



# Quarterly Report for Q1 2023: Selected findings

June 2, 2023

# Presentation outline

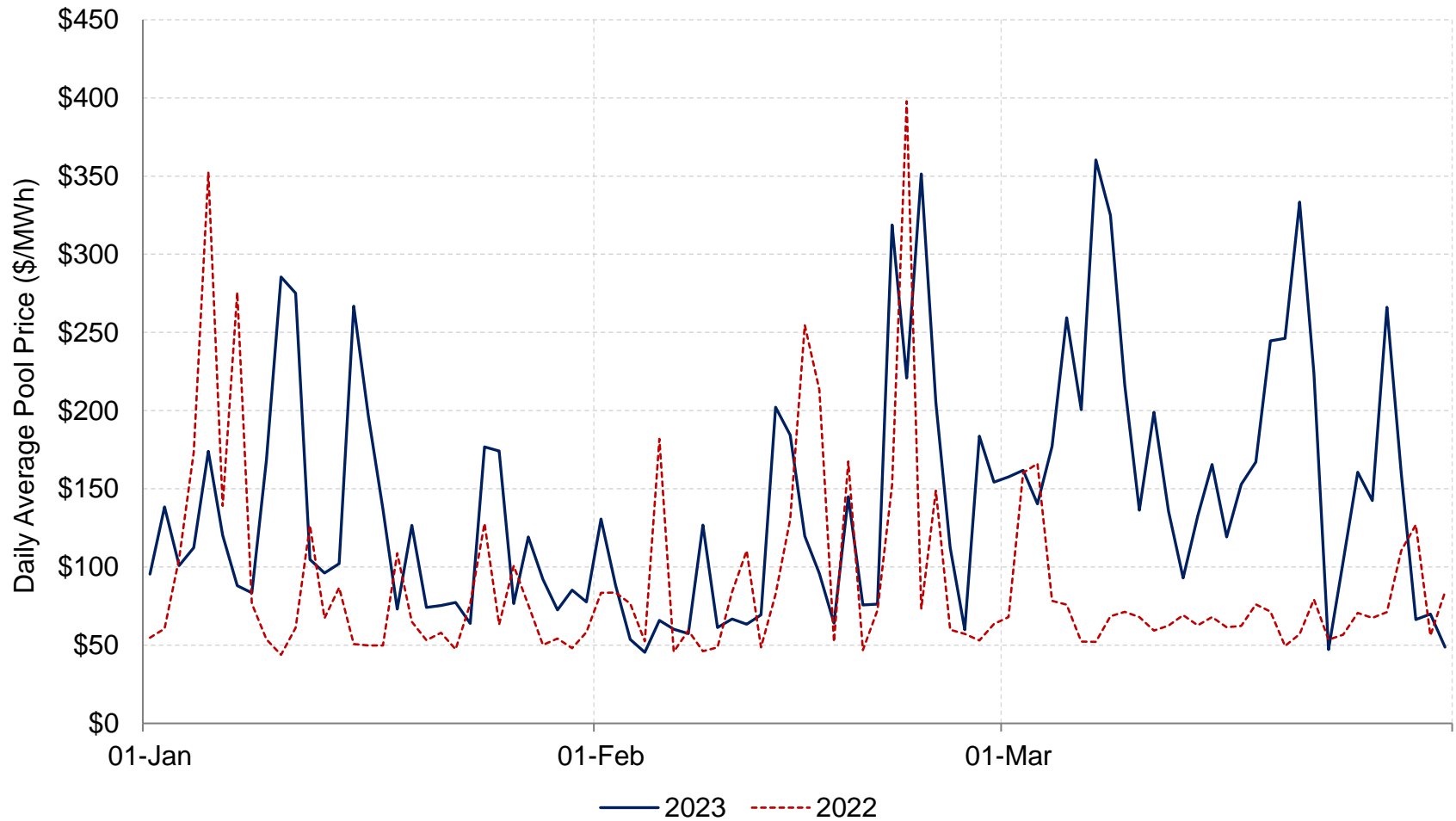
- Scope of this presentation
- Energy market
  - Wind and solar growth
  - Market power and offer behaviour
  - Carbon emissions
  - Market share offer control
- Power system
- Forward market
- Retail market

# Scope of this presentation

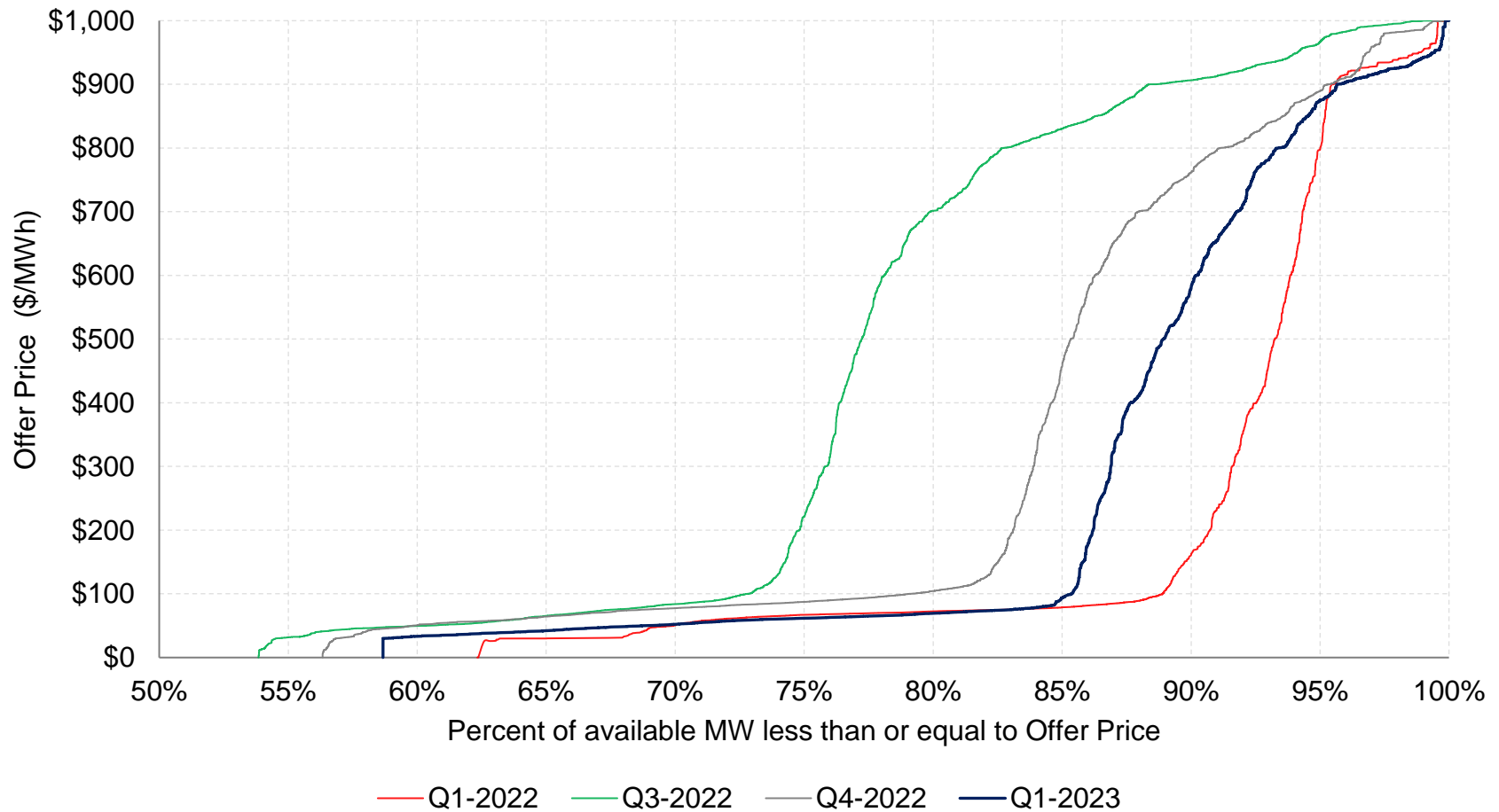
- This presentation provides a selection of findings contained in the MSA's Quarterly Report for Q1 2023
  - Only selected figures are included here
  - Readers are referred to the Quarterly Report itself for discussion of the figures
- All content in this presentation was copied directly from the Quarterly Report and no additional information, including by exclusion of any material, is provided here.

# Energy market

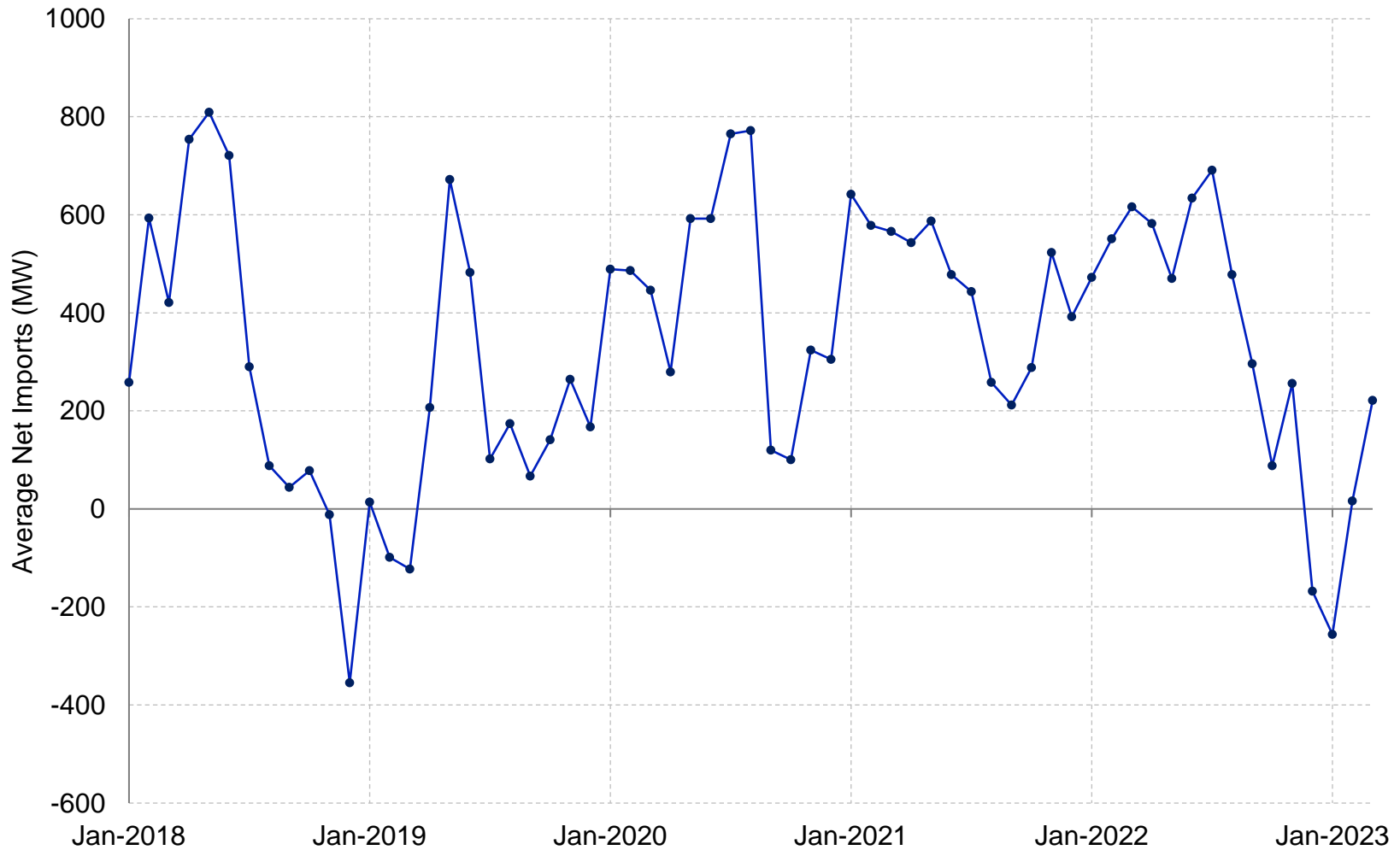
*Figure 2: Daily average pool prices in Q1 2023 and Q1 2022*



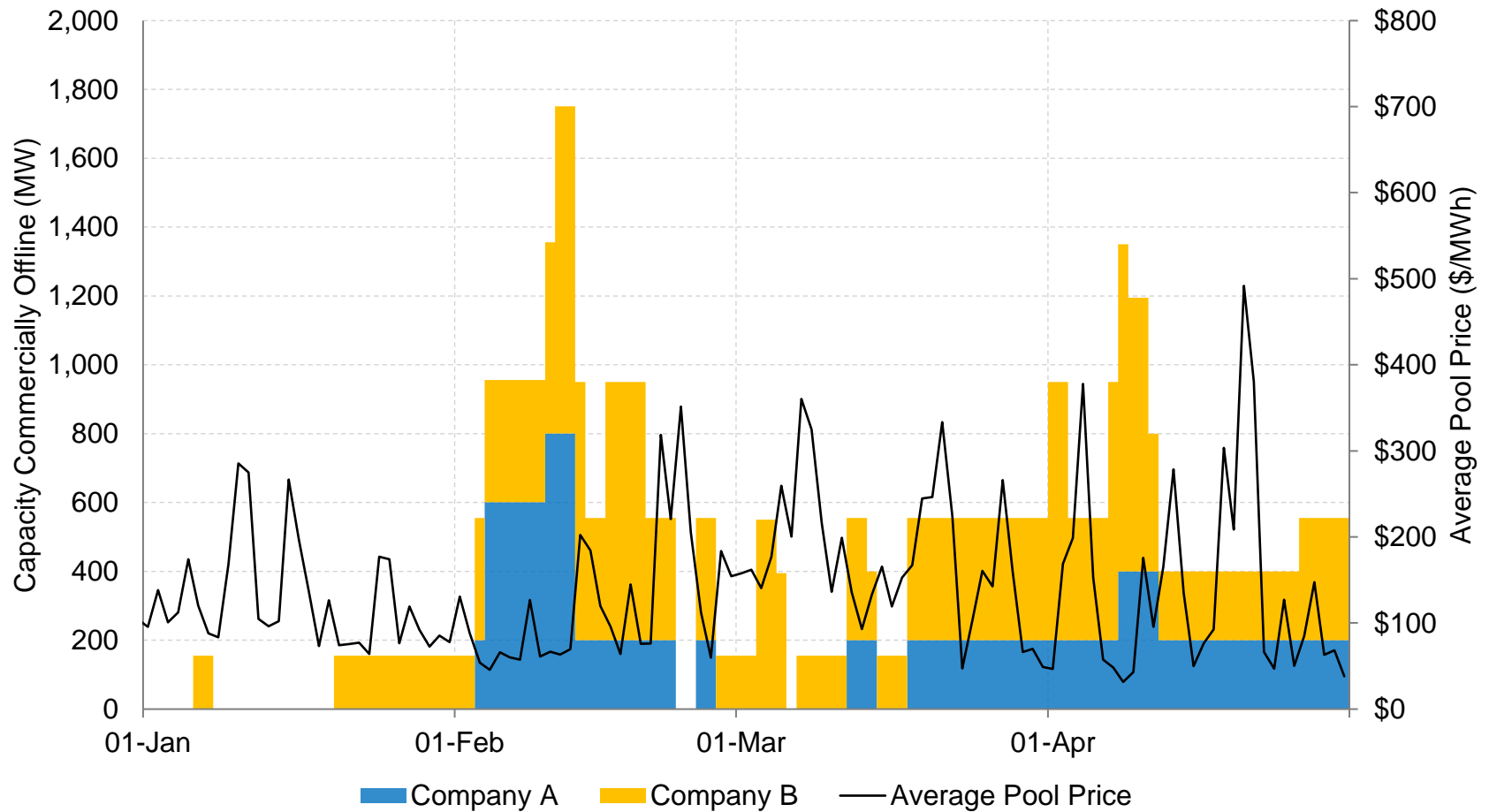
*Figure 3: Offer price duration curves for coal and converted coal assets*



