

# SUMMER 2020

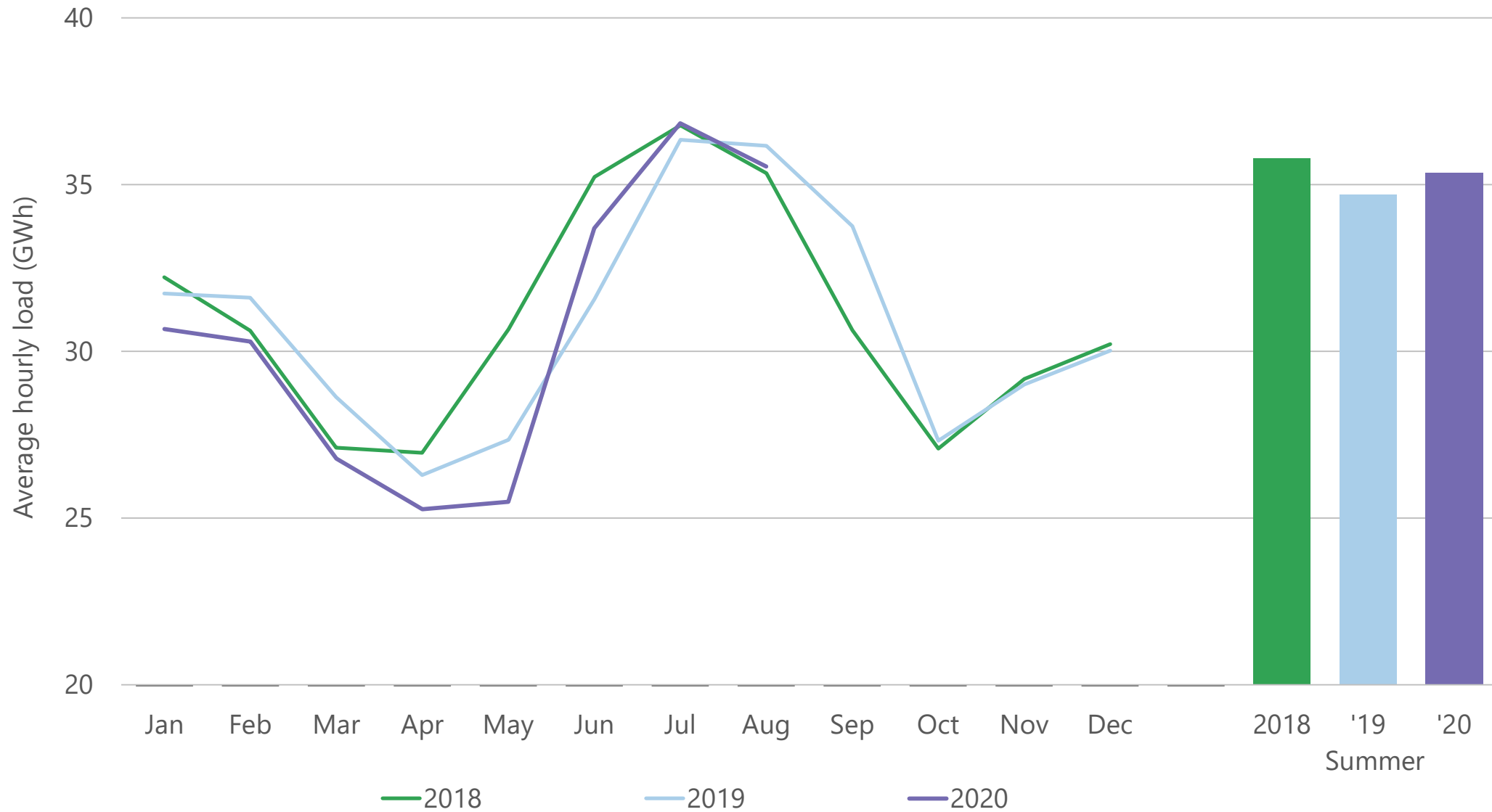
## QUARTERLY REPORT



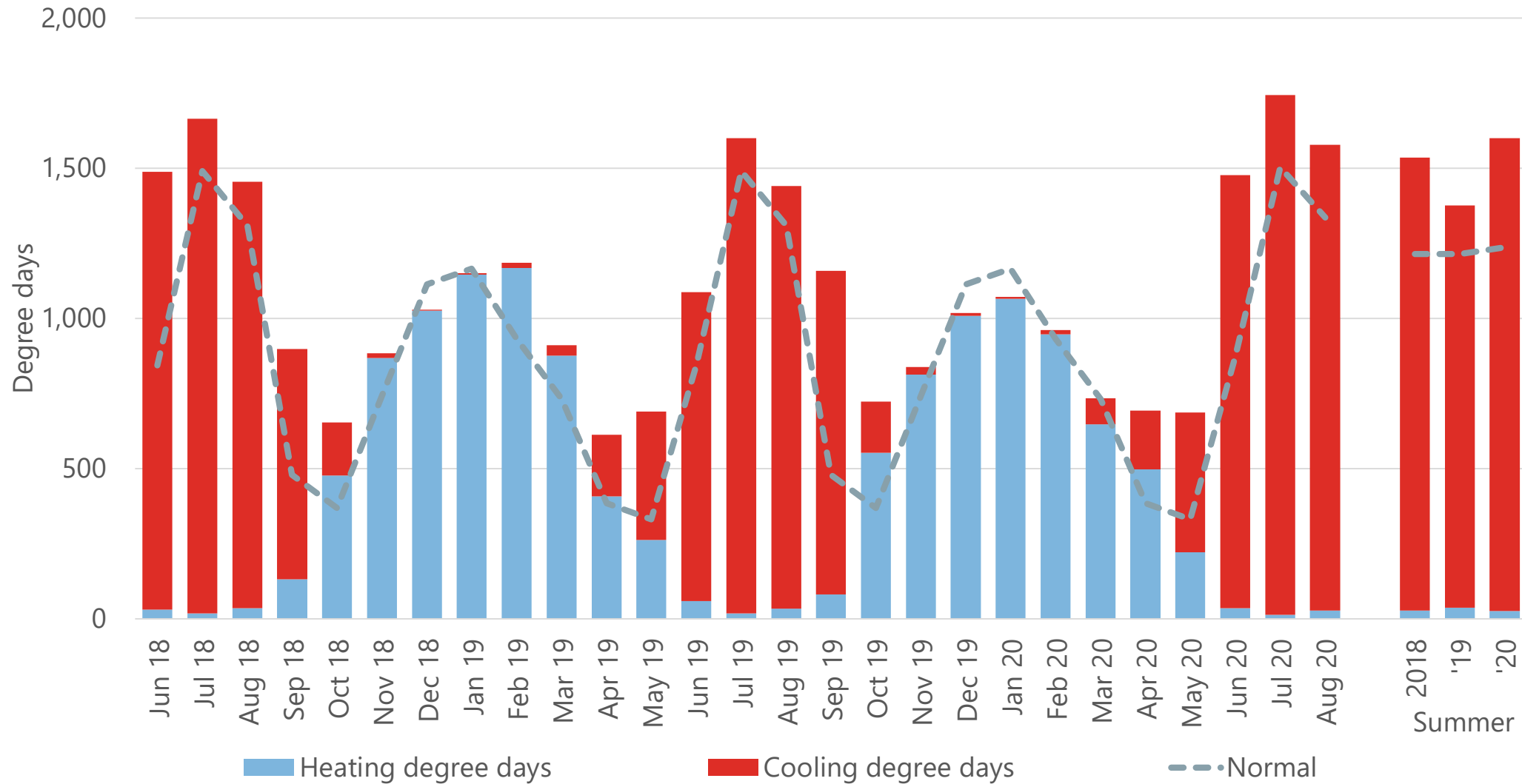
# SUMMER 2020 HIGHLIGHTS

- Overall, load and generation were up slightly from 2019. Much of the increase can be attributed to warmer weather.
- Generation by coal resources continued to decline, while generation by wind resources continued to increase.
- Offered capacity in market commitment status was 75 percent of the total, while self-commitment status was 23 percent.
- Average day-ahead and real-time energy prices were both down 12 percent from 2019, while gas price was up 7 percent.
- Most congested areas were located in the Kansas City area.
- The special issues section discusses MMU involvement in the SPP planning process.

