

Market Monitor Report

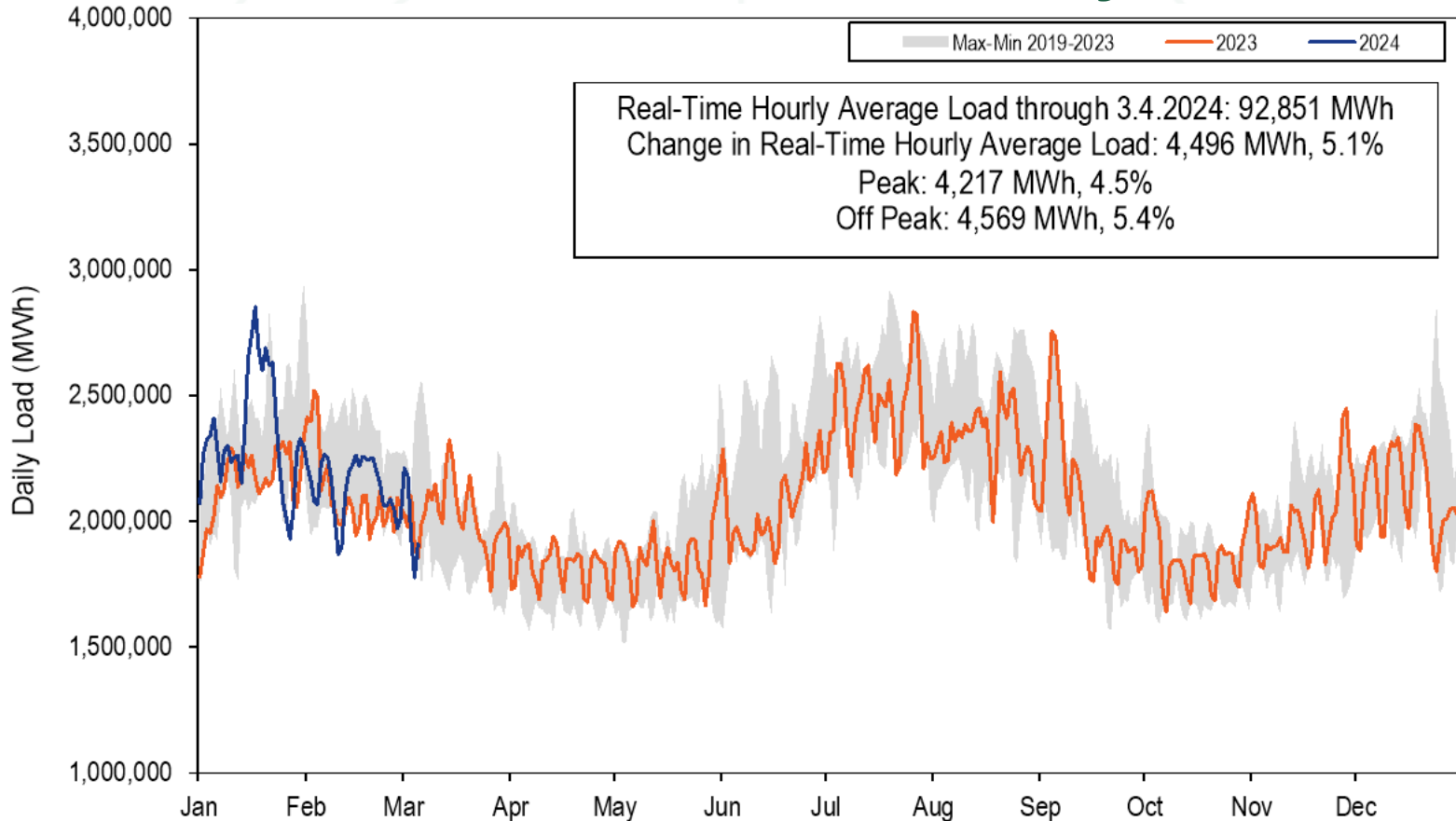
MC Webinar
03.18.2024

IMM

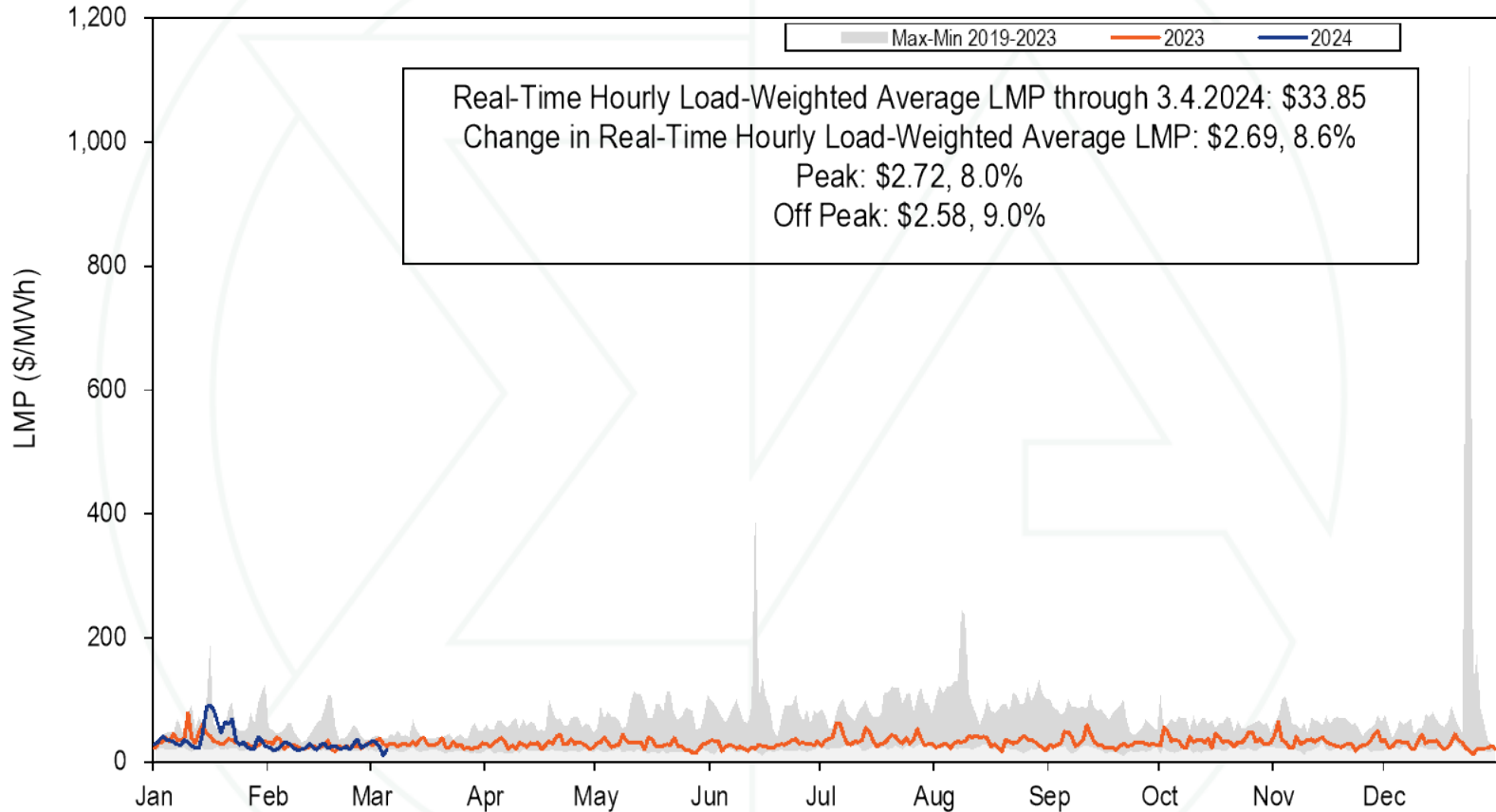


