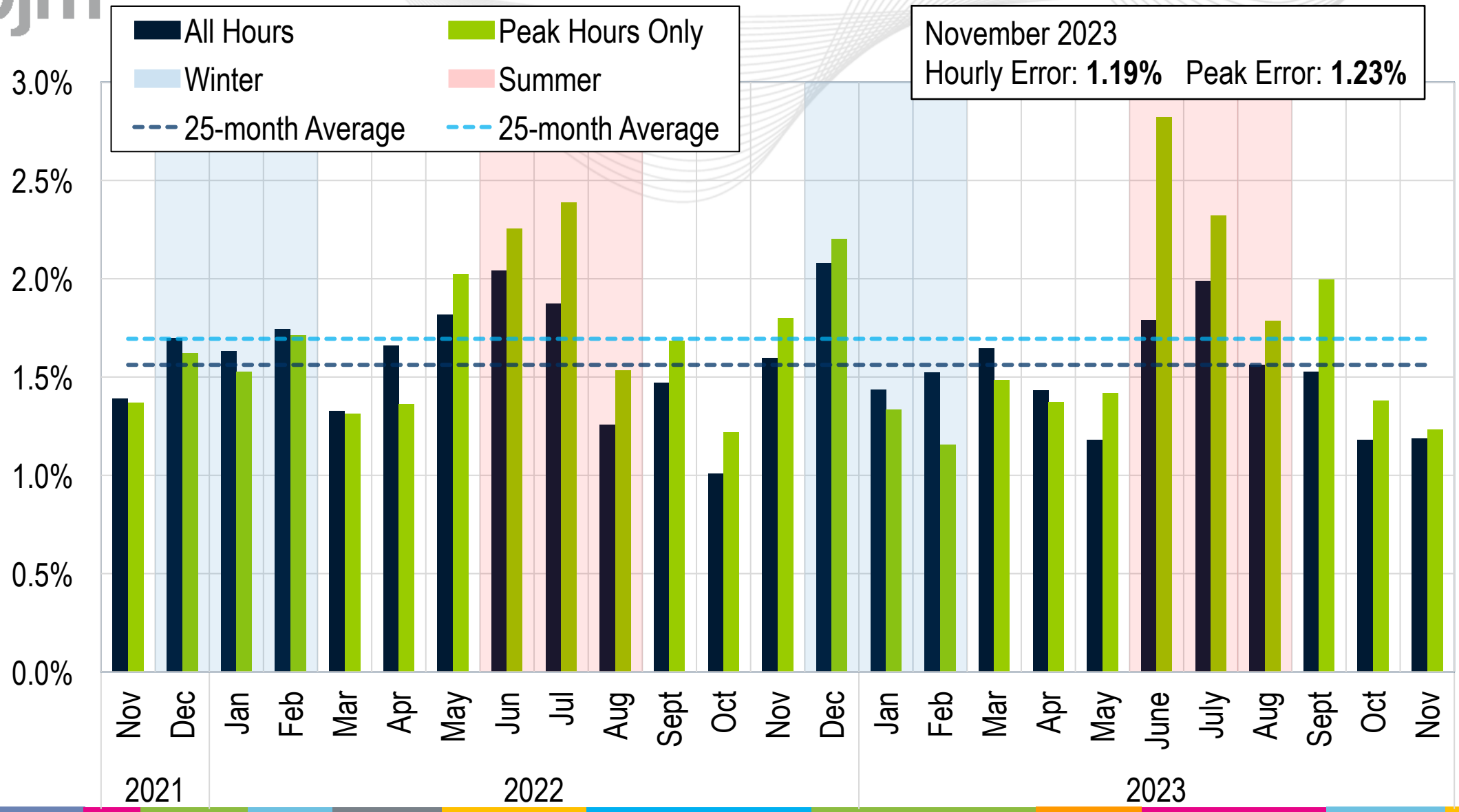
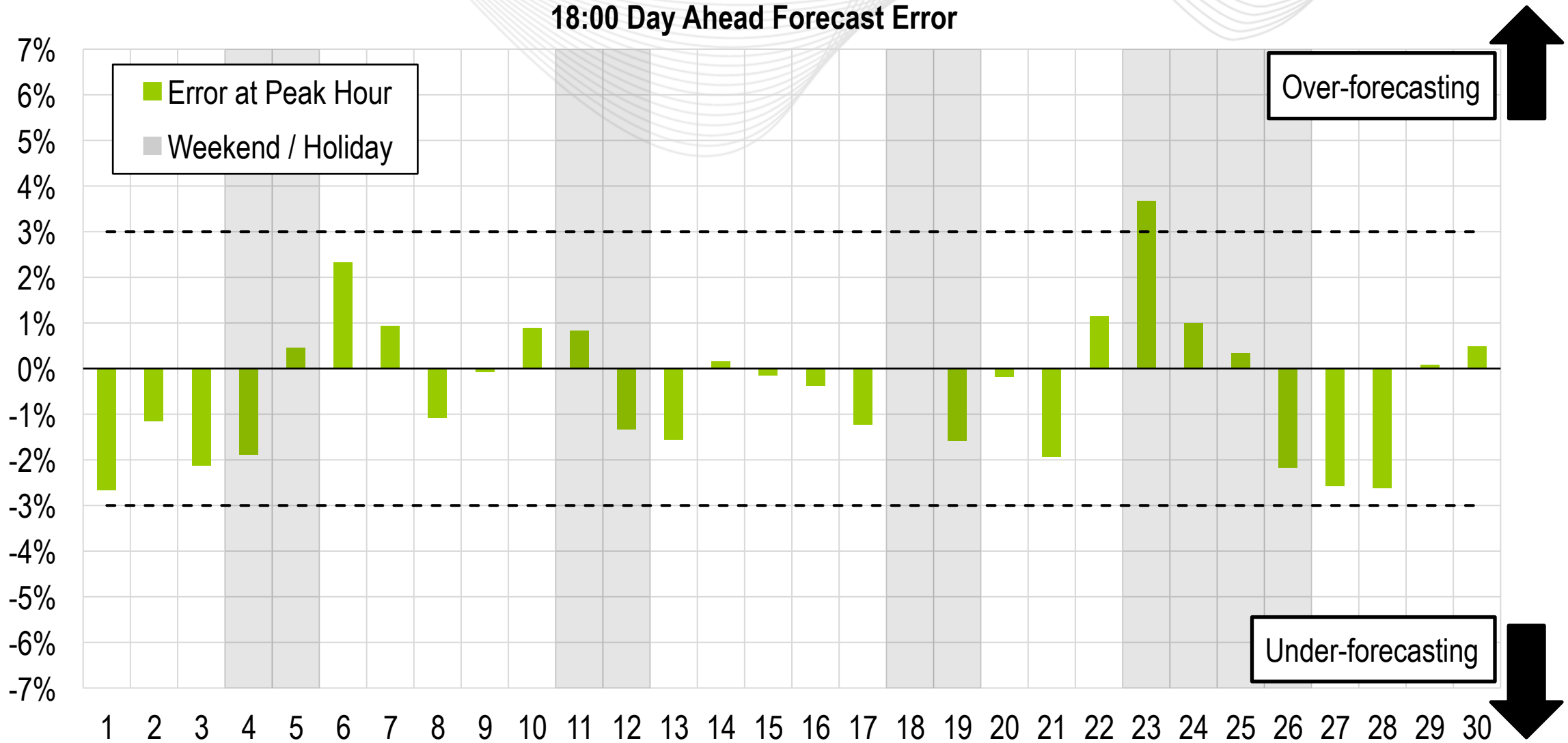
System Operations Report

