Cold Weather Operations
December 12–16, 2025

Operating Committee
January 8, 2025

Operations Update

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3	Unit Commitment
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Key Takeaways for Operations

Instantaneous Peak Load 136,467 MW – December 15 @ 08:20

Successes

- Sufficient generation to cover reserves, serve load and exports.
- Advanced coordination with neighbors

Challenges

- Load forecasting (modeling) considering first cold weather event
- Actual temperatures coming in lower than forecasted
- Emission limitations of generators and notification to PJM

Emergency Procedures

Cold Weather Alert – ComEd Zone

Dec. 13, 2025, 00:01 through Dec. 13, 2025, 23:59 (issued Dec. 11, 2025)

Cold Weather Alert – Western Region

Dec. 14, 2025, 00:01 through Dec. 15, 2025, 23:59 (issued Dec. 11, 2025)

Unit Commitment

Risk-based scheduling approach – Unit startup and operating risk, natural gas availability	PJM projected adequate generation availability to meet electric demand, reserve requirements and interchange schedules leading up to cold weather period. Minimal at-risk megawatts associated with Cold Weather Operating Limitations.
Reliability cases were conducted, and units were committed for reliability based on anticipated congestion and capacity projections.	
No advanced commitment to gas only resources, CTs & steam units	• Strategically staffed CT sites to support start up success rate • CTs were surveyed for fuel availability – value in having fuel status.

Cold Weather Operating Limits

PJM collects Operating Limit and Startup temperatures yearly as part of the Cold Weather Preparation Checklist.

Operating Limit

Ambient temperature that the plant designed to reliably operate down to. Considering all plant systems, components, controls, electrical, mechanical and water systems, including switchyard equipment owned by the Generating Facility

Startup Temp

Minimum temperature at which the plant could start reliably while shut down and in a cold state

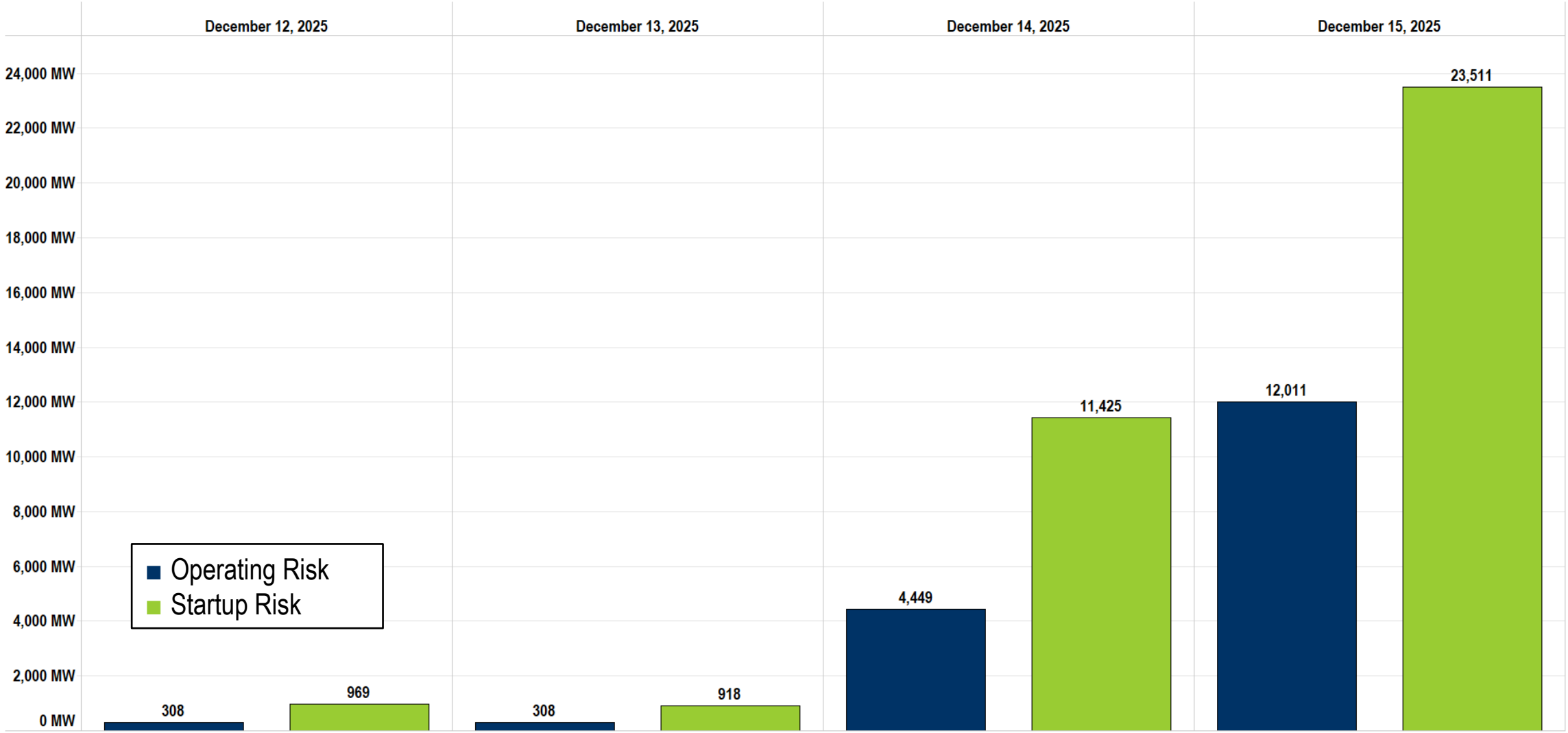
Data is analyzed and passed to PJM Dispatch to inform operations planning and situational awareness.

