



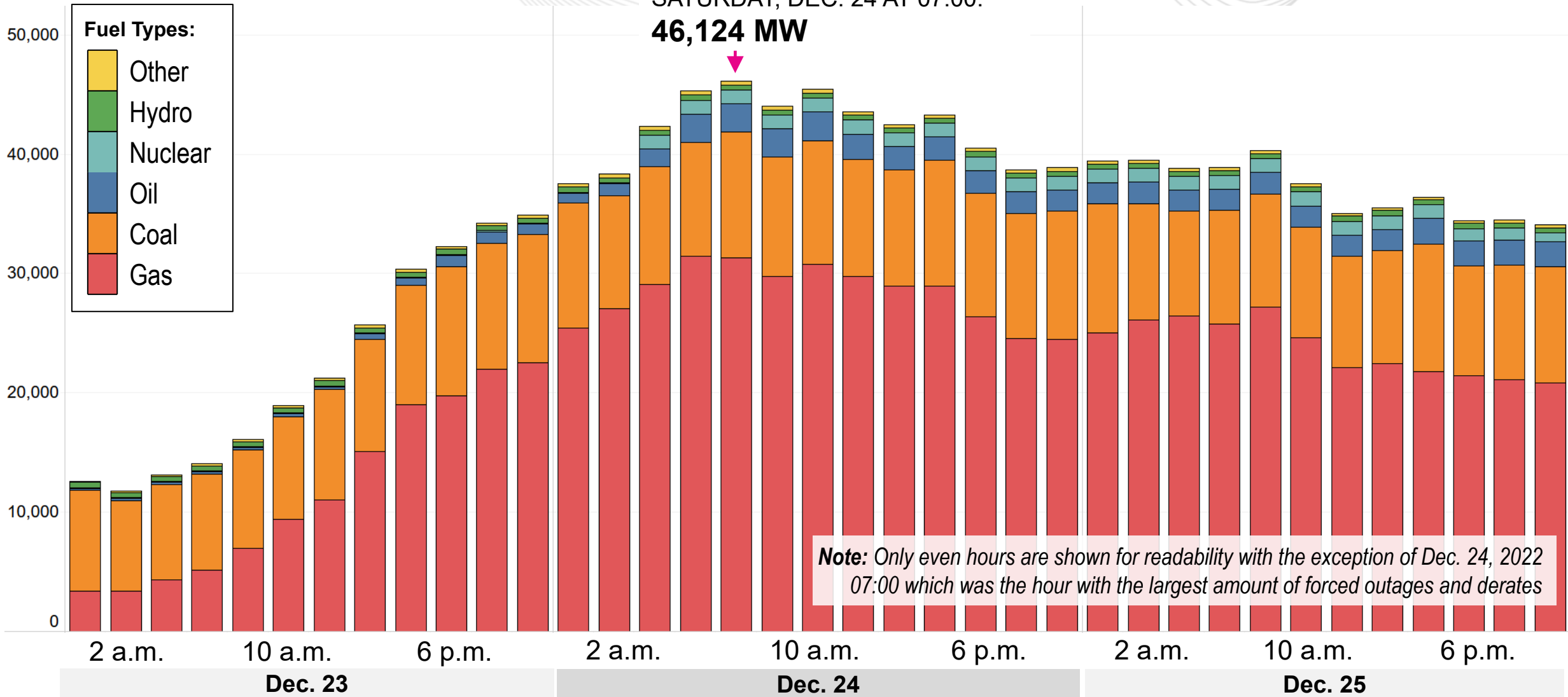
Winter Storm Elliott Natural Gas Fuel Supply Issues

Brian Fitzpatrick
Principal Fuel Supply Strategist
Operating Committee
April 13, 2023

Forced Outages/Derates by Fuel Type

SATURDAY, DEC. 24 AT 07:00:

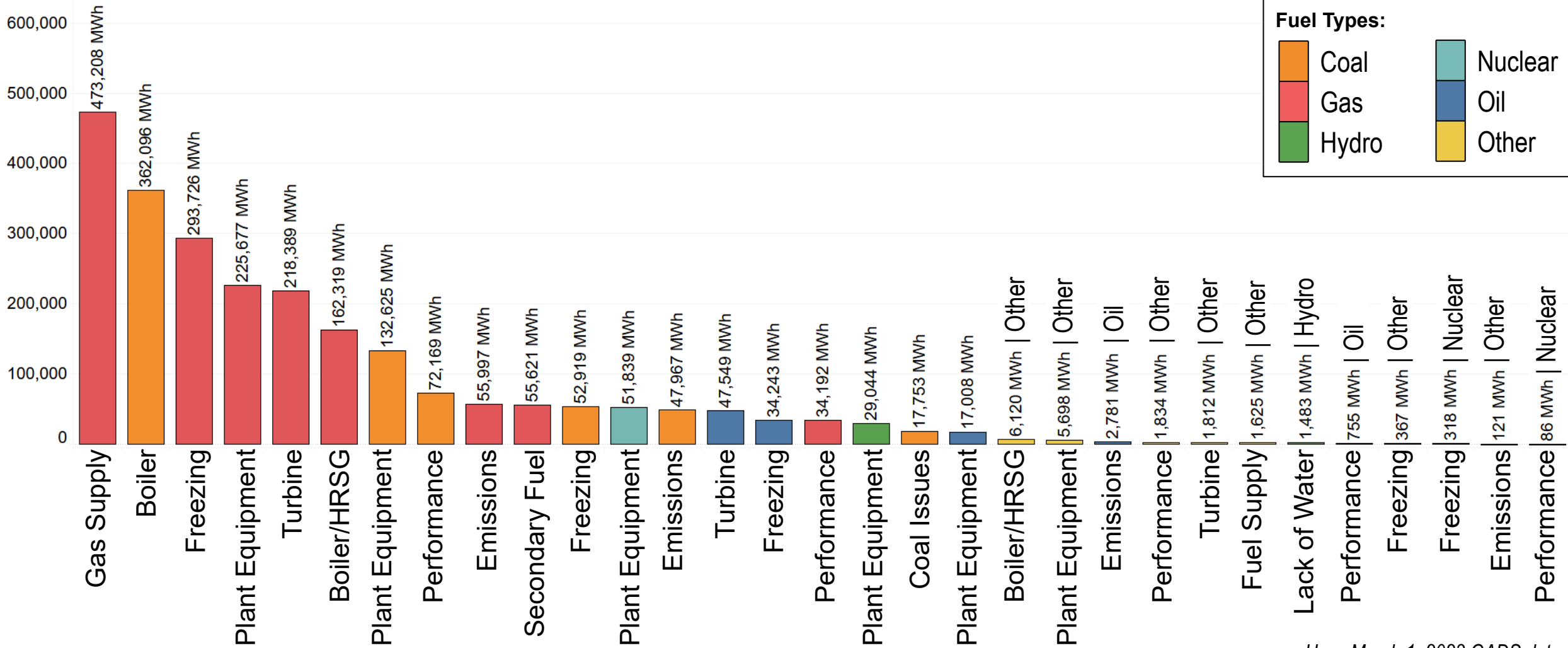
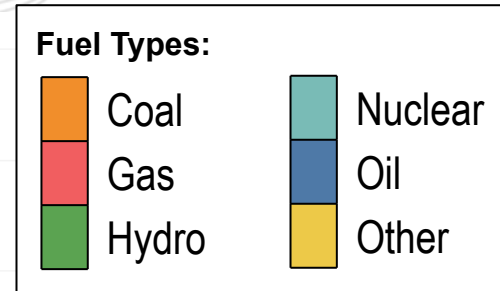
46,124 MW



Note: Only even hours are shown for readability with the exception of Dec. 24, 2022 07:00 which was the hour with the largest amount of forced outages and derates