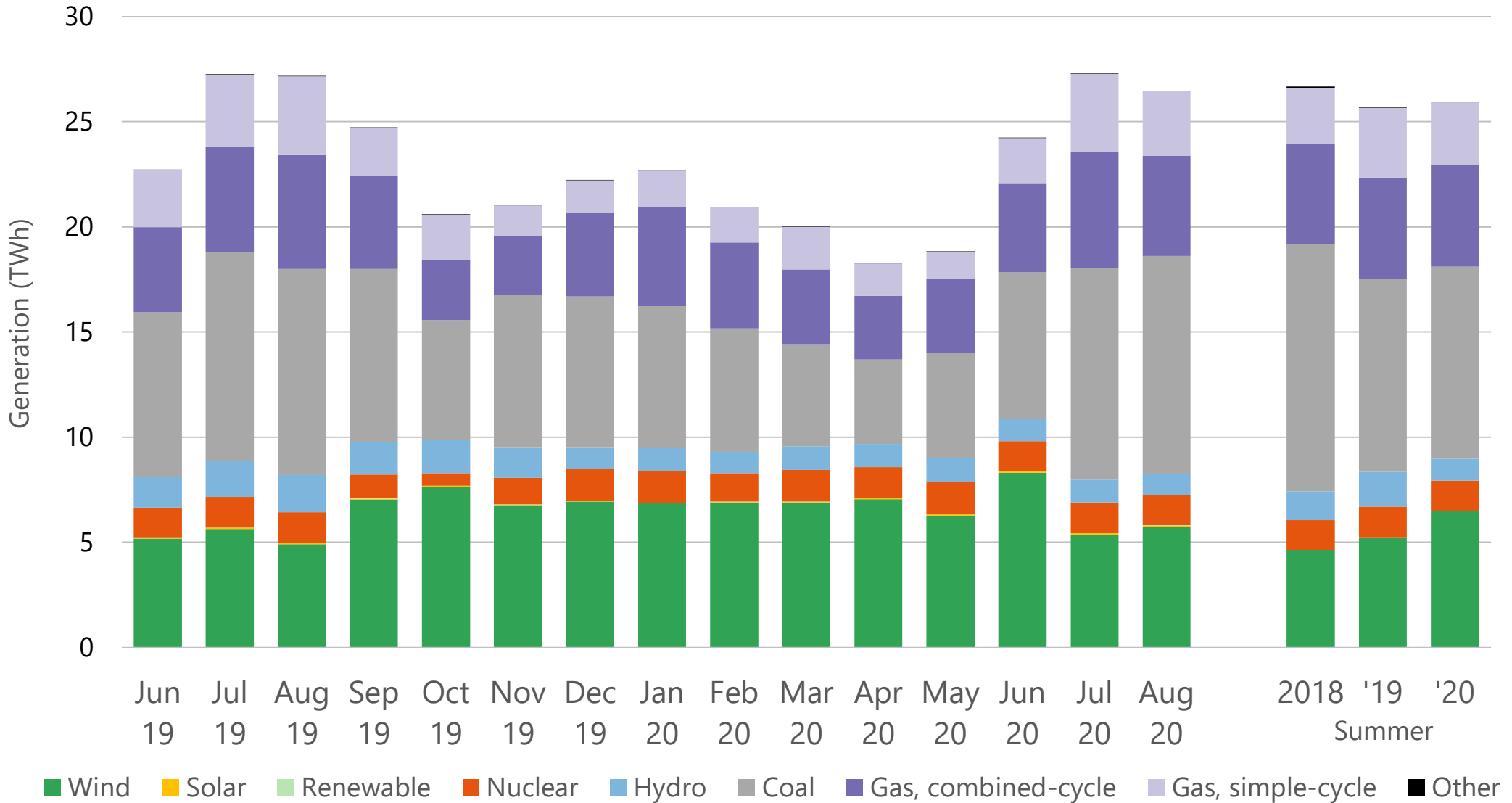
# OVERALL LOAD UP SLIGHTLY



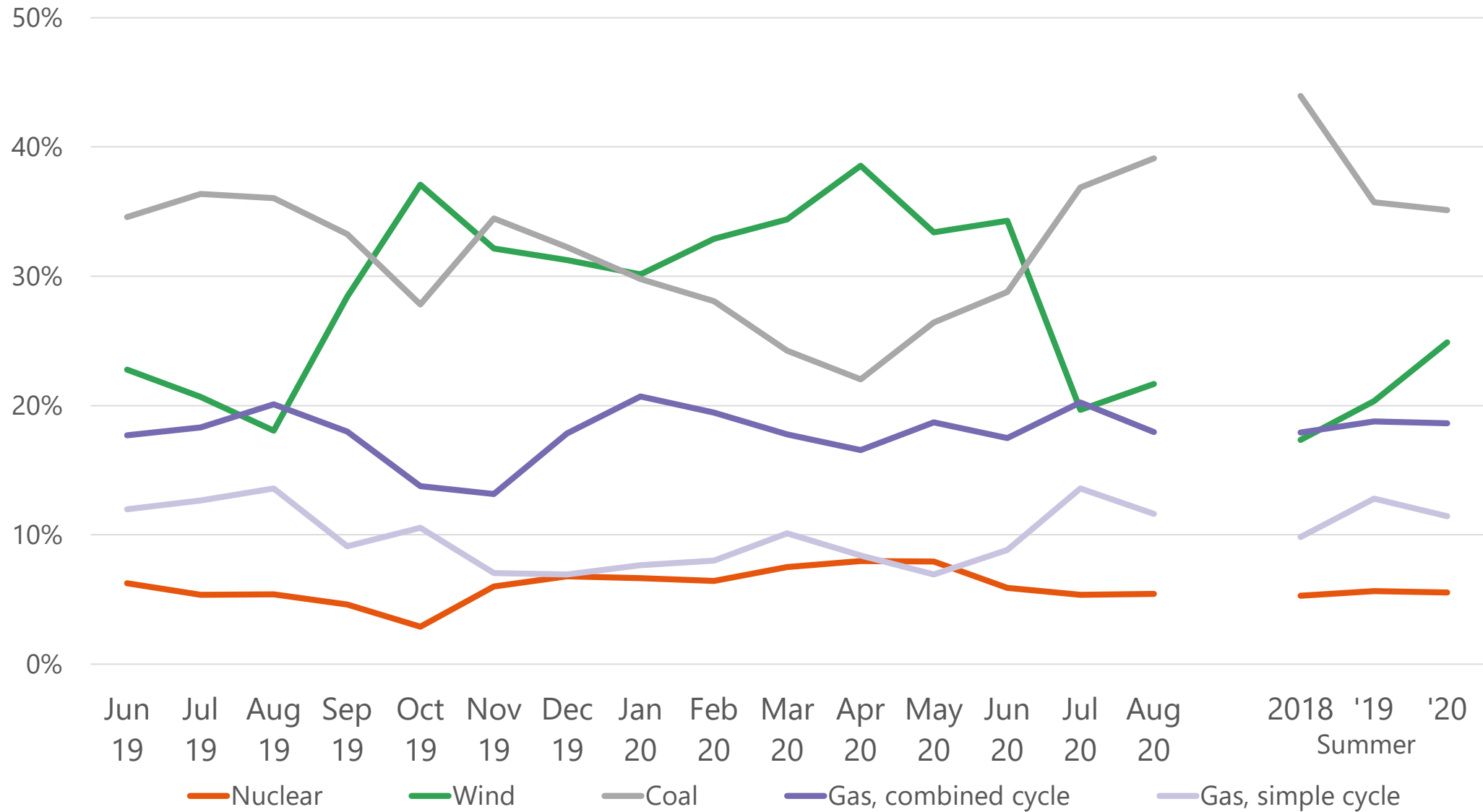
# TEMPERATURES WERE WARMER



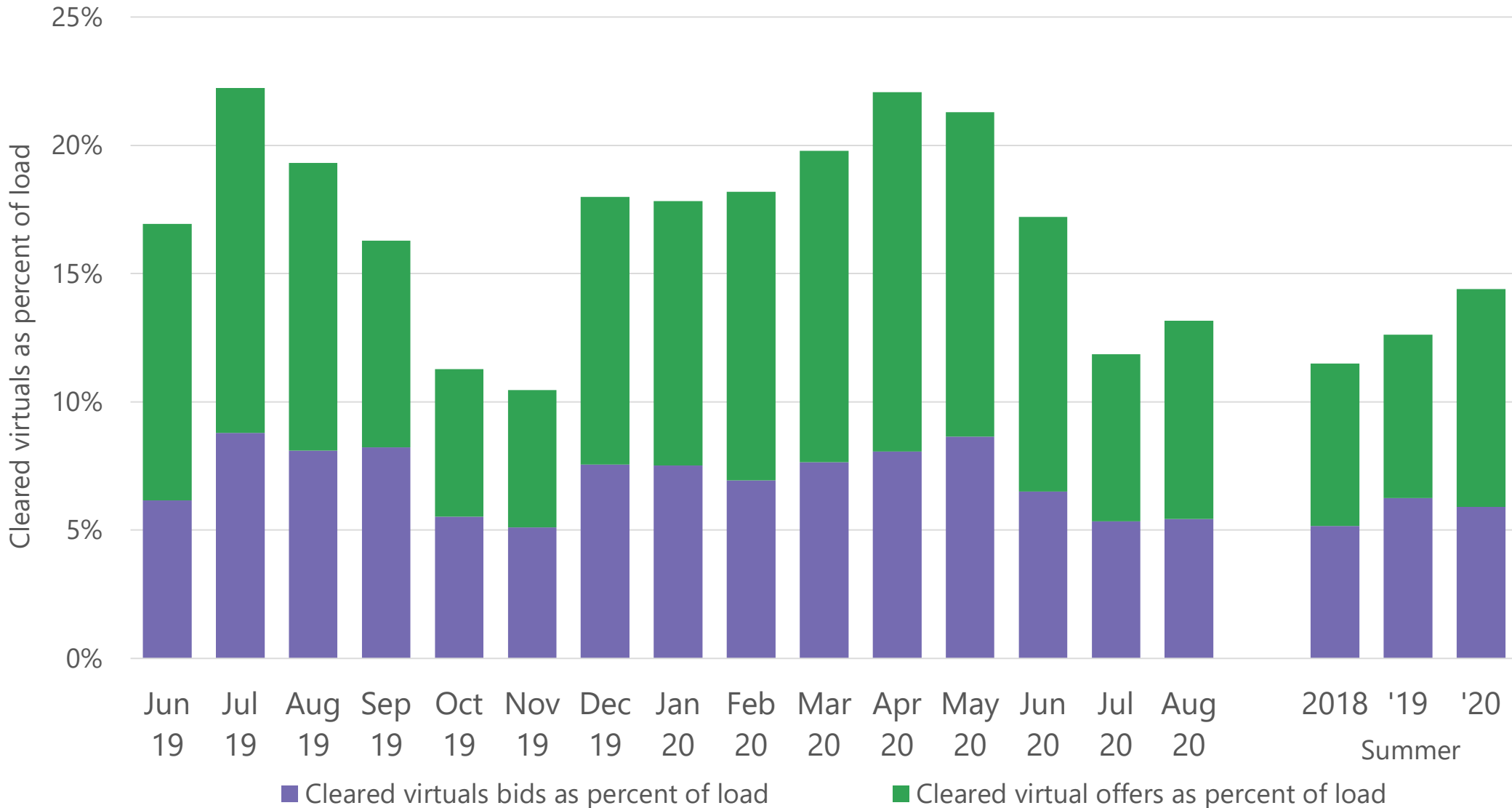
# GENERATION WAS UP SLIGHTLY



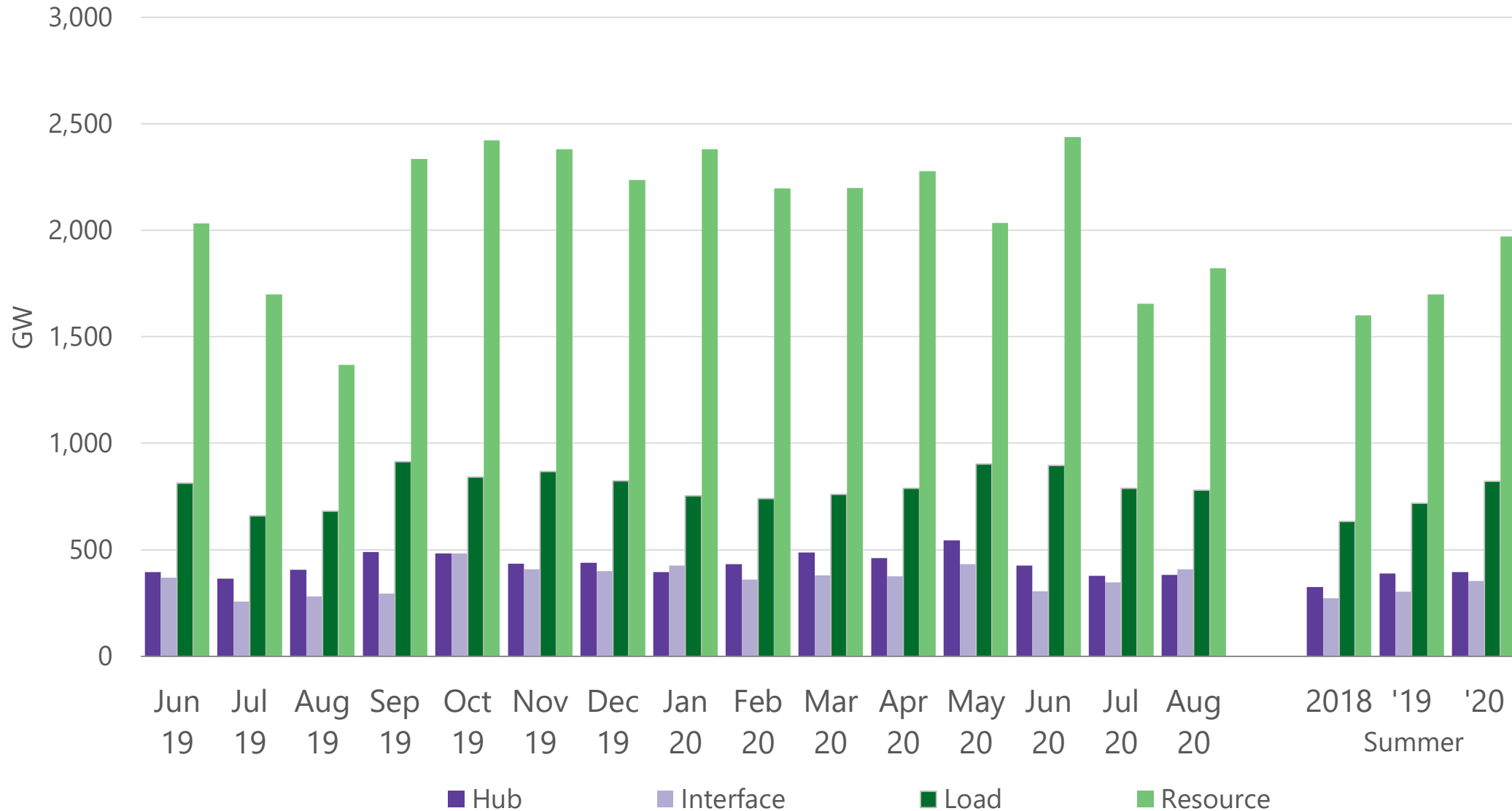
# COAL HAD HIGHEST GENERATION BY FUEL TYPE