Manual 14D Section 6.3.4: Other Requirements

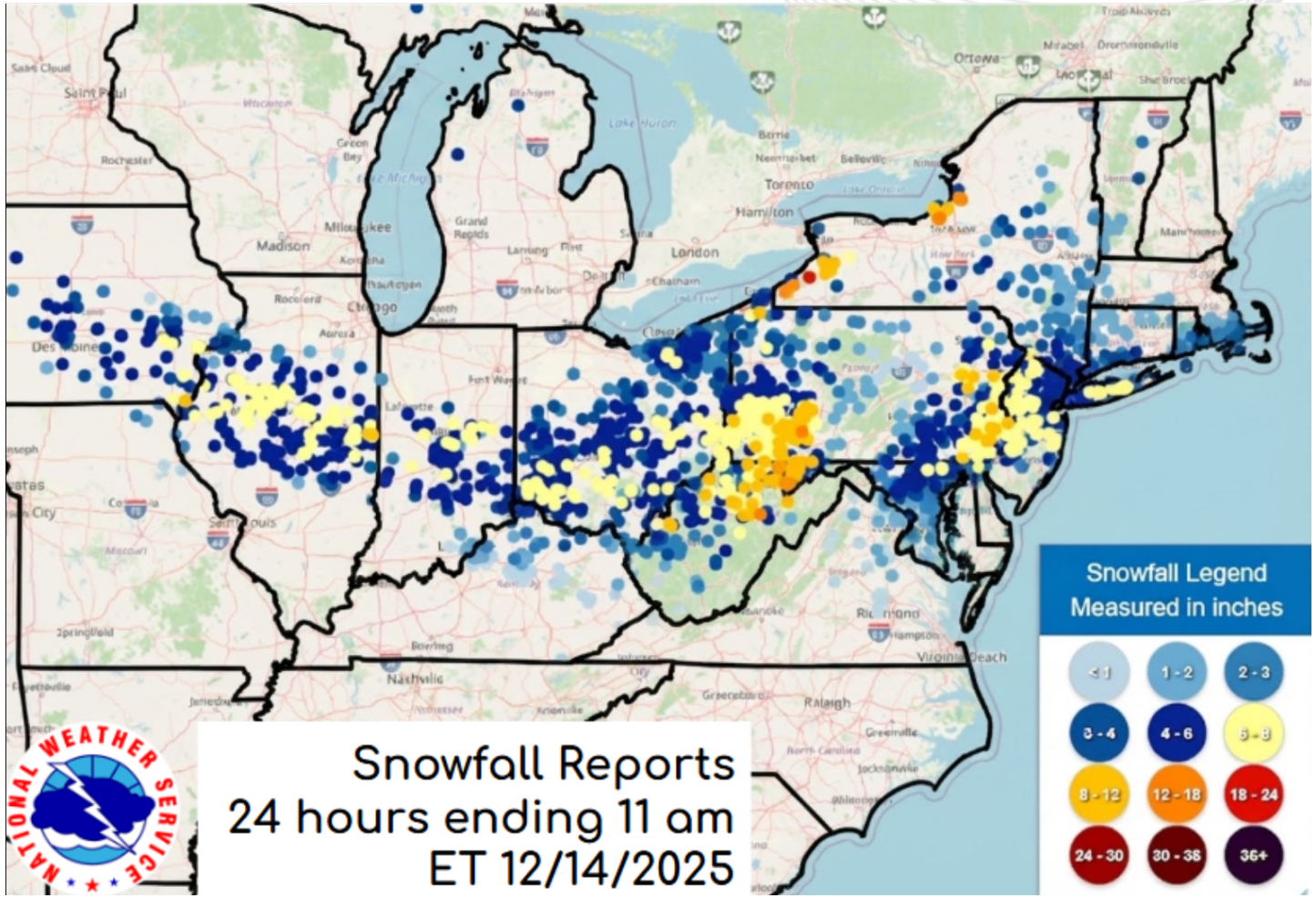
> Prior to entering commercial operations, and upon any material change affecting cold weather operating limits, all Generating Facilities must provide PJM with design data specific to cold weather. This includes, but is not limited to, the lowest temperature the facility is designed to operate reliably down to, and any procedural or contractual limits that require action when outside temperature reaches a specific low temperature. Additional data is required from inverter based resources.

Aggregated CWOL Data

Cold Weather Operating Risk

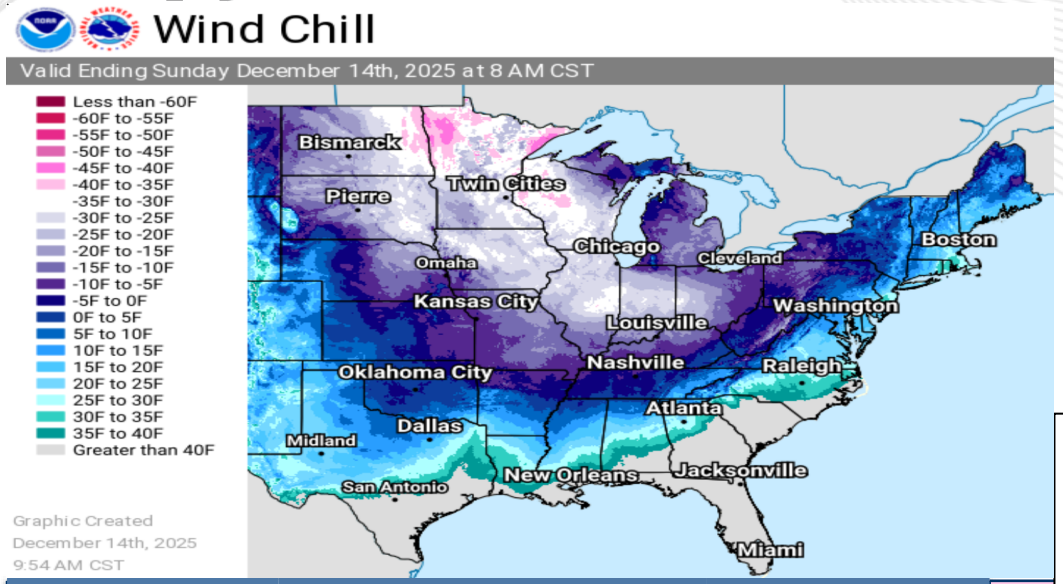


Snowstorm Dec. 13–14, 2025



- Swath of snow across the middle of the RTO
- Heaviest in Appalachians where over 12” fell
- Several inches of snow in portions of Mid-Atlantic Region
- Snowiest start to winter in over 5 years in portions of East
- Snowiest December in Ohio Valley in 15–25 years
- As much or more snow has fallen then entire last winter in portions of COMED

