



# Quarterly Report for Q3 2023: Selected findings

November 15, 2023

# Presentation outline

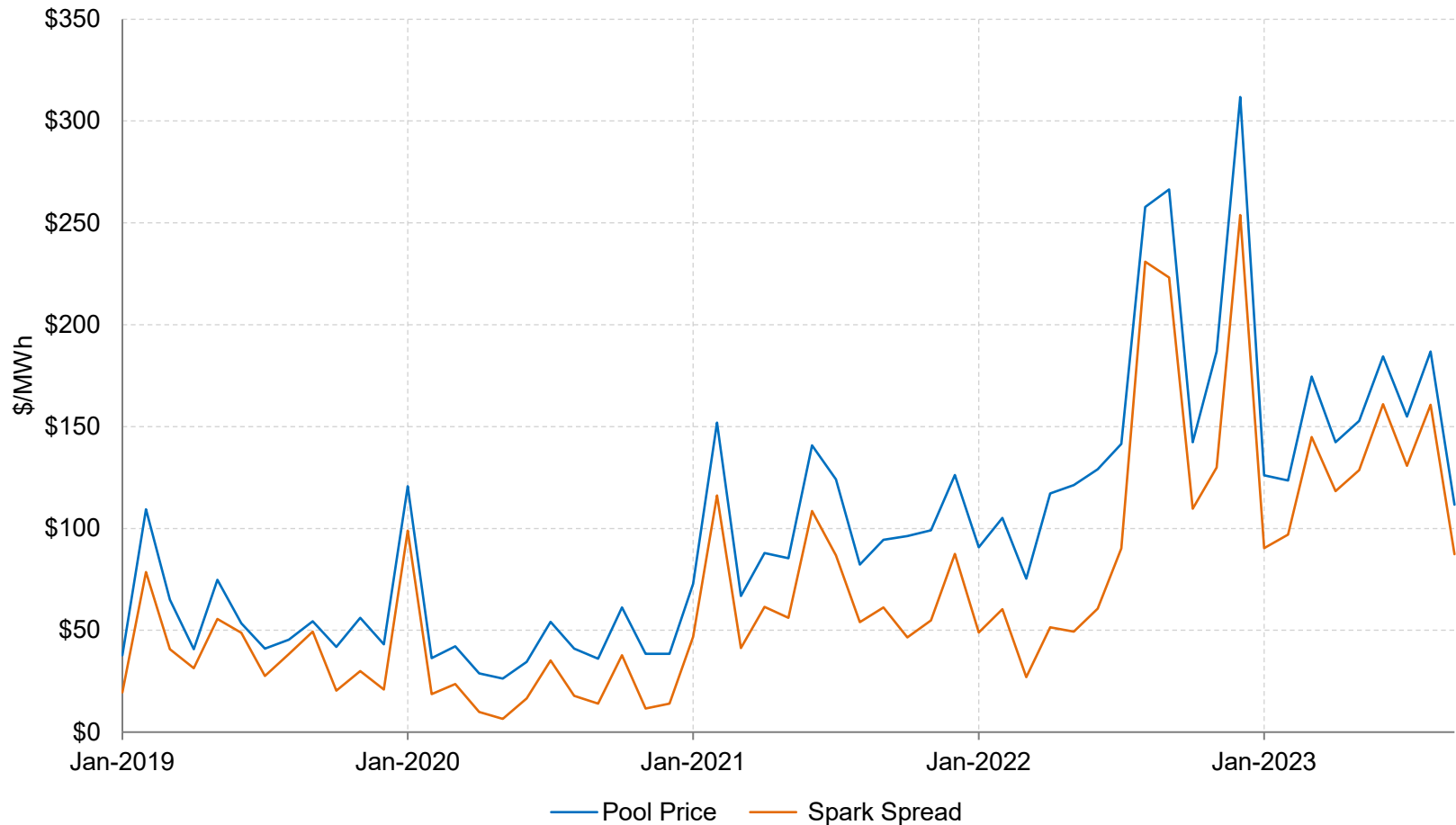
- Scope of this presentation
- Energy market
  - Market events
  - Market power and offer behaviour
  - Carbon emissions
  - Fuel supply
- Power system
  - Trends in transmission congestion
  - Pool price inaccuracies caused by inaccurate price reconstitution
  - Imports and exports
- Operating reserve markets
- Forward market
- Retail market

# Scope of this presentation

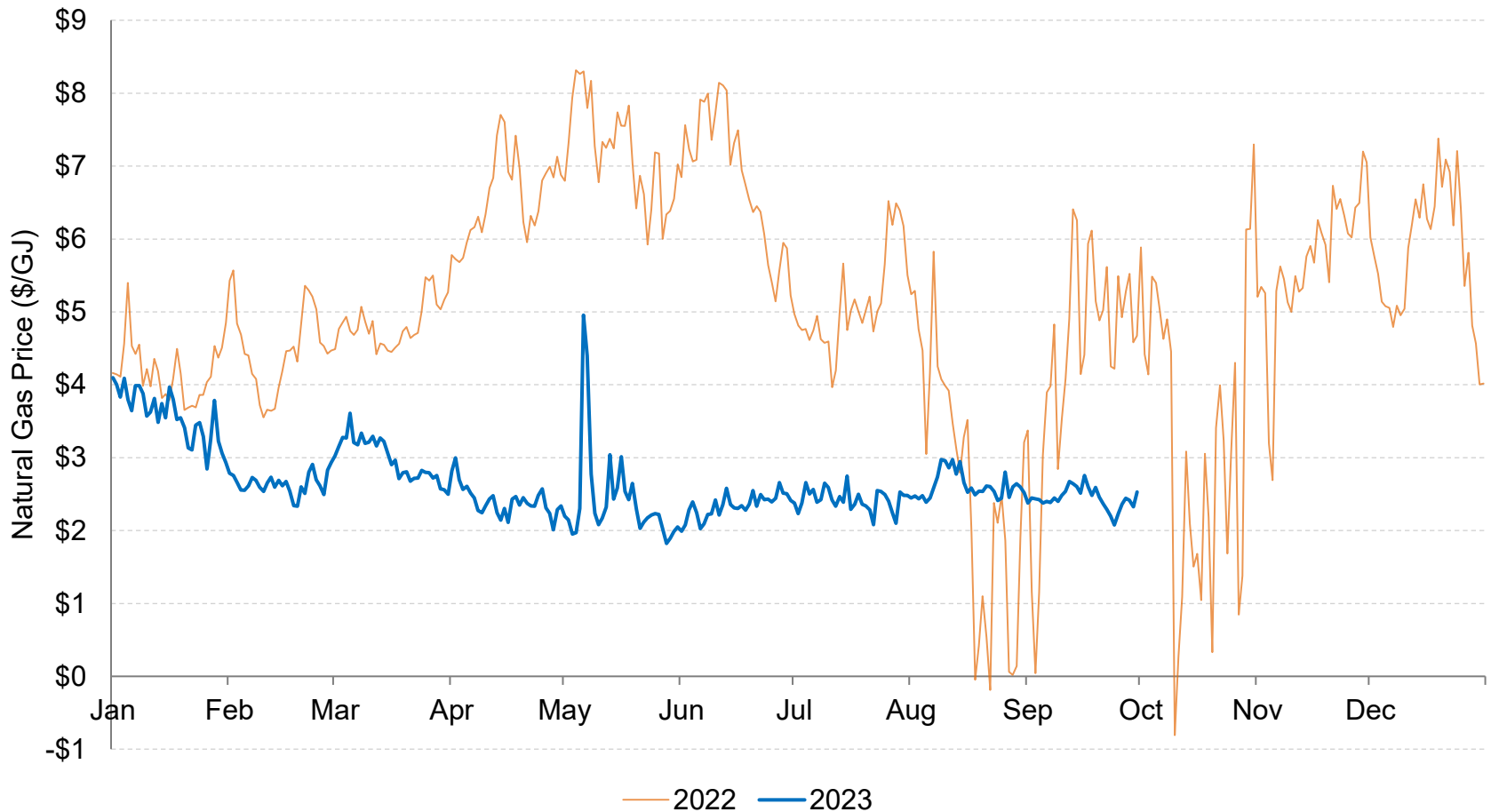
- This presentation provides a selection of findings contained in the MSA's Quarterly Report for Q3 2023
  - Only selected figures are included here
  - Readers are referred to the Quarterly Report itself for discussion of the figures
- All content in this presentation was copied directly from the Quarterly Report and no additional information, including by exclusion of any material, is provided here.

# Energy market

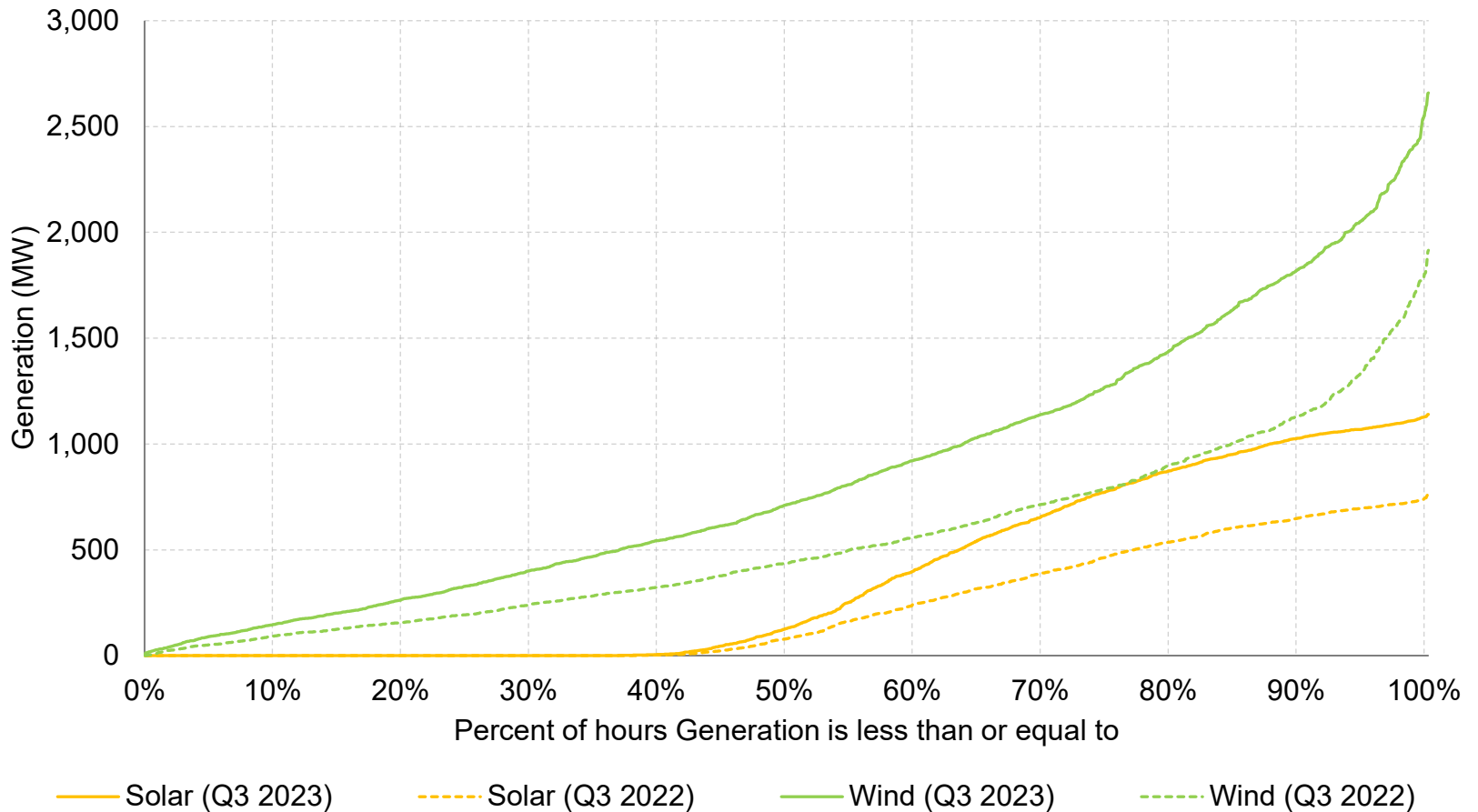
*Figure 1: Average pool price and spark spread by month (January 2019 to September 2023)*



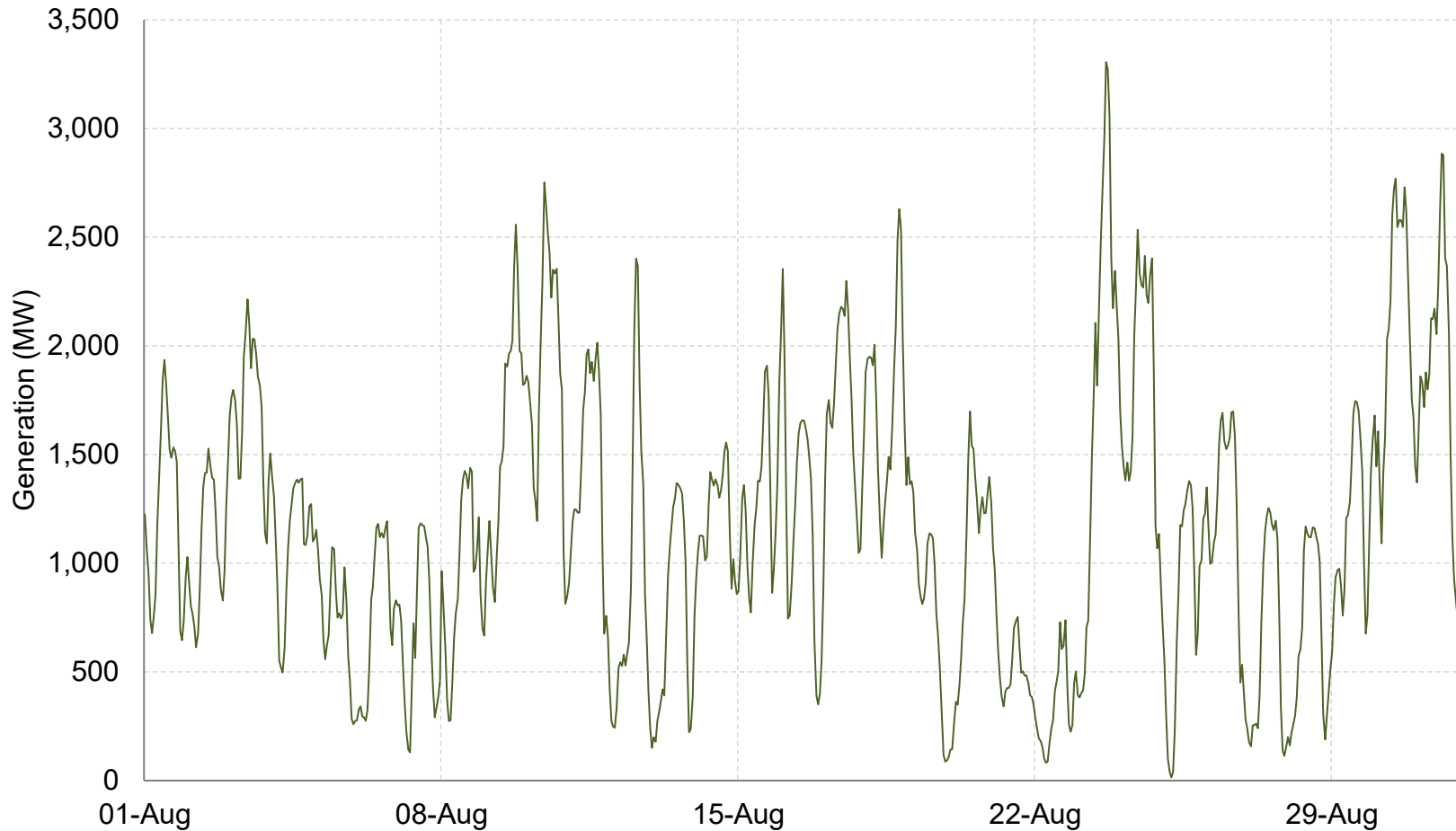
*Figure 2: Same-day natural gas prices at AB-NIT  
(2022 and Q1 to Q3)*



