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Item 9.3: System Operations Update

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Vice President, System Operations

Board of Directors Meeting

February 9-10, 2026

*Revised 02/04/2026

Purpose

- Provide an update on key operational metrics to the Board of Directors
- Provide information on recent Ancillary Services performance
- Provide information on hot topics

For information only

No action is requested; for discussion only.

Key Takeaways

- All key operational metrics are trending well, and all Ancillary Services are performing well.
- The ERCOT grid operated reliably during Winter Storm Fern.
- ERCOT implemented SOC and Cryptocurrency Mining Demand (Crypto) forecasting models to enhance system operations' situational awareness on forecasted energy sufficiency.
- Between January of 2025 and January of 2026 Data Centers' growth in actual demand was 15.5%.

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Winter Storm Fern

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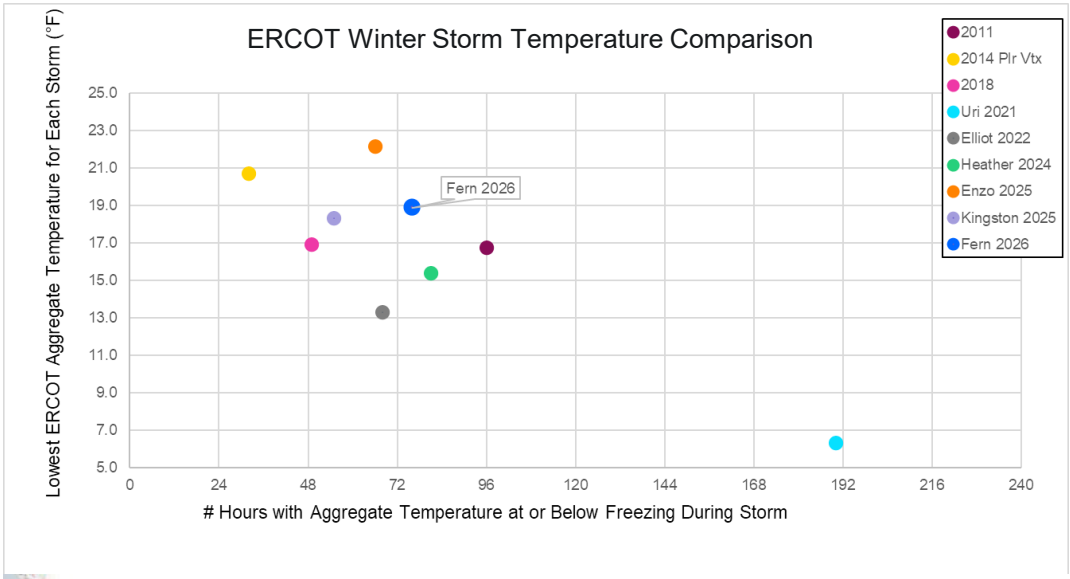
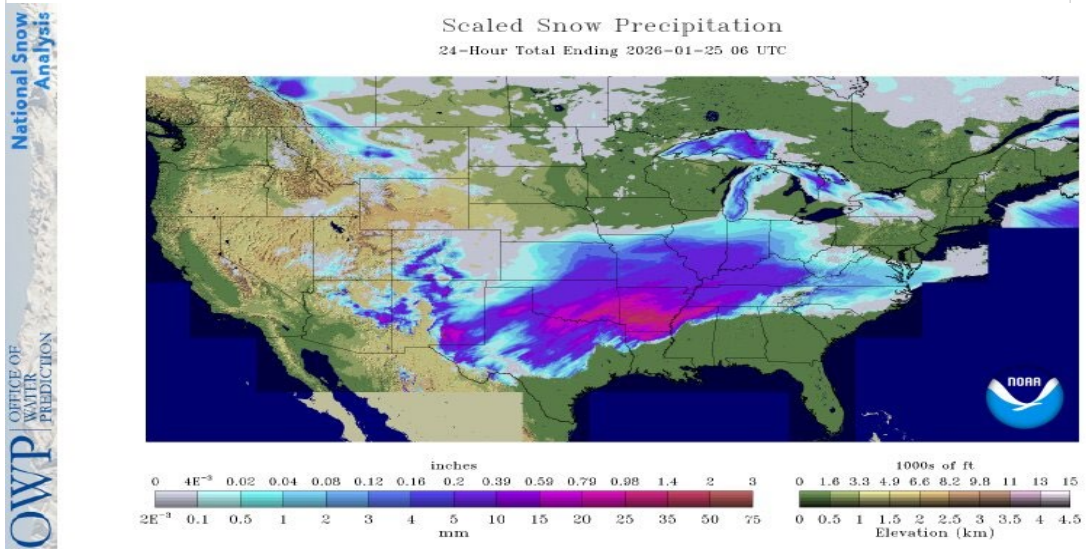
Winter Storm Fern: January 23 – 27

- Cold temperatures impacted the entire ERCOT region, while winter precipitation impacted the upper half of the state.
- Sufficient Resources were available to meet demand throughout the duration of the winter storm.
- Transmission outages during the event were low for the amount of winter precipitation observed (total, not concurrent):
  - 345 kV: 3 transmission outages
  - 138 kV: 15 transmission outages
  - 69 kV: 2 transmission outages





Key Takeaway: Winter Storm Fern resulted in minimal impacts to ERCOT system reliability.

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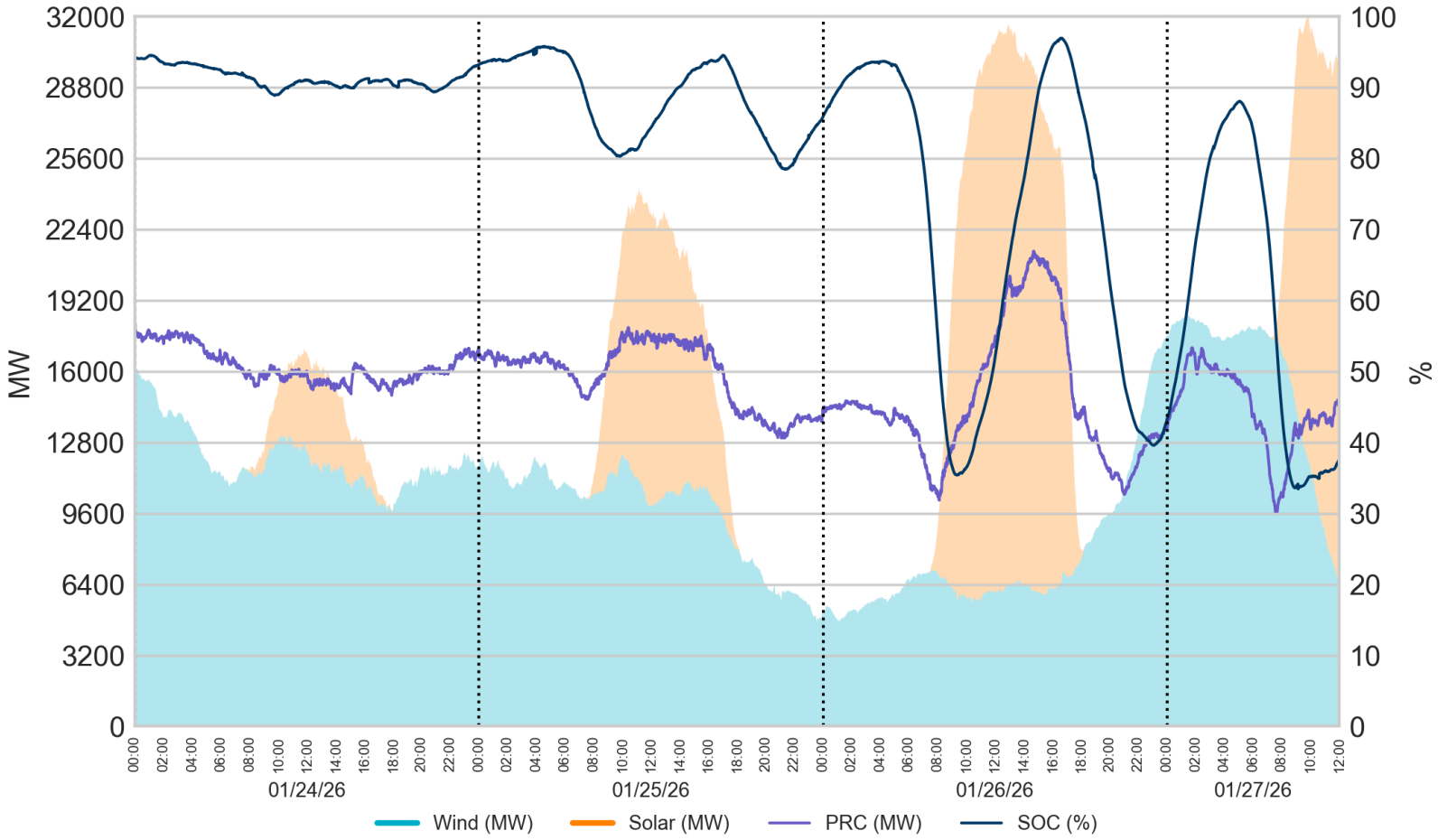
ESR SOC, Solar & Wind Generation during Winter Storm Fern



About 13.5GW of wind (nameplate) capacity was unavailable due to icing, but the actual lost generation was less due to reduced wind speeds.

Key Takeaway: ERCOT had adequate generation and reserves throughout Winter Storm Fern. ESRs maintained sufficient SOC and were prepared for the morning and evening load peaks.