Temperatures – Dec. 12–16, 2025



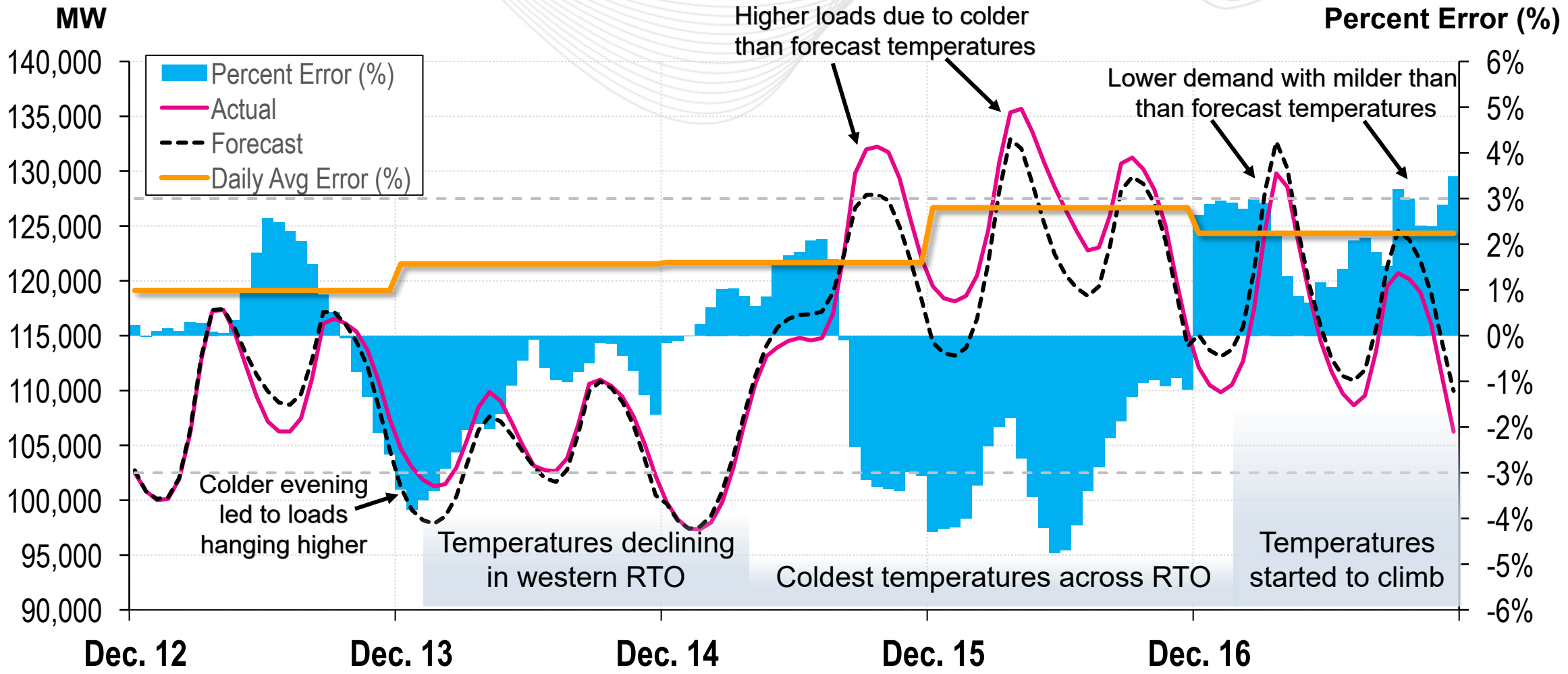
On Dec. 14: Temperatures fell from west to east as cold air moved in behind snow.