# VIRTUAL TRANSACTIONS CONTINUED TO GROW

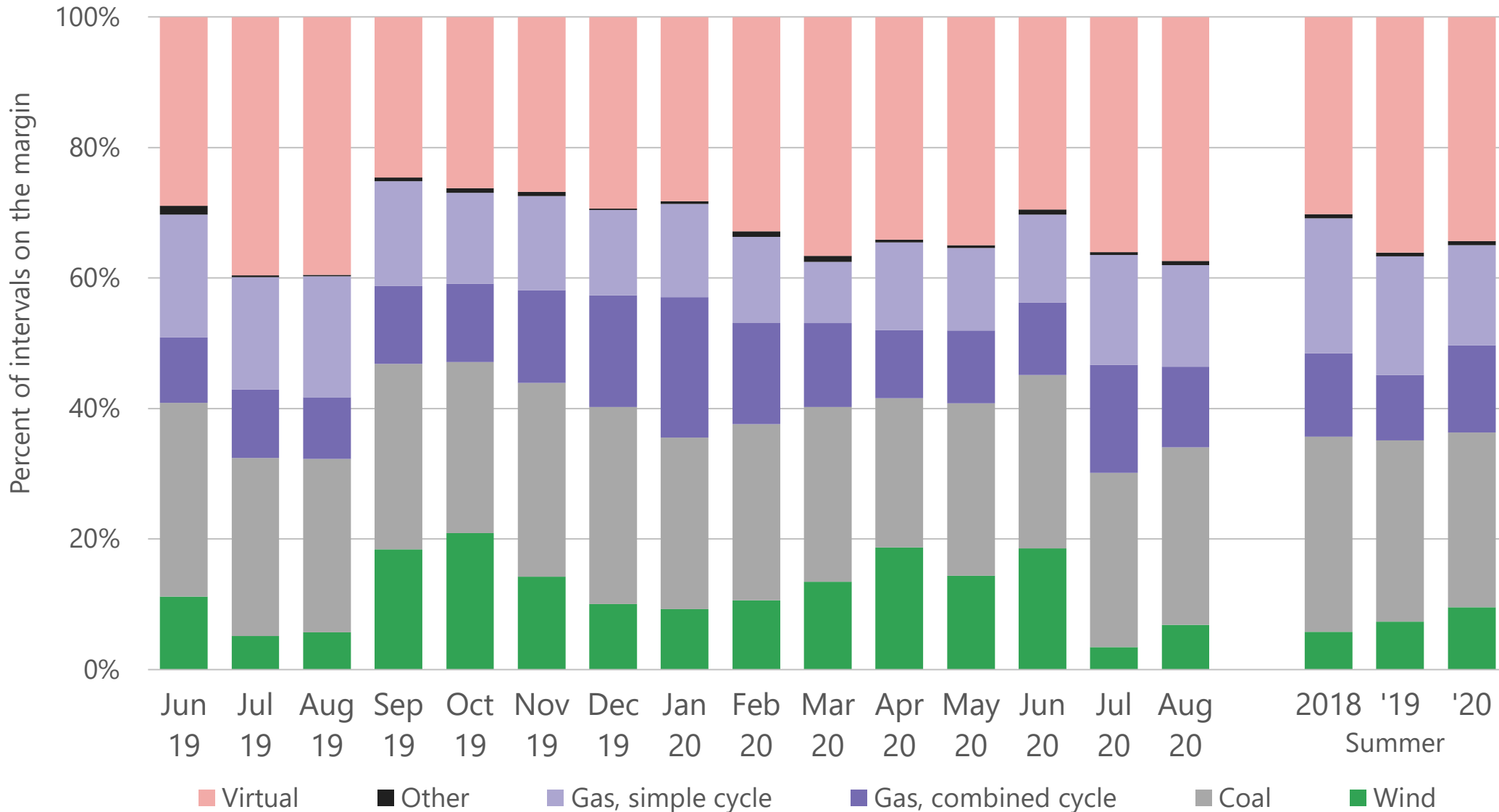


# MOST VIRTUALS AT RESOURCE LOCATIONS

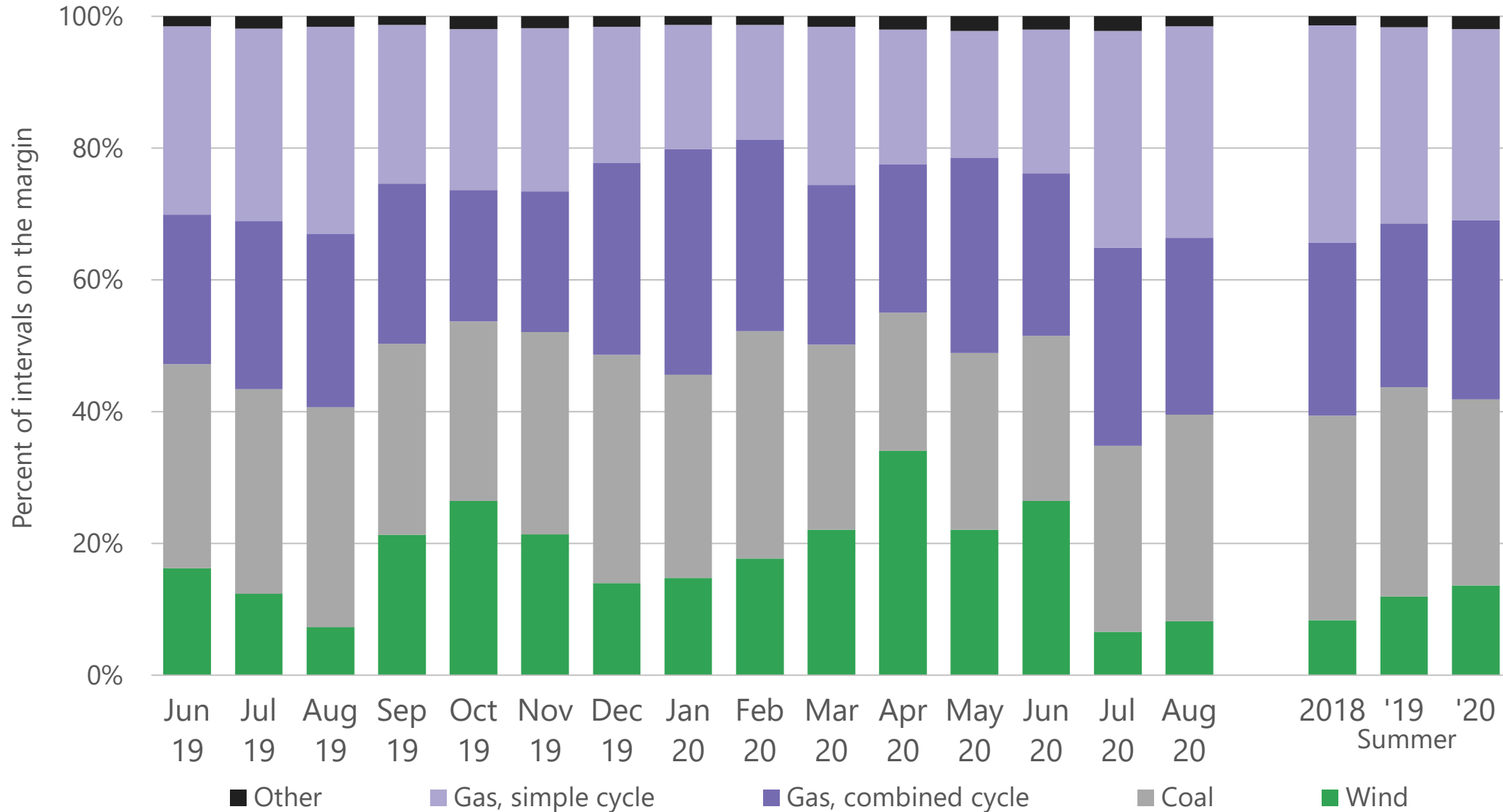




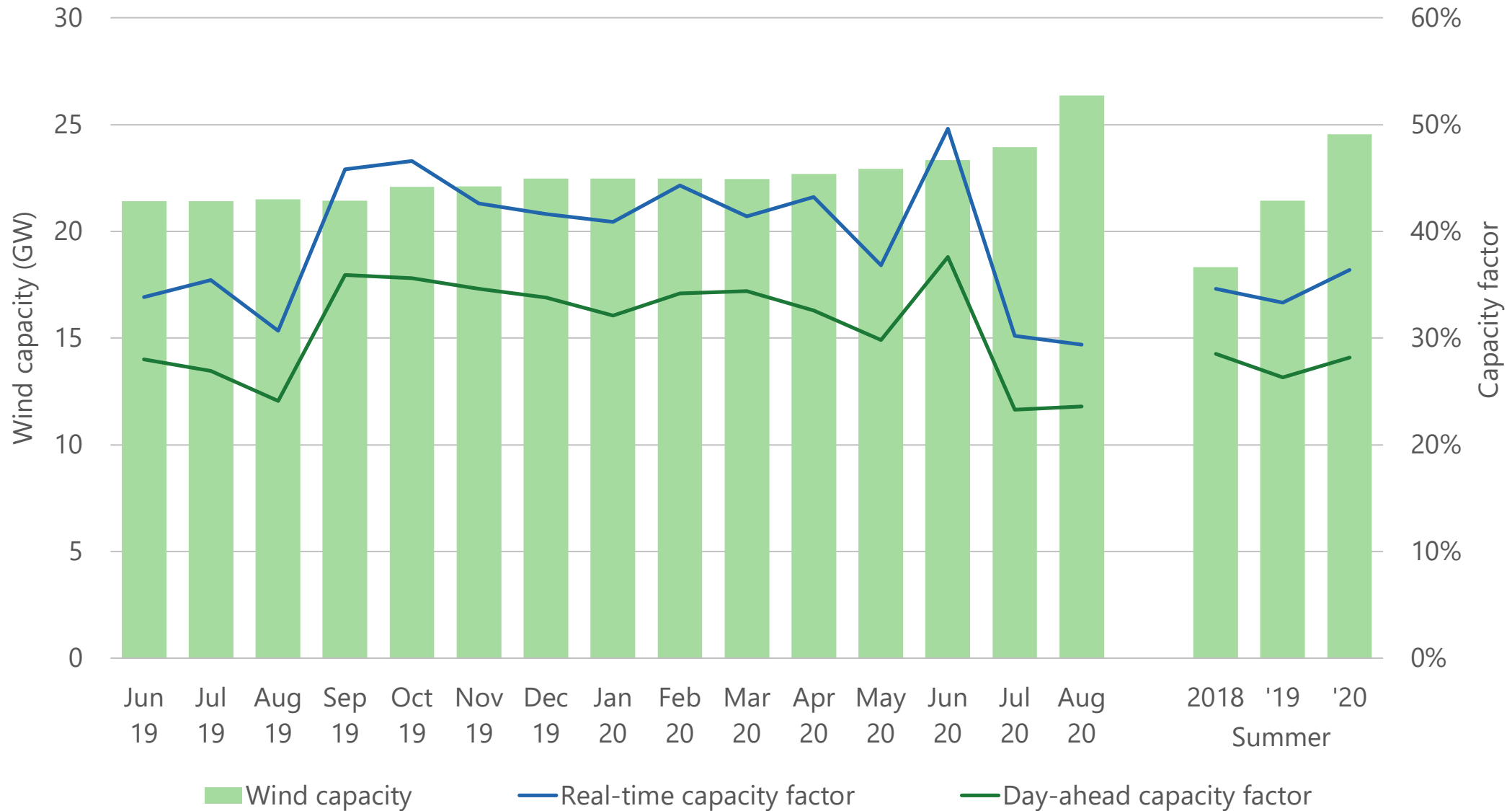
# VIRTUALS SET PRICES MORE FREQUENTLY IN DAY-AHEAD



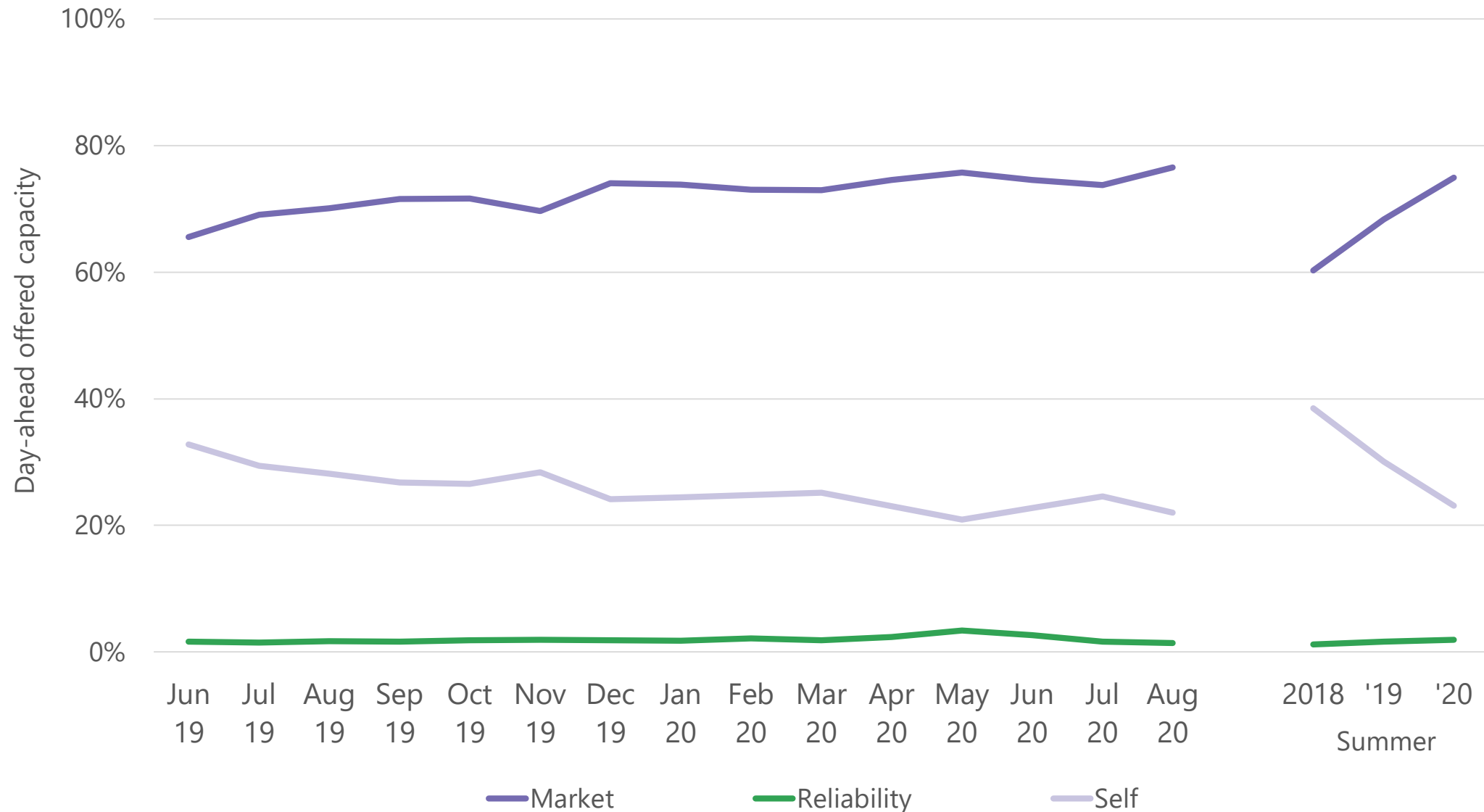
# PRICES SET EVENLY BETWEEN COAL, GAS-SIMPLE CYCLE, AND GAS-COMBINED CYCLE IN REAL-TIME