Monitoring Analytics

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.**

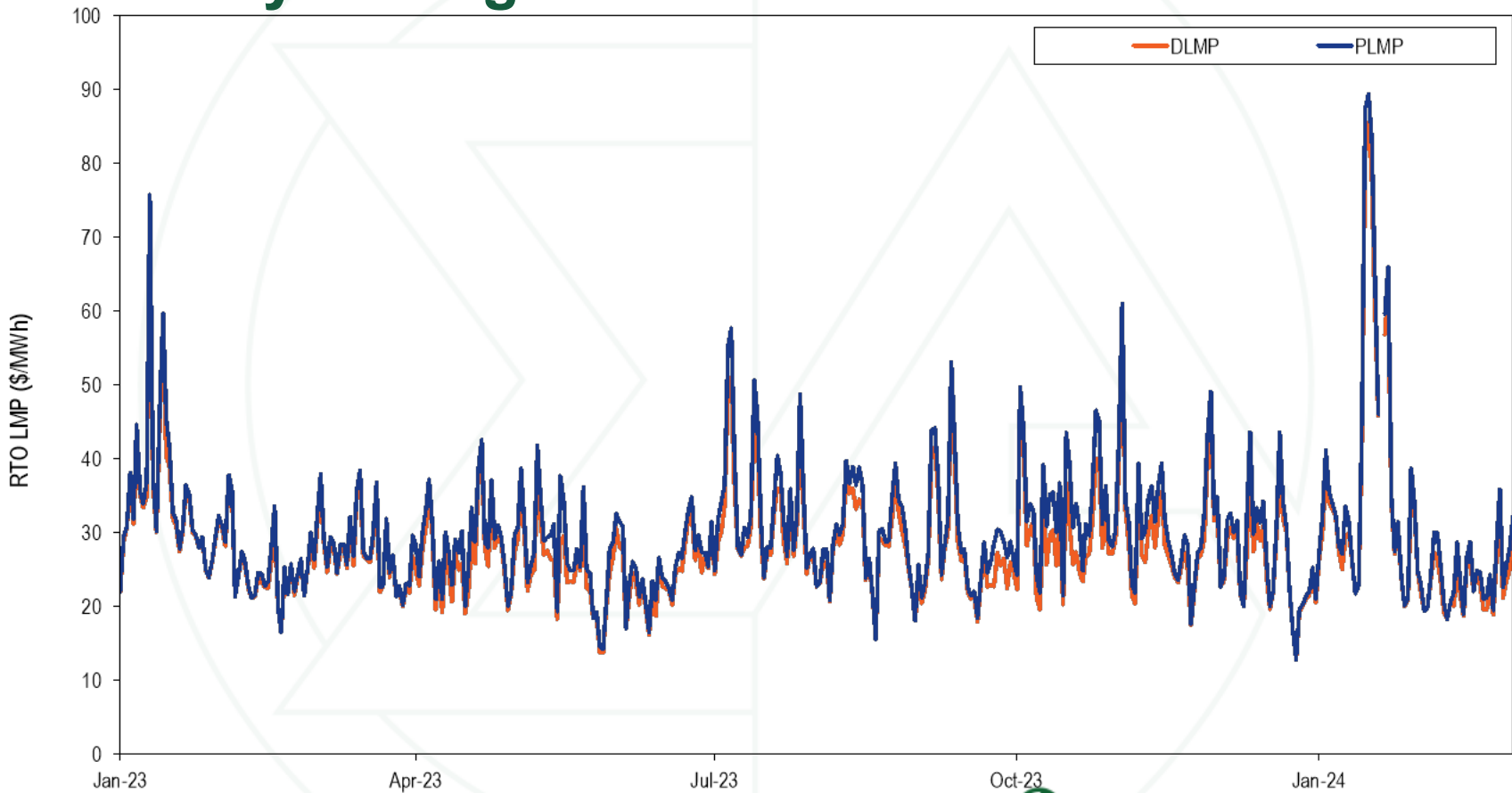
Fast Start Pricing: DLMP and PLMP