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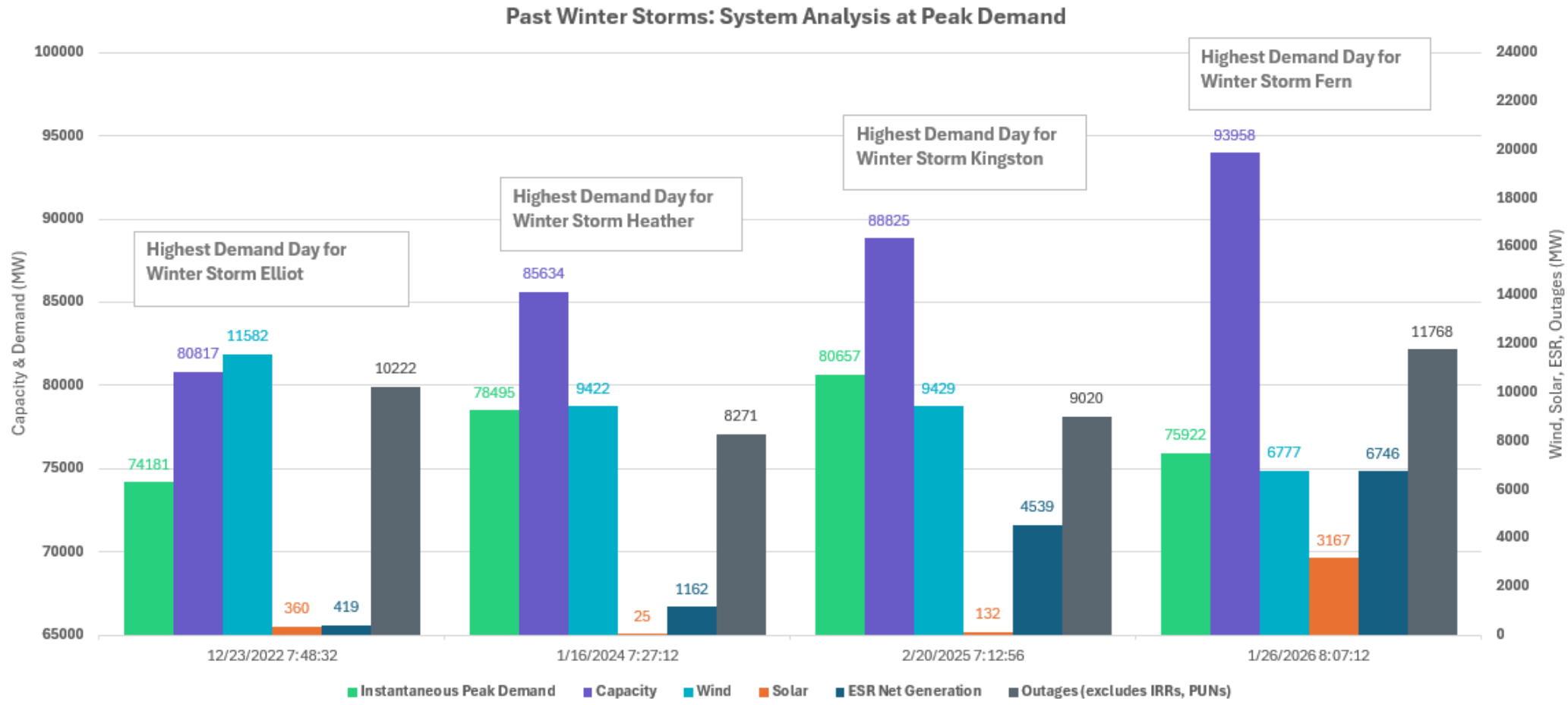
System Analysis at Various Winter Peaks



Key Takeaway: ERCOT's maximum unofficial instantaneous peak demand during Winter Storm Fern was 75,922 MW, which was not a new winter peak (winter peak recorded during Winter Storm Kingston), and there was 6,777 MW wind and 3,167 MW solar output at that time.

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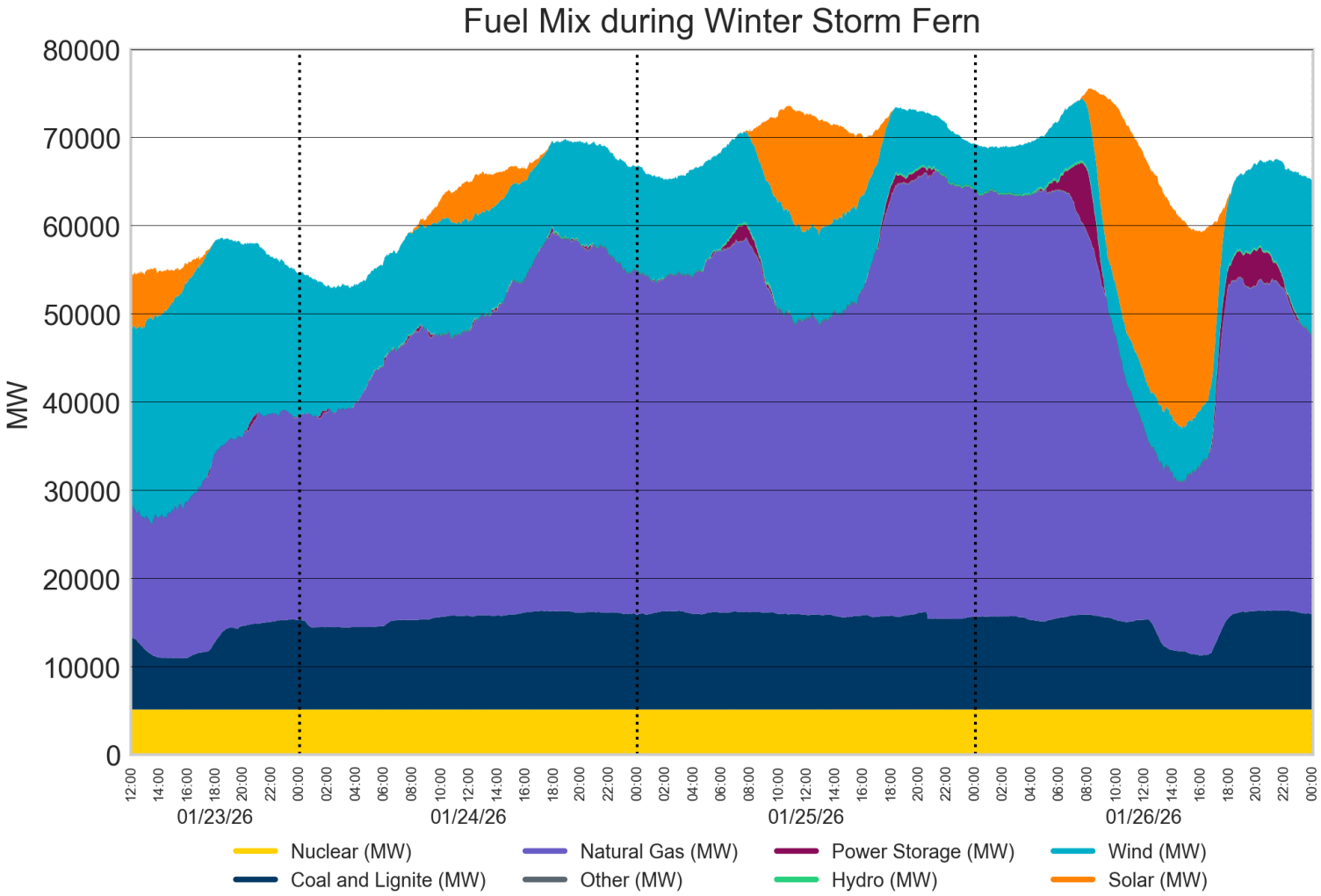
ERCOT Fuel Mix During Winter Storm Fern



Reduced demand and higher wind output (due to minimal additional icing impacts overnight) during the evening of 1/25 through the morning of 1/26 required less ESR discharge for the 1/25 evening peak and more state of charge to be available for the 1/26 morning peak.

Key Takeaway: All resource types contributed to meeting demand during Winter Storm Fern.

Winter Storm Fern – Special Topics

- Department of Energy (DOE) 202(c) Orders
- Transmission Emergency
- Load Forecast and Reductions
- Resource Outages

DOE 202(c) Orders and TCEQ Enforcement Discretion

- ERCOT successfully sought enforcement discretion from TCEQ.
- ERCOT successfully sought a 202(c) order from US DOE to ensure generators could maximize their availability.
- ERCOT successfully sought a separate 202(c) order that was offered by the DOE for the use of backup generation that may be available at data centers and other sites.
  - ERCOT quickly developed a process to implement order if required.
  - ERCOT is currently developing an enhanced process for implementation should similar 202(c) orders be issued in the future.
- ERCOT did not enter an Energy Emergency Alert Level 2, thus not requiring DOE Order 202(c) implementation.

Key Takeaway: ERCOT successfully sought regulatory relief in preparation for Winter Storm Fern. Continuous improvement efforts are underway to ensure new applications of regulatory relief can be utilized in future winter storms.

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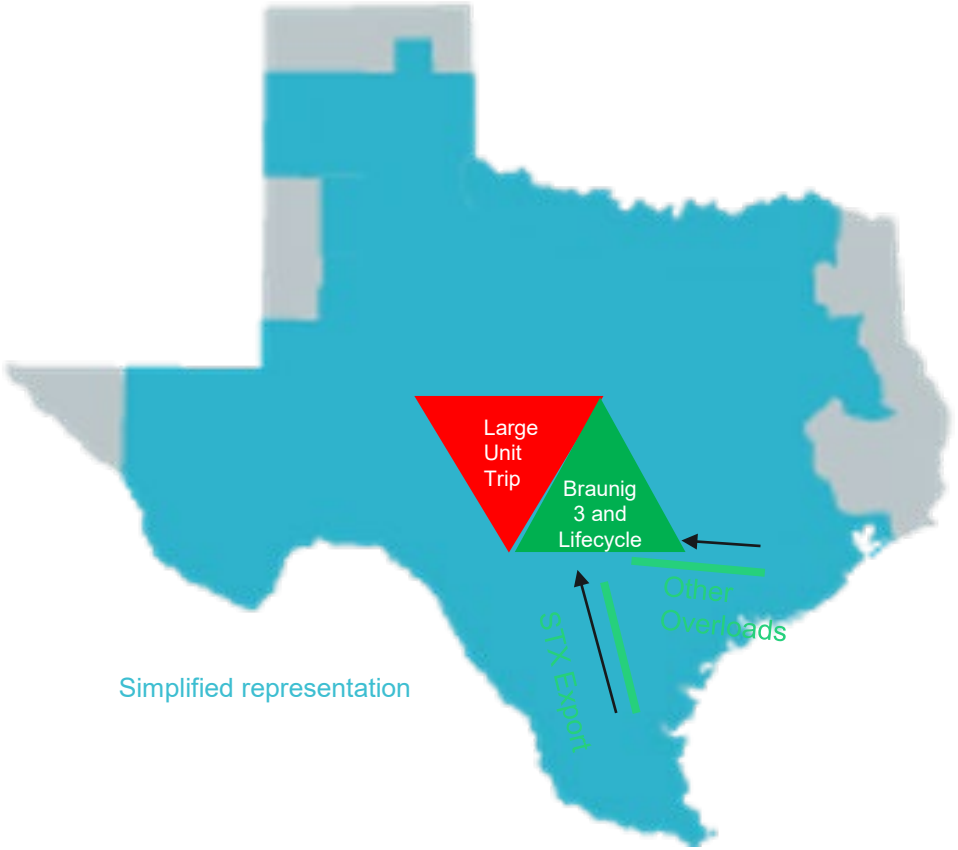
Transmission Emergency



- Following trip of a large unit in Central Texas, South Texas Export IROL was briefly exceeded and other transmission lines between Houston and San Antonio experienced post-contingency overloads.
- A localized transmission emergency was in effect from Jan. 25th 9:04 PM – Jan. 26th 10:00 AM in San Antonio to Houston area.
  - Real Time Co-optimization (RTC) system redistributed Ancillary Services across the system to maximize generation used to relieve overloads, reducing manual action required.
  - Braunig Unit 3 repairs under Reliability Must Run (RMR) contract were completed prior to the storm.
    - ERCOT committed the unit throughout storm, providing support to relieve overloads and manage the binding South Texas Export.
  - ERCOT committed the Life Cycle units during the Transmission Emergency to relieve the overloads.

