

Market Monitor Report

MC Webinar
02.20.2024

IMM



Monitoring Analytics

Topics in Report

- **Winter Storm Gerri preliminary review**
- **Fast start pricing results**
- **Reserve market results**
- **Incremental auction parameters**



Winter Storm Gerri

- **Between Jan 13 and Jan 19, several winter storms affected PJM.**
 - **This presentation refers to the entire period as Winter Storm Gerri.**
- **Alerts:**
 - **Cold Weather Advisory Western Zone**
 - Jan 14, 2024, 00:01 through Jan. 22, 2024, 10:00
 - **Cold Weather Alert Western Region**
 - Jan 14, 2024, 00:01 through Jan 17, 2024, 23:59
 - Jan. 19, 2024, 16:00 through Jan 22, 2024, 10:00
 - **Conservative Operations**
 - Jan. 13, 2024, 00:01 through Jan. 17, 2024, 23:59

Winter Storm Gerri

- **A cold weather alert was not implemented in MAD (Mid-Atlantic, Dominion).**
 - **Temperatures in MAD did not reach PJM's general guidance.**
 - **Manual 13 – Section 3.3.2: As a general guide, PJM can initiate a Cold Weather Alert across the RTO or on a Control Zone basis when the forecasted weather conditions approach minimum or actual temperatures of 10 degrees Fahrenheit or below.**

Winter Storm Gerri

- **Market Highlights (Jan 15-17):**
 - **Average load-weighted LMP: \$88/MWh**
 - **Gas prices ranged between \$8 and \$25/MMBtu.**
 - **1/12: PJM committed a few units for multiple days (MLK weekend gas package).**
 - **DA load bid on 1/15 and 1/16 less than PJM's forecast and RT load.**
 - **1/14: PJM committed more units out of market to:**
 - **Cover difference between DA load and forecast on 1/15.**
 - **Ensure units started before the cold temperatures arrived.**
 - **Most uplift was paid to oil and gas steam turbines.**

Out of Market Commitments

- **Only a few units committed out of market on Friday (1/12) for the MLK gas weekend package (gas days 13 through 16).**
 - **These units were committed before the DA market deadline.**
- **Most of the units committed out of market (conservative ops) were scheduled on Sunday (1/14) starting Monday (1/15), the rest on Tuesday (1/16) starting Wednesday (1/17).**
- **By Wednesday (1/17), very few STs/CCs had not been scheduled via markets or out of market.**

Out of Market Commitments

- **Not all out of market commitments resulted in uneconomic operation.**
 - **Some units were economic all days.**
 - **Some units were uneconomic some days and economic the rest but made positive net revenues for the entire period.**
- **Total uplift from Jan 13 through 18 (including units not committed out of market) was \$46.6M.**
 - **73 percent was paid to oil and gas steam units.**

Load

- **Monday Jan 15:**
 - DA load (including losses) was below PJM's forecast (including losses) by 7 percent.
 - DA load (excluding losses) was below RT load (excluding losses) by 4 percent.
- **Tuesday Jan 16**
 - DA load (including losses) was below PJM's forecast (including losses) by 6 percent.
 - DA load (excluding losses) was below RT load (excluding losses) by 4 percent .
- **Wednesday Jan 17**
 - DA load (including losses) was below PJM's forecast (including losses) by 0.2 percent.
 - DA load (excluding losses) was below RT load (excluding losses) by 2 percent.

Load (Jan 15 18:00)

Component	Area			
	PJM	Mid-Atlantic	Western	Dominion
DA Net Demand	117,385			
DA Net Virtuals at Hub/Interface	1,917			
DA Net Demand at Zones	115,468	38,186	60,241	17,037
DA Calculated Losses	2,760	860	1,496	404
DA Load (Including Losses)	118,228	39,045	61,737	17,441
Forecast (Including Losses)	126,687	40,449	66,106	18,556
Forecast Difference (MWh)	(8,459)	(1,404)	(4,369)	(1,115)
Forecast Difference (%)	(7%)	(3%)	(7%)	(6%)
RT Load (No Losses)	120,290	39,803	62,985	17,485
RT Difference (MWh)	(4,822)	(1,618)	(2,744)	(448)
RT Difference (%)	(4%)	(4%)	(4%)	(3%)

Load (Jan 16 18:00)

Component	Area			
	PJM	Mid-Atlantic	Western	Dominion
DA Net Demand	122,246			
DA Net Virtuals at Hub/Interface	2,111			
DA Net Demand at Zones	120,135	39,884	62,692	17,690
DA Calculated Losses	2,850	891	1,567	392
DA Load (Including Losses)	122,985	40,775	64,259	18,082
Forecast (Including Losses)	131,337	41,485	68,221	20,108
Forecast Difference (MWh)	(8,352)	(710)	(3,962)	(2,026)
Forecast Difference (%)	(6%)	(2%)	(6%)	(10%)
RT Load (No Losses)	124,754	41,254	64,775	18,708
RT Difference (MWh)	(4,620)	(1,370)	(2,083)	(1,018)
RT Difference (%)	(4%)	(3%)	(3%)	(5%)

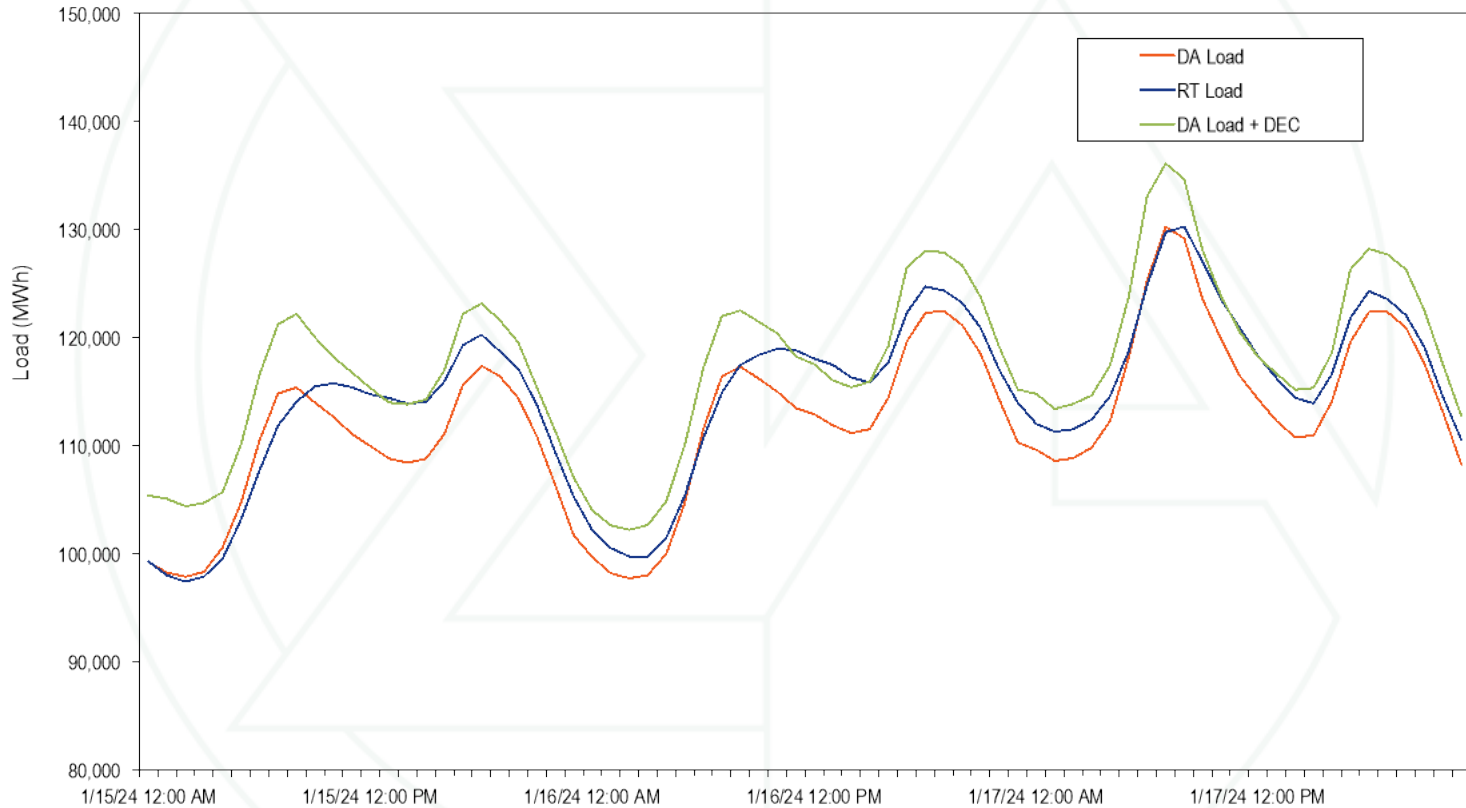
Load (Jan 17 08:00)