- **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**

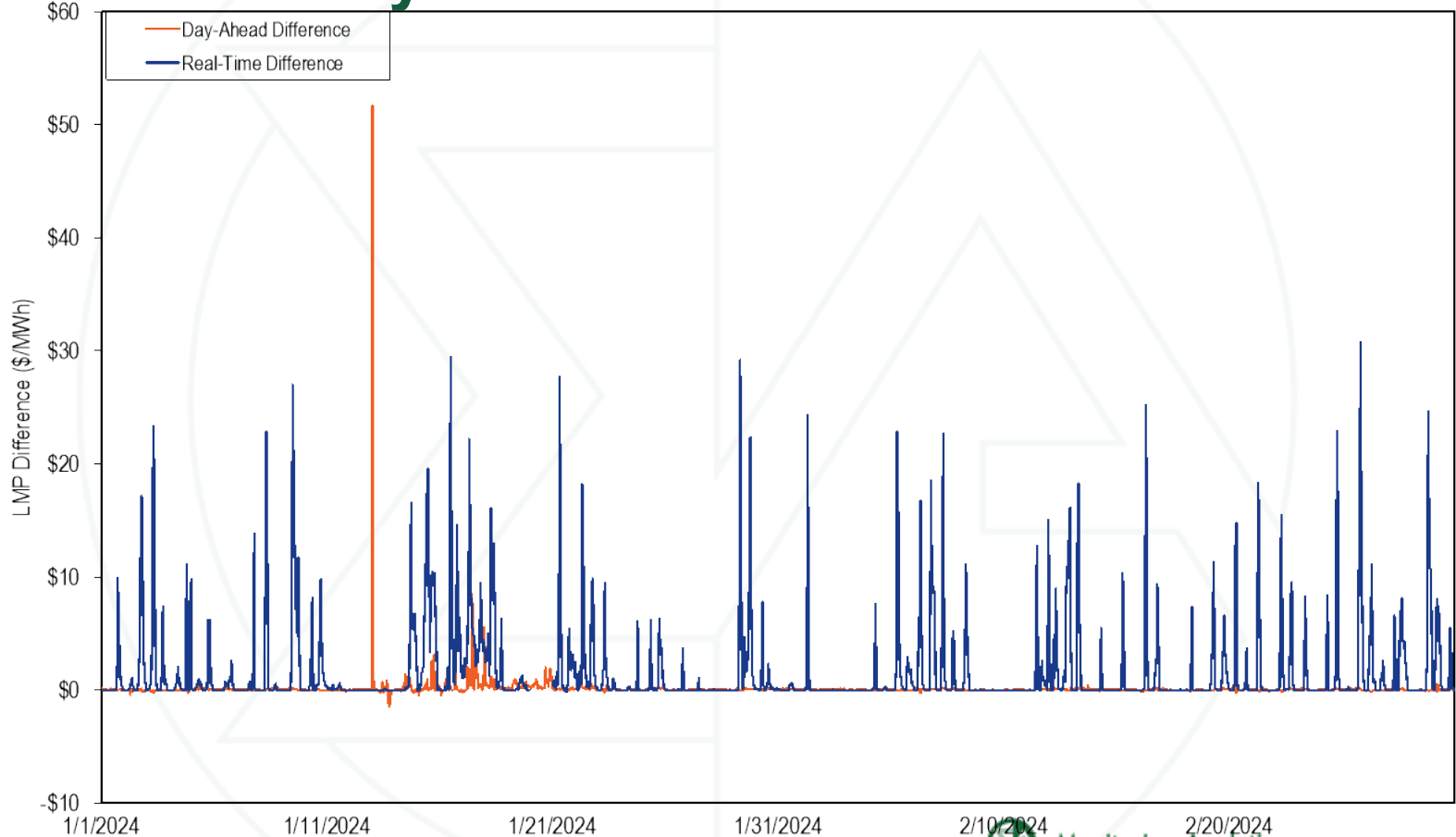
Monthly Average Load-Weighted DLMP and PLMP