Stephanie Schwarz
Manager, Markets Coordination
Operating Committee
December 7, 2023

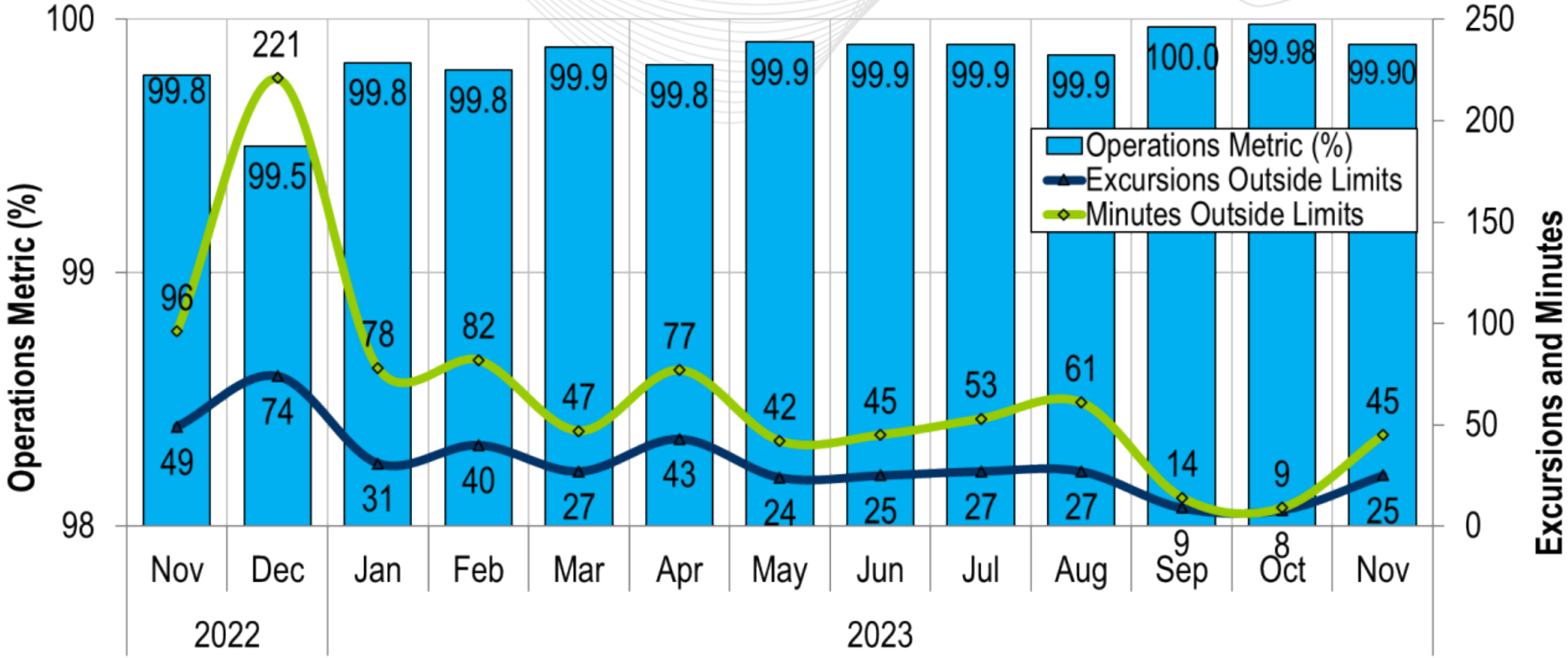
Average Load Forecast Error



Daily Peak Forecast Error (November)



Monthly BAAL Performance Score



PJM's BAAL performance has exceeded the goal of 99% for each month in 2022 and 2023.

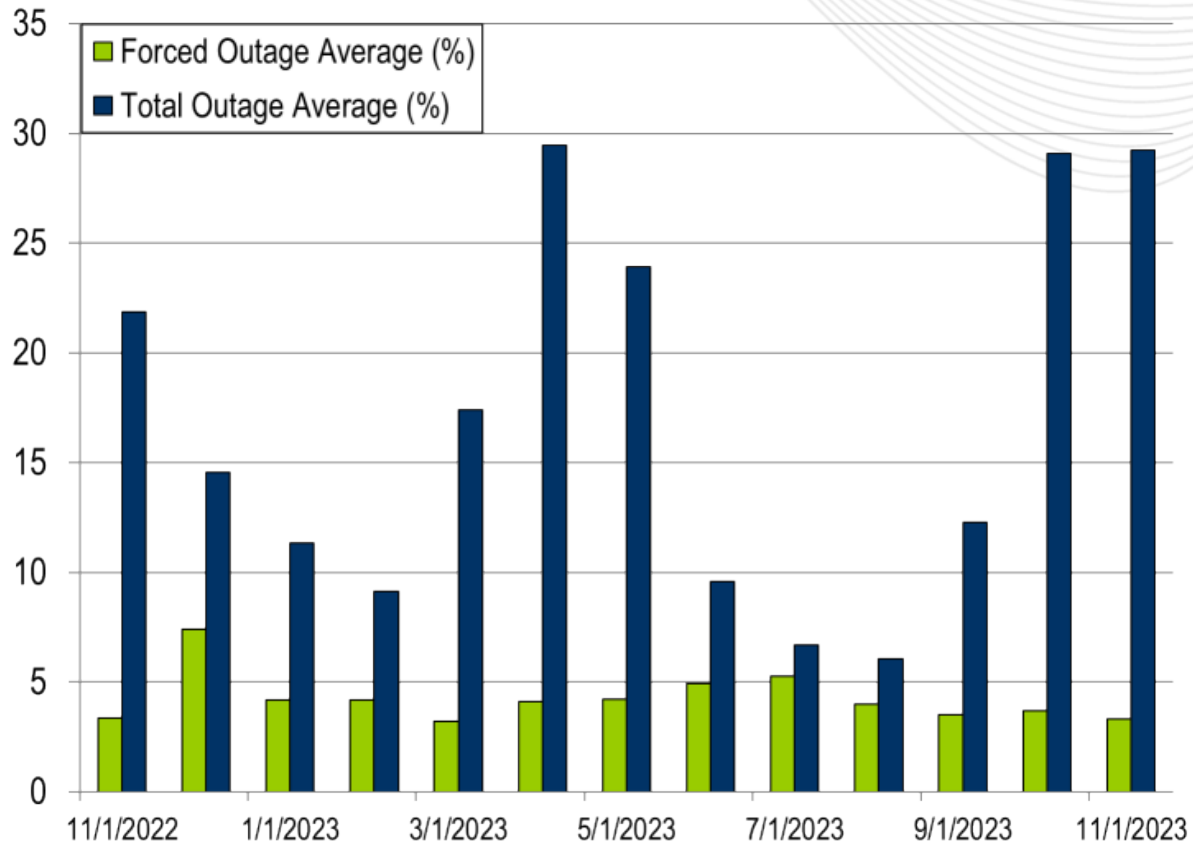
Operational Summary (November)