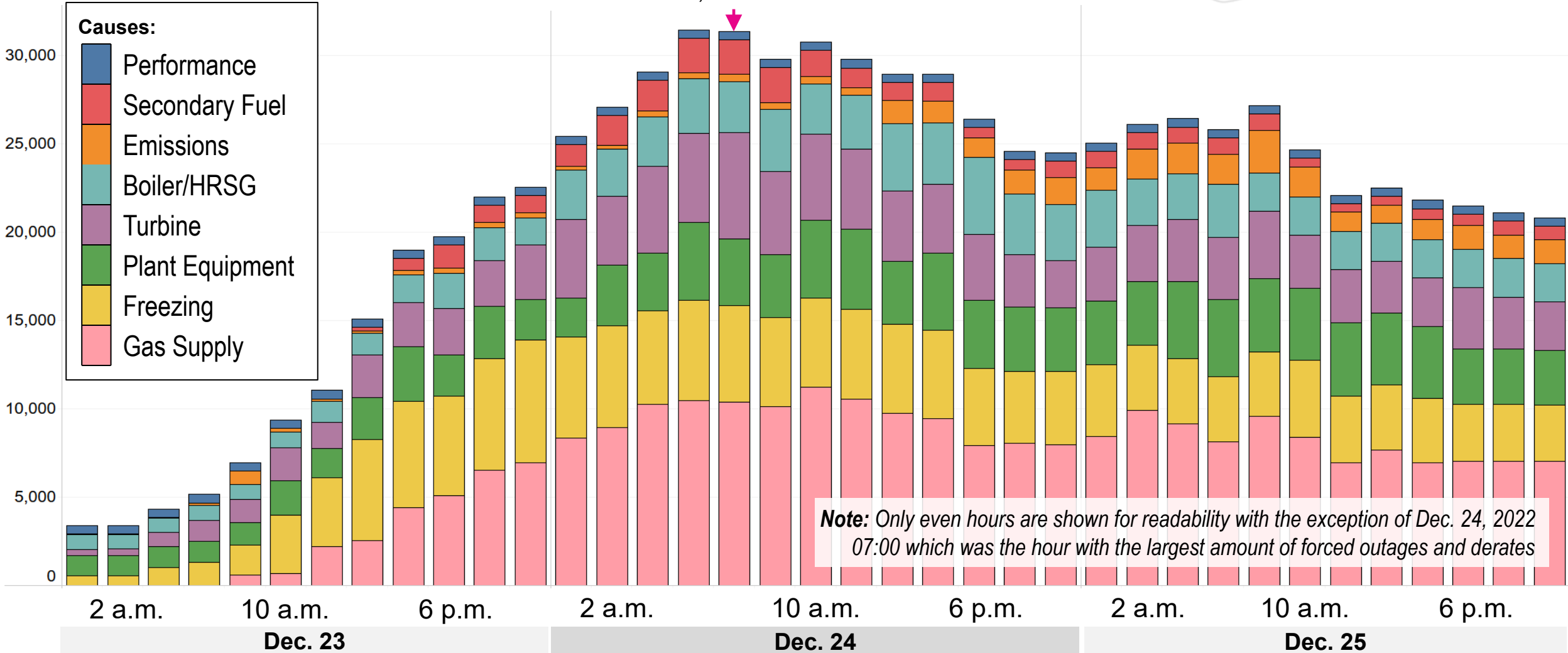
Forced MWh by Fuel Type and Cause



Uses March 1, 2023 GADS data

Gas – Forced Outages/Derates by Cause

SATURDAY, DEC. 24 AT 07:00



Note: Only even hours are shown for readability with the exception of Dec. 24, 2022 07:00 which was the hour with the largest amount of forced outages and derates

