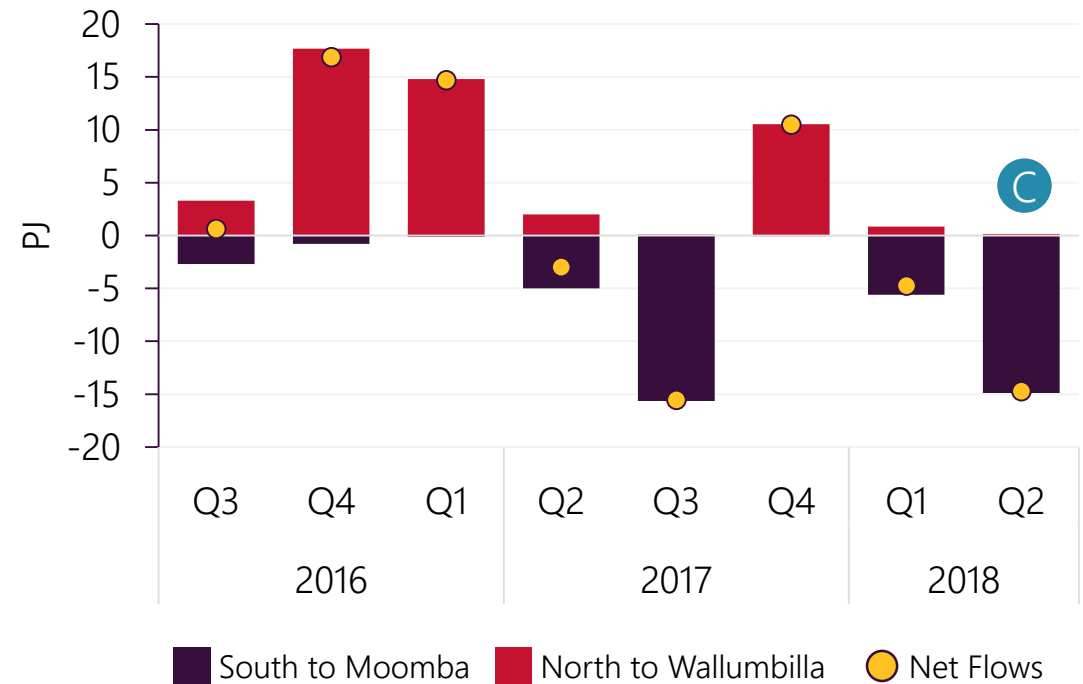
Raise 6sec
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# QLD gas continues to support southern demand