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%
2024	Jan-Feb	\$31.89	\$31.93	\$0.04	0.1%	\$29.11	\$31.08	\$1.97	6.8%
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%	\$39.96	\$41.96	\$1.99	5.0%
2024	Feb	\$23.67	\$23.70	\$0.03	0.1%	\$23.20	\$24.86	\$1.66	7.2%
2024	Jan-Feb	\$36.95	\$37.08	\$0.12	0.3%	\$32.09	\$33.93	\$1.84	5.7%

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%
2023	Jan-Feb	1.2%	0.3%	0.0%	1.6%	4.6%	1.7%	0.0%	6.4%
2023		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%
2024	Feb	0.0%	0.0%	0.0%	0.0%	2.2%	0.1%	0.1%	2.4%
2024	Jan-Feb	0.4%	0.4%	0.0%	0.8%	2.8%	0.6%	0.1%	3.5%

Fast Start Impacts: Zone Average Differences

2024 Jan - Feb								
Zone	Day-Ahead				Real-Time			
	Average DLMP	Average PLMP	Difference	Percent Difference	Average DLMP	Average PLMP	Difference	Percent Difference
ACEC	\$19.91	\$19.93	\$0.02	0.1%	\$23.00	\$24.18	\$1.18	5.1%
AEP	\$25.80	\$25.83	\$0.03	0.1%	\$28.51	\$30.34	\$1.83	6.4%
APS	\$26.76	\$26.78	\$0.03	0.1%	\$29.44	\$31.38	\$1.94	6.6%
ATSI	\$25.57	\$25.60	\$0.03	0.1%	\$28.33	\$30.12	\$1.79	6.3%
BGE	\$31.69	\$31.72	\$0.03	0.1%	\$34.29	\$36.65	\$2.36	6.9%
COMED	\$22.13	\$22.16	\$0.03	0.1%	\$24.56	\$26.19	\$1.63	6.6%
DAY	\$26.91	\$26.94	\$0.03	0.1%	\$29.70	\$31.61	\$1.91	6.4%
DUKE	\$26.42	\$26.45	\$0.03	0.1%	\$29.05	\$30.92	\$1.87	6.4%
DOM	\$29.75	\$29.77	\$0.02	0.1%	\$33.89	\$35.99	\$2.10	6.2%
DPL	\$22.15	\$22.17	\$0.01	0.1%	\$25.24	\$27.41	\$2.17	8.6%
DUQ	\$25.76	\$25.79	\$0.03	0.1%	\$28.38	\$30.21	\$1.83	6.5%
EKPC	\$25.78	\$25.81	\$0.03	0.1%	\$28.91	\$30.76	\$1.85	6.4%
JCPLC	\$20.55	\$20.57	\$0.02	0.1%	\$23.70	\$24.97	\$1.27	5.3%
MEC	\$22.75	\$22.78	\$0.03	0.1%	\$25.73	\$27.35	\$1.61	6.3%
OVEC	\$25.35	\$25.38	\$0.03	0.1%	\$27.94	\$29.72	\$1.78	6.4%
PECO	\$19.04	\$19.06	\$0.02	0.1%	\$22.10	\$23.18	\$1.09	4.9%
PE	\$25.30	\$25.31	\$0.01	0.0%	\$28.59	\$30.40	\$1.81	6.3%
PEPCO	\$30.00	\$30.02	\$0.03	0.1%	\$32.68	\$34.86	\$2.18	6.7%
PPL	\$20.97	\$20.99	\$0.03	0.1%	\$23.80	\$25.20	\$1.40	5.9%
PSEG	\$20.71	\$20.73	\$0.02	0.1%	\$24.10	\$25.38	\$1.28	5.3%
REC	\$22.18	\$22.20	\$0.02	0.1%	\$25.94	\$27.30	\$1.36	5.3%