*Figure 3: Duration curves for wind and solar generation (Q3 and Q3 2022)*



*Figure 4: Hourly intermittent generation in August 2023*





# Market events

*Figure 9: EEA hours by year (2010 to Q3 2023)*

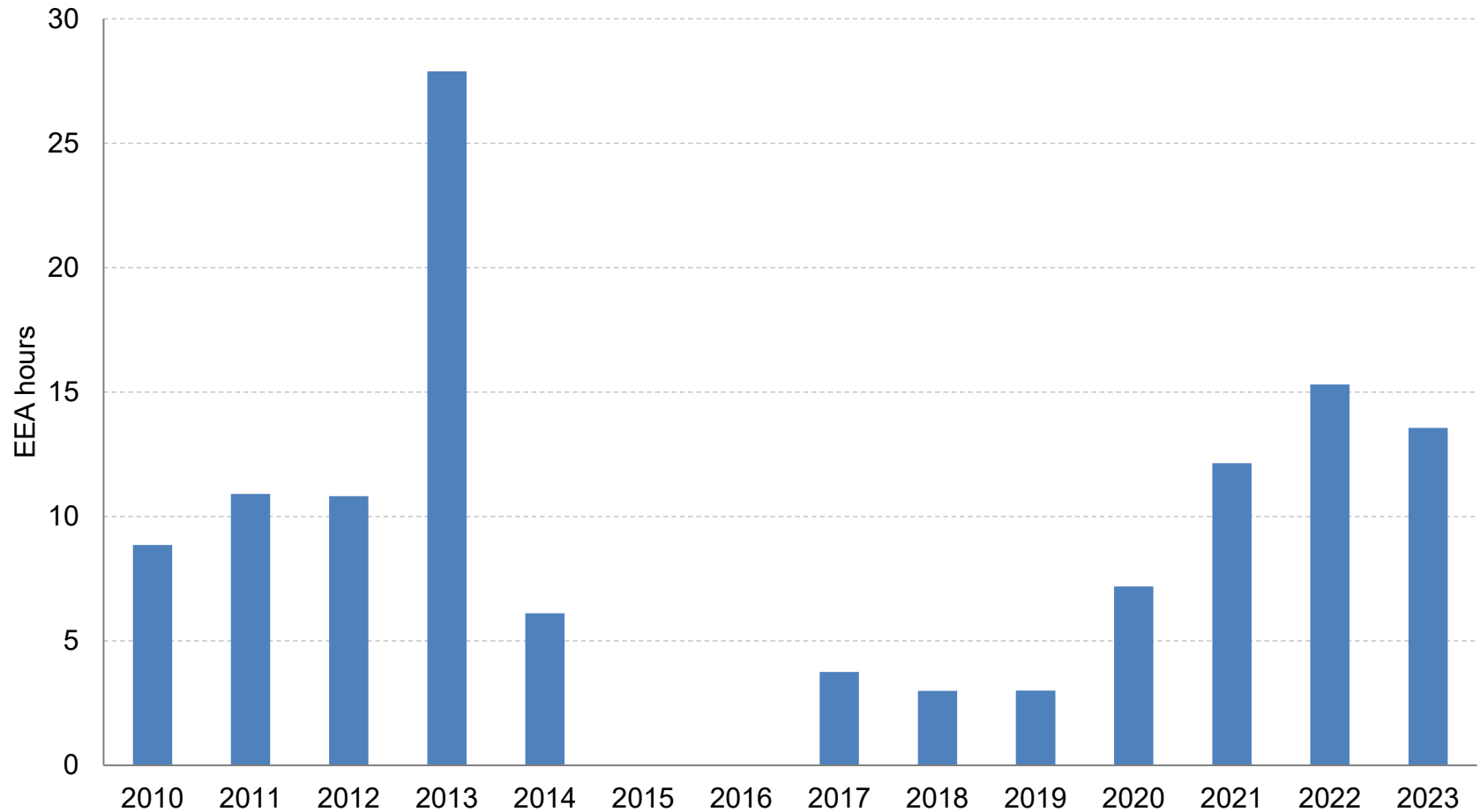
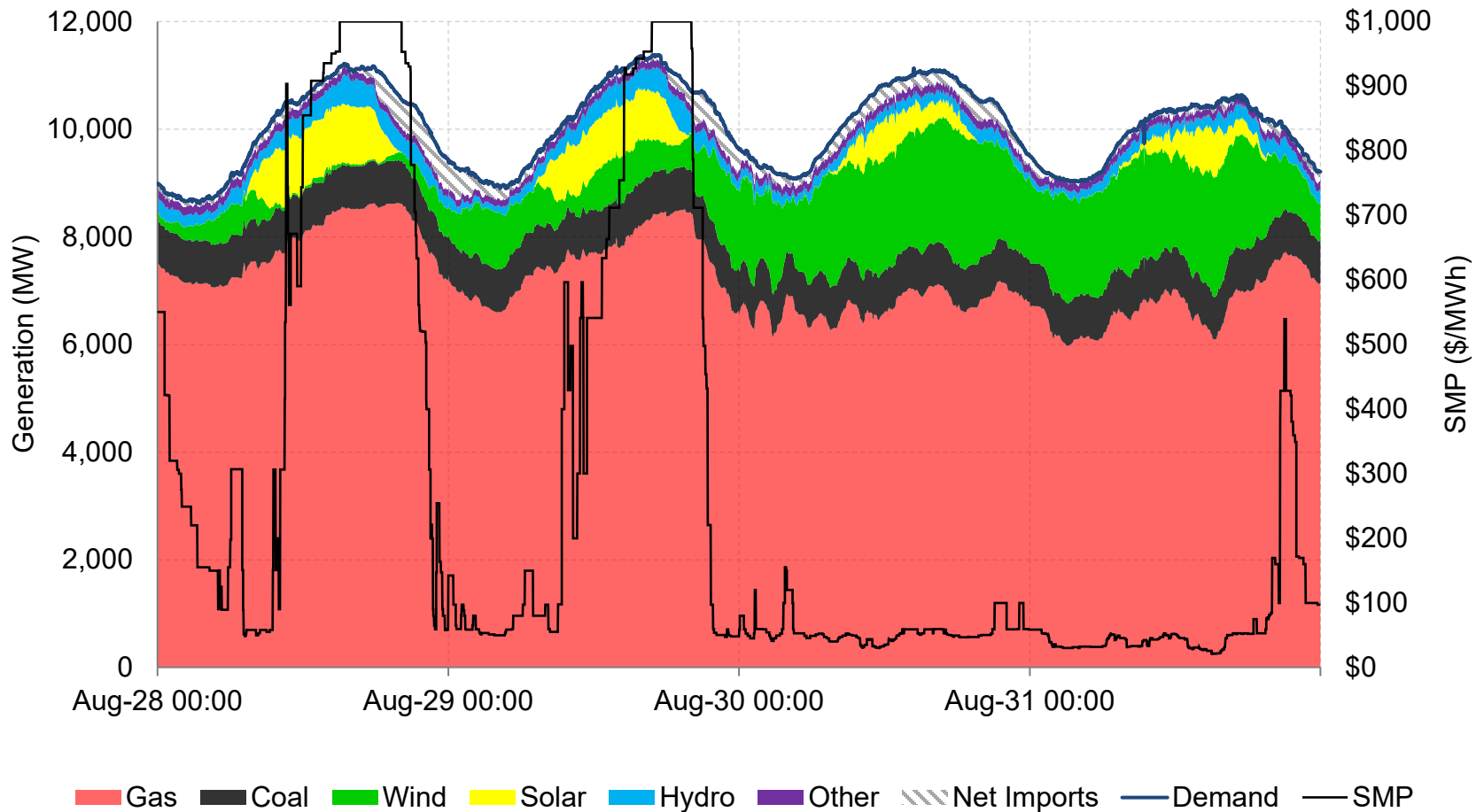
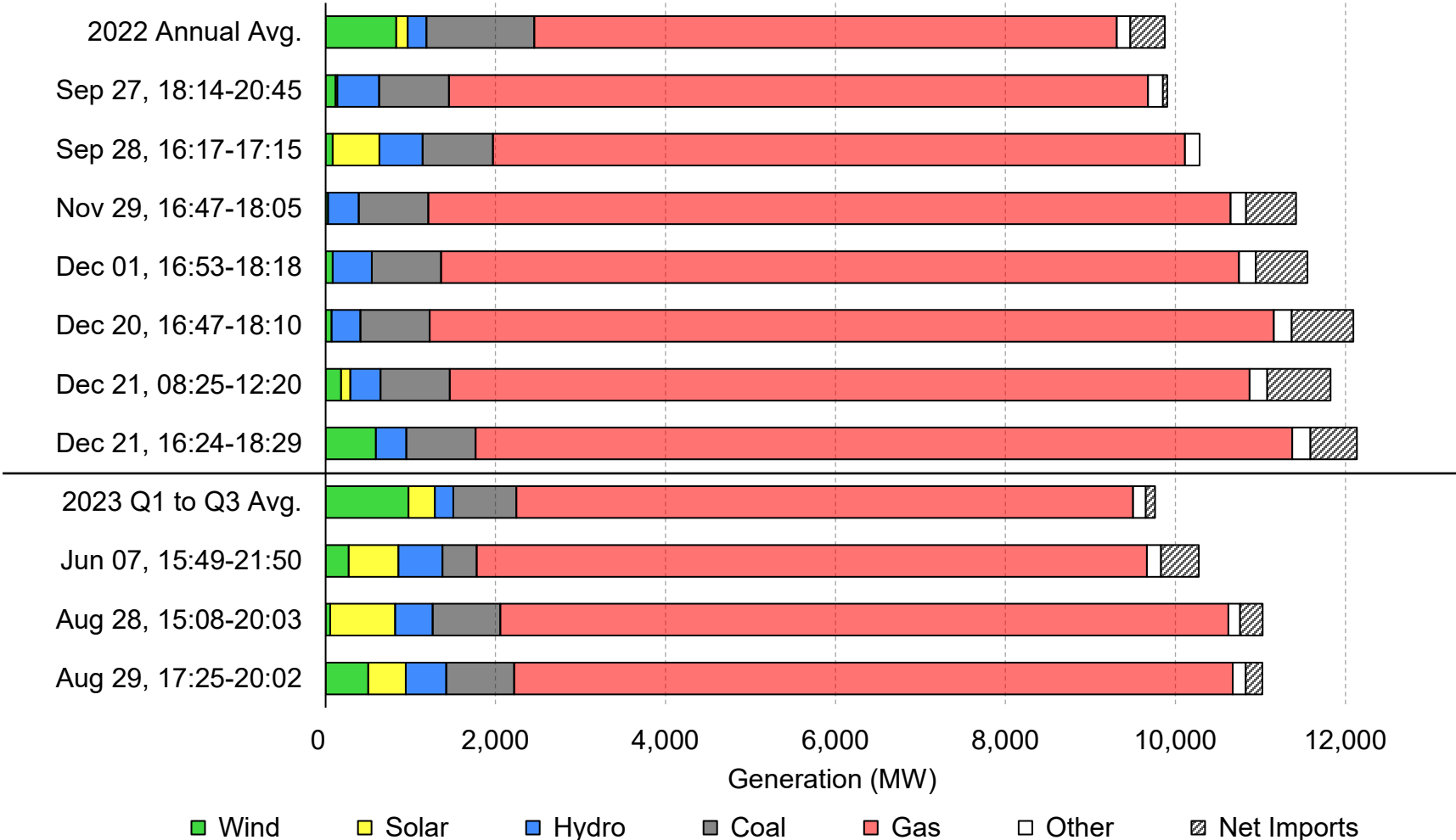


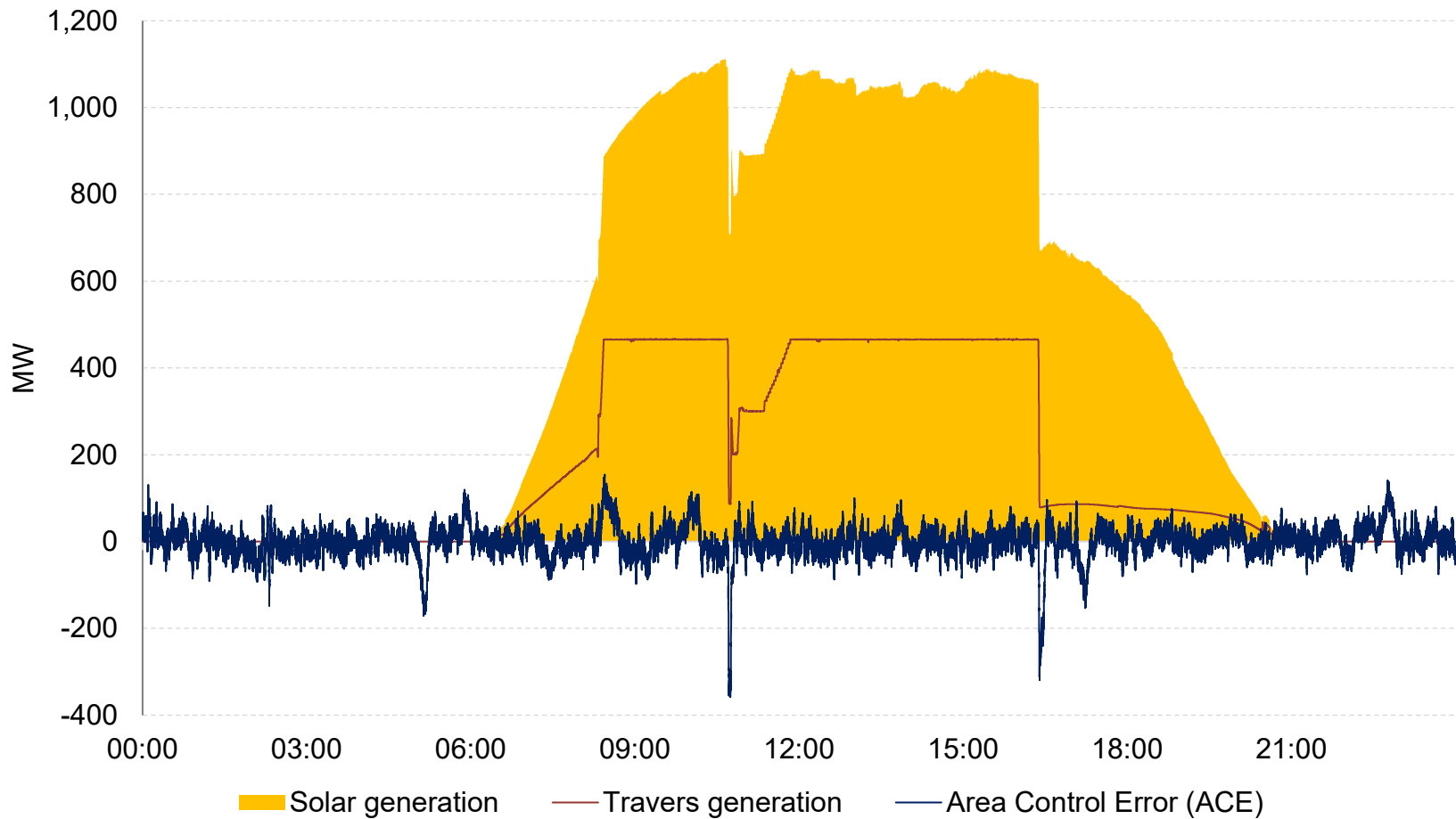
Figure 10: Generation by fuel type (August 28 to 31)



