



Markets Report

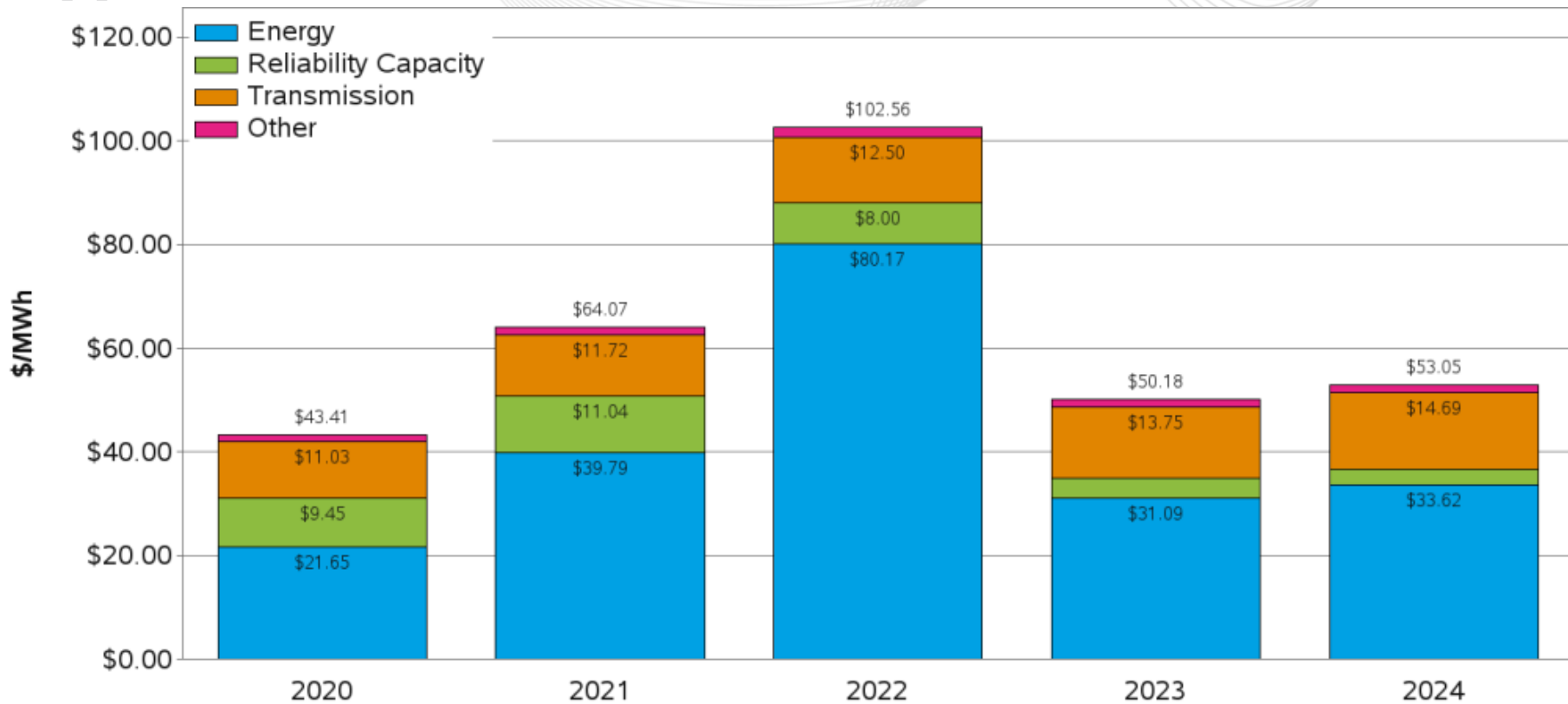
MC Webinar

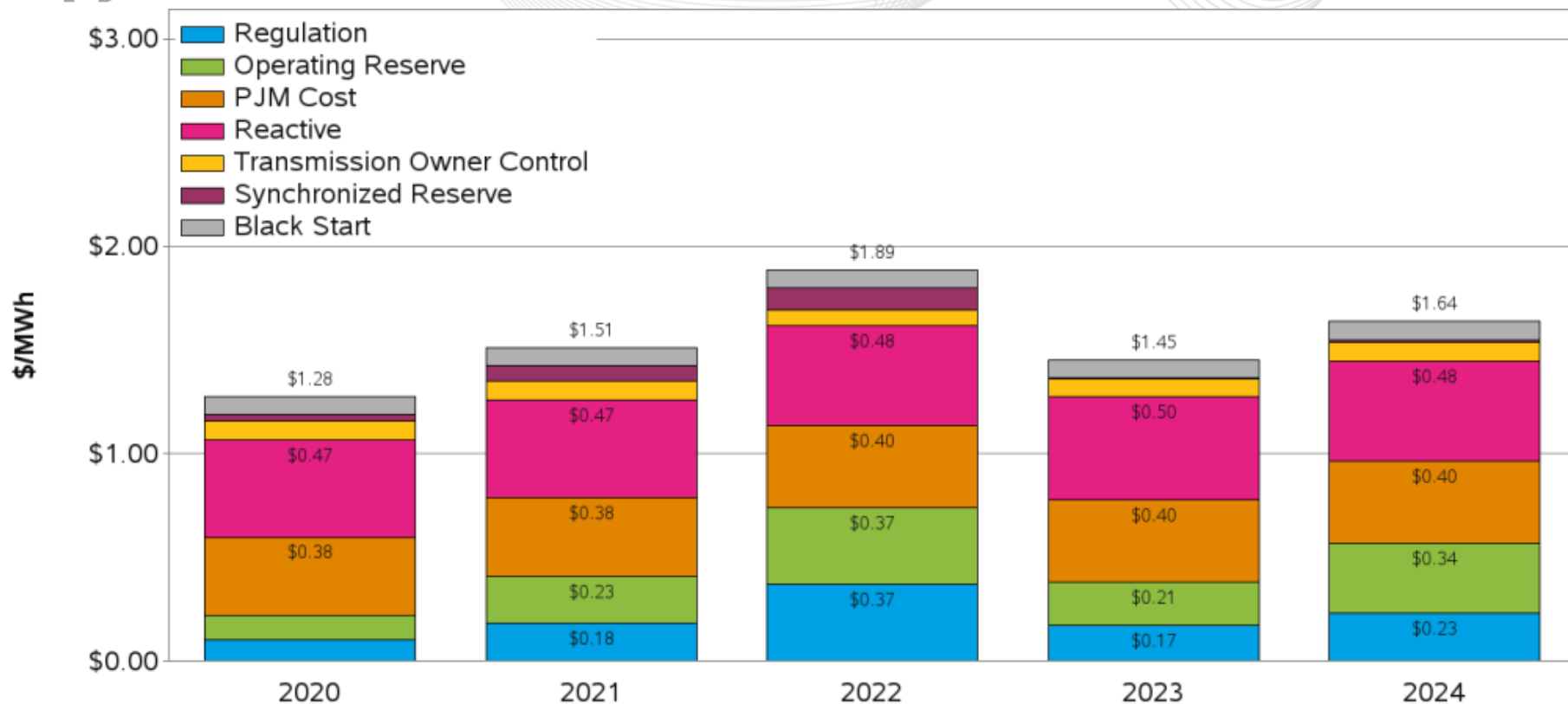
Dec 16, 2024

- PJM Wholesale Cost in 2023 is \$53.35/MWh, up from full-year 2022 costs of \$50.18/MWh. ([Slides 5 & 6](#))
- Slides pertaining to weather conditions, in addition to slides showing average fuel prices, generation on-line fuel mixes, and System Marginal Prices have been combined into a **Market Conditions** section. ([Slides 7- 22](#))
- In November, temperatures were mild for most of the month. The sum of Heating and Cooling Degree Days was below with its historic average. ([Slides 8-10](#))
- Energy use was also below with its historic average for November. ([Slides 8-10](#))
- In November, uplift exceeded \$800,000 on 4 days. ([Slides 26 & 27](#))

- Load-weighted average LMP for 2024 is \$33.62/MWh: ([Slides 35-37](#))
 - November 2024 was \$28.30/MWh, which is lower than November 2023 (\$33.00/MWh) and much lower than November 2022 (\$52.90/MWh).
- There was one 5-minute interval that experienced shortage pricing in November. ([Slide 34](#), Report Appendix)
- FTR revenue adequacy for the month of November is 100% and the 2024-2025 Planning Year is currently funded at 100%. ([Slides 52-55](#))
- Congestion values have been similar to those seen in 2023 and lower than 2022. ([Slide 53](#))
- Regulation and Synchronized Reserve market costs have generally tracked with energy prices over time. ([Slides 69-71](#))

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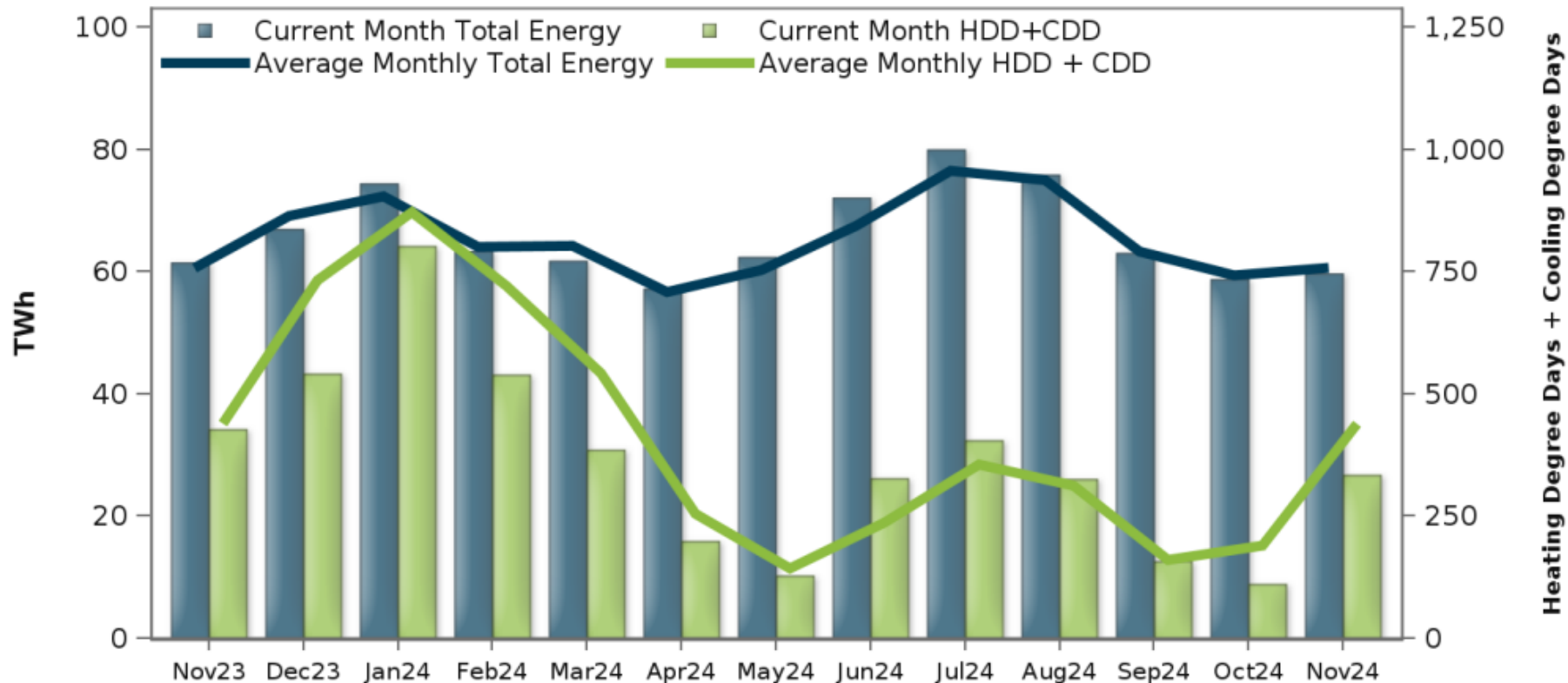




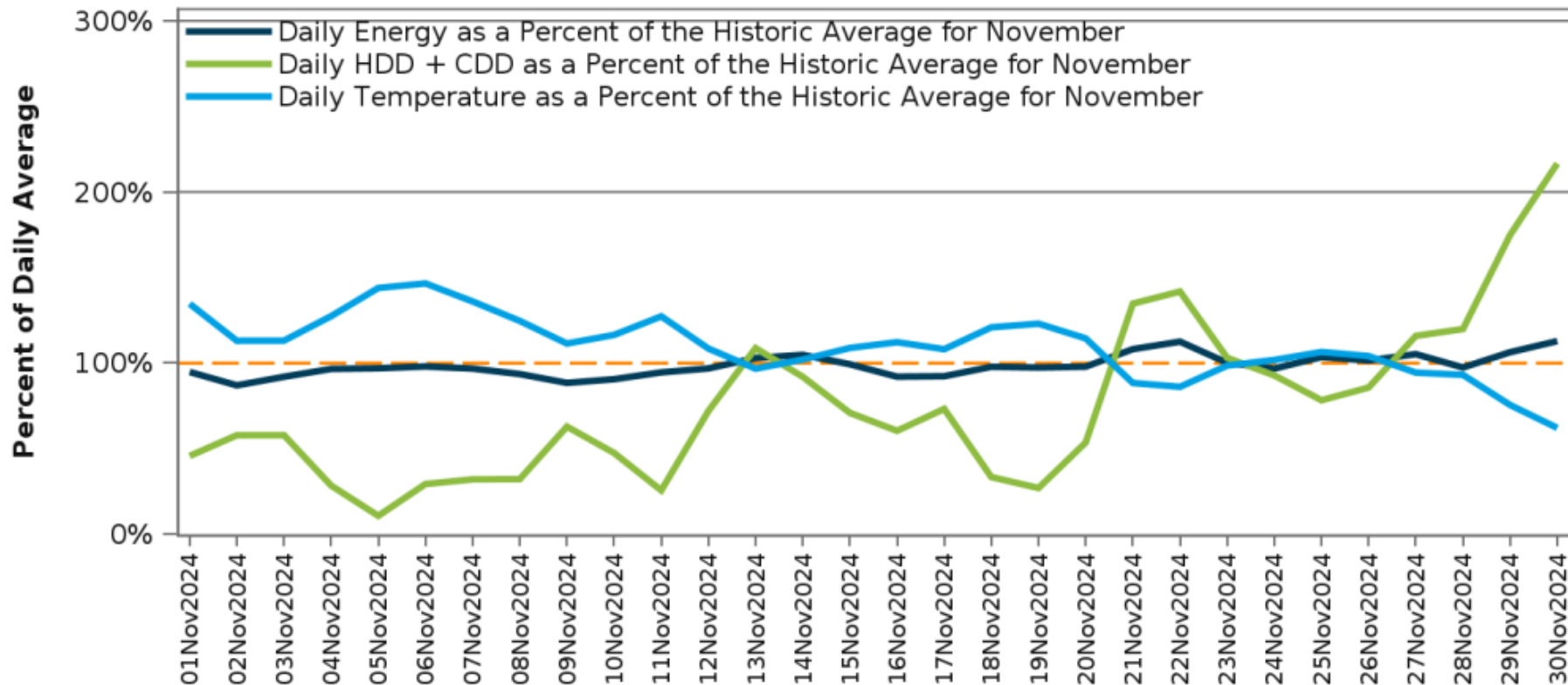
Market Conditions

- The weather parameter shown in the following slide is a monthly sum of daily Heating Degree Days (HDD) and Cooling Degree Days (CDD).
- Degree days represent a deviation from a baseline temperature, in this case 60 degrees for HDD and 65 degrees for CDD. As temperatures get more extreme, colder or hotter, either HDDs or CDDs, respectively, will increase.
- Typically, winter months will only record HDDs, while summer months will only record CDDs. Shoulder months may have both HDDs and CDDs.
- Degree Days are calculated using a daily load weighting that weights values from stations in each TO zone according to the zonal contribution to the RTO peak on that day.
- Average values use data from 1998 to the most recent complete year, in this case, 2023. Averages include load data for all of TO zones in the current RTO footprint.

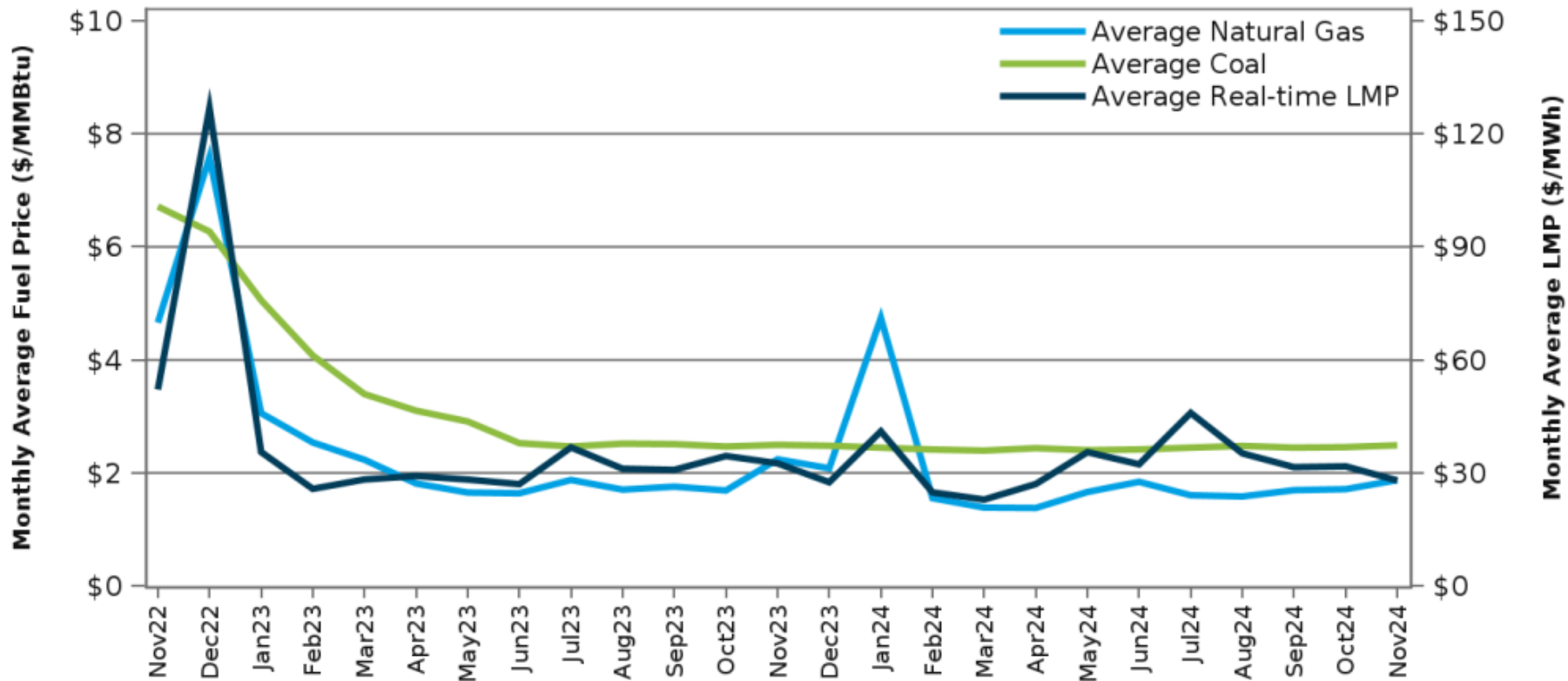
Historic Average Weather and Energy versus Current Month



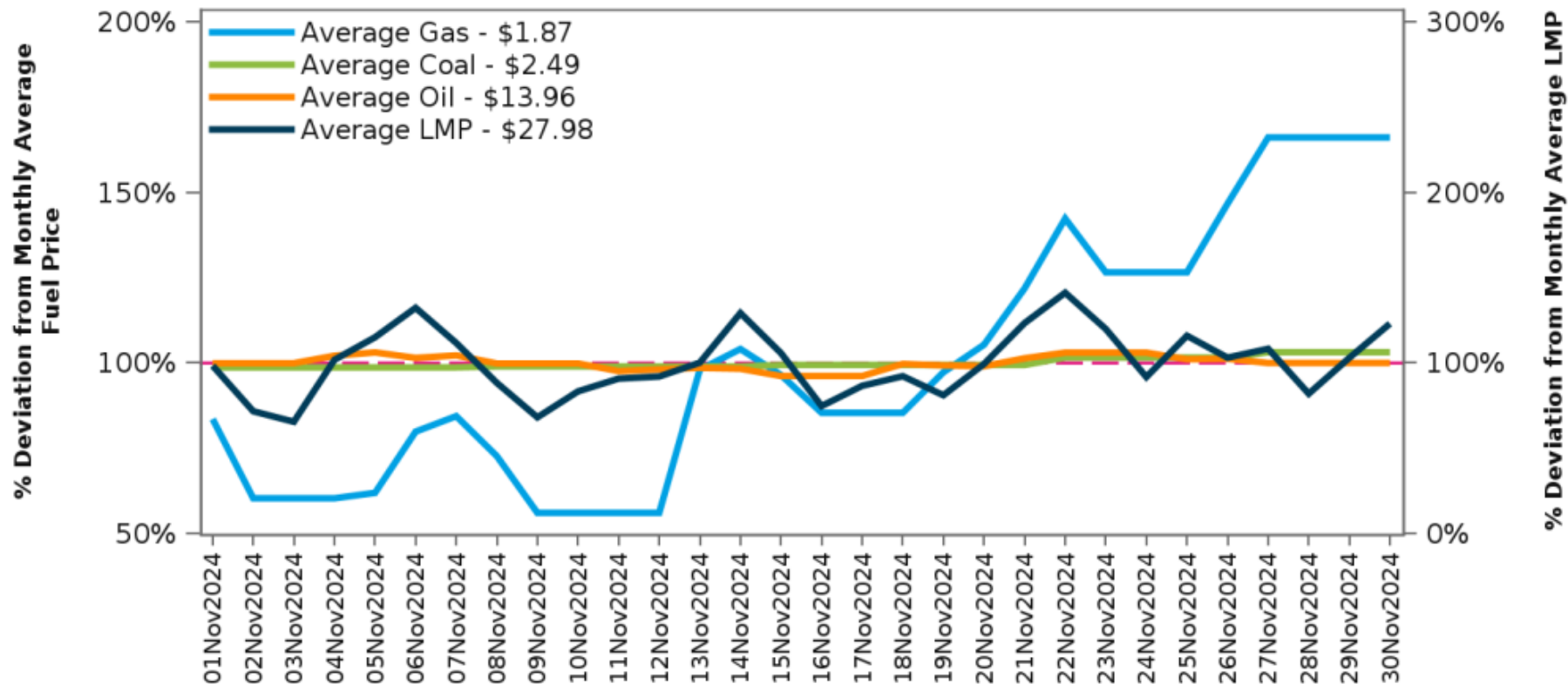
Historic Average Weather and Energy versus Current Month - Daily