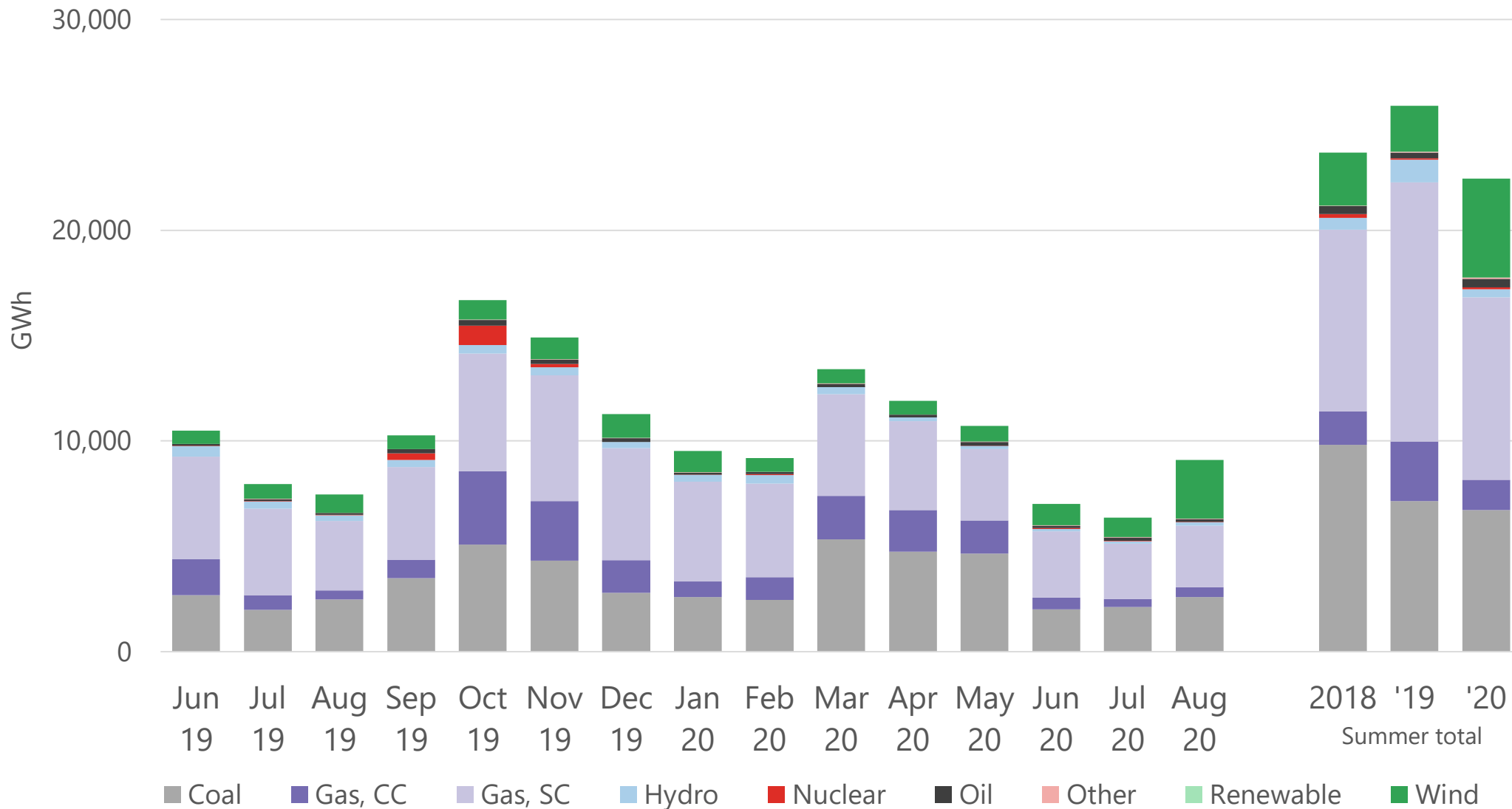
# WIND CAPACITY CONTINUED TO GROW



# MARKET OFFERS CONTINUED TO INCREASE



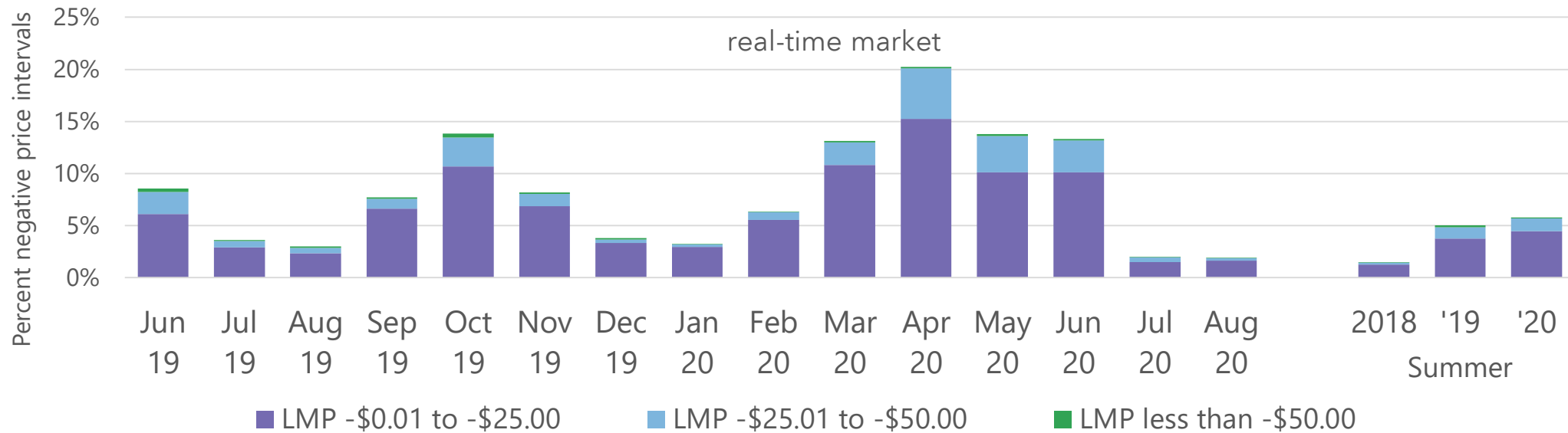
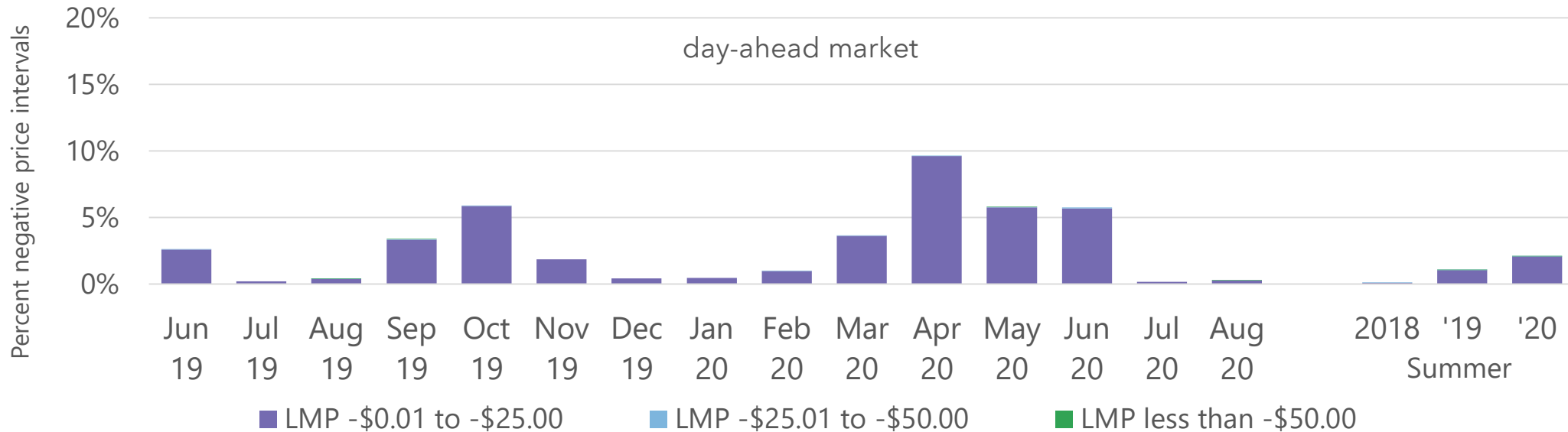
# OUTAGES DECLINED



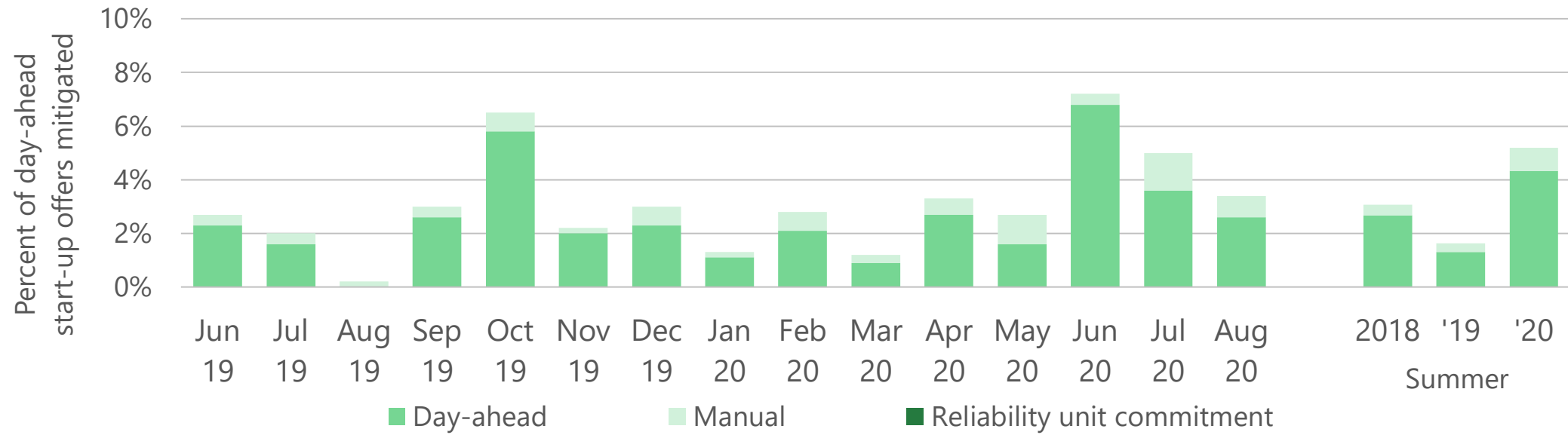
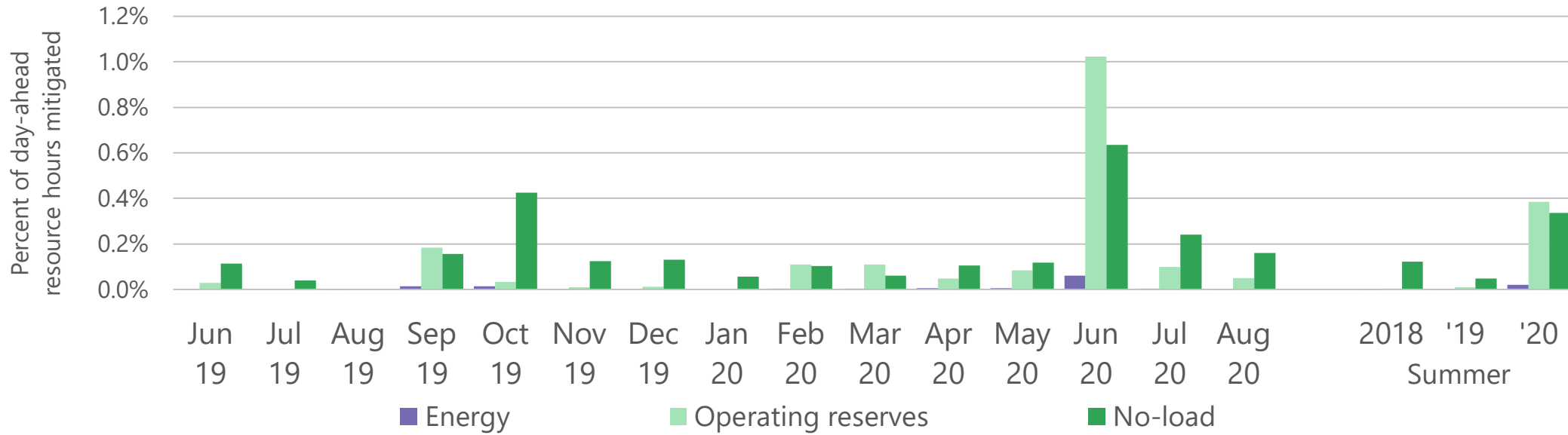
# PRICES DECLINED