*Figure 4: Monthly average net imports  
(January 2018 to March 2023)*

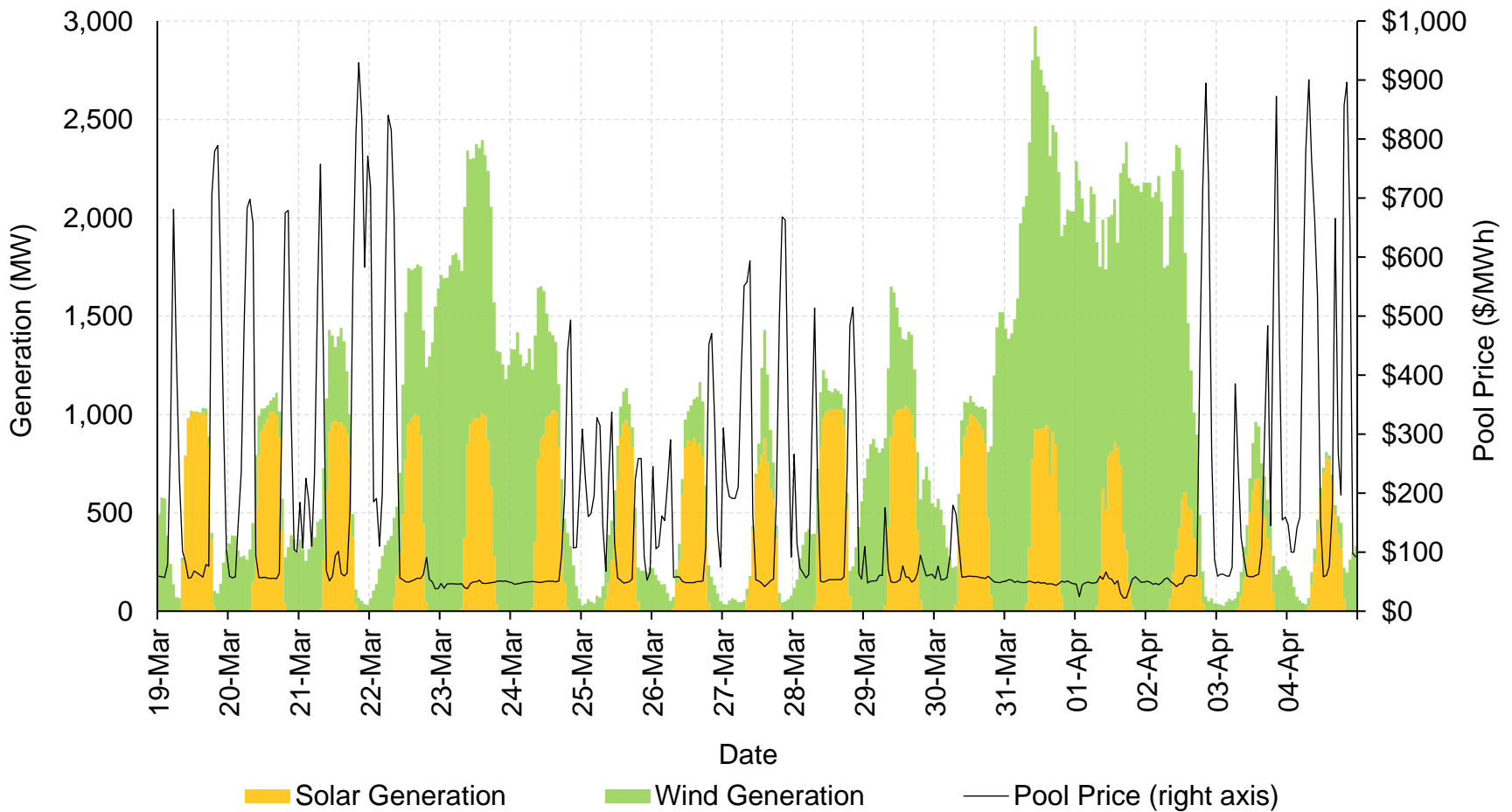


*Figure 17: Coal and converted coal capacity commercially offline, by day and company (January 1 to April 30, 2023)*



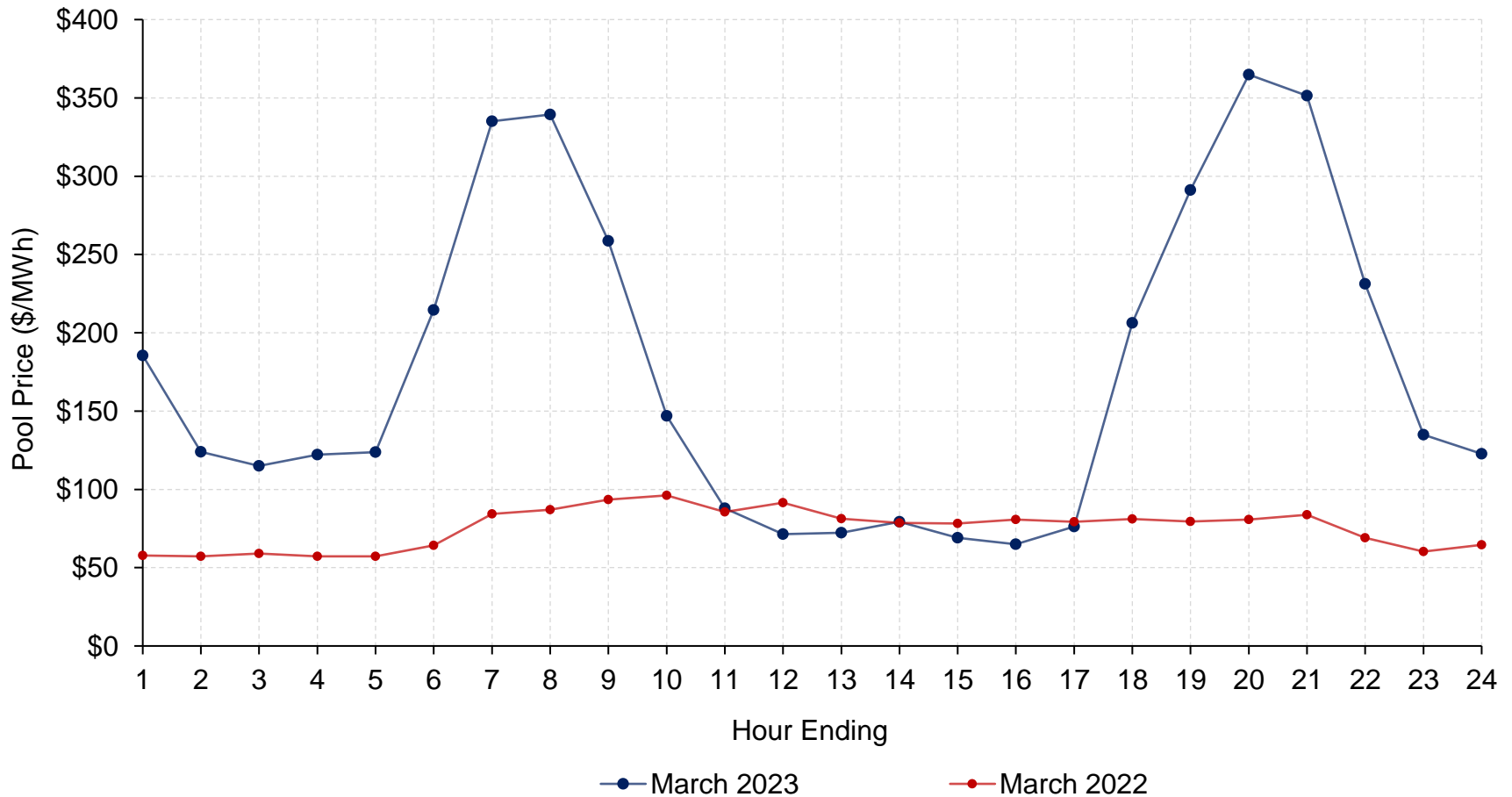


*Figure 8: Wind generation, solar generation, and pool prices (March 19 to April 4, 2023)*