Seasonality of Longford production continues in 2018



SWQP flowing south to meet demand

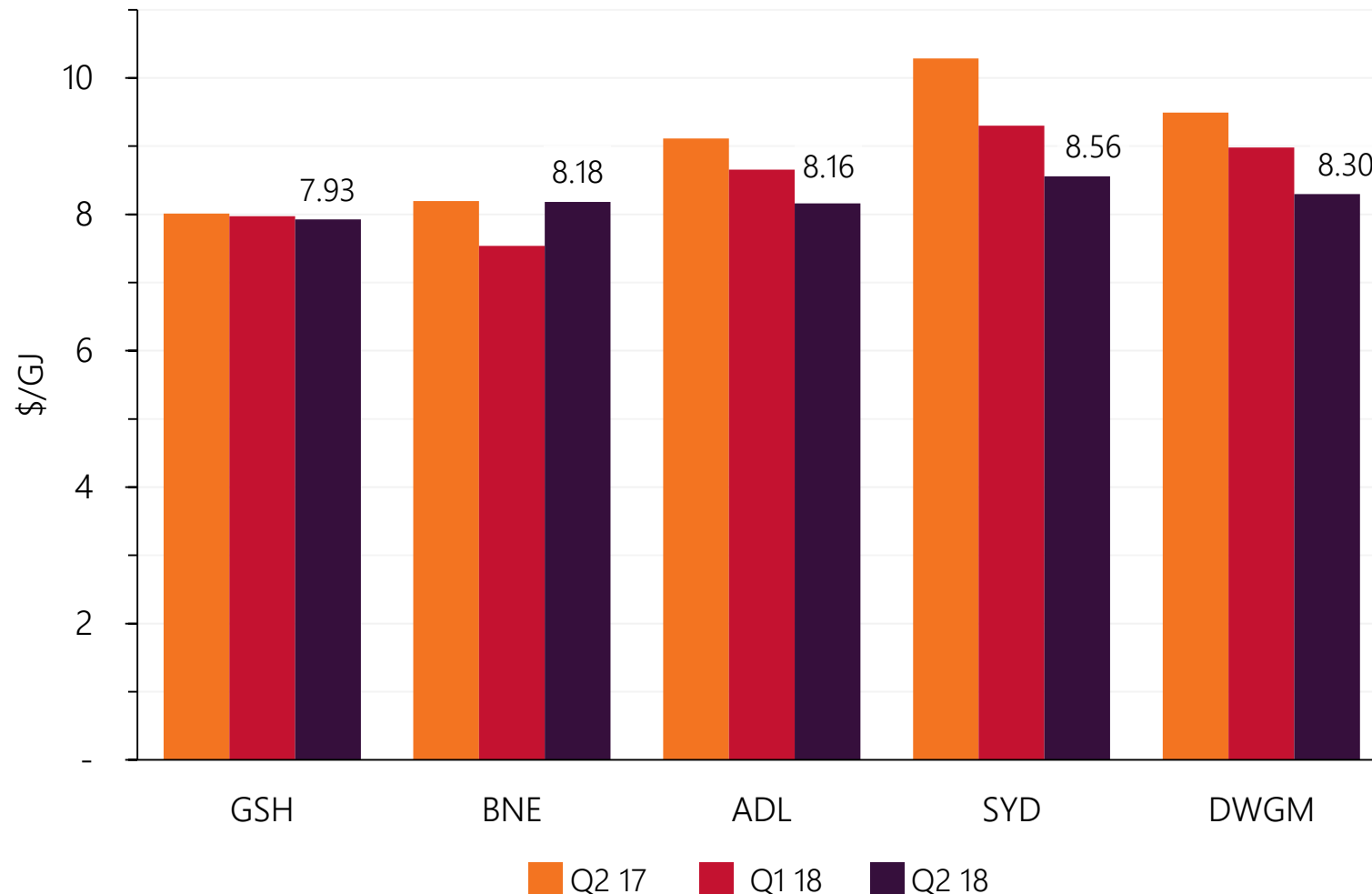


## SWQP flows south

- A Longford production decreased from the record levels of 2017 – down in Q1 and Q2 2018
- B Seasonal production driven by contractual load profiles that increase in line with heating requirements during the cooler months
- C SWQP sent QLD gas almost exclusively south during Q2, despite increased quarterly Longford production compared to Q1