# NEGATIVE PRICE INTERVALS CLIMBED SLIGHTLY

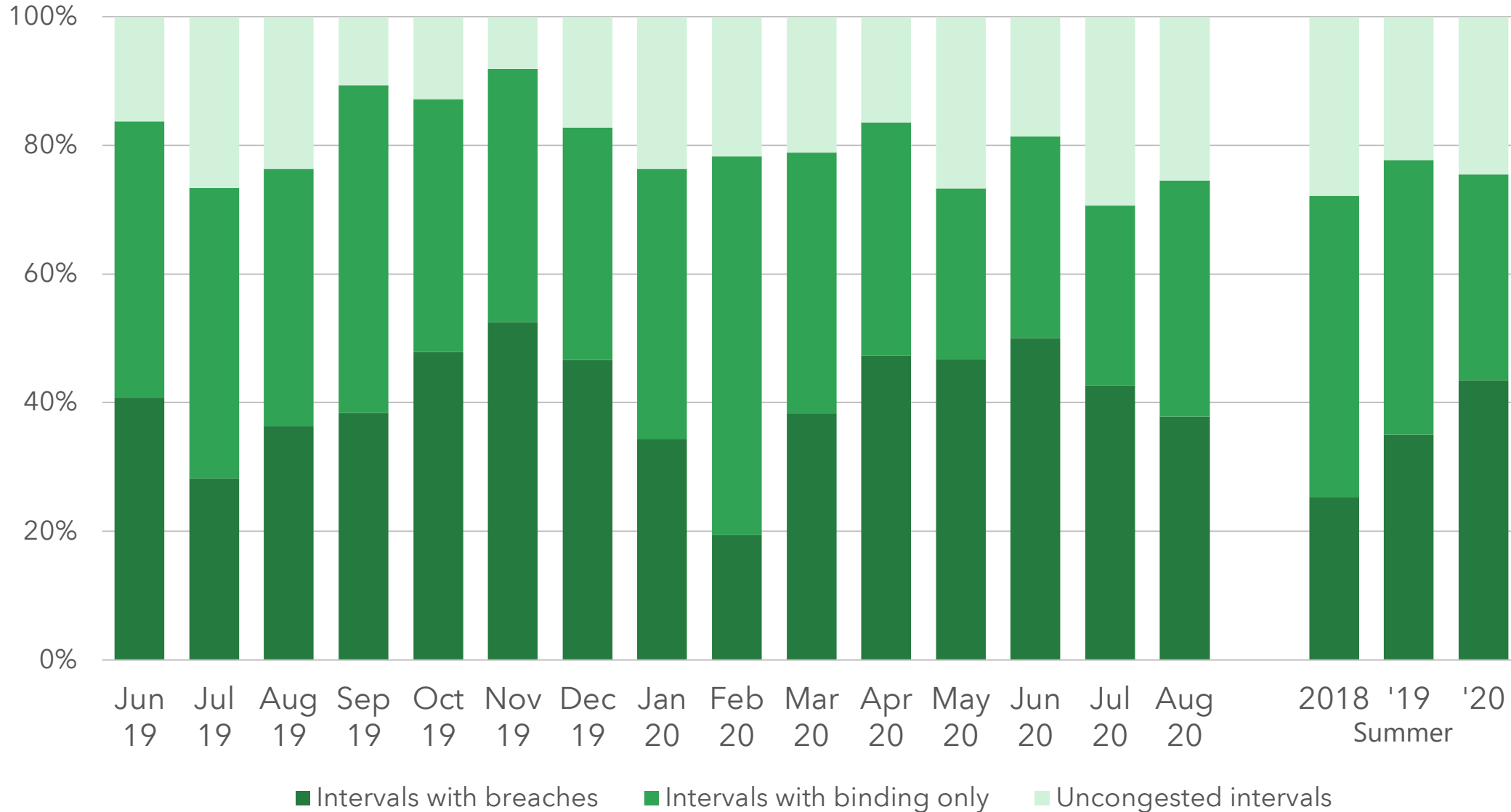


# MITIGATION INCREASED

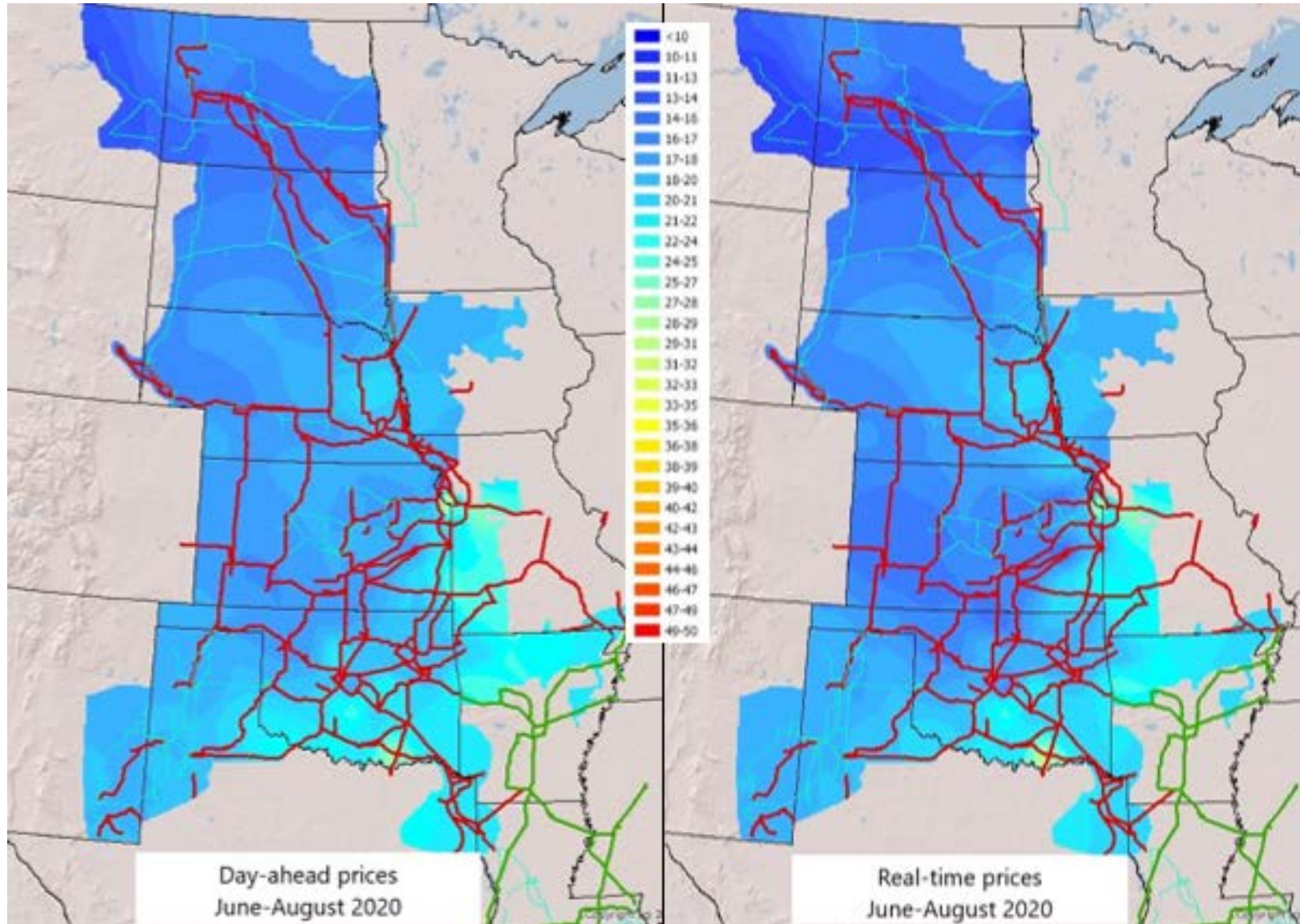




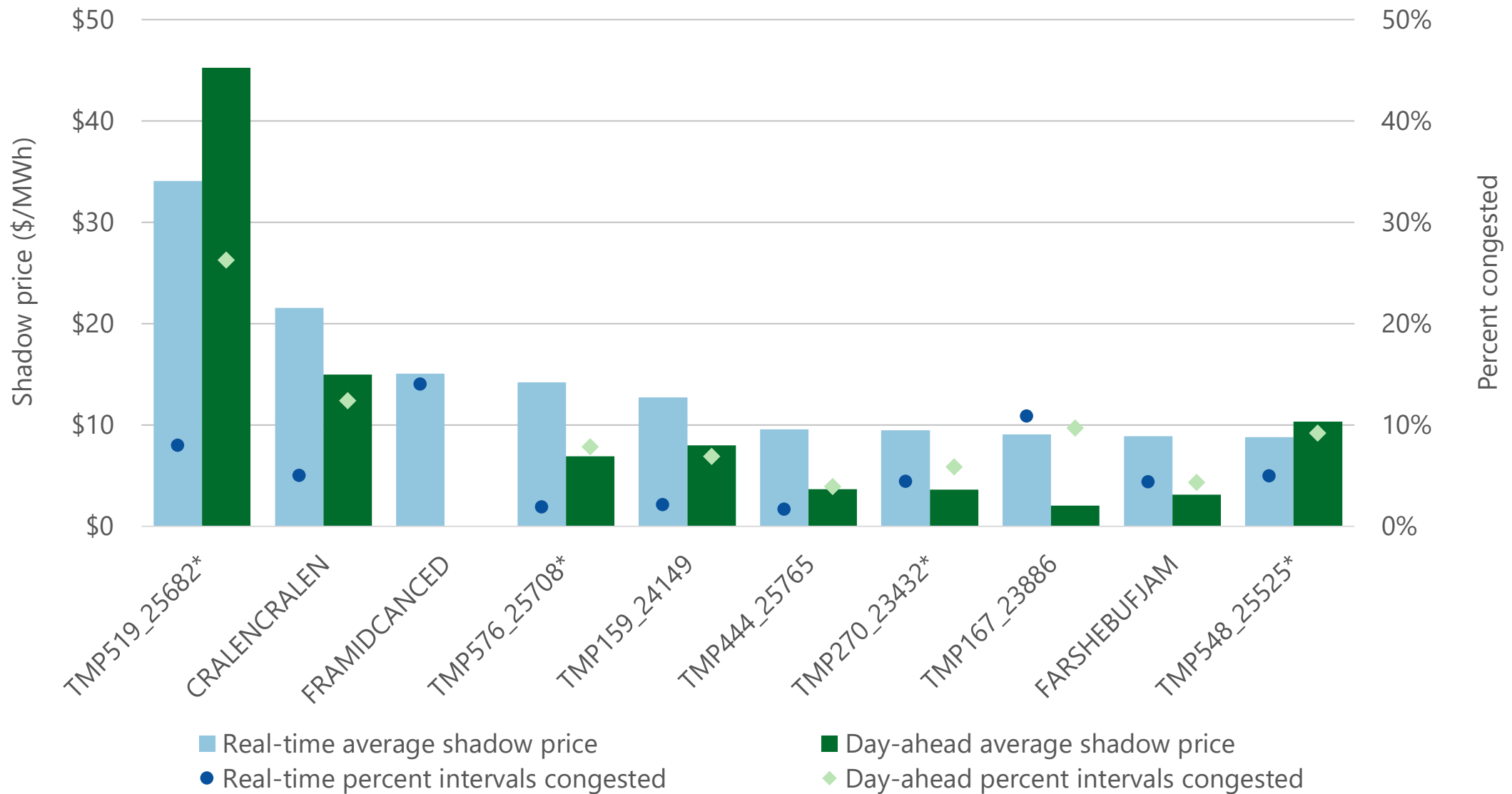
# REAL-TIME BREACHED INTERVALS INCREASED



