

Market Monitor Report

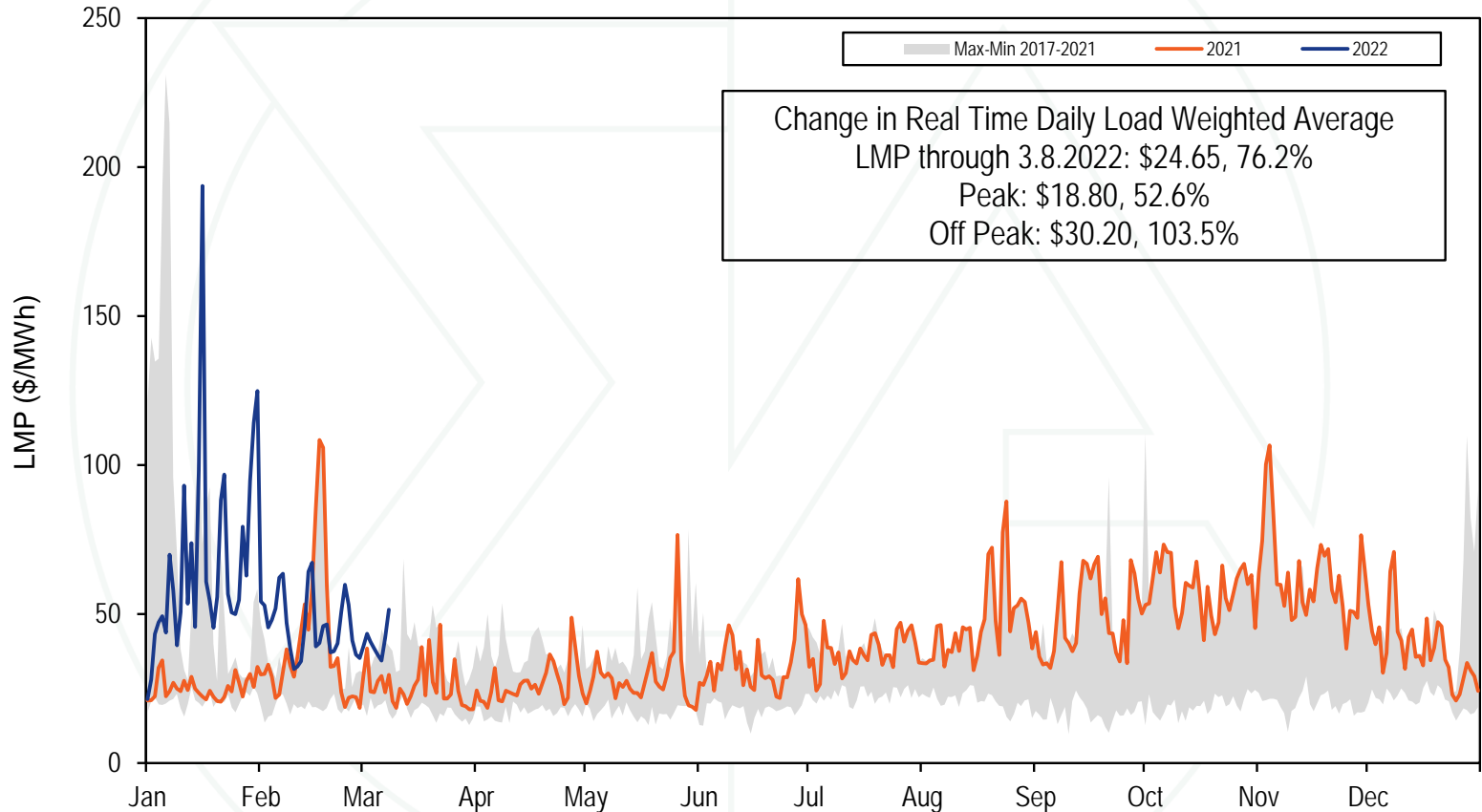
MC Webinar
03.21.2022

IMM

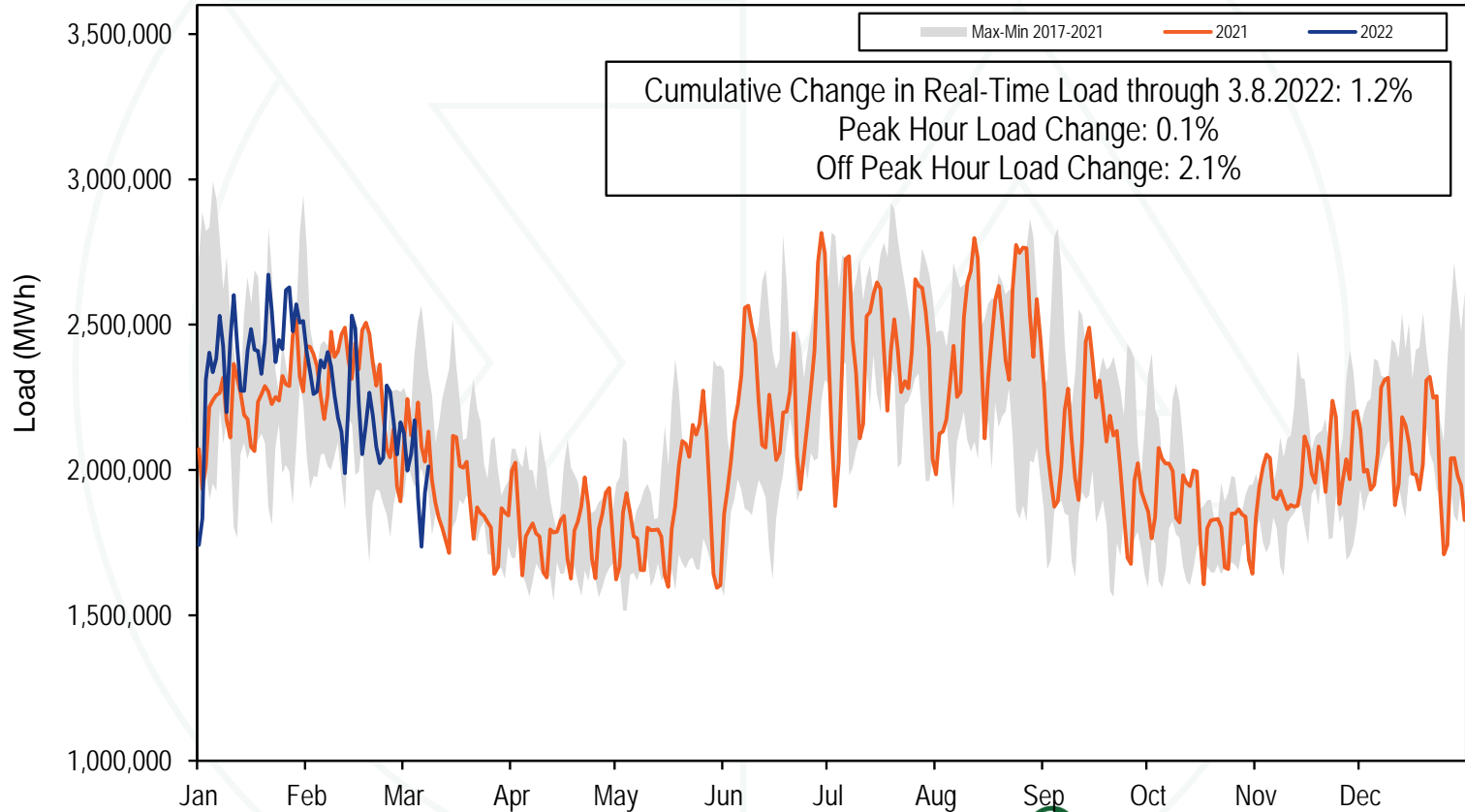


Monitoring Analytics

2022 YTD PJM Real-Time LMP



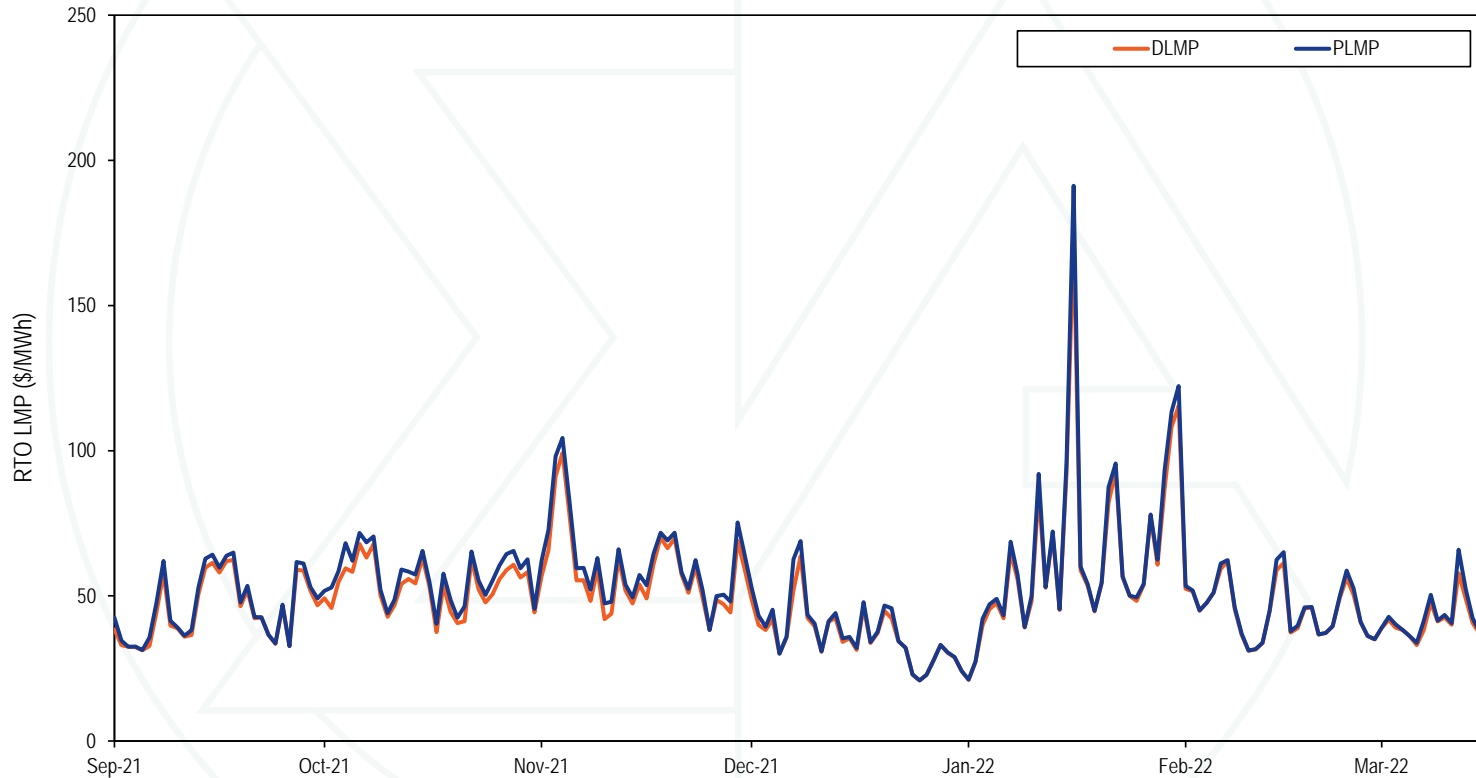
2022 YTD PJM Real-Time Daily Load



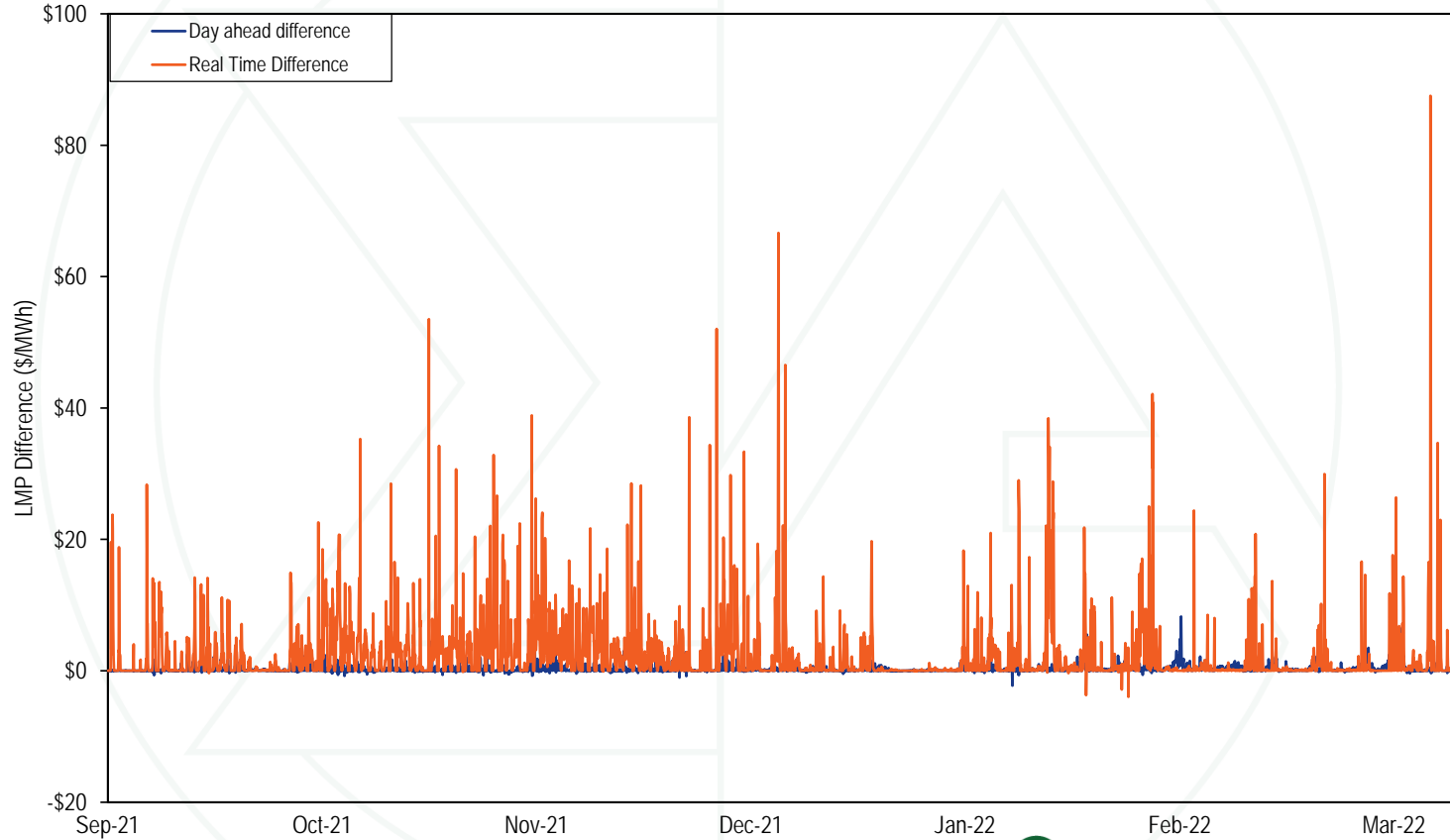
Monthly Average Load-Weighted DLMP and PLMP