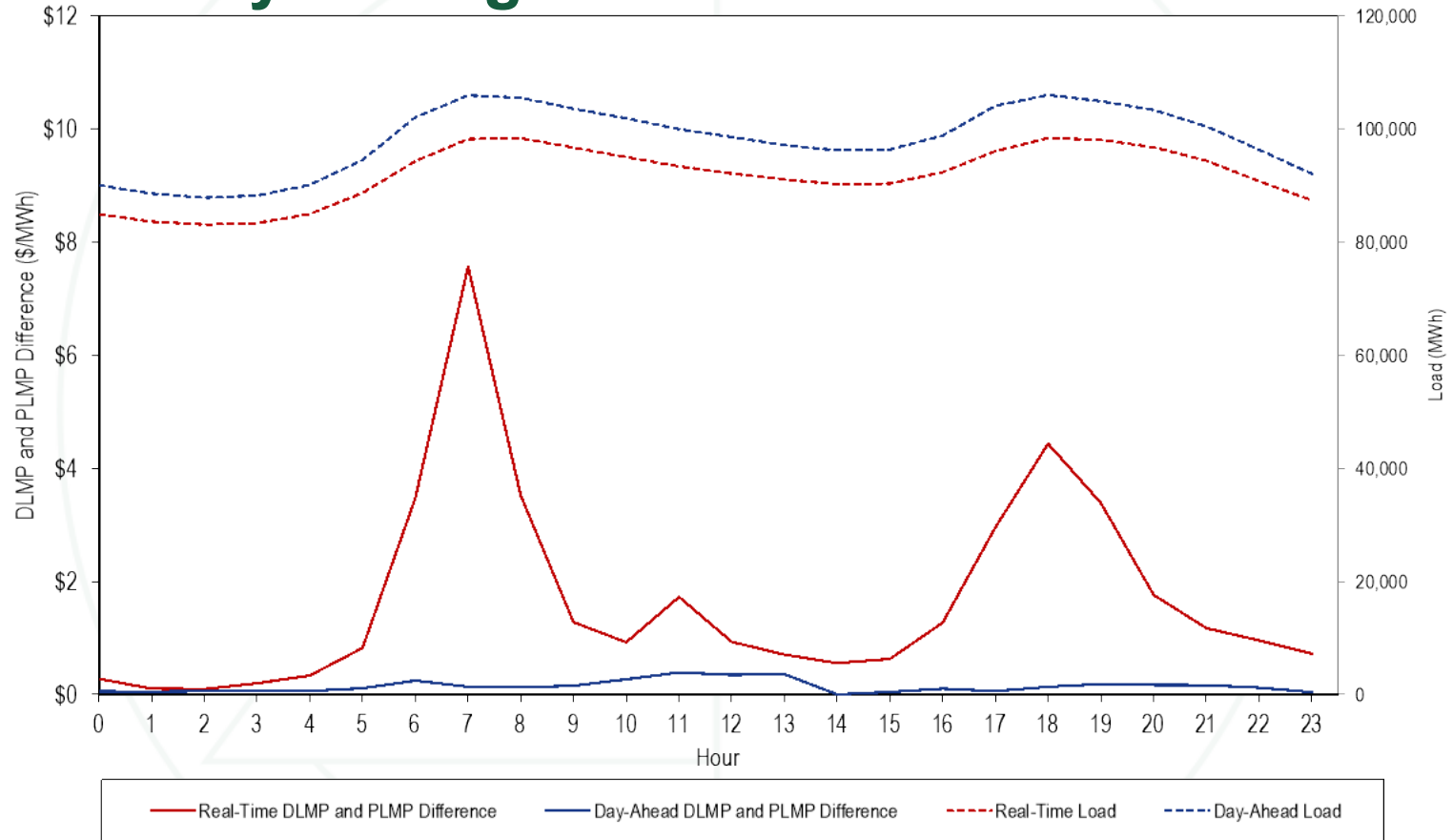
Fast Start Impacts: Hub Average Differences