On Dec. 15: Coldest in RTO

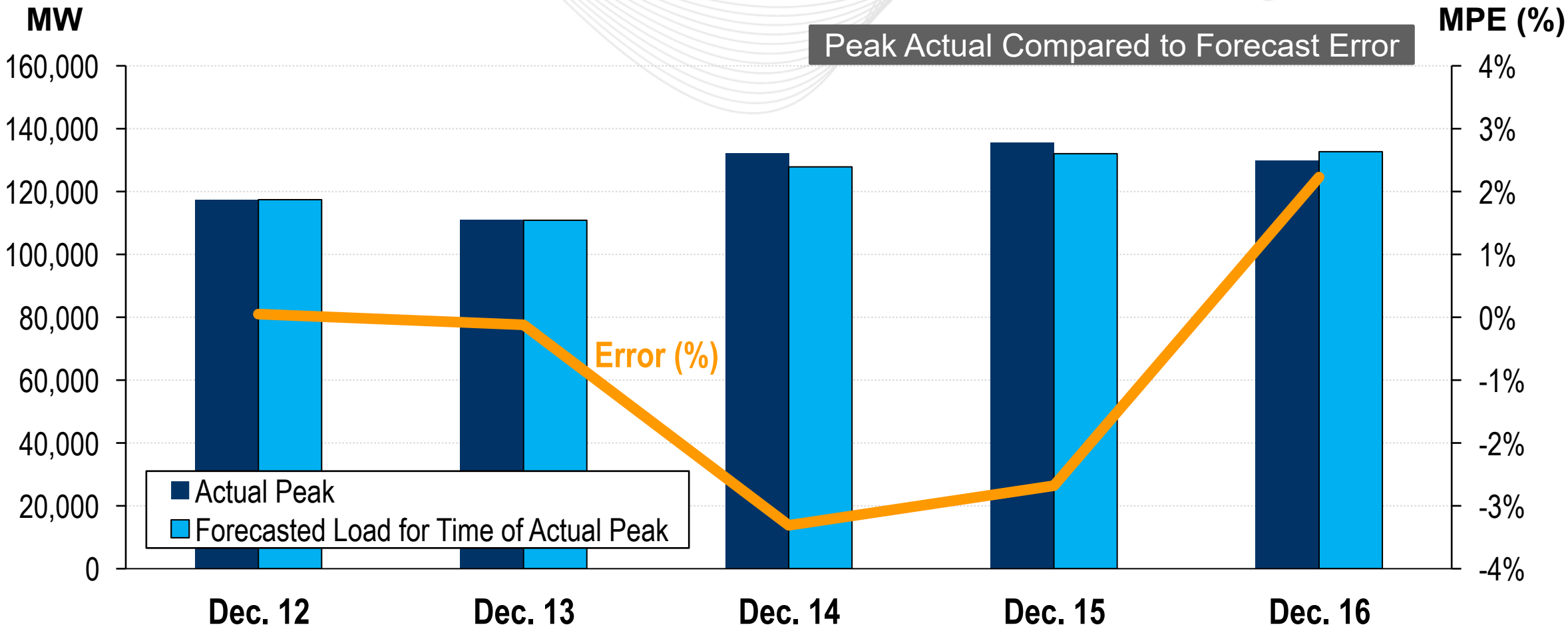
From Dec. 13–14: Snow pushed across RTO.

Winter Storm Elliott Dec. 23–26, 2022			Jan. 18–23, 2025, Cold Wave		Dec. 12–16, 2025, Cold Wave	
Cities	Coldest Air Temperature	Coldest Wind Chill	Coldest Air Temperature	Coldest Wind Chill	Coldest Air Temperature	Coldest Wind Chill
Chicago	-8°F	-35°F	-8°F	-29°F	-2°F	-21°F
Columbus	-7°F	-34°F	-3°F	-18°F	1°F	-17°F
Louisville	-5°F	-31°F	4°F	-12°F	5°F	-12°F
Philadelphia	7°F	-14°F	10°F	-6°F	19°F	6°F
Richmond	8°F	-11°F	9°F	2°F	15°F	3°F

Forecast Performance During December Cold Wave



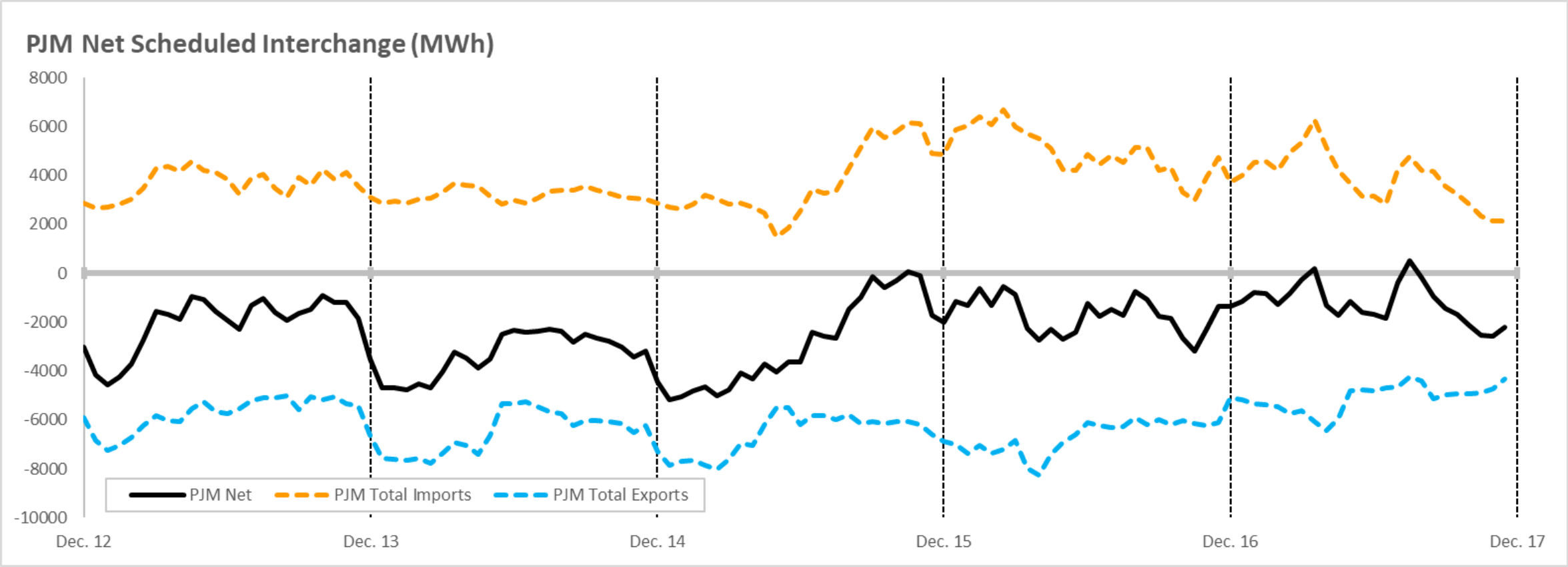
Forecast Error Trend for Dec. 12–16, 2025