| Year | Month | Day-Ahead Load-Weighted Average | | | | Real-Time Load-Weighted Average | | | |
|------|-----------|---------------------------------|---------|------------|--------------------|---------------------------------|---------|------------|--------------------|
| | | DLMP | PLMP | Difference | Percent Difference | DLMP | PLMP | Difference | Percent Difference |
| 2021 | Sep | \$46.00 | \$46.14 | \$0.13 | 0.3% | \$47.73 | \$49.63 | \$1.90 | 4.0% |
| 2021 | Oct | \$57.86 | \$57.98 | \$0.12 | 0.2% | \$54.53 | \$58.42 | \$3.89 | 7.1% |
| 2021 | Nov | \$60.76 | \$61.00 | \$0.24 | 0.4% | \$59.27 | \$63.01 | \$3.74 | 6.3% |
| 2021 | Dec | \$37.74 | \$37.85 | \$0.11 | 0.3% | \$37.37 | \$38.92 | \$1.55 | 4.2% |
| 2021 | Sep - Dec | \$50.30 | \$50.46 | \$0.15 | 0.3% | \$49.47 | \$52.20 | \$2.73 | 5.5% |
| 2022 | Jan | \$63.93 | \$64.15 | \$0.22 | 0.3% | \$66.43 | \$69.06 | \$2.64 | 4.0% |
| 2022 | Feb | \$49.75 | \$50.13 | \$0.39 | 0.8% | \$45.93 | \$46.76 | \$0.83 | 1.8% |