Component	Area			
	PJM	Mid-Atlantic	Western	Dominion
DA Net Demand	130,159			
DA Net Virtuals at Hub/Interface	1,891			
DA Net Demand at Zones	128,267	42,744	64,533	20,999
DA Calculated Losses	3,493	1,070	1,842	582
DA Load (Including Losses)	131,761	43,814	66,374	21,581
Forecast (Including Losses)	132,014	41,951	67,022	21,534
Forecast Difference (MWh)	(253)	1,863	(648)	47
Forecast Difference (%)	(0%)	4%	(1%)	0%
RT Load (No Losses)	130,293	42,752	66,457	21,065
RT Difference (MWh)	(2,025)	(7)	(1,925)	(66)
RT Difference (%)	(2%)	(0%)	(3%)	(0%)

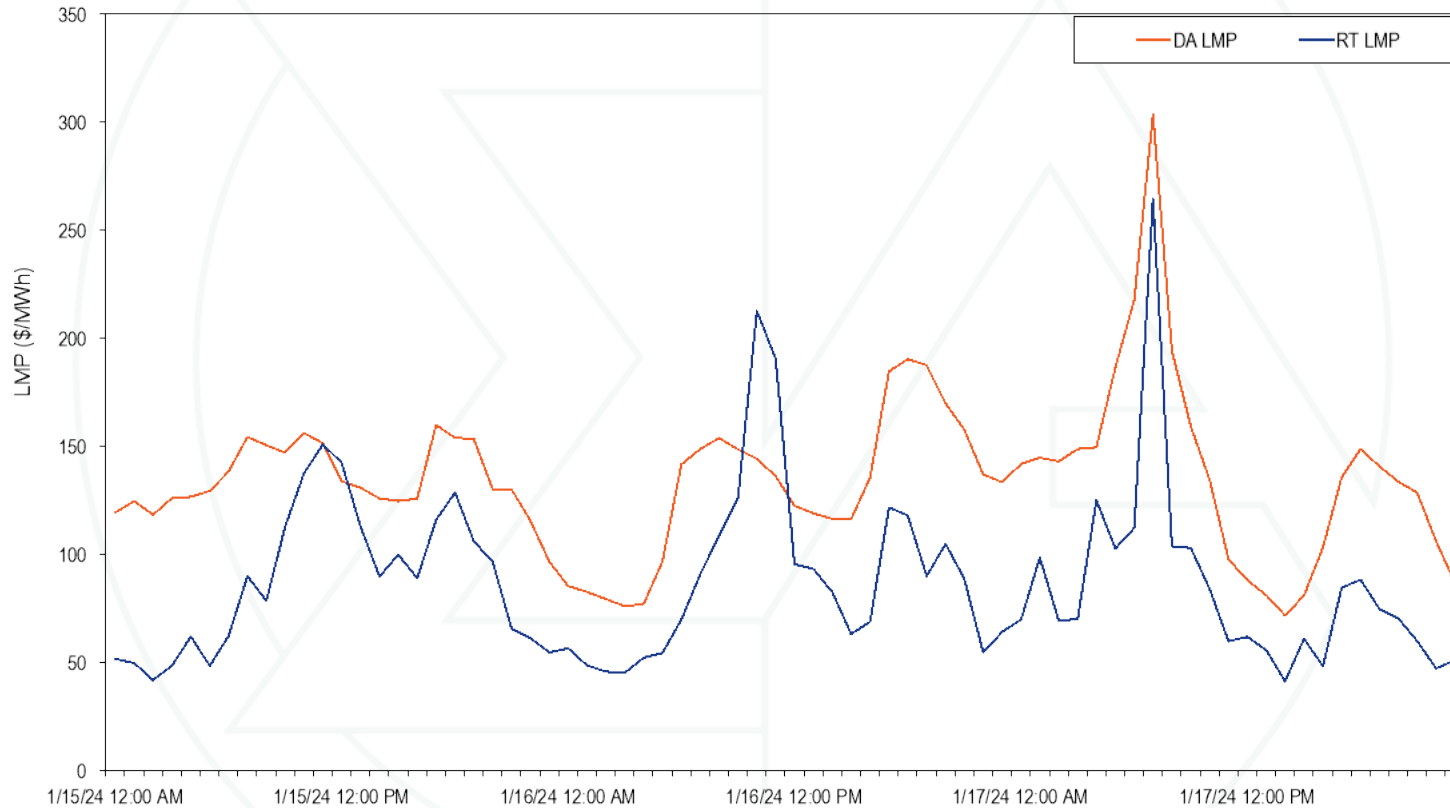
Self Scheduling

- **Self scheduling consistent with other recent winter periods:**
 - **Winter Storm Gerri (Jan 15 – 17, 2024): 48 percent of all RT generation was self scheduled as price taker.**
 - **Winter Storm Elliott (Dec 23 – 25, 2022): 49 percent of all RT generation was self scheduled as price taker.**
 - **Winter Storm Izzy (Jan 16 – 18, 2022): 50 percent of all RT generation was self scheduled as price taker.**