2024 Jan - Feb								
Hub	Day-Ahead				Real-Time			
	Average DLMP	Average PLMP	Difference	Percent Difference	Average DLMP	Average PLMP	Difference	Percent Difference
AEP GEN HUB	\$30.46	\$30.50	\$0.04	0.1%	\$27.54	\$29.31	\$1.77	6.4%
AEP-DAYTON HUB	\$31.14	\$31.19	\$0.04	0.1%	\$28.14	\$29.95	\$1.81	6.4%
ATSI GEN HUB	\$30.64	\$30.68	\$0.04	0.1%	\$27.71	\$29.47	\$1.76	6.3%
CHICAGO GEN HUB	\$26.78	\$26.86	\$0.09	0.3%	\$24.06	\$25.67	\$1.61	6.7%
CHICAGO HUB	\$27.41	\$27.44	\$0.03	0.1%	\$24.61	\$26.24	\$1.62	6.6%
DOMINION HUB	\$34.10	\$34.14	\$0.04	0.1%	\$31.16	\$33.16	\$2.00	6.4%
EASTERN HUB	\$28.35	\$28.37	\$0.02	0.1%	\$25.51	\$27.70	\$2.19	8.6%
N ILLINOIS HUB	\$27.14	\$27.24	\$0.10	0.4%	\$24.56	\$26.19	\$1.63	6.6%
NEW JERSEY HUB	\$25.85	\$25.89	\$0.03	0.1%	\$23.75	\$25.01	\$1.26	5.3%
OHIO HUB	\$31.10	\$31.14	\$0.04	0.1%	\$28.11	\$29.91	\$1.80	6.4%
WEST INT HUB	\$32.07	\$32.12	\$0.04	0.1%	\$29.09	\$30.96	\$1.87	6.4%
WESTERN HUB	\$33.61	\$33.64	\$0.03	0.1%	\$30.15	\$32.17	\$2.02	6.7%

Zonal Real-Time PLMP-DLMP Difference Frequency

Zone	2024 Jan - Feb										
	< (\$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-RT0	0.0%	1.1%	67.2%	26.4%	3.2%	2.0%	0.1%	0.0%	0.0%	0.0%	
ACEC	0.0%	5.0%	67.4%	24.4%	1.9%	1.2%	0.1%	0.0%	0.0%	0.0%	
AEP	0.0%	2.0%	67.3%	25.2%	3.1%	2.2%	0.1%	0.0%	0.0%	0.0%	
APS	0.0%	0.8%	67.2%	26.0%	3.2%	2.6%	0.1%	0.0%	0.0%	0.0%	
ATSI	0.0%	3.2%	67.2%	24.4%	3.1%	2.1%	0.1%	0.0%	0.0%	0.0%	
BGE	0.0%	1.6%	67.2%	24.6%	3.2%	3.0%	0.4%	0.0%	0.0%	0.0%	
COMED	0.0%	2.6%	67.5%	25.0%	2.9%	1.9%	0.1%	0.0%	0.0%	0.0%	
DAY	0.0%	2.3%	67.2%	24.7%	3.0%	2.4%	0.2%	0.0%	0.0%	0.0%	
DUKE	0.0%	2.2%	67.3%	25.0%	3.0%	2.4%	0.2%	0.0%	0.0%	0.0%	
DOM	0.0%	1.6%	67.3%	24.6%	3.5%	2.7%	0.3%	0.0%	0.0%	0.0%	
DPL	0.1%	7.3%	67.2%	22.1%	1.8%	1.2%	0.1%	0.1%	0.0%	0.0%	
DUQ	0.0%	2.9%	67.3%	24.6%	3.1%	2.0%	0.1%	0.0%	0.0%	0.0%	
EKPC	0.0%	1.9%	67.2%	25.1%	3.2%	2.4%	0.2%	0.0%	0.0%	0.0%	
JCPLC	0.0%	2.5%	67.4%	26.8%	2.0%	1.2%	0.1%	0.0%	0.0%	0.0%	
MEC	0.0%	0.8%	67.2%	26.9%	2.8%	2.1%	0.2%	0.0%	0.0%	0.0%	
OVEC	0.2%	2.4%	67.3%	24.7%	2.9%	2.2%	0.2%	0.0%	0.1%	0.0%	
PECO	0.0%	7.0%	67.3%	22.6%	1.8%	1.2%	0.1%	0.0%	0.0%	0.0%	
PE	0.1%	1.8%	67.1%	25.4%	3.2%	2.3%	0.1%	0.0%	0.0%	0.0%	
PEPCO	0.0%	1.6%	67.2%	24.5%	3.4%	2.8%	0.4%	0.0%	0.0%	0.0%	
PPL	0.0%	1.5%	67.2%	27.6%	2.3%	1.3%	0.0%	0.0%	0.0%	0.0%	
PSEG	0.0%	2.7%	67.4%	26.4%	2.0%	1.5%	0.1%	0.0%	0.0%	0.0%	
REC	0.1%	2.7%	67.2%	26.2%	2.3%	1.6%	0.1%	0.0%	0.0%	0.0%	