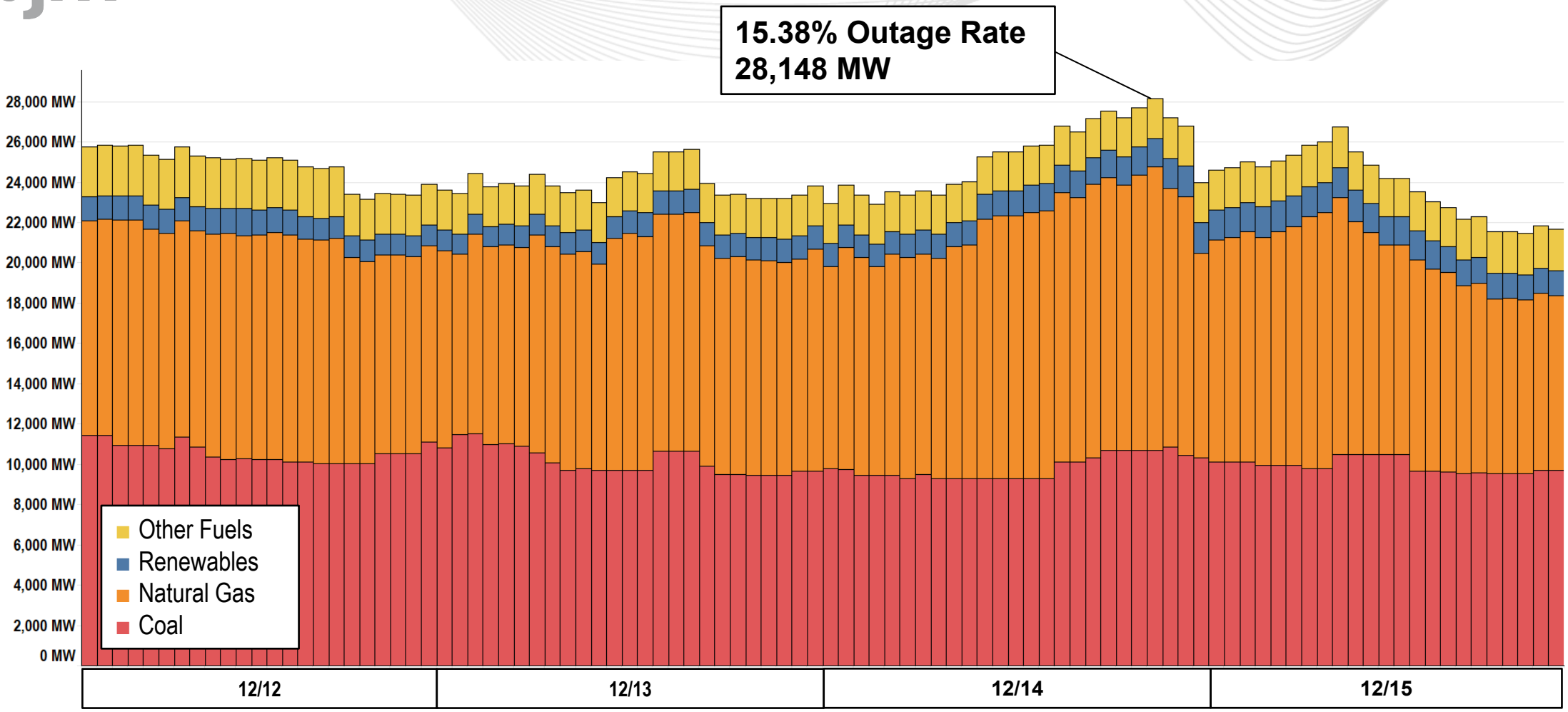
Peak Loads and Daily Low Temperatures and Effective Temperatures

		2014		2015	2019	2022		2024	2025 (January)					2025 (December)				
		1/7	1/8	2/20	1/31	12/23	12/24	1/17	1/15	1/20	1/21	1/22	1/23	12/12	12/13	12/14	12/15	12/16
Chicago, IL (ORD)	*Temp.*	-11	-6	-6	-21	-8	-1	3	5	-2	-8	0	11	21	4	-2	3	17
	Eff. Temp.	-23	-6	-10	-29	-26	-16	-9	1	-8	-19	-12	6	18	-3	-12	-5	16
Columbus, OH (CMH)	*Temp.*	-7	11	-7	-4	-7	-1	7	4	3	-1	-3	15	27	18	4	1	11
	Eff. Temp.	-24	7	-11	-8	-24	-13	-1	0	-5	-8	-7	12	25	12	-5	-3	9
Pittsburgh, PA (PIT)	*Temp.*	-9	2	-9	-5	-5	-3	8	9	5	-1	-7	10	19	22	11	6	12
	Eff. Temp.	-20	-2	-12	-11	-24	-16	0	5	1	-4	-7	7	18	18	2	2	11
Philadelphia, PA (PHL)	*Temp.*	4	10	2	6	9	8	14	22	14	10	11	12	26	26	21	19	20
	Eff. Temp.	-10	4	-8	-2	-8	-5	9	14	9	5	2	11	23	26	14	14	20
Washington, DC (DCA)	*Temp.*	7	14	6	10	14	9	16	23	17	16	15	15	31	29	19	18	24
	Eff. Temp.	-2	10	0	5	7	4	13	18	11	10	8	13	30	29	9	11	24
Richmond, VA (RIC)	*Temp.*	10	13	5	13	15	8	15	21	18	13	16	10	27	27	19	15	22
	Eff. Temp.	1	10	0	12	6	-3	14	18	15	10	11	8	27	26	9	10	21
RTO Load-Weighted Average	*Temp.*	-1	8	-2	0	5	4	10	13	10	7	5	15	26	26	13	11	18
	Eff. Temp.	-11	5	-7	-5	-7	-7	5	9	5	2	0	12	24	23	7	6	16
RTO Peak Load (GW)		143.0	134.6	143.4	138.1	134.7	128.6	133.6	129.9	133.1	139.2	143.7	138.8	117.4	111.0	132.2	135.7	129.8