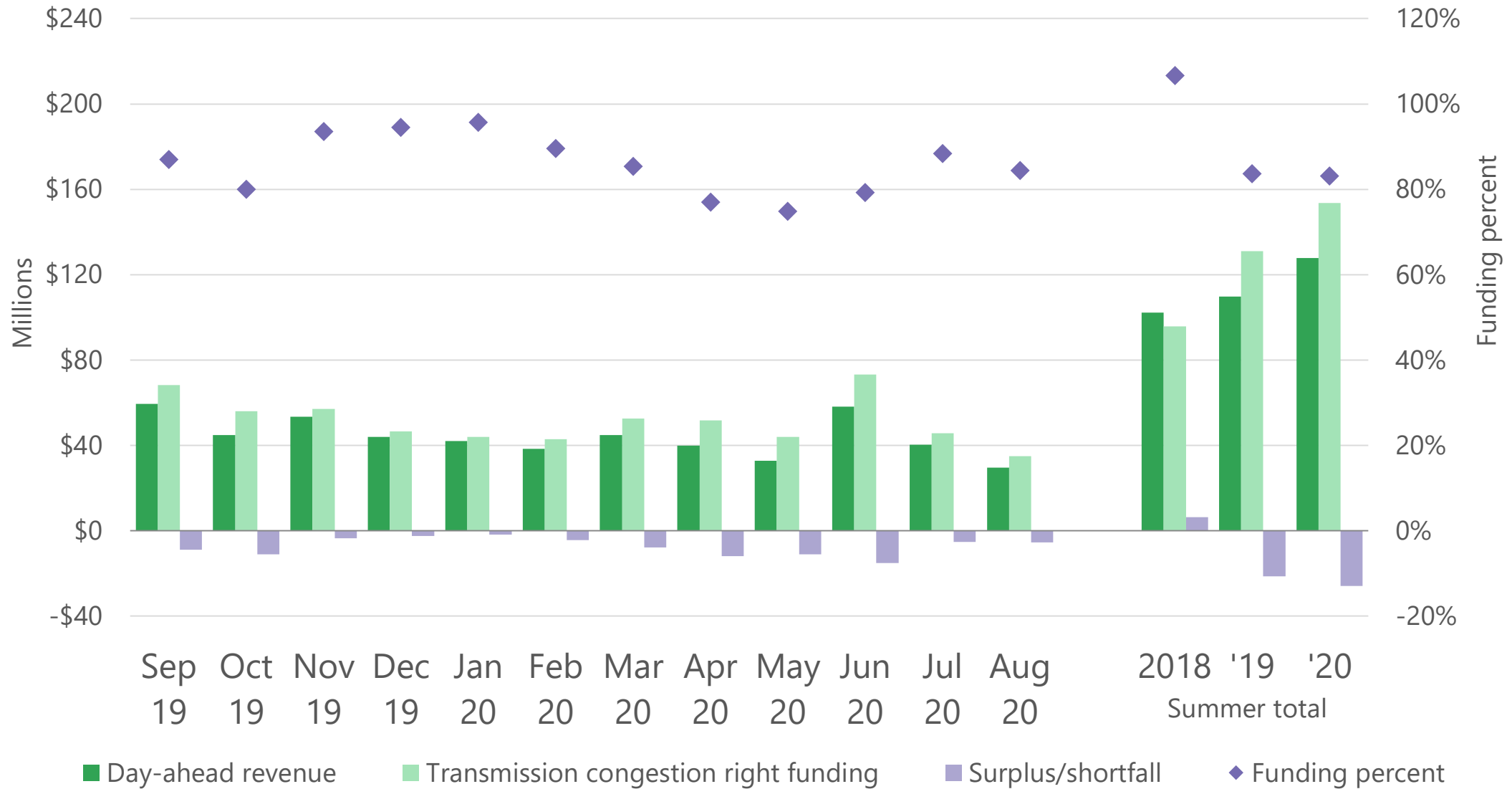
# CONGESTION PATTERN SIMILAR BETWEEN MARKETS