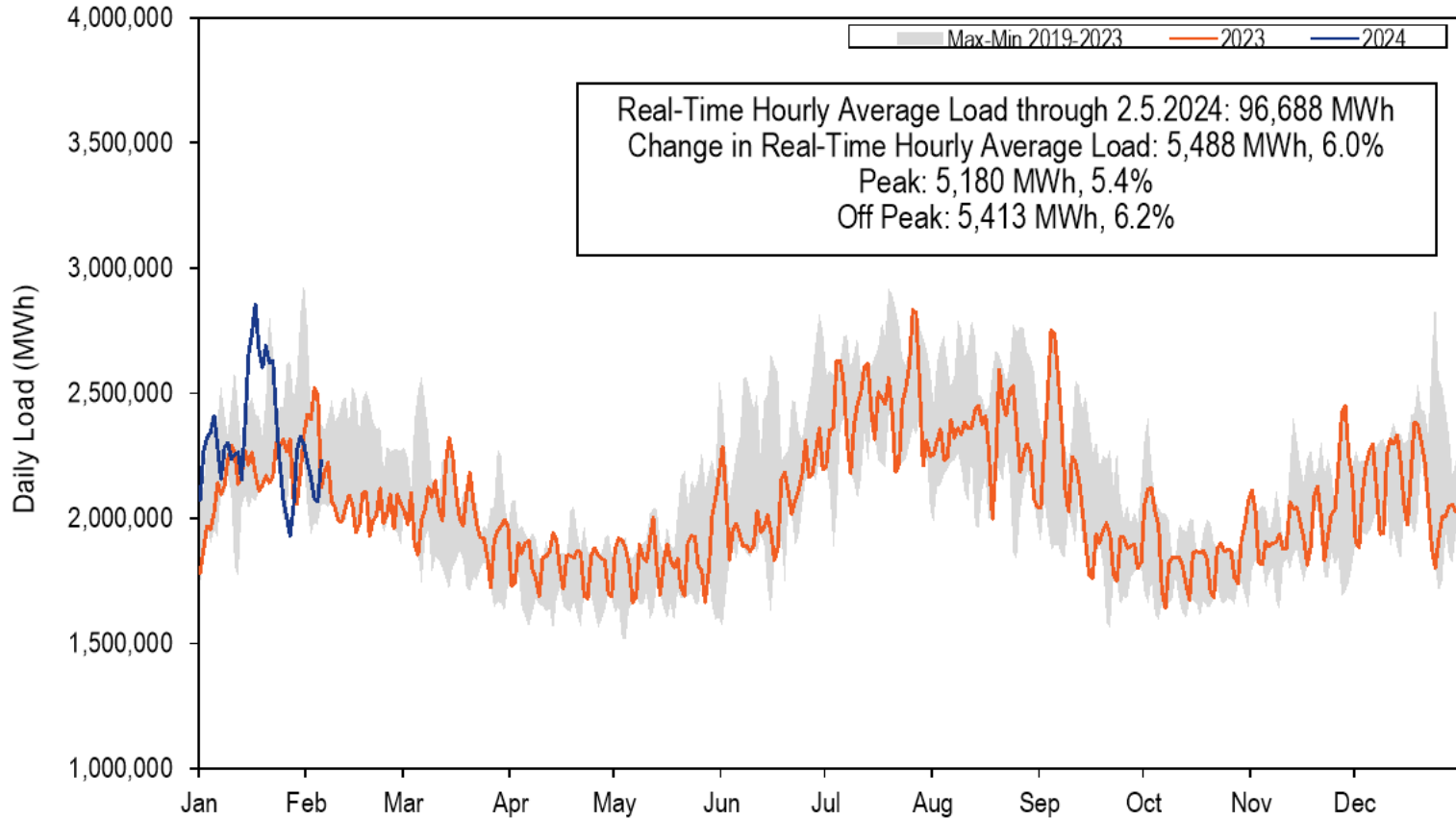
Load During Gerri



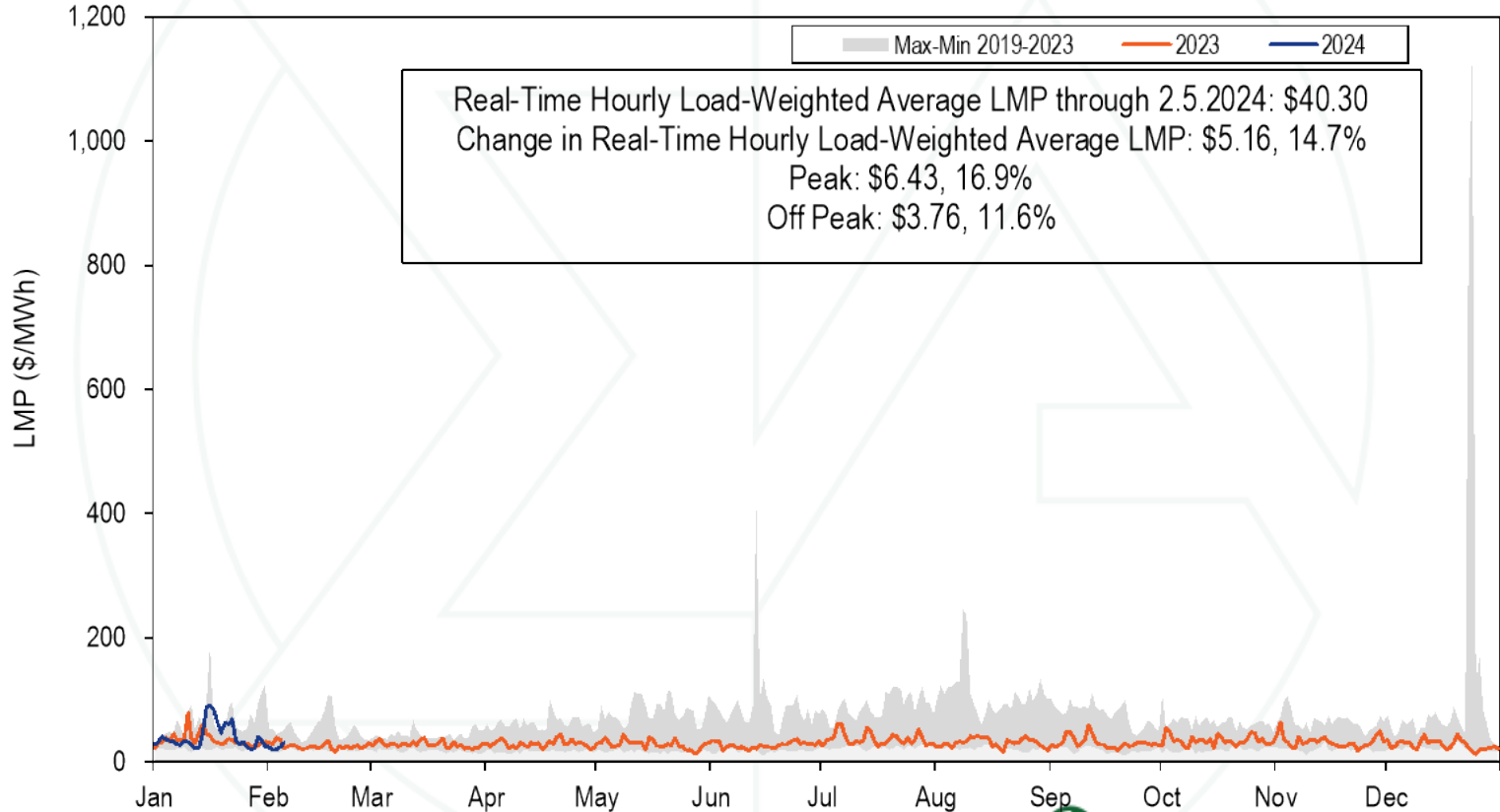
LMP During Gerri



2024 YTD PJM Real-Time Daily Load



2024 YTD PJM Real-Time Daily LMP



Fast Start Pricing: DLMP and PLMP

- **PJM implemented fast start pricing in both the day-ahead and real-time markets on September 1, 2021.**
- **The goal of fast start pricing is to allow inflexible resources to set prices based on the sum of their commitment costs per MWh and their marginal costs.**
- **The pricing run LMP (PLMP) is now the official settlement LMP in PJM, replacing the dispatch run LMP (DLMP)**

Fast Start Pricing: DLMP and PLMP

- **Fast start pricing employs a new LMP calculation called the pricing run.**
- **The pricing run calculates LMP using the same optimal power flow algorithm as the dispatch run while simultaneously reducing (“relaxing” or ignoring) the economic minimum and maximum output MW constraints for all eligible fast start units.**