PJM Net Schedule Interchange

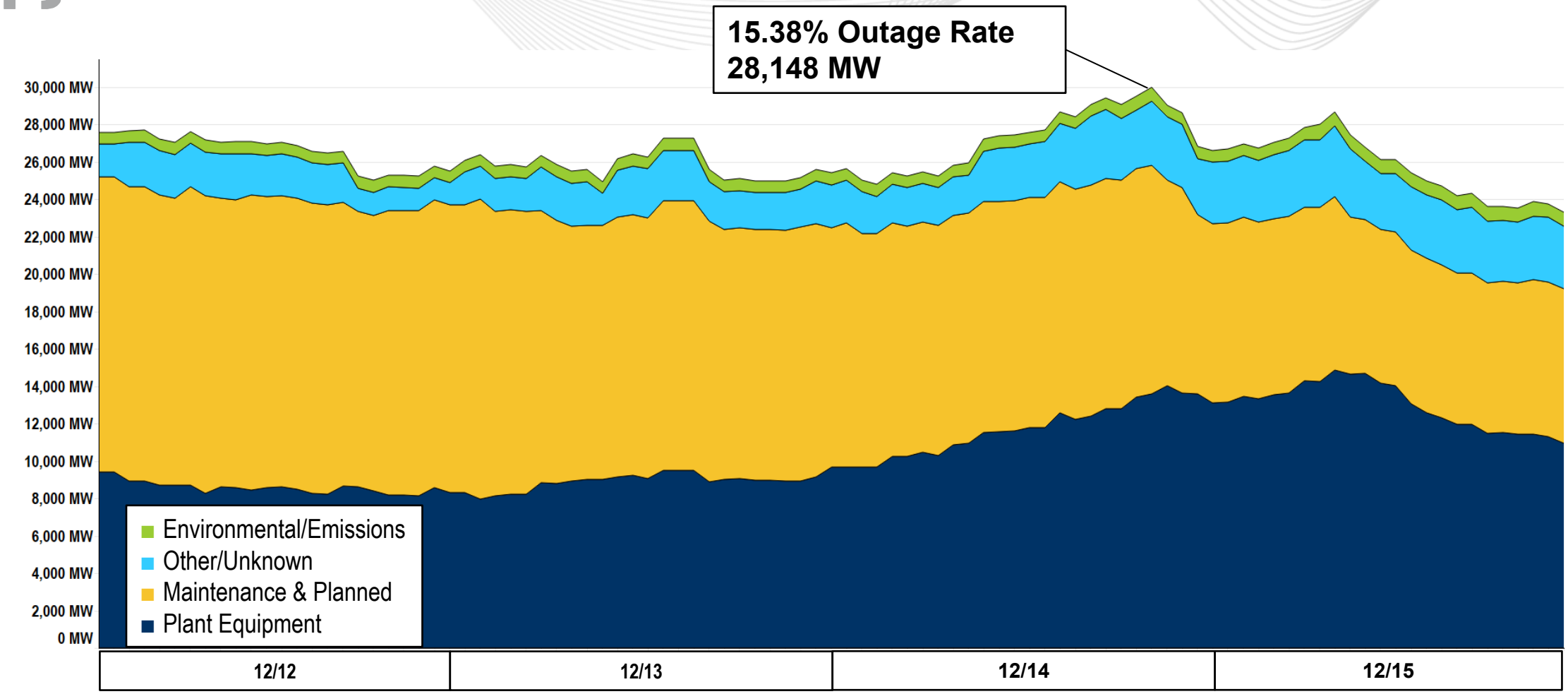


Generation Performance



Note: Outage data shown is collected from eDART and considered preliminary.

Generation Performance



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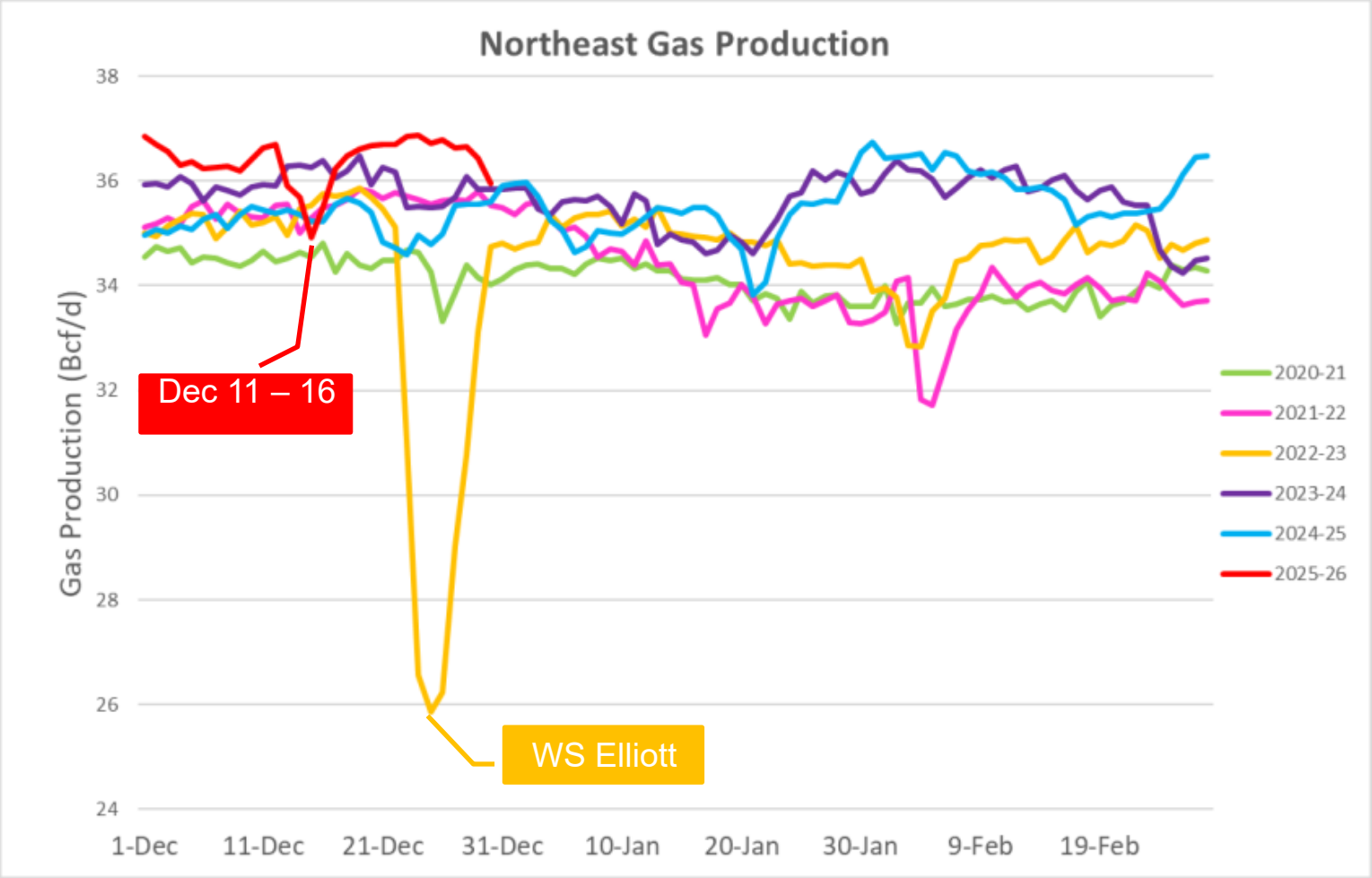
Key Takeaways on Gas Delivery Performance