# CONGESTION HIGHEST IN NW MISSOURI

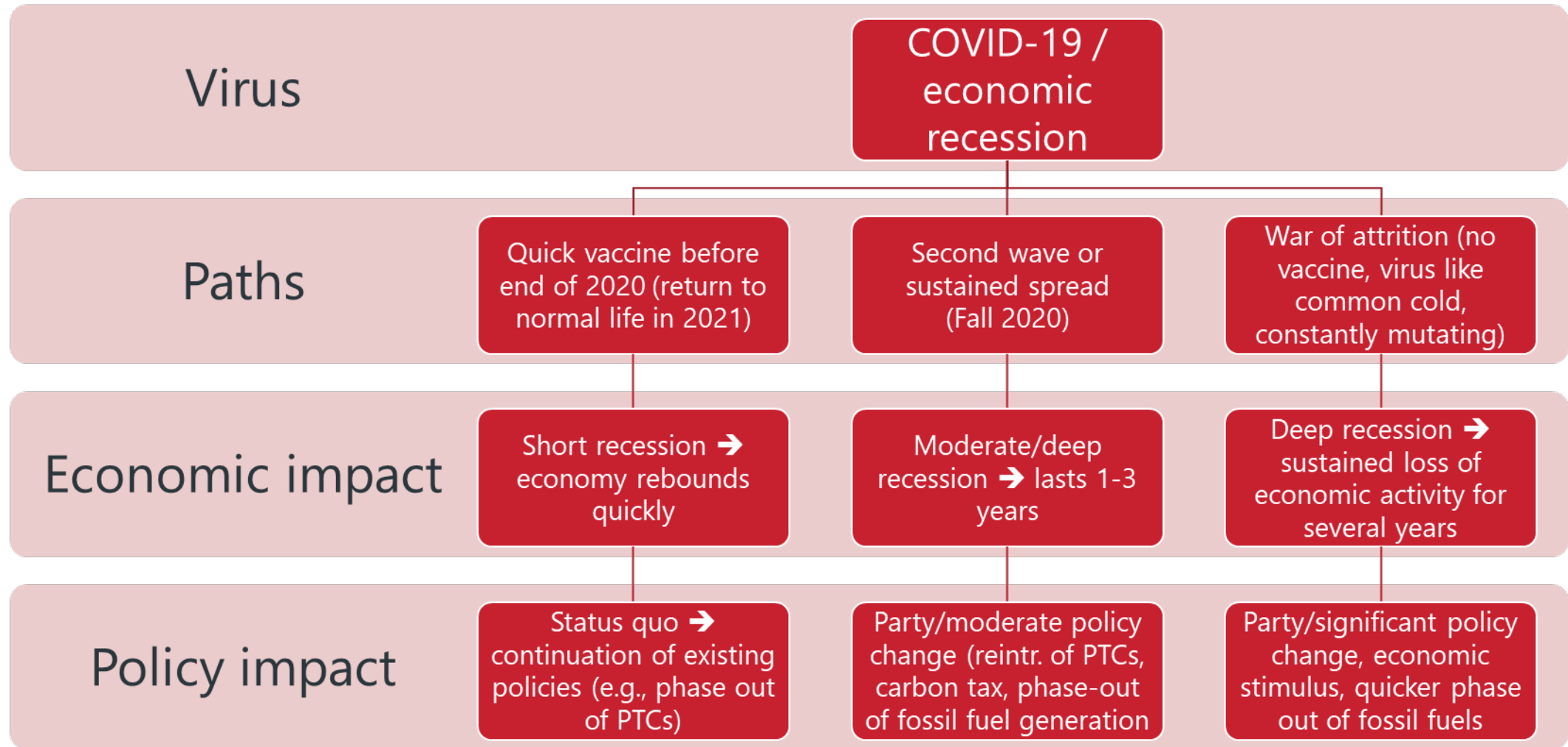


# TCRs REMAIN UNDERFUNDED

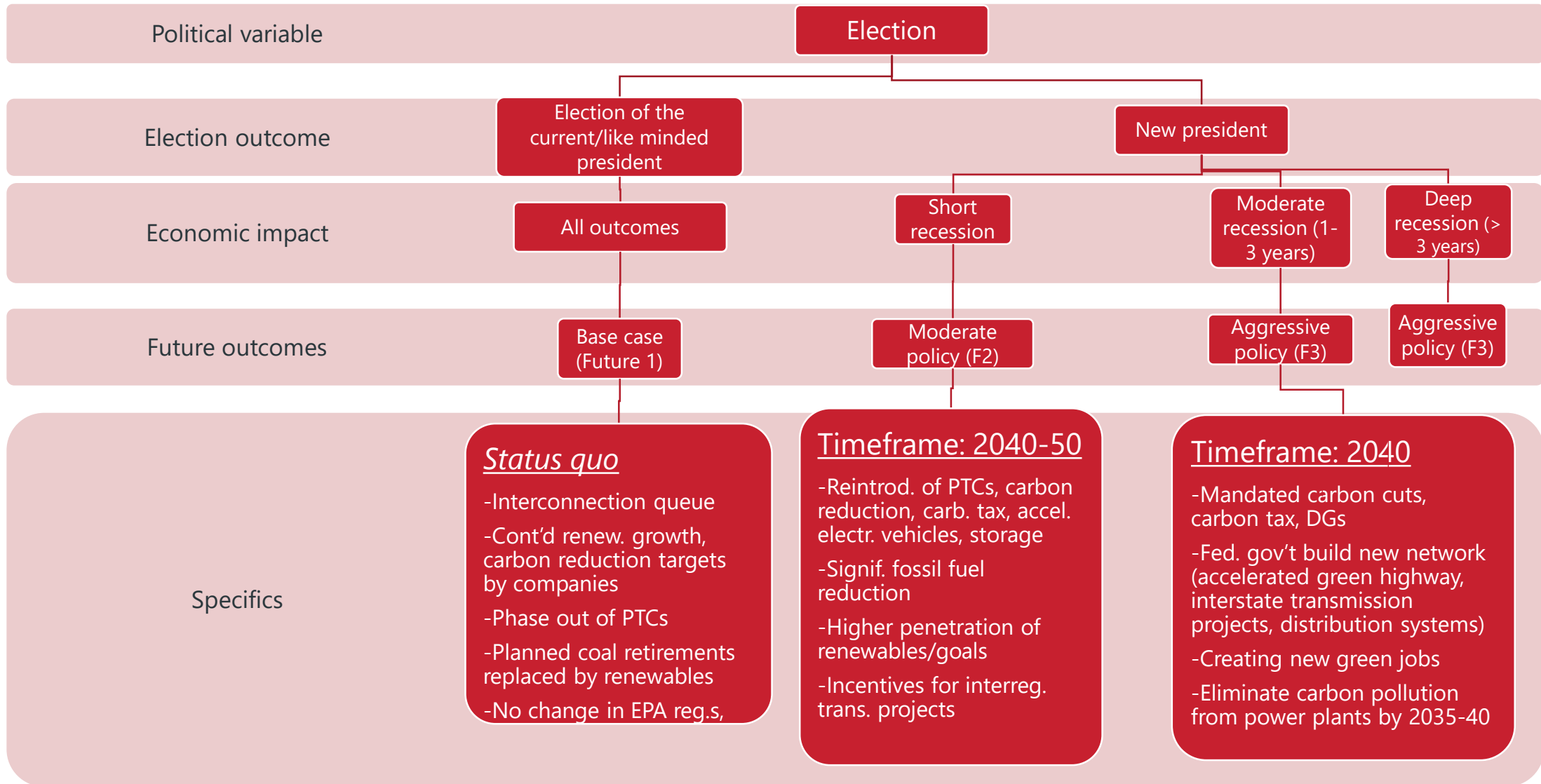


# **MARKET MONITORING UNIT INVOLVEMENT IN THE SPP PLANNING PROCESS**

# GENERAL FRAMEWORK FOR MMU RECOMMENDED FUTURES FOR THE 20-YEAR ASSESSMENT



# 20-YEAR ASSESSMENT SCOPE FUTURE RECOMMENDATION: *THREE FUTURES*



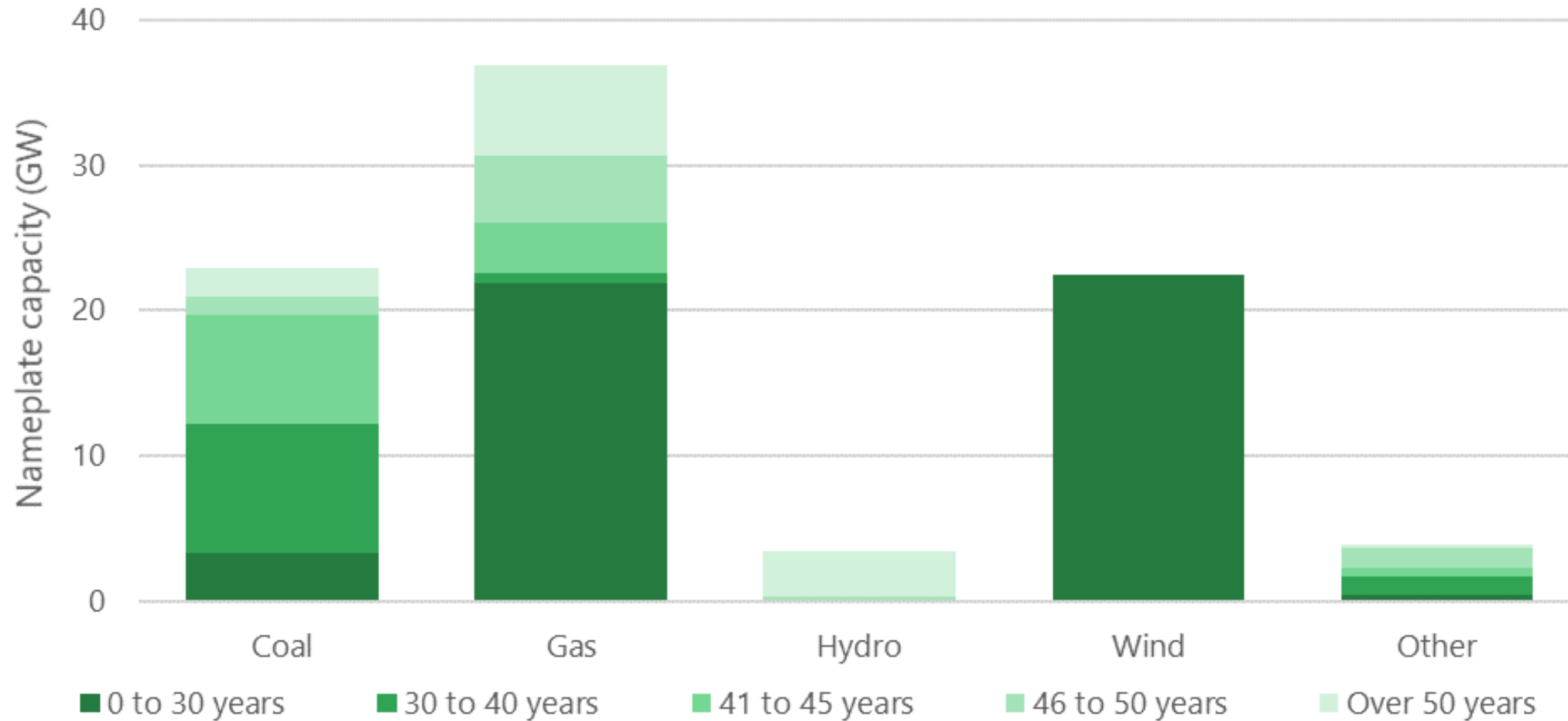
# 20-YEAR ASSESSMENT: SPECIFICS OF FUTURE 3

Specifics of Future 3 include:

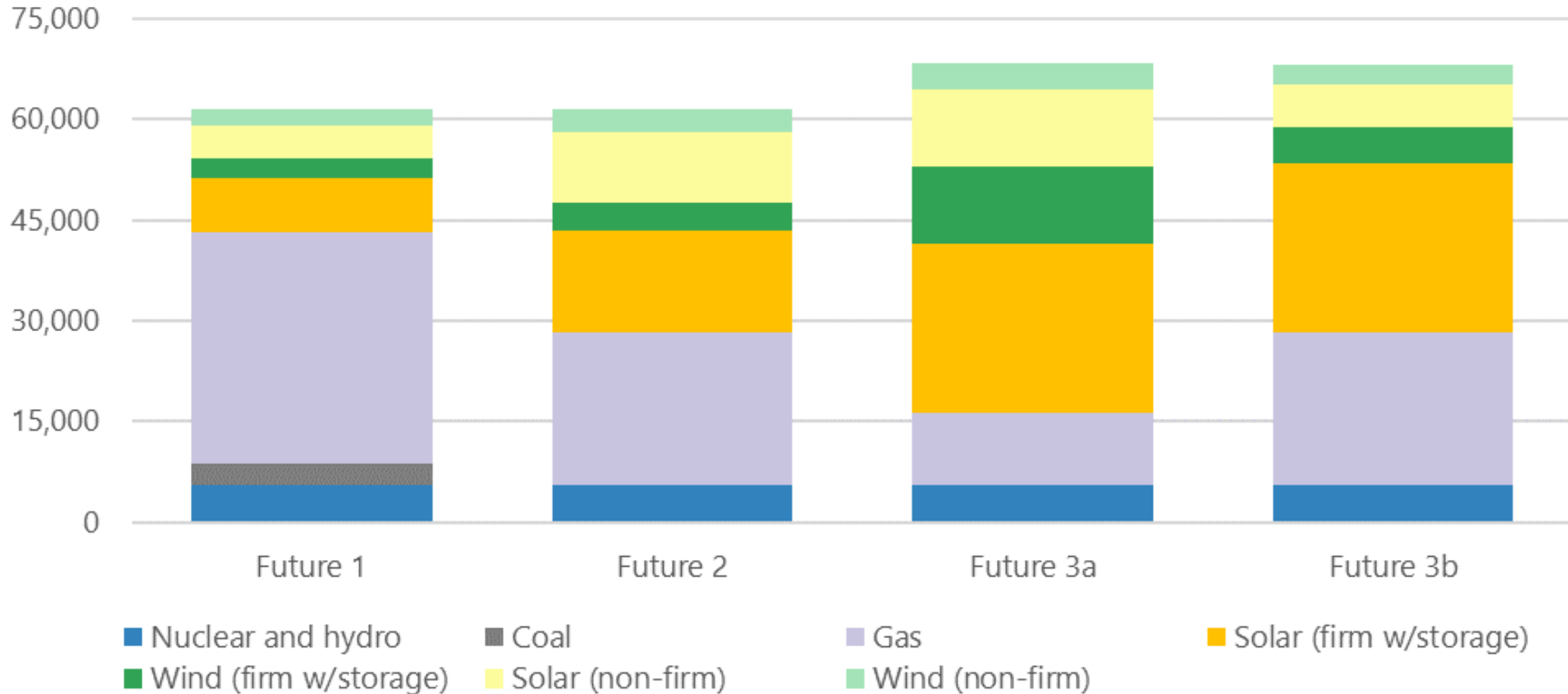
- Complete retirement of coal generation
- Gas capacity to not exceed 5 percent of total generation
  - Future 3a: 11,000 MW of gas capacity remains
  - Future 3b: 22,000 MW of gas capacity remains
- Future 3a:
  - Storage assumed at 60 percent of peak projected load
  - 66.5 GW solar capacity
  - 85.6 GW wind capacity
- Future 3b:
  - Storage assumed at 50 percent of peak projected load
  - 48 GW solar capacity
  - 65 GW wind capacity
- Results in an estimated 93-95 percent reduction of carbon emissions depending on load growth



# SPP RESOURCES AVERAGE AGE PROFILE, END OF 2019



# CAPACITY BUILD OUT BY FUTURE, WITH 12 PERCENT MARGIN IN 2042



# ITP 2022 SCOPE RECOMMENDATION BY MMU

Key assumptions	Future 1 ongoing plans (reelection and status quo)	Future 2 emerging technology
<b>Peak demand growth</b>	As in load forecast	As in load forecast
<b>Energy demand growth</b>	As in load forecast	↑ due to ↑ electrification (electric vehicle growth)