Average Fuel Prices - Monthly

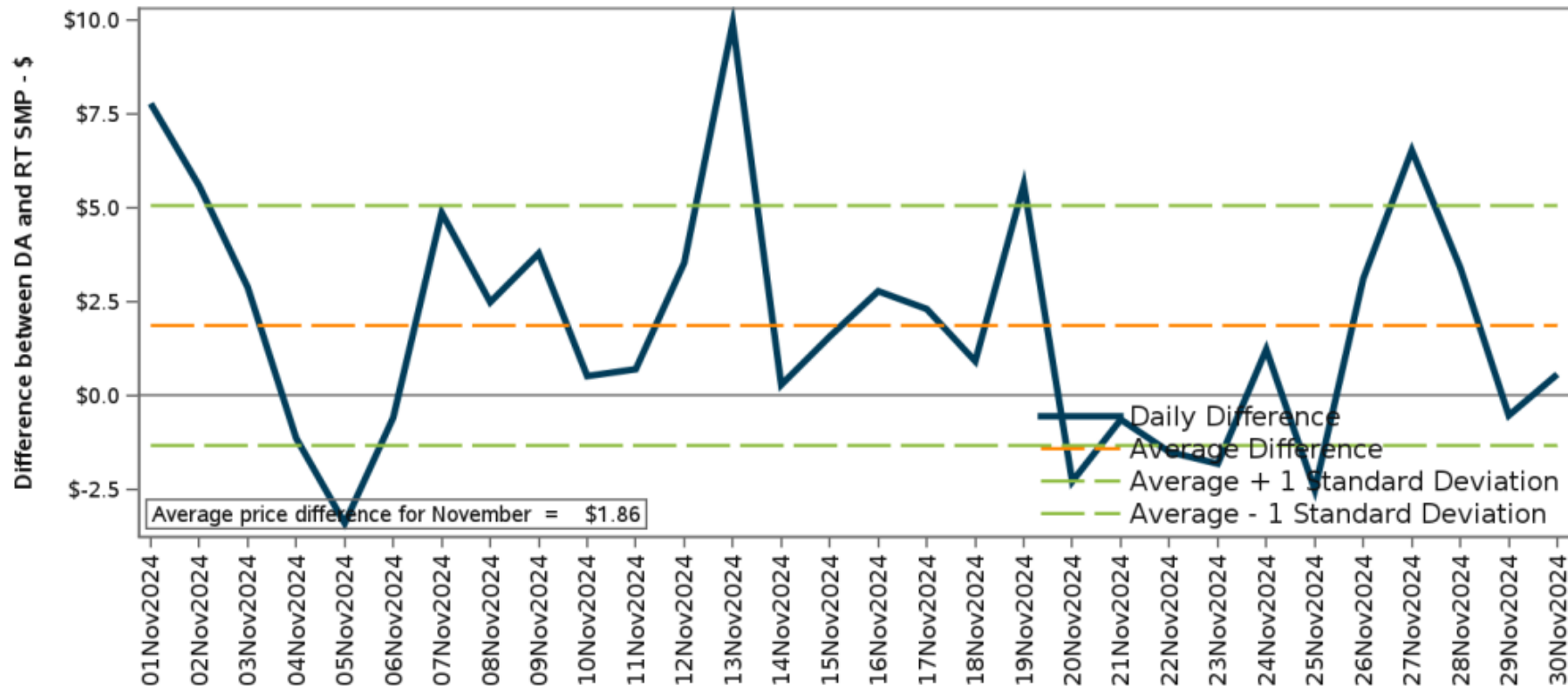


Fuel Price Source: S&P Global Platts



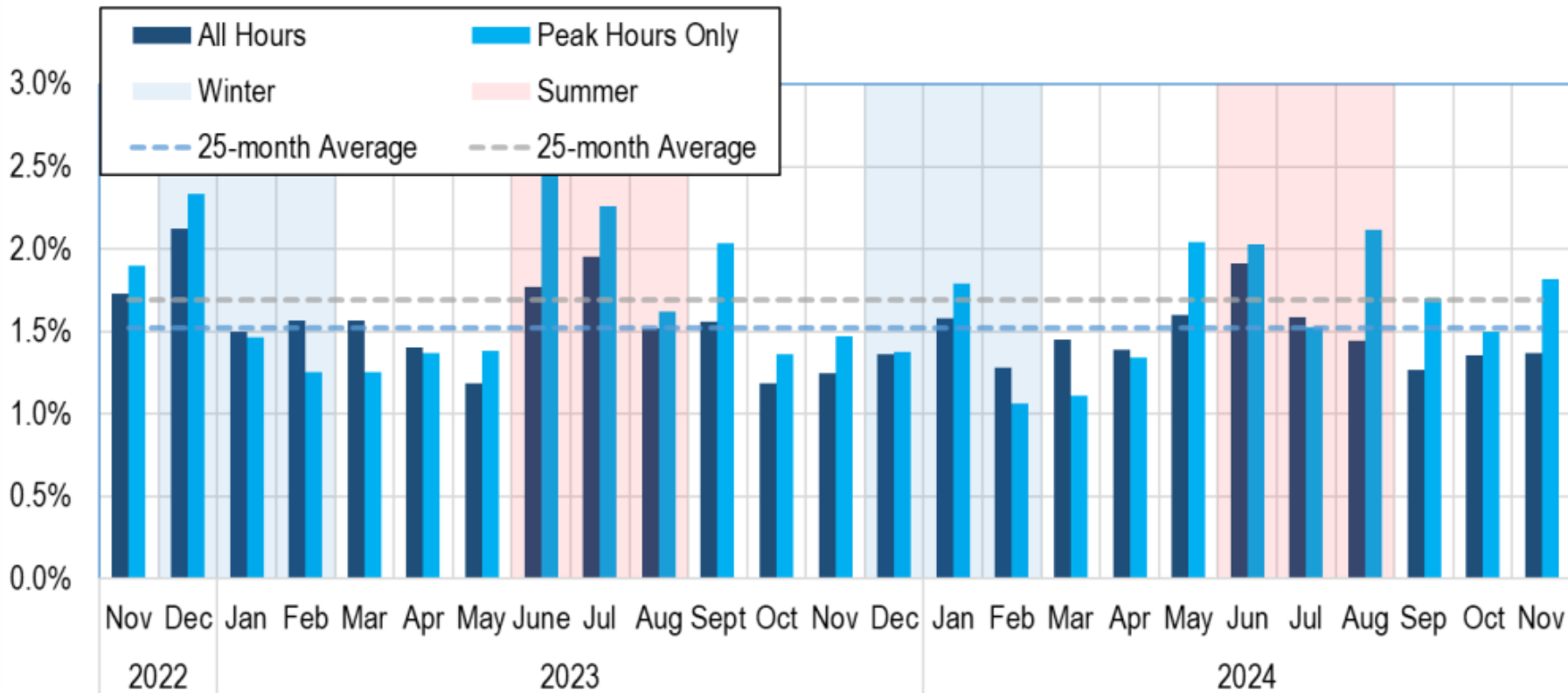
Fuel Price Source: S&P Global Platts

Daily Difference Between Day-Ahead and Real-Time System Marginal Prices

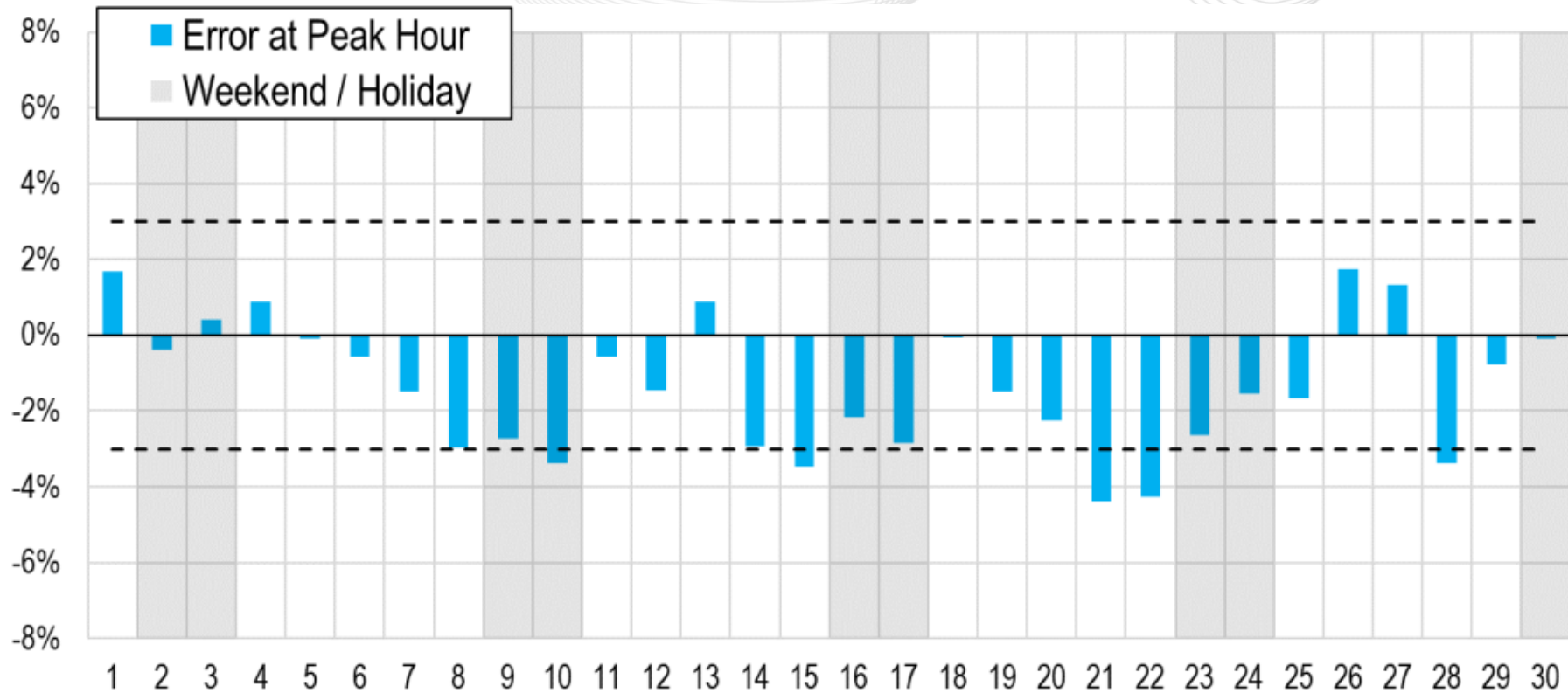


Positive values represent days when the DA daily average price was higher than RT. Negative values represent days when the DA price was lower.

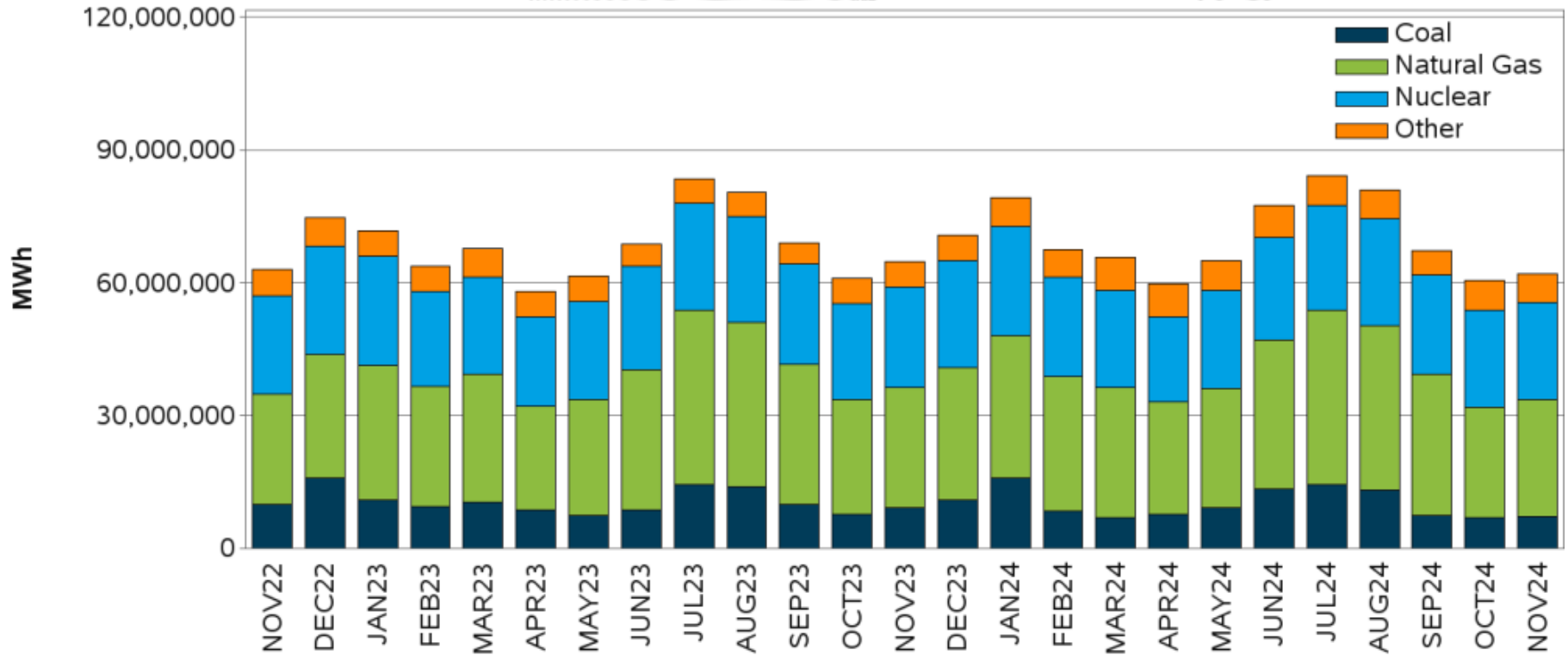
Load Forecast Error - Monthly Absolute Error, 10:00 Forecast



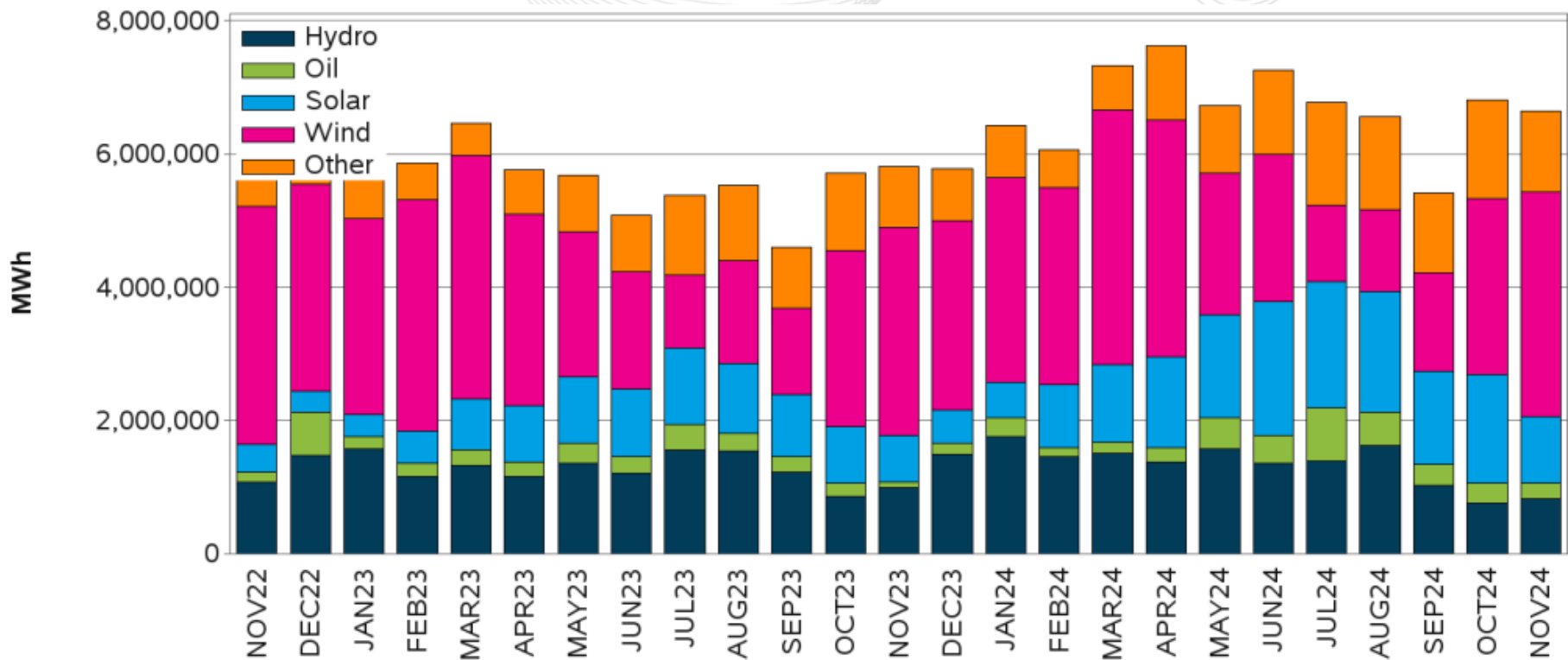
Load Forecast Error - November Daily Peaks, 10:00 Forecast



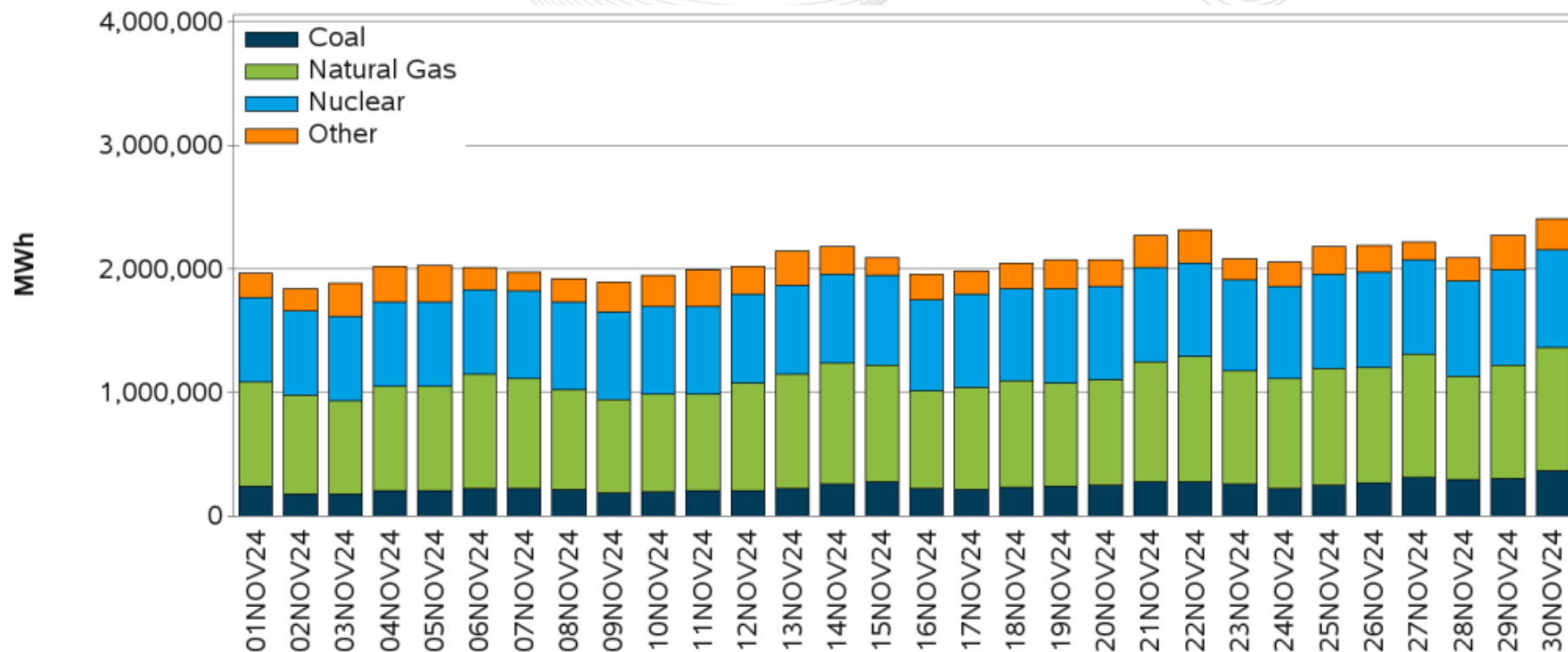
- PJM prepares a day-ahead load forecast at 10:00 am for use by our members.
 - This forecast is not used to clear the day-ahead market and is not utilized for the reliability tools that run subsequent to the day-ahead market.
-
- **November 10 (Sunday):** Temperatures were 2-4 degrees cooler with abundant clouds and showers leading to higher loads.
 - **November 15 (Friday):** Temperatures came in 3-6 degrees cooler across the RTO, especially in the Western Region, leading to higher peak load.
 - **November 21 (Thursday):** Temperatures decreased significantly off of above normal temperatures. The change was not captured well by models, and required SME adjustments to mitigate forecast error.
 - **November 22 (Friday):** Temperatures decreased significantly off of above normal temperatures. The change was not captured well by models, and required SME adjustments to mitigate forecast error.
 - **November 28 (Thursday):** Heavy rain and clouds with some cooler than forecasted temperatures led to a protracted midday peak on Thanksgiving.



Other includes Hydro, Oil, Solar, Wind, and Other

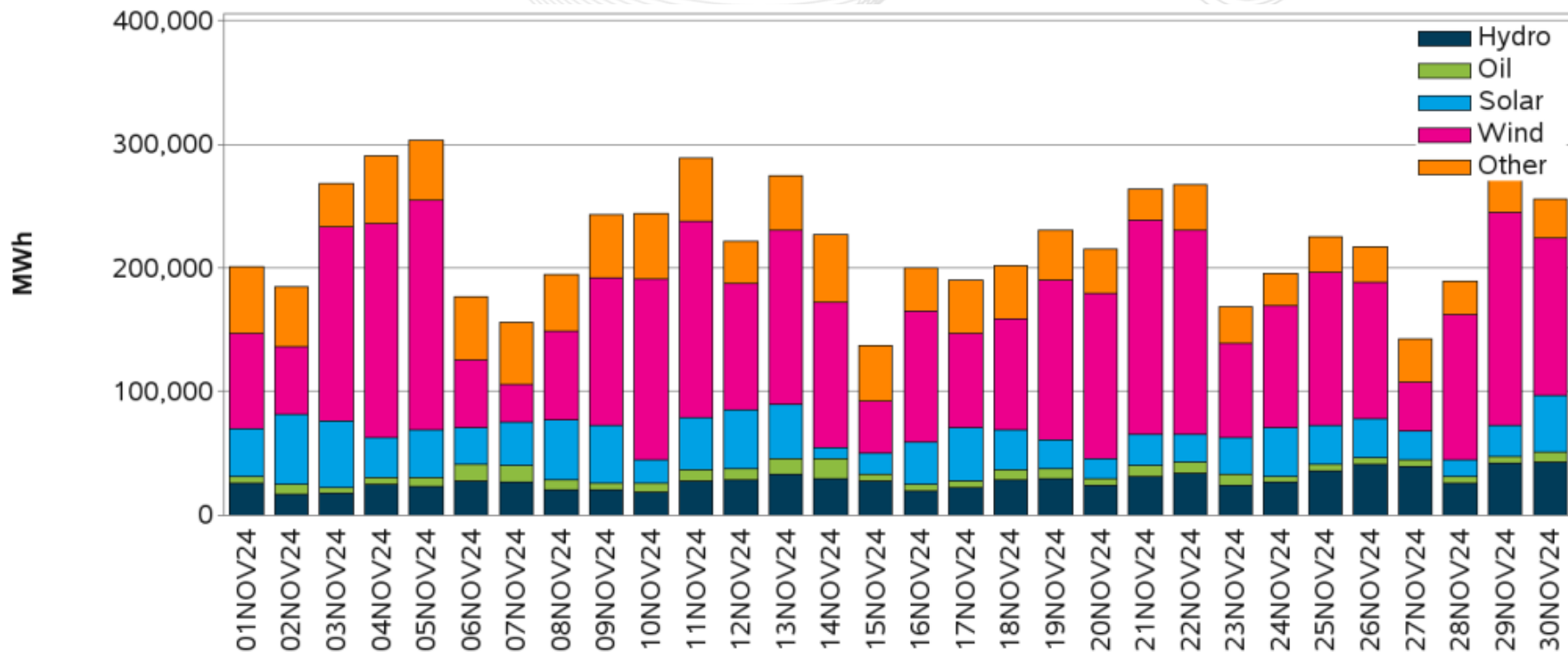


'Other' includes Flywheels, Multiple Fuels, Storage, and Other Renewables



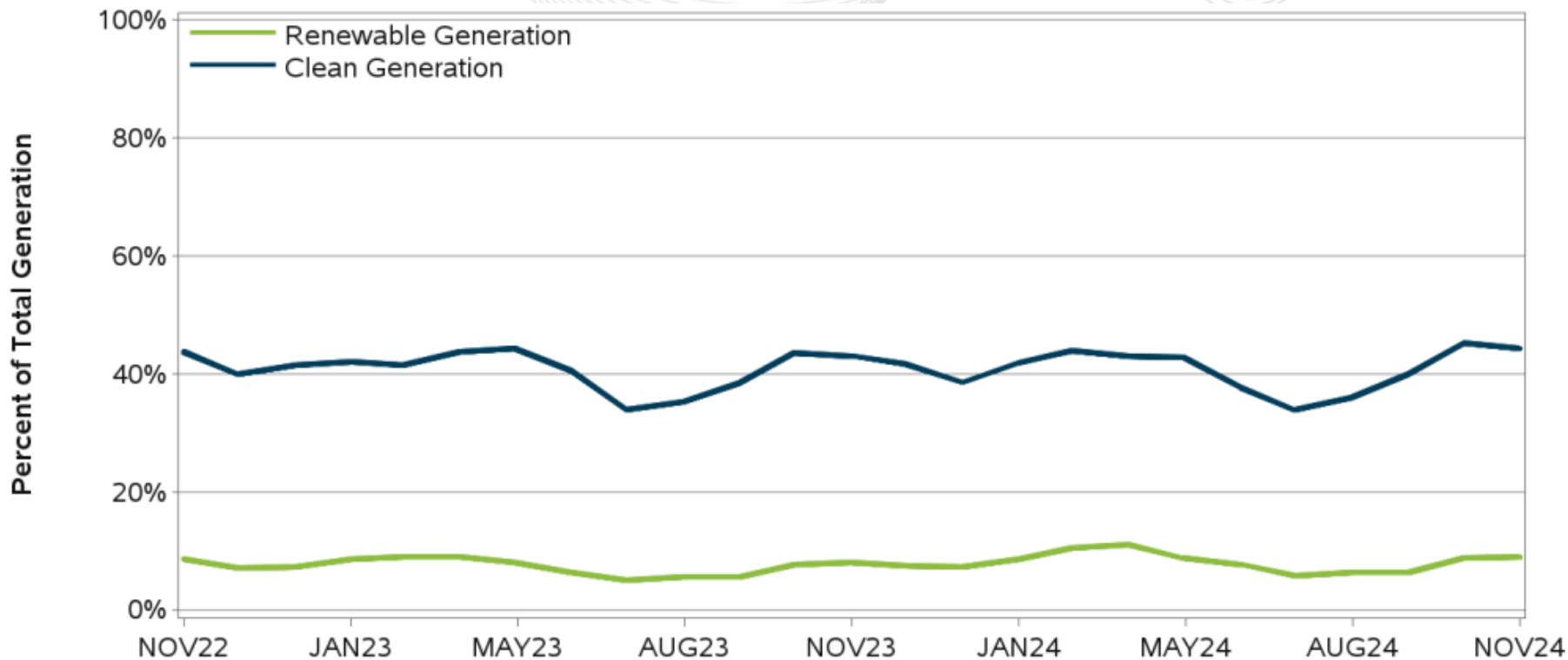
'Other' includes Hydro, Oil, Solar, Wind, and Other