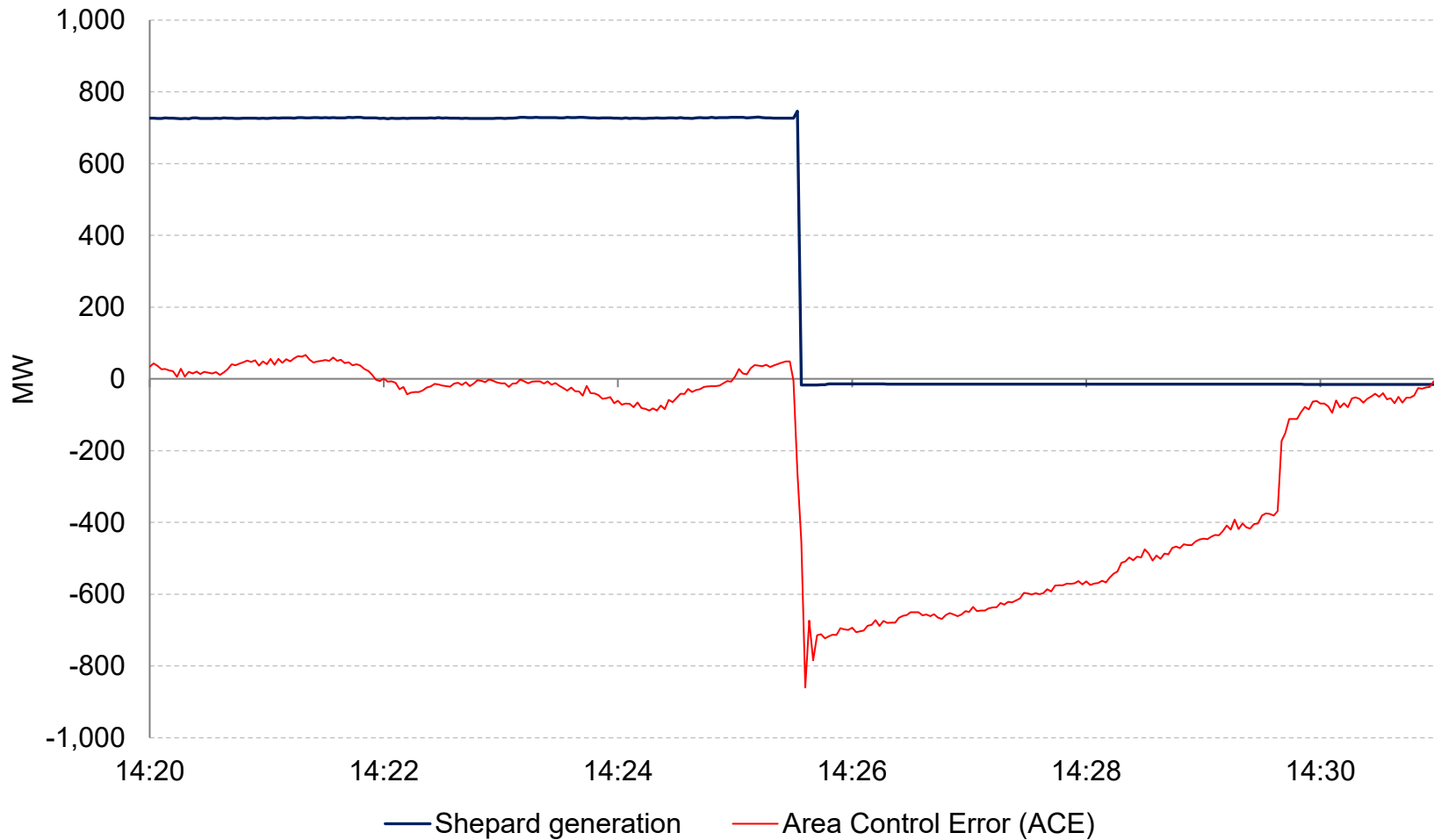
# Figure 12: Generation by fuel type during EEA events in 2022 and 2023



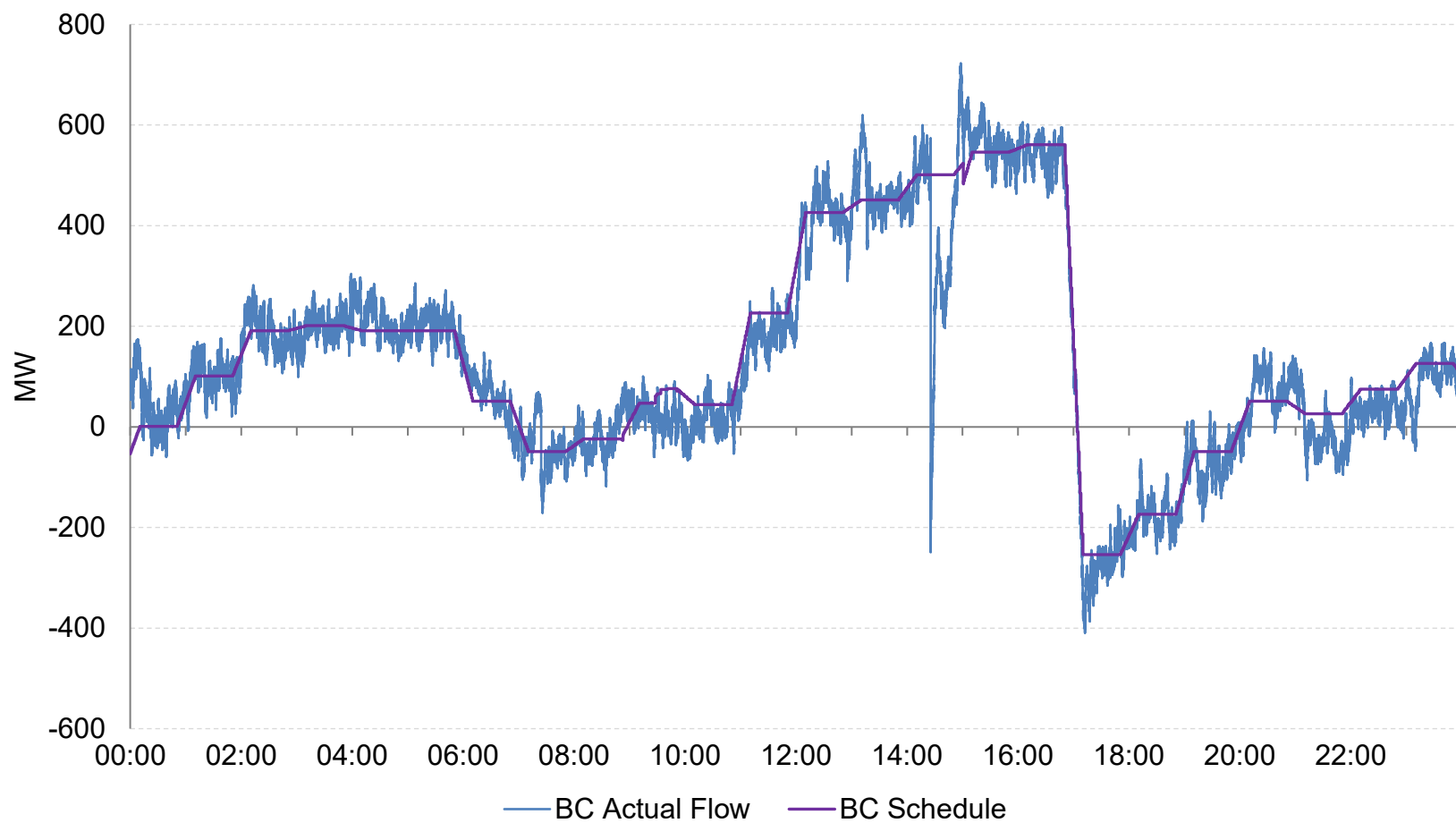
*Figure 16: Total solar generation, Travers solar generation, and Area Control Error (August 2)*



*Figure 18: Shepard generation and Area Control Error (July 25 from 14:20 to 14:31)*



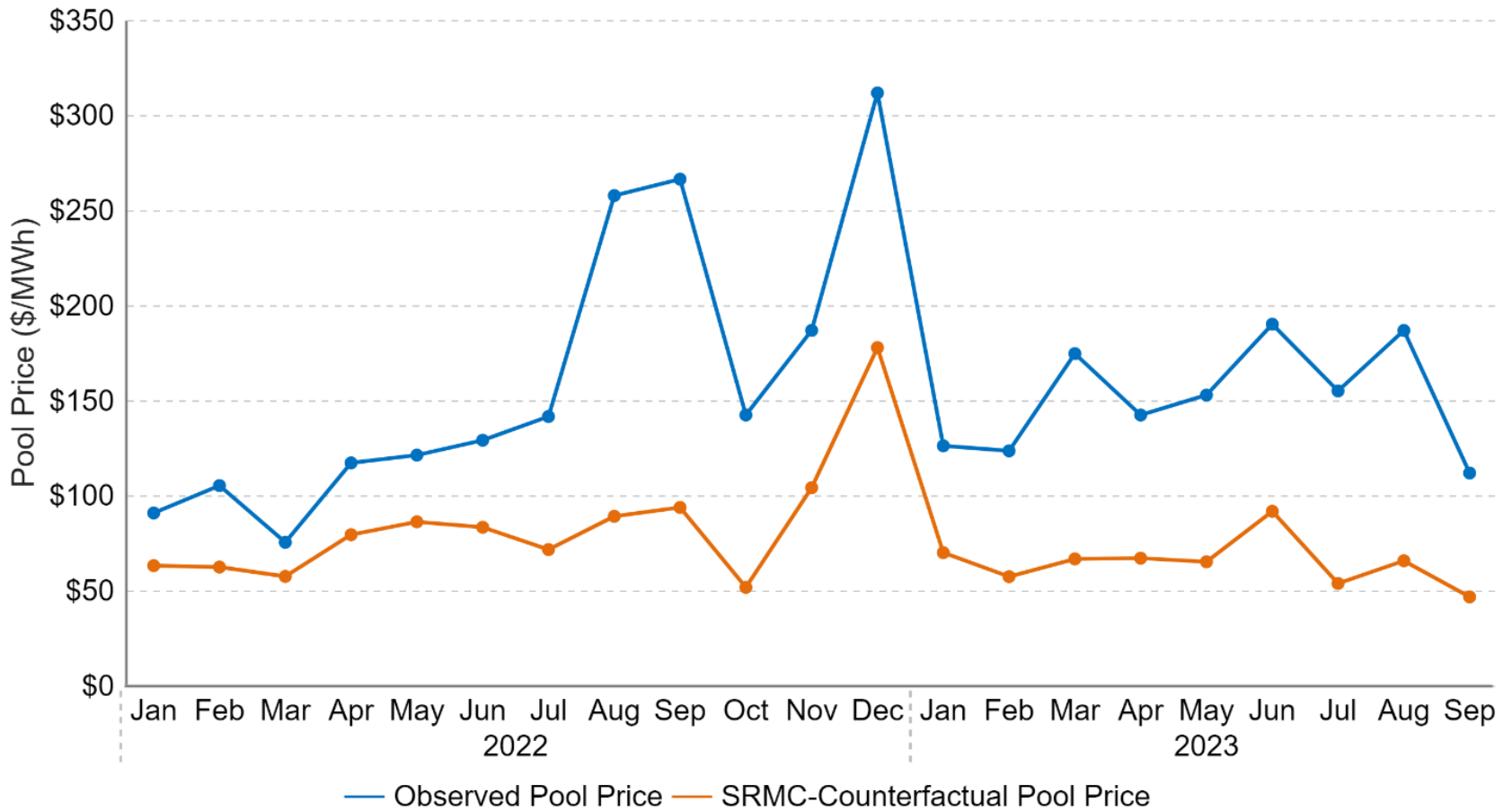
*Figure 19: The scheduled and actual flow of power over the BC intertie (July 25; exports are positive; data increment is 2 seconds)*



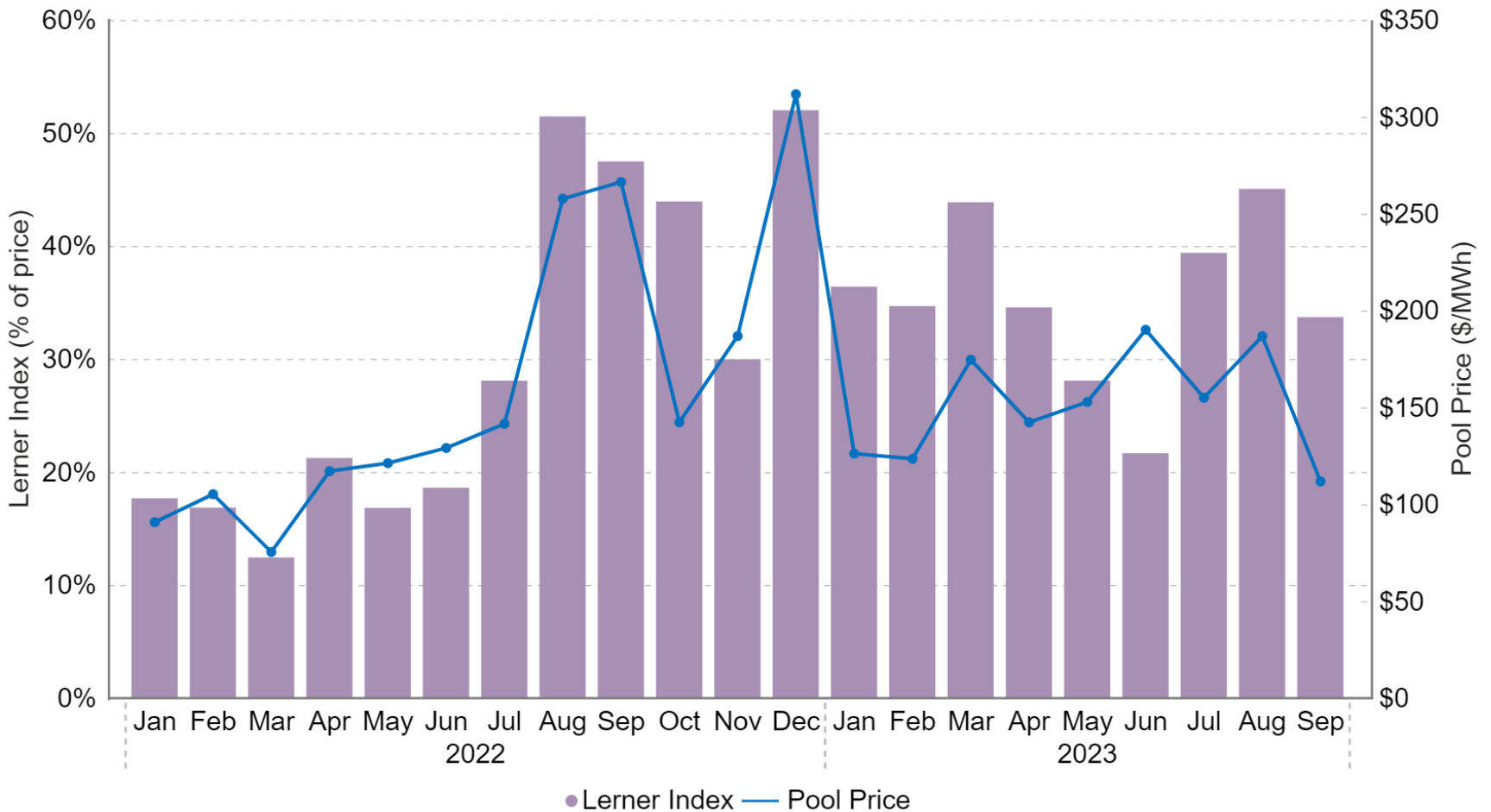
# Market power and offer behaviour



*Figure 20: Monthly observed, SRMC-counterfactual pool prices (Jan 2022 to Sep 2023)*



*Figure 22: Monthly average market markup  
(January 2022 to September 2023)*



*Figure 25: Monthly average static inefficiency  
(January 2022 to September 2023)*