Key Takeaway: A transmission emergency for the South Texas Export IROL was handled effectively via RTC improvements, Braunig Unit 3, and Life Cycle Power unit deployments.

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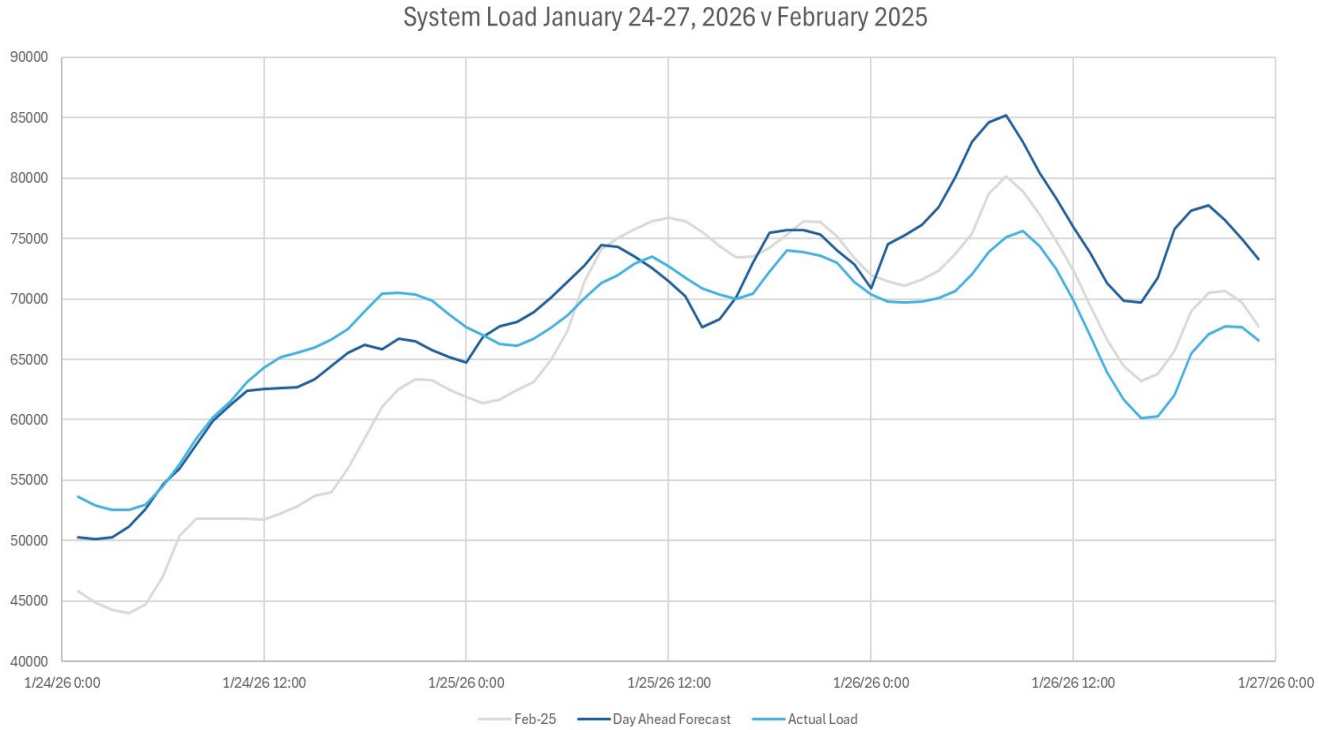
Load Forecast

- The load forecast peak for Winter Storm Fern was 84,500 MW, which assumes no demand response.
- This forecast was ~5 GW higher than February 2025 actual peak due to growth and colder temperatures.
  - System temp at peak 2025: 24.7F
  - System temp at peak 2026: 18.9F
  - Estimated 4GW of load growth
- Abnormal statewide school & business closure (more than typical Holiday) and reduced Oil and Gas demand resulted in actual load well under forecasted values.



Key Takeaway: The load forecast overestimated expected peak consumption on Monday, January 26th and Tuesday, January 27th. Further analysis is being conducted to apply insights into future winter weather forecasts.

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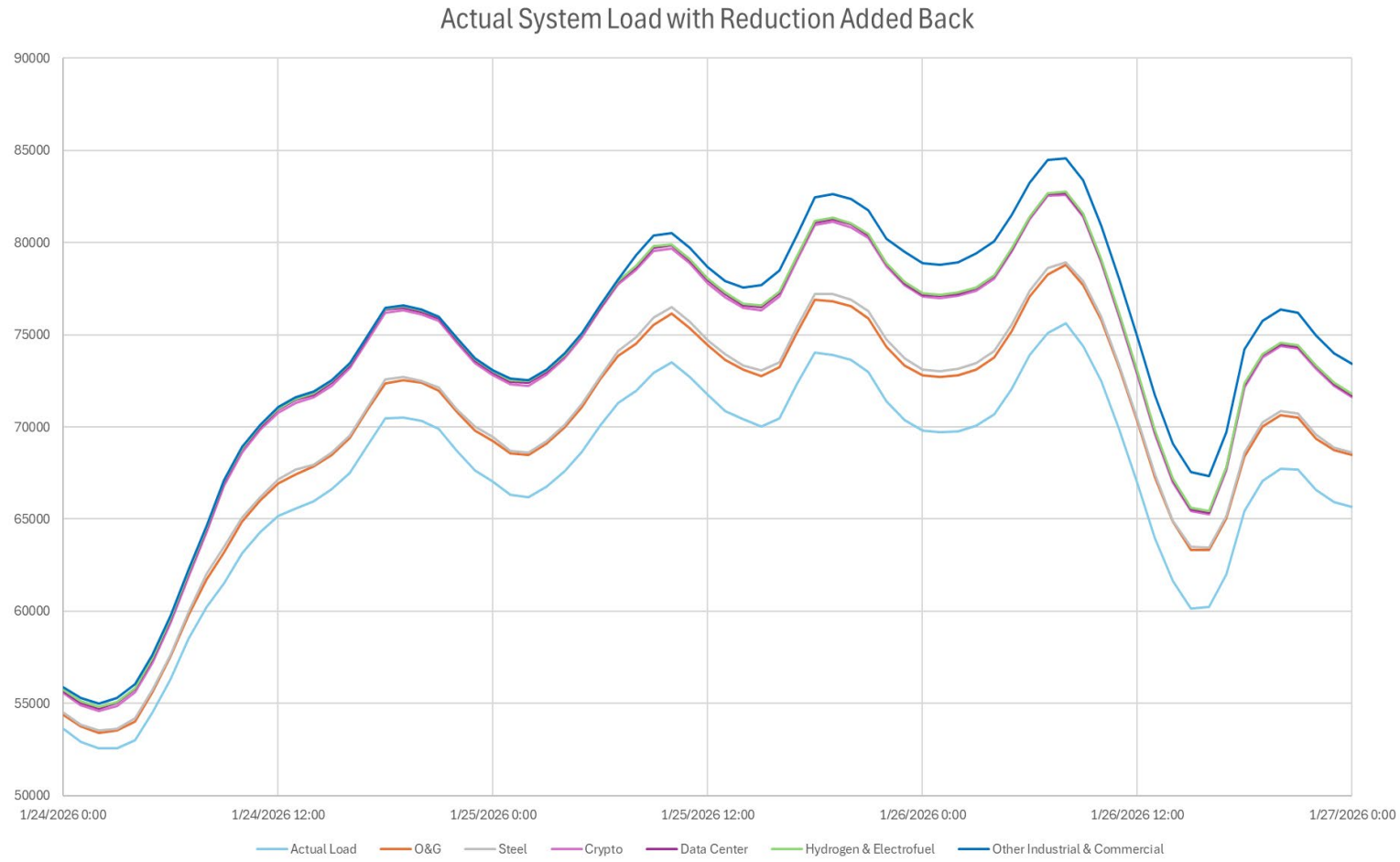
Estimated Demand Reductions for Customer Types

- ERCOT has developed capability to estimate load reductions for some large types of customers.
- Oil & Gas began reducing ~4,200 MW overnight Friday into Saturday and remained reduced through the event.
- Cryptocurrency mining began reducing ~4,100 MW Saturday.
- Others:
  - Hydrogen & Electrofuel: 75 MW
  - Data Center: 170 MW
  - Steel: 420 MW
- Impacts from school and other business closings are not available.



Key Takeaway: Adding back load reduction values brings Monday morning peak to 84,558 MW.

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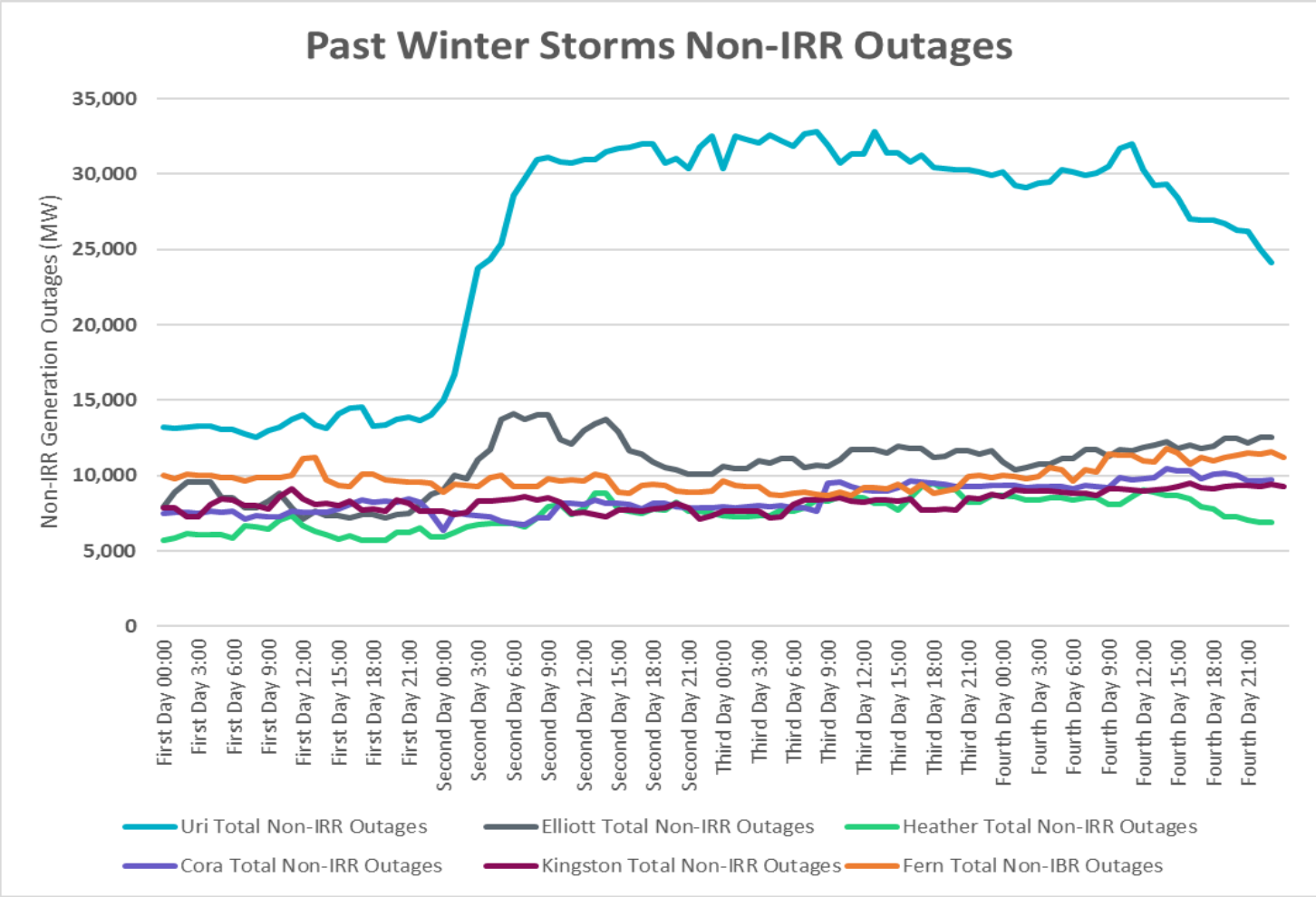
Historical Non-IRR Outage Data from Previous Winter Storms