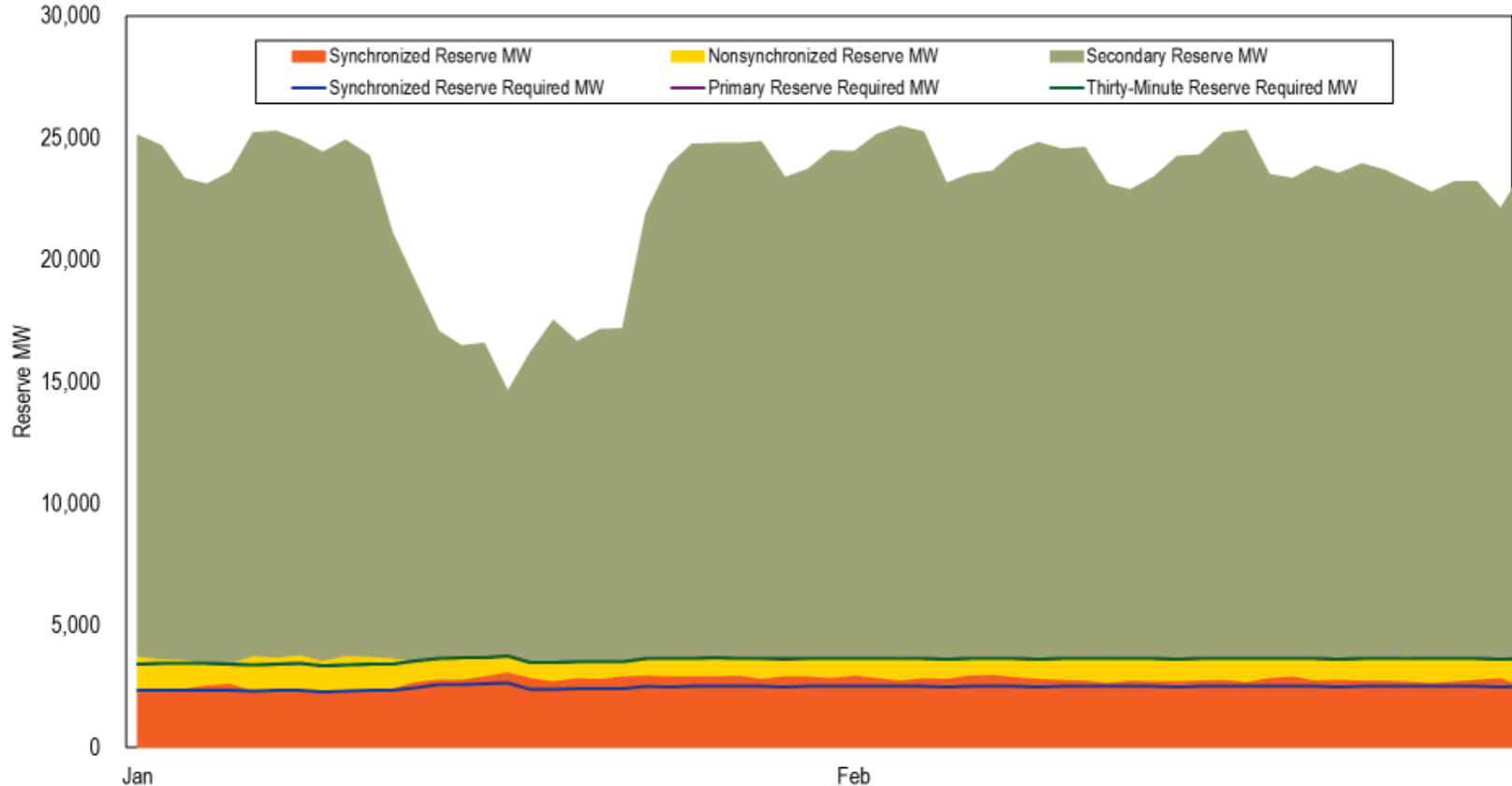
Hourly Average Load and LMP Difference



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%	\$24.49	\$25.23	\$0.74	3.0%
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
2024	Feb	2,769	2,827	1,215	868	3,983	3,694	15,323	20,219	19,306	23,914