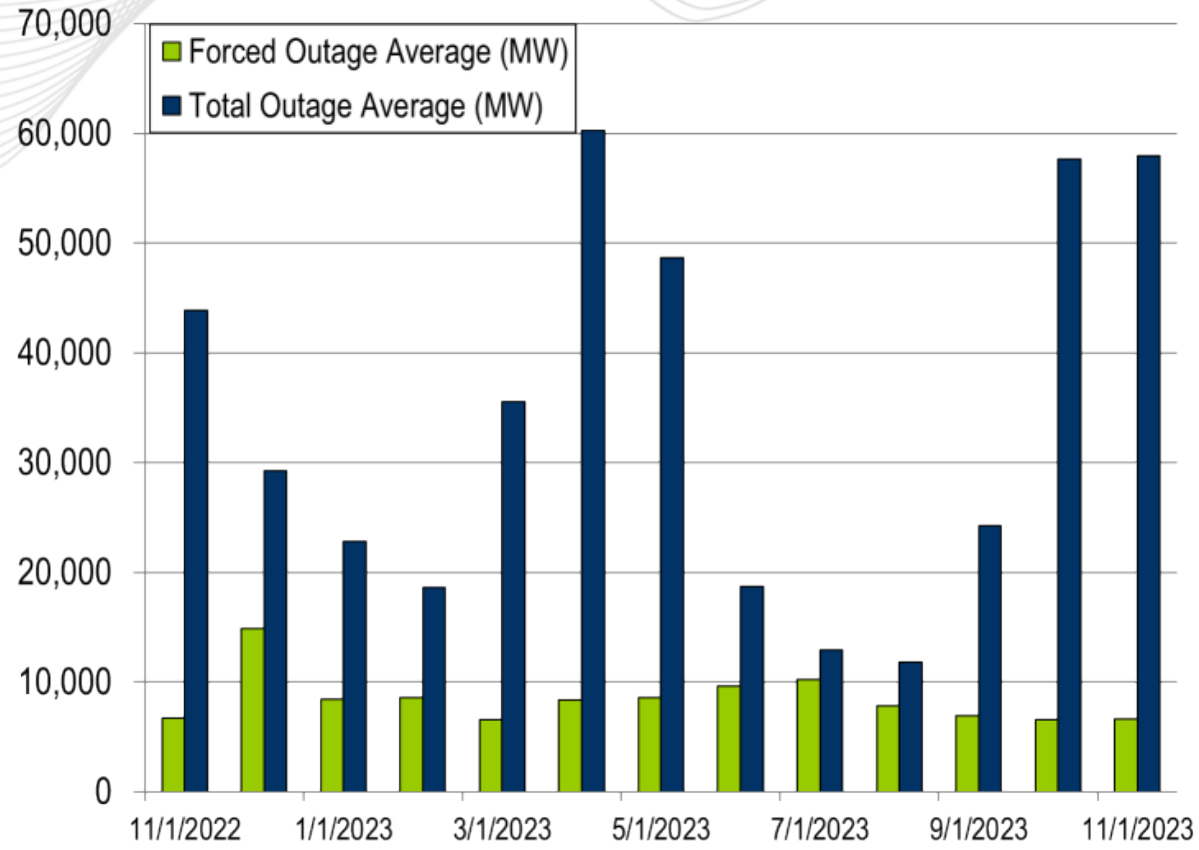
- 1 Shared Reserve event
- 2 Spin Events
- The following Emergency Procedures occurred:
  - 1 Geomagnetic Disturbance Warning
  - 2 High System Voltage Actions
  - 25 Post Contingency Local Load Relief Warnings (PCLLRWs)