Daily Generation by Fuel, Other - November



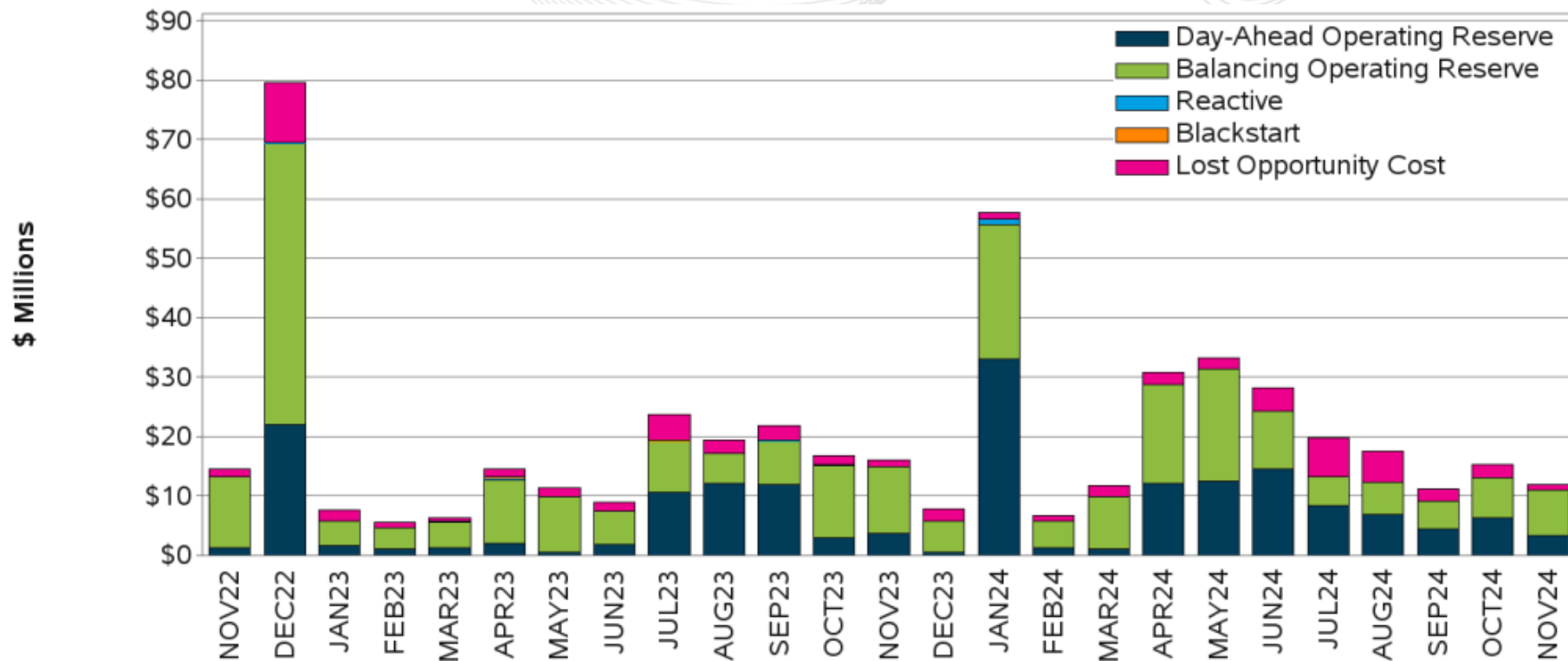
'Other' includes Flywheels, Multiple Fuels, Storage, and Other Renewables

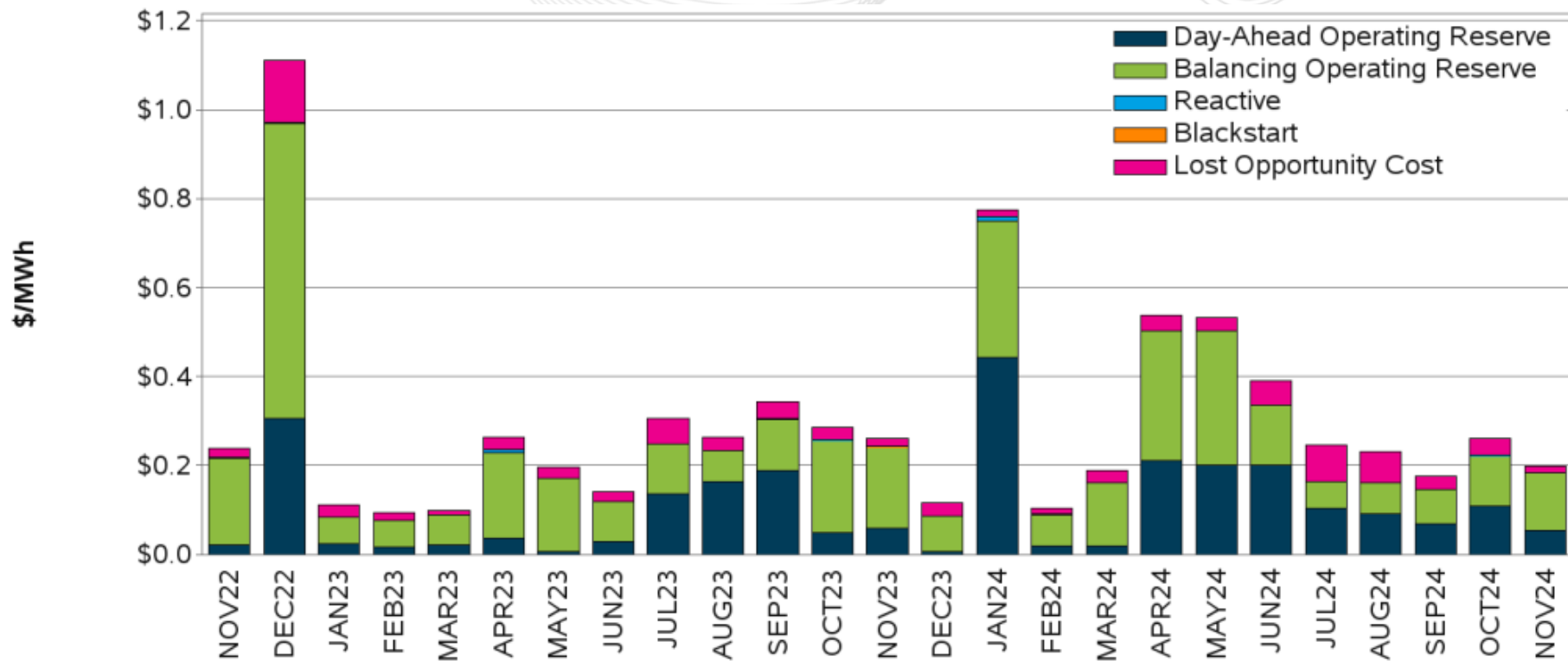
Percent of Renewable and Clean Generation

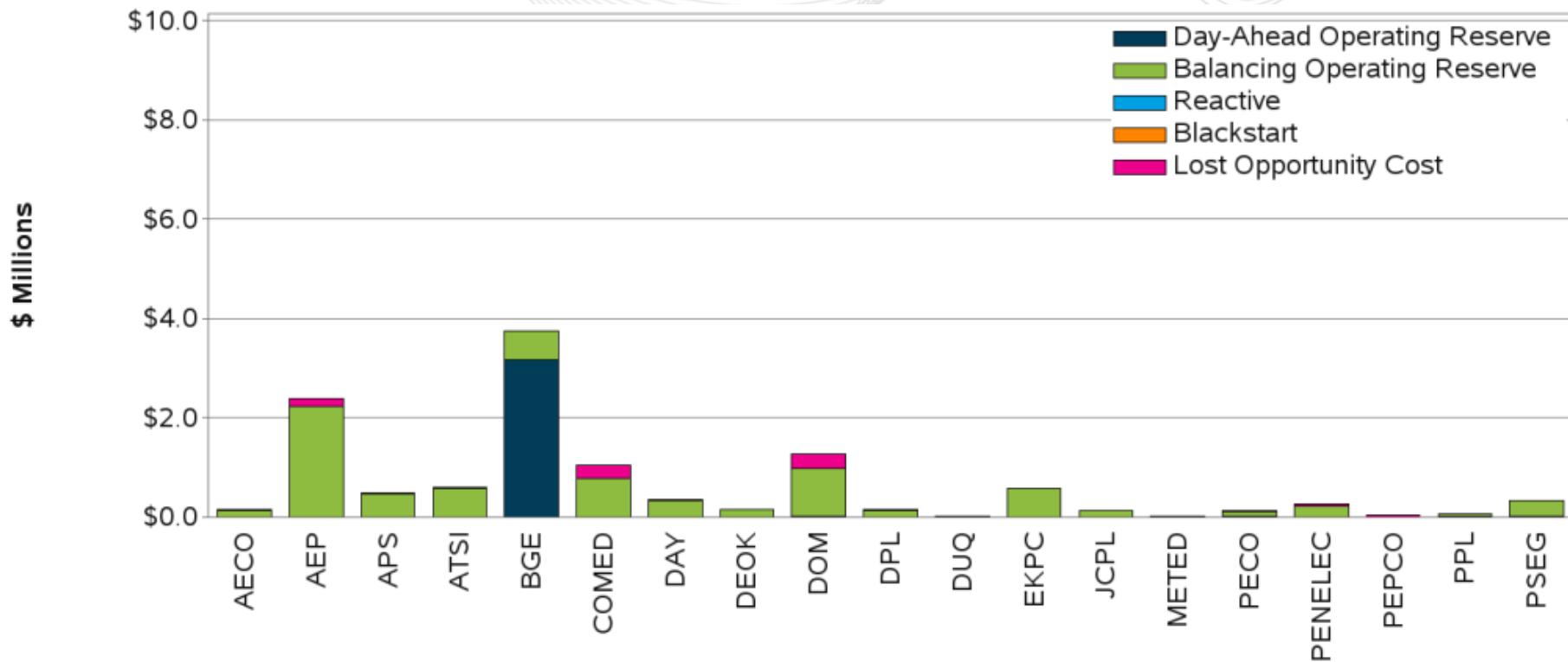


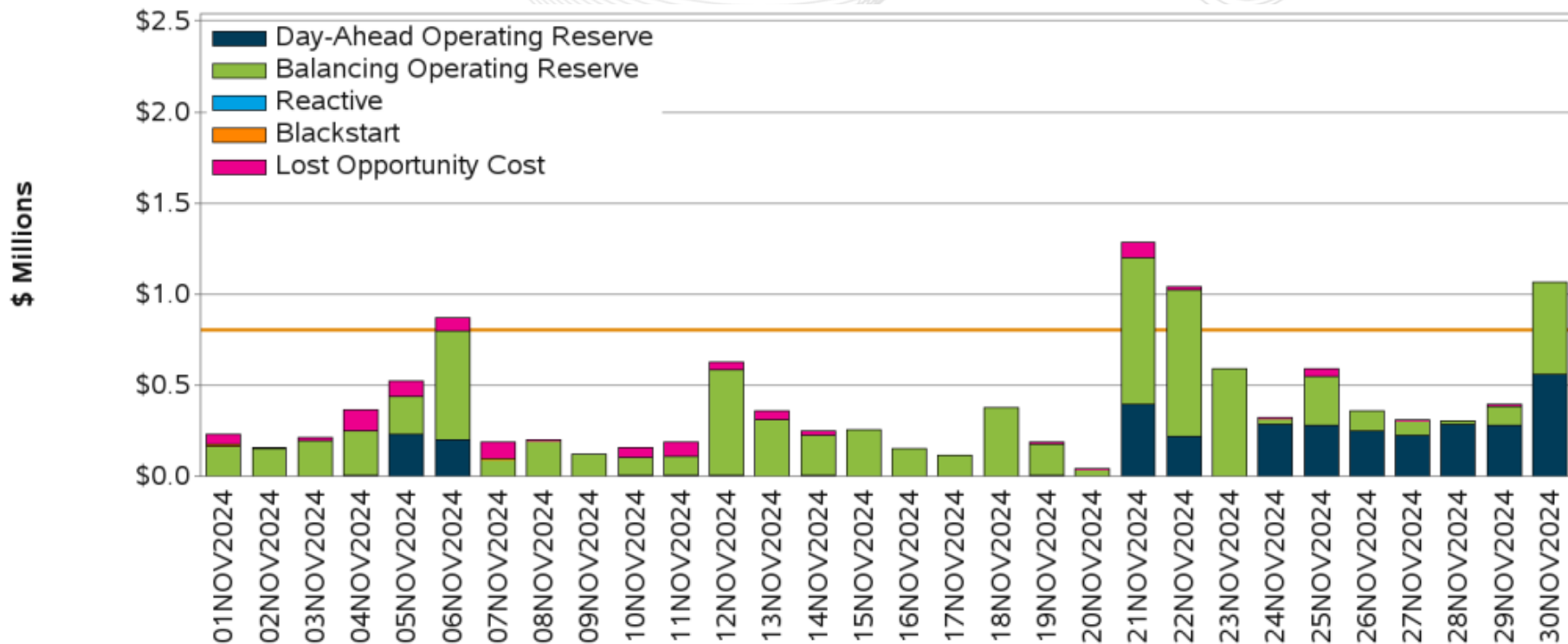
'Renewable' includes Wind, Solar, Hydro, and Other Renewables. 'Clean' includes Renewable and Nuclear.

Operating Reserve (Uplift)

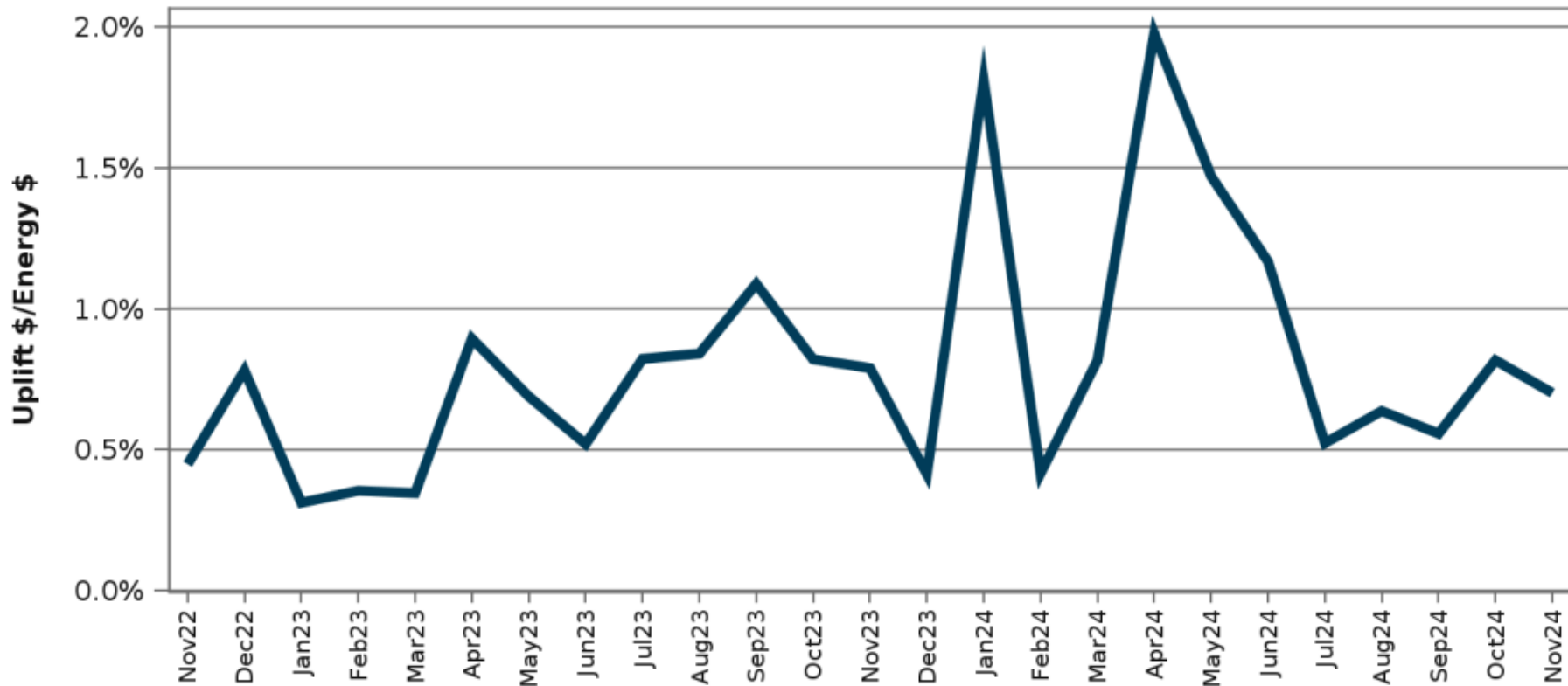




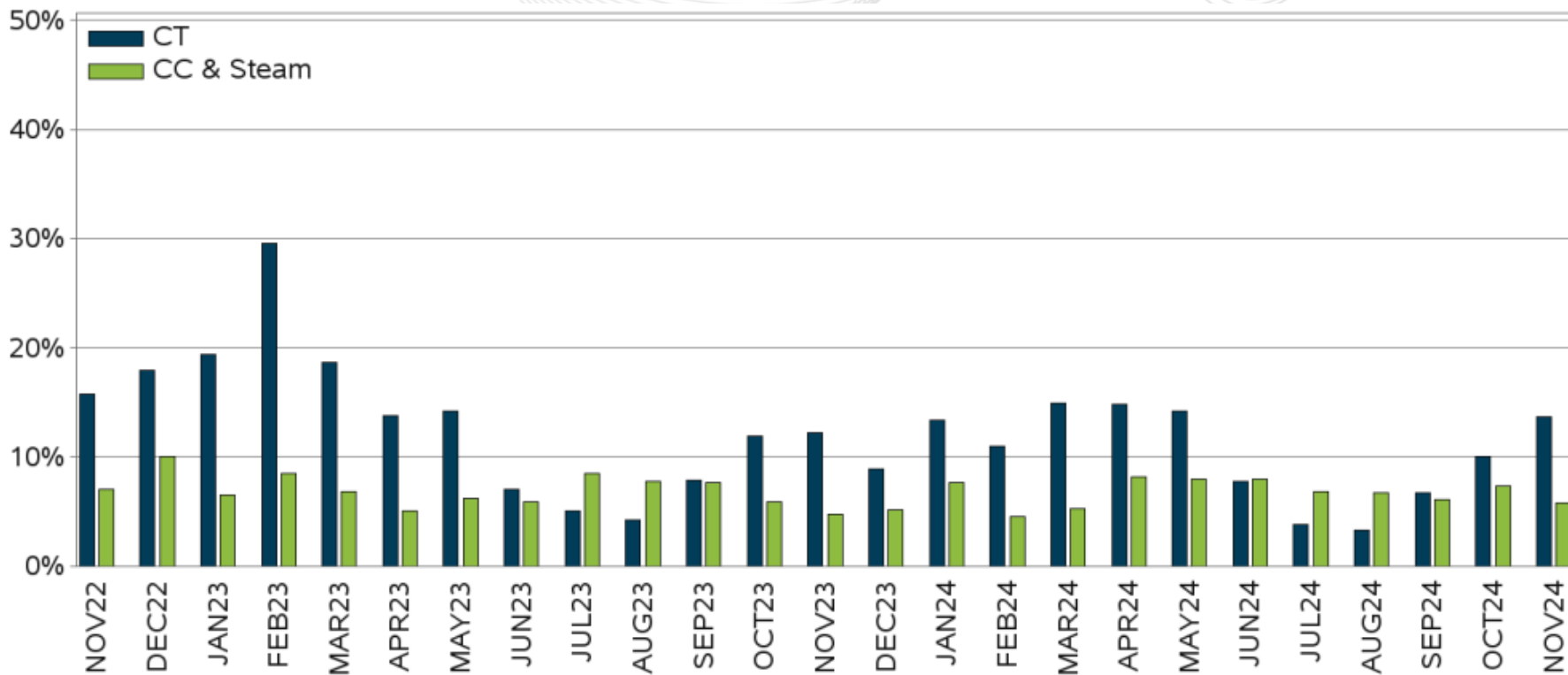




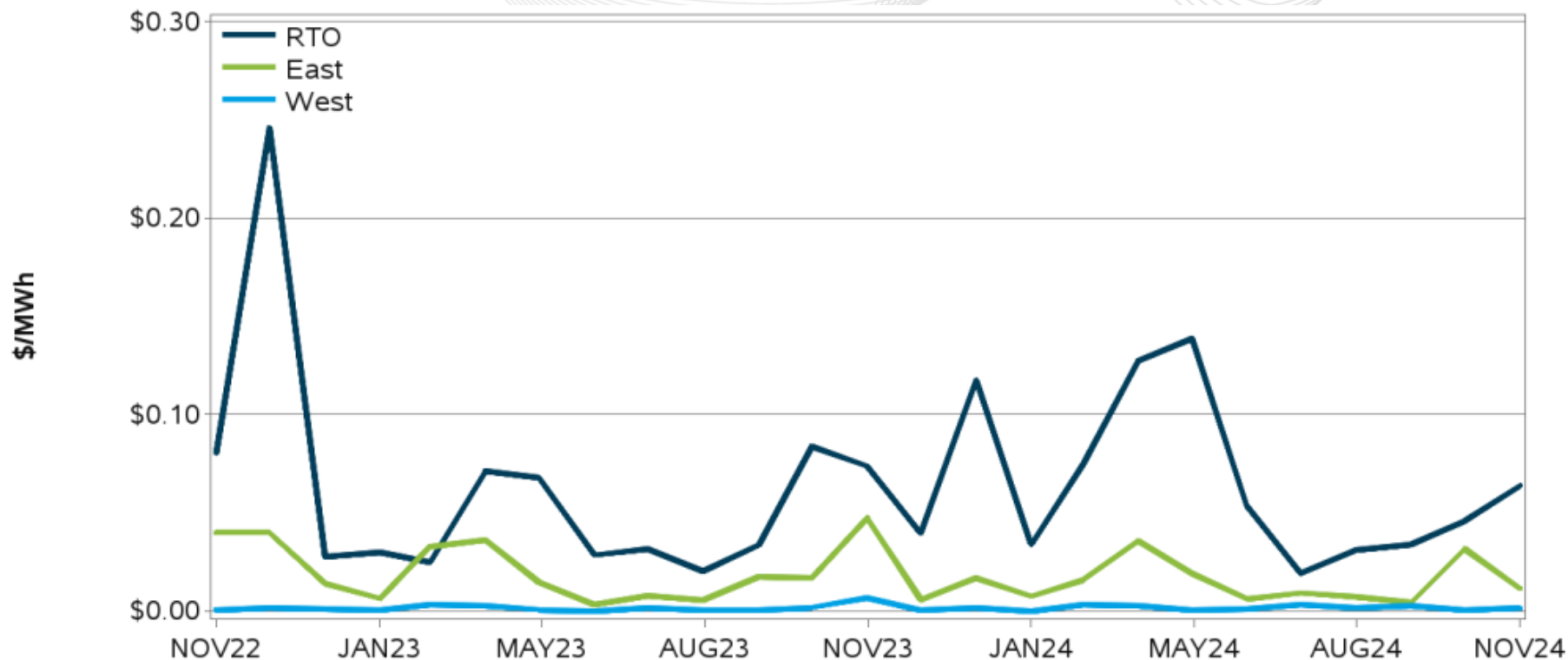
- In November, uplift exceeded \$800,000 on 4 days -
- Contributing factors to uplift were:
- More information on Uplift can be found on the PJM website at [Drivers of Uplift](#)