- Due to the low temperatures, the typical gas restrictions in North Texas were issued.
- ERCOT utilized the Firm Fuel Supply Service (FFSS) to keep units impacted by gas restrictions running (340 MW).
- Many generators reported their pipelines issuing Operational Flow Orders (OFOs).

Key Takeaway: Non-IRR outages stayed at a consistent level across recent winter storms.

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State of Charge and Cryptocurrency Mining Demand Forecasts

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State of Charge (SOC) and Cryptocurrency Mining Demand Forecasts

- ERCOT implemented SOC and Cryptocurrency Mining Demand (Crypto) forecasting models to enhance system operations' situational awareness on forecasted energy sufficiency.
- While these models continue to be tuned and improved, they have been used for general operational awareness since June 2025.

SOC

- Machine learning models are used for forecasting hourly system-level SOC
- Model inputs include the active wind/solar/load forecasts, expected battery usage, and historical battery behavior

Crypto

- ERCOT's MTLF Forecast does not explicitly model expected price response from crypto-demand, however some amount of historical response is captured in the forecast.
- The crypto model provides the forecasted response from these loads to better assess energy sufficiency when compared to the base MTLF.
- A statistical model is used for hourly forecasting
- Historical price-responsive and 4CP behavior are incorporated into the model

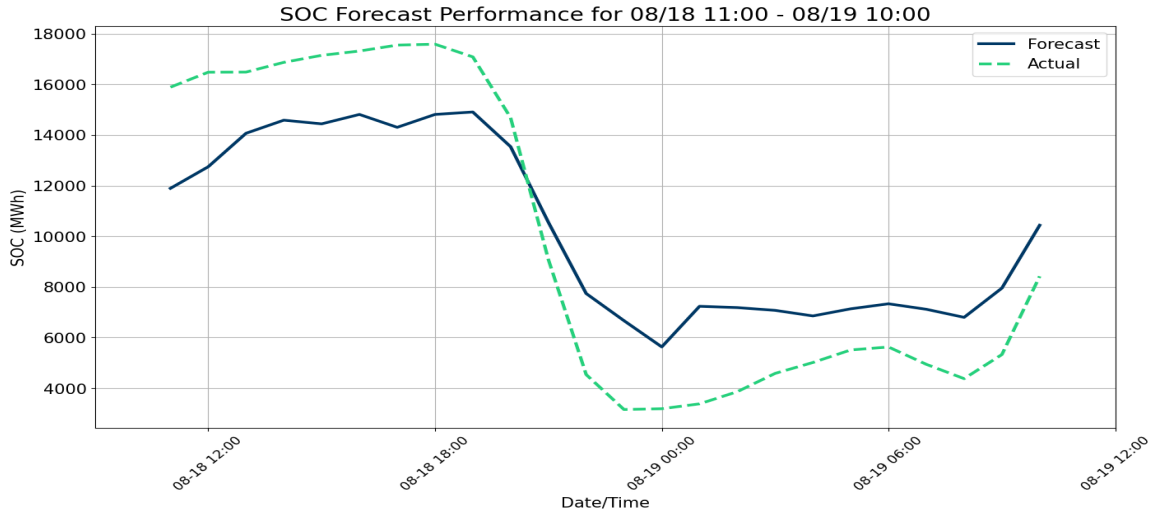

Fig. 1: Hourly SOC forecast created at 10:00am on 8/18/25

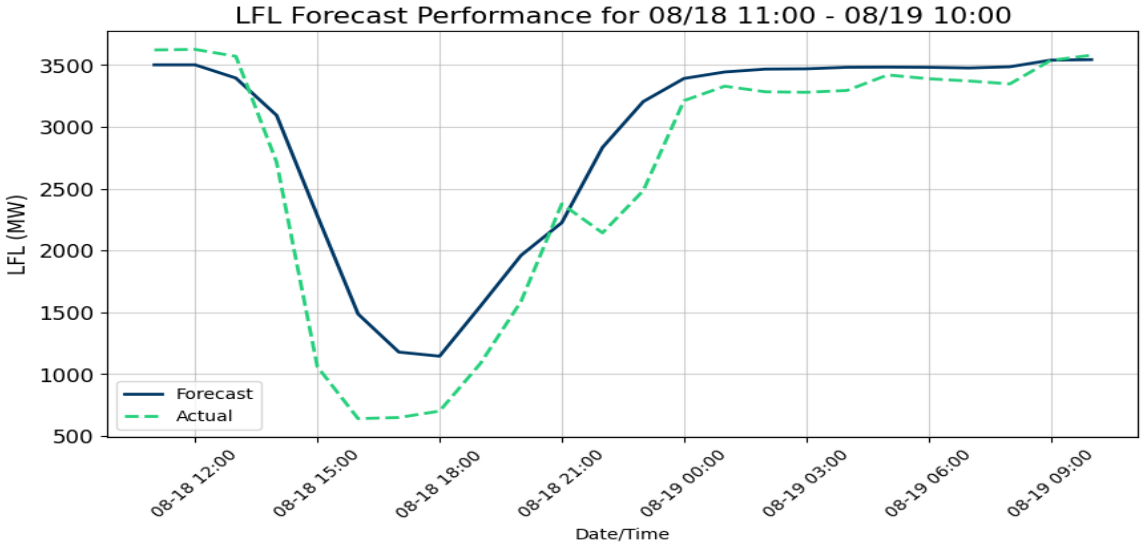

Fig. 2: Hourly LFL forecast created at 10:00am on 8/18/25

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Cloud-Based Data Center Growth

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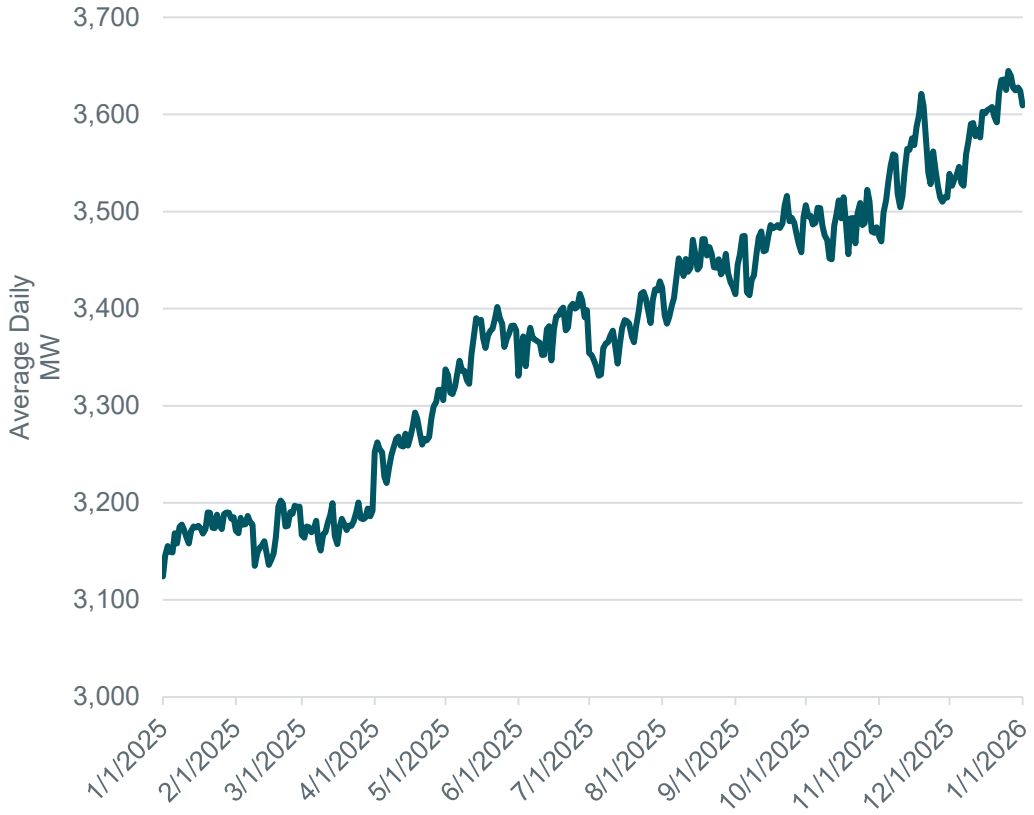
Cloud-Based Data Center Growth Jan 2025 - Jan 2026

- Cloud-based data centers include facilities like cloud-based computing, storage, co-locations, and AI computation, but not crypto mining.
- ERCOT has evaluated usage patterns and other sources to identify operational data center demand at sites that are 1MW and greater (approximately 400 cloud-based data center sites).
- The current installed capacity at these sites = 9,850 MW Approved to Energize in the Large Load Interconnection process (LLI) + Operational (non-LLI).

Note: this is a broader set of sites than the LLI tracking of requests that are 75MW and greater.