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 |
| 2021 | Sep | 2.2% | 0.8% | 0.0% | 3.0% | 6.7% | 1.3% | 0.0% | 8.1% |
| 2021 | Oct | 3.2% | 1.4% | 0.0% | 4.6% | 11.1% | 2.1% | 0.0% | 13.3% |
| 2021 | Nov | 3.2% | 0.3% | 0.0% | 3.5% | 11.3% | 0.6% | 0.0% | 11.9% |
| 2021 | Dec | 1.4% | 0.3% | 0.2% | 1.8% | 4.4% | 0.6% | 0.1% | 5.2% |
| 2022 | Jan | 1.3% | 0.3% | 0.2% | 1.8% | 5.0% | 0.9% | 0.2% | 6.2% |
| 2022 | Feb | 0.6% | 0.2% | 0.3% | 1.2% | 3.3% | 0.5% | 0.3% | 4.0% |

Fast Start Impacts: Zonal Average Differences

| Sep 2021 - Feb 2022 | | | | | | | | |
|---------------------|--------------|--------------|------------|--------------------|--------------|--------------|------------|--------------------|
| Zone | Day-Ahead | | | | Real-Time | | | |
| | Average DLMP | Average PLMP | Difference | Difference Percent | Average DLMP | Average PLMP | Difference | Difference Percent |
| ACEC | \$44.75 | \$44.89 | \$0.15 | 0.3% | \$45.77 | \$47.42 | \$1.66 | 3.6% |
| AEP | \$50.73 | \$50.93 | \$0.20 | 0.4% | \$49.18 | \$51.08 | \$1.90 | 3.9% |
| APS | \$52.99 | \$53.20 | \$0.21 | 0.4% | \$51.75 | \$53.74 | \$1.99 | 3.8% |
| ATSI | \$50.59 | \$50.79 | \$0.20 | 0.4% | \$48.43 | \$50.26 | \$1.83 | 3.8% |
| BGE | \$59.83 | \$60.04 | \$0.21 | 0.4% | \$58.50 | \$60.98 | \$2.47 | 4.2% |
| COMED | \$42.51 | \$42.70 | \$0.19 | 0.4% | \$40.64 | \$42.68 | \$2.04 | 5.0% |
| DAY | \$52.91 | \$53.12 | \$0.21 | 0.4% | \$51.17 | \$53.08 | \$1.91 | 3.7% |
| DUKE | \$51.63 | \$51.83 | \$0.20 | 0.4% | \$49.32 | \$51.17 | \$1.85 | 3.8% |
| DOM | \$58.10 | \$58.30 | \$0.19 | 0.3% | \$58.48 | \$60.78 | \$2.31 | 3.9% |
| DPL | \$51.40 | \$51.62 | \$0.22 | 0.4% | \$51.81 | \$54.76 | \$2.95 | 5.7% |
| DUQ | \$49.54 | \$49.74 | \$0.20 | 0.4% | \$47.57 | \$49.34 | \$1.77 | 3.7% |
| EKPC | \$51.74 | \$51.94 | \$0.20 | 0.4% | \$49.88 | \$51.75 | \$1.87 | 3.7% |
| JCPLC | \$47.01 | \$47.17 | \$0.16 | 0.3% | \$47.85 | \$49.73 | \$1.88 | 3.9% |
| MEC | \$55.27 | \$55.44 | \$0.16 | 0.3% | \$54.21 | \$56.25 | \$2.04 | 3.8% |
| OVEC | \$50.14 | \$50.34 | \$0.20 | 0.4% | \$48.38 | \$50.20 | \$1.81 | 3.8% |
| PECO | \$45.09 | \$45.23 | \$0.14 | 0.3% | \$46.03 | \$47.79 | \$1.76 | 3.8% |
| PE | \$52.93 | \$53.13 | \$0.20 | 0.4% | \$50.32 | \$52.05 | \$1.72 | 3.4% |
| PEPCO | \$58.58 | \$58.79 | \$0.21 | 0.4% | \$58.43 | \$60.88 | \$2.45 | 4.2% |
| PPL | \$49.65 | \$49.81 | \$0.16 | 0.3% | \$48.38 | \$50.20 | \$1.82 | 3.8% |
| PSEG | \$48.52 | \$48.67 | \$0.15 | 0.3% | \$49.98 | \$51.96 | \$1.98 | 4.0% |
| REC | \$51.37 | \$51.52 | \$0.15 | 0.3% | \$52.84 | \$54.96 | \$2.12 | 4.0% |