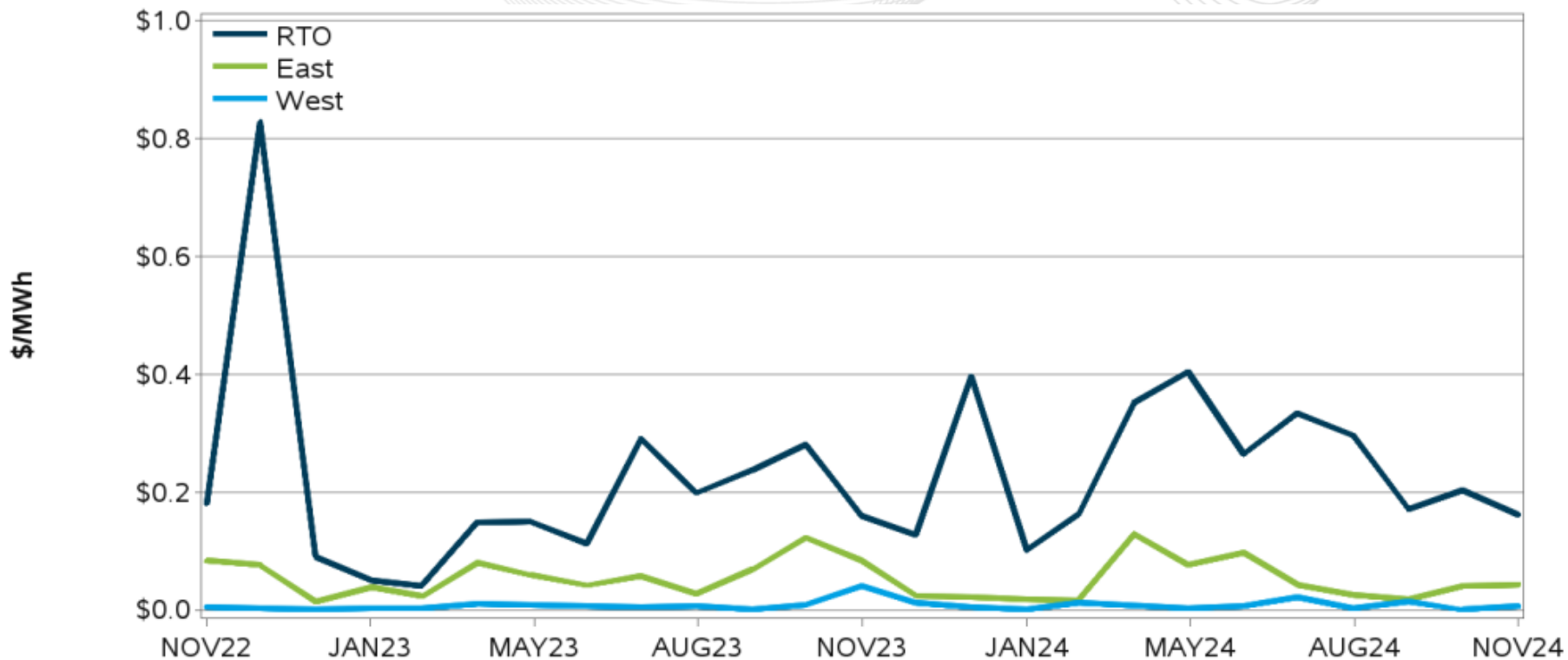
Percent of Total CT, CC and Steam Hours with LMP < Offer



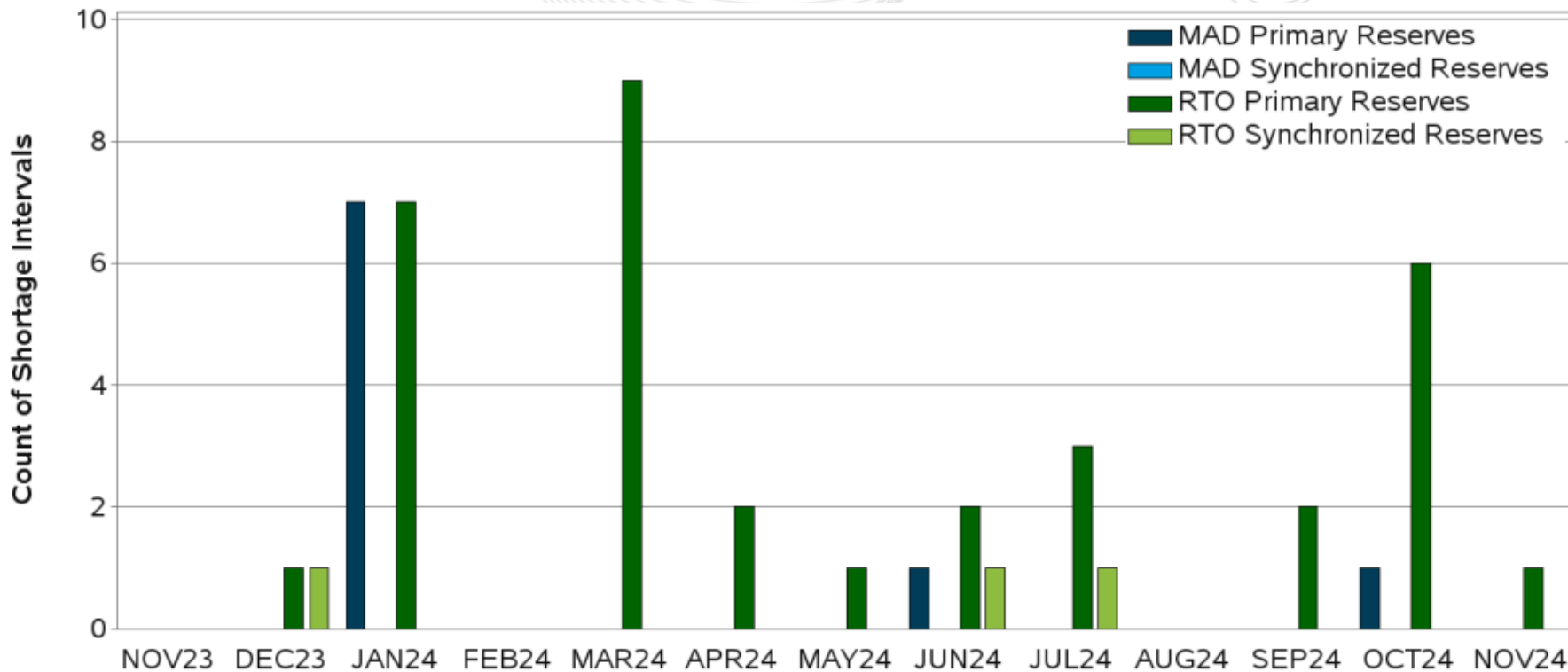
- Beginning in December 2008, the daily Balancing Operating Reserves (BOR) rate was replaced with six different BOR rates: RTO BOR for Reliability Rate, RTO BOR for Deviations Rate, East BOR for Reliability Rate, East BOR for Deviations Rate, West BOR for Reliability Rate, West BOR for Deviations Rate.
- Reliability rates are charged to all real-time load and exports, whereas deviation rates, as before, are charged only to real-time deviations. RTO rates are charged to the whole footprint, whereas East and West rate adders are charged based on location.



Deviations Balancing Operating Reserve Rates

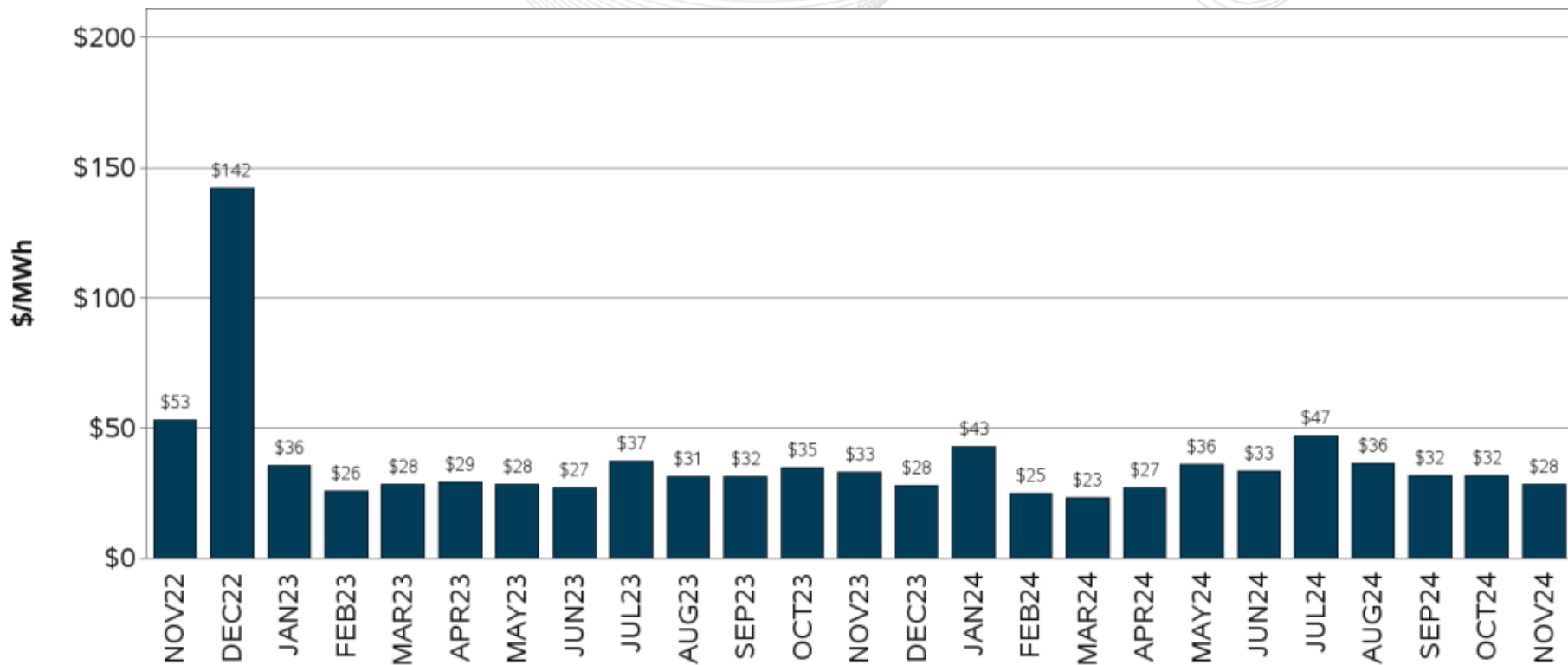


Energy Market LMP Summary

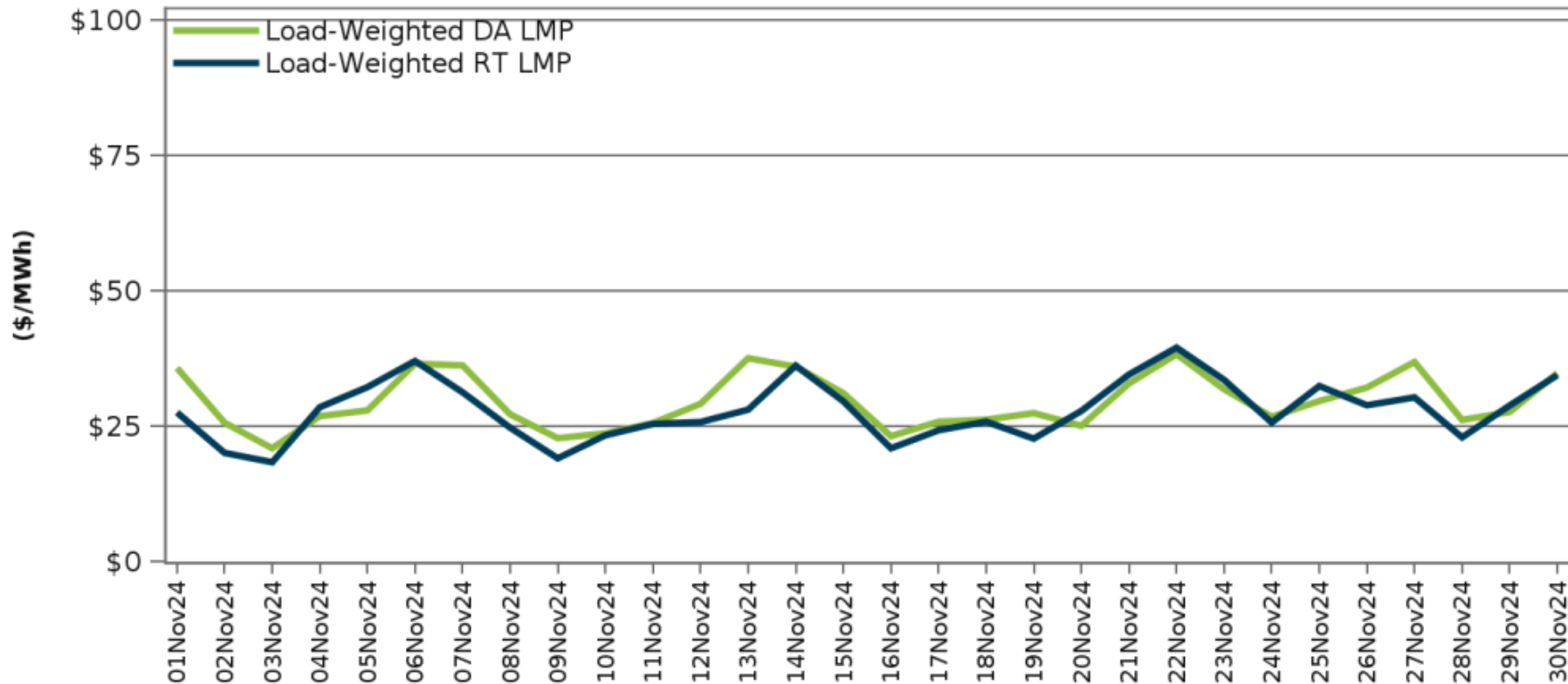


[Information on constraints and shadow prices can be found here](#)

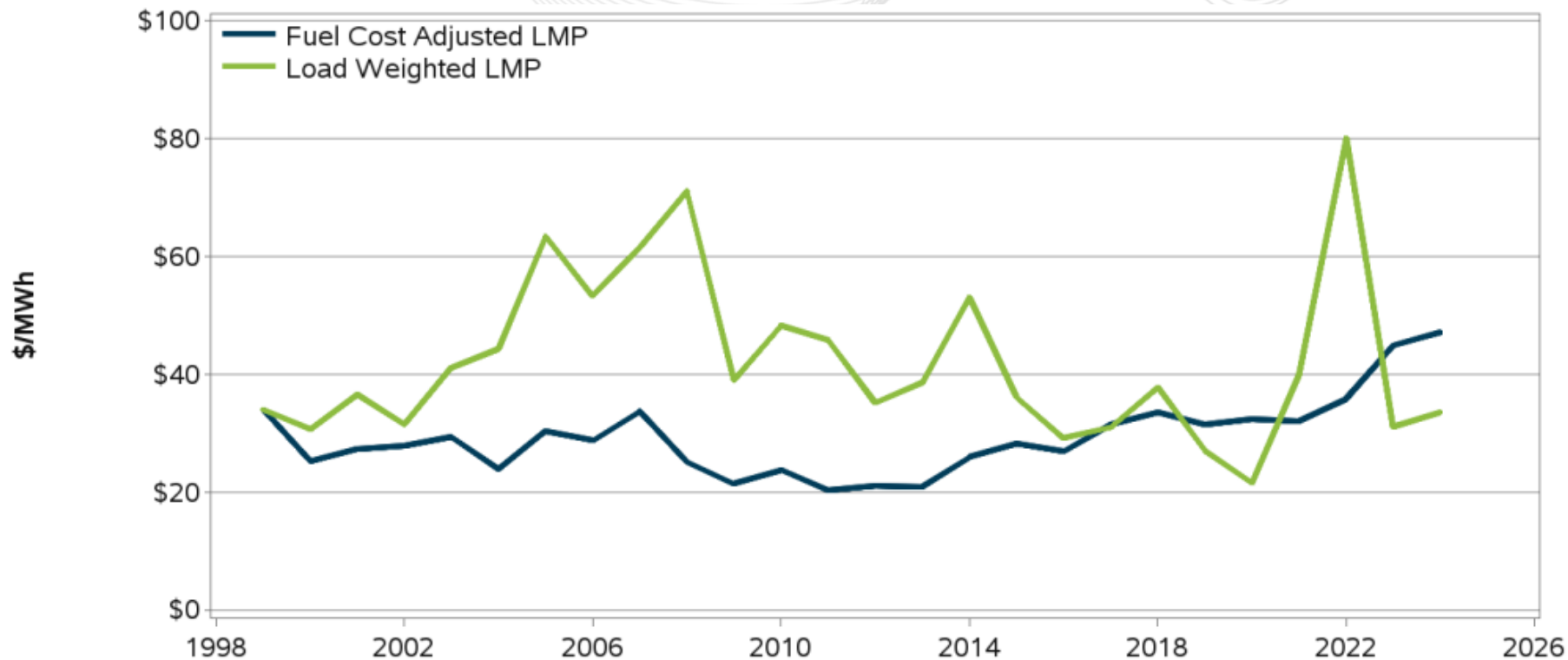
Monthly Load-Weighted Average Real-time LMP



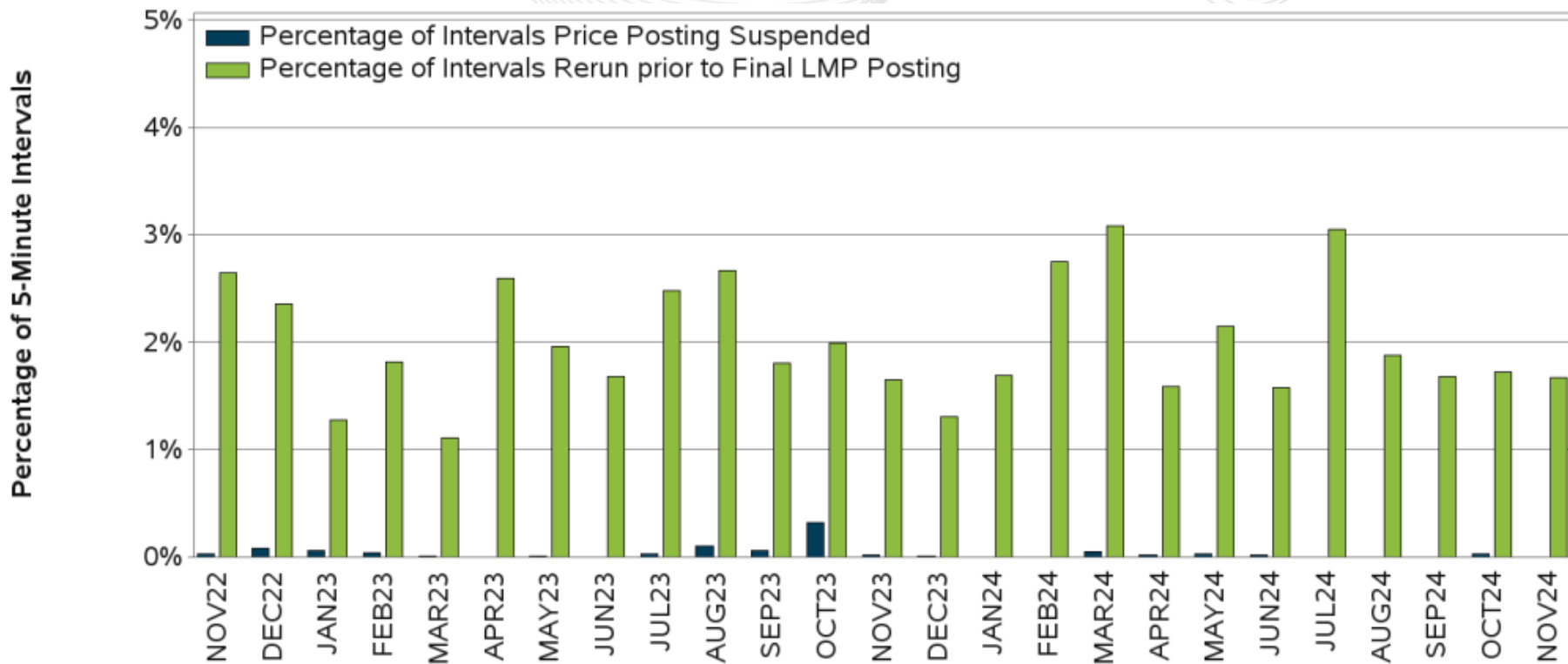
Daily Load-Weighted Average DA & RT LMP



Fuel Cost Adjusted LMP (Referenced to 1999 Fuel Prices)



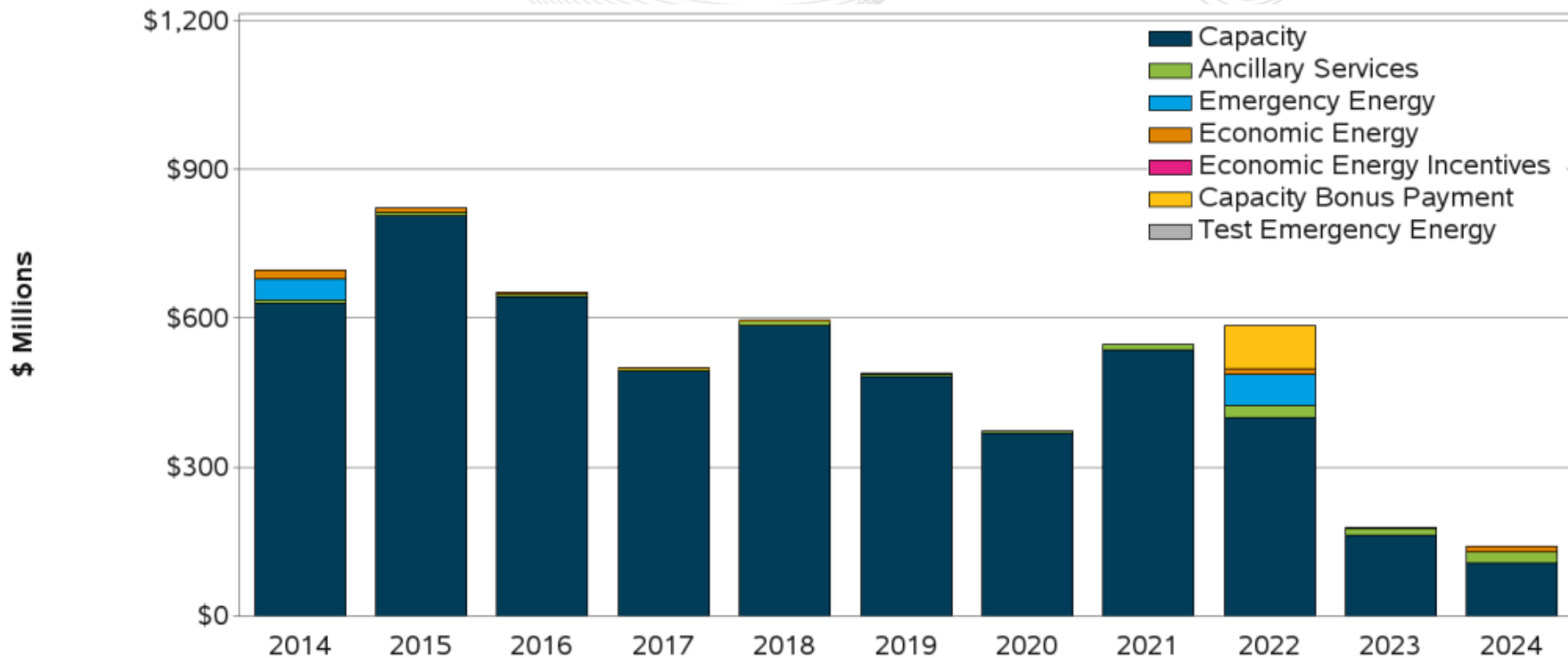
LMP Price Posting Suspensions and Reruns