Uses March 1, 2023 GADS data

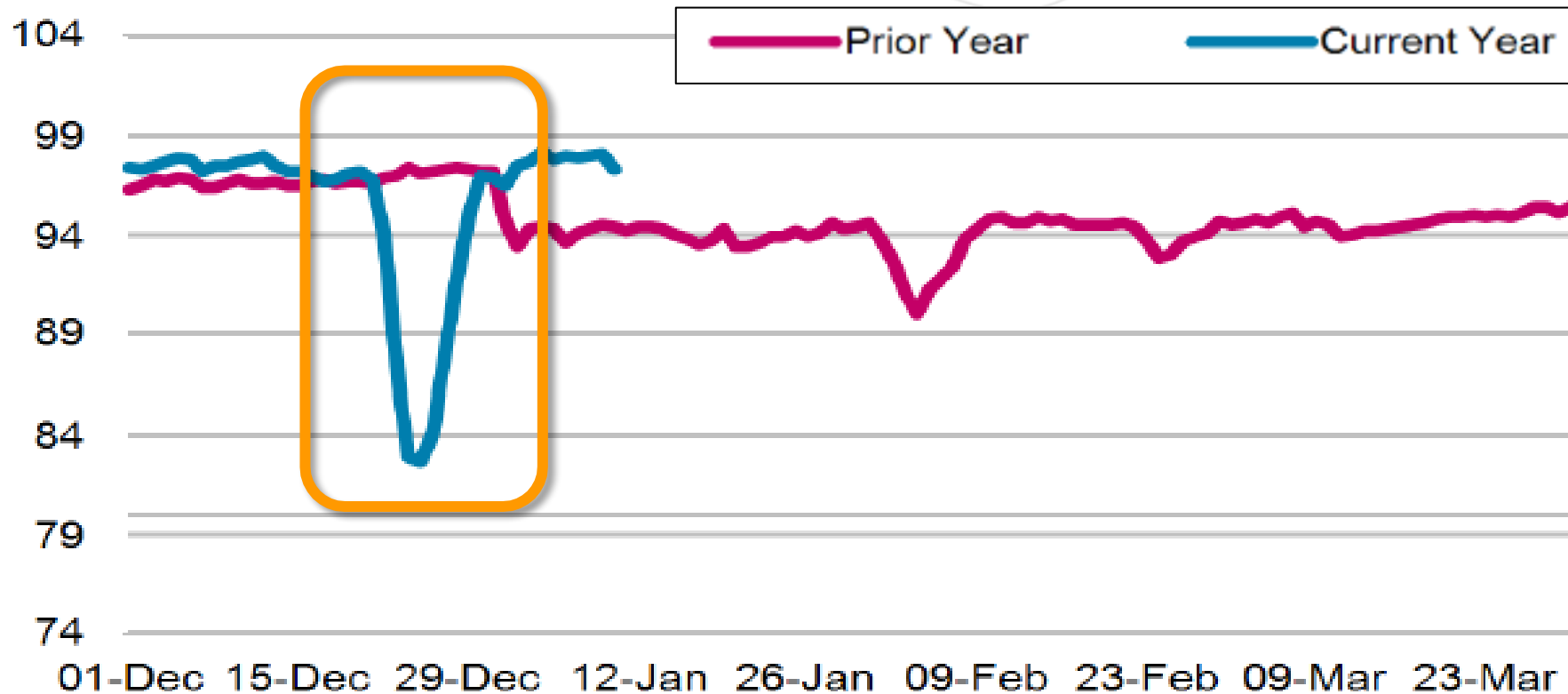


Pipeline Operating Conditions

INTERSTATE / INTRASTATE PIPELINE	December																	
	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Adelphia Gateway									4									
ANR		5				6												
BHE EGTS	1 2									7								
BHE Cove Point						2					7							
Columbia Gas Transmission	3		2 7															
Eastern Shore										7								
East Tennessee Natural Gas		7										9						
Horizon						2												
NGPL						2						9						
Northern Border			1								7							
Panhandle Eastern											8 Force Majeure - Upstream Supply Loss							
Tennessee Gas Pipeline										7								
Texas Eastern				7					7			8 Force Majeure - Loss of multiple compressor stations						
Texas Gas											9							
Transco						7												
Vector											9							