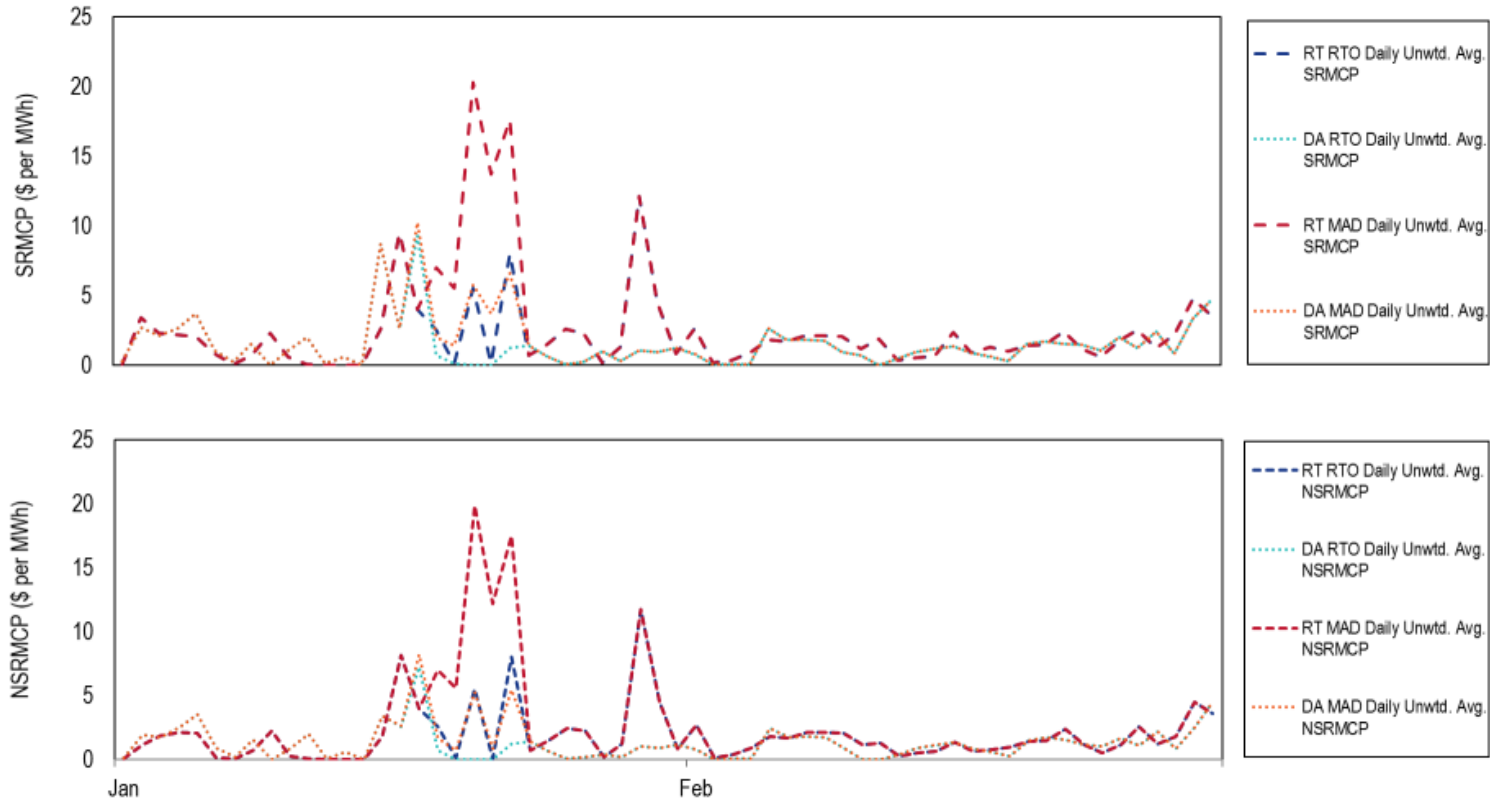
Day-Ahead & Real-Time MAD Reserve MW

Year	Month	Synchronized Reserve MW		Nonsynchronized Reserve MW		Total Primary Reserve MW		Secondary Reserve MW		Total Thirty-Minute Reserve MW	
		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
2024	Feb	1,959	1,992	932	707	2,891	2,699	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)	\$1,137,709	\$0	\$5,039,248
	2024	Feb	\$1,505,615	\$30,915	\$306,951	\$0	\$1,843,481
Nonsynchronized Reserve	2024	Jan	\$549,761	(\$804,845)	\$246,452	NA	(\$8,631)
	2024	Feb	\$406,207	(\$224,889)	\$144,292	NA	\$325,610
Secondary Reserve	2024	Jan	\$0	\$0	\$161,268	\$0	\$161,268
	2024	Feb	\$0	\$0	\$98,365	\$0	\$98,365

Reserve Prices



- Higher prices during winter storms.

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