Fast Start Pricing: DLMP and PLMP

- **The price signal no longer equals the short run marginal cost and therefore no longer provides the correct signal for efficient behavior for market participants making decisions on the margin.**
- **The differences between the actual LMP (DLMP) and the fast start LMP(PLMP) distort the incentive for market participants to behave competitively and to follow PJM's dispatch instructions.**

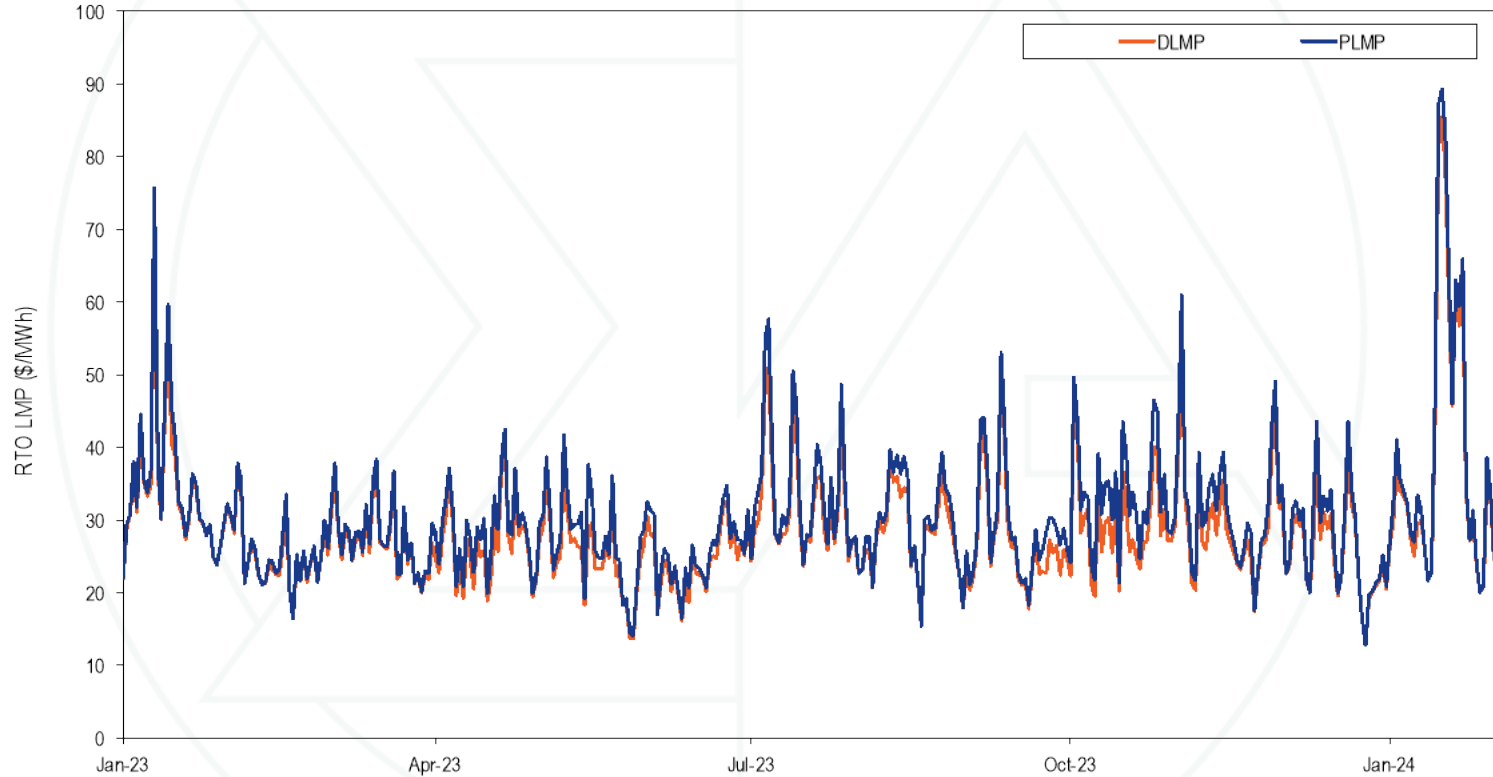
Fast Start Pricing: DLMP and PLMP

- **PJM also uses the pricing run for capping the system marginal price at \$3,700 per MWh.**
 - **This was last used during Winter Storm Elliott.**
 - **The cap applies to the marginal energy component of LMP, but the congestion and loss components of LMP can exceed the cap.**
- **PJM uses a lower default transmission constraint penalty factor in the pricing run in the day-ahead market.**
 - **\$30,000 per MWh in the dispatch run**
 - **\$2,000 per MWh in the pricing run**

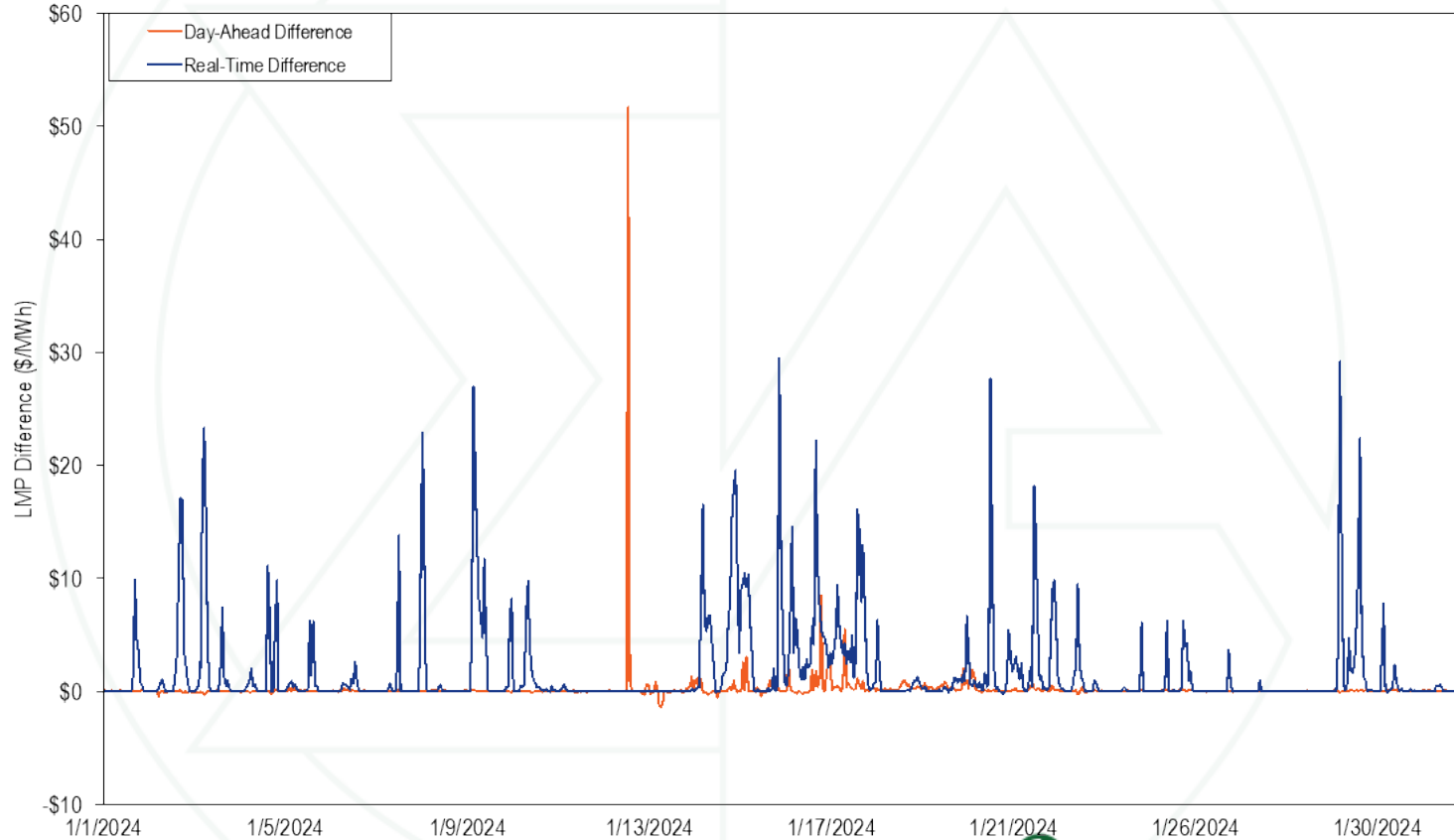
Monthly Average Load-Weighted DLMP and PLMP