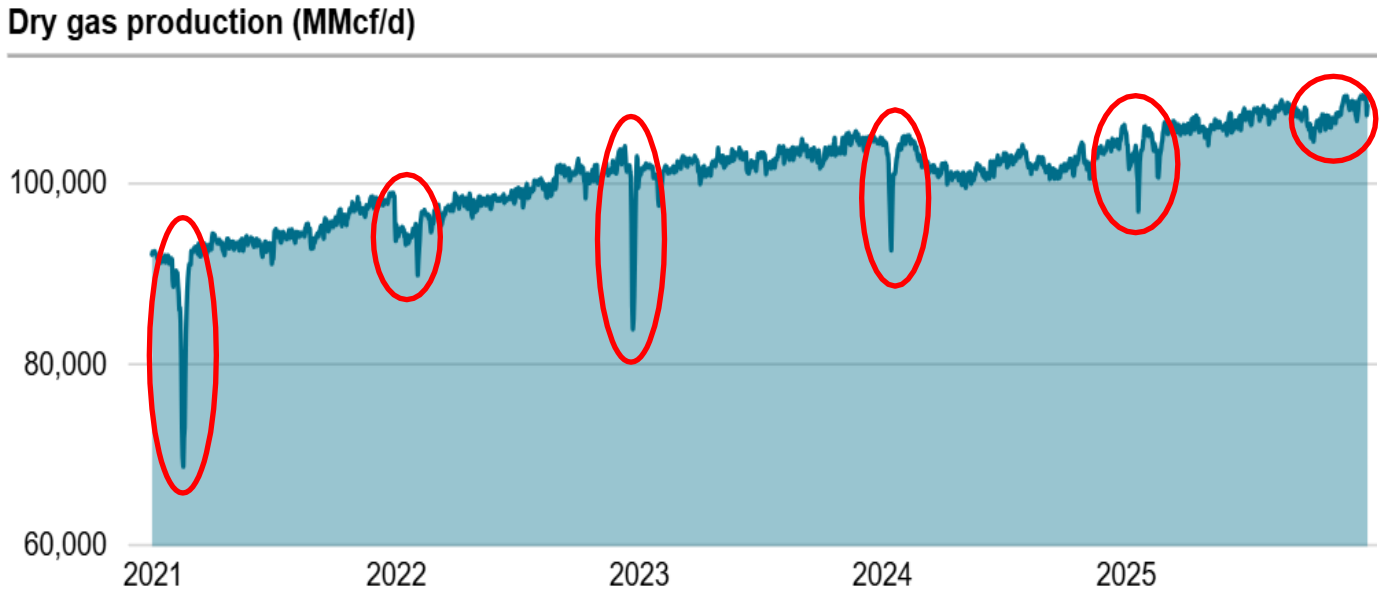
Interstate Pipelines	Local Gas Distribution Companies	Gas Production	Gas Availability/ Liquidity	Gas Prices
• Overall strong performance under high utilization rates • Hourly and daily capacity restrictions in place through the cold period requiring generators to maintain daily gas imbalances within specific tolerance levels and not be short supply	• Very minimal interruption notices called by LDCs. • Approximately 300 MW of gas-only CTs interrupted during this period.	• Production remained strong with minimal losses associated with colder conditions. • ~ 1.5 bcf/day (4%) decline in daily production in Appalachian region — For reference, ~11 bcf/day decline during WS Elliott	• Well forecasted demand, generator preparation and ample gas supply during the weekend period helped to mitigate gas liquidity issues.	• Spot gas prices remained relatively low during this period with average daily prices generally below $15/mmbtu across the PJM footprint

Regional Gas Production - Northeast



- Gas production remained strong during recent cold weather event with a brief 4% decline
- For comparison, Northeast gas production dropped ~11 Bcf/d during Winter Storm Elliott
- General consensus is that the upstream gas sector (producers, gatherers, and processors) have ramped up their winter preparedness and equipment winterization efforts since Winter Storm Elliott, mitigating large production losses.