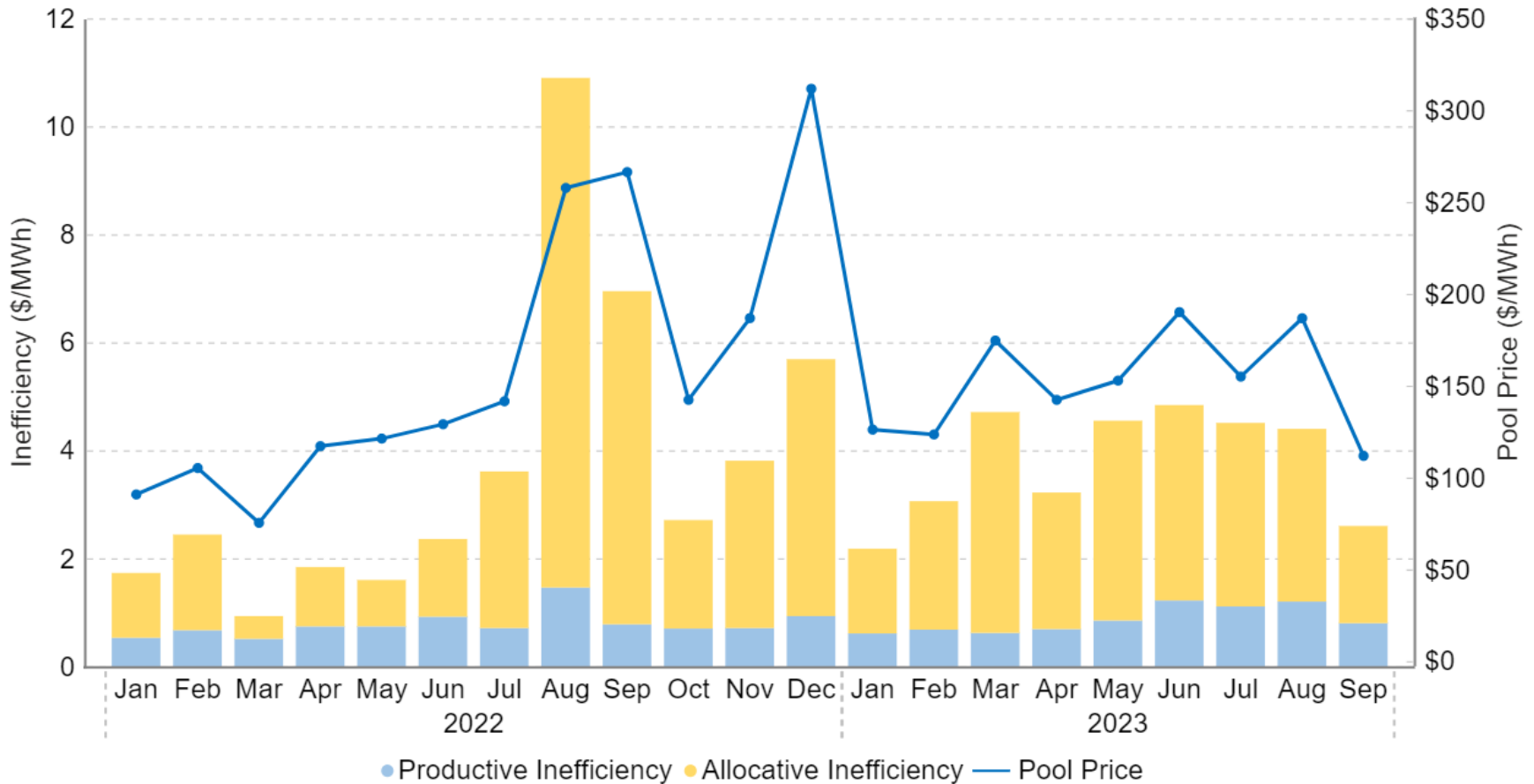
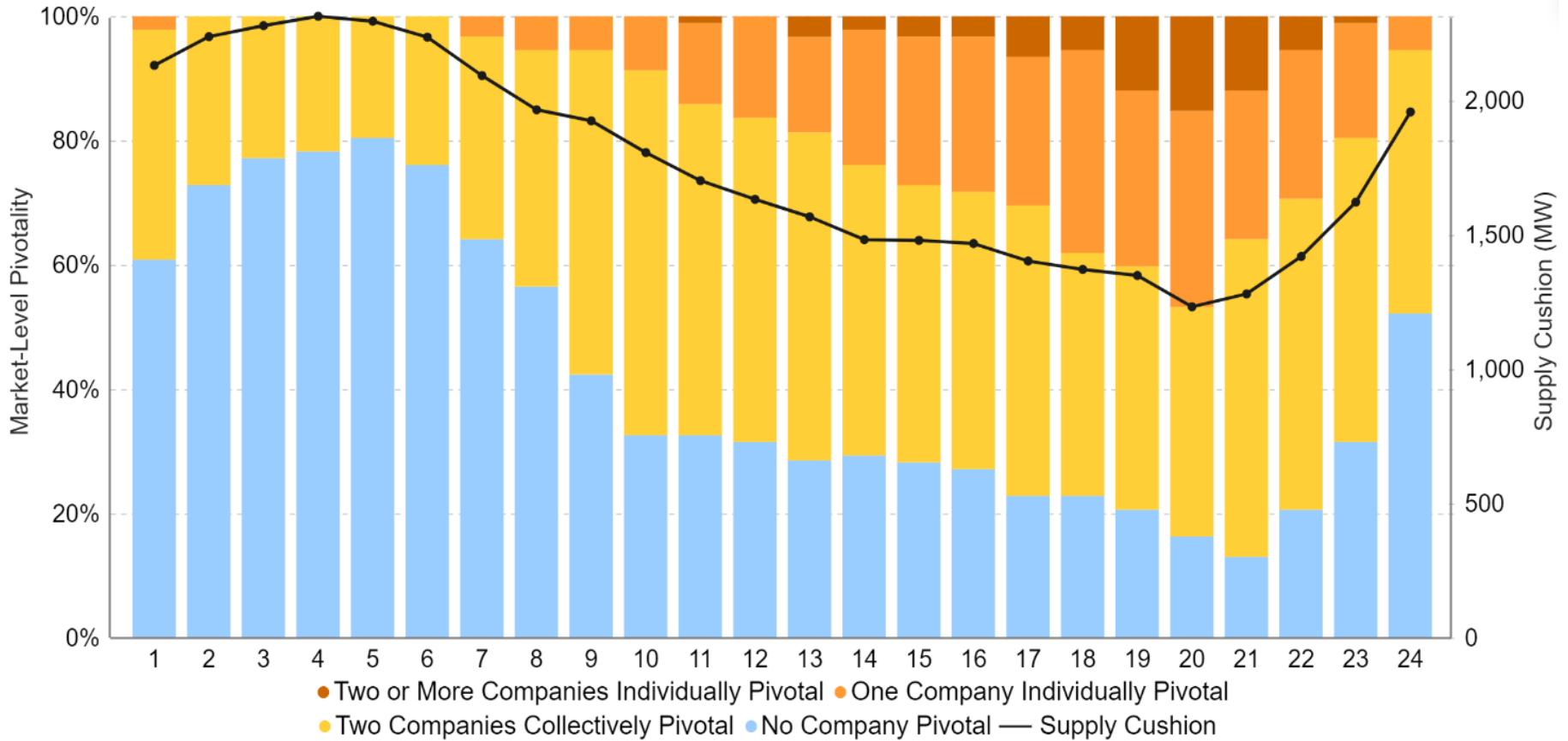
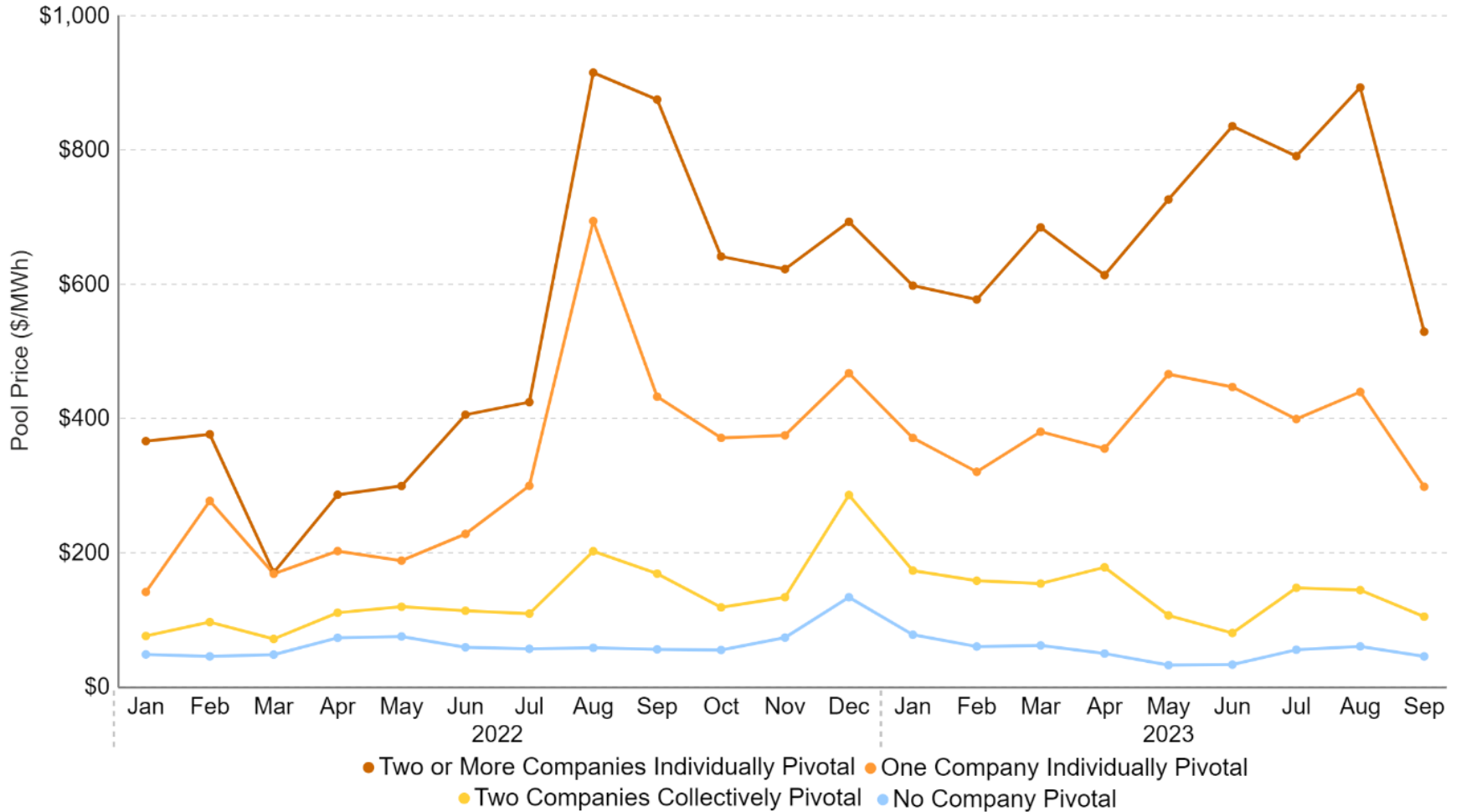


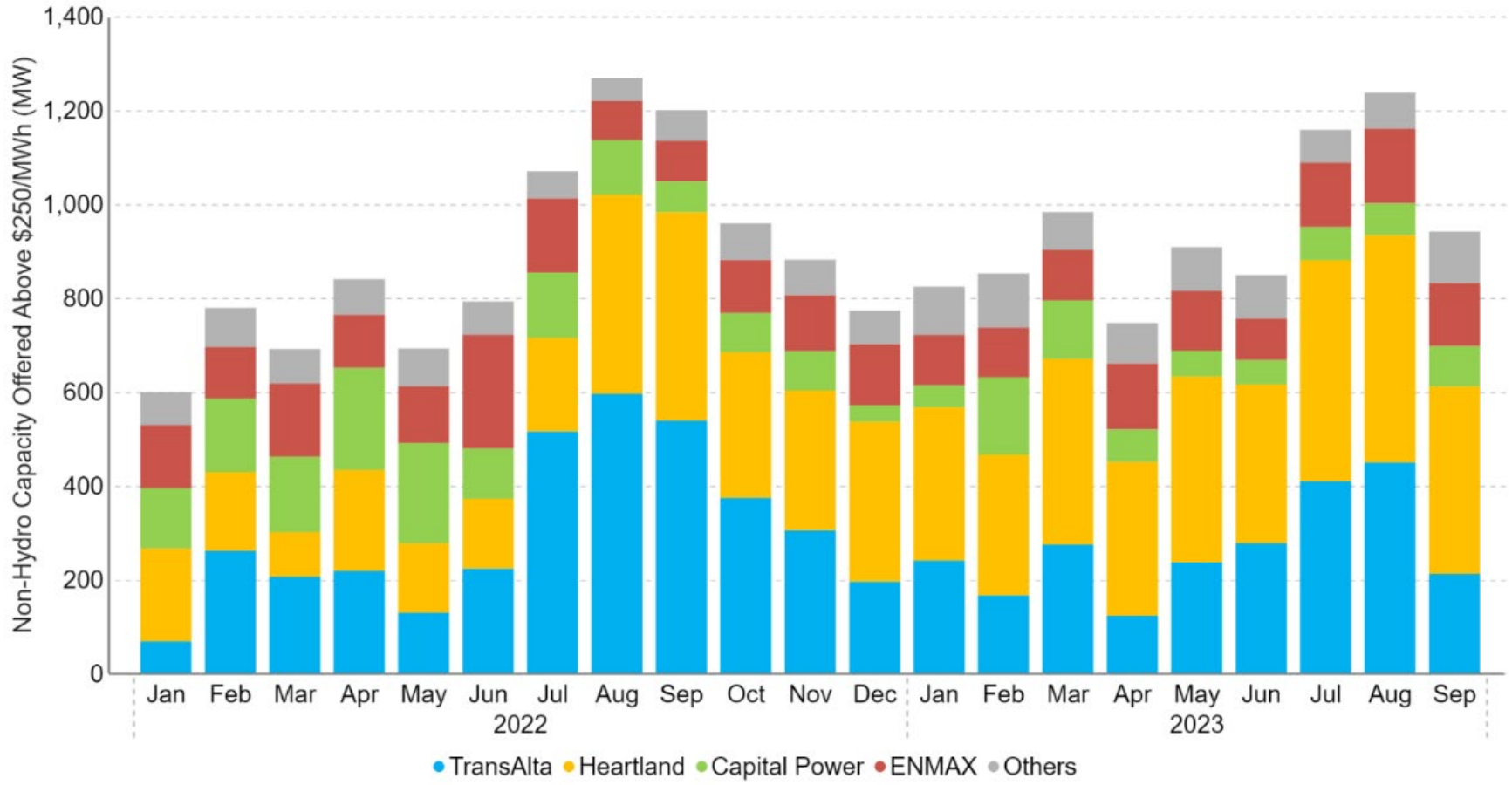
Figure 27: Market-level pivotality by hour ending in Q3



*Figure 29: Monthly average pool price by pivotality condition (January 2022 to September 2023)*

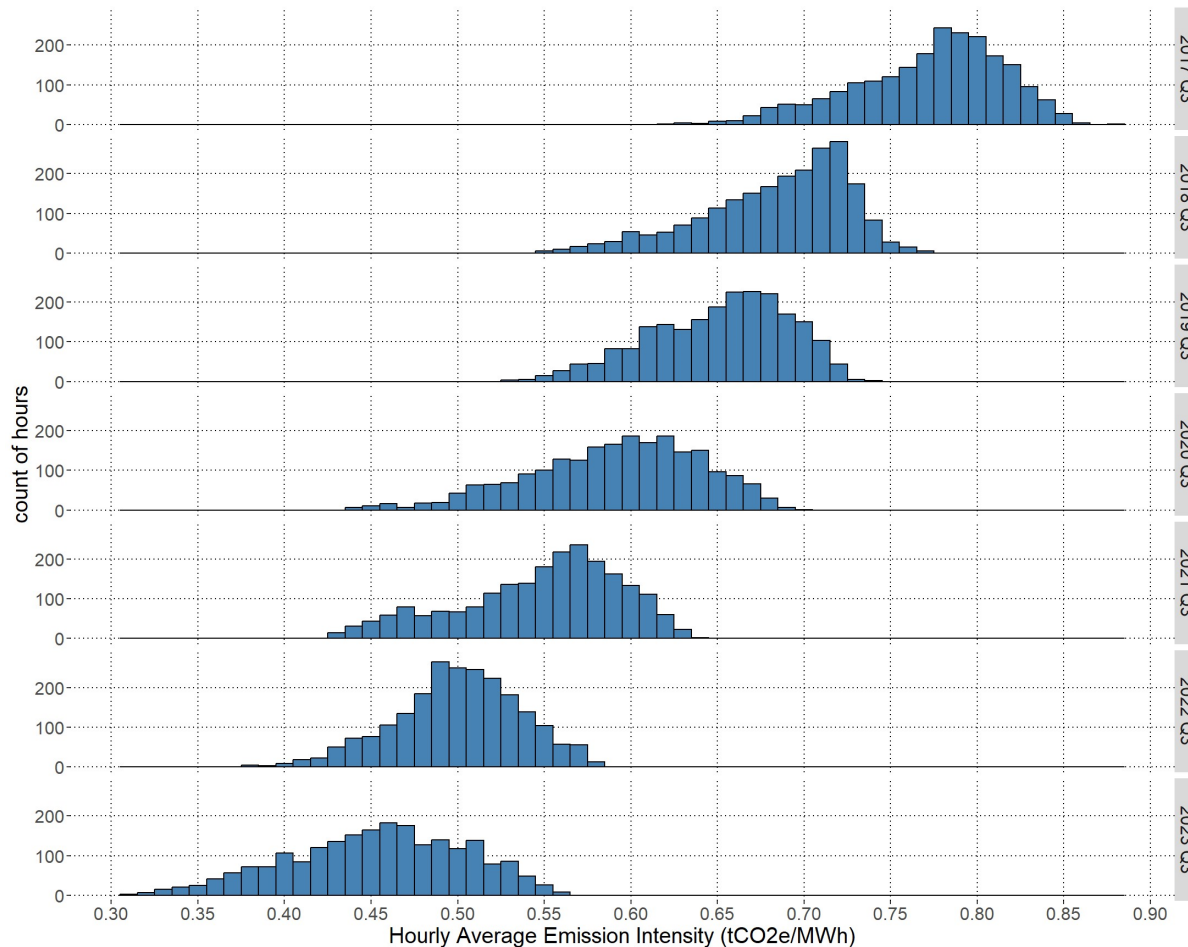


*Figure 30: Monthly average non-hydro capacity offered at/above \$250/MWh by company*