# Lower GPG demand contributes to lower gas prices

Average wholesale gas price by trading market

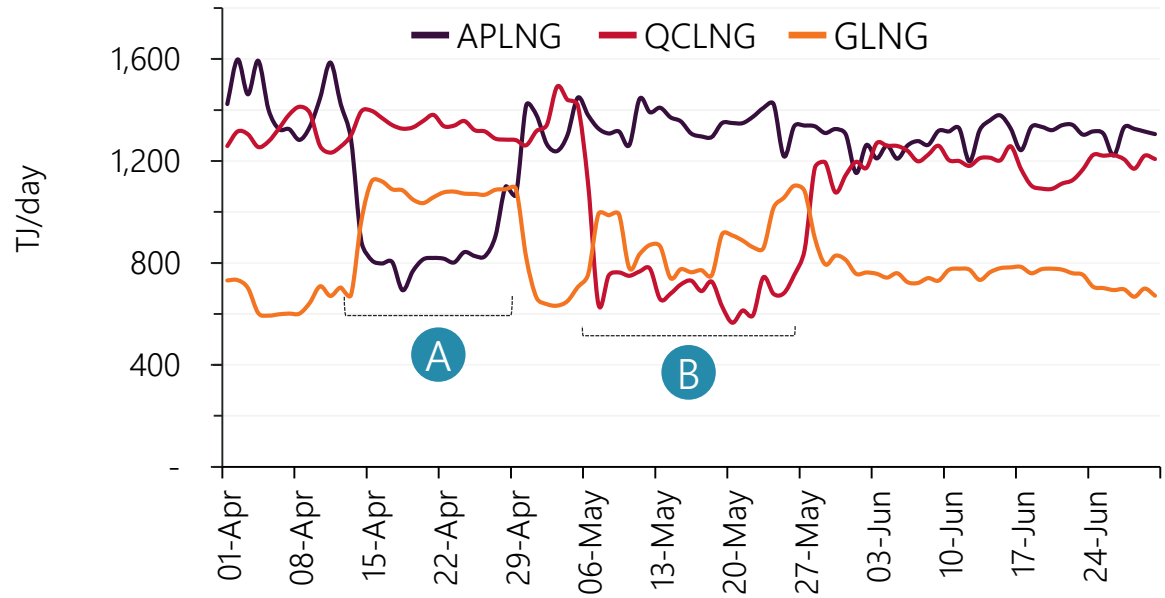


Gas price movements

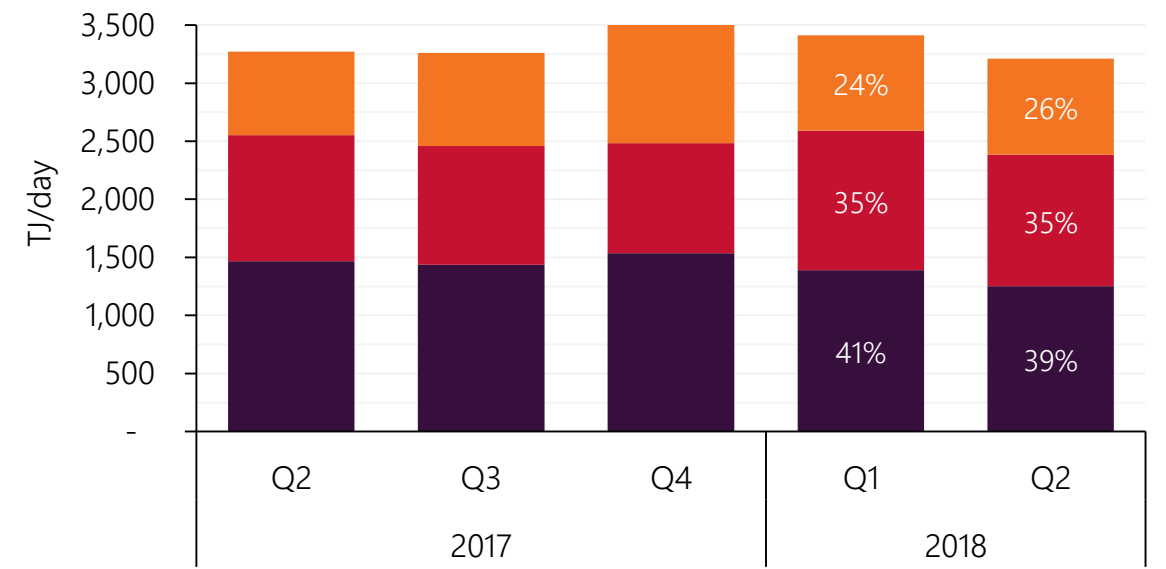
- A Prices decreased in most markets compared to Q1 2018
- B Largest quarterly price reductions recorded on the SYD STTM (-\$0.74/GJ) and VIC DWGM (-\$0.69/GJ)
- C 388 MW reduction in quarterly GPG demand compared to Q1 2018 eases pressure on gas prices
- D Maintenance on LNG facilities disrupted usual trading as the GSH recorded its second highest ever monthly delivered volume during May 2018 of 1,524 TJ