Shortage Case Approvals

- No Shortage Case Approvals for the month of November 2023

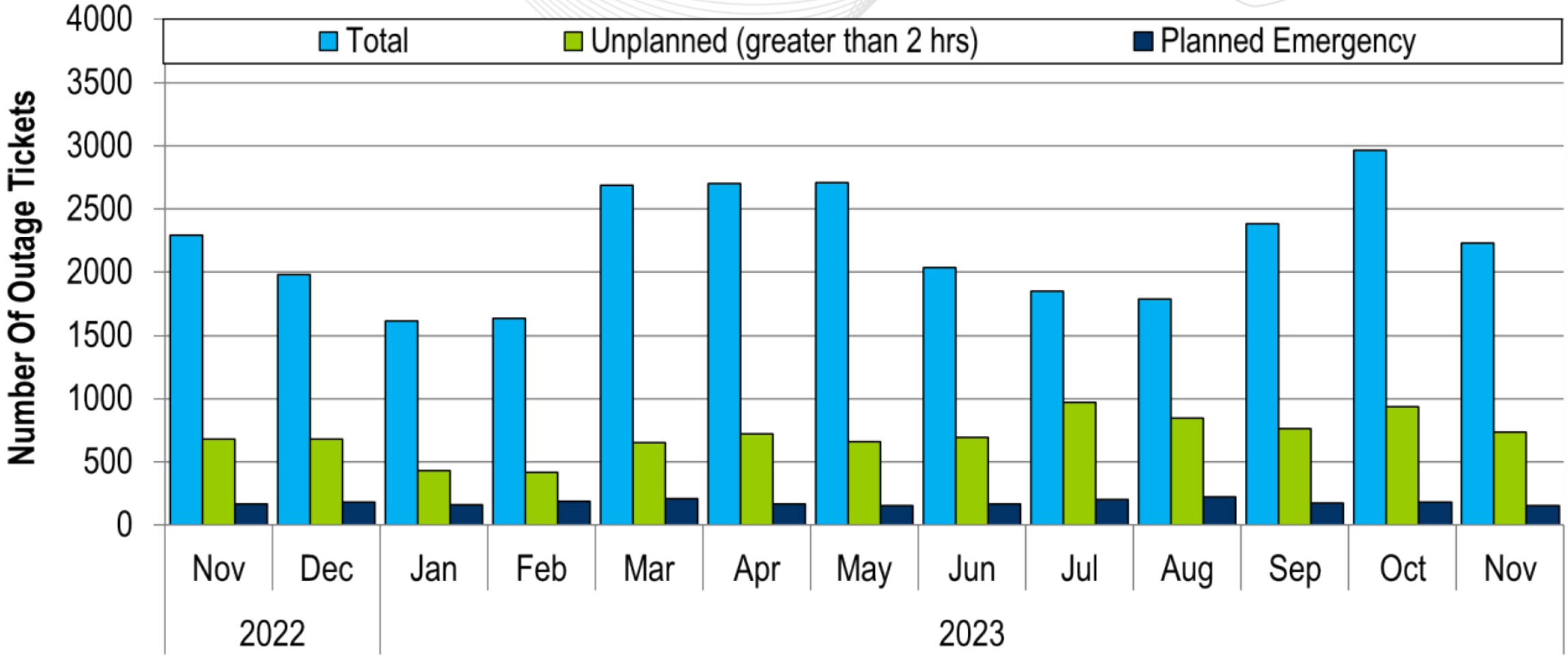
RTO Generation Outage Rate - Monthly





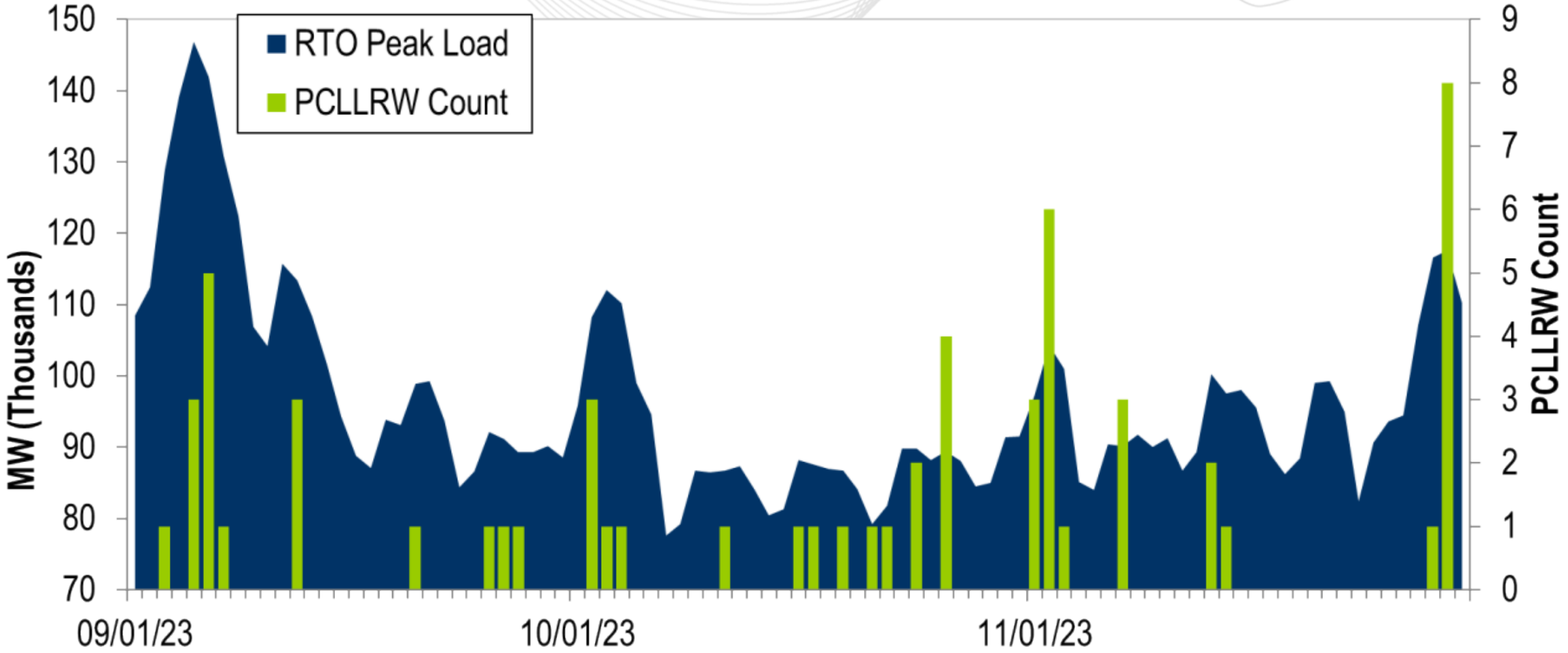
The 13-month average forced outage rate is 4.27% or 8,524 MW.
The 13-month average total outage rate is 16.30% or 32,702 MW.

2022-2023 Planned Emergency, Unplanned, and Total Outages by Ticket



Note: “Unplanned Outages" include tripped facilities. One tripping event may involve multiple facilities.

PCLLRW Count Vs. Peak Load – Daily Values For 3 Months



Spin Response

Event	Date	Start Time	End Time	Duration	Region	Assigned (MW)	Response (MW)	Penalty (MW)
1	11/07/23	16:19:01	16:24:23	00:05:22	RTO	2086.7	2086.7	0.0
2	11/10/23	01:21:36	01:29:40	00:08:04	RTO	1954.1	1954.1	0.0