	Pipeline Notice
1	Restrictions on Non-Firm Contracts Customers with interruptible transportation contracts at higher risk of not being able to schedule adequate pipeline capacity
2	Ratable Take Requirement Pipeline requiring customers to supply and burn gas at uniform hourly rates to avoid excessive pressure fluctuations
3	Critical Day (Transport Deliveries/Storage Withdrawals) Pipeline requiring customers to stay within their transportation and storage contractual requirements
4	Action Alert (Daily Balancing) Requires customers to ensure that their supply and demand is balanced at the end of each 24 hour gas day within the tolerances provided by the pipeline tariff provisions
5	Phase 1 Cold Weather Advisory Alerting customers of pending cold temperatures and tightening system conditions
6	Phase 2 Cold Weather Extreme Conditions Requires customers to abide by their specific contract and rate provisions and to burn gas on a uniform hourly basis as their contracts direct. Interruptible contracts at greater risk of having service cut
7	Daily Balancing OFO Requires customers to ensure that their supply and demand is balanced at the end of each 24 hour gas day within the tolerances provided by the pipeline tariff provisions
8	Force Majeure Declared when there is an event outside of the pipeline's control occurs which may render service unavailable to certain customers regardless of contractual arrangements (ex. Loss of compressor station)
9	Loss of Upstream Supply As a result of less gas coming into the pipeline due to upstream supply failures, pipelines provide notice that risk of downstream pressure loss and customer nomination cuts are increasing.

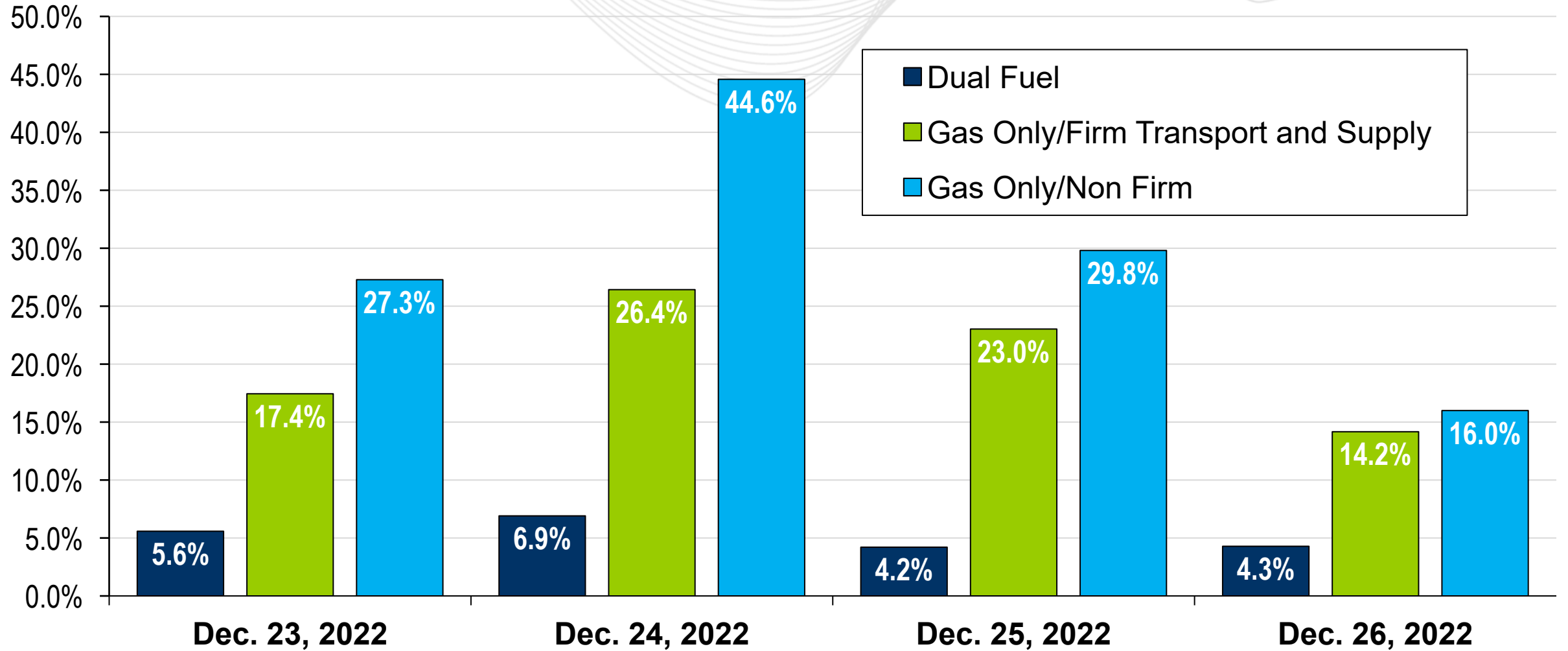
U.S. Dry Gas Production (Bcf/d)