# Planned maintenance reduces pipeline flows and LNG exports

LNG Pipeline dynamics change during maintenance



LNG Pipeline dynamics change during maintenance



## Pipeline flows to Curtis Island reduced during Q2

- A APLNG planned maintenance at their LNG facility and reduced gas production from the Combabula and Talinga gas plants. Increase in corresponding GLNG pipeline flows to Curtis Island
- B QCLNG planned maintenance at their LNG facility and Woleebee Creek gas plant. Increase in corresponding GLNG pipeline flows to Curtis Island
- C Compared to Q1, average daily flows reduced during the quarter by ~200 TJ/d as 2 fewer LNG cargoes were exported compared to Q1 2018 (73 in Q2 v 75 Q1)



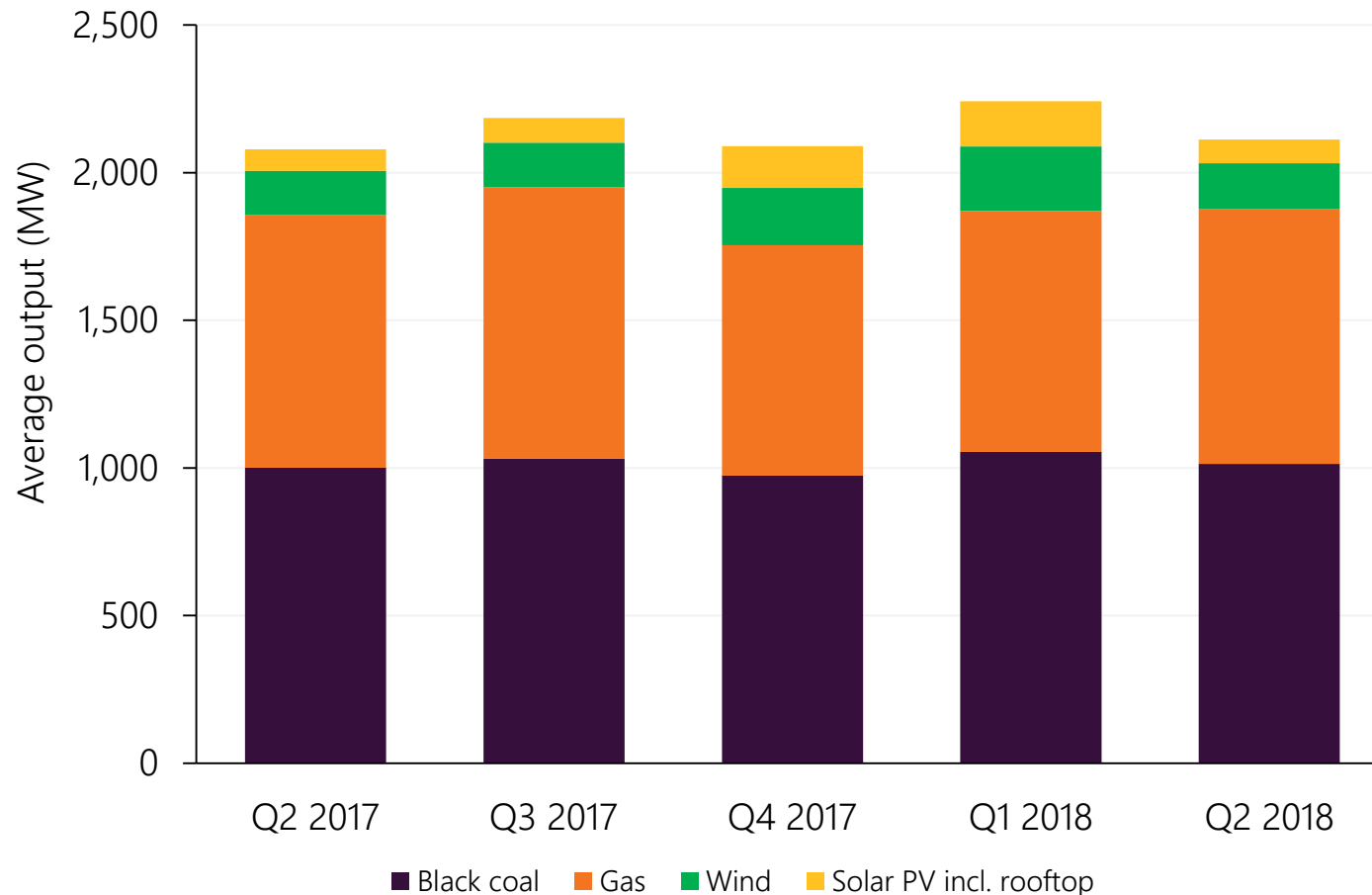


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AUSTRALIAN ENERGY MARKET OPERATOR