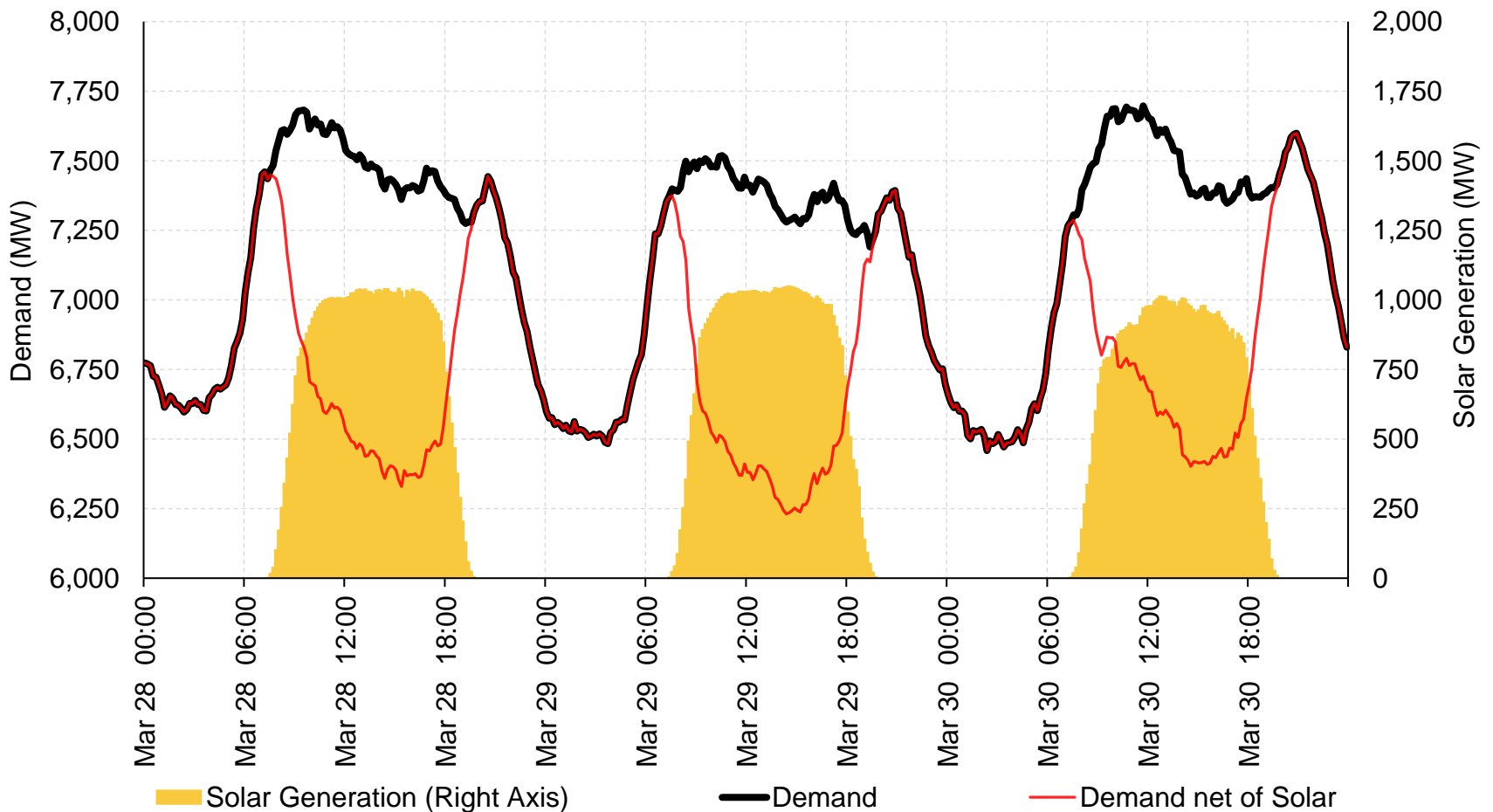


# Wind and solar growth

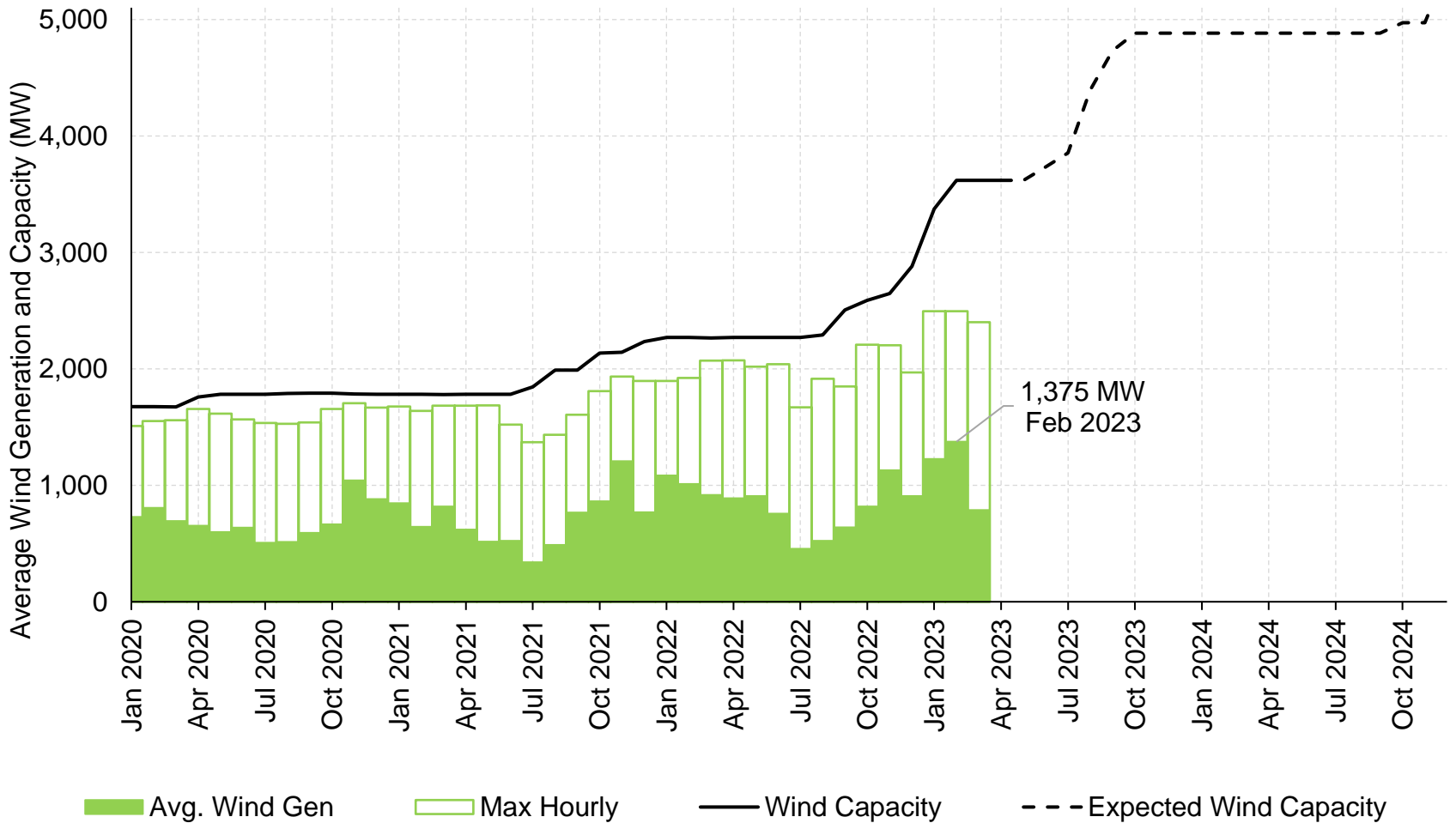
*Figure 5: Average daily shape of pool prices  
(March 2022 and March 2023)*



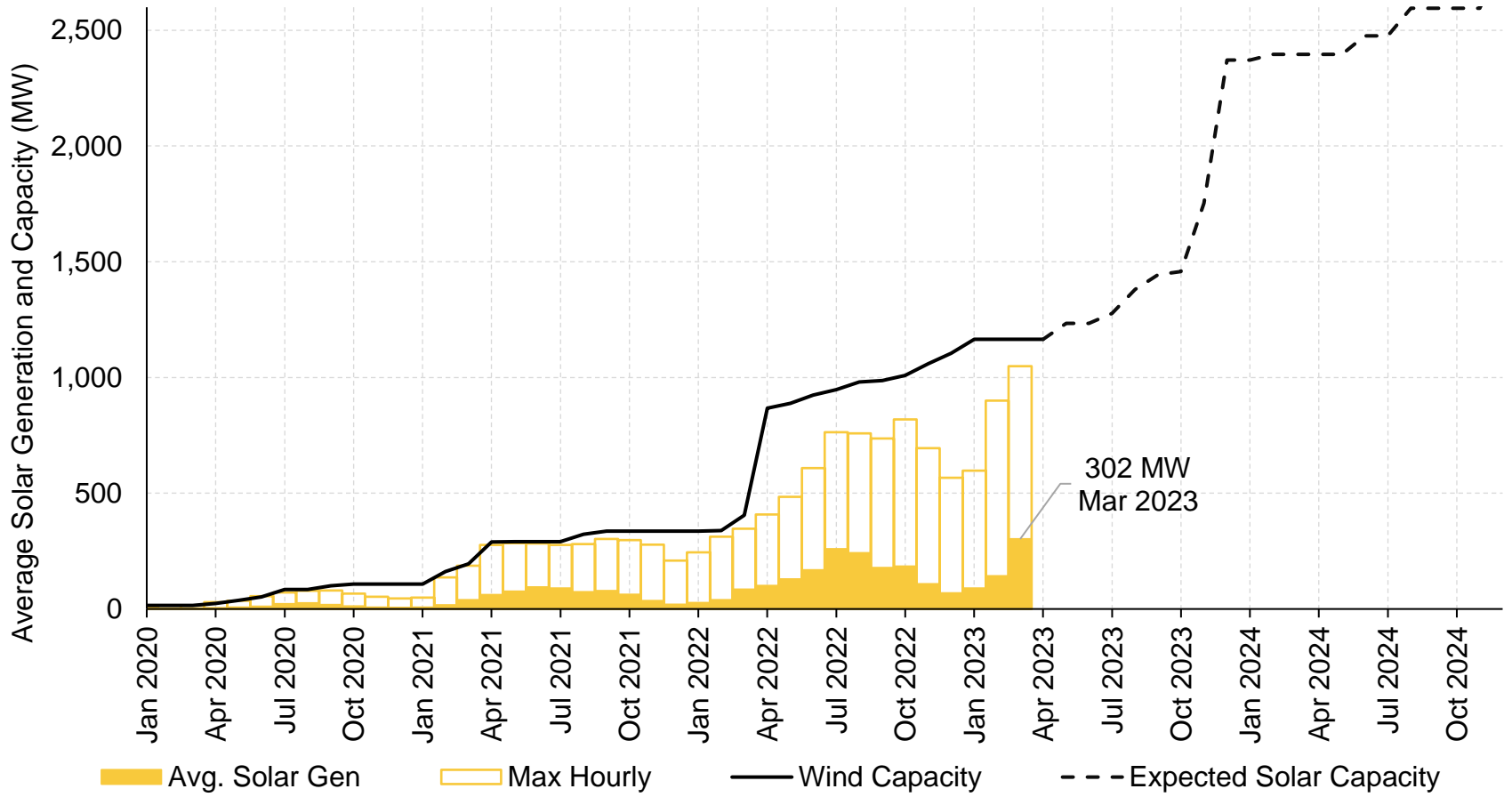
*Figure 9: Demand net of solar generation  
(March 28 to 30, 2023)*



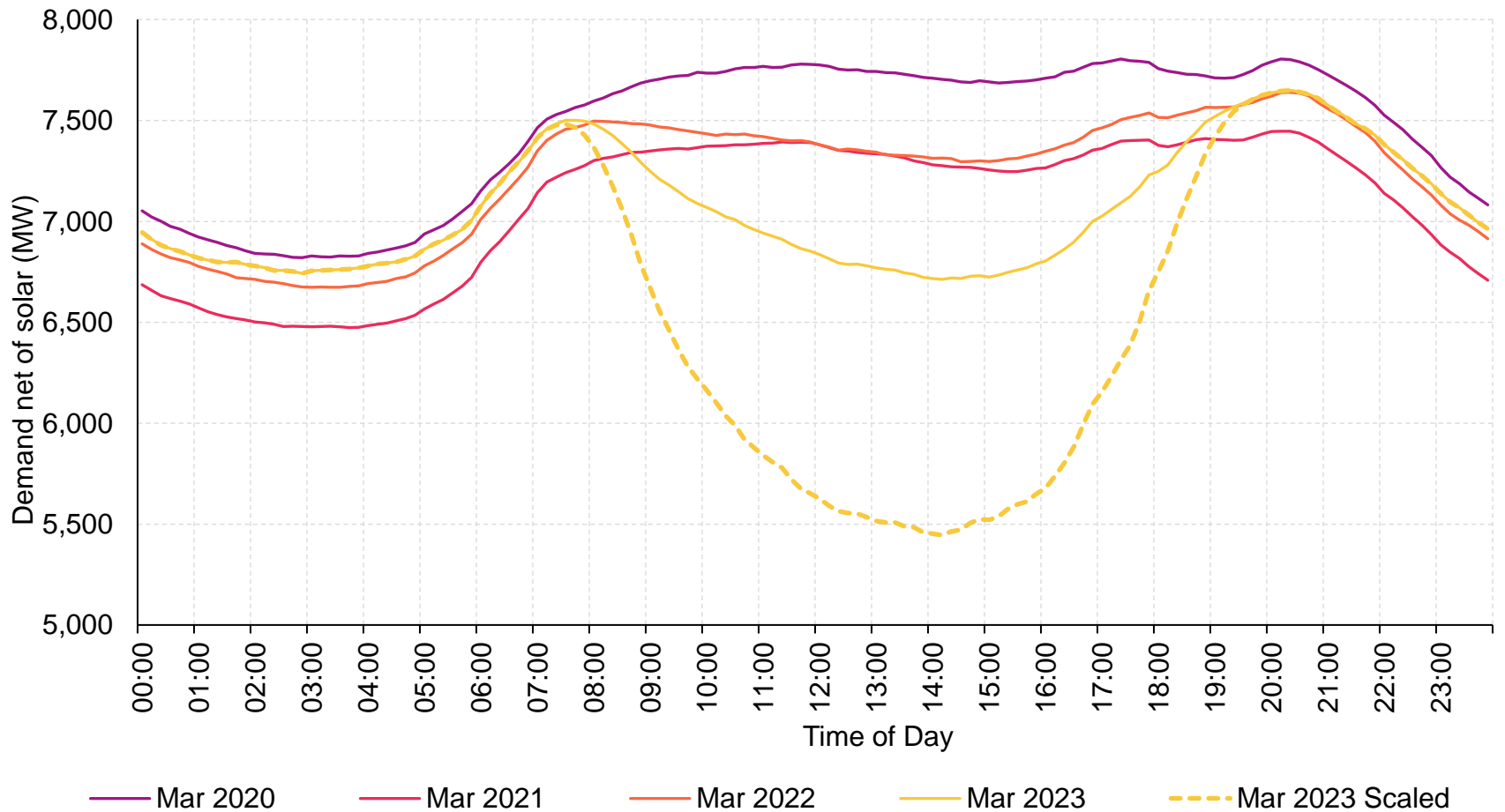
*Figure 6: Monthly average wind generation and capacity (January 2020 to March 2023, and capacity under construction)*



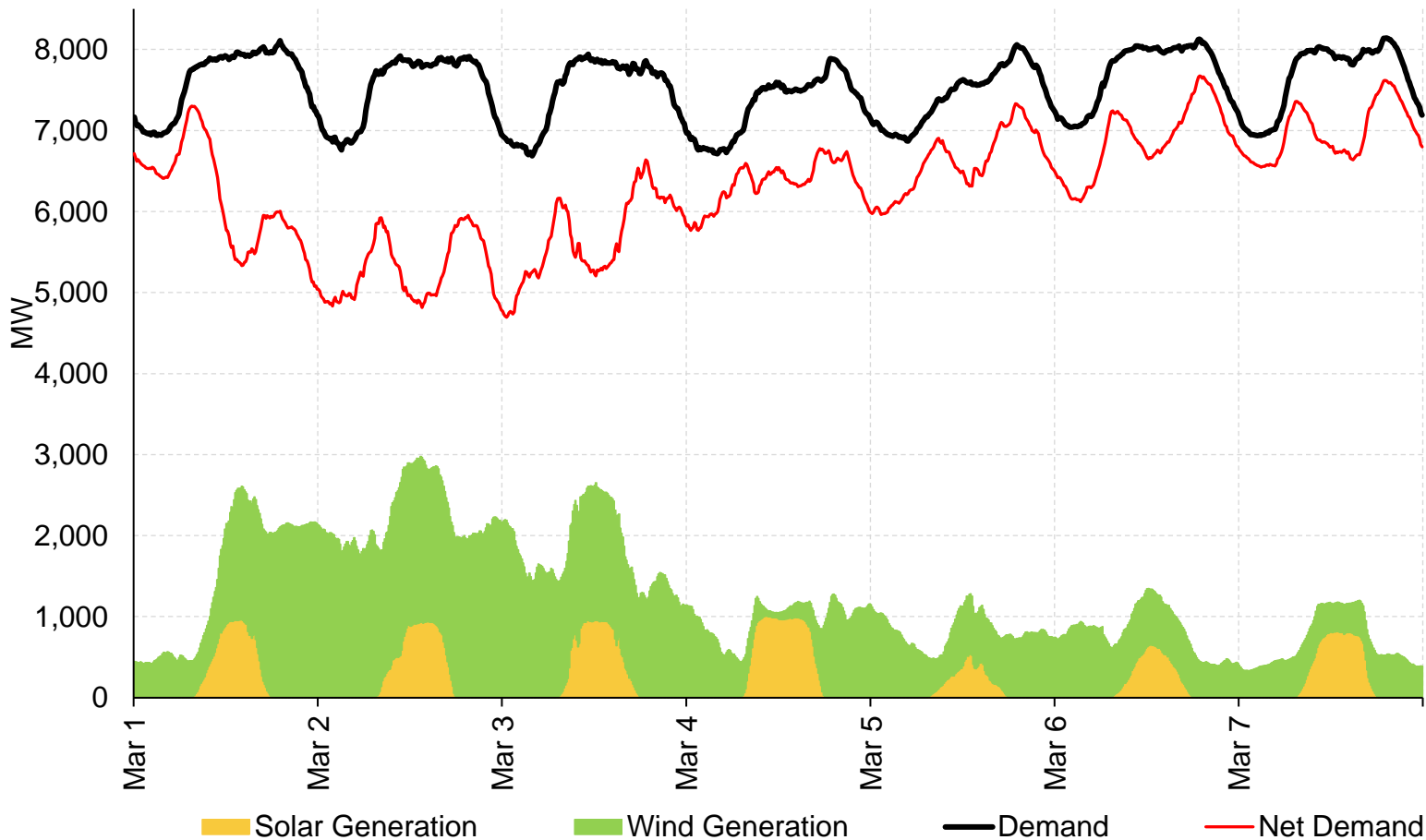
*Figure 7: Monthly average solar generation and capacity (January 2020 to March 2023, and capacity under construction)*