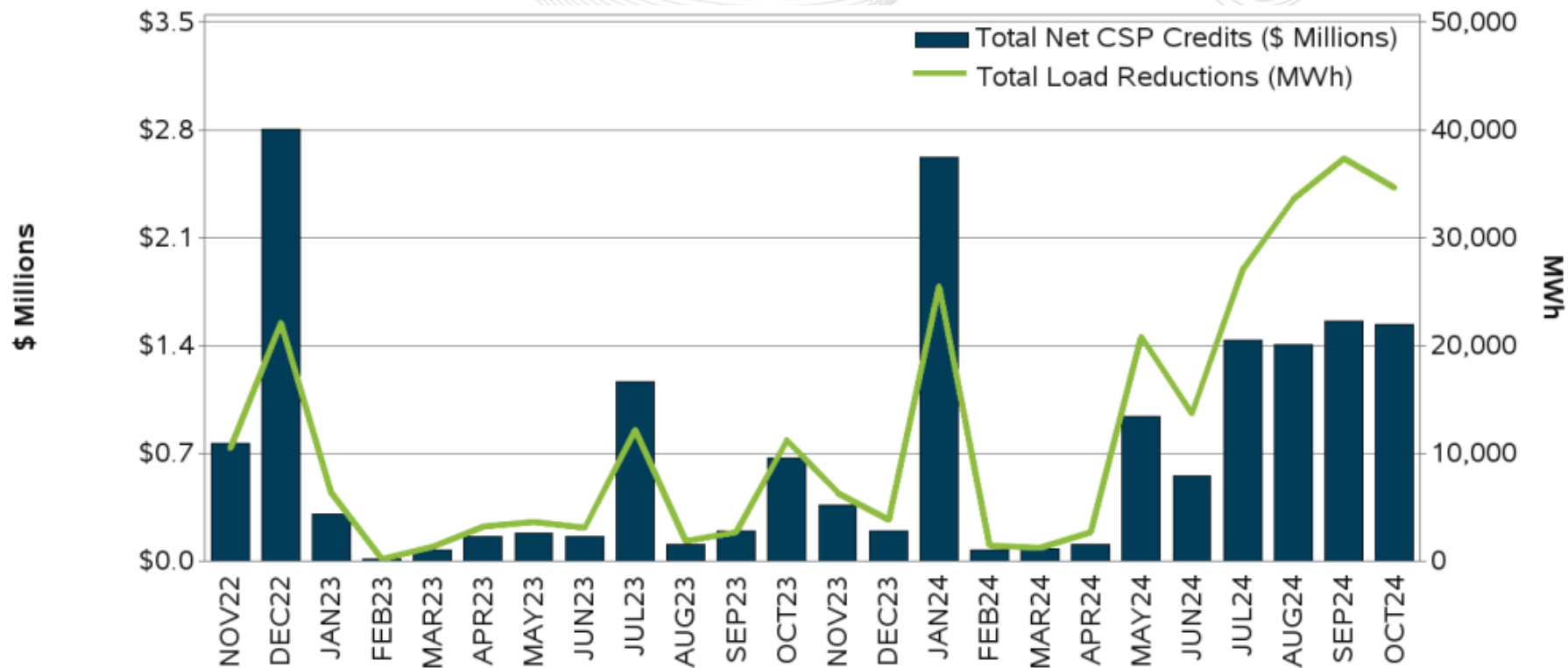


Energy Market

Demand Response Summary

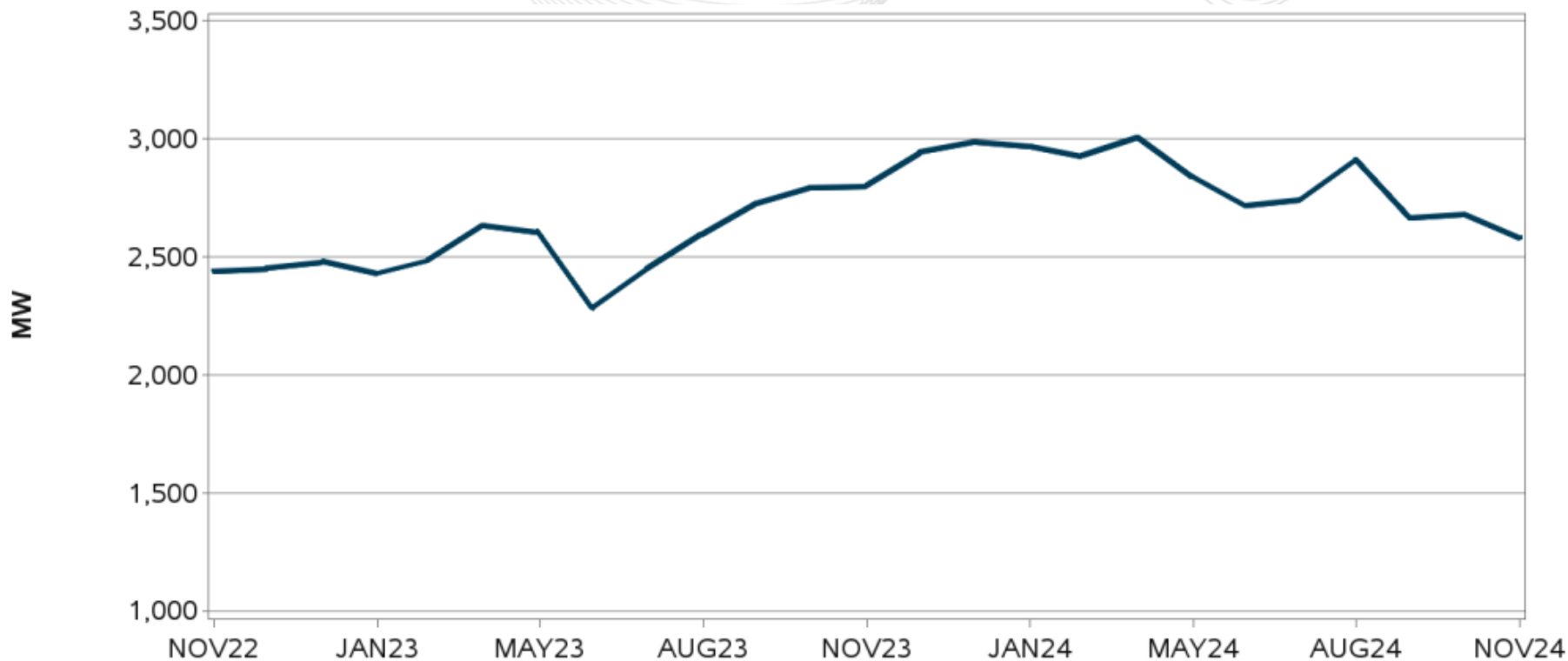
Demand Side Response Estimated Revenue





*Data for the last few months are subject to significant change due to the settlement window.

Total Registered MW in PJM's Economic Demand Response

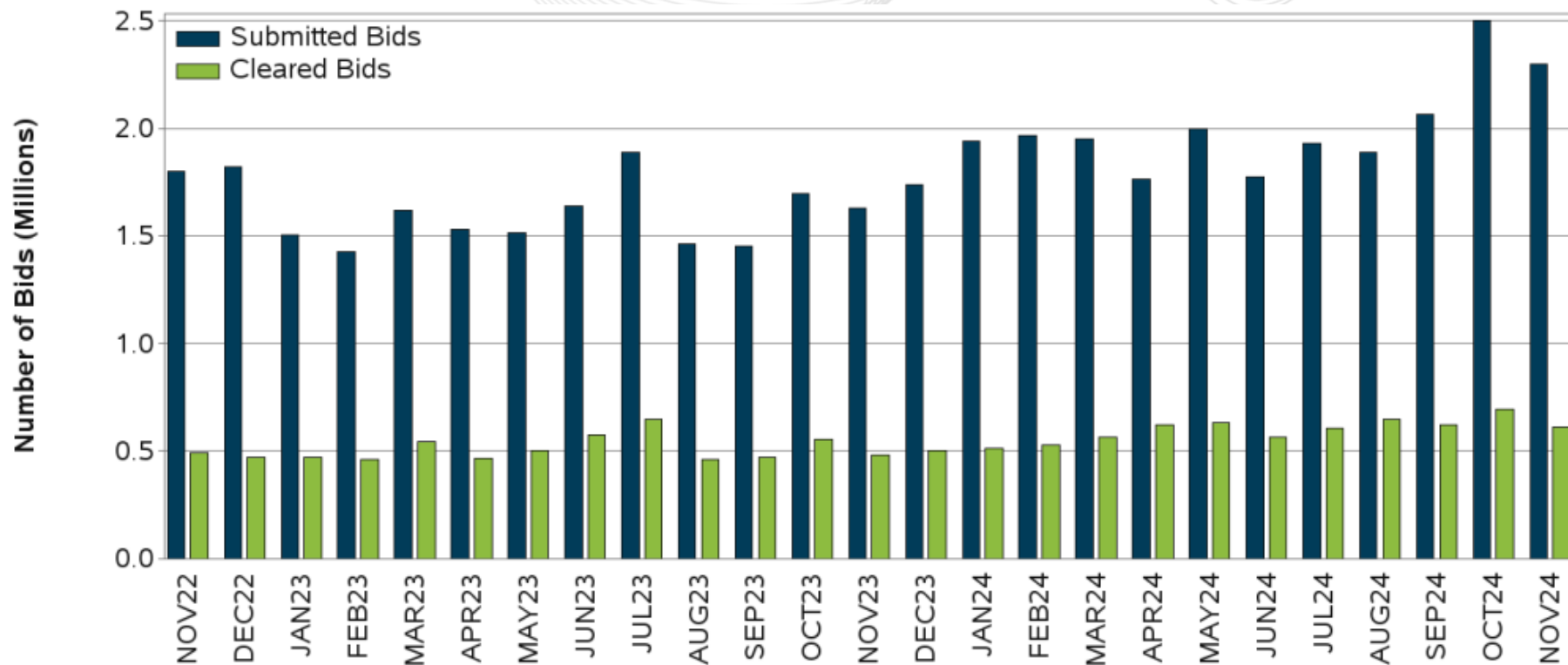


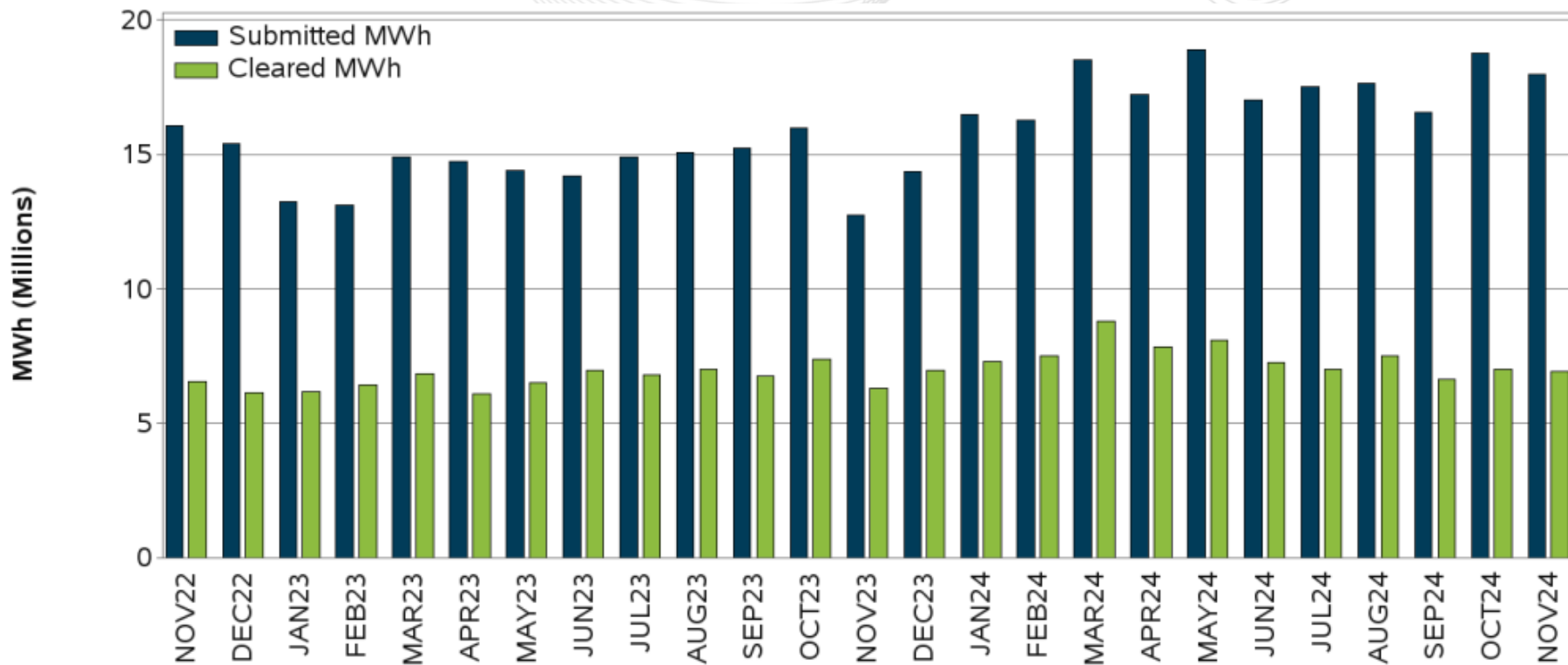
Energy Market

Virtual Activity Summary

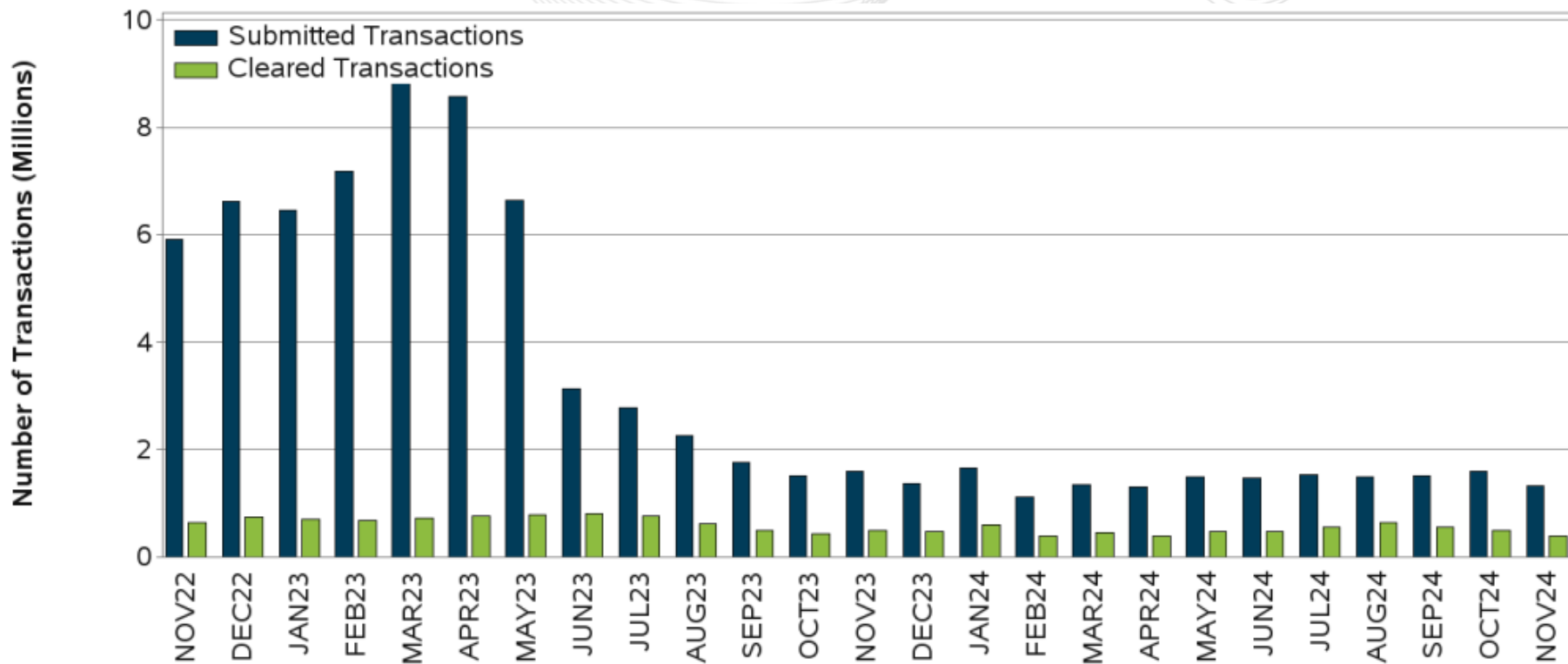
- The following six charts depict trends in submitted and cleared virtual and up-to-congestion transactions, in terms of number and volume, into the PJM Energy Market. The first two of these charts show the submitted and cleared increment and decrement bids (virtual transactions or virtuals) and they are the same as what was previously being presented in this report. The two charts after them display the trends in submitted and cleared up-to-congestion transactions into the PJM Energy Market. The last two of these six charts combine the virtual and up-to-congestion transactions and show the sum of these two categories.
- To clarify what a bid or transaction is, please consider the following example: An offer (increment, decrement or up-to-congestion) of 10 MW, valid for eight hours for a given day, is captured in the charts as eight submitted bids/transactions and 80 submitted MWh. If this offer fully clears for three of the hours it was submitted for, it shows in the charts as three cleared bids/transactions and 30 cleared MWh.

Virtual Bids (INCs & DEC)s - Total Number

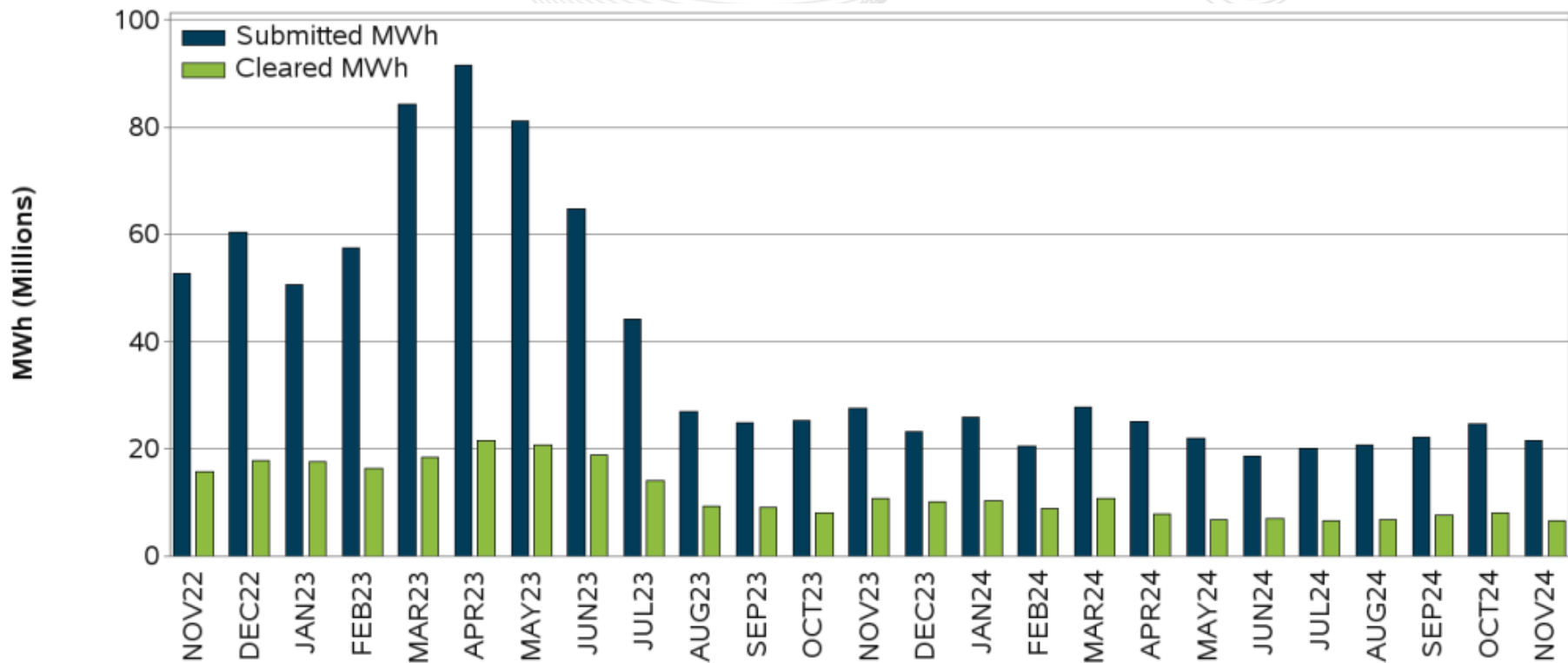




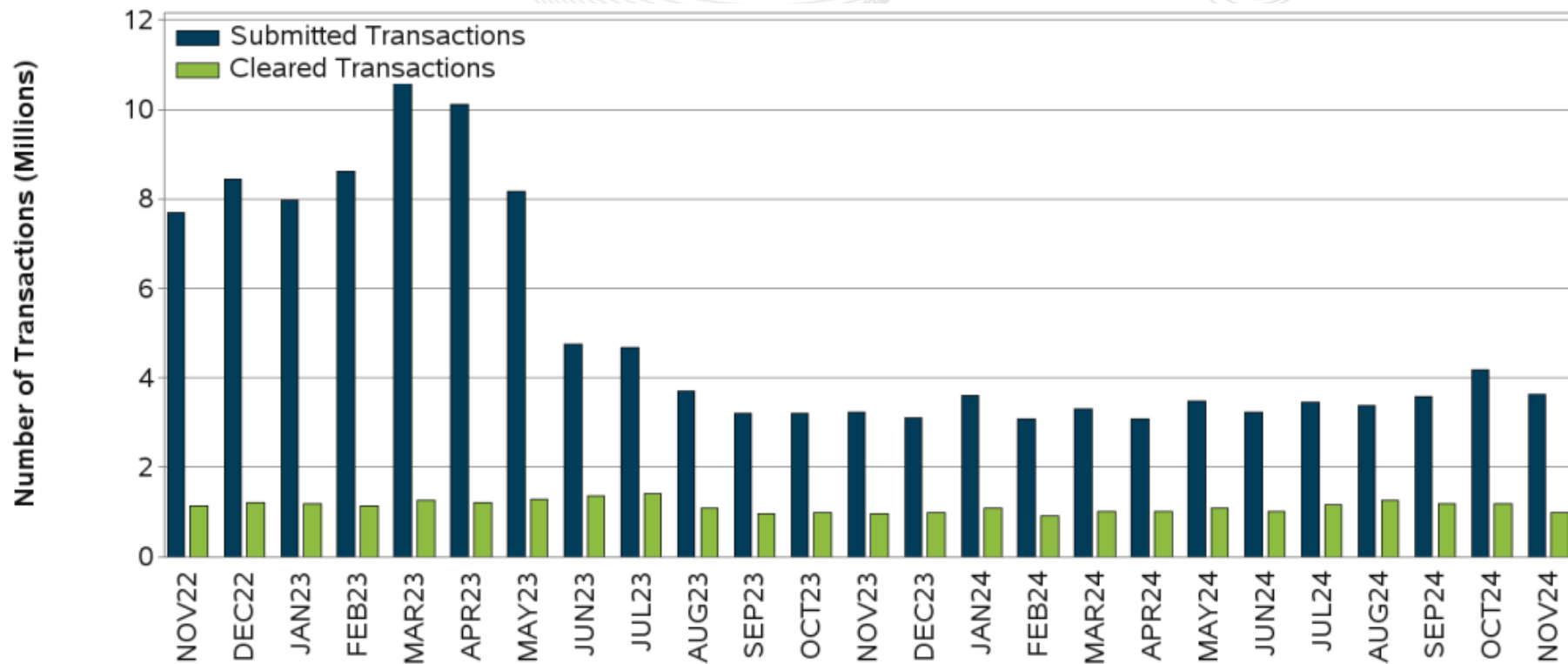
Up-To-Congestion Transactions - Total Number



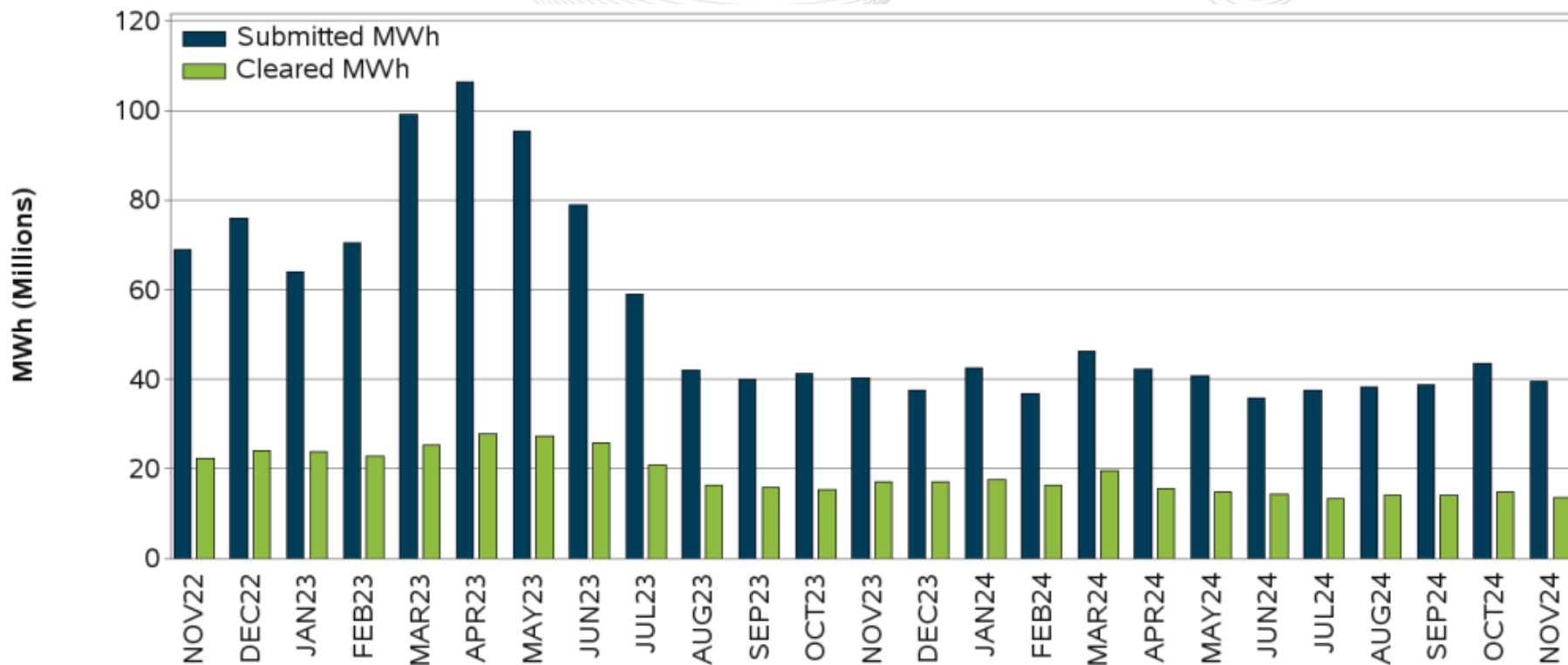
Up-To-Congestion Transactions - Total Volume