# WEM generation and fuel mix: coal and gas still dominant

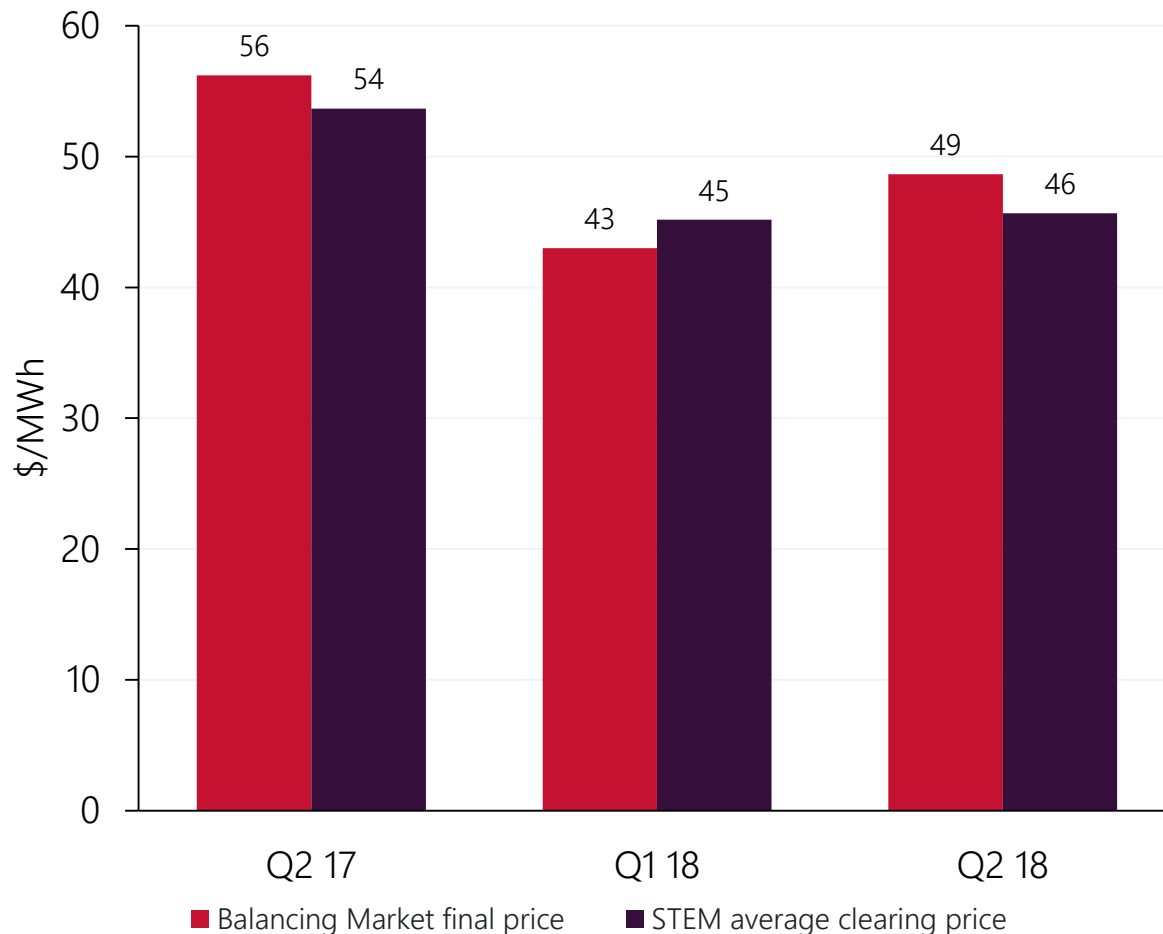
WEM supply mix



- Dominated by black coal and gas, followed by wind and solar PV.
- Q2 2018 consumption has remained in line with Q2 2017.
- Solar PV values in Q2 2018 were lower than Q1 2018 due to decreased output from rooftop solar PV due to weather patterns. Installed distributed solar PV continues to increase.