*Figure 10: Average daily demand net of solar profiles (March 2019 to 2023, and March 2023 scaled for capacity under construction)*

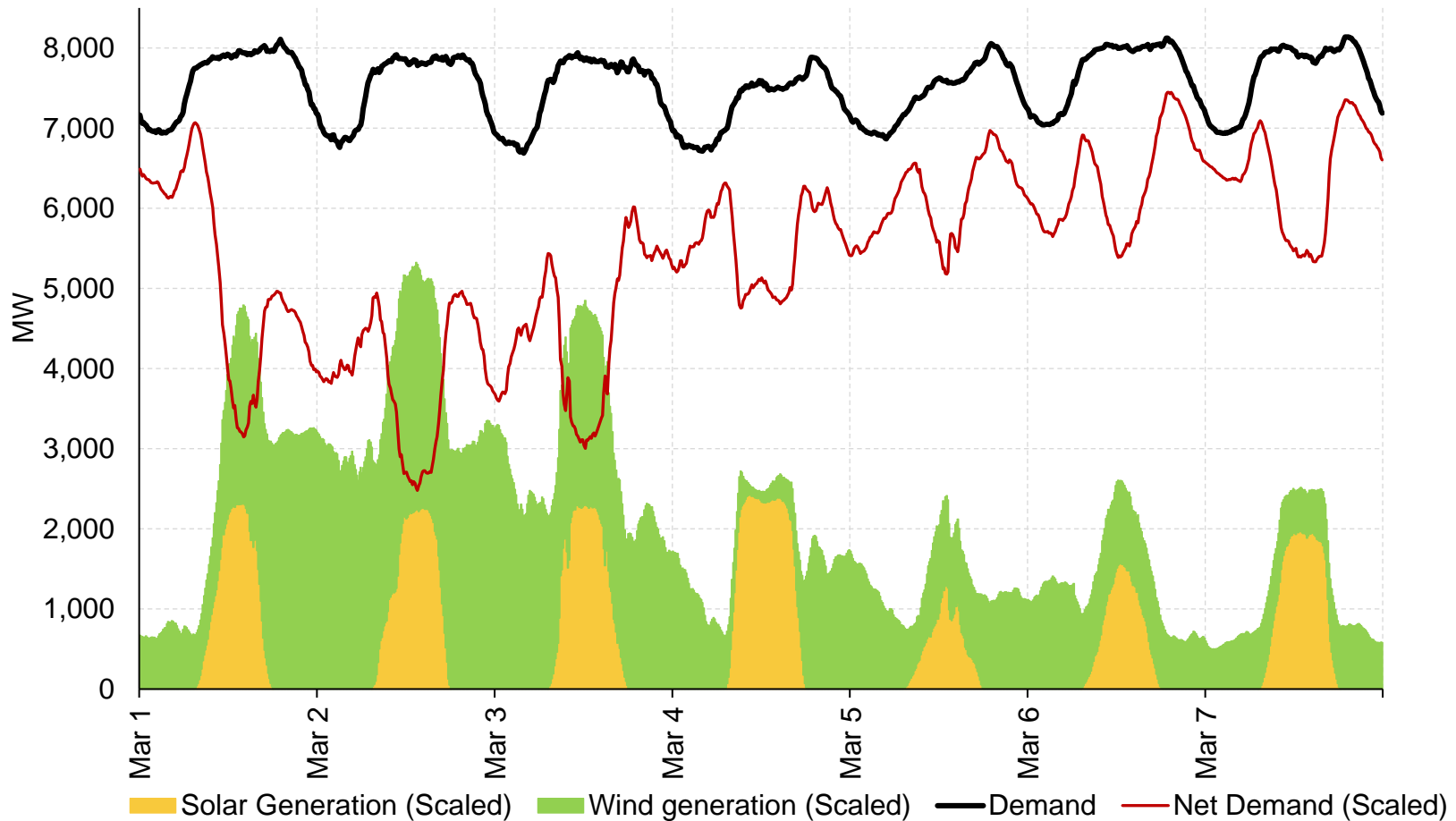


*Figure 11: Demand, wind and solar generation, and net demand (March 1 to 7, 2023)*

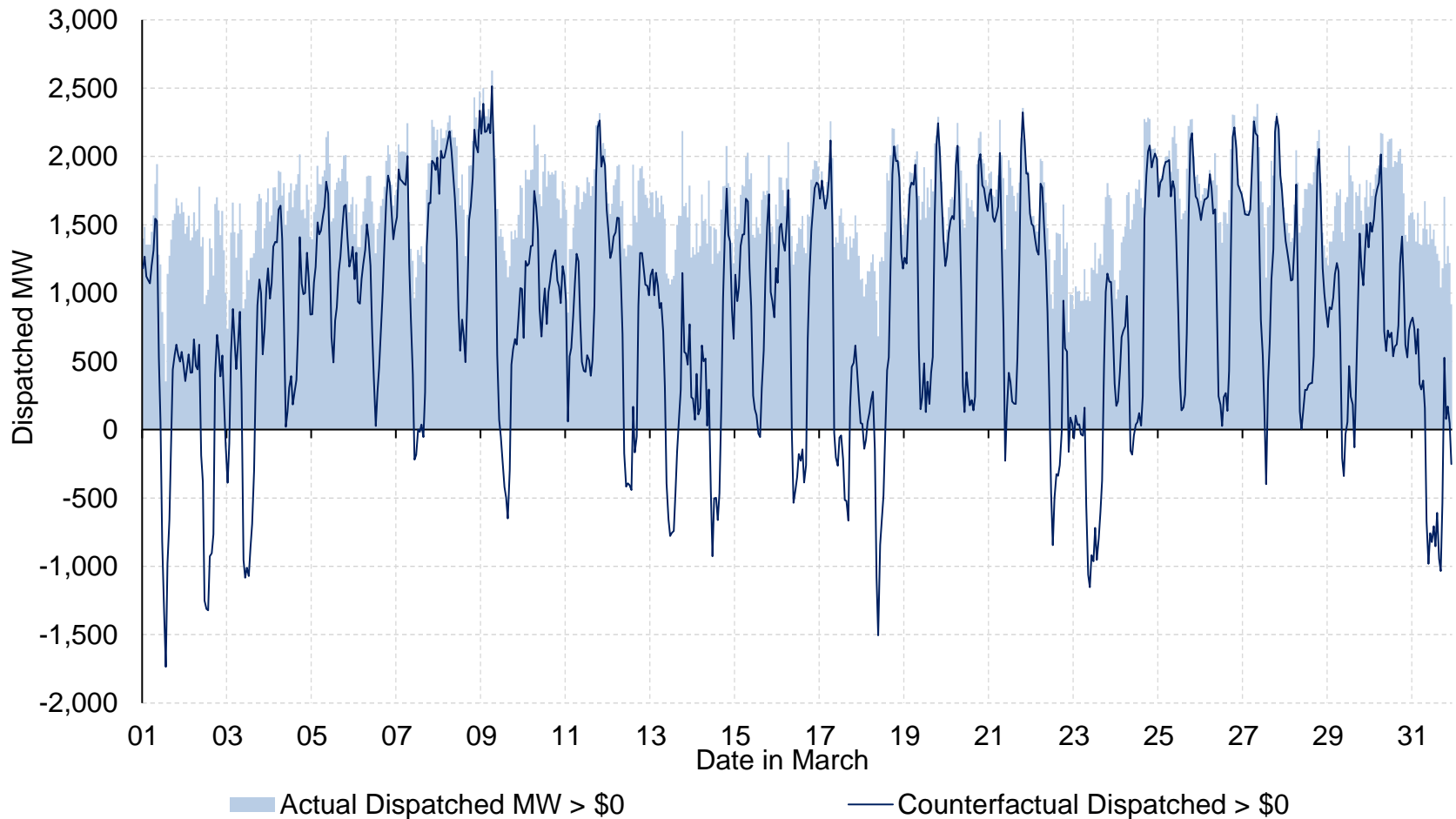




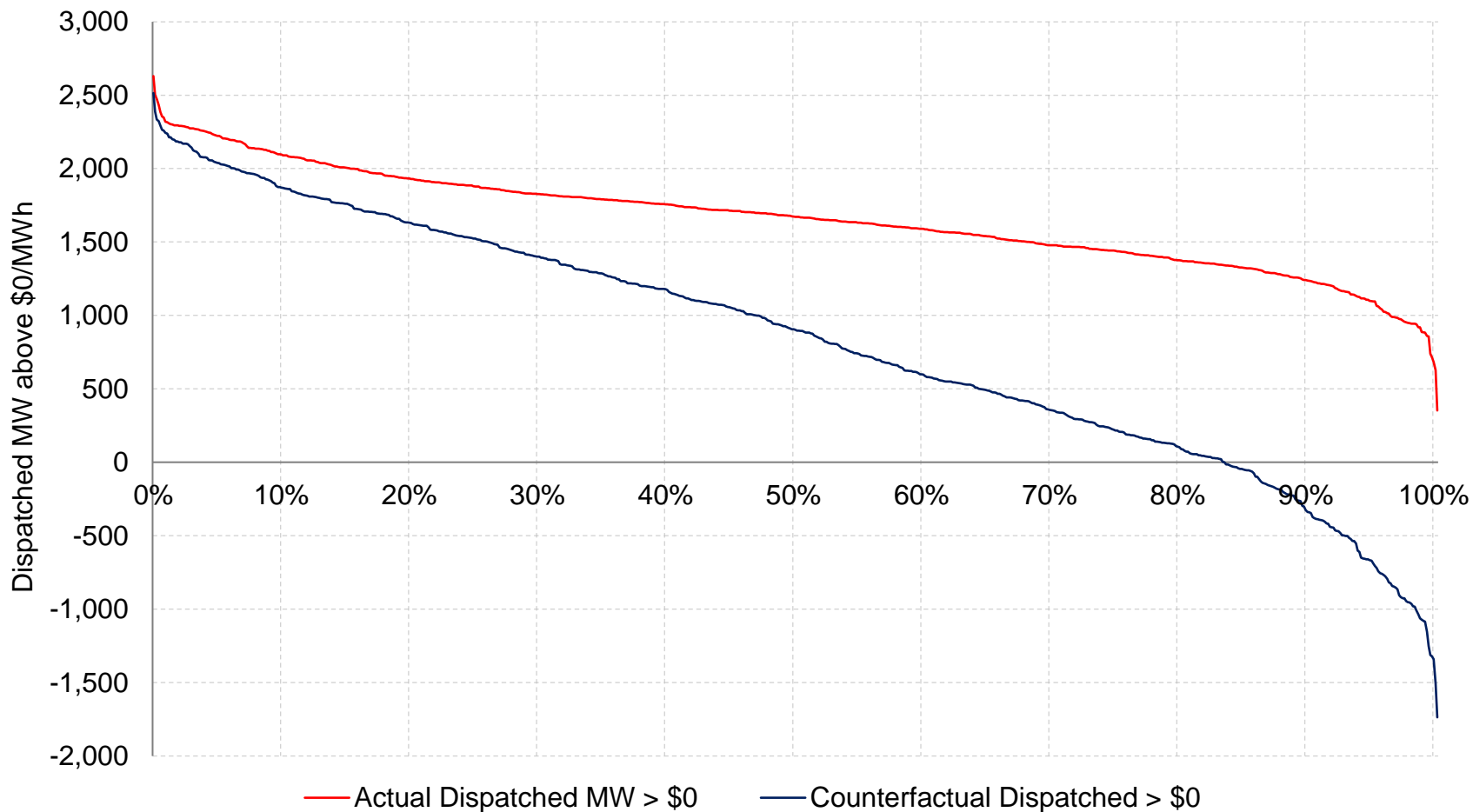
*Figure 12: Demand, net demand scaled, scaled wind and scaled solar generation  
(March 1 to March 7, 2023)*



*Figure 14: Actual and counterfactual dispatch above \$0 (March 1 to 31, 2023)*



*Figure 15: Duration curves of dispatched MW above \$0/MWh in March (actual and counterfactual)*



The expected market consequences of additional wind, solar, and thermal supply may include:

- more commercially offline thermal generation capacity,
- thermal generation assets being mothballed or retired,
- more dispatchable capacity being offered at marginal cost rather than \$0/MWh,
- more supply surplus events,
- increased transmission congestion,
- higher export volumes, and
- increased demand.