# Carbon emissions

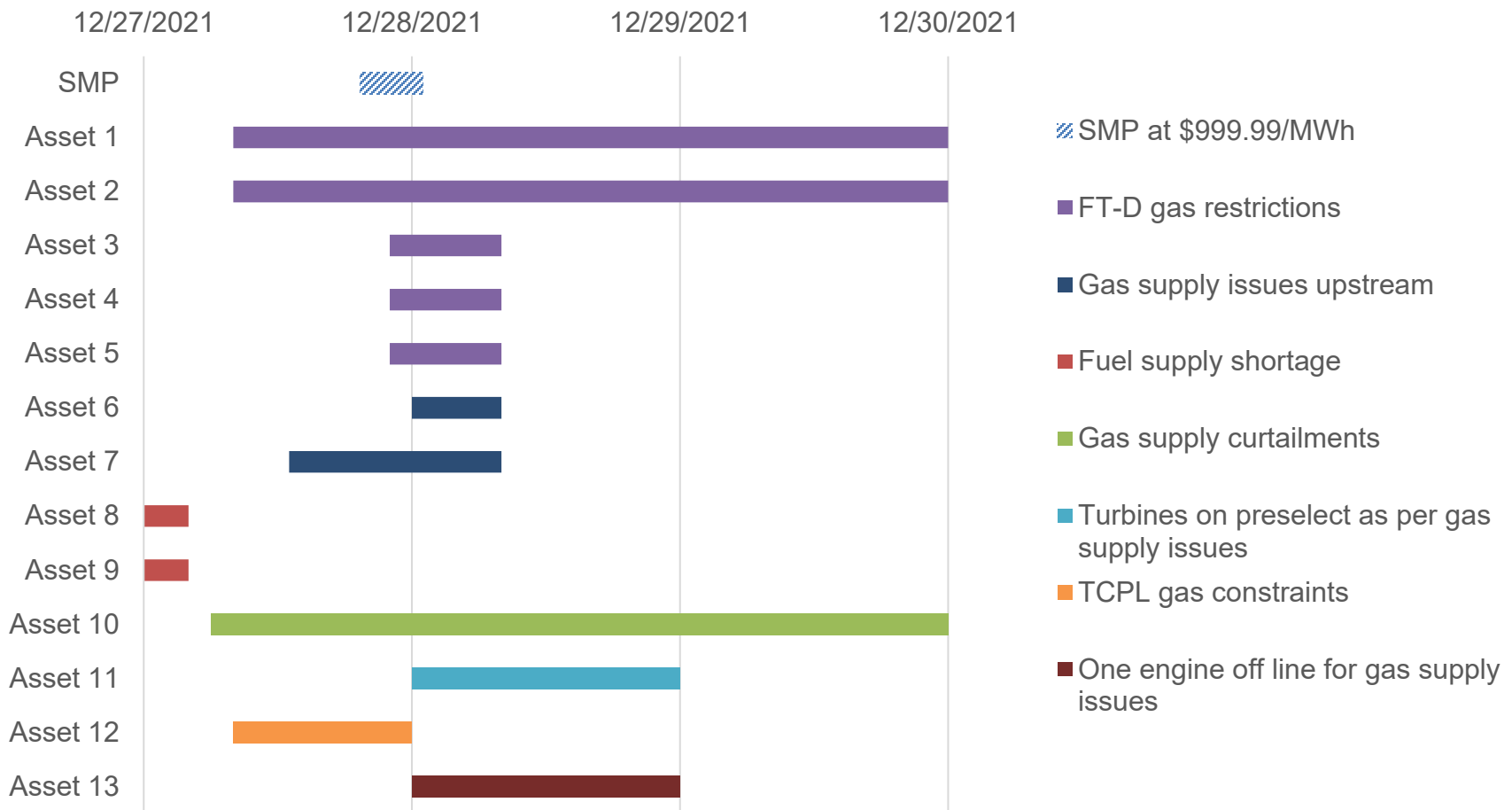
*Figure 33: The distribution of average carbon emission intensities in Q3 (2017 to 2023)*





# Fuel supply

*Figure 38: SMP and fuel supply-related AC restatement reasons declared by market participants (December 27-29, 2021)*



***The AESO should develop and publicly communicate revisions to the fuel management framework that allow it to coordinate fuel supply management***

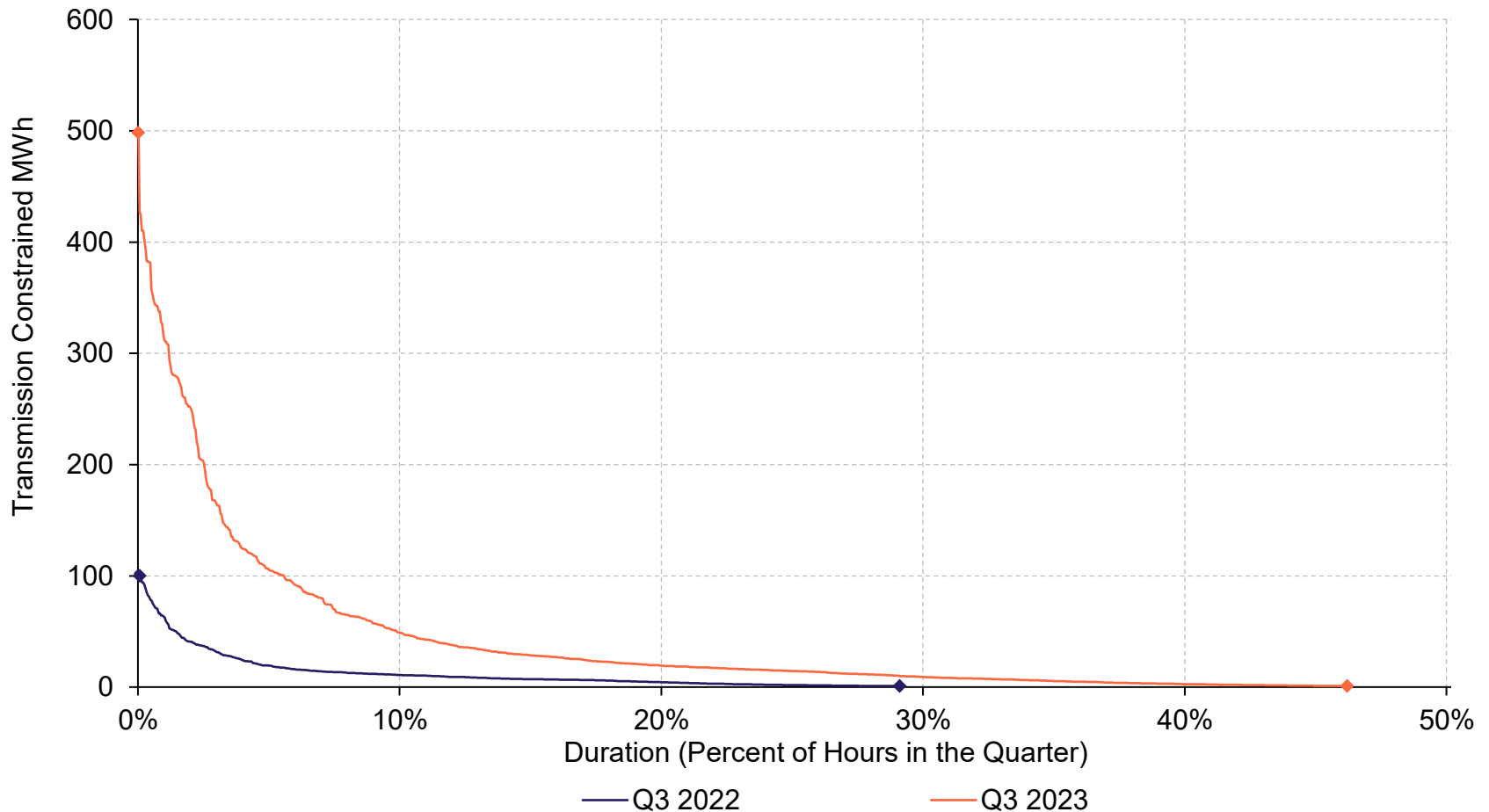
The MSA is of the view that the current framework for fuel supply management does not enable the AESO to effectively coordinate the provision of reliability in the presence of fuel supply constraints. A significant barrier in this respect is the lack of relevant data that the AESO would use for this function. Market participants are not currently obligated and have no systematic ability to provide the AESO with details of their fuel supply arrangements or any constraints they may face.

***The AESO should reconsider and clarify the application of the fuel supply management framework to cogeneration***

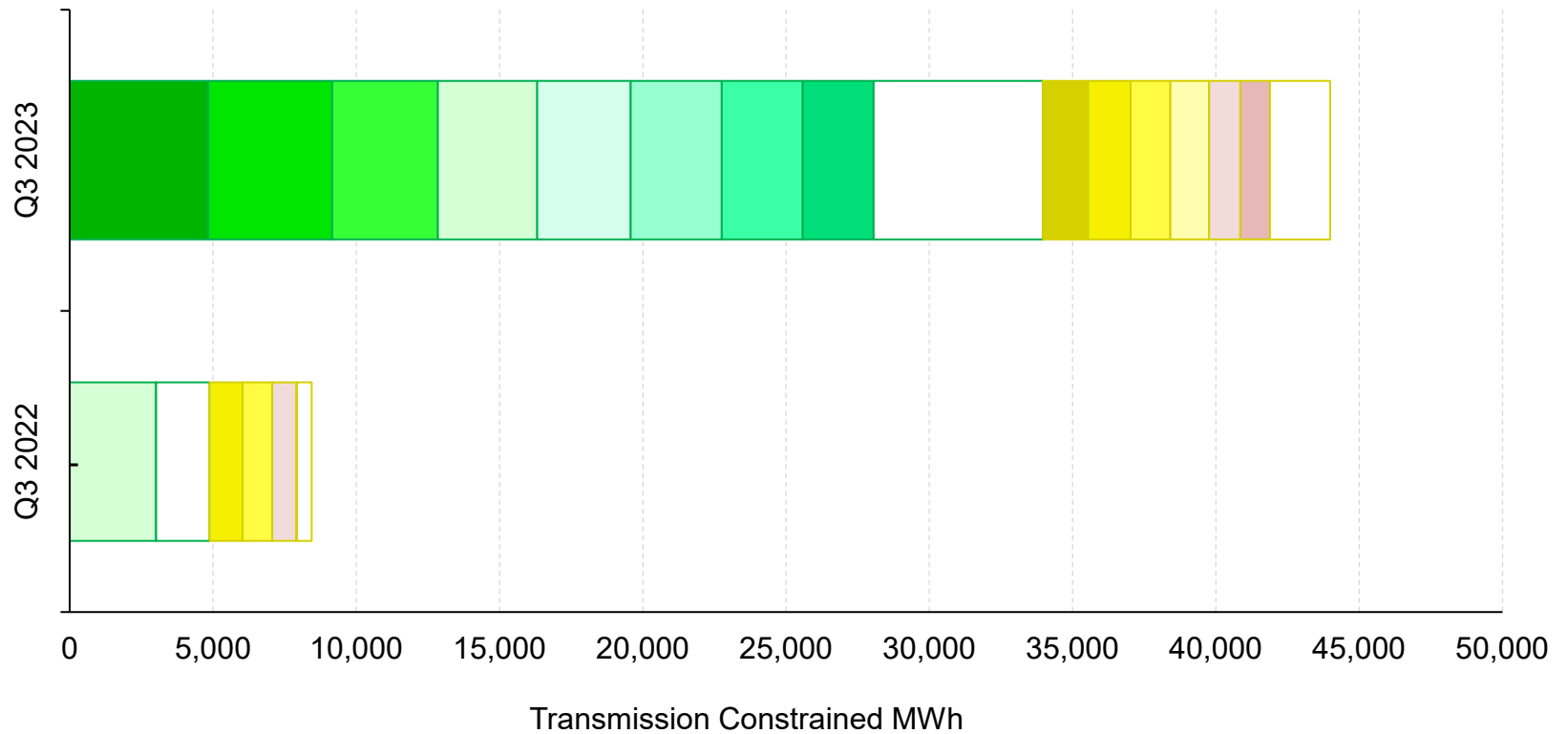
The MSA recommends that the AESO reconsider how the current framework for fuel supply management applies to cogeneration. Specifically, the CADG definition of AOR should be reviewed, which currently includes a “physical or operational constraint.” This could be interpreted similarly to MSG to include the forced shut down of onsite industrial processes.

# Power system: Trends in transmission congestion

*Figure 42: Duration of wind and solar constraint volume (Q3 2022 and Q3)*



*Figure 47: Wind and solar transmission constrained MWh by asset (Q3 and Q3 2022)*



- HHW1
- WHE1
- WHT1
- RTL1
- CYP1
- FMG1
- WHT2
- SCR4
- Other Wind
- CLR2
- STR1
- STR2
- CLR1
- NMK1
- TVS1
- Other Solar

Power system:  
Pool price inaccuracies caused by inaccurate price  
reconstitution

The MSA has identified four cases where the pool price is at risk of being set inaccurately.

1. When a wind or solar asset over-reports its potential real power capability, and is transmission constrained, the pool price may be set too low.
2. When a wind or solar asset under-reports its potential real power capability, and is transmission constrained, the pool price may be set too high.
3. When there are data issues resulting in no price reconstitution, when there ought to be, the pool price may be set too high.
4. When the AESO uses constrained down generation to manage wind and solar power ramp up constraints, the pool price may be set too low.