# WEM prices decrease in Q2

WEM wholesale electricity prices

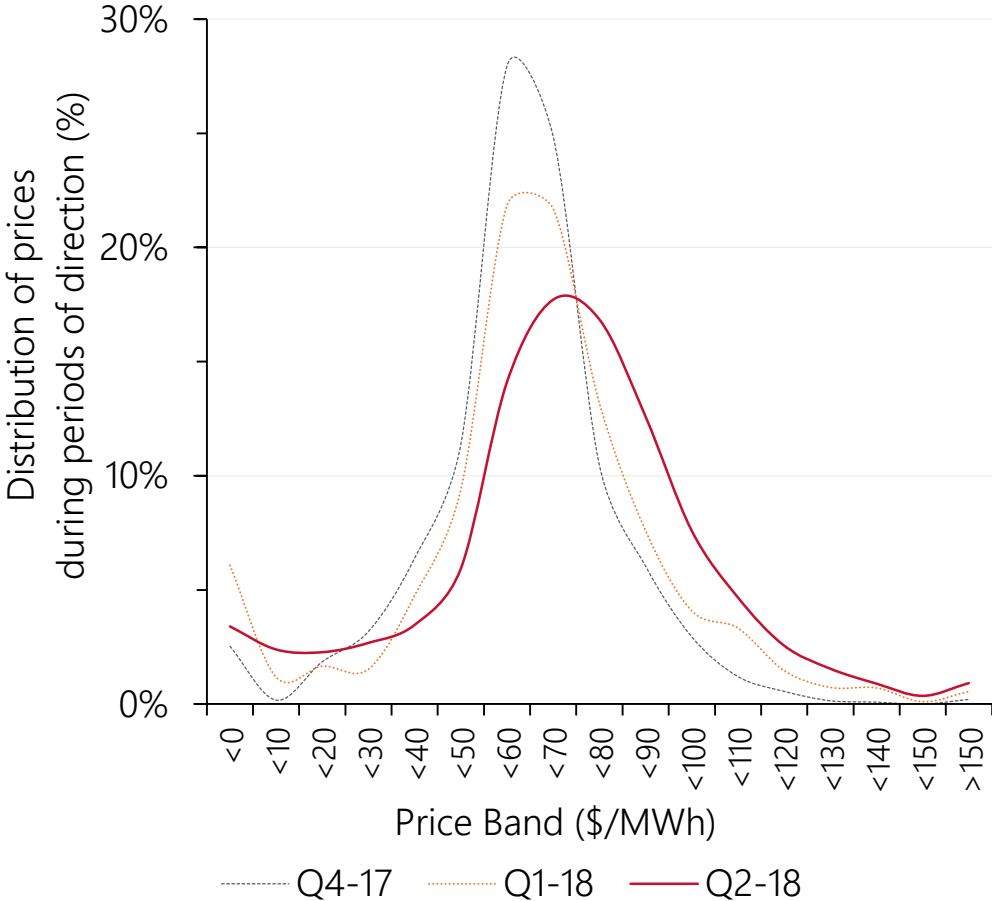


## Q2 2018 vs Q2 2017

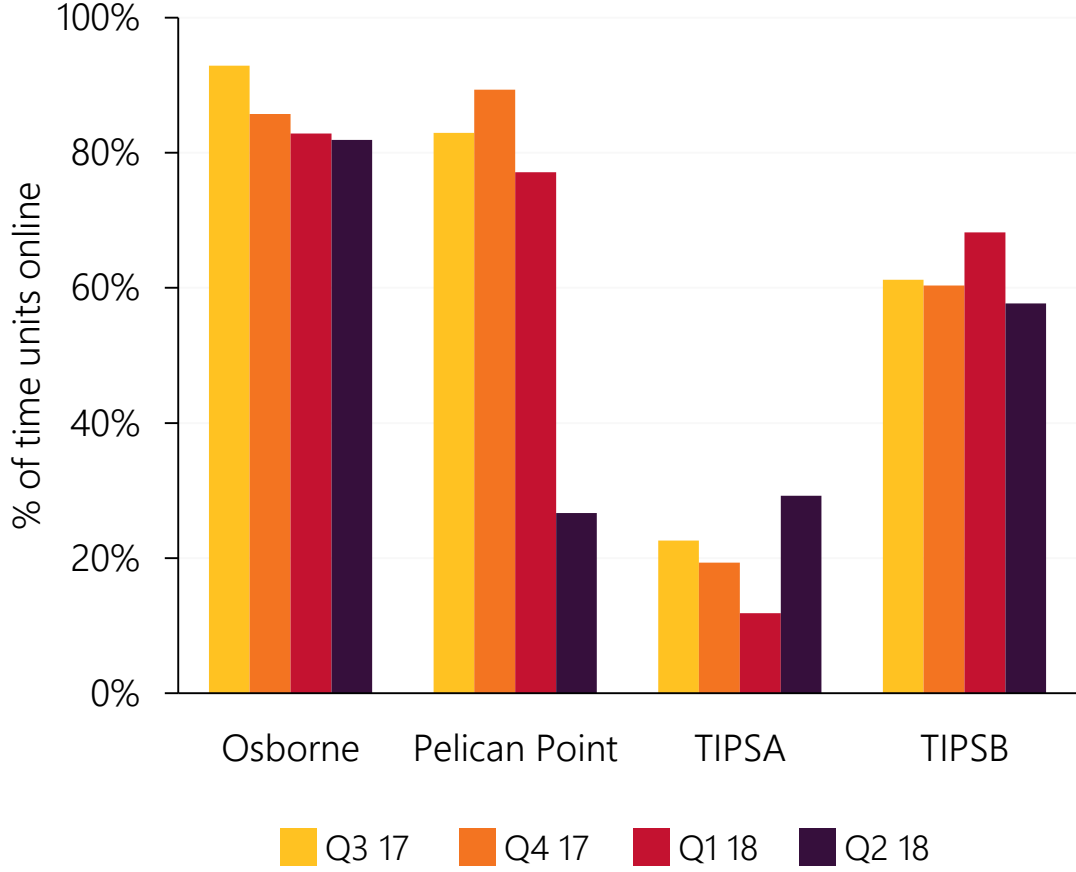
- Average prices in both the Short Term Energy Market (STEM) and Balancing Market were lower in Q2 2018 compared to Q2 2017.
- Fewer outages in Q2 2018 with increased availability of lower cost generation.
- Synergy Balancing Portfolio set the Balancing Market price for 71% of the trading intervals in Q2 2018, compared to 84% of the trading intervals in Q2 2017.
- Quantity traded bilaterally in Q2 2018 (26%) was 2% higher than in Q2 2017 with a corresponding decrease of 2% in the quantity traded in STEM (12%).