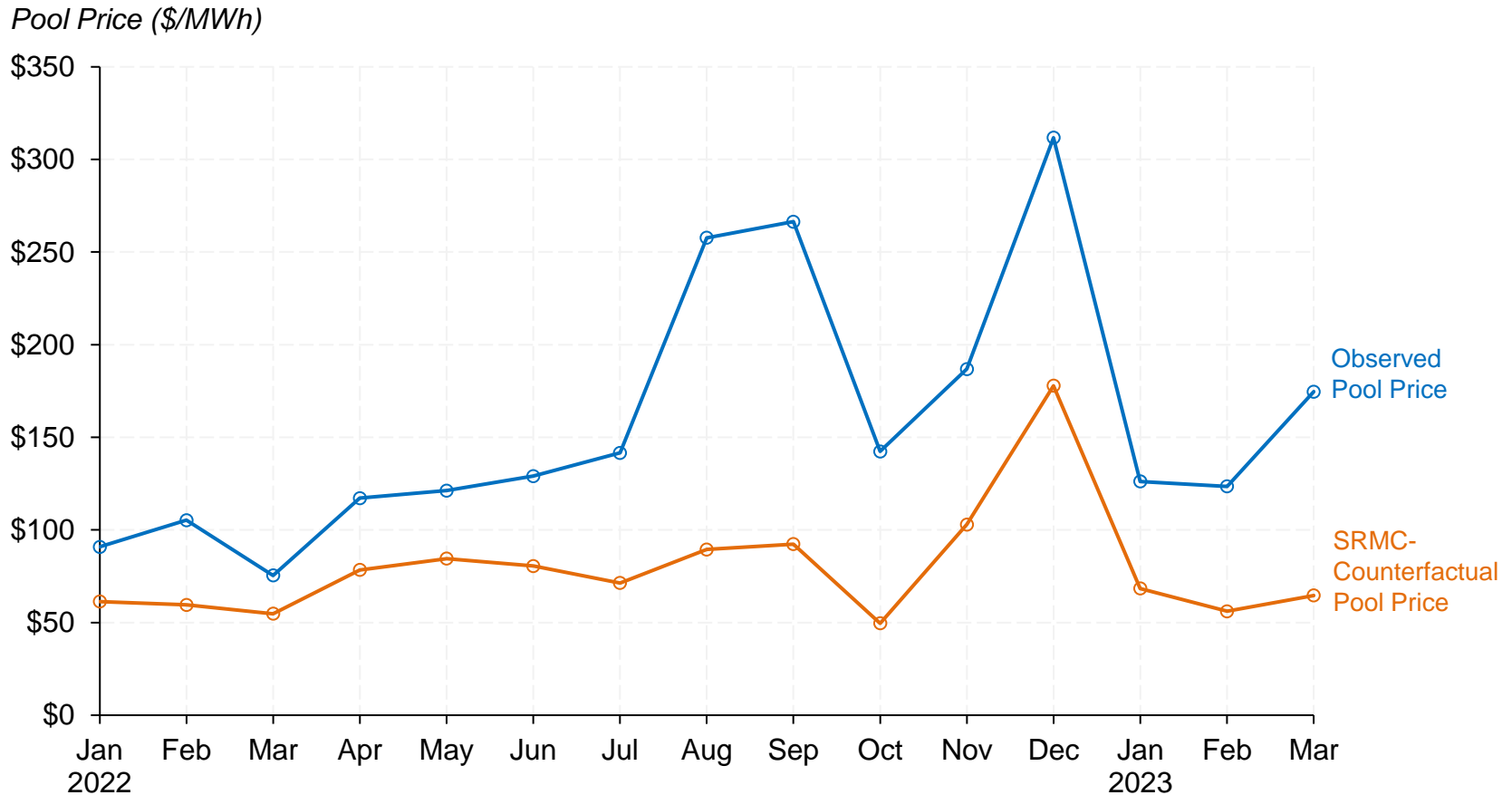
In the MSA's view, the current long lead time rule and the market's decentralized approach to co-ordinating unit commitment is no longer appropriate.

In the short term, revision of the long lead time rule is necessary.

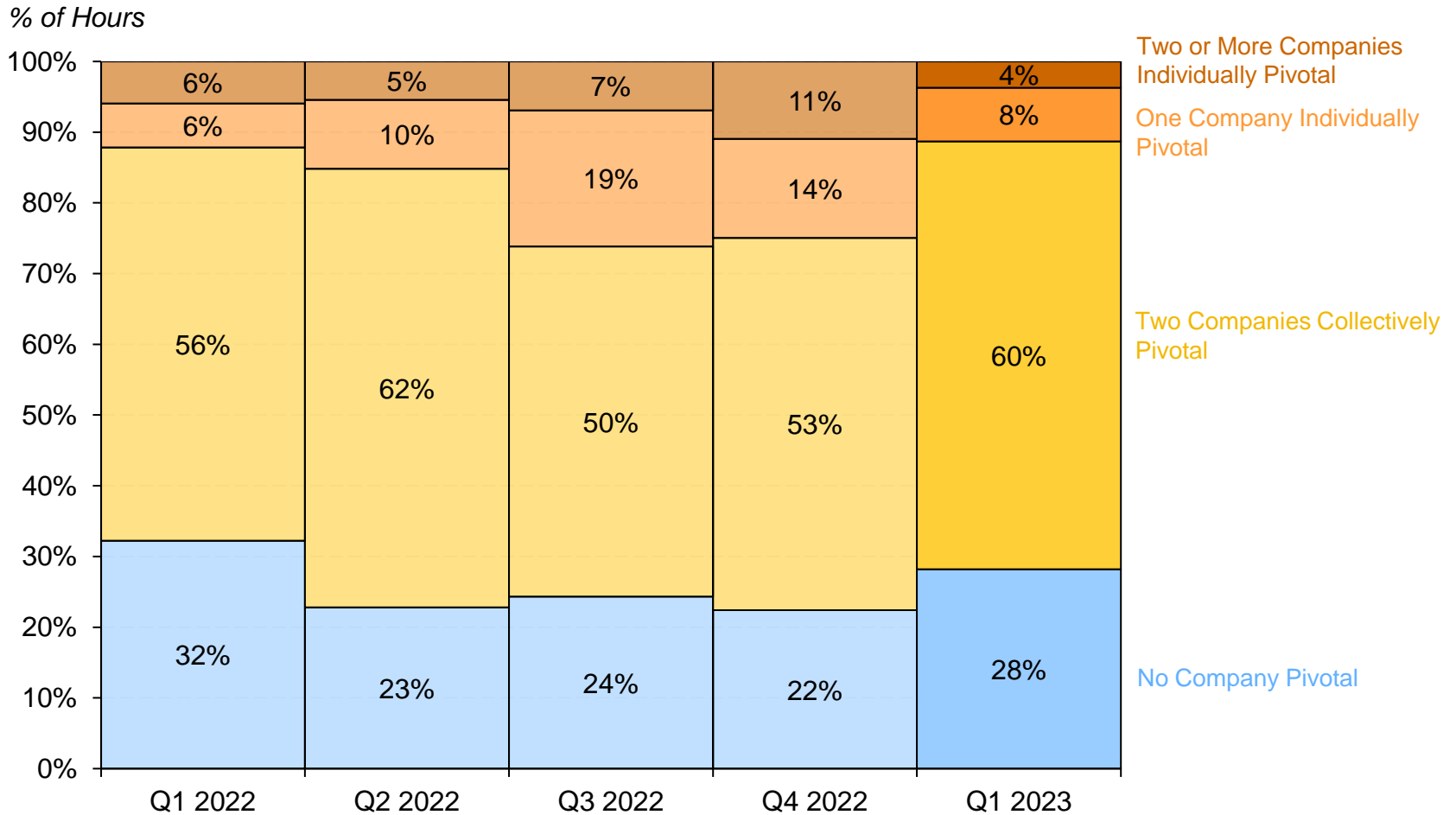
In the longer term, for resources to continue to be allocated efficiently in the context of substantial investment in wind and solar generation capacity, the development of a market mechanism to manage unit commitment is required, such as a day-ahead market common in other jurisdictions.

# Market power and offer behaviour

*Figure 19: Observed, SRMC-counterfactual pool prices by month (January 2022 to March 2023)*