*Figure 48: Constrained down generation for the asset  
(May 1, 2023)*

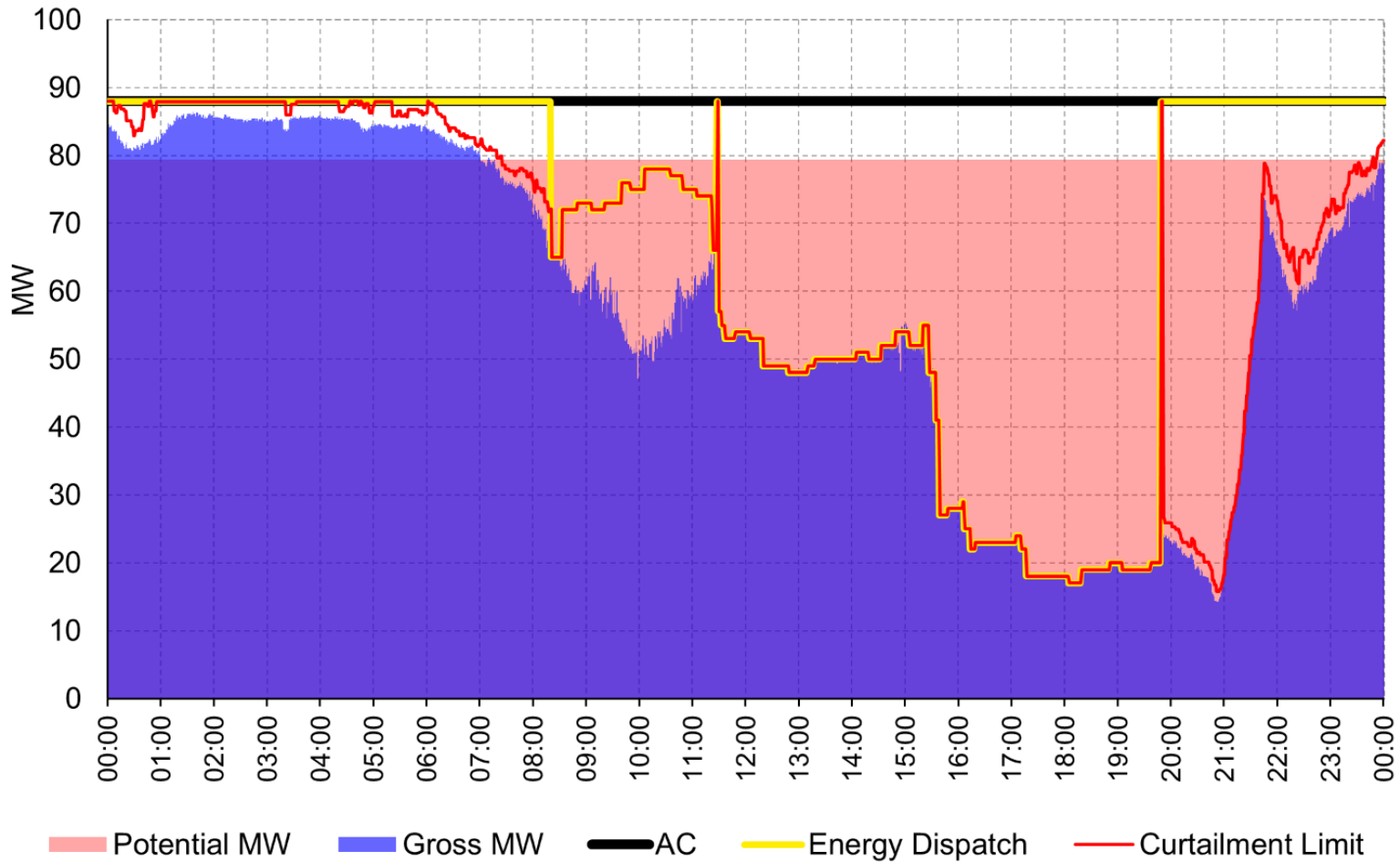
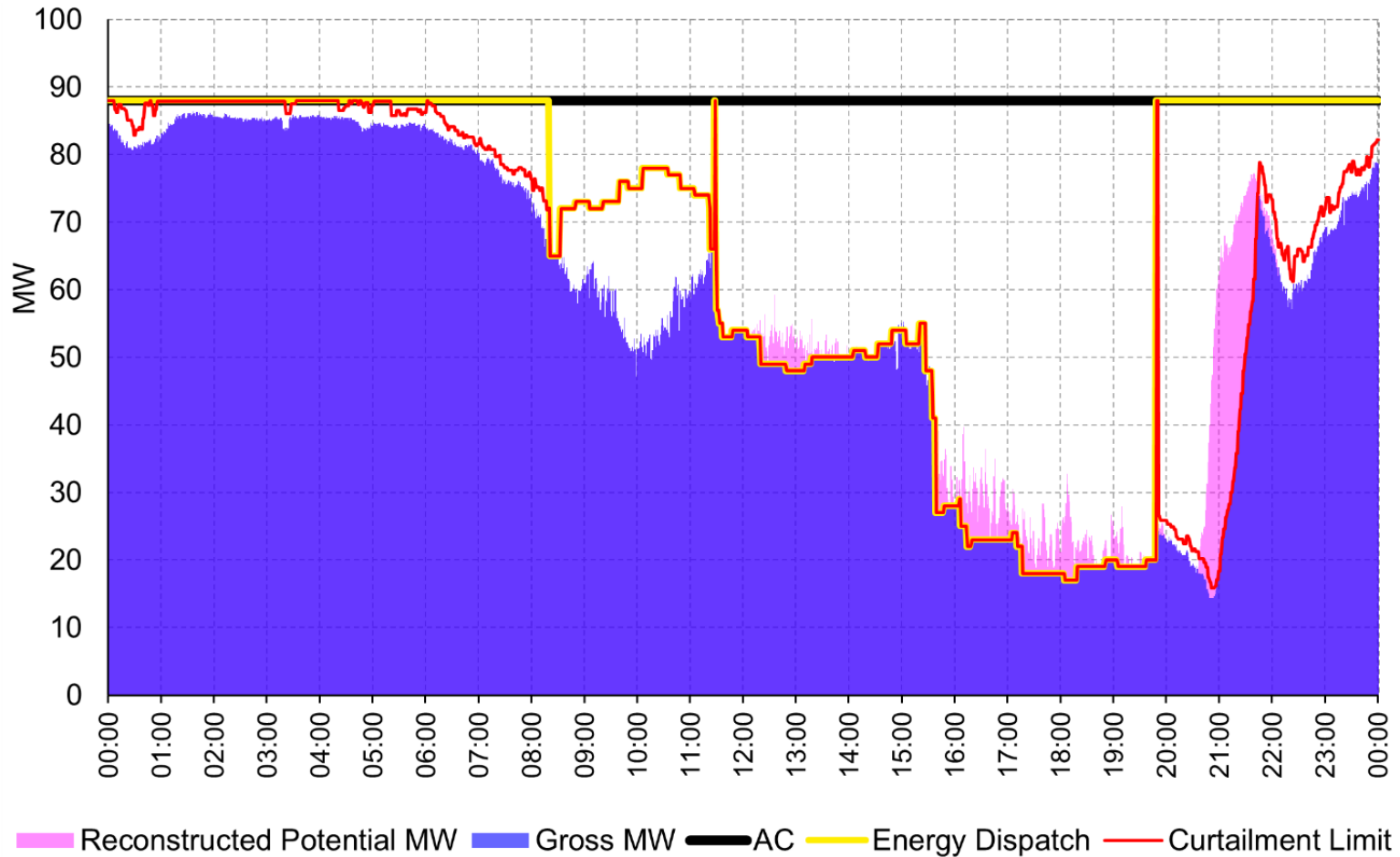
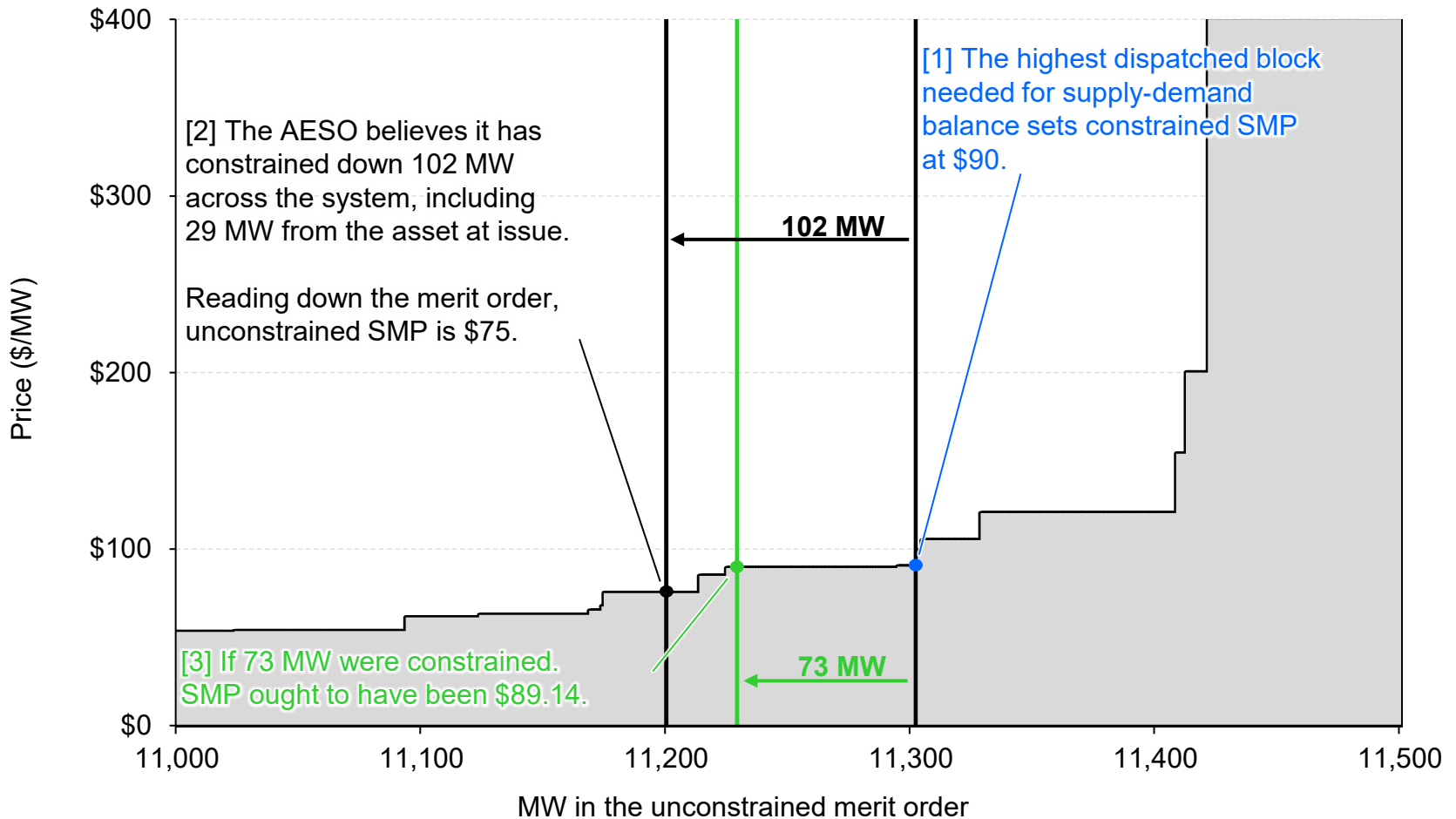


Figure 49: Reconstructed constrained down generation for the asset (May 1, 2023)

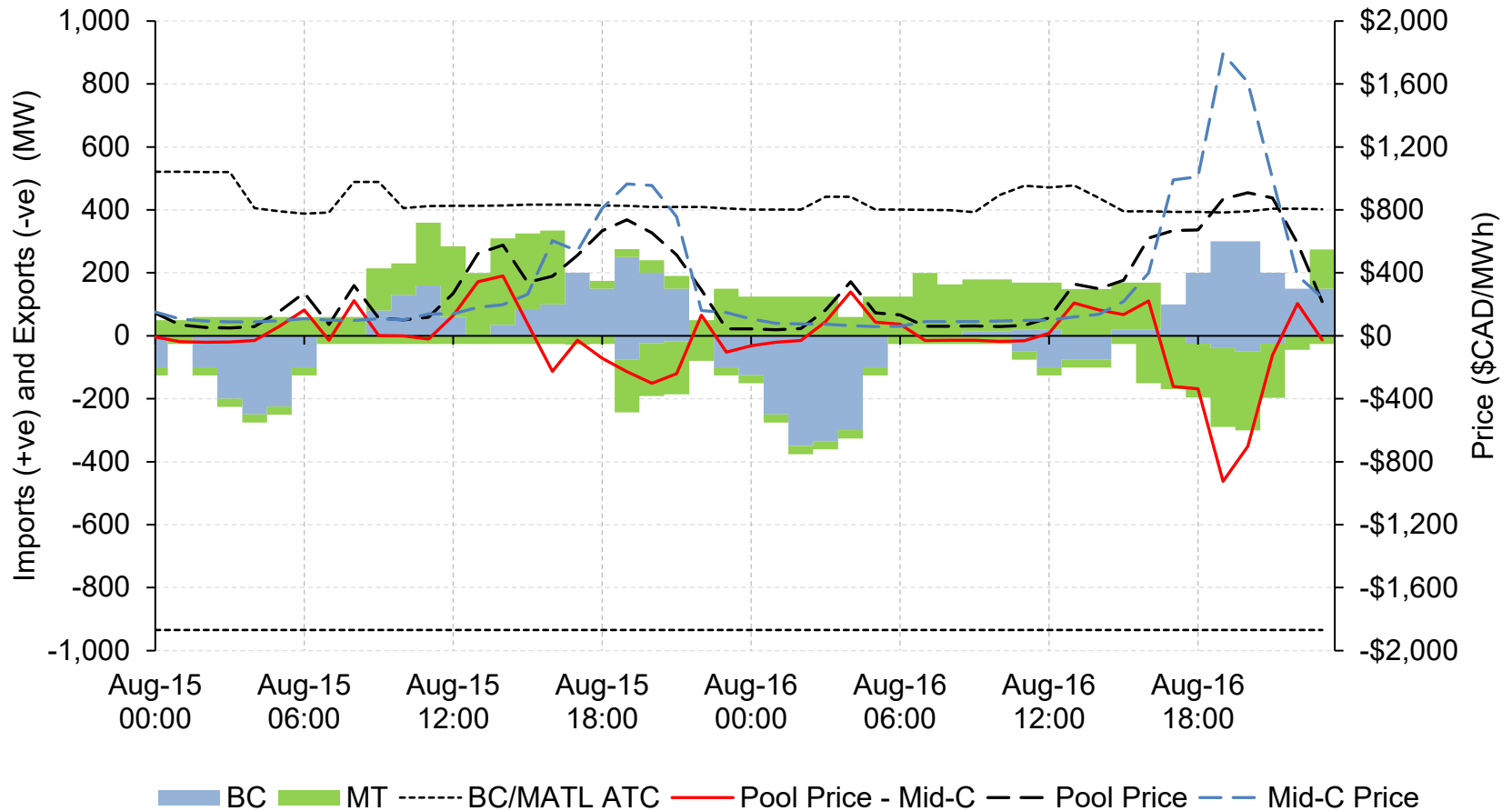


*Figure 50: Unconstrained energy market merit order snapshot on May 1, 2023, at 14:30:30*

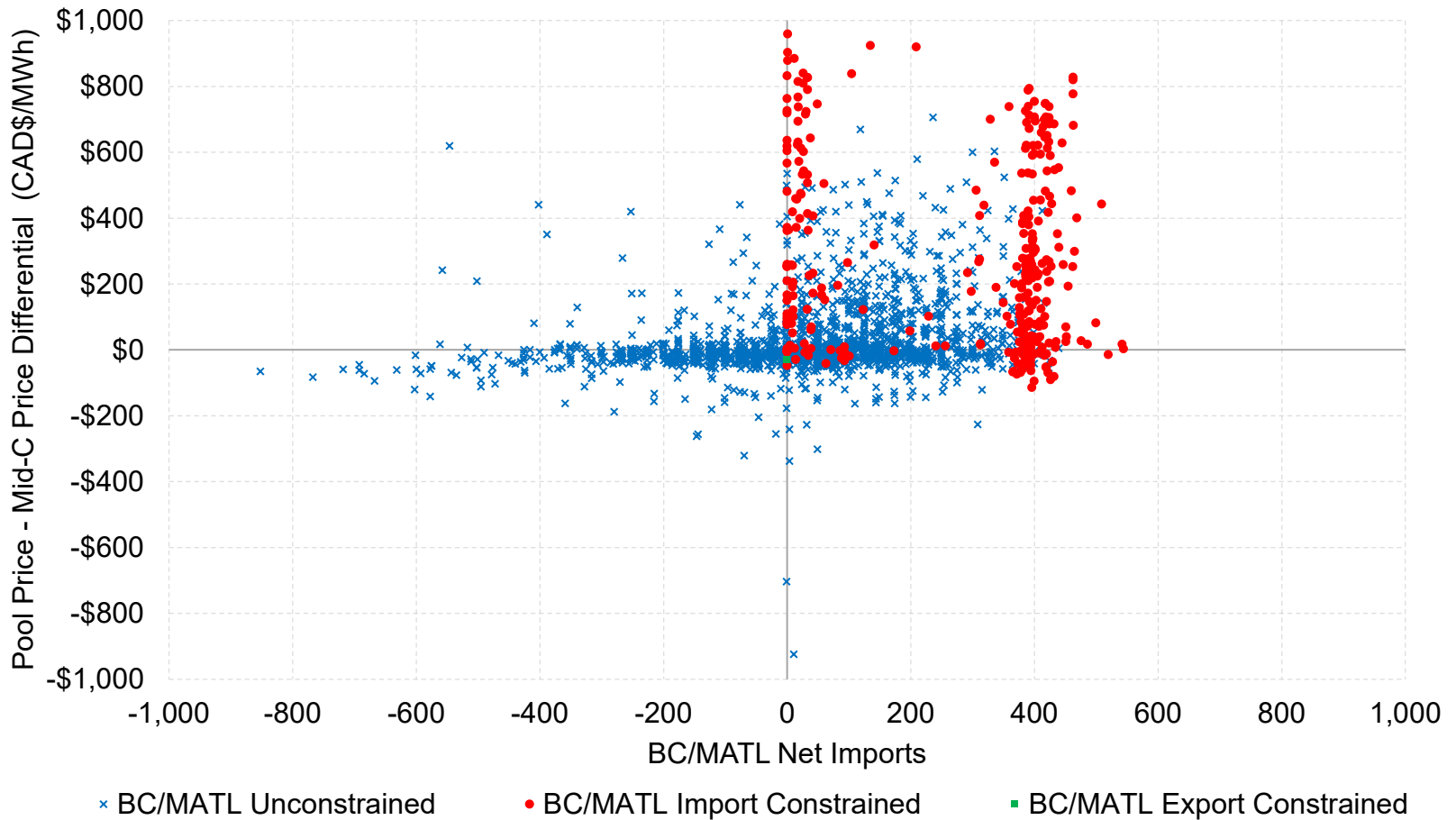


# Power system: Imports and exports

*Figure 59: Hourly import (+ve) and export (-ve) volumes on BC/MATL and Alberta/Mid-C pricing (August 15 and 16, 2023)*