Key Takeaway: Between January of 2025 and January of 2026, Data Centers' actual MW growth was 15.5%

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Appendix
Operational Metrics and Ancillary Services (AS) Performance

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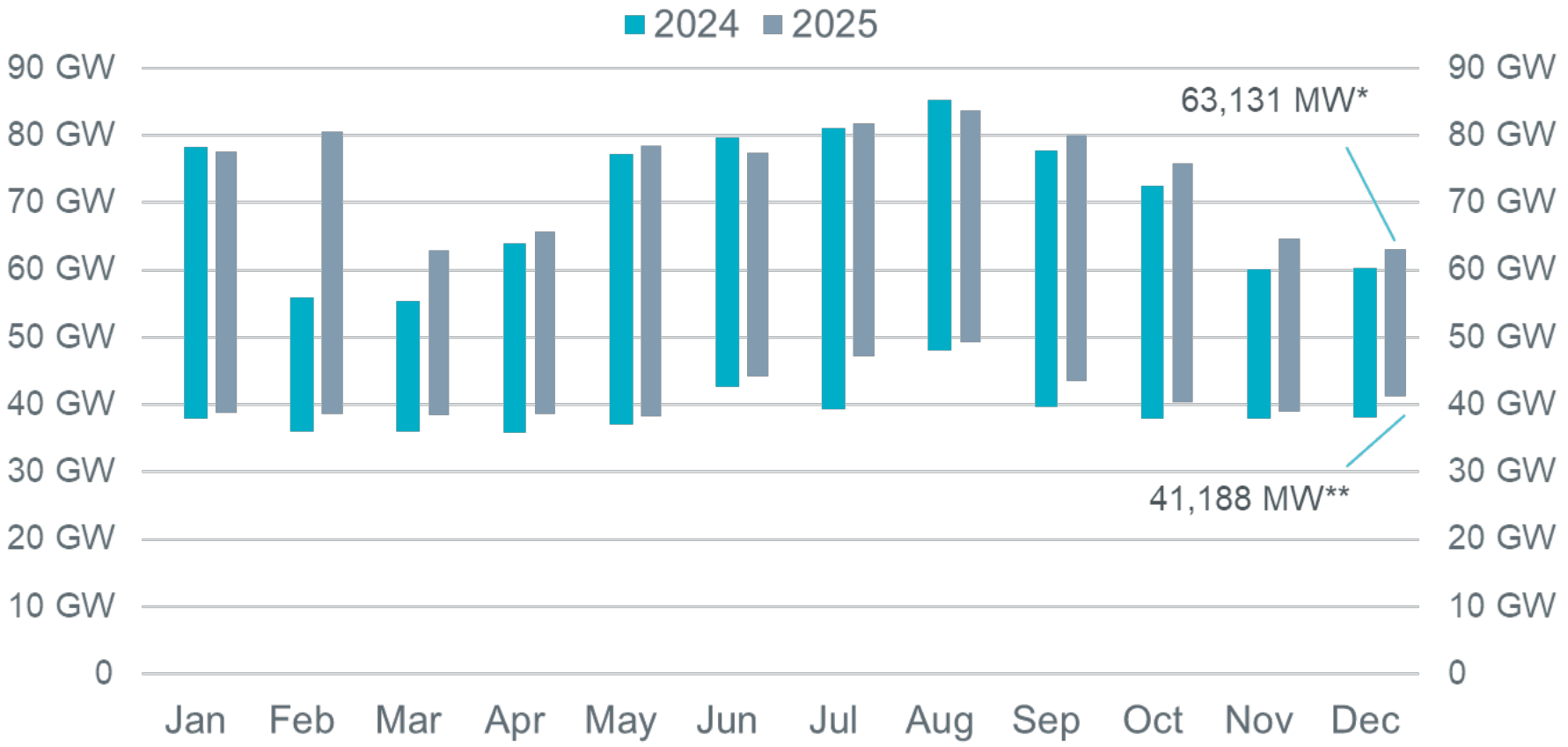
Demand



*Based on the maximum net system hourly value from July release of Demand and Energy 2025 report.

**Based on the minimum net system 15-minute interval value from January release of Demand and Energy 2026 report.

Data for latest two months are based on preliminary settlements.

Key Takeaway: ERCOT set a new all-time record of 64,698 MW* for the month of November on 11/17/2025. This is 4,524 MW more than the November 2024 demand of 60,174 MW on 11/4/2024.

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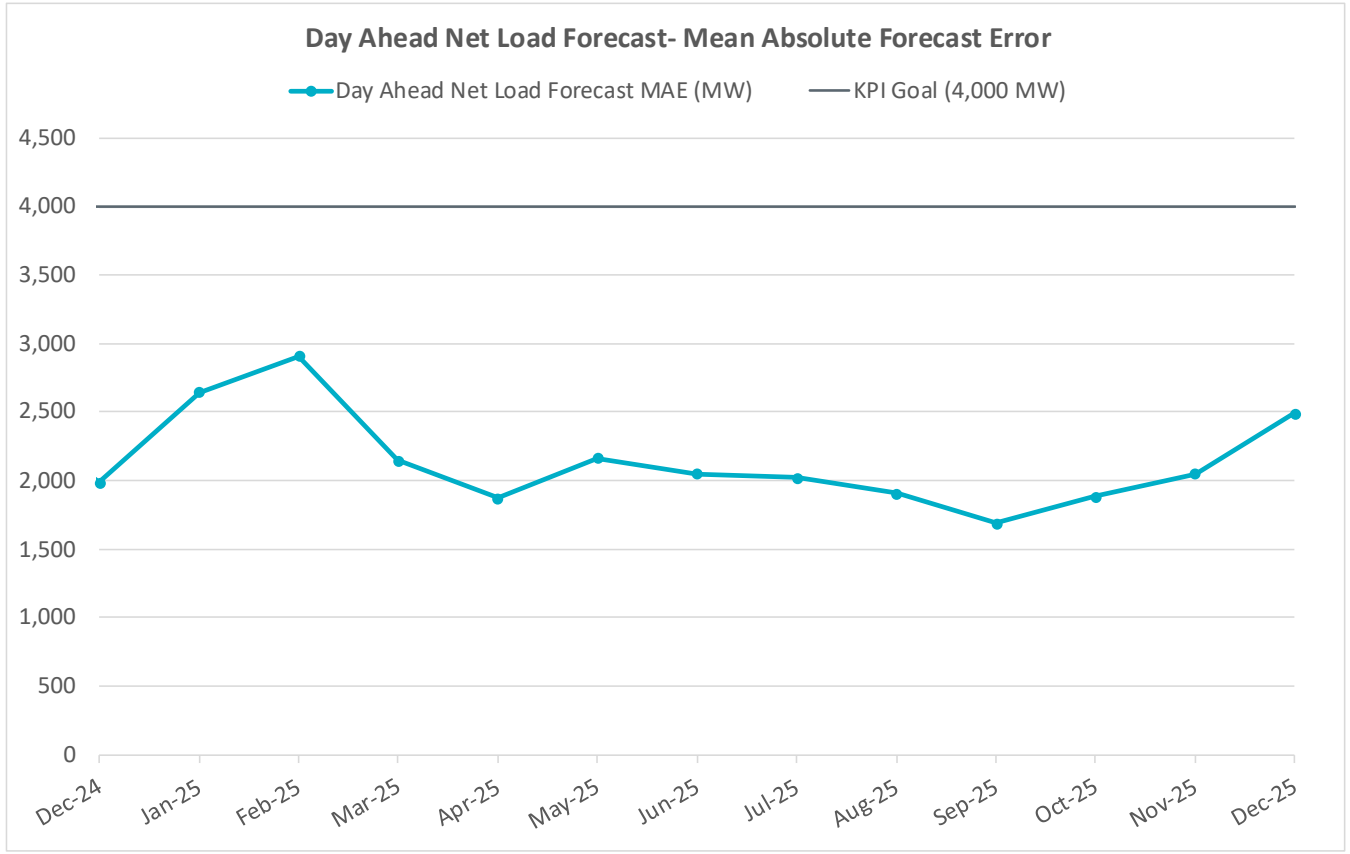
Forecast Performance



Key Takeaway(s): Day Ahead Net Load Forecast Mean Absolute Forecast Error has met the target and has been trending well.

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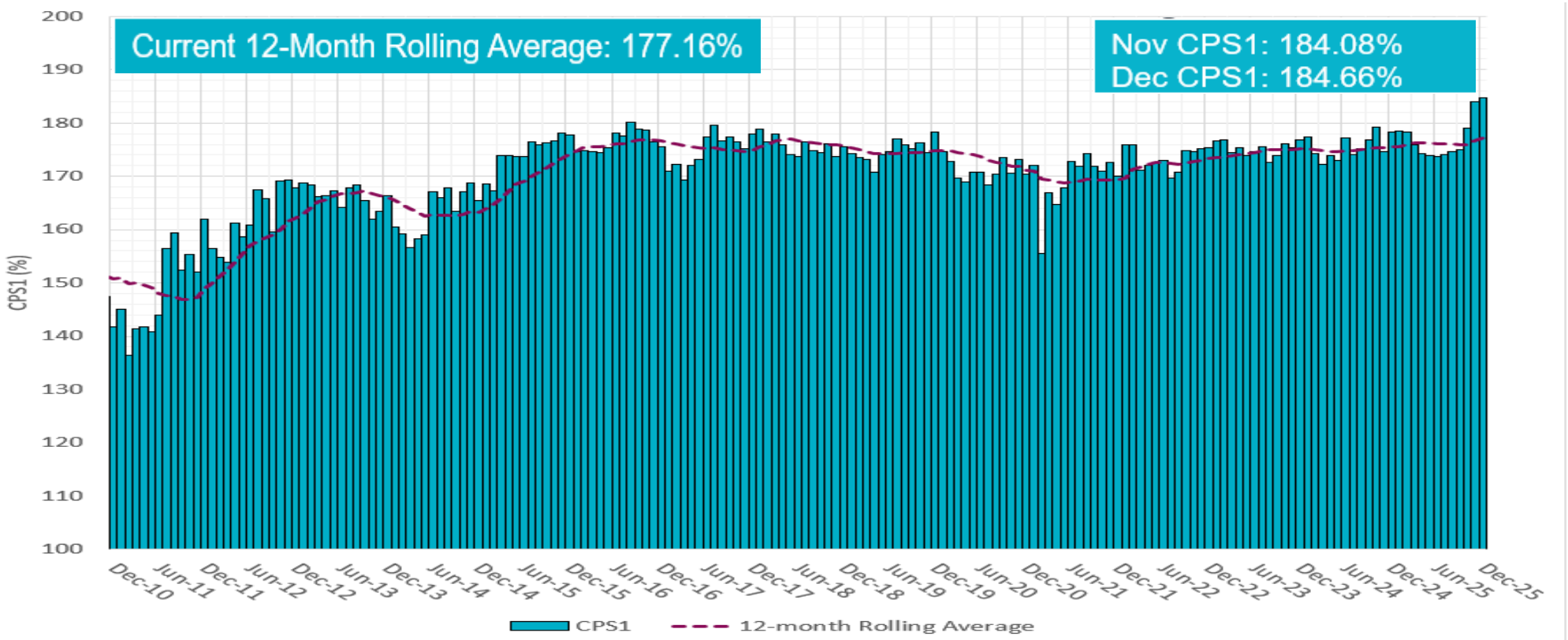
Frequency Control

- Control Performance Standard 1 (CPS-1) is a measure of the frequency control on a power system, pursuant to NERC Standard BAL-001. The 12-month rolling-average of this measure is required to stay above 100%.