Operational Flexibility Metrics

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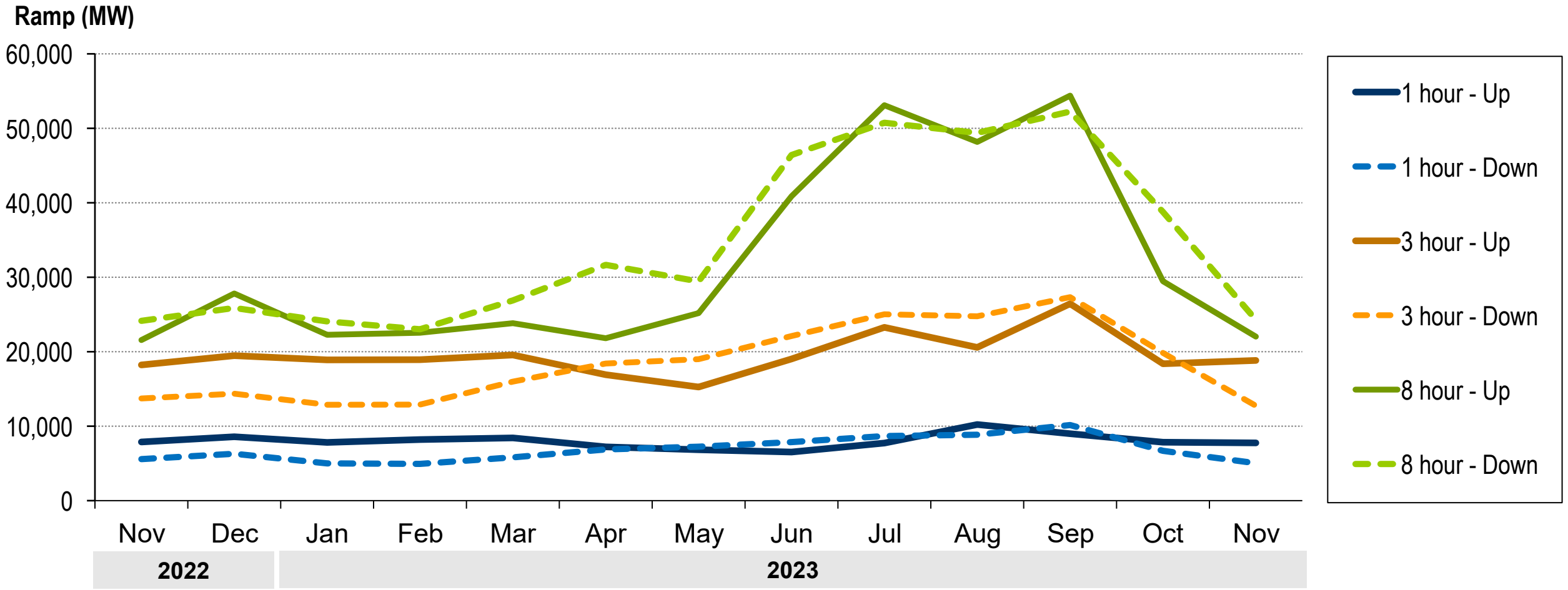
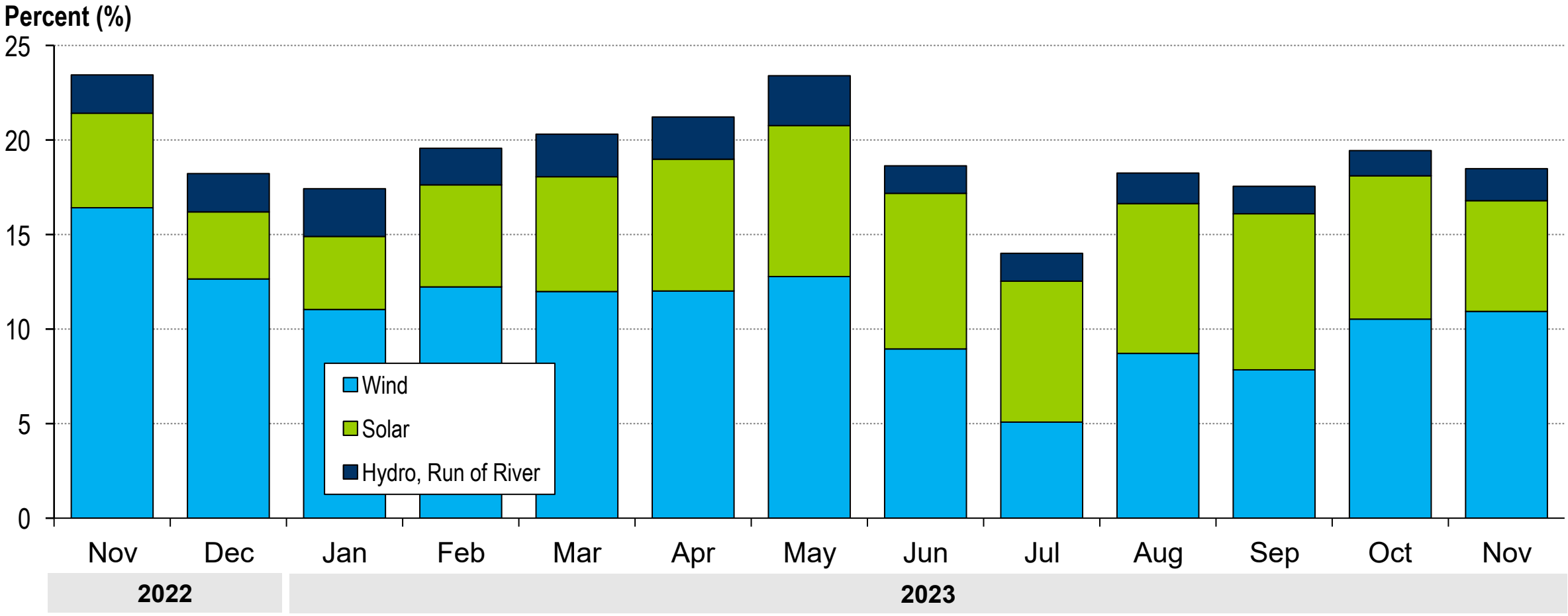
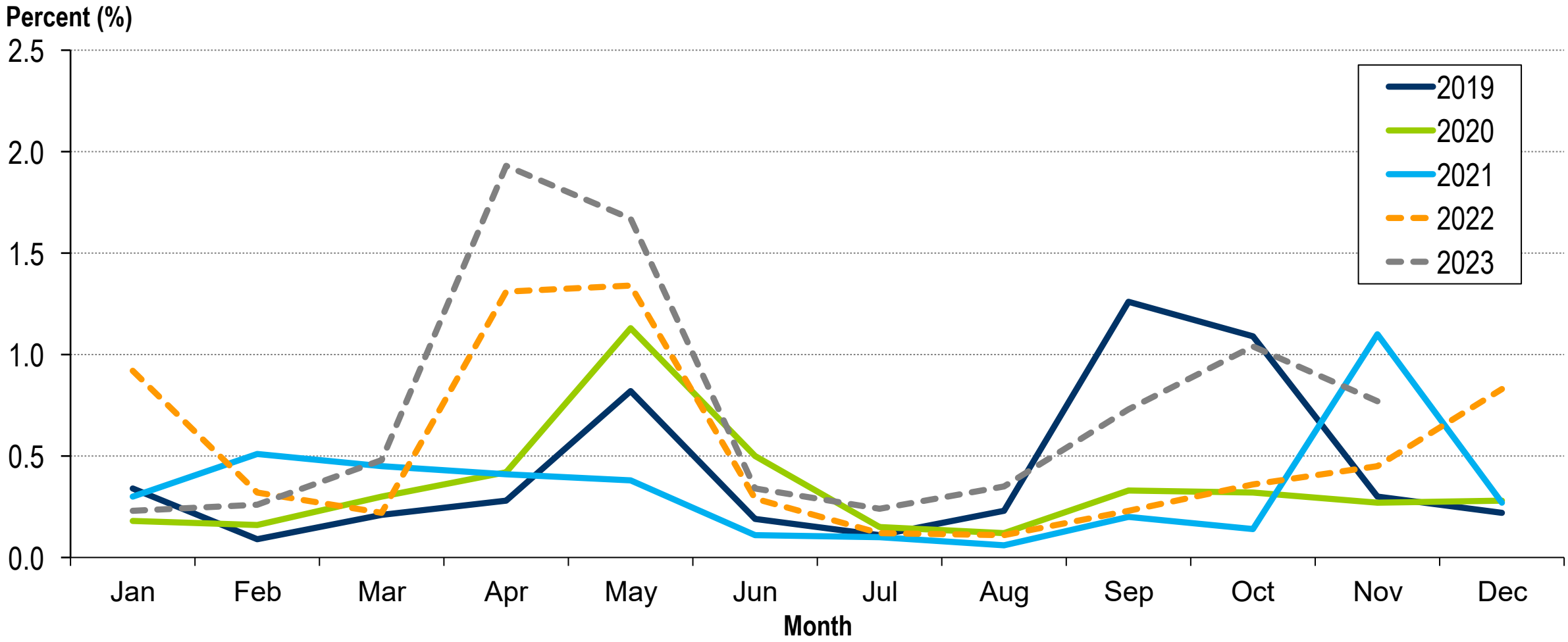
1) Monthly Maximum Net Load Ramp