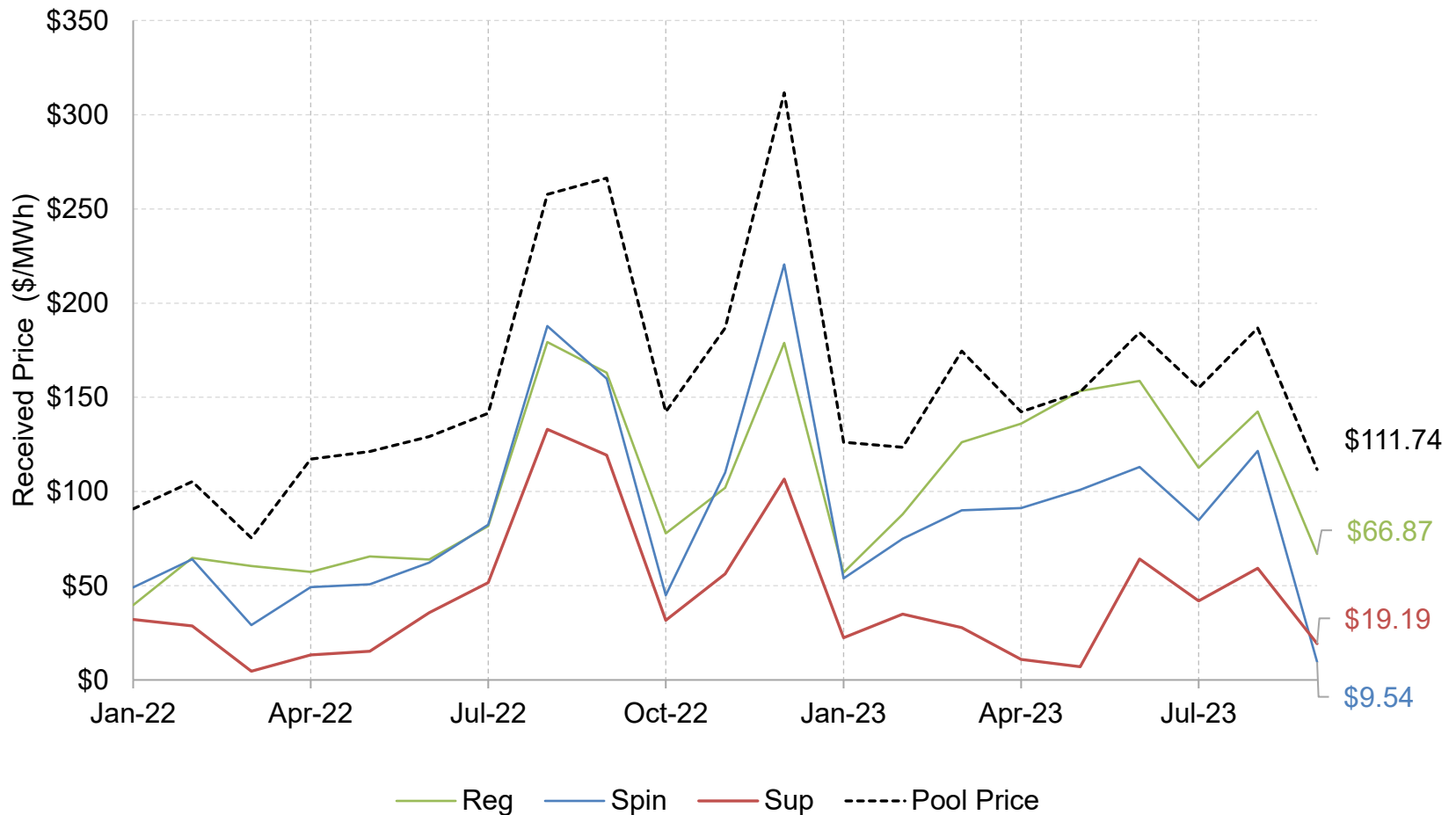


*Figure 60: Alberta and Mid-C price differential and net BC/MATL flows (Q3)*



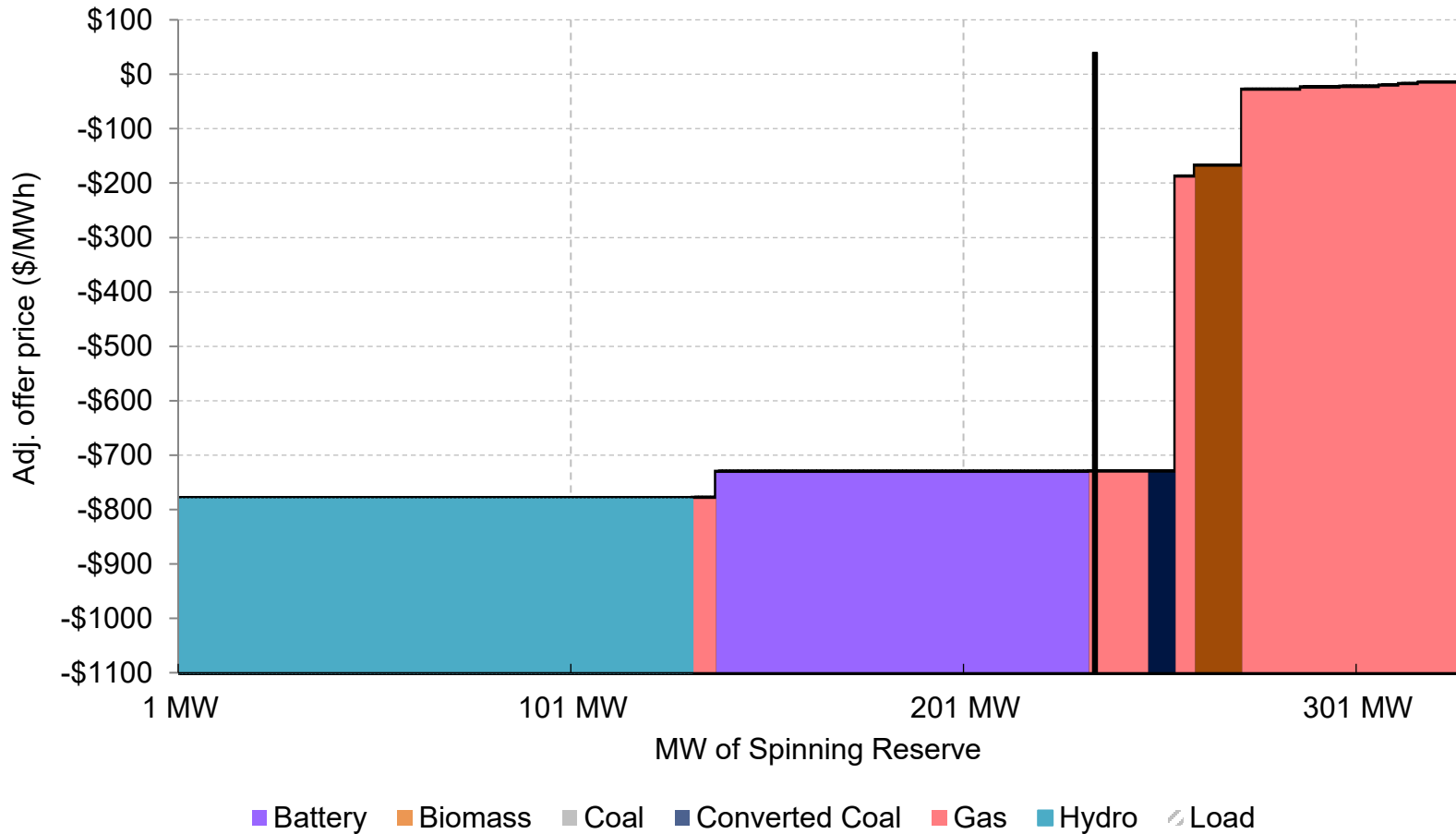
# Operating reserve markets

*Figure 62: Average received price for active spinning, supplemental, and regulating reserves (July 2022 to September 2023)*

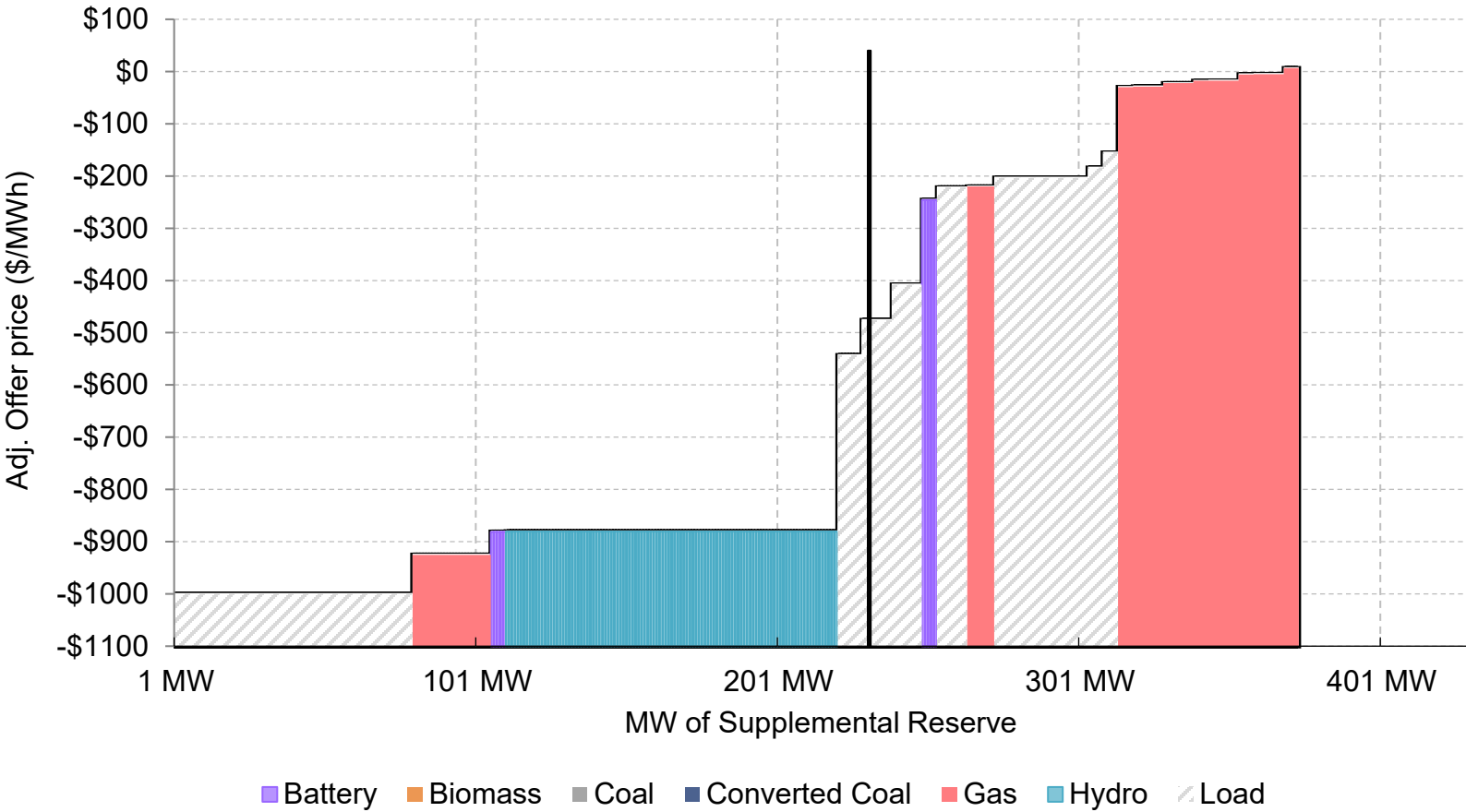




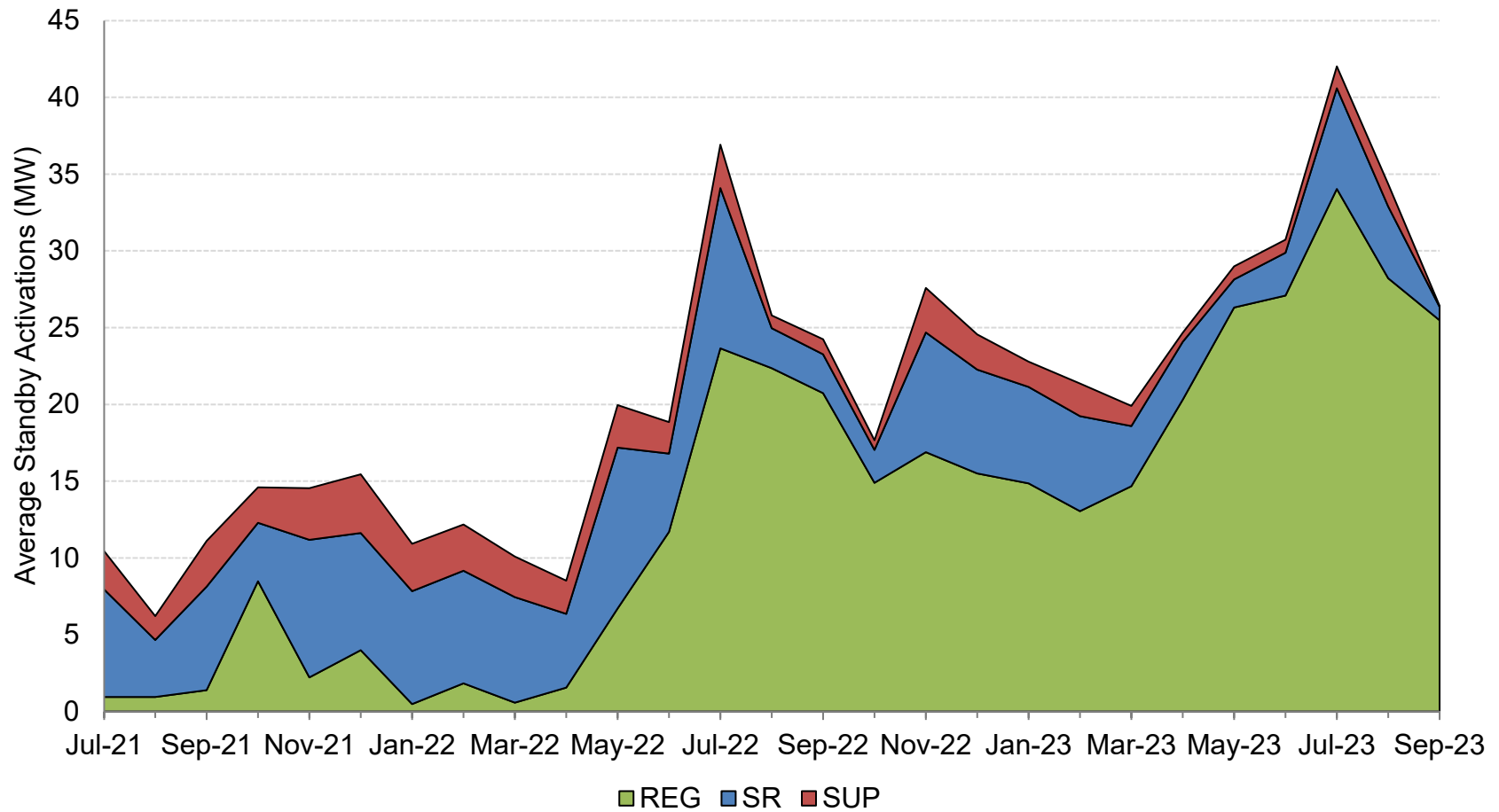
*Figure 66: Offers for active on-peak spinning reserve  
(September 21, 2023)*