Year	Month	Day-Ahead Load-Weighted Average				Real-Time Load-Weighted Average			
		DLMP	PLMP	Difference	Percent Difference	DLMP	PLMP	Difference	Percent Difference
2023	Jan	\$36.53	\$36.58	\$0.05	0.1%	\$34.66	\$35.75	\$1.09	3.1%
2023	Feb	\$31.16	\$31.22	\$0.06	0.2%	\$25.47	\$26.04	\$0.57	2.2%
2023	Mar	\$28.39	\$28.41	\$0.02	0.1%	\$27.58	\$28.42	\$0.85	3.1%
2023	Apr	\$29.81	\$29.81	(\$0.00)	(0.0%)	\$27.09	\$29.32	\$2.22	8.2%
2023	May	\$28.86	\$28.80	(\$0.05)	(0.2%)	\$25.91	\$28.44	\$2.53	9.7%
2023	Jun	\$27.82	\$27.82	(\$0.00)	(0.0%)	\$25.69	\$27.29	\$1.60	6.2%
2023	Jul	\$40.46	\$40.56	\$0.10	0.3%	\$34.34	\$37.21	\$2.87	8.4%
2023	Aug	\$30.49	\$30.54	\$0.05	0.2%	\$29.77	\$31.33	\$1.55	5.2%
2023	Sep	\$30.82	\$30.91	\$0.09	0.3%	\$29.33	\$31.55	\$2.22	7.6%
2023	Oct	\$35.03	\$35.05	\$0.02	0.1%	\$30.66	\$34.92	\$4.26	13.9%
2023	Nov	\$33.32	\$33.40	\$0.08	0.2%	\$30.00	\$32.94	\$2.94	9.8%
2023	Dec	\$29.89	\$29.94	\$0.05	0.2%	\$26.37	\$27.97	\$1.59	6.0%
2023		\$32.16	\$32.20	\$0.04	0.1%	\$29.13	\$31.10	\$1.97	6.8%
2024	Jan	\$48.45	\$48.65	\$0.20	0.4%	\$40.82	\$42.78	\$1.95	4.8%

Daily Average Real-Time DLMP and PLMP



Hourly Difference: PLMP – DLMP



Fast Start Units as a Percent of Marginal Units

Year	Month	Dispatch Run				Pricing Run			
		CT	Diesel	Wind	All Fast Start Units	CT	Diesel	Wind	All Fast Start Units
2023	Jan	1.6%	0.5%	0.1%	2.1%	6.2%	2.8%	0.0%	9.0%
2023	Feb	0.9%	0.2%	0.0%	1.1%	3.1%	0.6%	0.0%	3.7%
2023	Mar	0.8%	0.4%	0.1%	1.2%	3.0%	0.7%	0.1%	3.8%
2023	Apr	2.5%	0.4%	0.2%	3.2%	8.1%	0.8%	0.2%	9.1%
2023	May	1.0%	0.3%	0.1%	1.3%	4.8%	0.7%	0.1%	5.6%
2023	Jun	0.5%	0.2%	0.0%	0.7%	2.5%	0.5%	0.0%	3.0%
2023	Jul	1.4%	0.9%	0.0%	2.4%	8.6%	1.6%	0.0%	10.3%
2023	Aug	0.9%	1.5%	0.0%	2.4%	5.1%	2.3%	0.0%	7.4%
2023	Sep	0.4%	0.8%	0.1%	1.3%	5.1%	1.4%	0.1%	6.6%
2023	Oct	1.4%	0.3%	0.0%	1.7%	6.9%	0.8%	0.0%	7.7%
2023	Nov	4.0%	0.6%	0.0%	4.5%	11.4%	1.4%	0.0%	12.8%
2023	Dec	1.4%	0.7%	0.0%	2.2%	7.2%	2.0%	0.0%	9.3%
		1.4%	0.6%	0.0%	2.0%	6.0%	1.3%	0.0%	7.4%
2024	Jan	0.8%	0.7%	0.0%	1.6%	3.5%	1.1%	0.0%	4.7%

Fast Start Impacts: Zone Average Differences

Zone	2024 Jan							
	Day-Ahead				Real-Time			
	Average DLMP	Average PLMP	Difference	Percent Difference	Average DLMP	Average PLMP	Difference	Percent Difference
ACEC	\$21.30	\$21.33	\$0.02	0.1%	\$23.28	\$24.51	\$1.22	5.3%
AEP	\$27.61	\$27.65	\$0.03	0.1%	\$28.87	\$30.71	\$1.84	6.4%
APS	\$28.64	\$28.67	\$0.03	0.1%	\$29.85	\$31.80	\$1.95	6.5%
ATSI	\$27.37	\$27.41	\$0.03	0.1%	\$28.64	\$30.44	\$1.80	6.3%
BGE	\$33.93	\$33.96	\$0.03	0.1%	\$34.83	\$37.19	\$2.36	6.8%
COMED	\$23.69	\$23.72	\$0.03	0.1%	\$24.85	\$26.49	\$1.64	6.6%
DAY	\$28.80	\$28.84	\$0.03	0.1%	\$30.08	\$32.00	\$1.92	6.4%
DUKE	\$28.28	\$28.31	\$0.03	0.1%	\$29.44	\$31.32	\$1.88	6.4%
DOM	\$31.85	\$31.88	\$0.03	0.1%	\$34.53	\$36.65	\$2.11	6.1%
DPL	\$23.71	\$23.73	\$0.01	0.1%	\$25.73	\$28.03	\$2.30	8.9%
DUQ	\$27.57	\$27.60	\$0.03	0.1%	\$28.75	\$30.60	\$1.85	6.4%
EKPC	\$27.60	\$27.63	\$0.03	0.1%	\$29.30	\$31.16	\$1.86	6.4%
JCPLC	\$21.99	\$22.02	\$0.02	0.1%	\$23.97	\$25.27	\$1.30	5.4%
MEC	\$24.35	\$24.38	\$0.03	0.1%	\$26.04	\$27.68	\$1.64	6.3%
OVEC	\$27.14	\$27.17	\$0.03	0.1%	\$28.29	\$30.08	\$1.79	6.3%
PECO	\$20.38	\$20.40	\$0.02	0.1%	\$22.39	\$23.53	\$1.13	5.1%
PE	\$27.08	\$27.09	\$0.01	0.0%	\$28.91	\$30.75	\$1.84	6.4%
PEPCO	\$32.11	\$32.14	\$0.03	0.1%	\$33.17	\$35.35	\$2.18	6.6%
PPL	\$22.44	\$22.47	\$0.03	0.1%	\$24.13	\$25.56	\$1.43	5.9%
PSEG	\$22.16	\$22.19	\$0.02	0.1%	\$24.36	\$25.67	\$1.31	5.4%
REC	\$23.72	\$23.75	\$0.02	0.1%	\$26.08	\$27.47	\$1.39	5.3%