<b>Natural gas prices</b>	Current industry forecast	Prices influenced by emissions pricing policy
<b>Coal prices</b>	Current industry forecast	Prices influenced by emissions pricing policy
<b>Emissions prices</b>	Current industry forecast	↑ carbon prices per target of carbon reduction of 80% from 2000 levels
<b>Fossil fuel retirements</b>	Coal aged-based at 50; gas/oil at 51; < 50% of coal retirement replaced by gas	Complete coal retirement driven by emission reduction targets; gas/oil retirement age-based
<b>Environmental regulations</b>	Current regulations	Federally funded green energy network, mandated carbon cuts, carbon tax

# ITP 2022 SCOPE RECOMMENDATION BY MMU

Key assumptions	Future 1 ongoing plans (reelection and status quo)		Future 2 emerging technology	
	Year 5 1% of projected peak load	Year 10 5% of projected peak load	Year 5 2% of projected peak load	Year 10 15% of projected peak load
<b>Demand response</b>	As in load forecast		↑ demand response (focus on savings rather than consumption per policy shift)	
<b>Demand response (solar)</b>	As in load forecast		↑ penetration (policy shift and incentives to behind the meter installation)	
<b>Energy efficiency</b>	As in load forecast		↑ energy efficiency > F1 (due to significant ↑ incentives)	
<b>Storage</b>	Year 5 1% of projected peak load	Year 10 5% of projected peak load	Year 5 2% of projected peak load	Year 10 15% of projected peak load
<b>Solar (GW)</b>	6	12	7	20
<b>Wind (GW)</b>	32	38	35	50

# QUESTIONS?

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