**Well
Freeze Offs**
~20%
Production Loss
Dec. 23 – 26, 2022



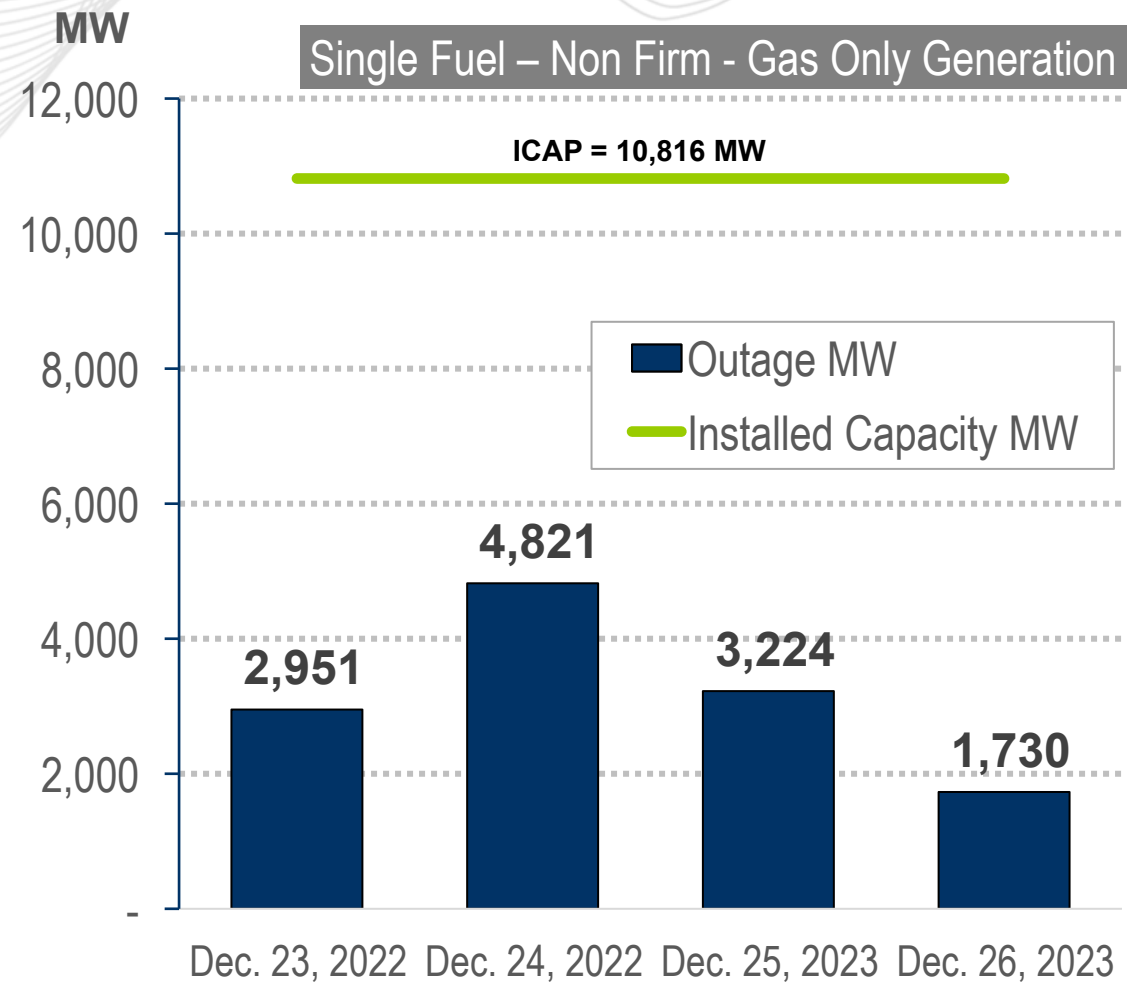