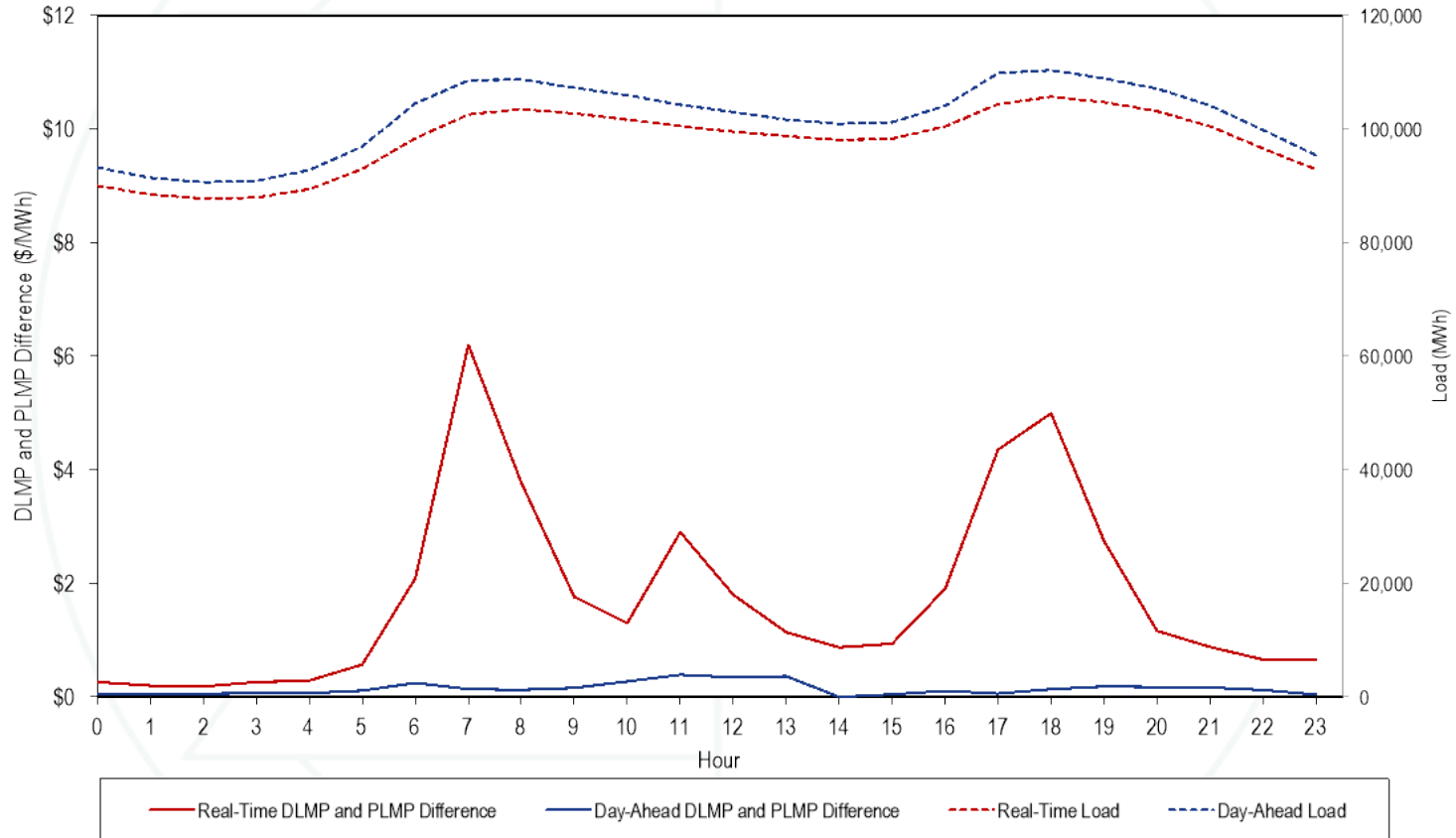
Fast Start Impacts: Hub Average Differences

Hub	2024 Jan							
	Average DLMP	Day-Ahead			Average DLMP	Real-Time		
		Average PLMP	Difference	Percent Difference		Average PLMP	Difference	Percent Difference
AEP GEN HUB	\$31.01	\$31.05	\$0.04	0.1%	\$27.88	\$29.66	\$1.78	6.4%
AEP-DAYTON HUB	\$31.71	\$31.76	\$0.04	0.1%	\$28.50	\$30.31	\$1.82	6.4%
ATSI GEN HUB	\$31.14	\$31.19	\$0.04	0.1%	\$28.00	\$29.76	\$1.76	6.3%
CHICAGO GEN HUB	\$27.23	\$27.32	\$0.09	0.3%	\$24.35	\$25.97	\$1.62	6.7%
CHICAGO HUB	\$27.88	\$27.91	\$0.03	0.1%	\$24.89	\$26.53	\$1.63	6.6%
DOMINION HUB	\$34.80	\$34.84	\$0.04	0.1%	\$31.65	\$33.66	\$2.01	6.4%
EASTERN HUB	\$28.86	\$28.88	\$0.02	0.1%	\$25.99	\$28.30	\$2.31	8.9%
N ILLINOIS HUB	\$27.60	\$27.71	\$0.11	0.4%	\$24.85	\$26.49	\$1.64	6.6%
NEW JERSEY HUB	\$26.19	\$26.23	\$0.03	0.1%	\$24.02	\$25.31	\$1.29	5.4%
OHIO HUB	\$31.67	\$31.72	\$0.04	0.1%	\$28.46	\$30.27	\$1.81	6.4%
WEST INT HUB	\$32.68	\$32.72	\$0.04	0.1%	\$29.48	\$31.36	\$1.88	6.4%
WESTERN HUB	\$34.25	\$34.28	\$0.03	0.1%	\$30.58	\$32.61	\$2.03	6.6%