12 Month Rolling Average CPS1 KPI
Target > 140 % | Stretch > 150%



Key Takeaway(s): Frequency control has been performing extremely well.

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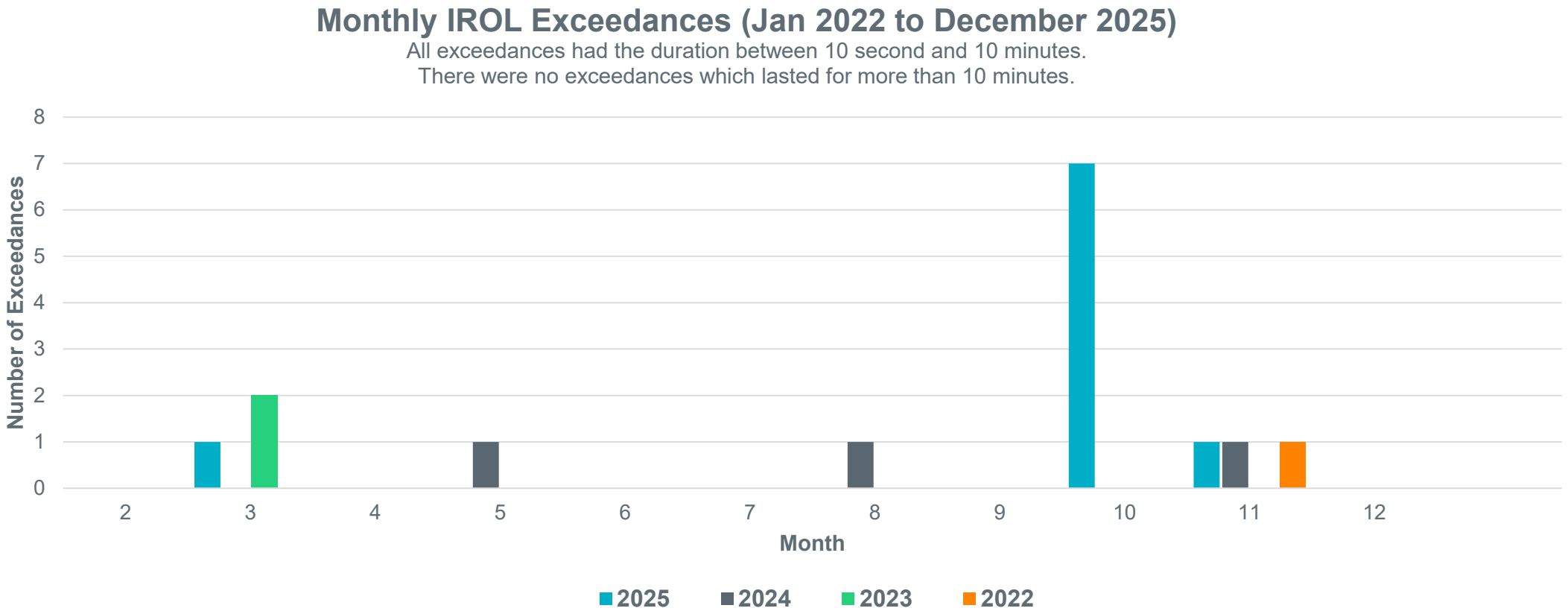
Transmission Limit Control

The most-recent Interconnection Reliability Operating Limit (IROL) exceedance occurred in November 2025.



Key Takeaway: In November, ERCOT had 1 IROL exceedance occur.

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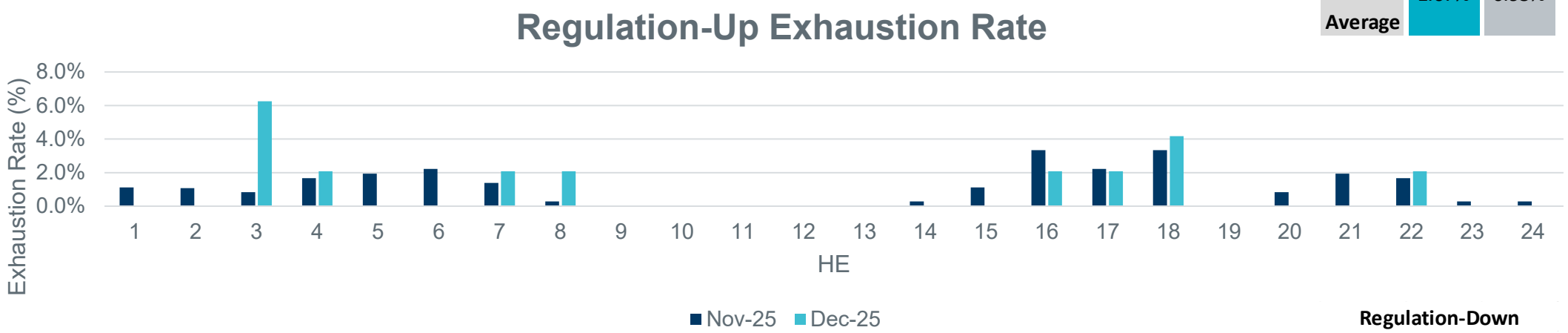
Regulation Service Deployments for November to December 4th 2025

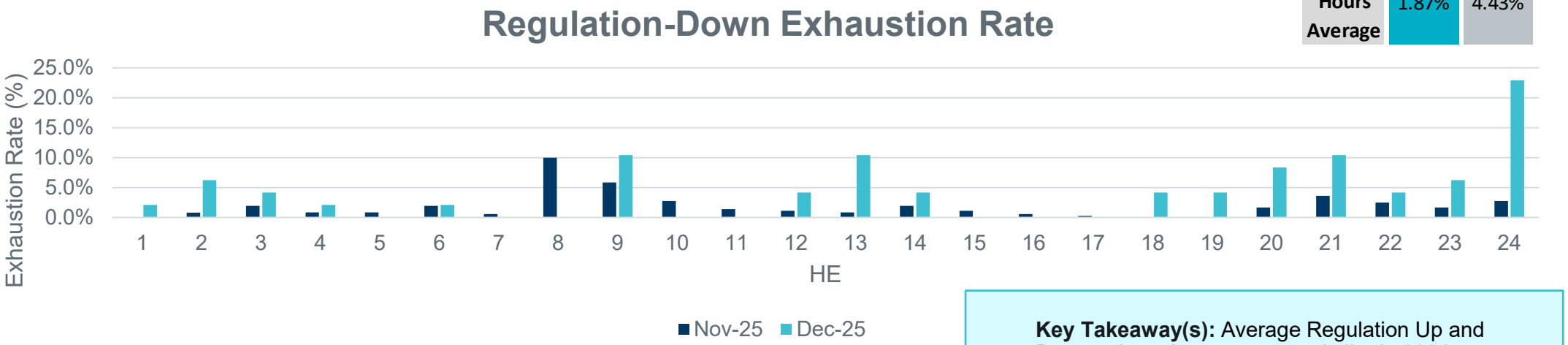
Regulation-Up

	Nov-25	Dec-25
All Hours Average	1.07%	0.95%



Regulation-Down

	Nov-25	Dec-25
All Hours Average	1.87%	4.43%



Key Takeaway(s): Average Regulation Up and Down exhaustion rates were similar in 2024

December data currently excludes days after RTC. Future reports will backfill December 2025 post-RTC.

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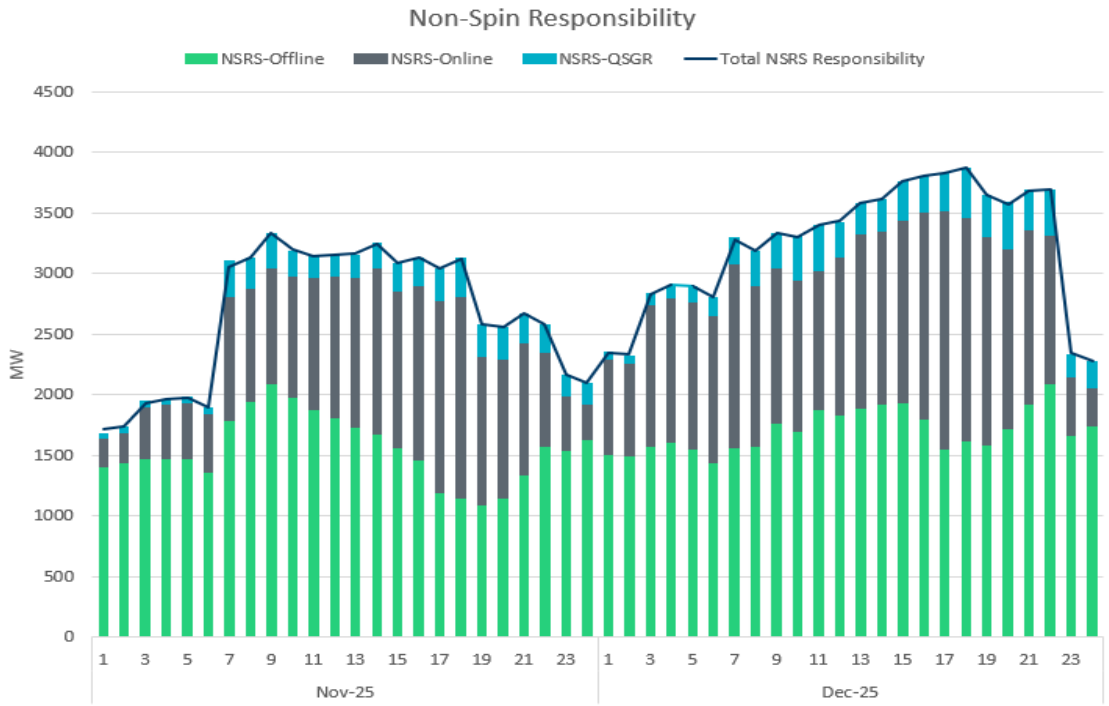
Non-Spinning Reserve Service (Non-Spin) Deployments for Nov – Dec 2025

From Nov to Dec 2025, there were 4 events that resulted in deployment of offline Non-Spin.

From Nov to Dec 4th 2025, an average of ~43% of Non-Spin was provided using online capacity and by Quick Start Generation Resources.

From Dec 5th to Dec 31st 2025, an average of ~51% of Non-Spin awards was provided using online capacity and by Quick Start Generation Resources.