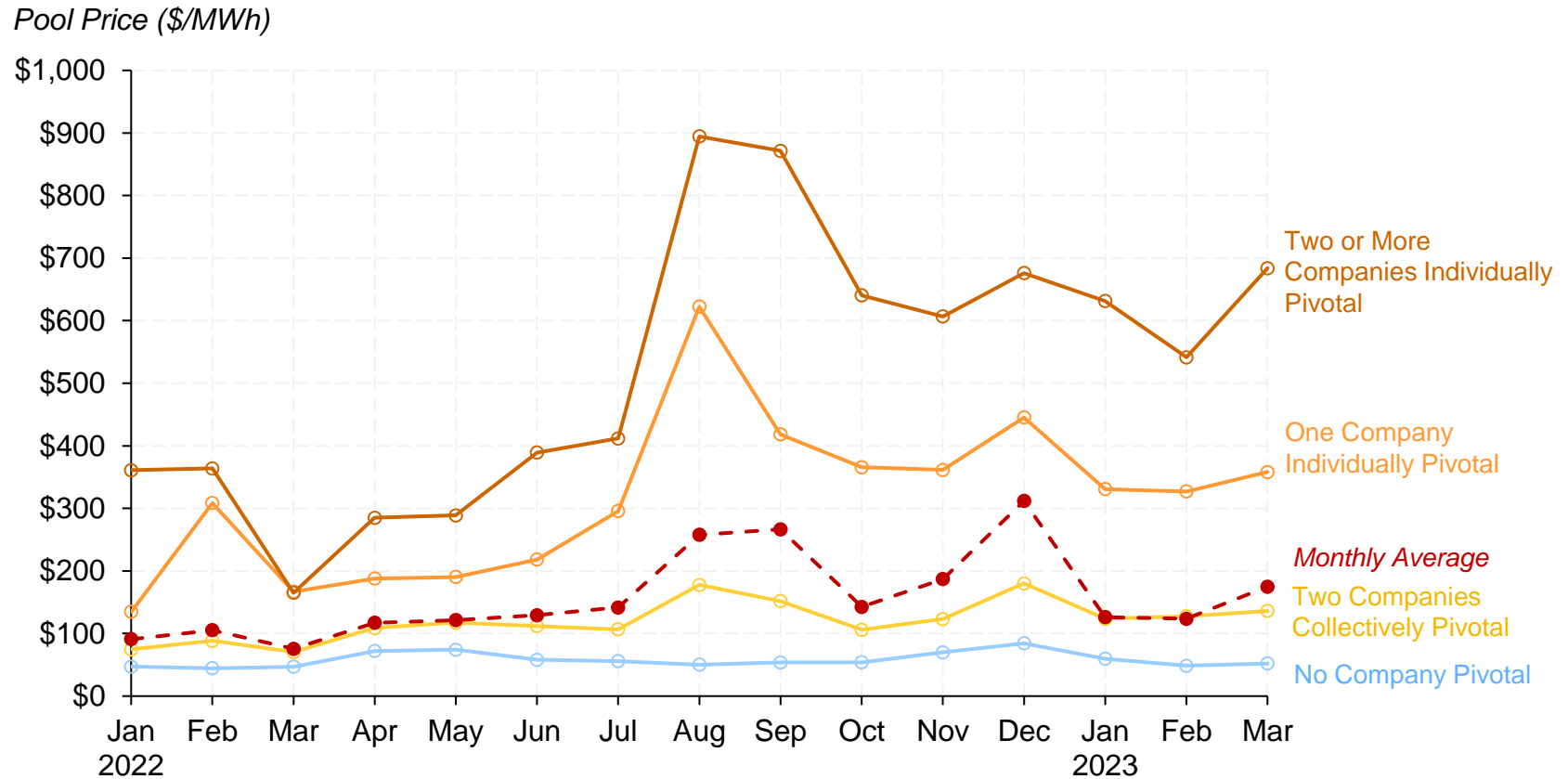


# Figure 26: Market-level pivotality (Q1 2022 to Q1 2023)



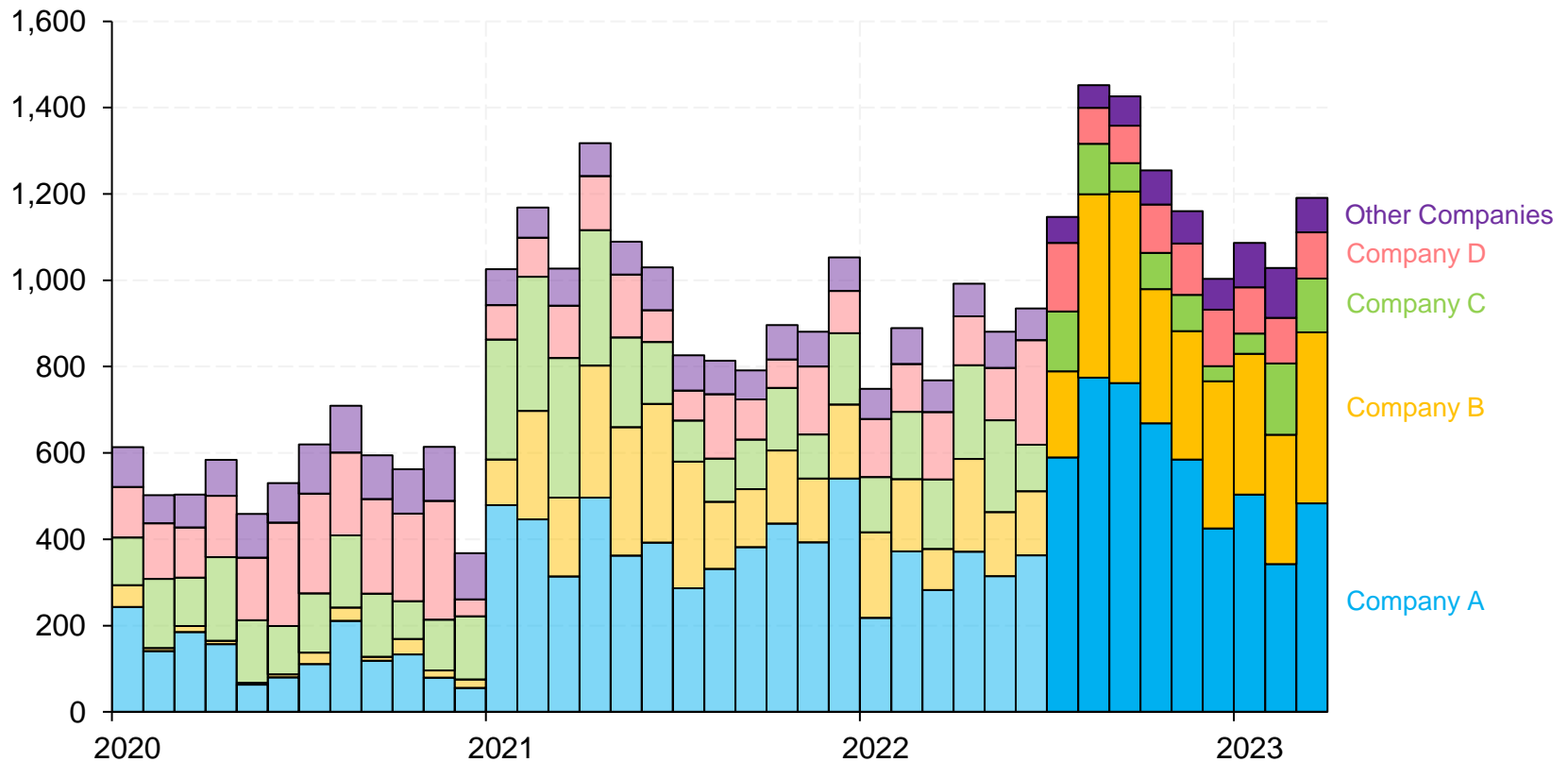


# Figure 32: Monthly average pool price by pivotality condition (January 2022 to March 2023)



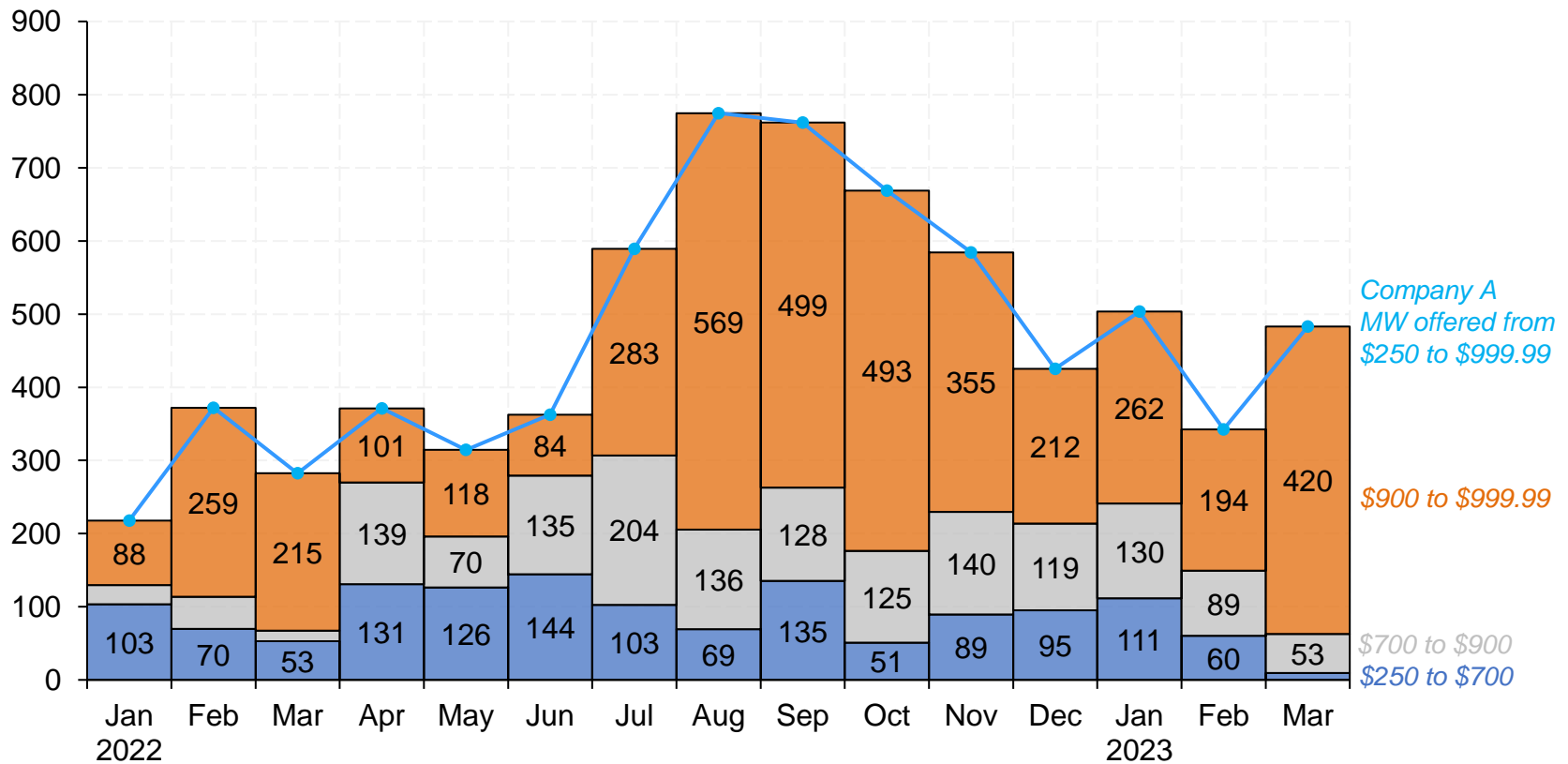
*Figure 37: Monthly average non-wind-solar-MSG capacity priced at or above \$250/MWh in the merit order by company (January 2020 to March 2023)*

*Non-Wind-Solar-MSG Capacity Priced at/above \$250/MWh (MW)*

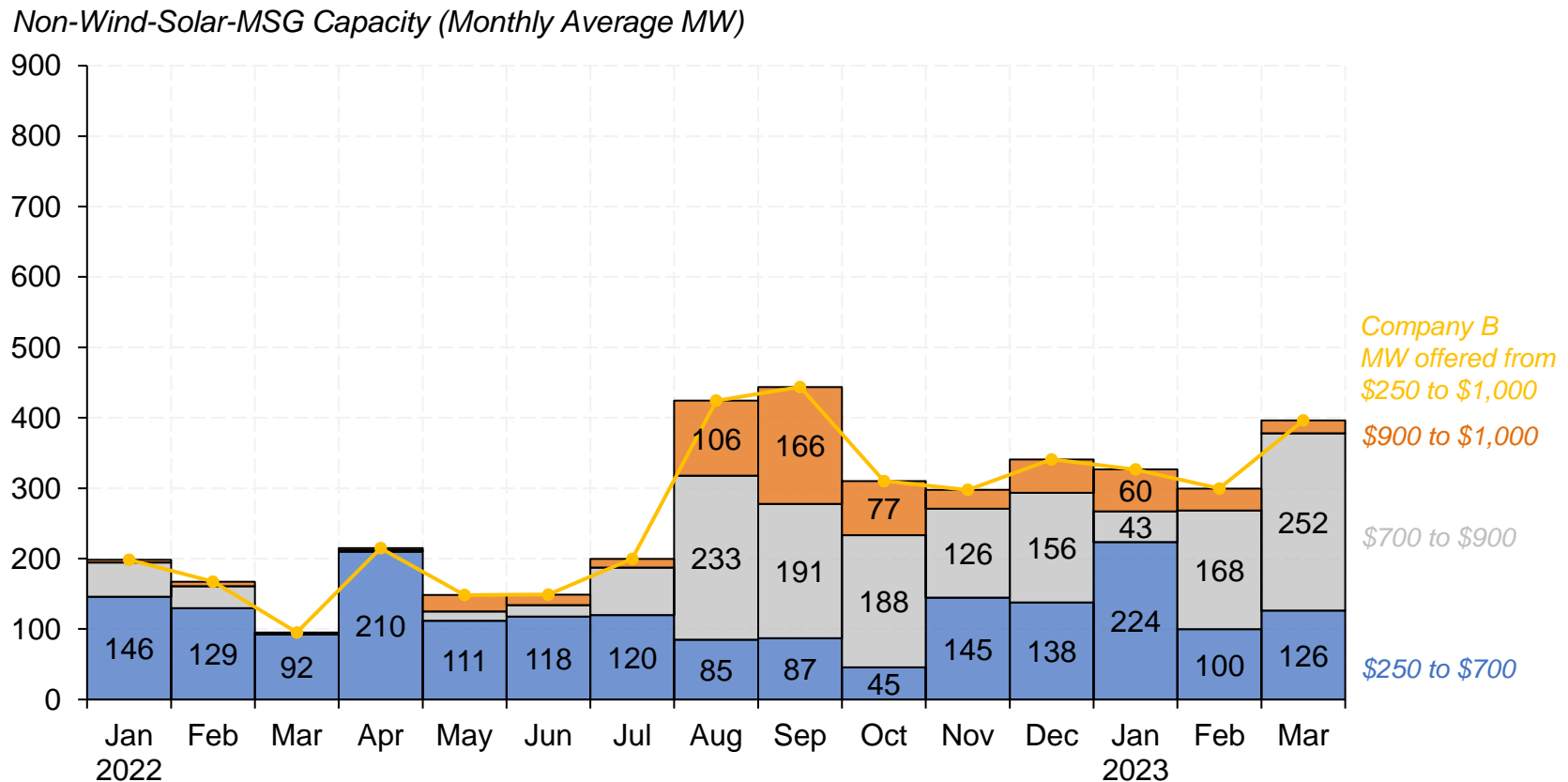


*Figure 39: Average monthly non-wind-solar-MSG capacity offered by Company A at prices between \$250/MWh and the price cap (January 2022 to March 2023)*

Non-Wind-Solar-MSG Capacity (Monthly Average MW)

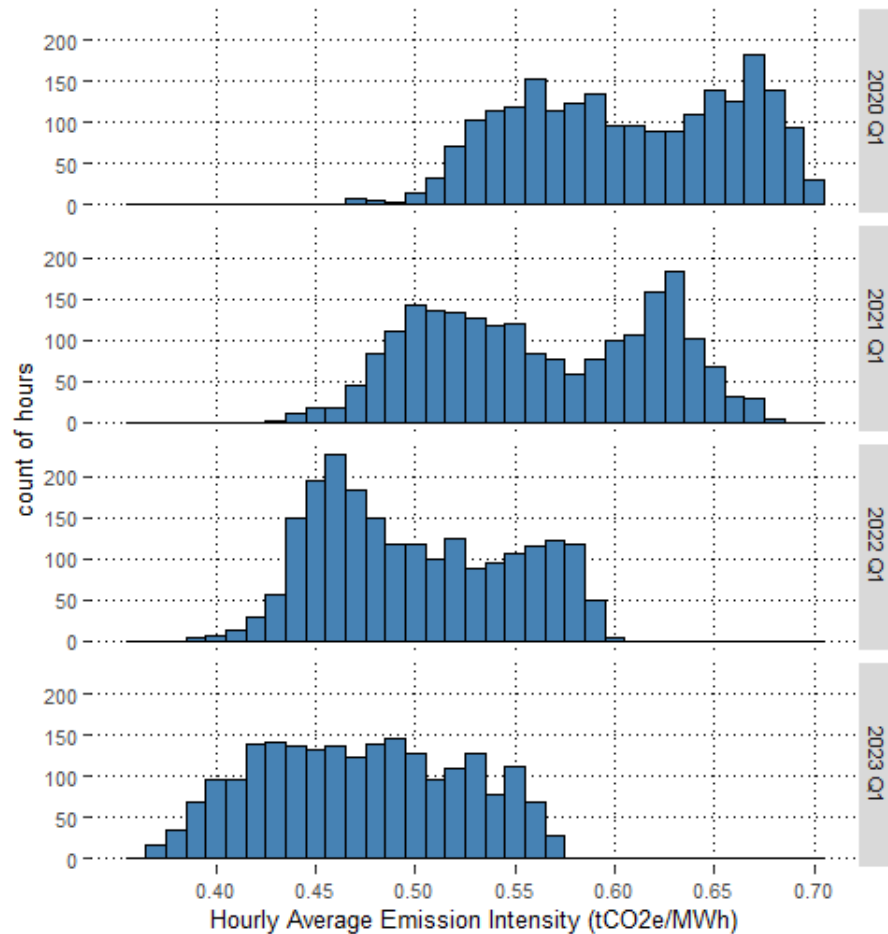


*Figure 41: Average monthly non-wind-solar-MSG capacity offered by Company B at prices between \$250/MWh and the price cap (January 2022 to March 2023)*



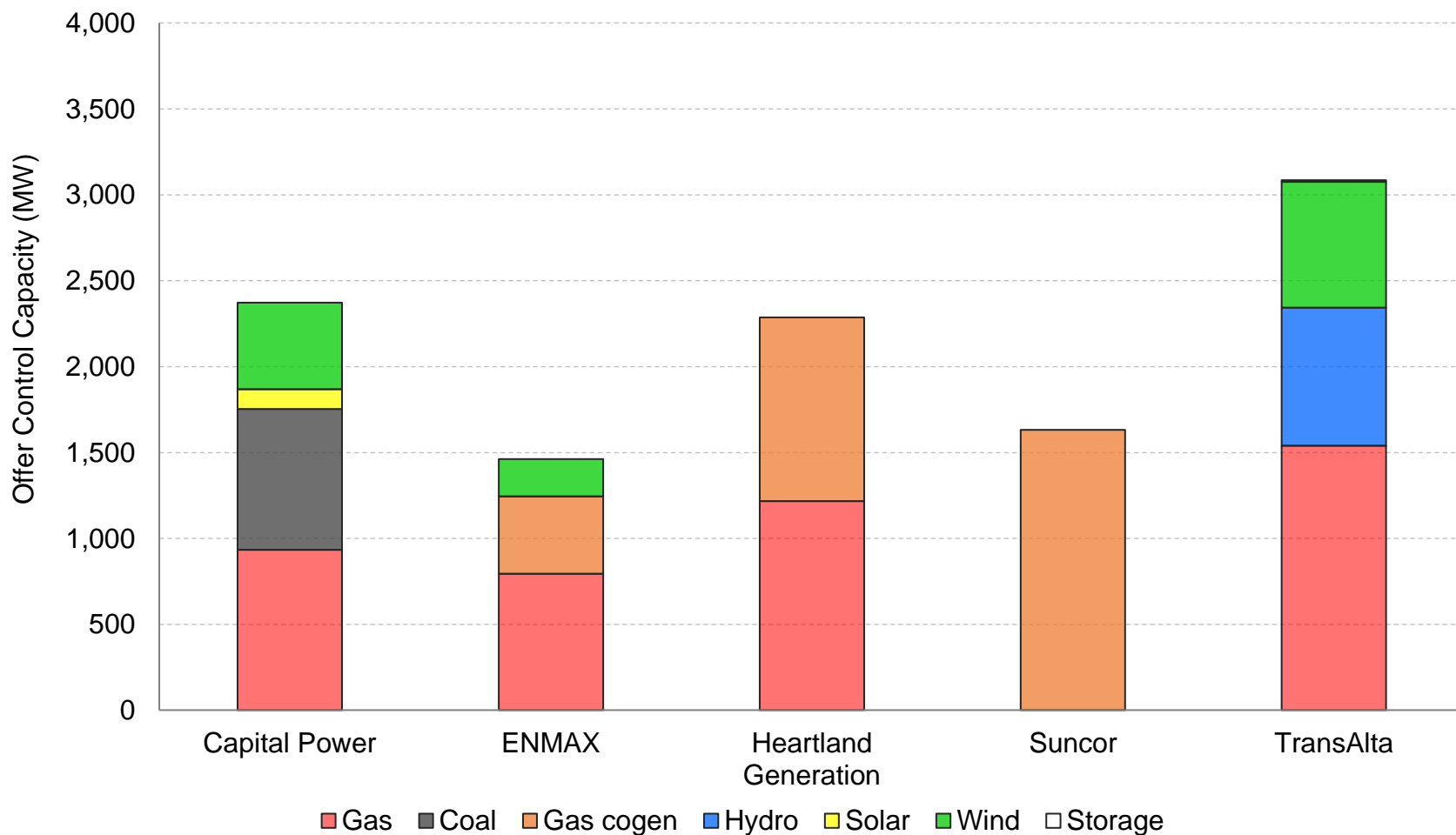
# Carbon emissions

*Figure 45: The distribution of average carbon emission intensities in Q1 (2020 to 2023)*