Fast Start Impacts: Hub Average Differences

Sep 2021 - Feb 2022

| Hub | Day-Ahead | | | | Real-Time | | | |
|-----------------|--------------|--------------|------------|--------------------|--------------|--------------|------------|--------------------|
| | Average DLMP | Average PLMP | Difference | Difference Percent | Average DLMP | Average PLMP | Difference | Difference Percent |
| AEP GEN HUB | \$49.55 | \$49.75 | \$0.20 | 0.4% | \$47.61 | \$49.41 | \$1.80 | 3.8% |
| AEP-DAYTON HUB | \$49.93 | \$50.13 | \$0.20 | 0.4% | \$47.96 | \$49.84 | \$1.88 | 3.9% |
| ATSI GEN HUB | \$49.66 | \$49.86 | \$0.20 | 0.4% | \$47.30 | \$49.09 | \$1.80 | 3.8% |
| CHICAGO GEN HUB | \$41.81 | \$41.99 | \$0.19 | 0.4% | \$39.67 | \$41.67 | \$2.00 | 5.0% |
| CHICAGO HUB | \$42.77 | \$42.97 | \$0.19 | 0.4% | \$40.89 | \$42.95 | \$2.06 | 5.0% |
| DOMINION HUB | \$57.01 | \$57.21 | \$0.19 | 0.3% | \$57.20 | \$59.40 | \$2.21 | 3.9% |
| EASTERN HUB | \$50.35 | \$50.57 | \$0.22 | 0.4% | \$50.61 | \$53.35 | \$2.74 | 5.4% |
| N ILLINOIS HUB | \$42.44 | \$42.63 | \$0.19 | 0.5% | \$40.55 | \$42.58 | \$2.03 | 5.0% |
| NEW JERSEY HUB | \$47.37 | \$47.52 | \$0.15 | 0.3% | \$48.53 | \$50.43 | \$1.90 | 3.9% |
| OHIO HUB | \$49.62 | \$49.82 | \$0.20 | 0.4% | \$47.49 | \$49.39 | \$1.91 | 4.0% |
| WEST INT HUB | \$51.81 | \$52.00 | \$0.20 | 0.4% | \$50.50 | \$52.44 | \$1.95 | 3.9% |
| WESTERN HUB | \$54.64 | \$54.85 | \$0.21 | 0.4% | \$52.55 | \$54.56 | \$2.01 | 3.8% |