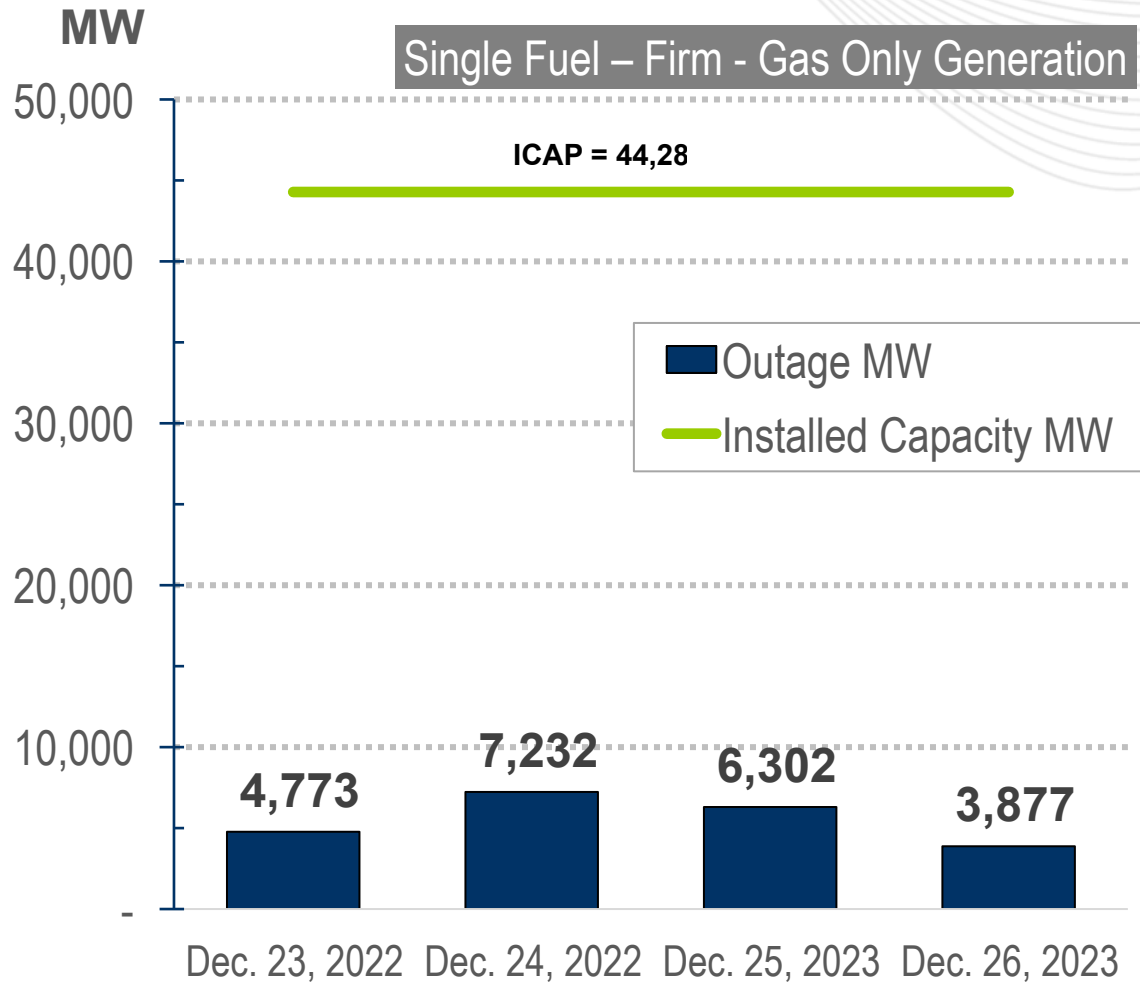
Gas Fuel Related Outages by Category by Percent of ICAP