Zonal Real-Time PLMP-DLMP Difference Frequency

Zone	2024 Jan										
	< (\$50)	(\$50) to (\$10)	(\$10) to \$0	\$0	\$0 to \$10	\$10 to \$20	\$20 to \$50	\$50 to \$100	\$100 to \$200	>= \$200	
PJM-RTO	2.0%	59.0%	33.6%	3.1%	2.2%	0.1%	0.0%	0.0%	0.0%	0.0%	
ACEC	3.9%	59.1%	32.8%	2.4%	1.7%	0.1%	0.0%	0.0%	0.0%	0.0%	
AEP	3.7%	59.1%	31.9%	3.2%	2.0%	0.1%	0.0%	0.0%	0.0%	0.0%	
APS	1.5%	59.1%	33.5%	3.3%	2.6%	0.1%	0.0%	0.0%	0.0%	0.0%	
ATSI	5.9%	59.0%	30.3%	2.8%	1.9%	0.1%	0.0%	0.0%	0.0%	0.0%	
BGE	2.5%	59.0%	32.4%	3.2%	2.5%	0.3%	0.0%	0.0%	0.0%	0.0%	
COMED	4.2%	59.5%	31.5%	2.8%	1.9%	0.1%	0.0%	0.0%	0.0%	0.0%	
DAY	4.3%	59.1%	31.1%	3.0%	2.2%	0.2%	0.0%	0.1%	0.0%	0.0%	
DUKE	4.0%	59.1%	31.5%	2.8%	2.3%	0.2%	0.0%	0.0%	0.0%	0.0%	
DOM	2.8%	59.1%	31.5%	3.7%	2.5%	0.3%	0.1%	0.0%	0.0%	0.0%	
DPL	4.9%	58.9%	31.9%	2.3%	1.8%	0.1%	0.0%	0.1%	0.0%	0.0%	
DUQ	5.4%	59.1%	30.8%	2.8%	1.9%	0.1%	0.0%	0.0%	0.0%	0.0%	
EKPC	3.5%	59.1%	31.7%	3.3%	2.3%	0.2%	0.0%	0.0%	0.0%	0.0%	
JCPLC	3.1%	59.1%	33.5%	2.5%	1.7%	0.1%	0.0%	0.0%	0.0%	0.0%	
MEC	1.4%	59.0%	33.8%	2.6%	2.9%	0.3%	0.0%	0.0%	0.0%	0.0%	
OVEC	4.4%	59.2%	31.1%	2.7%	1.9%	0.1%	0.4%	0.0%	0.2%	0.0%	
PECO	4.7%	59.0%	32.2%	2.3%	1.7%	0.1%	0.0%	0.0%	0.0%	0.0%	
PE	3.3%	58.9%	31.4%	3.3%	2.9%	0.1%	0.1%	0.0%	0.0%	0.0%	
PEPCO	2.7%	59.0%	31.9%	3.6%	2.4%	0.3%	0.0%	0.0%	0.0%	0.0%	
PPL	2.5%	58.9%	34.2%	2.6%	1.7%	0.0%	0.0%	0.0%	0.0%	0.0%	
PSEG	3.3%	59.0%	32.8%	2.6%	2.1%	0.1%	0.1%	0.0%	0.0%	0.0%	
REC	4.3%	58.9%	31.7%	2.7%	2.1%	0.1%	0.2%	0.0%	0.0%	0.0%	

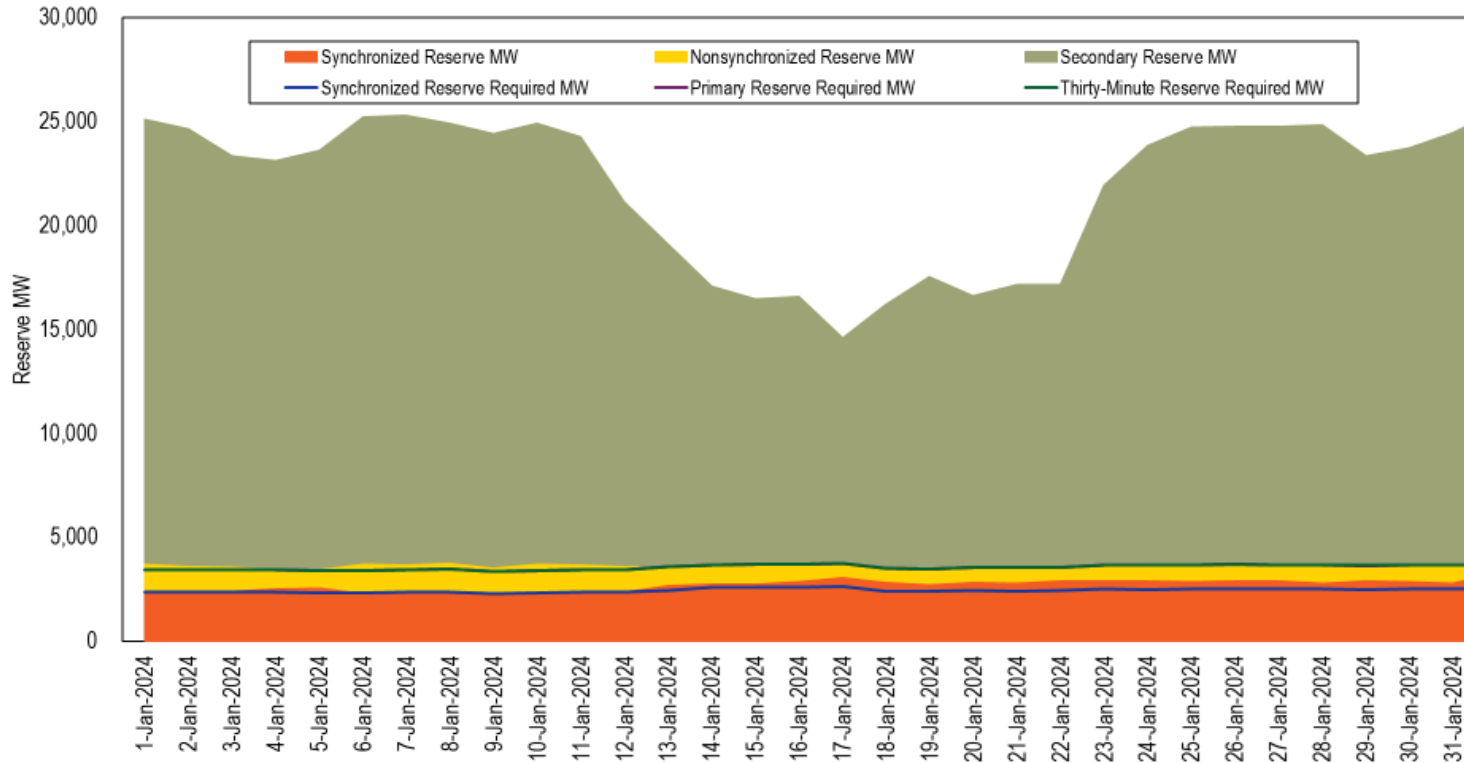
Hourly Average Load and LMP Difference



Real-Time Load-Weighted Average LMP

	2023				2024			
	Off Peak	On Peak	Difference	Percent Difference	Off Peak	On Peak	Difference	Percent Difference
Jan	\$33.20	\$38.53	\$5.32	16.0%	\$38.50	\$47.10	\$8.60	22.3%
Feb	\$23.45	\$28.67	\$5.22	22.3%				
Mar	\$26.96	\$29.78	\$2.82	10.5%				
Apr	\$24.08	\$35.00	\$10.92	45.4%				
May	\$22.65	\$33.84	\$11.19	49.4%				
Jun	\$21.64	\$32.16	\$10.52	48.6%				
Jul	\$26.86	\$48.04	\$21.18	78.9%				
Aug	\$26.60	\$35.30	\$8.70	32.7%				
Sep	\$24.76	\$38.65	\$13.88	56.1%				
Oct	\$26.41	\$42.58	\$16.17	61.2%				
Nov	\$29.45	\$36.48	\$7.02	23.9%				
Dec	\$23.70	\$32.88	\$9.18	38.7%				

Real-Time Reserves and Requirements



Day-Ahead & Real-Time RTO Reserve MW

		Synchronized Reserve MW		Nonsynchronized Reserve MW		Total Primary Reserve MW		Secondary Reserve MW		Total Thirty-Minute Reserve MW	
Year	Month	DA	RT	DA	RT	DA	RT	DA	RT	DA	RT
2024	Jan	2,757	2,732	1,229	950	3,987	3,682	15,051	18,087	19,038	21,769