# Directions (2)

Dispatch prices during periods of direction

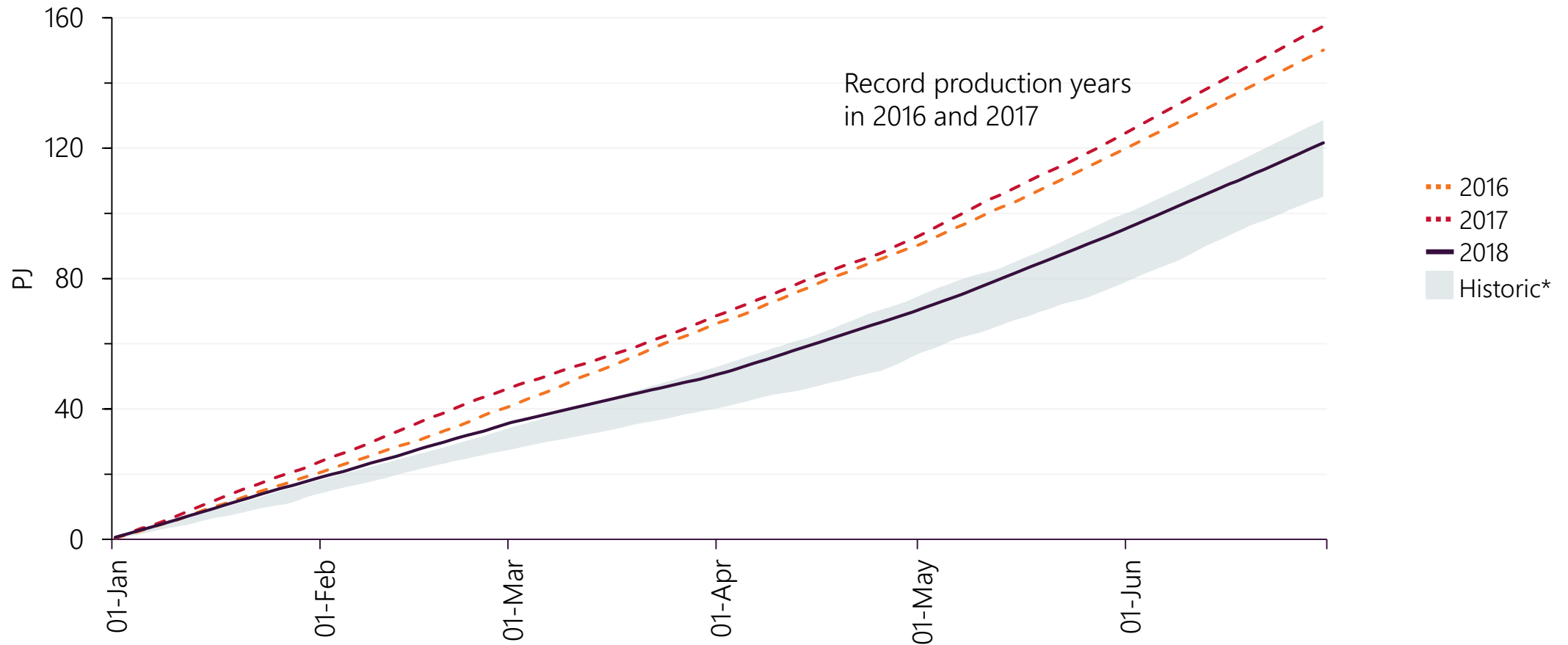


SA synchronous generation online



# Longford (2)

Longford cumulative production



# Gas production

Production by gas plant