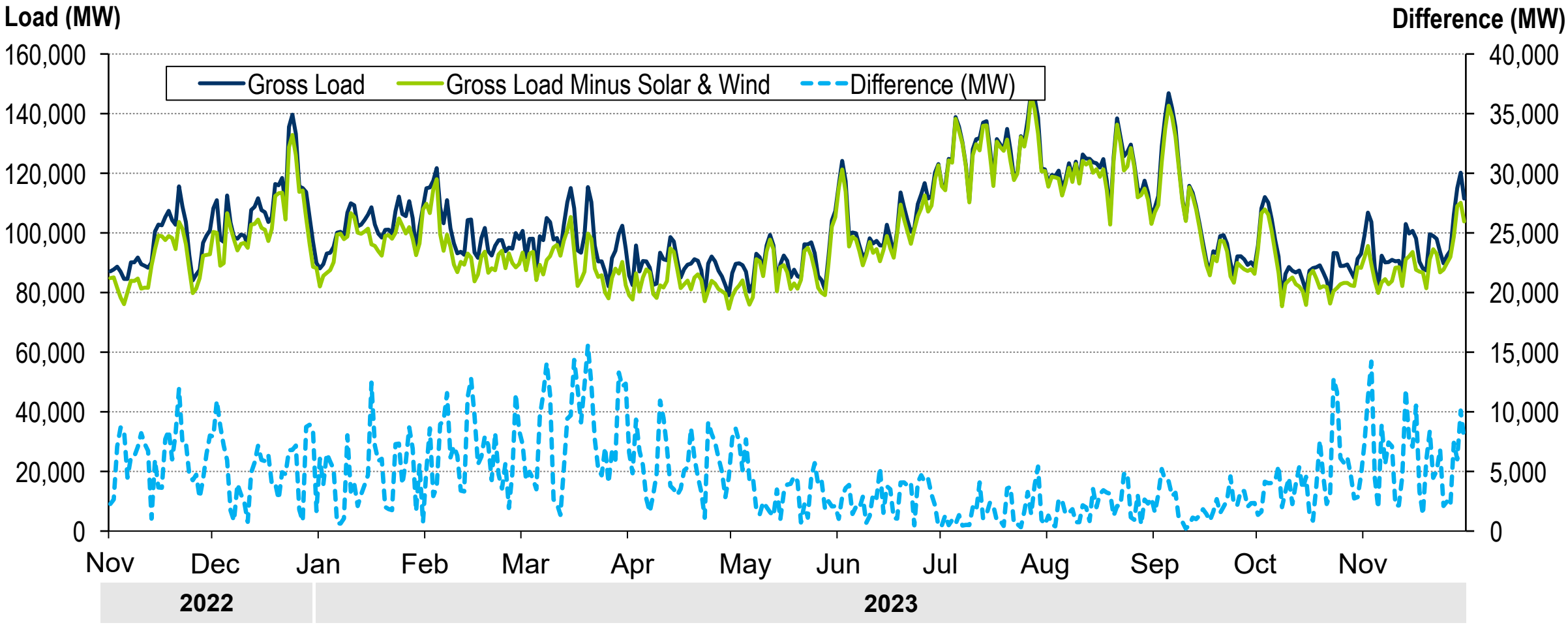
2) Hourly Maximum Percent of Load Served by Renewables



3) Monthly Percent of Negative Pricing Interval-Busses



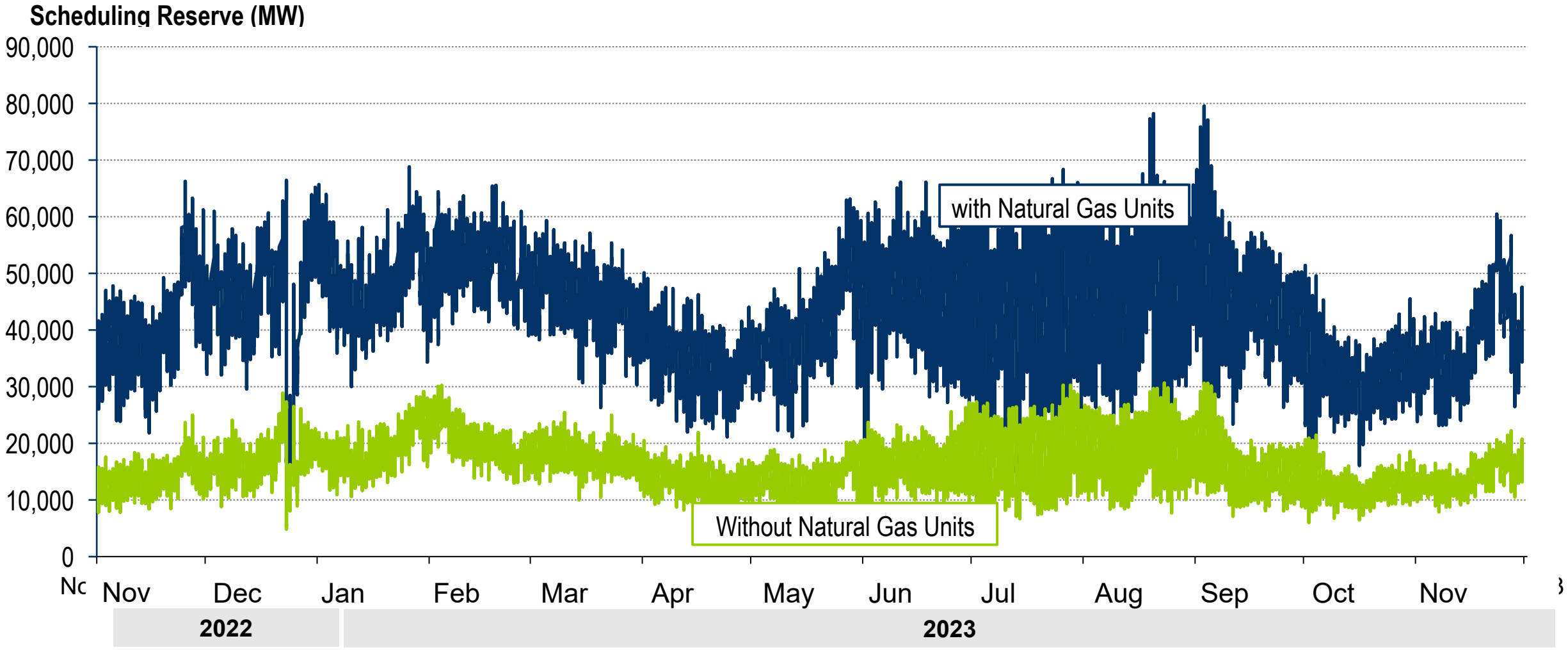
4) Daily Peak Gross Load and Gross Load Minus Solar & Wind



Scheduling Reserve

- Measure of offline/unscheduled generation that is capable of being scheduled and coming online in a future interval
- For each hourly interval, calculated potential generator scheduling reserve available in a 2-hour-forward horizon.
- Measured at an RTO level