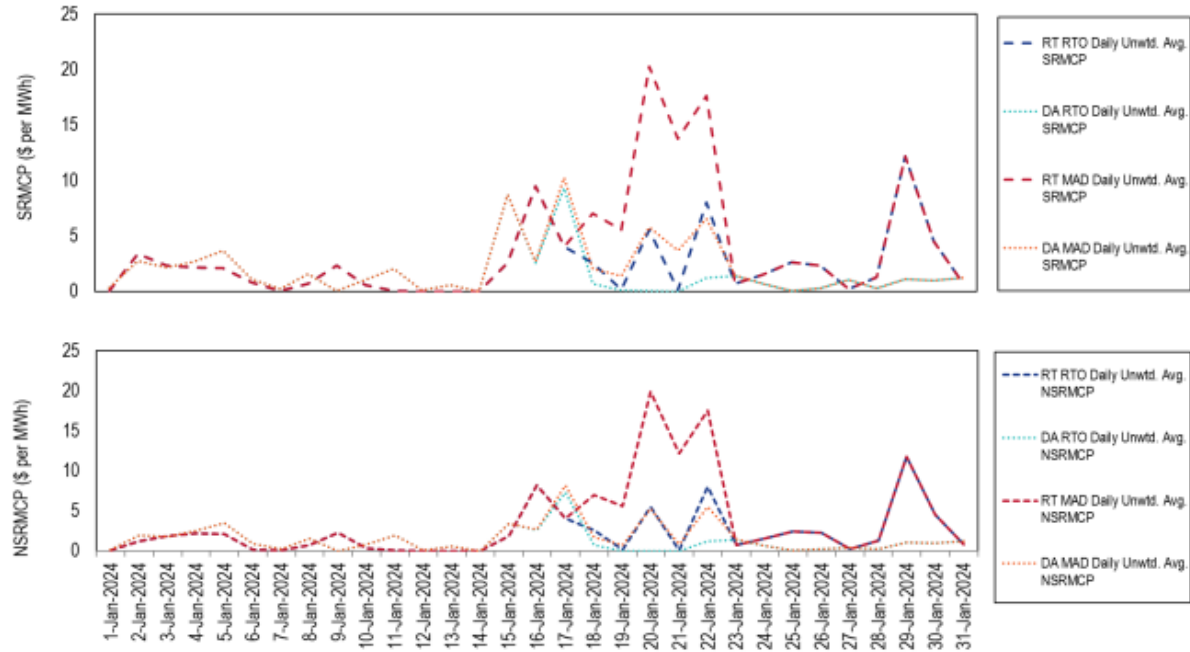
Day-Ahead & Real-Time MAD Reserve MW

		Synchronized Reserve MW		Nonsynchronized Reserve MW		Total Primary Reserve MW		Secondary Reserve MW		Total Thirty-Minute Reserve MW	
Year	Month	DA	RT	DA	RT	DA	RT	DA	RT	DA	RT
2024	Jan	1,995	2,008	936	754	2,932	2,762	NA	NA	NA	NA

Reserve Settlements by Month

Product	Year	Month	Total Day-Ahead Credits	Total Balancing MCP Credits	Total LOC Credits	Total Shortfall Charges	Total Credits
Synchronized Reserve	2024	Jan	\$4,327,646	(\$426,107)	\$1,138,215	\$0	\$5,039,754
Nonsynchronized Reserve	2024	Jan	\$549,761	(\$804,845)	\$246,452	NA	(\$8,631)
Secondary Reserve	2024	Jan	\$0	\$0	\$161,268	\$0	\$161,268

Reserve Prices



- Higher prices during winter storms.

Third IA PJM Buy Bids

- For the 2024/2025 Third IA, PJM will add additional demand of 3,324.7 MW of capacity commitments for the entire RTO.
- For June 1, 2024, PJM will have excess reserves of 4,761.4 MW (above IRM) based on current positions.
 - See Row S of table

RPM Reserve Margin

	01-Jun-19	01-Jun-20	01-Jun-21	01-Jun-22	01-Jun-23	01-Jun-24	
Forecast peak load ICAP (MW)	151,643.5	148,355.3	149,482.9	149,263.6	149,382.2	151,639.1	A
FRR peak load ICAP (MW)	12,284.2	11,488.3	11,717.7	28,292.8	29,554.6	30,431.0	B
PRD ICAP (MW)	0.0	558.0	510.0	230.0	235.0	305.0	C
Installed reserve margin (IRM)	16.0%	15.5%	14.7%	14.9%	14.9%	17.7%	D
Pool wide average EFORD	6.08%	5.78%	5.22%	5.08%	4.87%	5.10%	E
Forecast pool requirement (FPR)	1,0895	1,0882	1,0871	1,0906	1,0930	1,1170	$F=(1+D)*(1-E)$
RPM committed less deficiency UCAP (MW) (generation and DR)	162,276.1	159,560.4	156,633.6	137,944.8	136,408.5	139,810.2	G
RPM committed less deficiency ICAP (MW) (generation and DR)	172,781.2	169,348.8	165,260.2	145,327.4	143,391.7	147,323.7	$H=G/(1-E)$
RPM peak load ICAP (MW)	139,359.3	136,309.0	137,255.2	120,740.8	119,592.6	120,903.1	$J=A-B-C$
Reserve margin ICAP (MW)	33,421.9	33,039.8	28,005.0	24,586.6	23,799.1	26,420.6	$K=H-J$
Reserve margin (%)	24.0%	24.2%	20.4%	20.4%	19.9%	21.9%	$L=K/J$
Reserve margin in excess of IRM ICAP (MW)	11,124.4	11,911.9	7,828.5	6,596.3	5,979.8	5,020.8	$M=K-D*J$
Reserve margin in excess of IRM (%)	8.0%	8.7%	5.7%	5.5%	5.0%	4.2%	$N=M/J$
RPM peak load UCAP (MW)	130,886.3	128,430.3	130,090.5	114,607.2	113,768.4	114,737.0	$P=J*(1-E)$
RPM reliability requirement UCAP (MW)	151,832.0	148,331.5	149,210.1	131,679.9	130,714.7	135,048.8	$Q=J*F$
Reserve margin UCAP (MW)	31,389.8	31,130.1	26,543.1	23,337.6	22,640.1	25,073.2	$R=G-P$
Reserve cleared in excess of IRM UCAP (MW)	10,444.1	11,228.9	7,423.5	6,264.9	5,693.8	4,761.4	$S=G-Q$
Projected replacement capacity UCAP (MW)	0.0	0.0	0.0	0.0	0.0	0.0	T
Projected reserve margin	24.0%	24.2%	20.4%	20.4%	19.9%	21.9%	$U=(H-T)/(1-E)/J-1$

Incremental Auction Procurement Adjustment

- **Per OATT Attachment DD § 5.4.(c), PJM will update the Reliability Requirements for IAs if the change is greater than or equal to:**
 - **For First and Second IAs, the lesser of 500 MW or one percent of the applicable prior Reliability Requirement**
 - **For Third IAs, 0 MW**

Incremental Auction Procurement Adjustment

- **PJM will seek additional capacity commitments if:**
 - **Per OATT Attachment DD § 5.4(c)(1), the prior Reliability Requirement is less than the updated Reliability Requirement in an amount greater than or equal to:**
 - For First and Second IAs, the lesser of 500 MW or one percent of the applicable prior Reliability Requirement
 - For Third IAs, 0 MW
 - **Per OATT Attachment DD § 5.4(c)(2)(i), the updated Reliability Requirement exceeds the total capacity committed in all prior auctions for such Delivery Year by an amount greater than or equal to the lesser of 500 MW or one percent of the applicable prior Reliability Requirement**

Incremental Auction Procurement Adjustment

- **Per OATT Attachment DD § 5.4(c)(3)(i), PJM will seek to release prior capacity commitments if the prior Reliability Requirement exceeds the updated Reliability Requirement in an amount greater than or equal to:**
 - **For First and Second IAs, the lesser of 500 MW or one percent of the applicable prior Reliability Requirement**
 - **For Third IAs, 0 MW**

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