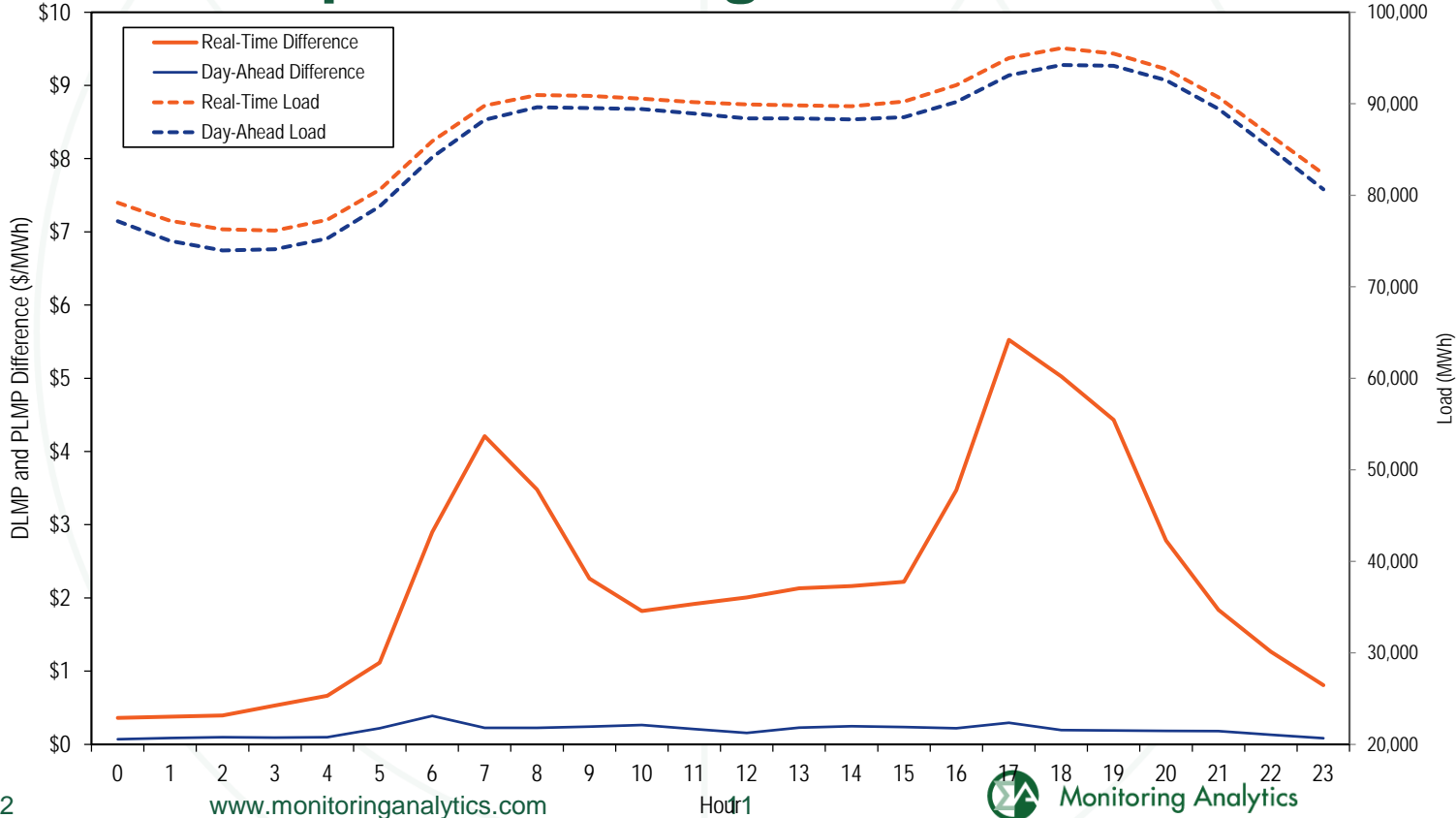


Zonal PLMP-DLMP Difference Frequency

Sep 2021 - Feb 2022

| Zone | < (\$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 | 0.0% | 1.1% | 0.0% | 0.8% | 49.8% | 43.6% | 2.9% | 1.4% | 0.3% | 0.1% |
| ACEC | 0.0% | 1.2% | 0.4% | 6.6% | 50.3% | 37.8% | 2.1% | 1.1% | 0.4% | 0.2% |
| AEP | 0.0% | 1.1% | 0.0% | 1.2% | 49.9% | 43.5% | 2.9% | 1.1% | 0.2% | 0.1% |
| APS | 0.0% | 1.1% | 0.0% | 1.1% | 50.0% | 43.0% | 3.0% | 1.4% | 0.3% | 0.1% |
| ATSI | 0.0% | 1.1% | 0.0% | 1.6% | 49.9% | 43.4% | 2.6% | 1.0% | 0.2% | 0.1% |
| BGE | 0.0% | 1.1% | 0.1% | 2.6% | 49.9% | 40.0% | 3.7% | 1.9% | 0.6% | 0.1% |
| COMED | 0.0% | 1.1% | 0.0% | 2.3% | 50.3% | 42.0% | 2.8% | 1.2% | 0.3% | 0.1% |
| DAY | 0.0% | 1.1% | 0.0% | 1.3% | 50.0% | 43.1% | 2.9% | 1.1% | 0.2% | 0.1% |
| DUKE | 0.0% | 1.1% | 0.0% | 1.3% | 50.0% | 43.3% | 2.8% | 1.1% | 0.2% | 0.1% |
| DOM | 0.0% | 1.1% | 0.1% | 2.0% | 50.1% | 41.0% | 3.4% | 1.7% | 0.4% | 0.1% |
| DPL | 0.0% | 1.1% | 0.1% | 8.9% | 50.3% | 33.3% | 2.4% | 2.5% | 0.8% | 0.5% |
| DUQ | 0.0% | 1.1% | 0.0% | 1.7% | 50.0% | 43.3% | 2.6% | 1.0% | 0.2% | 0.1% |
| EKPC | 0.0% | 1.1% | 0.0% | 1.4% | 50.0% | 43.1% | 2.9% | 1.1% | 0.2% | 0.1% |
| JCPLC | 0.0% | 1.1% | 0.1% | 3.8% | 50.4% | 40.7% | 2.2% | 1.2% | 0.4% | 0.2% |
| MEC | 0.0% | 1.1% | 0.2% | 3.4% | 50.1% | 39.8% | 3.1% | 1.6% | 0.6% | 0.2% |
| OVEC | 0.0% | 1.1% | 0.0% | 1.4% | 50.1% | 43.3% | 2.7% | 1.1% | 0.2% | 0.1% |
| PECO | 0.0% | 1.1% | 0.1% | 7.9% | 50.3% | 36.7% | 2.2% | 1.1% | 0.4% | 0.2% |
| PE | 0.0% | 1.1% | 0.1% | 1.4% | 49.9% | 43.1% | 3.0% | 1.1% | 0.3% | 0.1% |
| PEPCO | 0.0% | 1.1% | 0.1% | 2.6% | 50.0% | 40.0% | 3.6% | 1.9% | 0.5% | 0.1% |
| PPL | 0.0% | 1.1% | 0.1% | 3.3% | 50.2% | 41.0% | 2.5% | 1.3% | 0.4% | 0.1% |