*Figure 67: Offers for active on-peak supplemental reserve  
(September 21, 2023)*

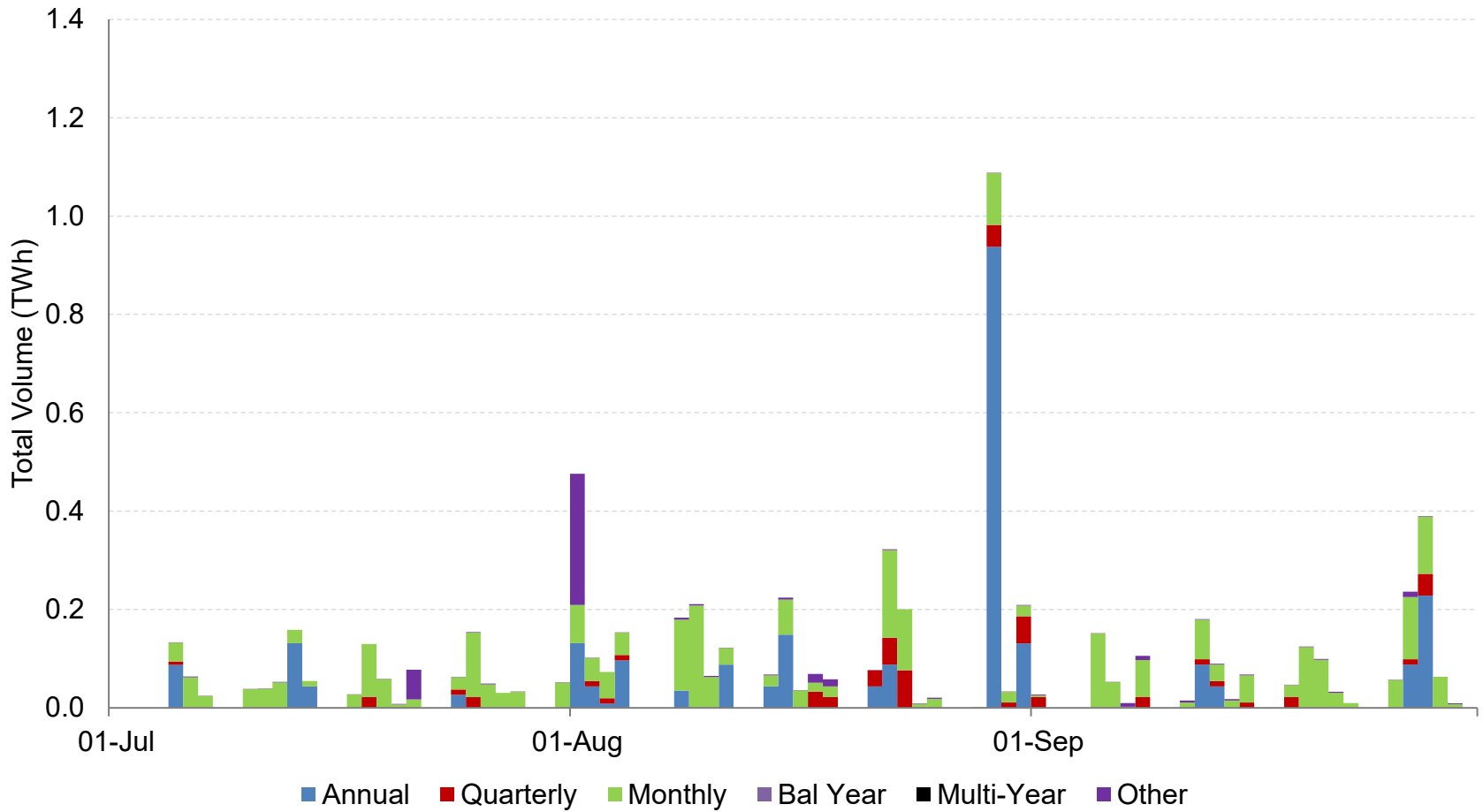


*Figure 72: Hourly average of standby activations by operating reserve product and month*

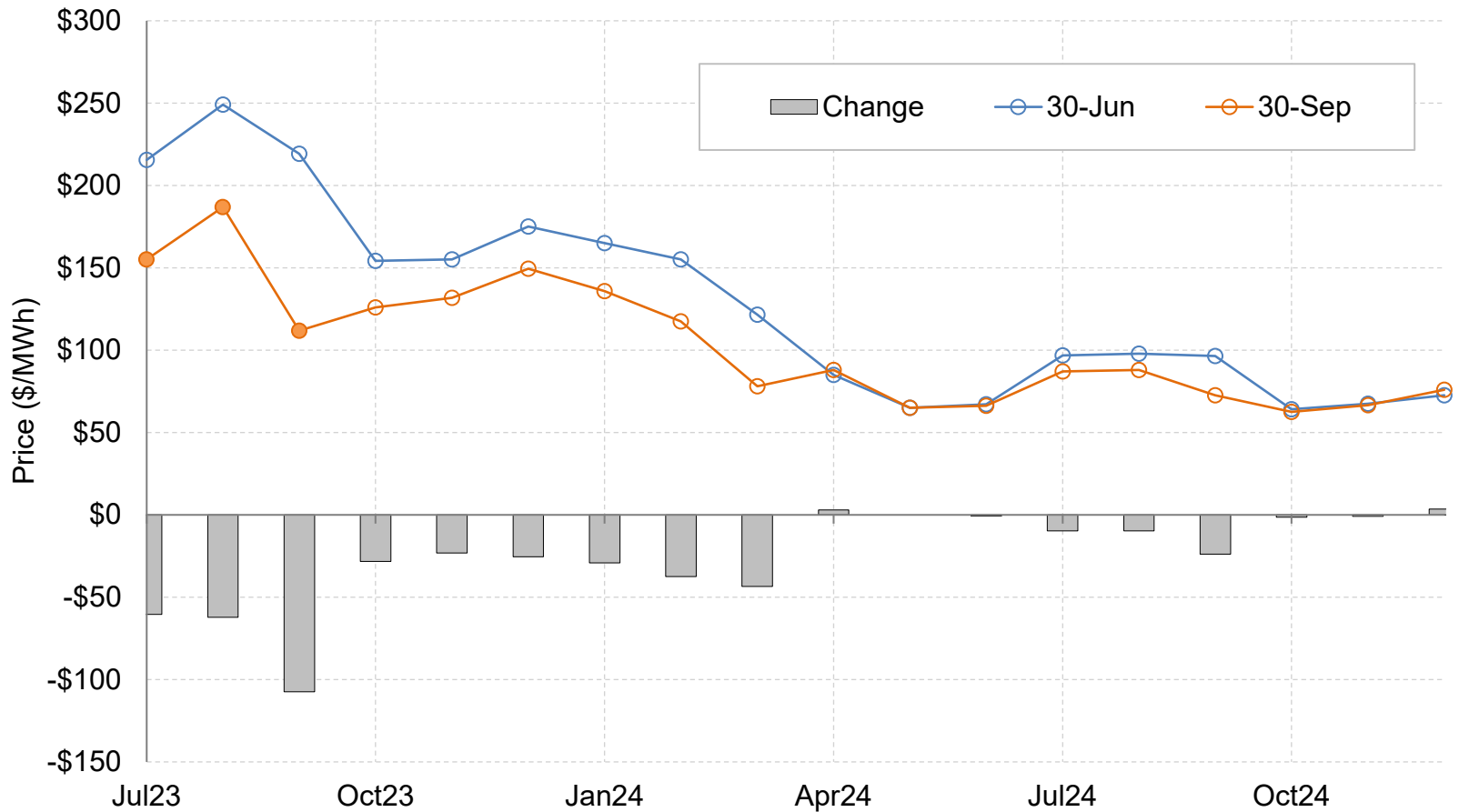


# Forward market

Figure 76: Total volumes by trade date and term in Q3



*Figure 78: Monthly forward curve for July 2023 to December 2024 (as of June 30 and September 30)*



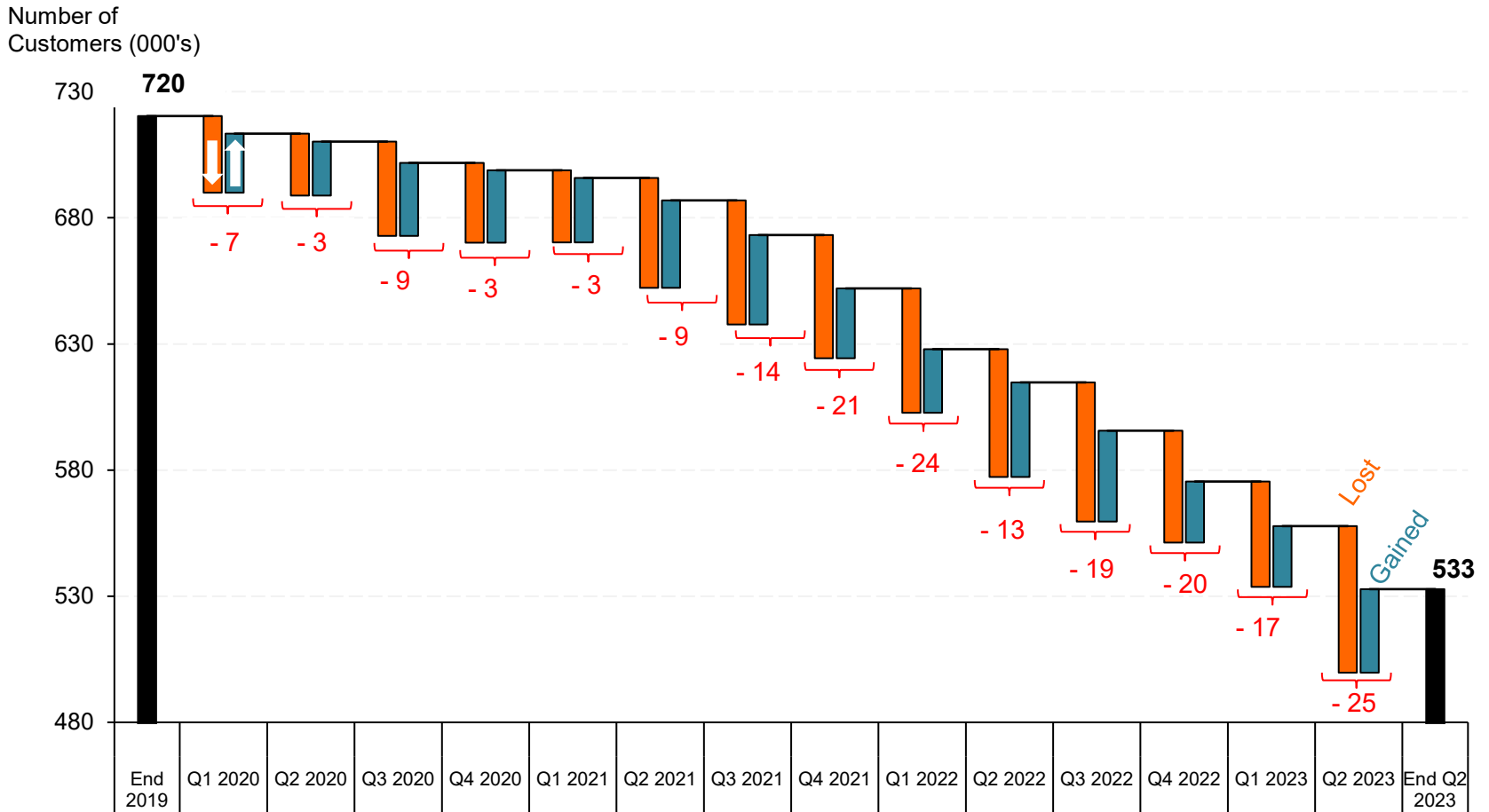
*Table 14: Monthly forward prices for Alberta and Mid-C  
(\$CAD; as of September 29)*

	<b>AB</b>	<b>Mid-C</b>	<b>Difference (AB - MidC)</b>
Oct 2023	\$126	\$86	<b>\$40</b>
Nov 2023	\$132	\$111	<b>\$21</b>
Dec 2023	\$150	\$157	<b>(\$8)</b>
Jan 2024	\$136	\$157	<b>(\$21)</b>
Feb 2024	\$118	\$142	<b>(\$24)</b>
Mar 2024	\$78	\$91	<b>(\$13)</b>

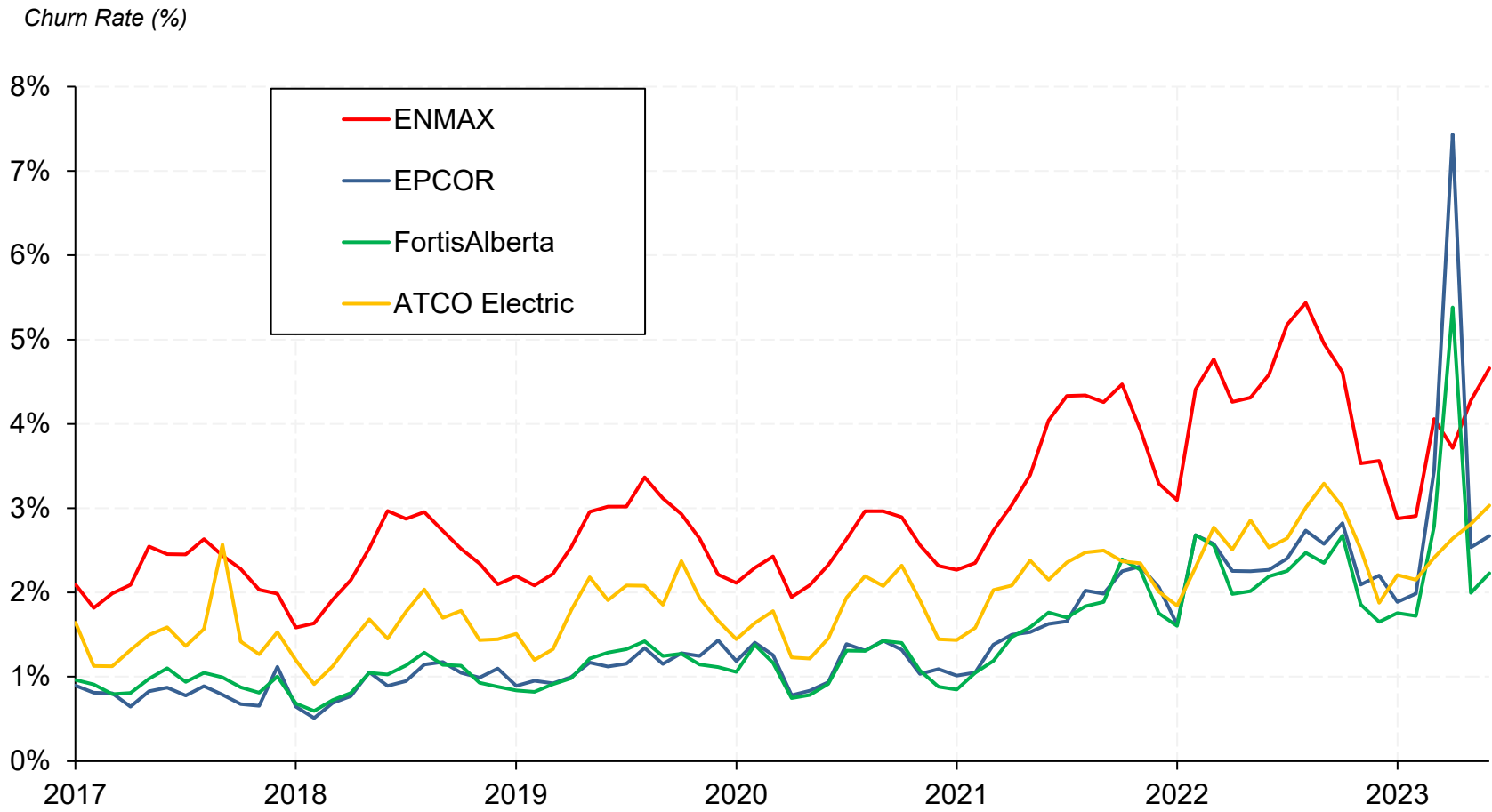
# Retail market



*Figure 80: RRO customer net losses, residential customers (Q1 2020 to Q2 2023)*



*Figure 83: RRO retailer churn rates by service area, residential customers (January 2017 to March 2023)*



*Figure 88: 5-year fixed rate electricity contract prices, residential customers, ENMAX service area (September 1, 2022 to September 30, 2023)*