Total U.S. Gas Production

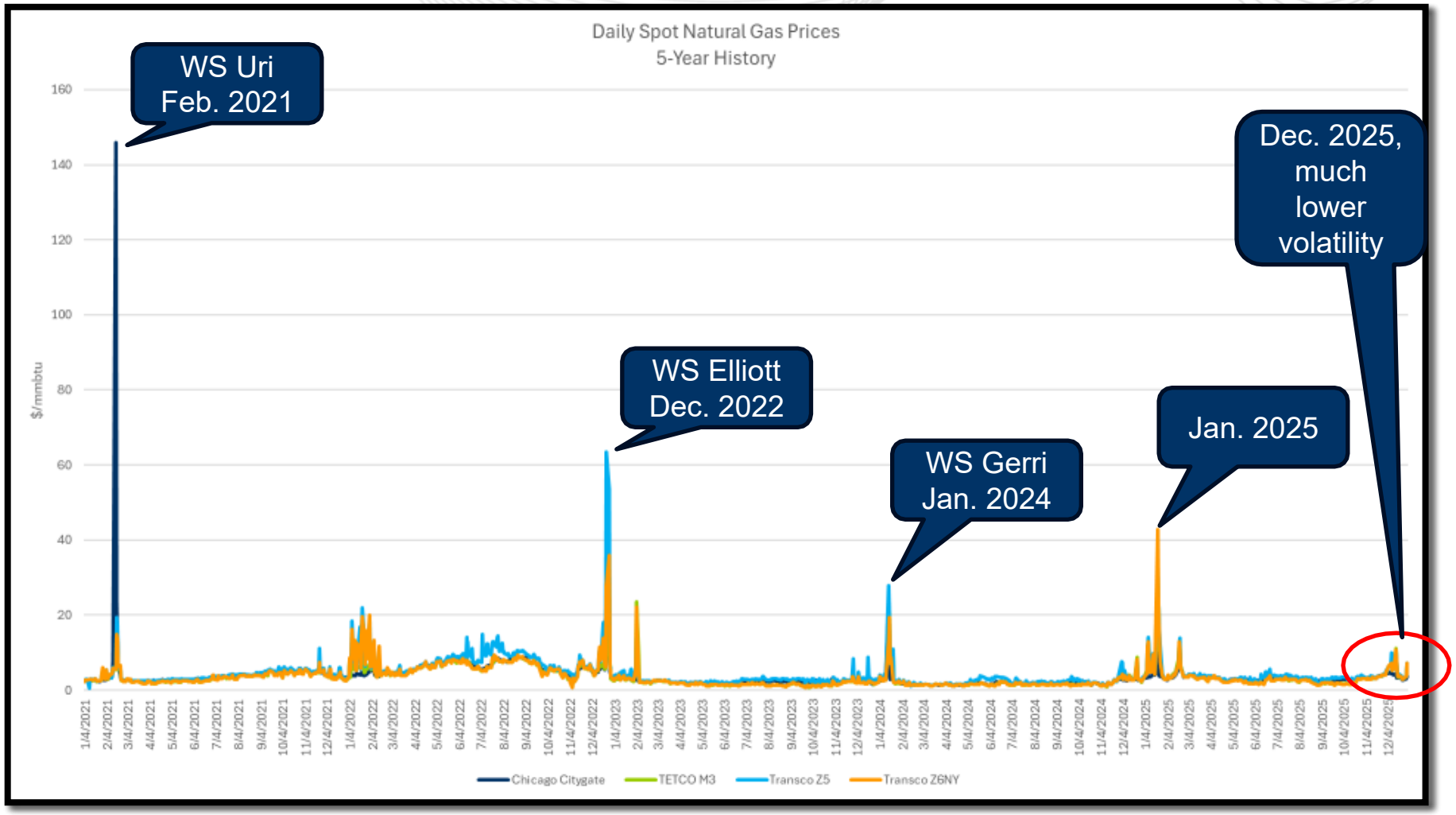


Winter gas production losses trending down favorably since Elliott and Uri

Overall gas production continues to increase

Total U.S. production declined less than 2% during December 2025 cold peak

Average Daily Spot Natural Gas Prices at Select PJM Gas Hubs



New Informational Features Employed for Winter 25/26

Markets Gateway Update	***Effective 10/1/25*** • In compliance with NERC TOP-002-5 • New field in Unit Limitations for gas generators to provide indication of gas supply concerns during Cold Weather Advisories and Alerts • A number of generators exercised the use of this field during the cold period
eDART Cause Codes	***Effective 12/1/25*** • Four new cause codes to better identify root cause of gas-related outages

Outage Coordination

Transmission Outage Coordination

- PJM held an SOS-T call on 12/12 to discuss projected conditions and transmission outage scheduling.
- PJM and Transmission Owners coordinated to reschedule transmission outages causing significant congestion.
- Transmission Owners proactively rescheduled outages of lesser impact to minimize risk.

Transmission Performance

- Transmission system performance was good
- Issued 30 PCLLRWs
  - Local thermal and voltage
  - List of December PCLLRWs found here:

    20260105-item-04---december-2025-operations-summary.pdf

Transmission Performance

Transmission Performance

Generation Deliverability

- East Waynesboro – Ringgold 138 kV line loss of Reid – Antrim (sectionalized) 138 kV line (Thermal)
  - Localized congestion
  - Helpful generation impacted by emissions limitations
  - Explored options to request approval of a 202c

Transmission Performance

Transmission Performance

Generation Deliverability

- High flows across the AEP/DOM Transfer Interface and AP-South Transfer
  - High demand in BGE, PEPCO and Dominion Zones
  - Interchange to Balancing Authorities south of PJM
- Exhausted non-cost options
- Utilized off-cost operation

Contact

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