# Market share offer control

*Figure 50: Dispatchable MW by fuel type for market participants with more than 5% offer control*



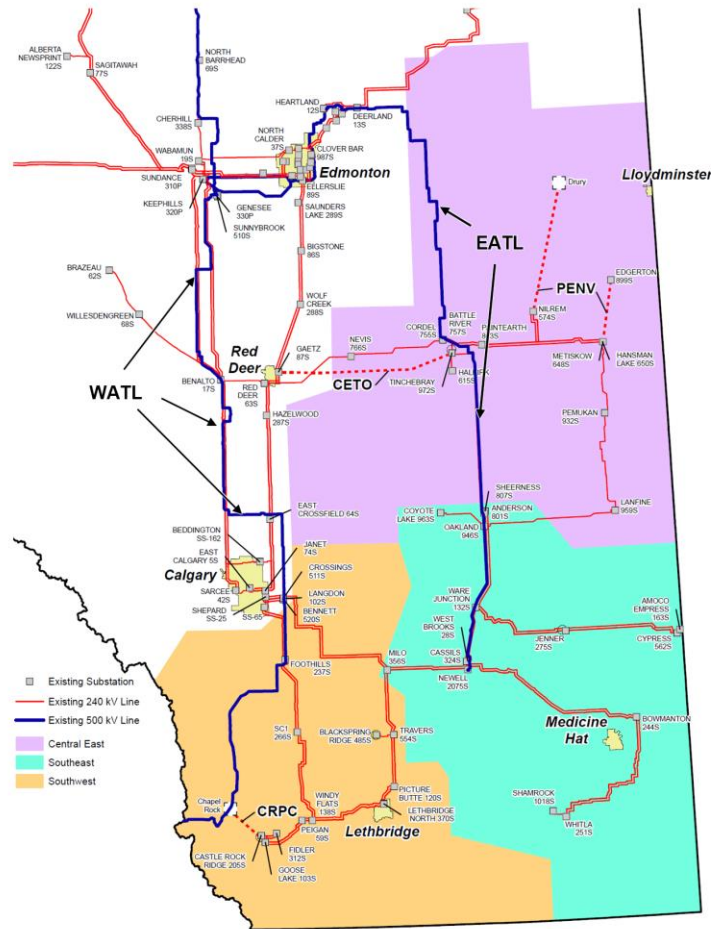


*Table 10: Market share offer control of electricity market participants with greater than 5% offer control between MSOC 2022 and 2023*

<b>Company</b>	<b>Apr/3/2022</b>		<b>Mar/31/2023</b>	
	<b>Control (MW)</b>	<b>%</b>	<b>Control (MW)</b>	<b>%</b>
TransAlta	2,956	18.5%	3,086	17.0%
Capital Power	2,277	14.3%	2,372	13.1%
Heartland Generation	2,276	14.3%	2,286	12.6%
Suncor	1,182	7.4%	1,632	9.0%
ENMAX	1,452	9.1%	1,462	8.0%
Other	5,509	34.5%	7,001	38.5%
Total Dispatchable	15,652	98.0%	17,839	98.2%
Total Non-dispatchable	319	2.0%	328	1.8%
<b>Grand Total</b>	<b>15,971</b>	<b>100%</b>	<b>18,167</b>	<b>100%</b>

# Power system

# Figure 51: EATL and WATL



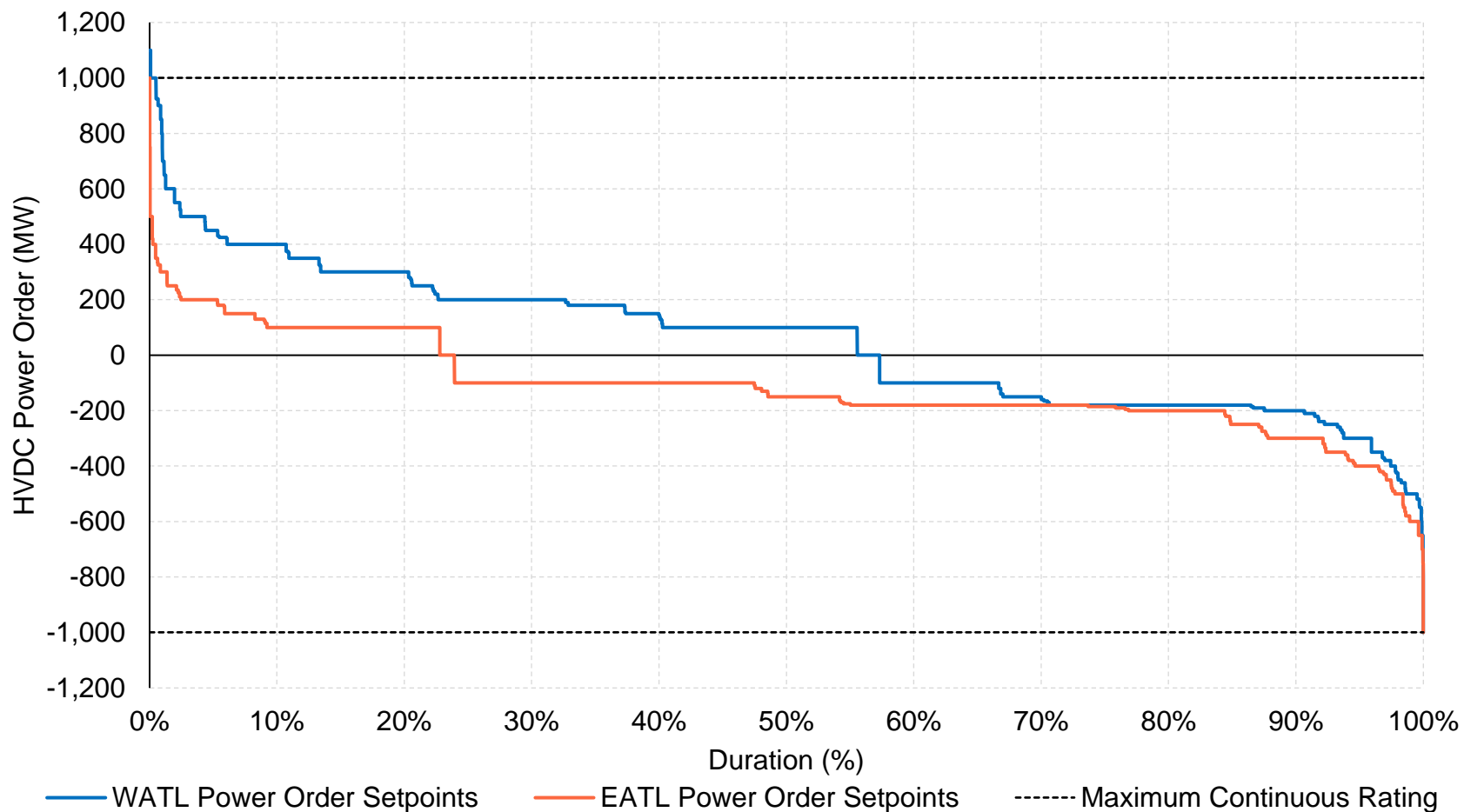
WATL power order dispatch instructions are mainly impacted by:

- inertia activity from the BC-Alberta interconnection;
- wind and solar generation in the South of the province;
- generation levels of the generating stations east of Calgary, especially Shepard generating station;
- load levels in Calgary; and
- generation, load, and voltage levels near the Keephills/Ellerslie/Genesee region southwest of Edmonton

EATL power order dispatch instructions are mainly impacted by:

- generation levels at the Sheerness generating station;
- increasingly, levels of wind and solar generation in the southeast of the province; and
- load and voltage profiles in the industrial regions northeast of Edmonton

*Figure 53: Historical HVDC power orders, hourly sorted from high to low (December 2015 to December 2022)*

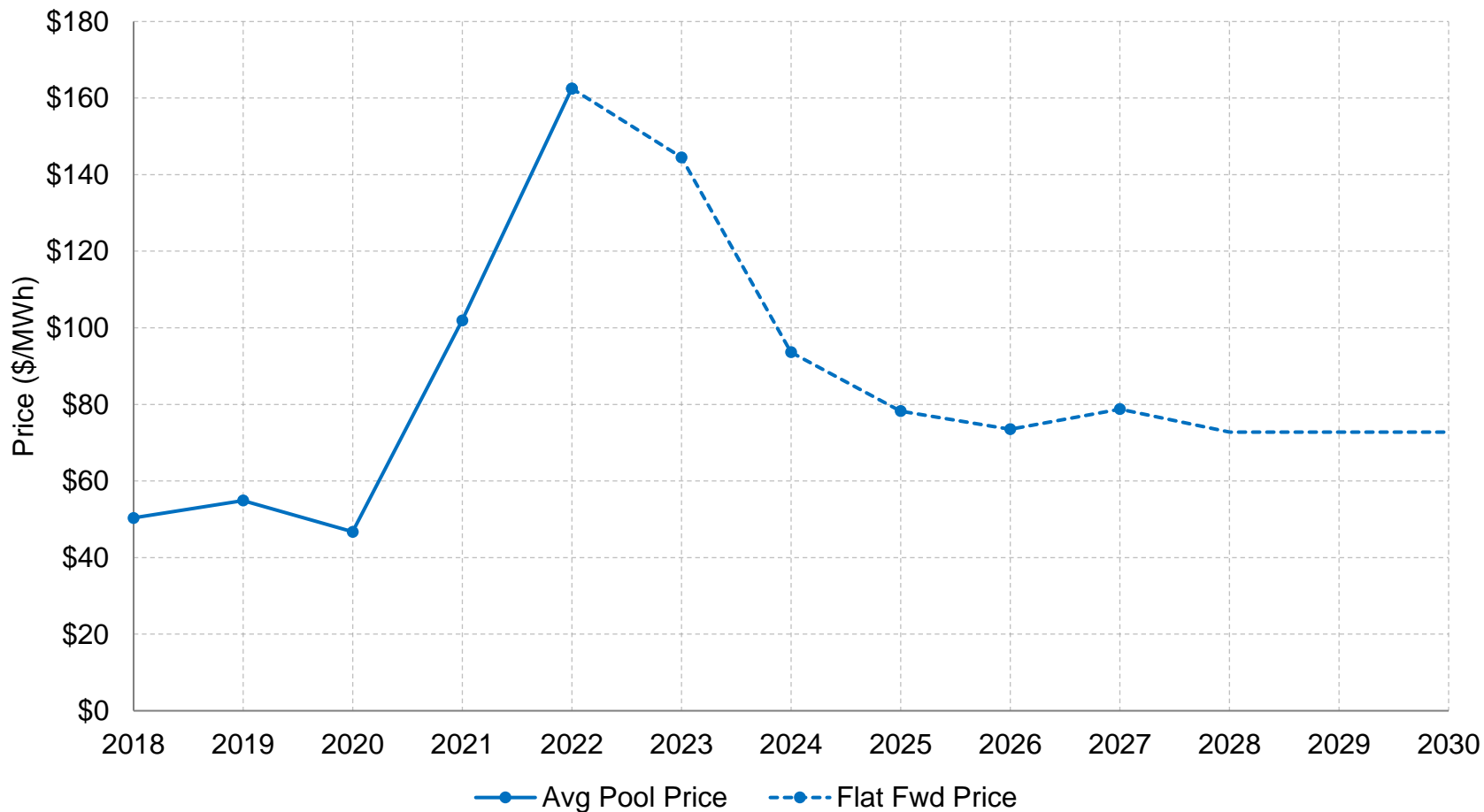


*Table 13: Direction of power flows on EATL and WATL  
(December 2015 to December 2022)*

		WATL			EATL total
		South to north	Zero	North to south	
EATL	North to south	3.9%	1.2%	17.4%	22.5%
	Zero	0.1%	1.5%	0.8%	2.4%
	South to north	38.1%	0.4%	36.6%	75.1%
	WATL total	42.1%	3.0%	54.8%	100.0%

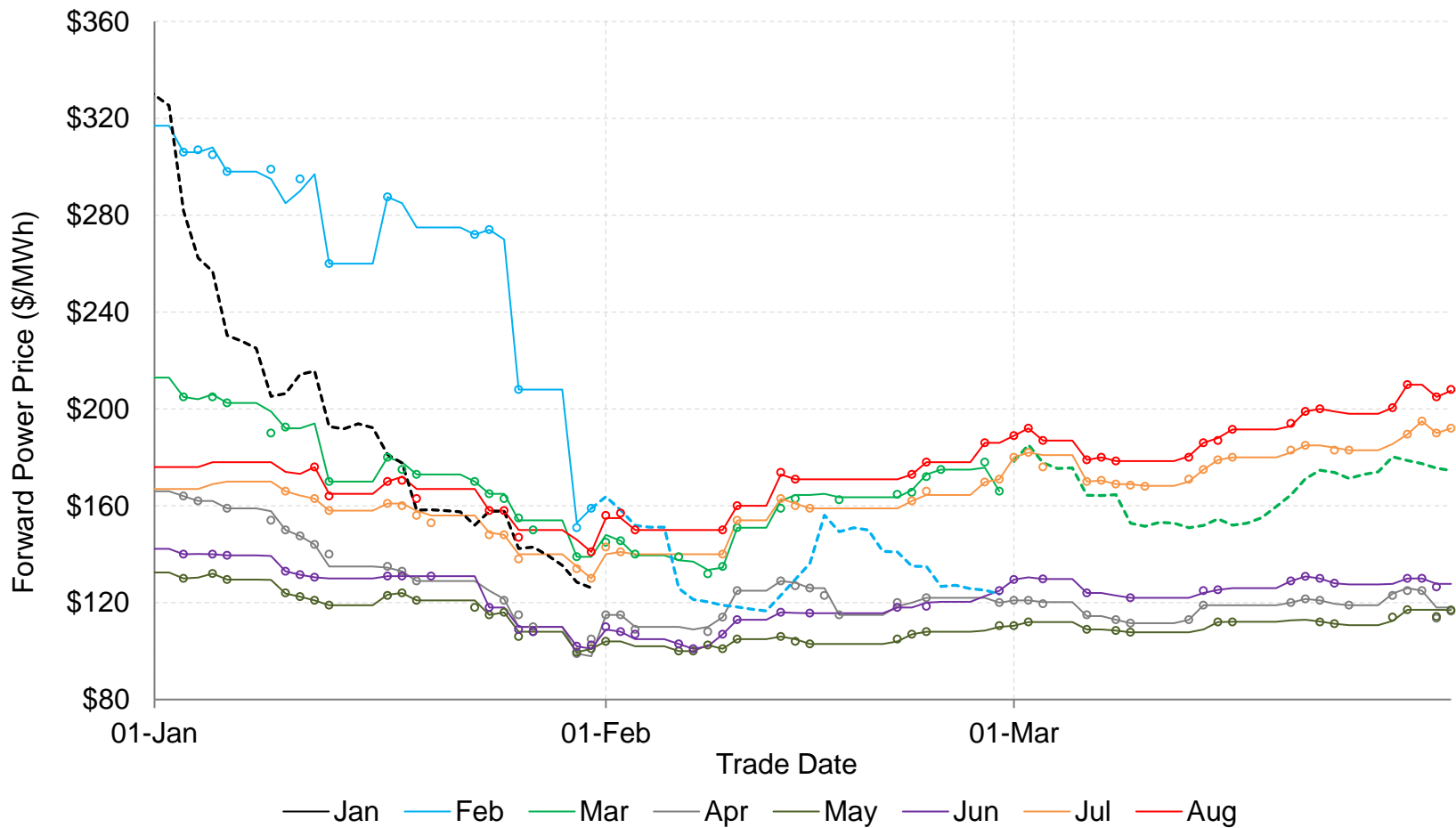
# Forward market

*Figure 67: The annual forward curve for power (as of late March 2023, nominal \$)*