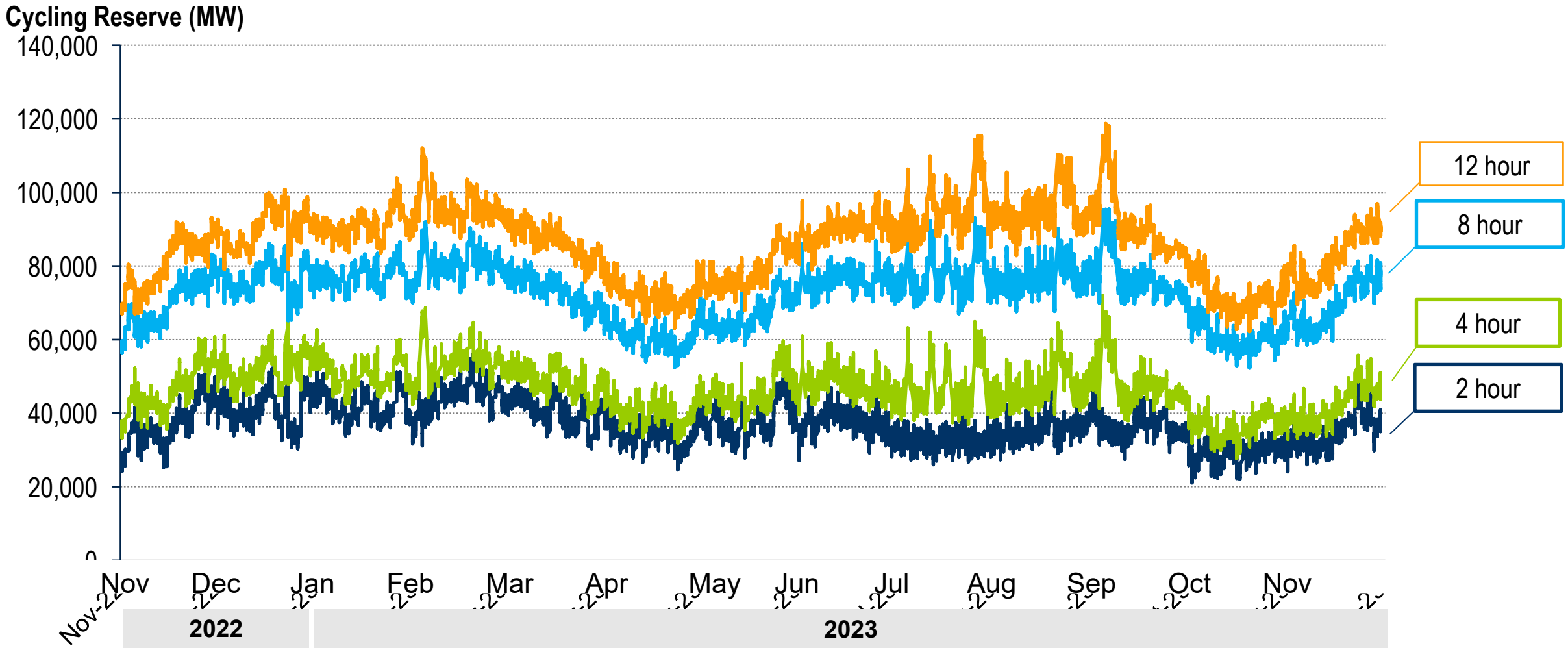
5) Hourly Scheduling Reserve



Cycling Reserve

- Measure of currently online generation that can shut down and return in a forward horizon
  - Complement to scheduling reserve
- For each hourly interval, calculated potential generator cycling reserve available in 2-hour, 4-hour, 8-hour and 12-hour-forward horizons.
- Measured at an RTO level

6) Hourly Cycling Reserve



Contact

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System Operations Report

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Appendix

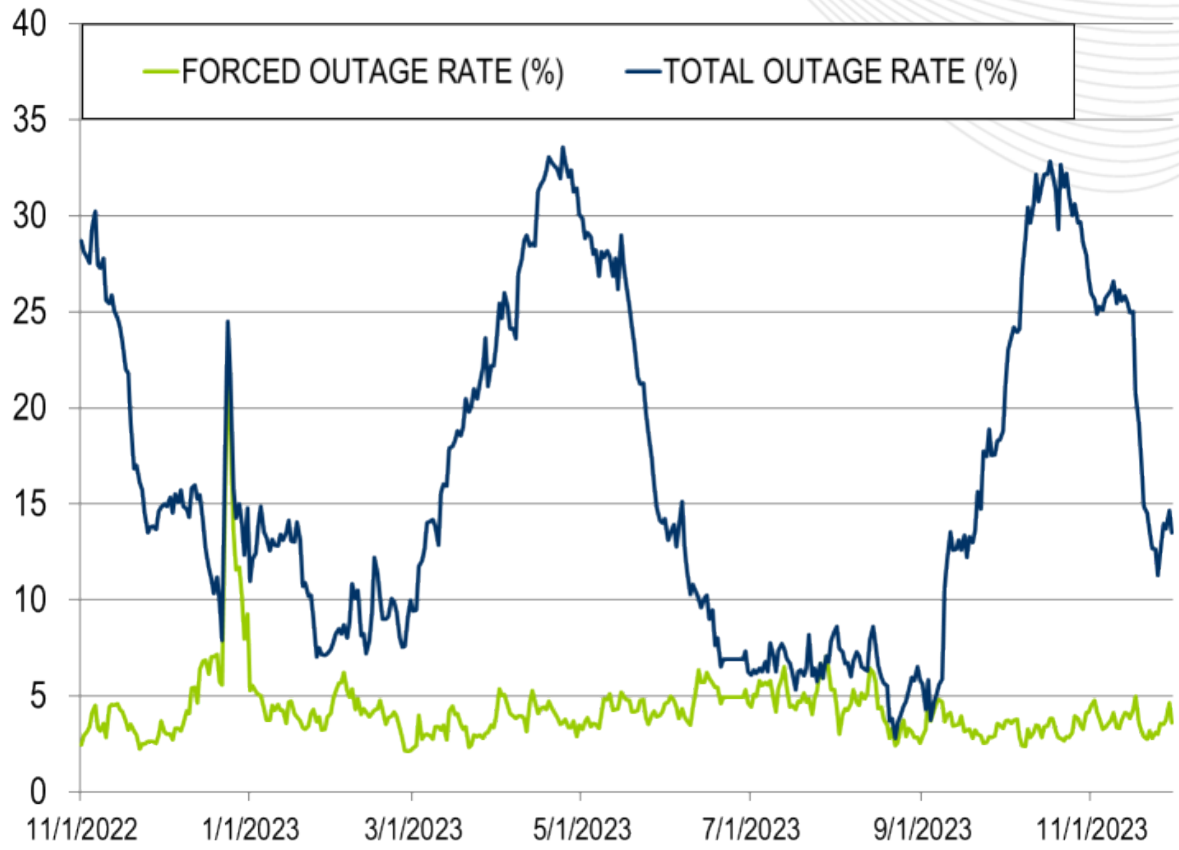
Balancing Authority ACE Limit - Performance Measure