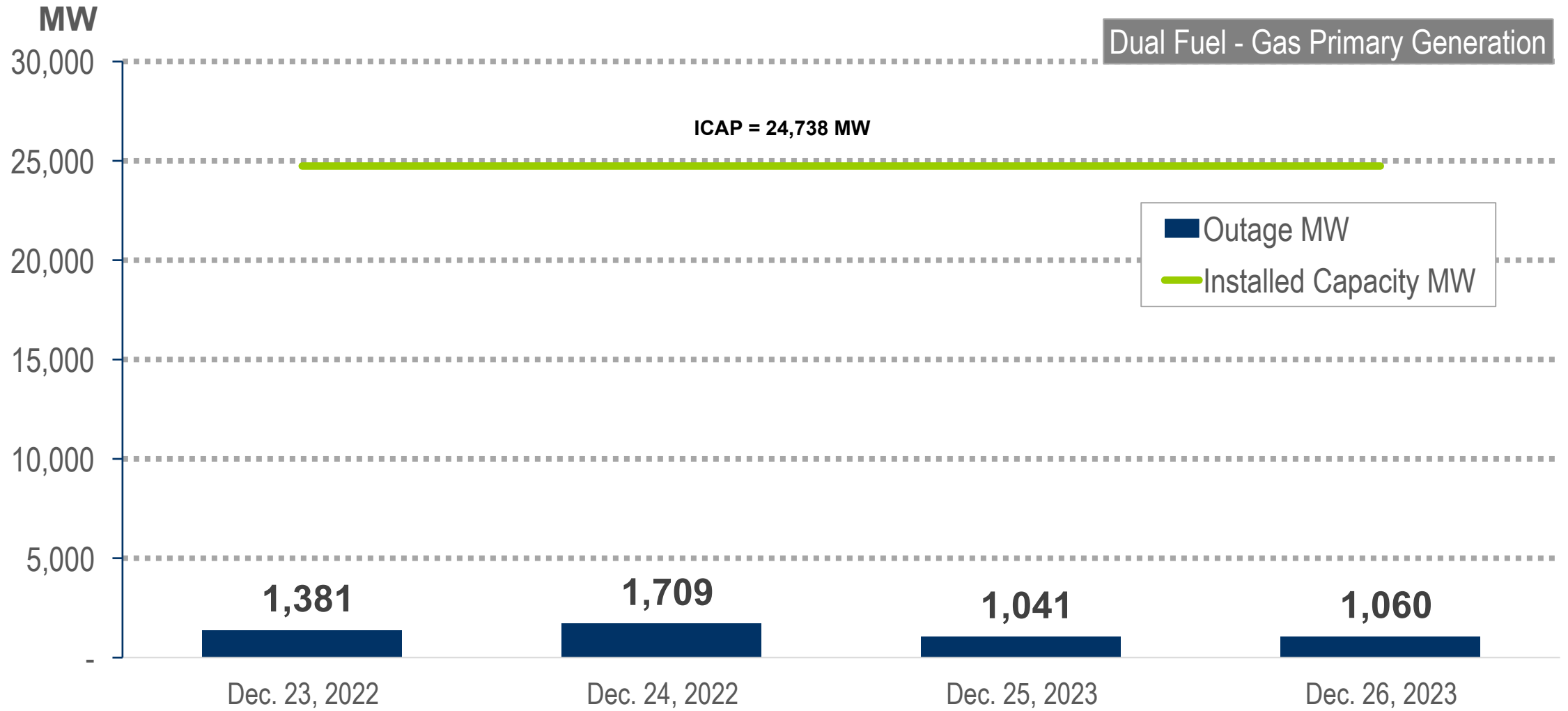


Appendix



Gas Generation Outage MW Due to Supply Loss Firm vs Non Firm Contracts





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Winter Storm Elliott – Gas Supply Issues

**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