INCs, DECs and Up-To-Congestion Transactions - Total Number



INCs, DEC and Up-To-Congestion Transactions - Total Volume

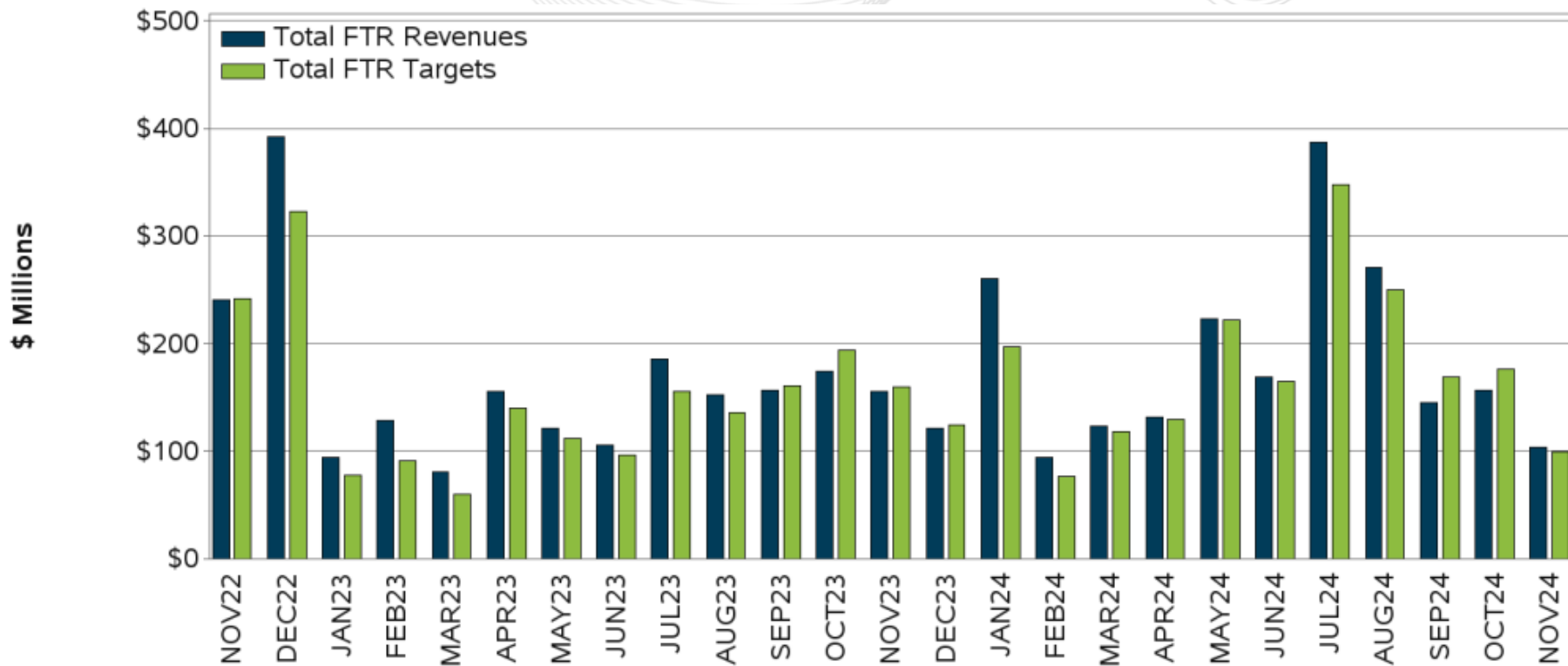


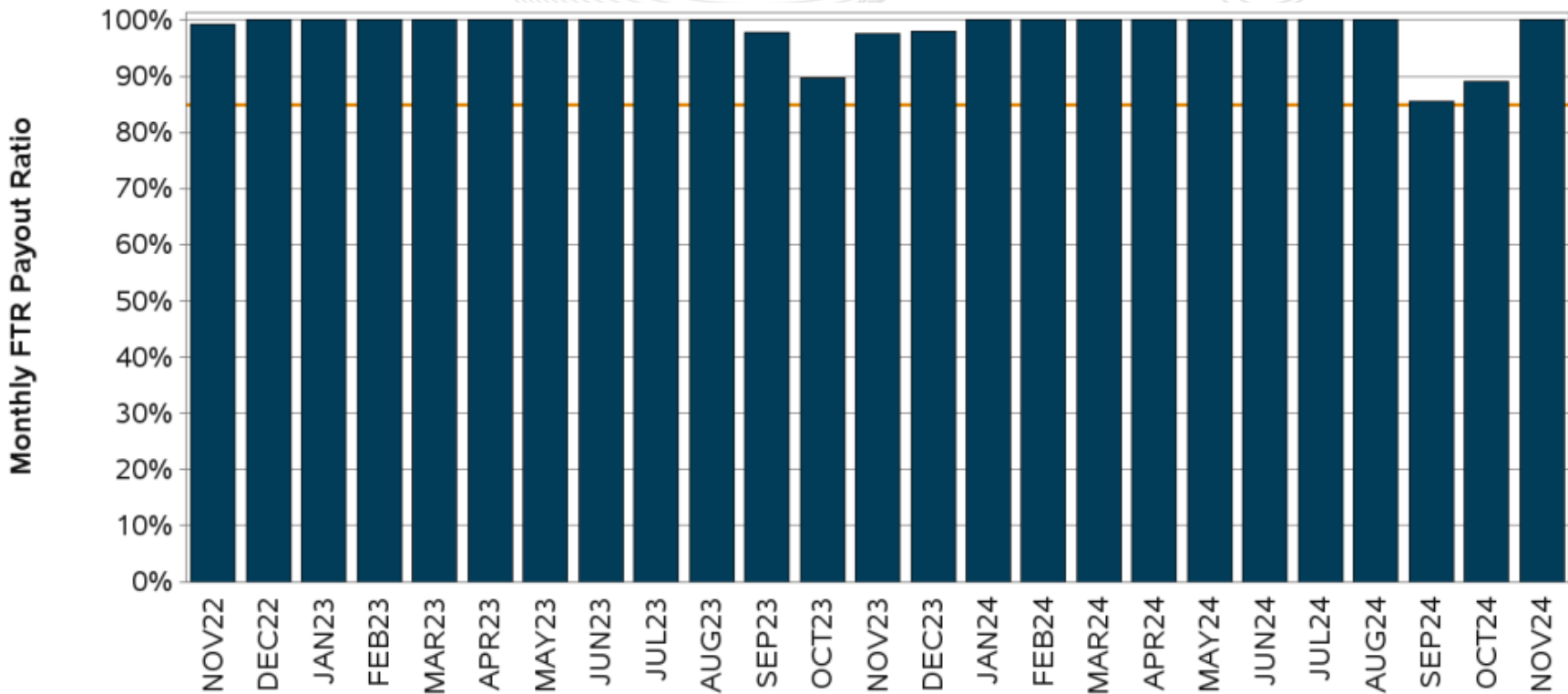
Energy Market

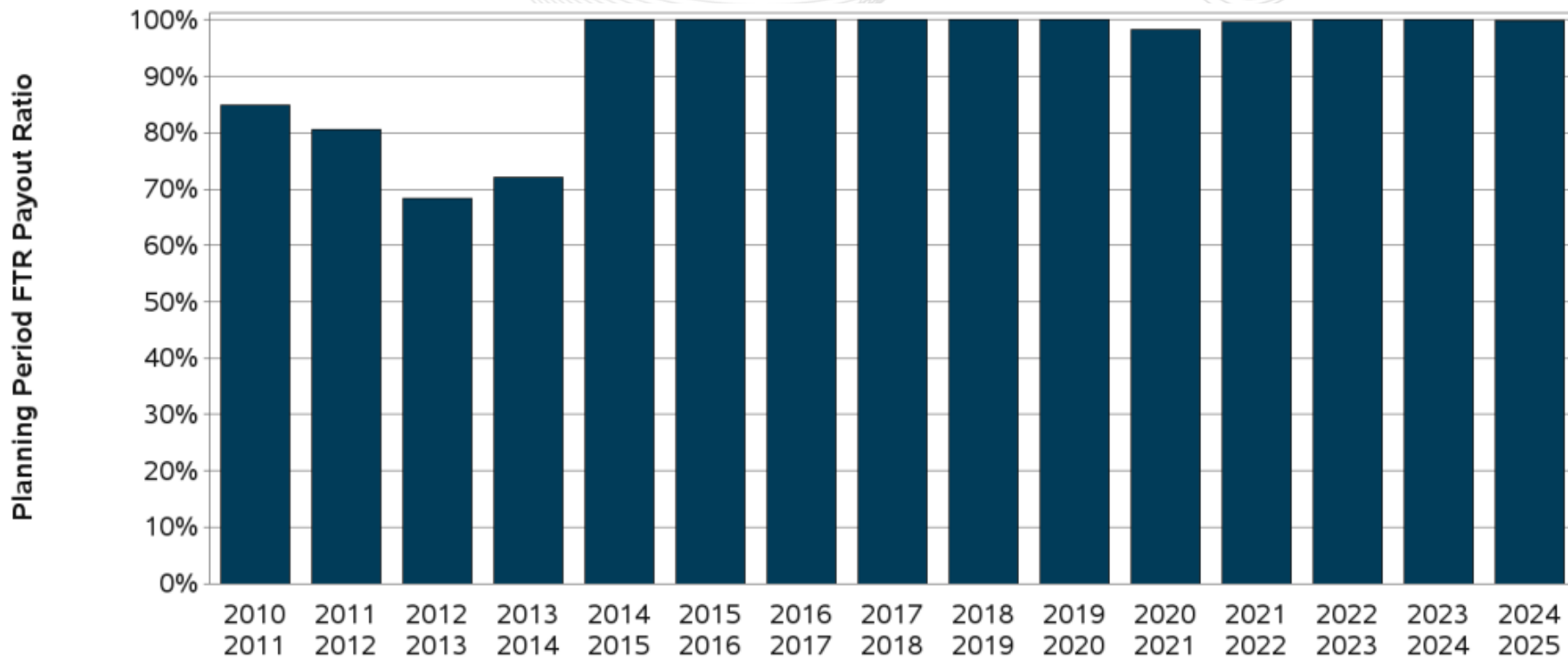
Congestion and FTR Summary

Period	Surplus / Underfunding	Payout Ratio
November 2024	\$3,835,758	100%
2024	\$117,515,695	100%
2024/2025	\$26,192,946	100%

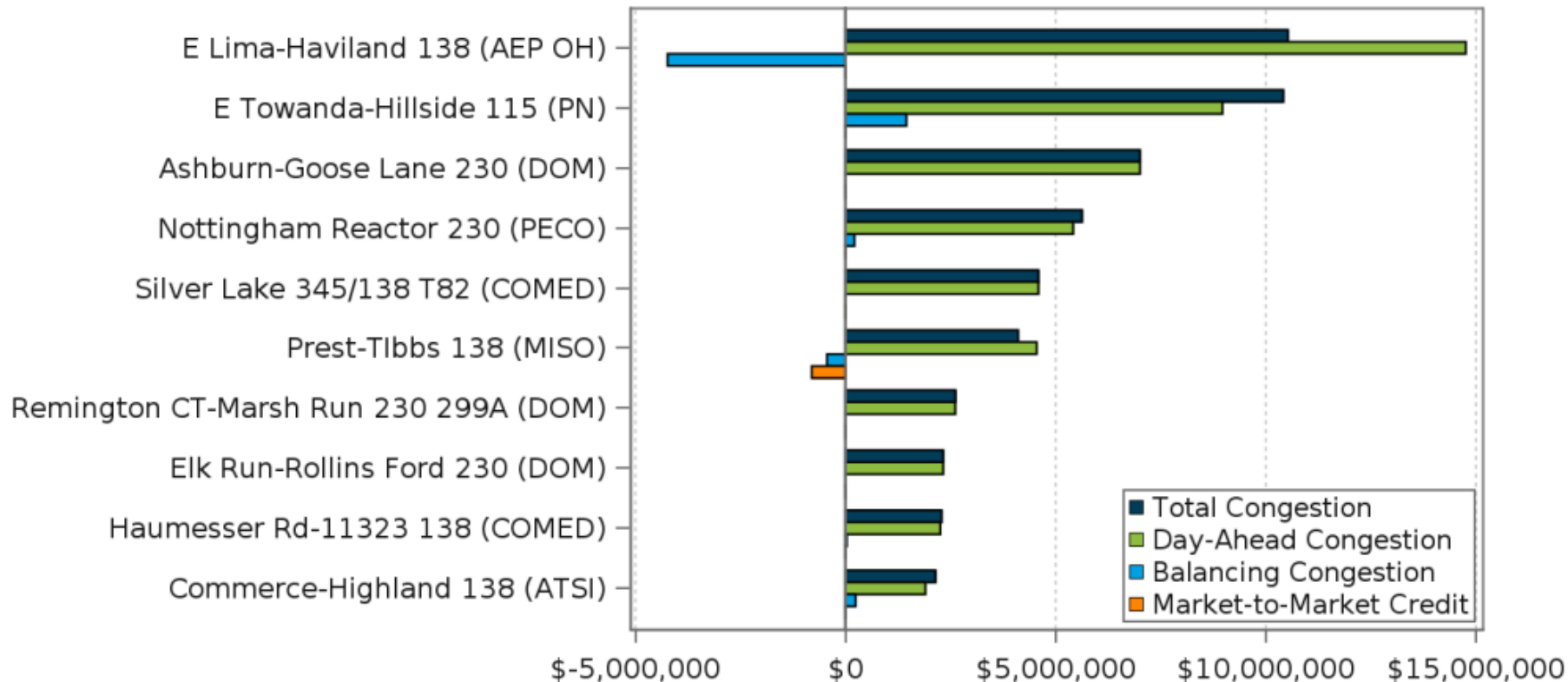
FTR Revenue vs. FTR Target Allocation





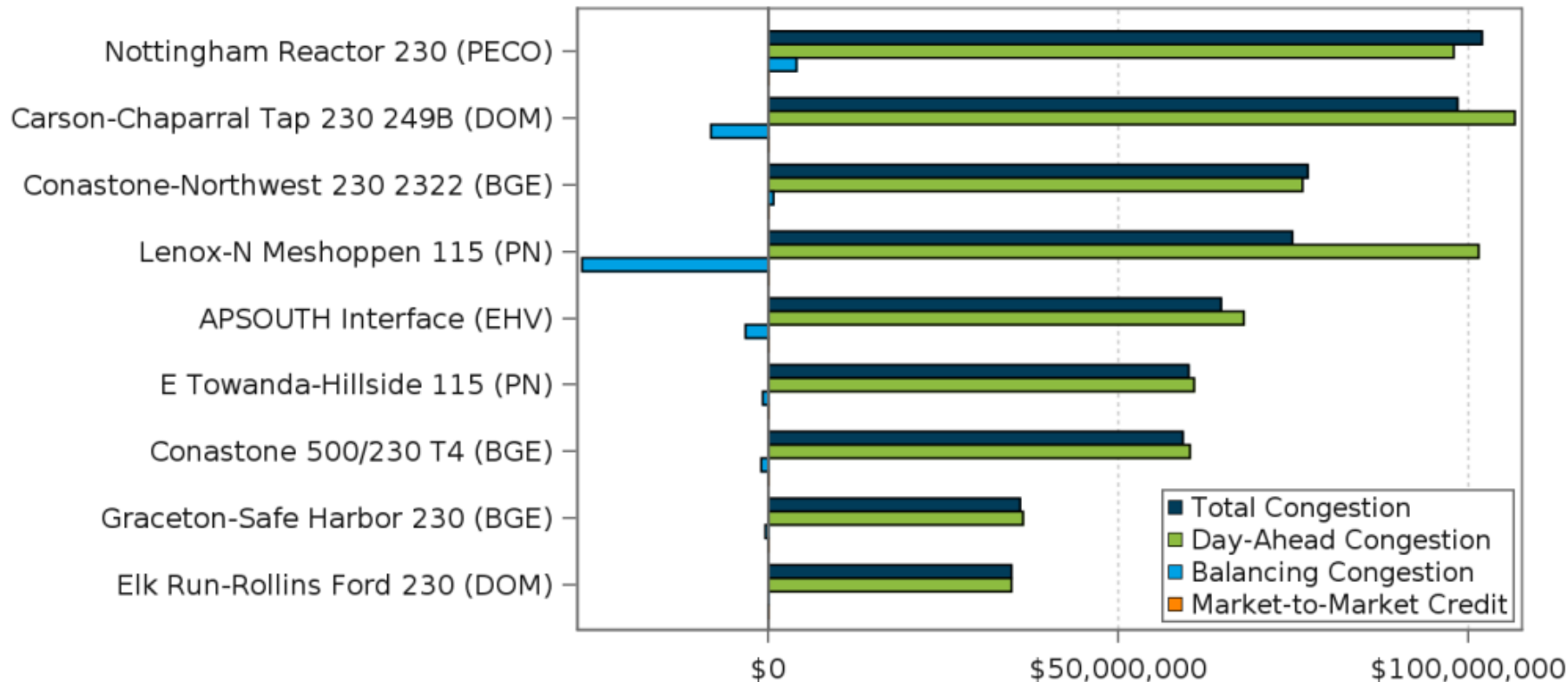


Ten Most Heavily Congested Transmission Facilities - Overall, November



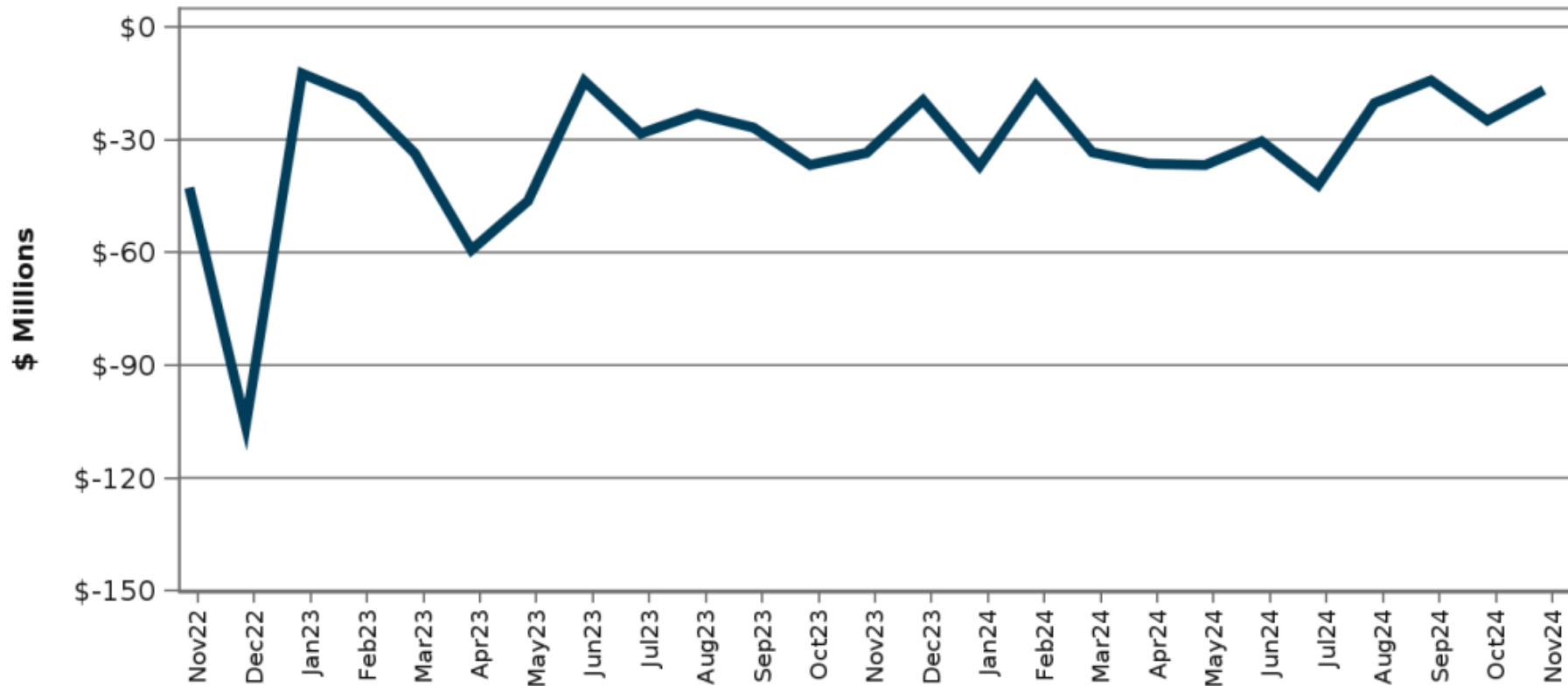
The ten most heavily congested facilities account for 75% of total congestion for November.

Ten Most Heavily Congested Transmission Facilities - Overall, 2024



The ten most heavily congested facilities account for 47% of total congestion for 2024.