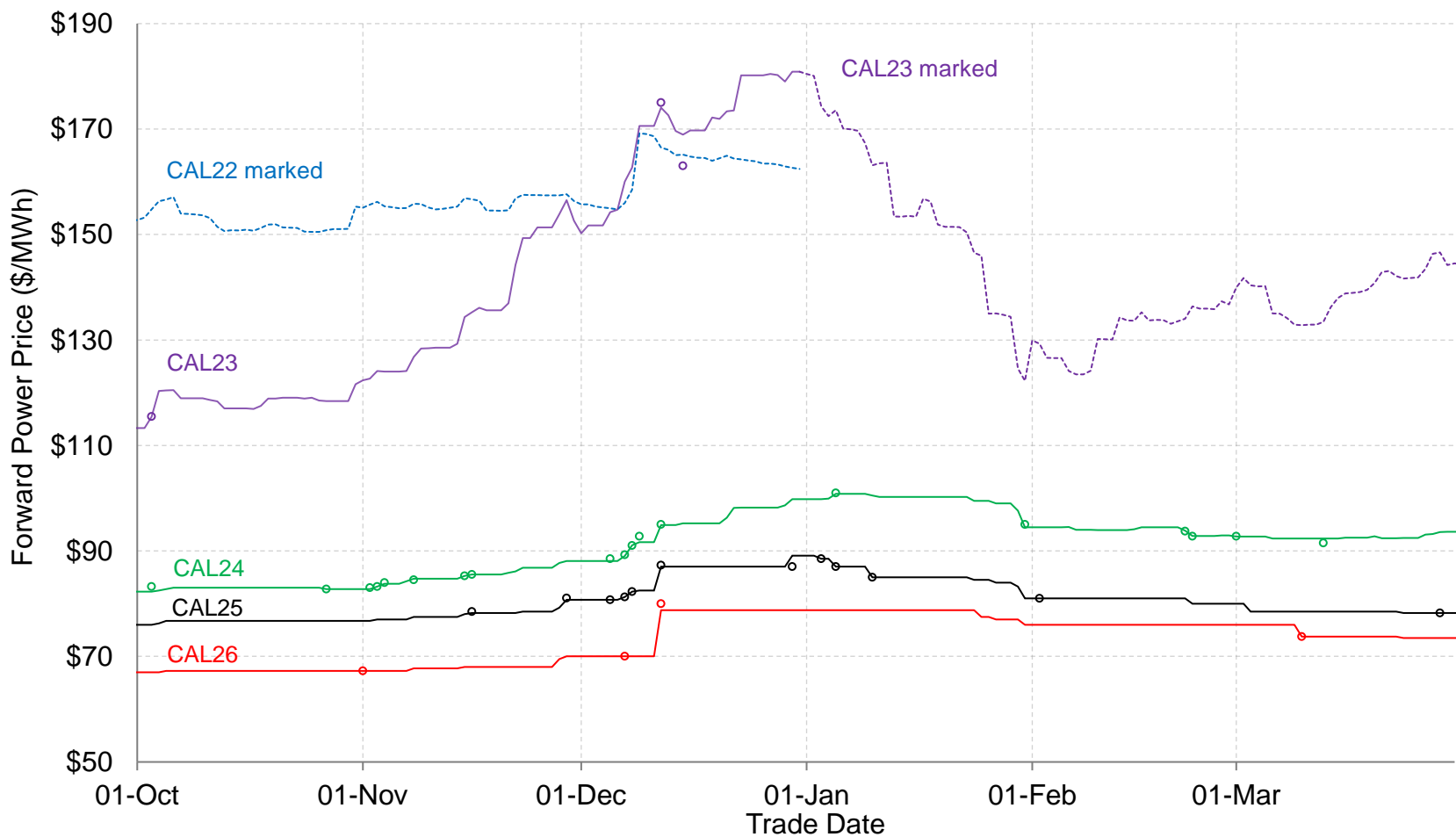




*Figure 69: The price of select monthly flat contracts over time (January 1 to March 31, 2023)*

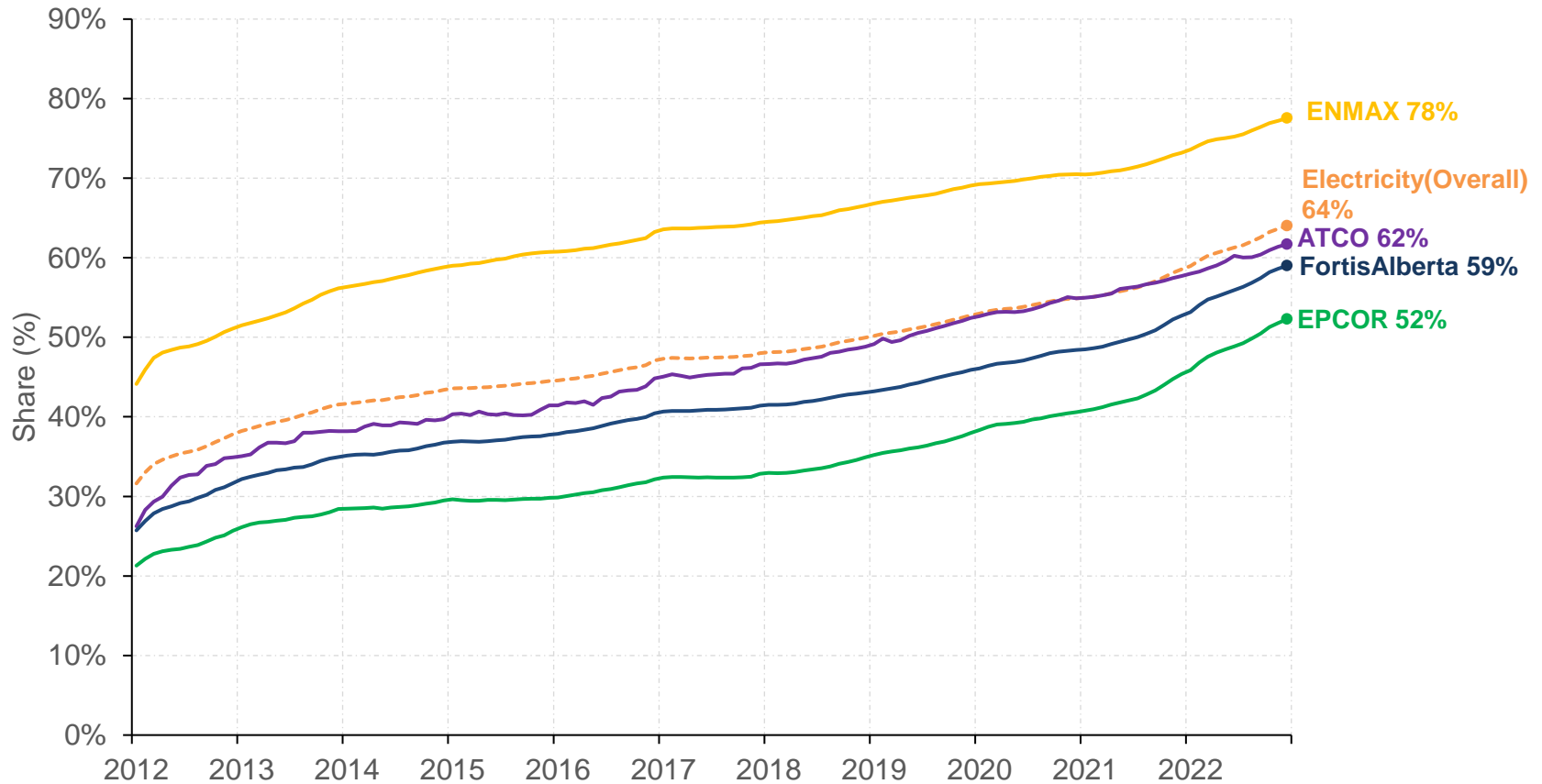


*Figure 73: Annual flat forward prices over time  
(October 1, 2022 to March 31, 2023)*

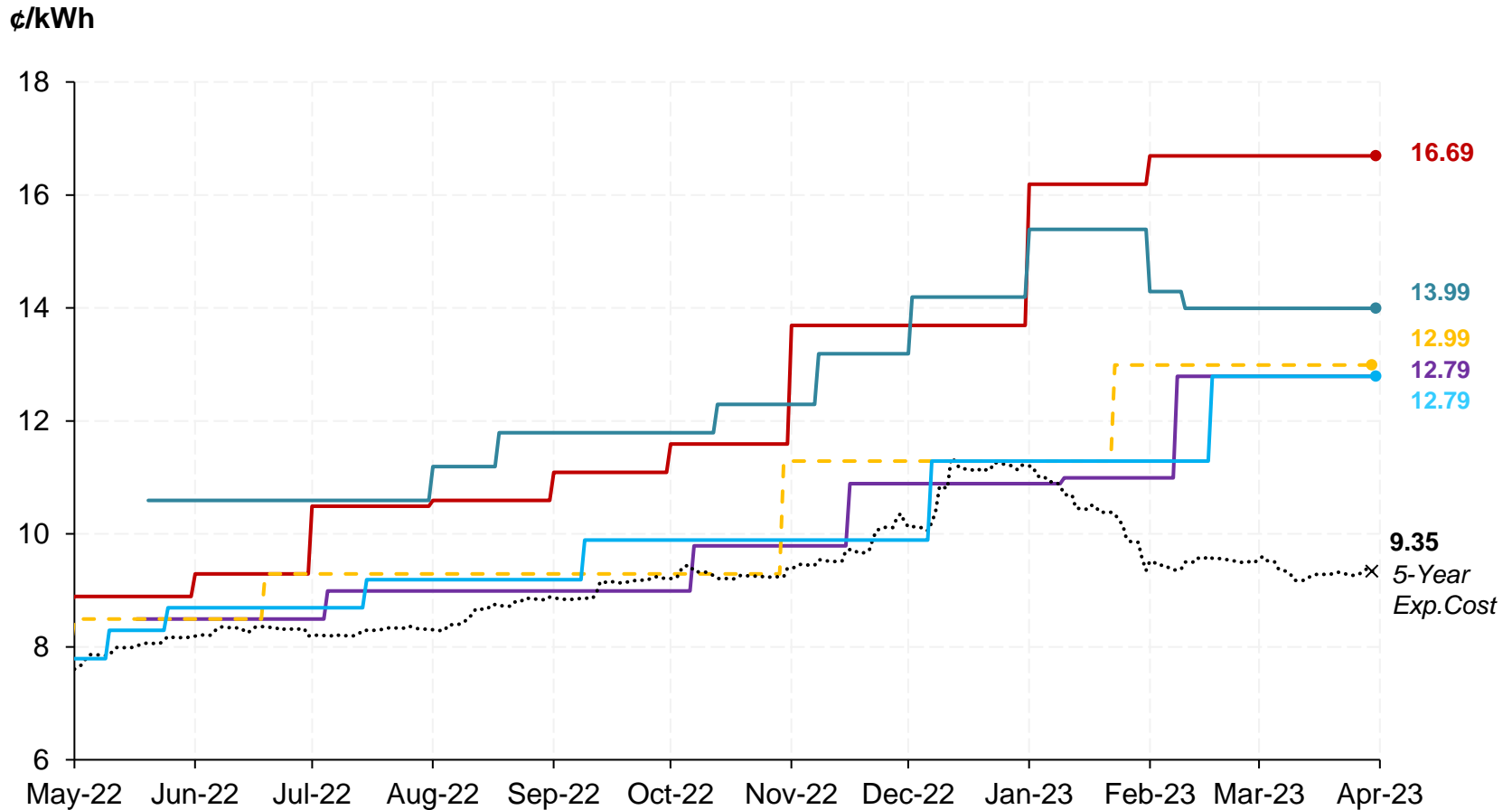


# Retail market

*Figure 80: Competitive retail customer share (Electricity)  
by service area, residential customers  
(January 2012 to December 2022)*



*Figure 84: 5-year fixed rate electricity contract prices, residential customers, ENMAX service area (May 1, 2022 to March 31, 2023)*



*Table 23: Lowest competitive fixed rates for electricity among select retailers (January 1, 2022 vs. March 31, 2023)*

<b>Contract Type</b>	<b>As of Jan 1, 2022 (¢/kWh)</b>	<b>As of Mar 31, 2023 (¢/kWh)</b>	<b>% Change</b>
1 Year	7.99	14.1	<b>+76%</b>
3 Year	7.89	12.69	<b>+61%</b>
5 Year	6.89	12.79	<b>+86%</b>

*Figure 89: May 2023 to April 2024 estimated residential RRO monthly rates and billing rates, EPCOR service area (as of April 1, 2023)*