Deployment Start Time	Deployment Duration	Max Deployment (MW)
11/7/2025 16:36	01:43:31	736.6
12/6/25 16:43	01:31:00	1415.7
12/8/25 16:59	00:56:00	1281
12/11/25 16:34	00:56:00	1512.98



Data shown is from Nov to Dec 4th 2025.

Key Takeaway: All recent Non-Spin deployments were to meet 30-minute ramping needs. Non-Spin performed well in all deployments.

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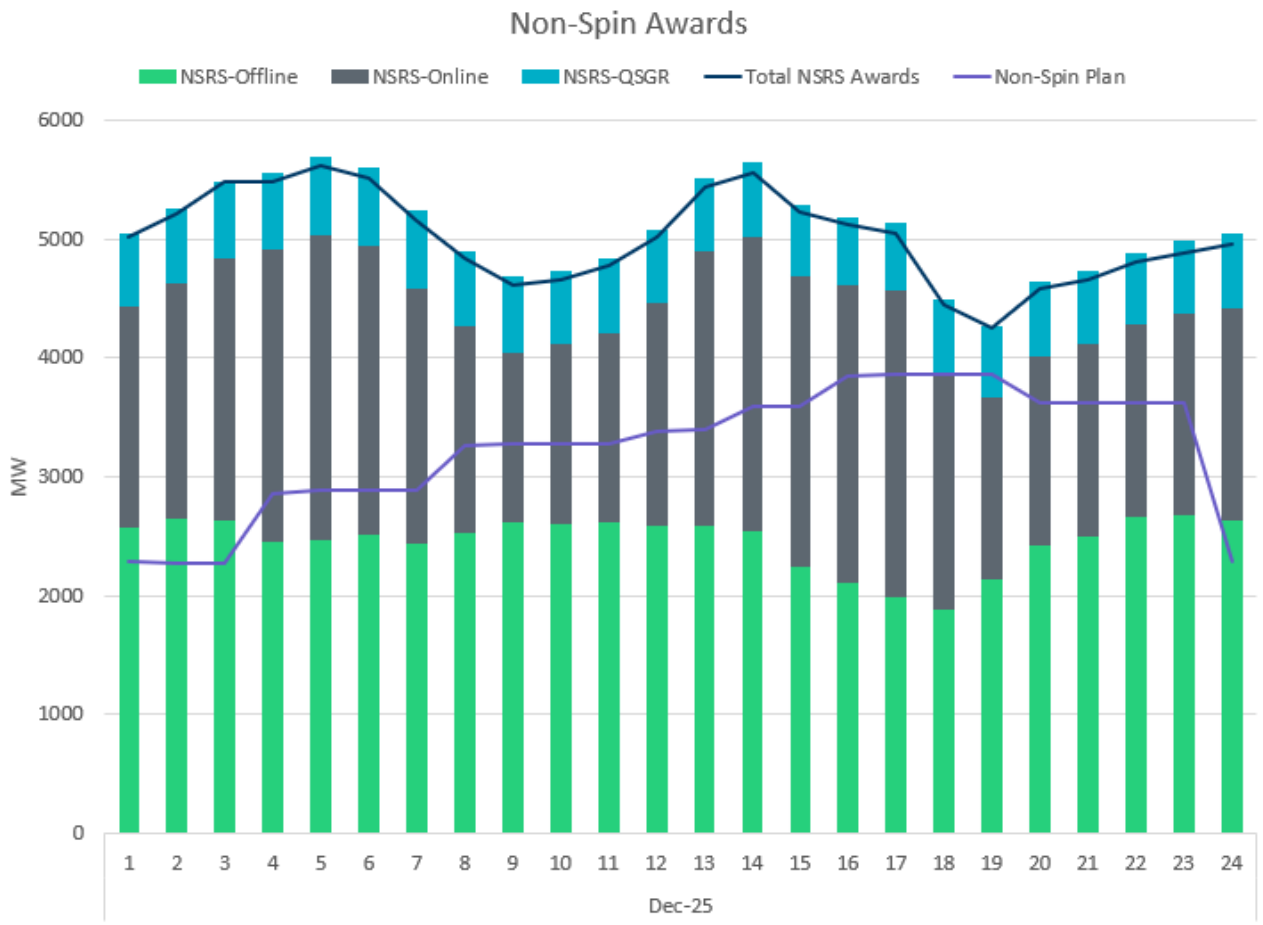
Non-Spinning Reserve Service (Non-Spin) Deployments for Nov – Dec 2025 Cont.



Data shown is from Dec 5th to Dec 31st 2025.

Key Takeaway: With the implementation of RTC Non-Spinning Reserve Service can be procured above the plan.

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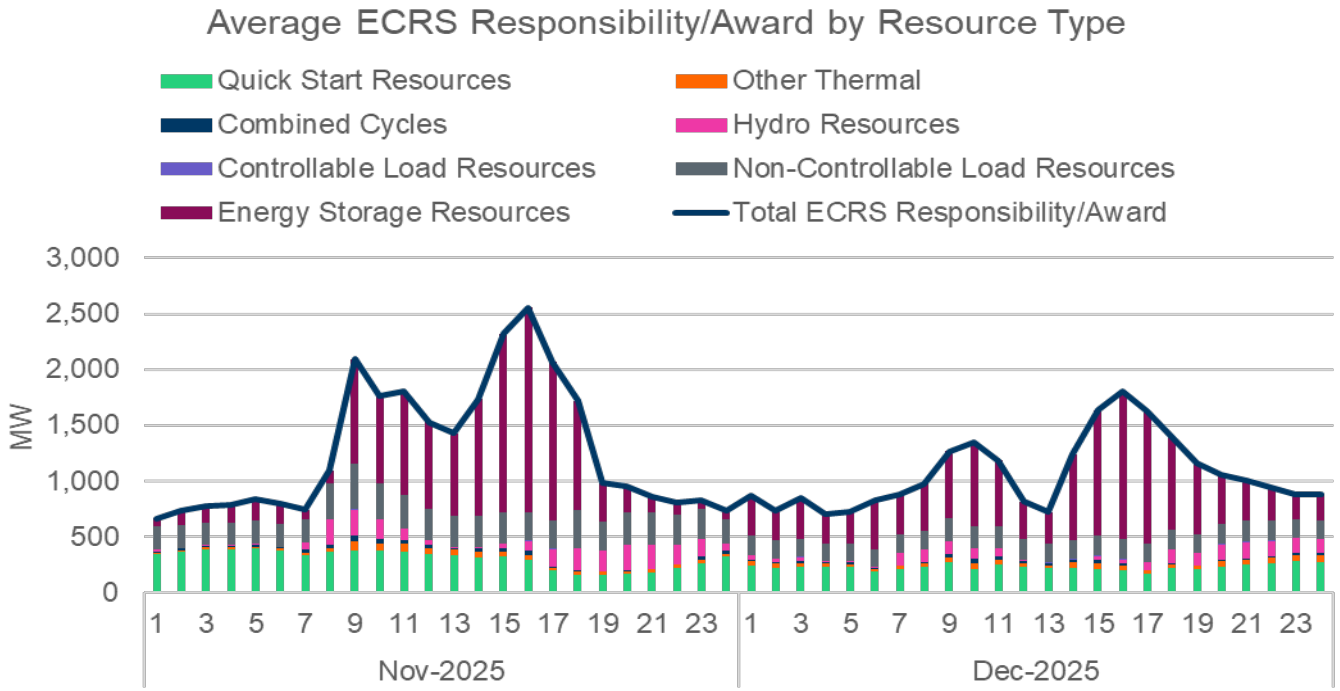
ERCOT Contingency Reserve Service (ECRS) Release for Nov-Dec 2025

From Nov to Dec 2025, there were no events that resulted in the release of SCED dispatchable ECRS.

With the implementation of RTC+B, ECRS is no longer released to SCED.

Deployment Start Time	Deployment Duration	Maximum SCED Dispatchable MW Released	Reason
N/A	N/A	N/A	N/A



Key Takeaway: There were no events that resulted in events that triggered ECRS deployments.

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Responsive Reserve Service (RRS) Released for November - December 2025

From November to December 2025, there was no manual release of RRS.

With the implementation of RTC+B, RRS is no longer manually released to SCED.

Key Takeaway: There was no manual RRS release from November-December 2025.

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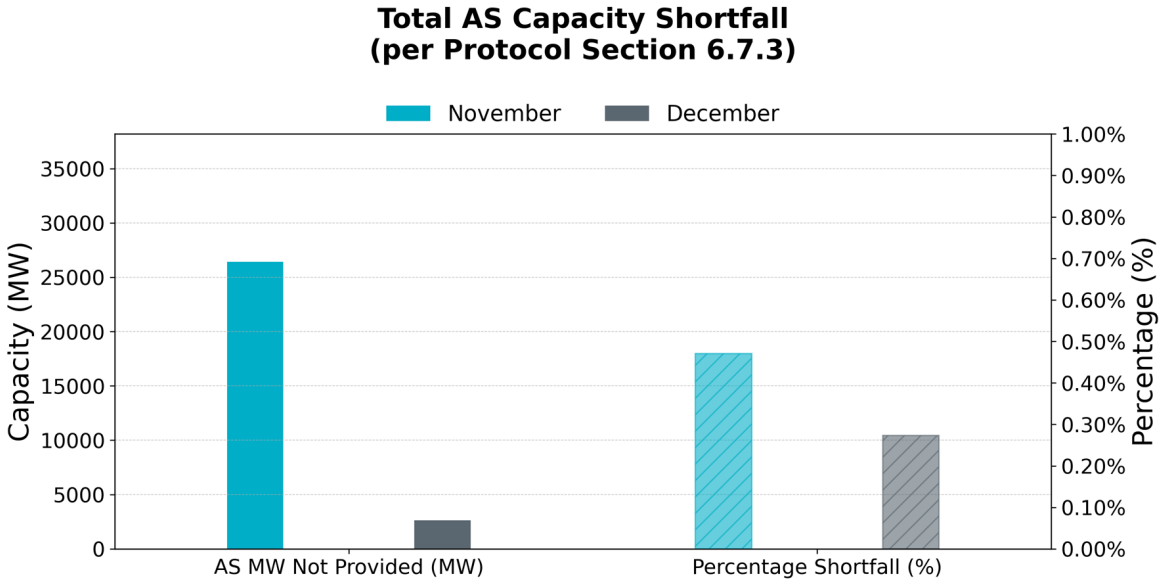
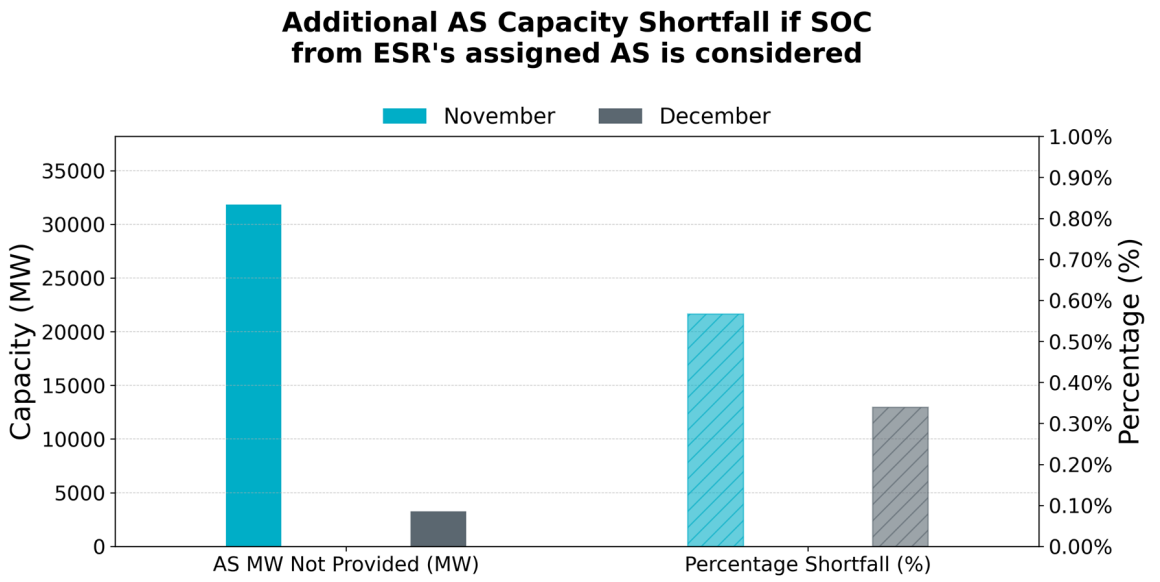
AS MW Shortfall Analysis