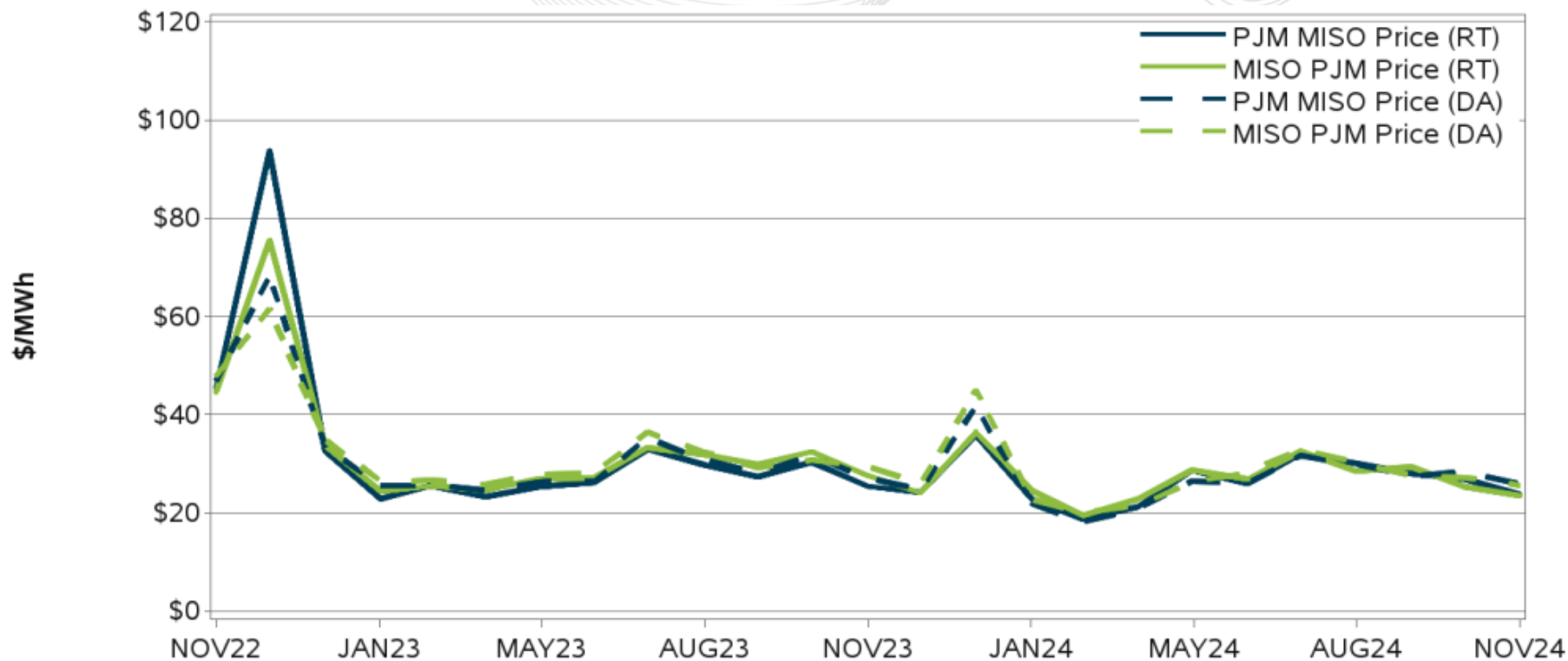
Balancing Congestion Charge Revenues (BLI 2215)

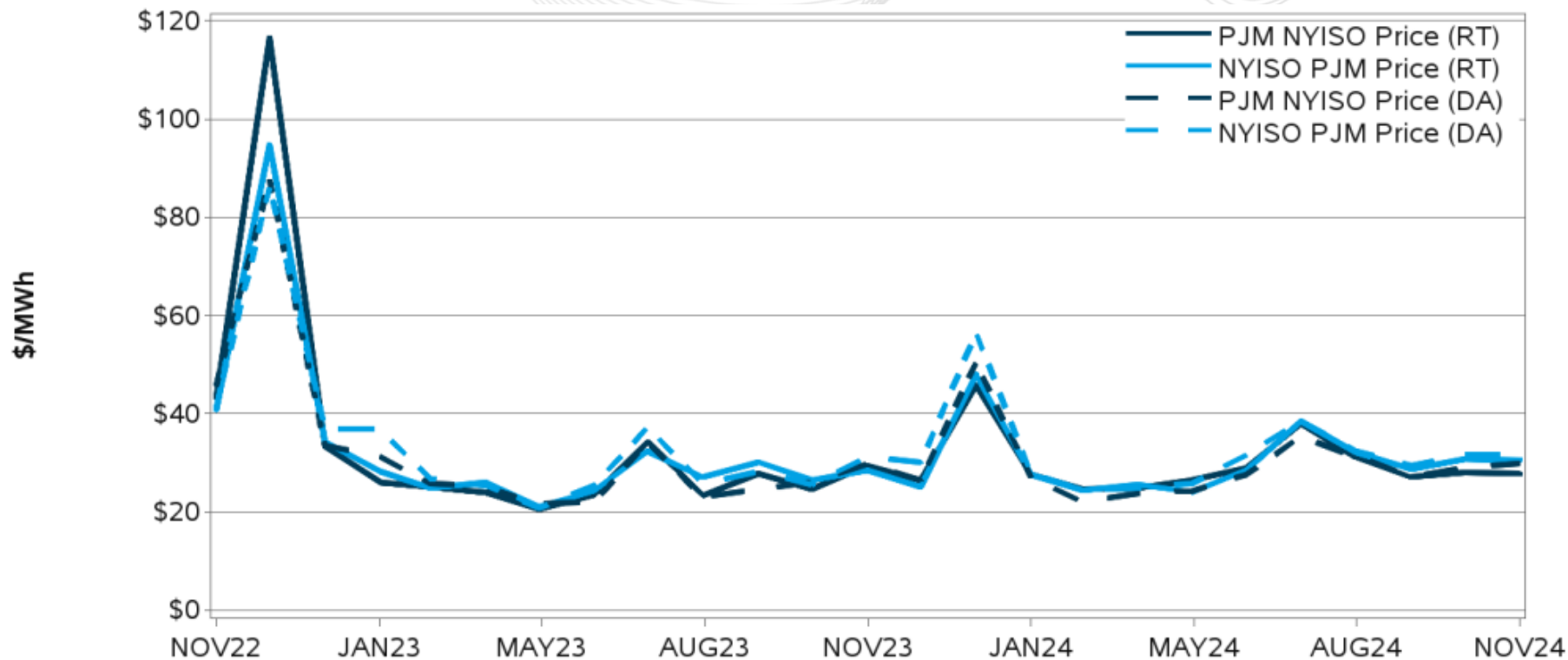


Energy Market

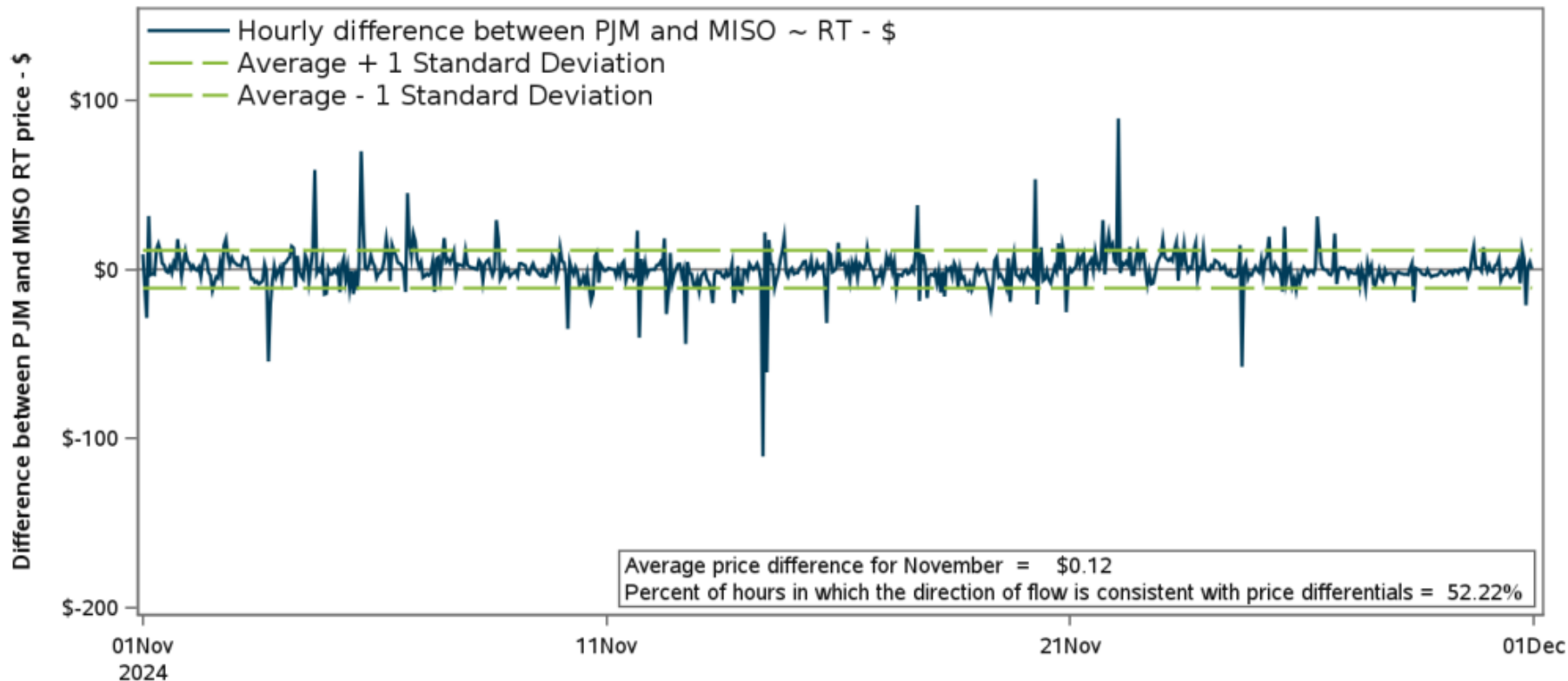
Interchange/Seams Summary

Monthly Average MISO Interface Pricing



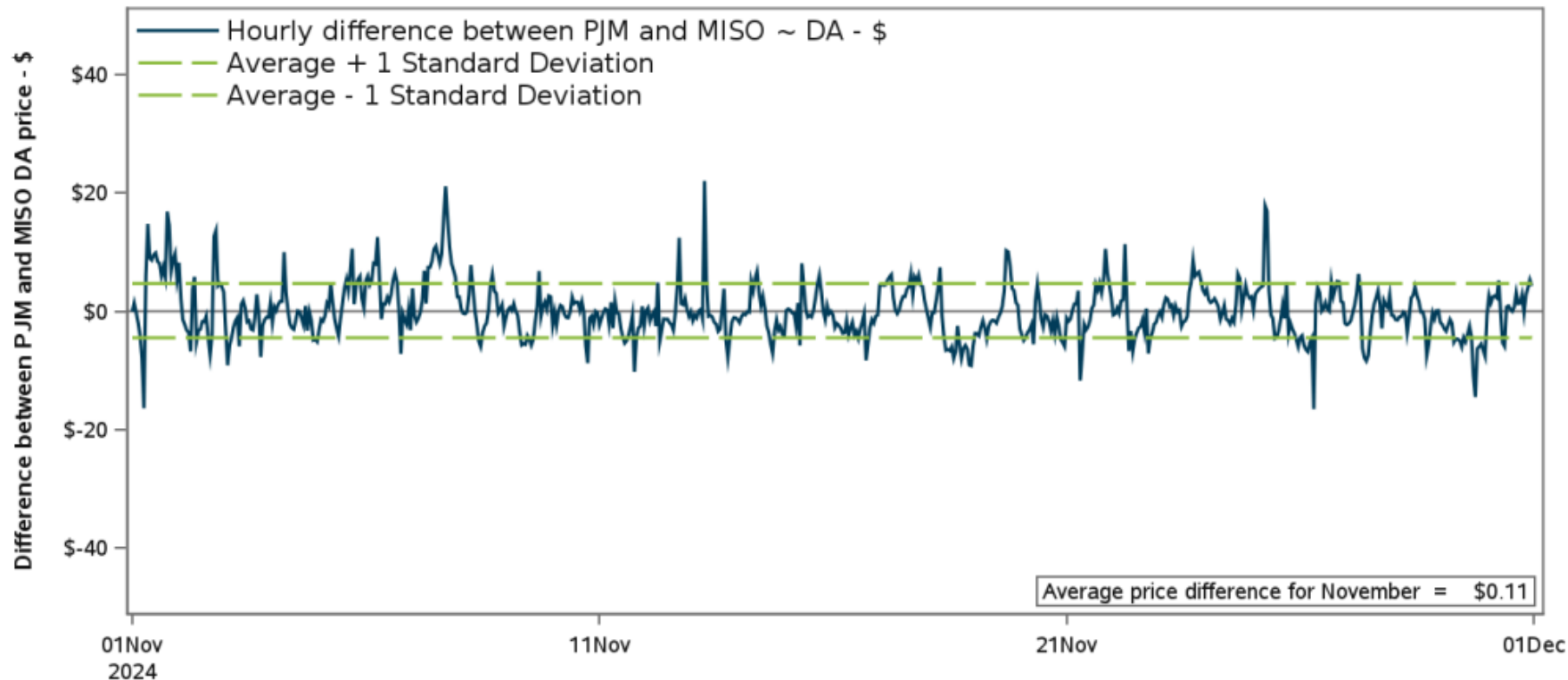


Hourly Difference Between PJM and MISO Real-Time Prices



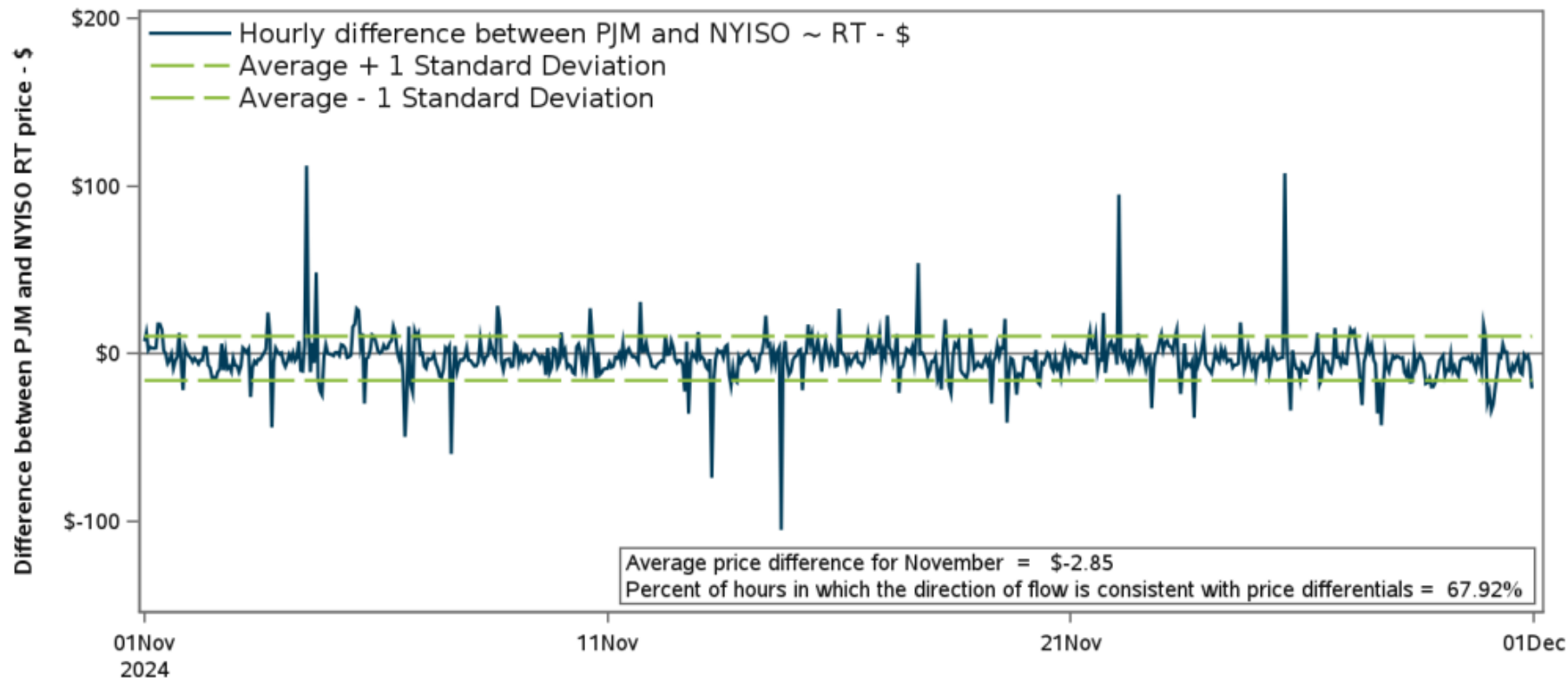
Positive values represent hours when the PJM price was higher. Negative values represent hours when the PJM price was lower.

Hourly Difference Between PJM and MISO Day-Ahead Prices



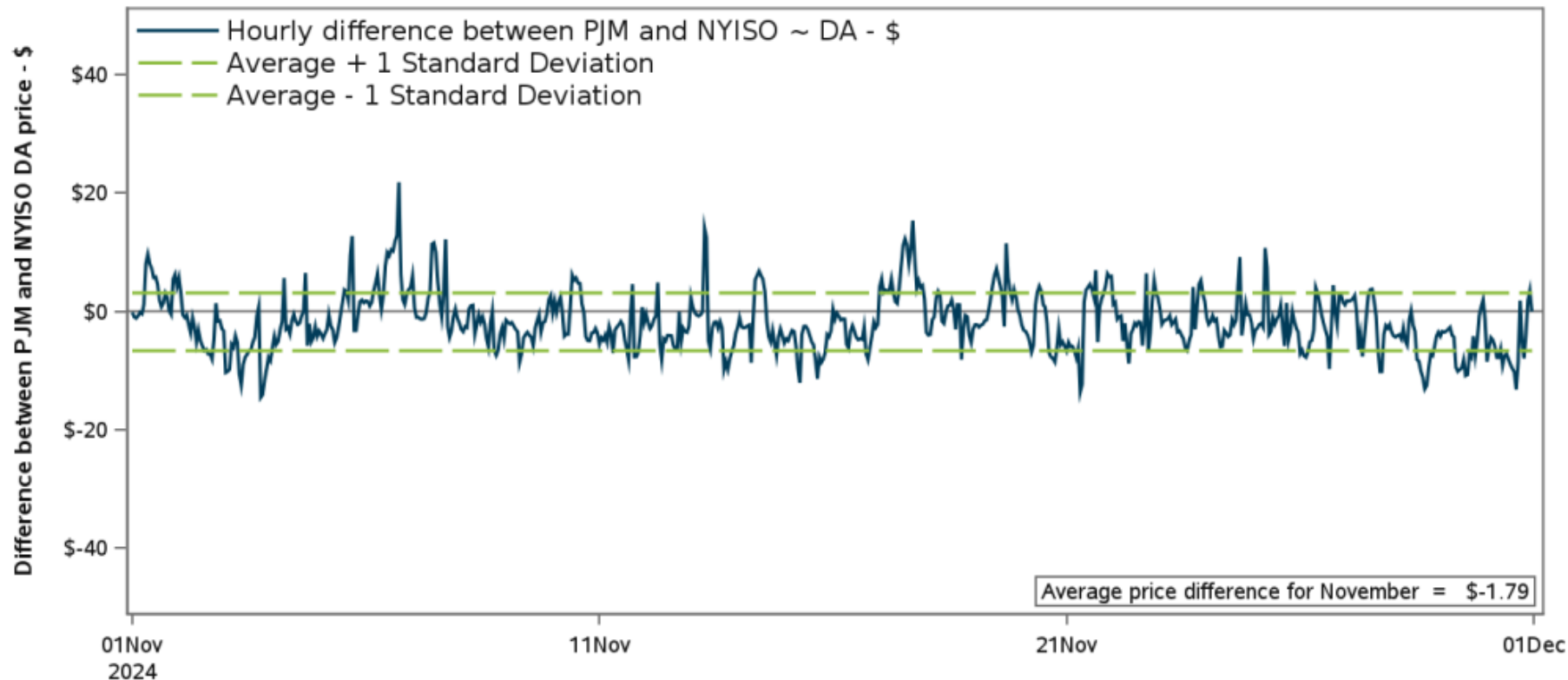
Positive values represent hours when the PJM price was higher. Negative values represent hours when the PJM price was lower.

Hourly Difference Between PJM and NYISO Real-Time Prices



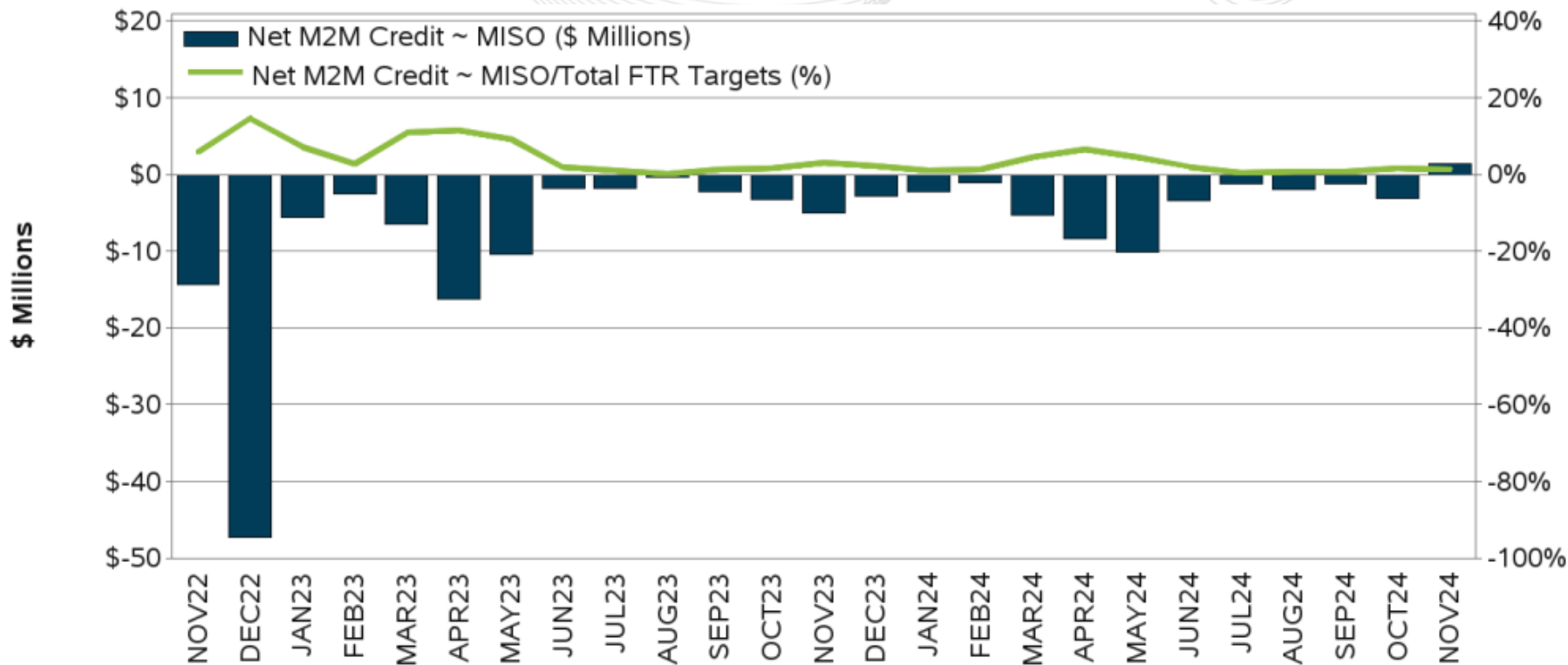
Positive values represent hours when the PJM price was higher. Negative values represent hours when the PJM price was lower.

Hourly Difference Between PJM and NYISO Day-Ahead Prices



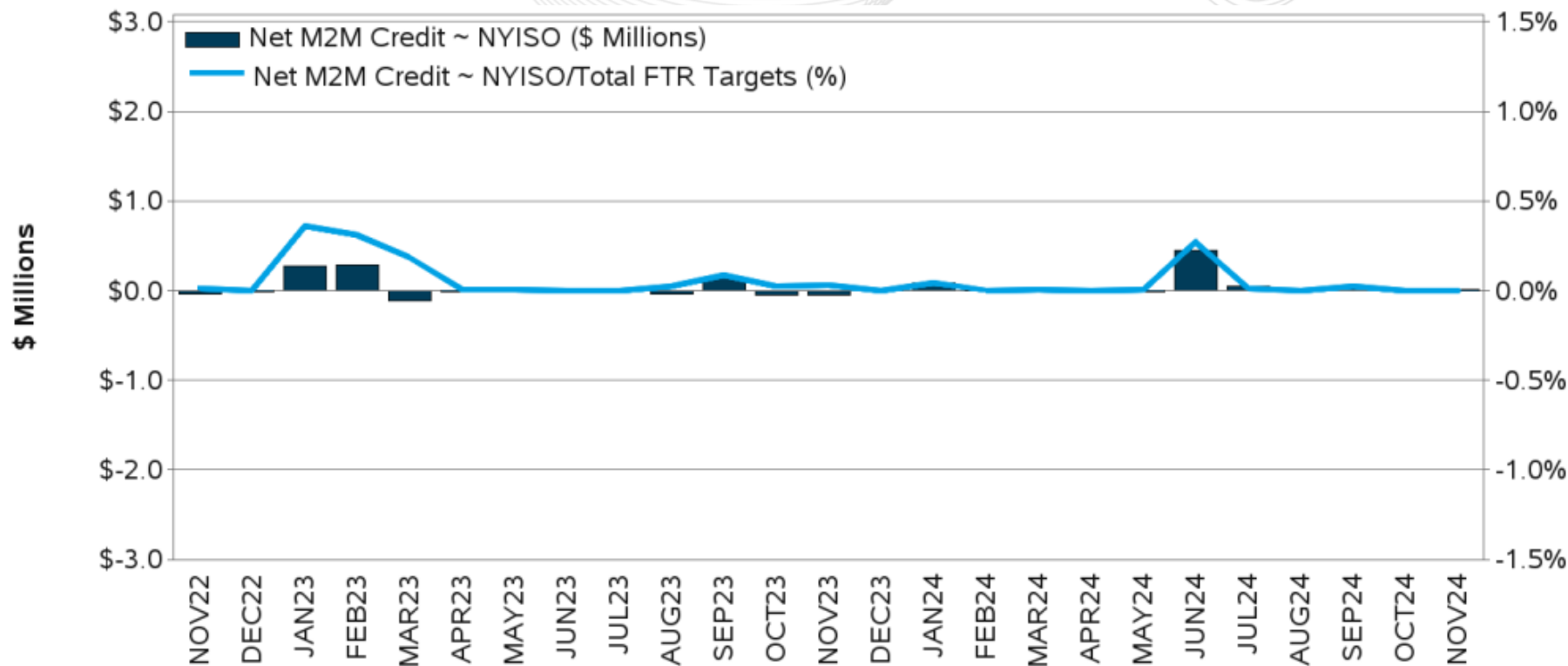
Positive values represent hours when the PJM price was higher. Negative values represent hours when the PJM price was lower.