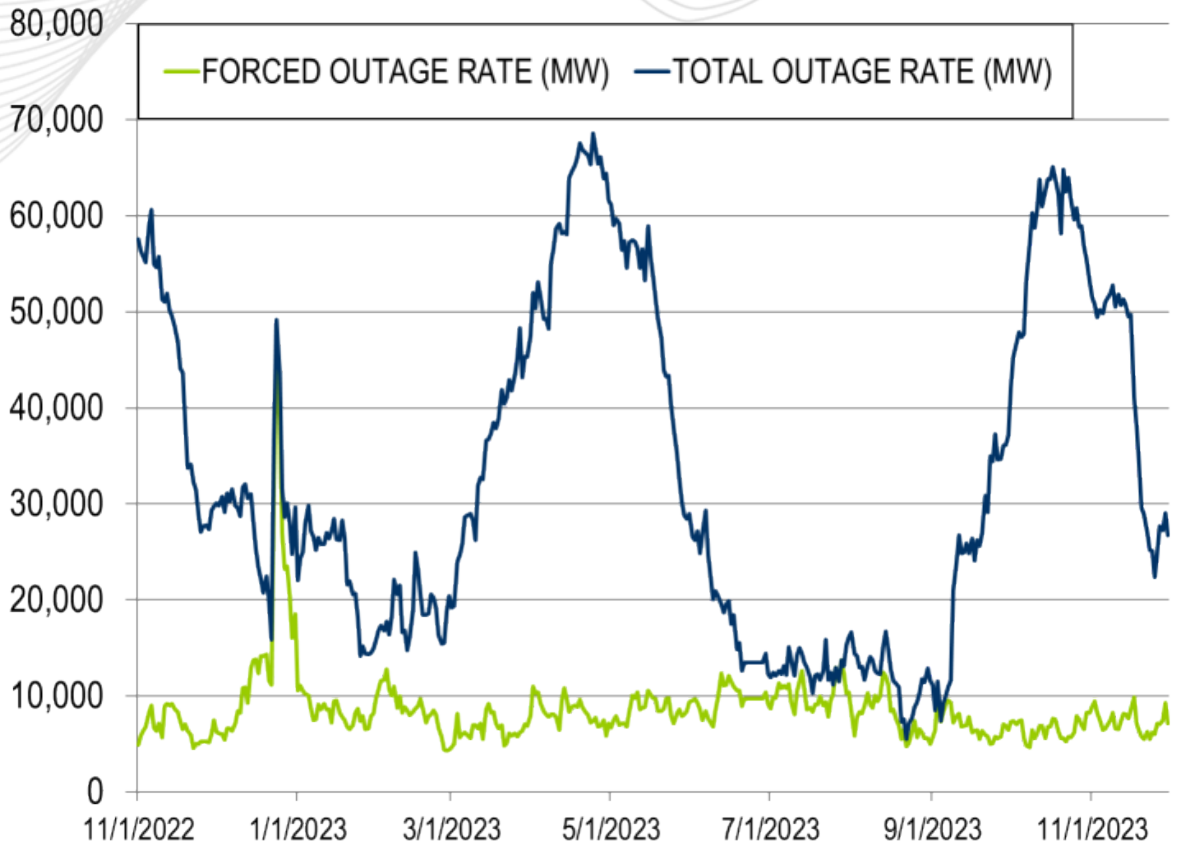
Goal Measurement: Balancing Authority ACE Limit (BAAL)

- The purpose of the new BAAL standard is to maintain interconnection frequency within a predefined frequency profile under all conditions (normal and abnormal), to prevent frequency-related instability, unplanned tripping of load or generation, or uncontrolled separation or cascading outages that adversely impact the reliability of the interconnection. NERC requires each balancing authority demonstrate real-time monitoring of ACE and interconnection frequency against associated limits and shall balance its resources and demands in real time so that its Reporting ACE does not exceed the BAAL ($BAAL_{LOW}$ or $BAAL_{HIGH}$) for a continuous time period greater than 30 minutes for each event.

- PJM directly measures the total number of BAAL excursions in minutes compared to the total number of minutes within a month. PJM has set a target value for this performance goal at 99% on a daily and monthly basis. In addition, current NERC rules limit the recovery period to no more than 30 minutes for a single event.

RTO Generation Outage Rate - Daily





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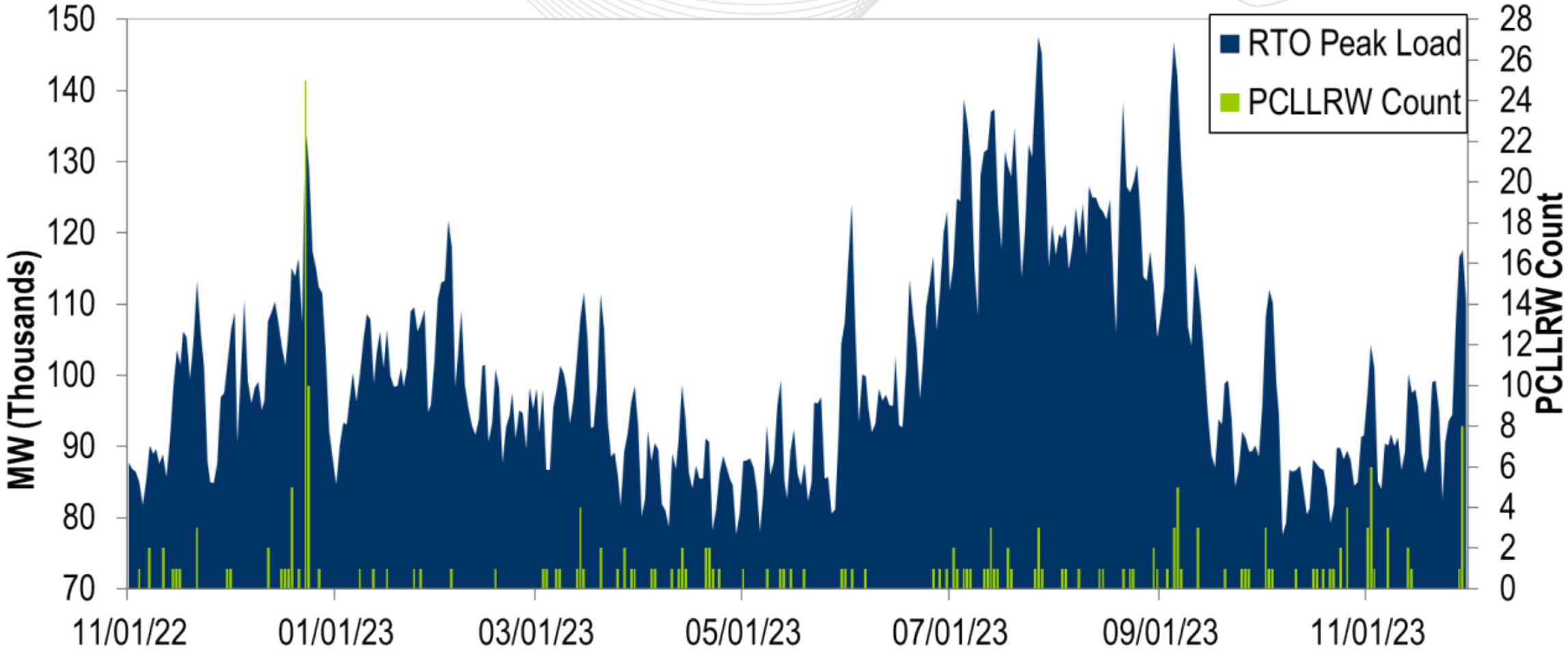
PCLLRW Count Vs. Peak Load – Daily Values For 13 Months



PROTECT THE POWER GRID

THINK BEFORE YOU CLICK!

Be alert to malicious phishing emails.

Report suspicious email activity to PJM.

(610) 666-2244 / it_ops_ctr_shift@pjm.com