Key Takeaway(s): This slide will be deprecated post-RTC as SOC is now an input to SCED when awarding AS. November and December 1-5th data will be the last data reported as RTC-cutover occurred on 12/5/2025.

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2025 Year-to-Date (YTD) Event Analysis Summary

Event Type	Number of Events (2025)	Number of Events (Nov-Dec 2025)
NERC Reportable by ERCOT*	0	0
Inverter Based Resource (IBR) Ride-Through Events	12	0
Large Load Ride-Through Events	12	2
Large Load Oscillation Events	1	0
IBR Oscillation Events	24	4
IBR Large MW Change Events (no fault associated)	39	8
Miscellaneous (transmission or telemetry event)	4	0

Key Takeaway: The Event Analysis team investigates each event to keep the system reliable and prevent reoccurring issues.

*Meeting the criteria for NERC's Electric Reliability Organization Event Analysis Process and requiring ERCOT to submit a report.

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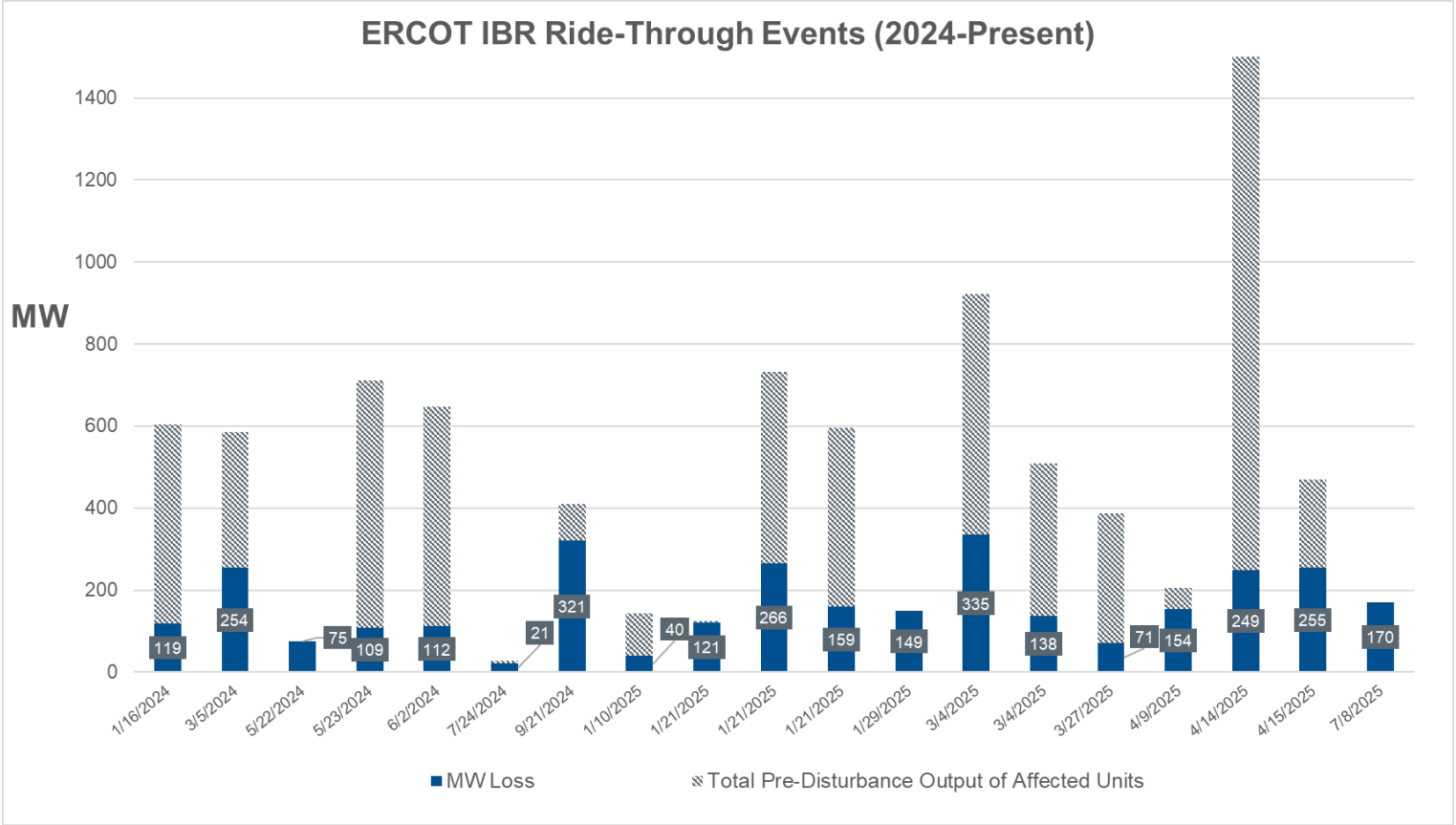
IBR Ride-Through Events



Key Takeaway: ERCOT continues to have IBR ride-through events, although the magnitude of events has remained below 500 MW. The most common cause of ride-through failure has been individual turbines tripping on a variety of different fault codes such as UPS failure, crowbar circuit failure, vibration sensors, etc. Also, improper frequency measurements during fault events have caused Power Plant Controllers to inhibit proper ride-through operation of turbines and inverters.

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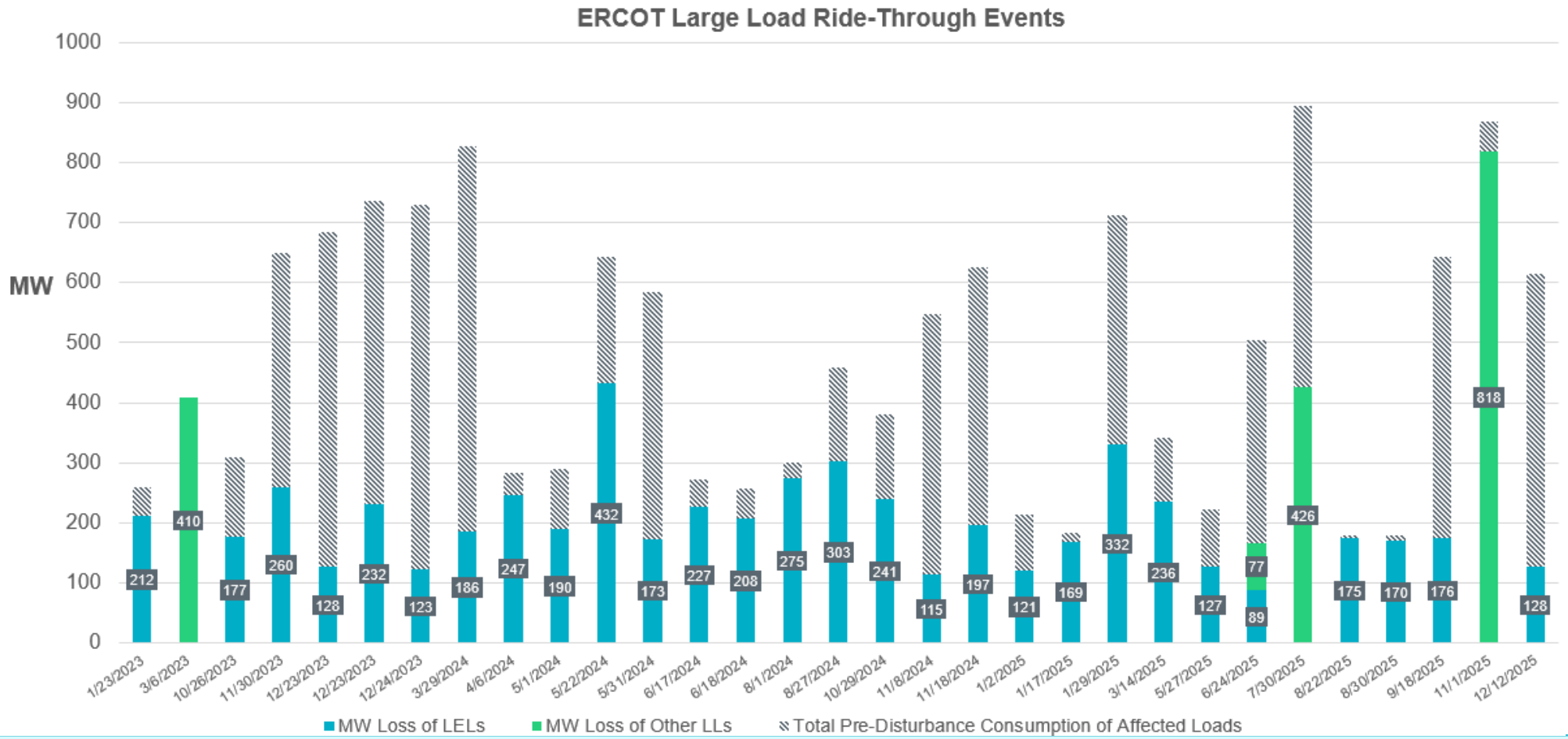
Large Load Ride-Through Events



Key Takeaway: Large Electronic Loads reduce consumption quickly when system faults occur in their area. The magnitude and frequency of these events will likely increase as more of these types of loads are connected to the system, especially when they are concentrated in an area.