| PSEG | 0.0% | 1.1% | 0.1% | 3.3% | 50.3% | 40.9% | 2.4% | 1.3% | 0.4% | 0.2% |
| REC | 0.0% | 1.1% | 0.1% | 2.5% | 50.0% | 41.7% | 2.4% | 1.5% | 0.5% | 0.1% |

Hourly Average Load and LMP Difference: Sep 2021 through Feb 2022



On Peak and Off Peak LMP

- In January 2022, average off peak LMP greater than average on peak LMP.
- This pattern has not occurred since January 2018.
- **Causes**
 - High LMPs on Sunday, January 16, 2022
 - High LMPs in the HE 7:00 AM, which is classified as off peak, especially on a few January days
 - Fast start pricing effects on LMP in the HE 7:00 AM, both day ahead and real time

Real-Time Monthly On Peak and Off Peak LMP

| | 2021 | | | | 2022 | | | |
|-----|----------|---------|------------|--------------------|----------|---------|------------|--------------------|
| | Off Peak | On Peak | Difference | Percent Difference | Off Peak | On Peak | Difference | Percent Difference |
| Jan | \$23.28 | \$27.27 | \$3.99 | 17.1% | \$71.11 | \$61.68 | (\$9.43) | -13.3% |
| Feb | \$34.53 | \$45.20 | \$10.67 | 30.9% | \$44.66 | \$47.05 | \$2.39 | 5.4% |
| Mar | \$23.24 | \$28.16 | \$4.92 | 21.2% | | | | |
| Apr | \$22.40 | \$30.19 | \$7.79 | 34.8% | | | | |
| May | \$22.08 | \$35.35 | \$13.28 | 60.1% | | | | |
| Jun | \$25.82 | \$37.95 | \$12.13 | 47.0% | | | | |
| Jul | \$29.94 | \$41.81 | \$11.87 | 39.6% | | | | |
| Aug | \$34.89 | \$54.24 | \$19.35 | 55.5% | | | | |
| Sep | \$37.86 | \$56.97 | \$19.11 | 50.5% | | | | |
| Oct | \$48.70 | \$66.77 | \$18.07 | 37.1% | | | | |
| Nov | \$54.93 | \$69.88 | \$14.95 | 27.2% | | | | |
| Dec | \$33.92 | \$41.76 | \$7.85 | 23.1% | | | | |

Monitoring Analytics, LLC

2621 Van Buren Avenue

Suite 160

Eagleville, PA

19403

(610) 271-8050

MA@monitoringanalytics.com

www.MonitoringAnalytics.com