PJM-MISO Market-to-Market Coordination Settlement



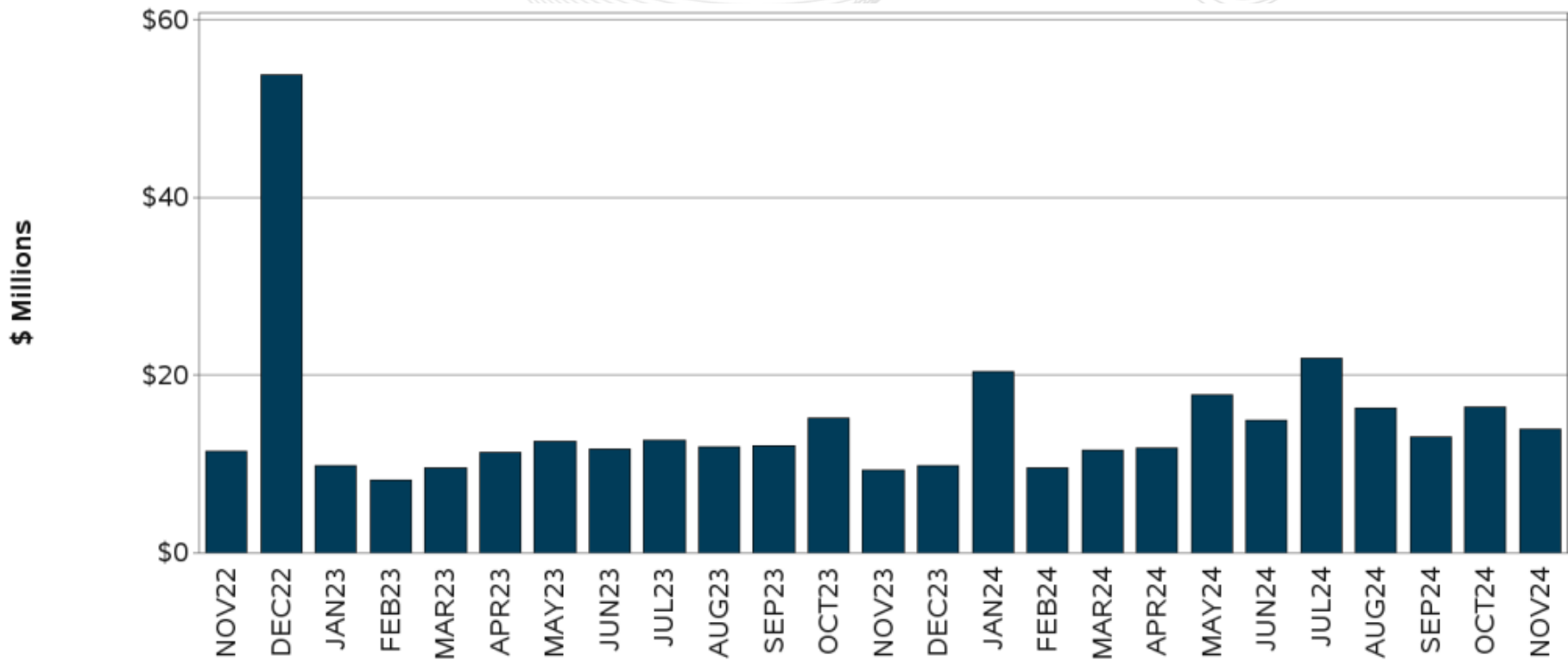
Negative M2M Credit represents PJM payment to MISO

PJM-NYISO Market-to-Market Coordination Settlement

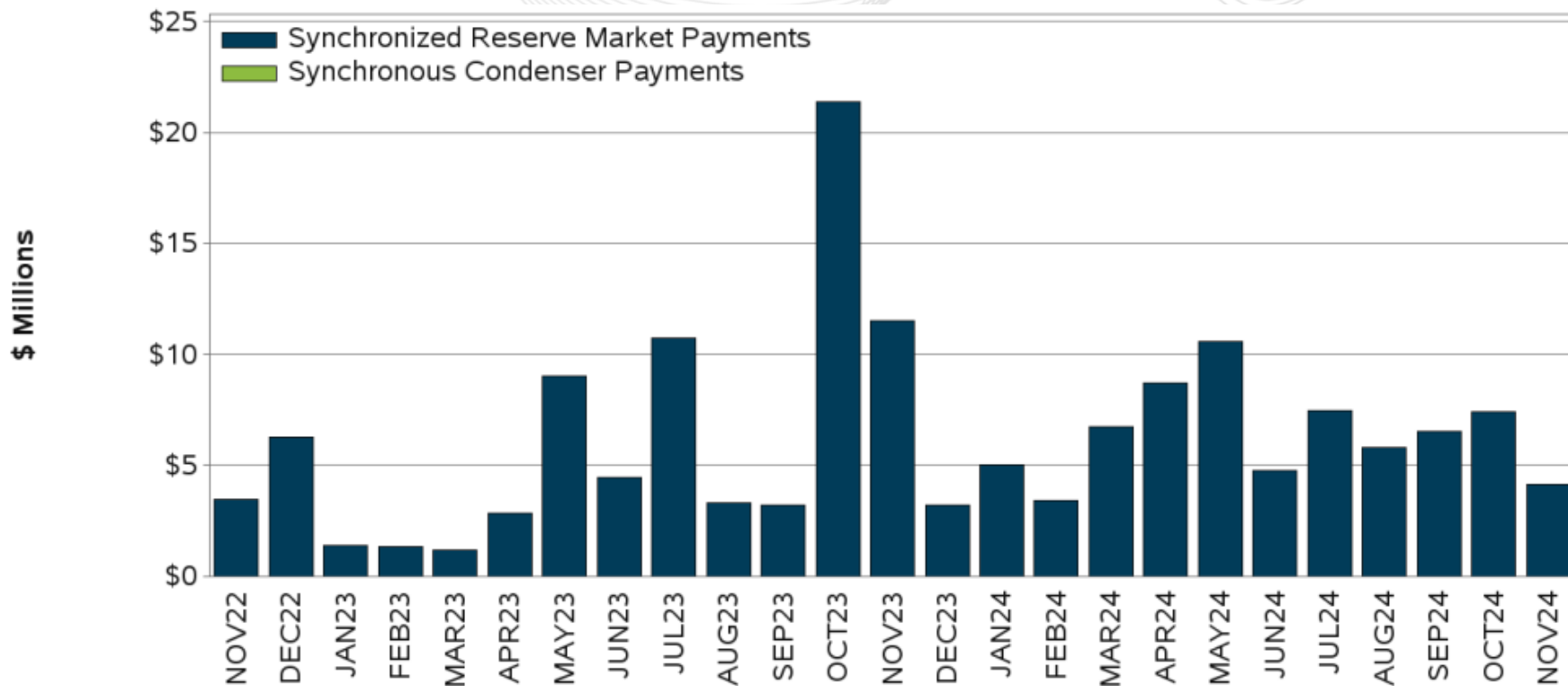


Negative M2M Credit represents PJM payment to NYISO

Ancillary Service Market Summary

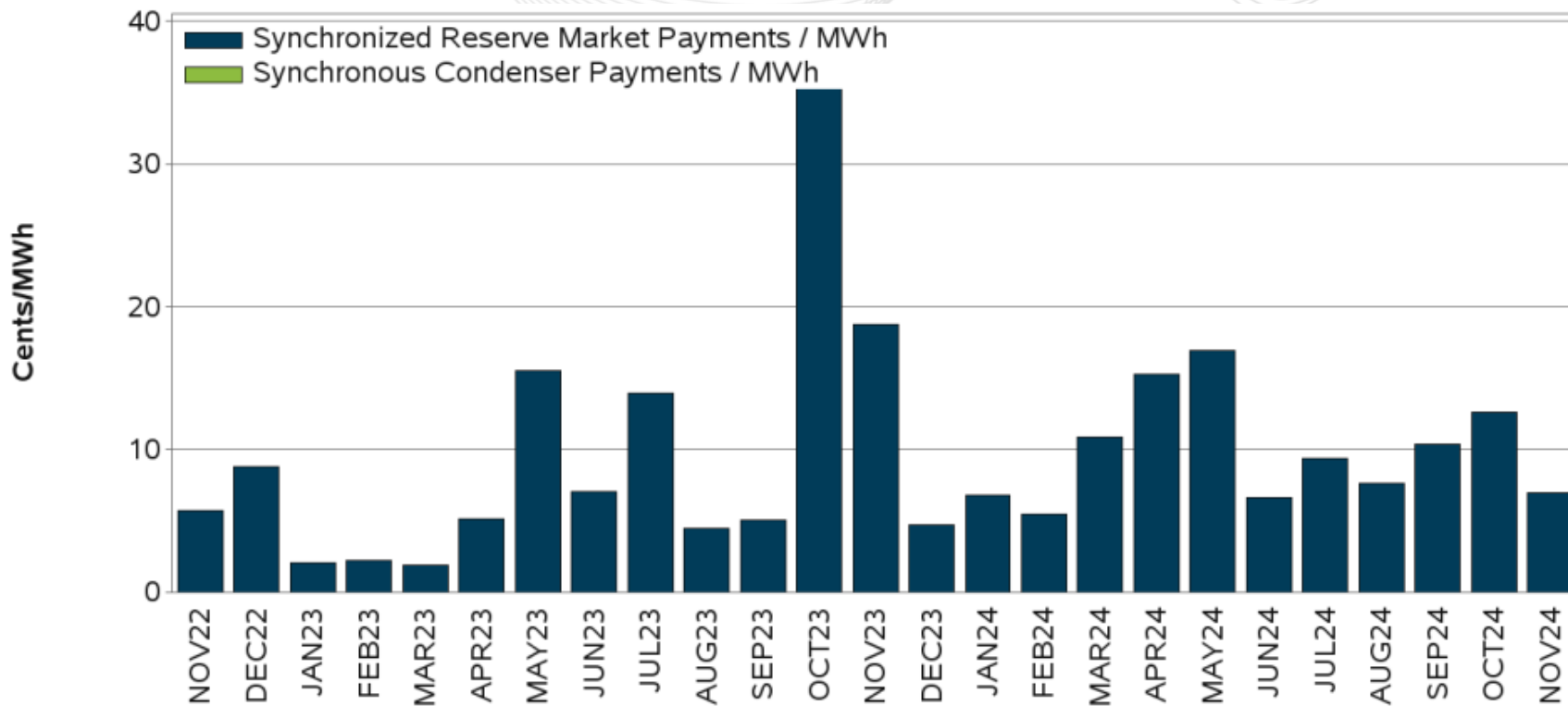


Synchronized Reserve and Synchronous Condenser Costs

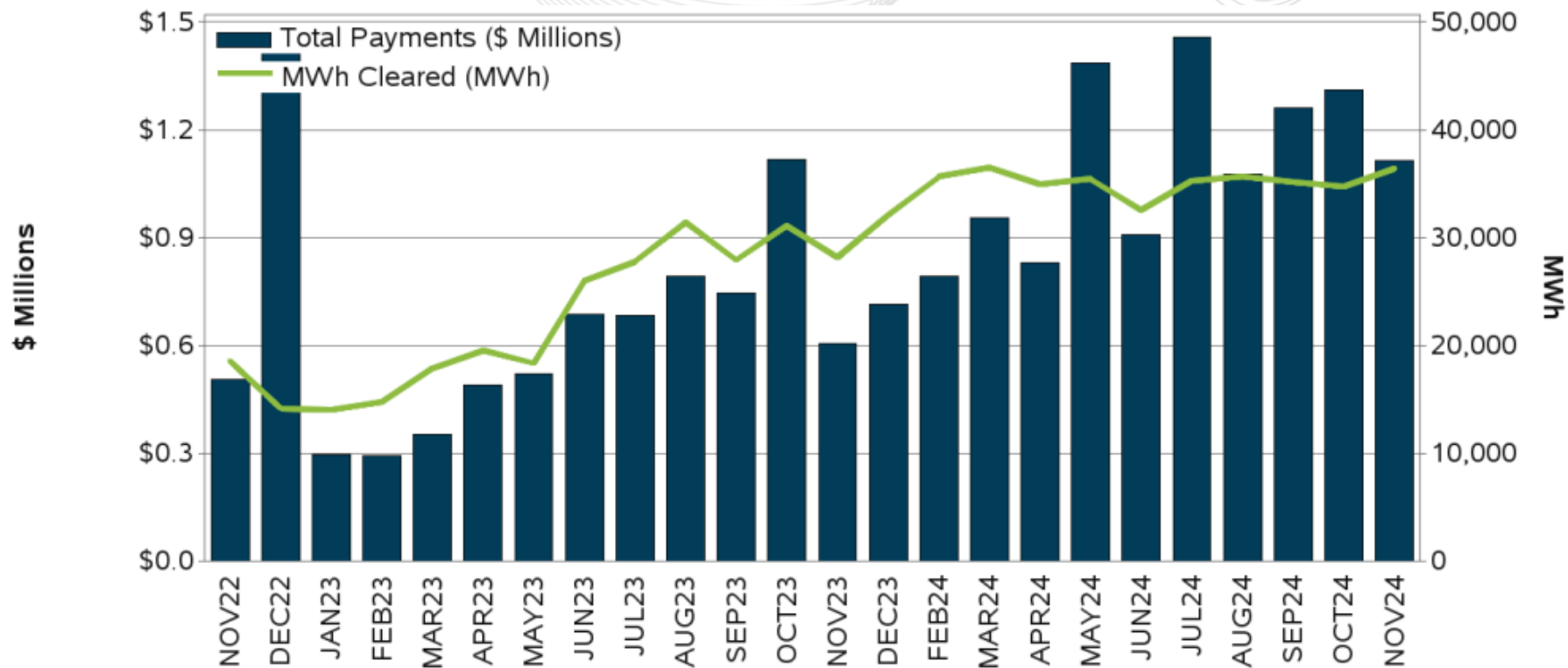




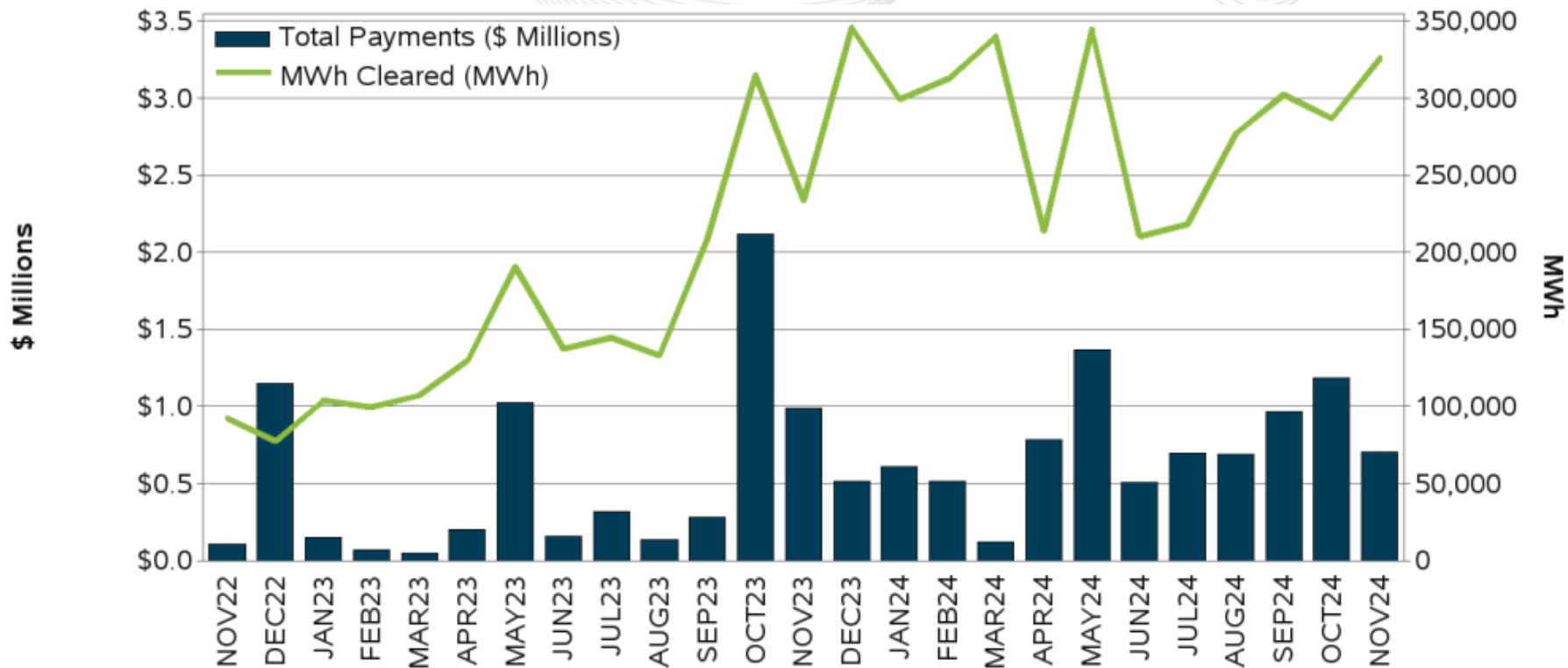
Load-Adjusted Synchronized Reserve and Synchronous Condenser Costs



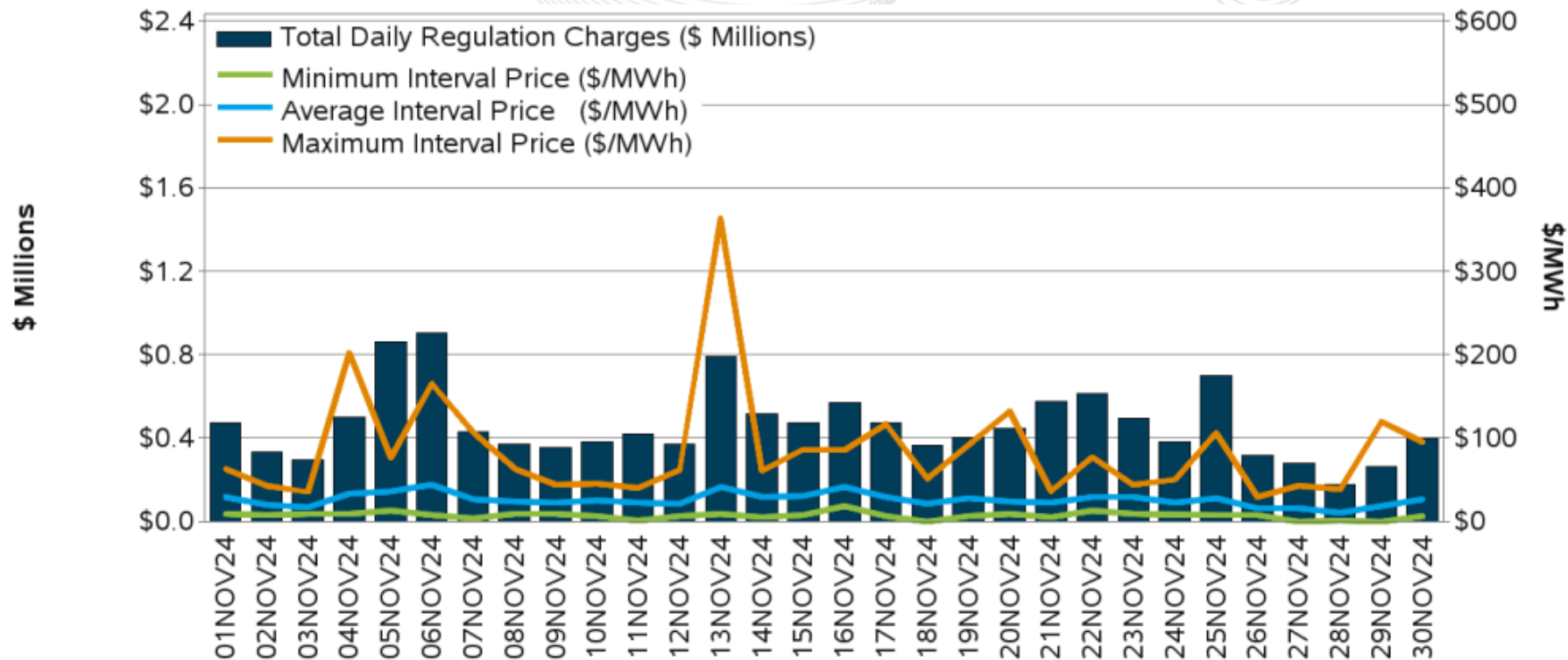
DR Participation in PJM Regulation Markets



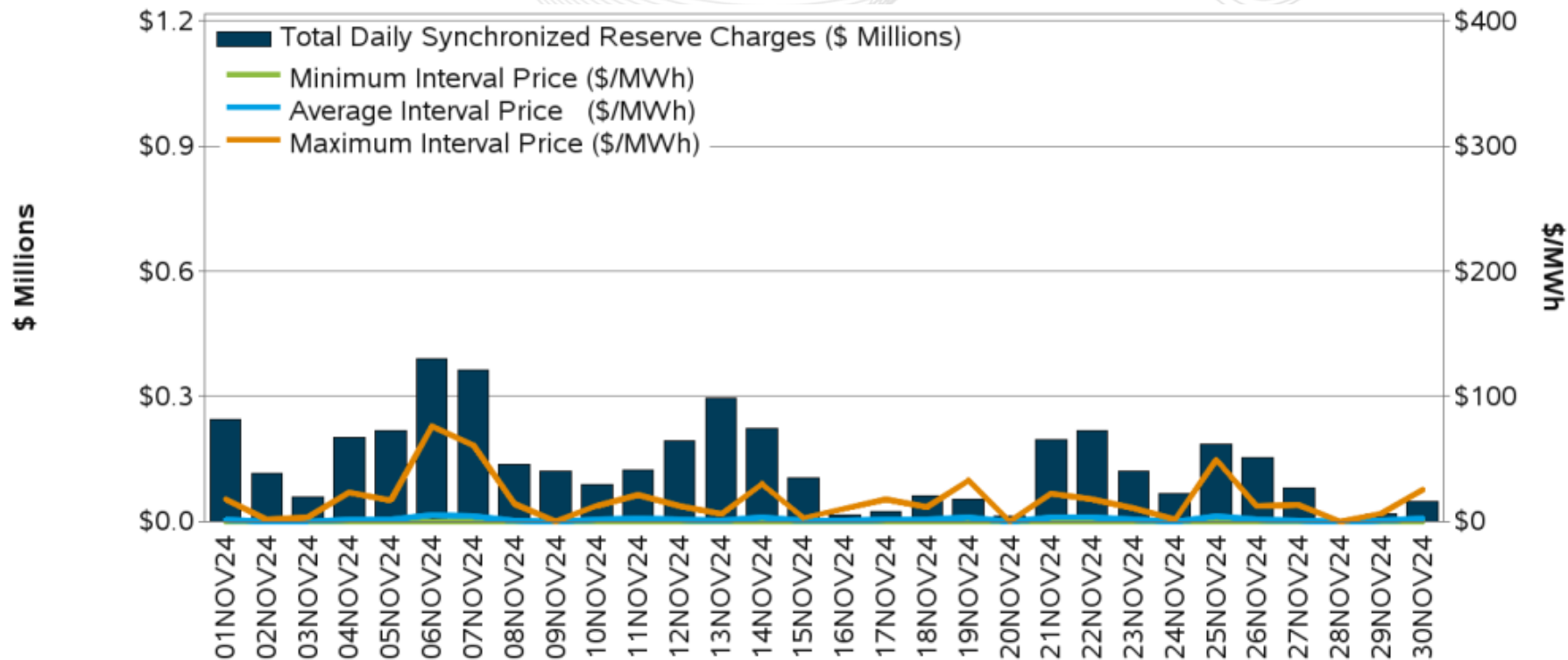
DR Participation in PJM Synchronized Reserve Markets



Regulation Market Daily Prices and Charges



Synchronized Reserve Market Daily Prices and Charges



Jennifer Warner-Freeman
Jennifer.Freeman@pjm.com

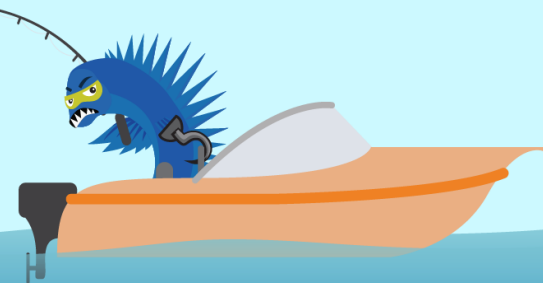


Member Hotline
(610) 666 – 8980
(866) 400 – 8980
custsvc@pjm.com

PROTECT THE POWER GRID THINK BEFORE YOU CLICK!



BE ALERT TO
MALICIOUS PHISHING
EMAILS



Report suspicious email activity to PJM.
Call (610) 666-2244 or email it_ops_ctr_shift@pjm.com