Climavision Forecasts Accurately Call for Early June Heatwave Pushing PJM to the Brink.

Horizon AI Point Forecasts Deliver Energy Market Benefits To Better Anticipate Demand Fluctuations, Optimize Operations, and Mitigate Financial Risks.

Heatwaves pose a significant financial risk to energy markets by driving up demand and spiking electricity prices. This case study showcases how if leveraged, Climavision's Horizon AI Point Forecast can help navigate crucial scenarios just like the one right before the start of summer 2024, helping energy providers and grid operators manage demand and avoid costly blackouts.

During the month of June, PJM (Pennsylvania-New Jersey-Maryland Interconnection), the Regional Transmission Organization (RTO) coordinating electricity across 13 states in the eastern U.S., faced a major heatwave that tested the resilience of its power grid. High Heat Alerts were issued as temperatures soared beyond seasonal norms, resulting in unprecedented demand and pushing the grid to its limits.

From June 16-22, 65 million customers in regions like Pennsylvania, New Jersey, Maryland, and Ohio experienced highs of 90-100°F. As temperatures climbed, electricity consumption spiked, with demand frequently exceeding 150,000 MW, compared to PJM's typical summer load of 115,000-130,000 MW. The grid operator struggled to keep pace with demand, risking potential blackouts.

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pjm®

■ Early summer heatwave tests resilience of PJM power grid.

■ Soaring temperatures drive peak consumption and raise potential blackout concerns.

■ Surge in demand triggers a dramatic rise in wholesale electricity prices.

■ Climavision's nodal-level, AI-infused Point forecasts capture the stretch of abnormal temps well, offering clarity for a challenging supply and demand week.

Forecast

Climavision's Horizon AI Point Forecast system provides clarity in the face of adverse weather conditions. The nodal-level NWP prediction model uses local observational datasets and AI-infused historical data to provide a clearer picture of what's coming. No matter where you operate, you can access the granular detail you need to stay ahead of the weather.

Climavision's Horizon AI Point Forecast, though not used at the time, could have provided critical, hyper-local insights into temperature trends during this period. The model forecasted 90+ degree days across PJM's largest cities for June 17-22.

RECORDED HIGH TEMPERATURES							
	6/16/2024	6/17/2024	6/18/2024	6/19/2024	6/20/2024	6/21/2024	6/22/2024
KORD	95	97	94	93	85	94	93
KIAD	86	91	92	89	91	97	100
KCLE	89	96	94	92	94	90	95
KRDU	90	92	92	91	91	96	98

JUNE 10TH FORECASTED HIGH TEMPERATURES (% FORECASTED TEMP DEVIATION)							
	6/16/2024	6/17/2024	6/18/2024	6/19/2024	6/20/2024	6/21/2024	6/22/2024
KORD	93 (2.11%)	95 (2.06%)	94 (**0%**)	93 (**0%**)	91 (7.06%)	91 (3.19%)	89 (4.30%)
KIAD	92 (6.98%)	93 (2.20%)	96 (4.35%)	95 (6.74%)	95 (4.40%)	95 (2.06%)	96 (4.00%)
KCLE	88 (1.12%)	96 (**0%**)	92 (2.13%)	91 (1.09%)	92 (2.13%)	90 (**0%**)	90 (5.26%)
KRDU	94 (4.44%)	93 (1.09%)	94 (2.17%)	93 (2.20%)	94 (3.30%)	96 (**0%**)	96 (2.04%)

JUNE 15TH FORECASTED HIGH TEMPERATURES (% FORECASTED TEMP DEVIATION)							
	6/16/2024	6/17/2024	6/18/2024	6/19/2024	6/20/2024	6/21/2024	6/22/2024
KORD	95 (**0%**)	99 (2.06%)	95 (1.06%)	93 (**0%**)	93 (9.41%)	90 (4.26%)	87 (6.45%)
KIAD	88 (2.33%)	94 (3.30%)	98 (6.52%)	95 (6.74%)	96 (5.49%)	100 (3.09%)	101 (1.00%)
KCLE	89 (**0%**)	96 (**0%**)	94 (**0%**)	92 (**0%**)	94 (**0%**)	92 (2.22%)	91 (4.21%)
KRDU	91 (1.11%)	93 (1.09%)	92 (**0%**)	92 (1.09%)	93 (2.20%)	97 (1.04%)	99 (1.02%)

For example, on June 18th, Chicago's O'Hare International Airport was forecasted to reach the mid-to-upper 90s, and the actual temperature hit 94°F. By June 22nd, Washington-Dulles (KIAD) was predicted to hit 100°F—and indeed, it did. If energy traders and grid operators had utilized this level of precision, they could have better prepared for the surge in demand and optimized their response.
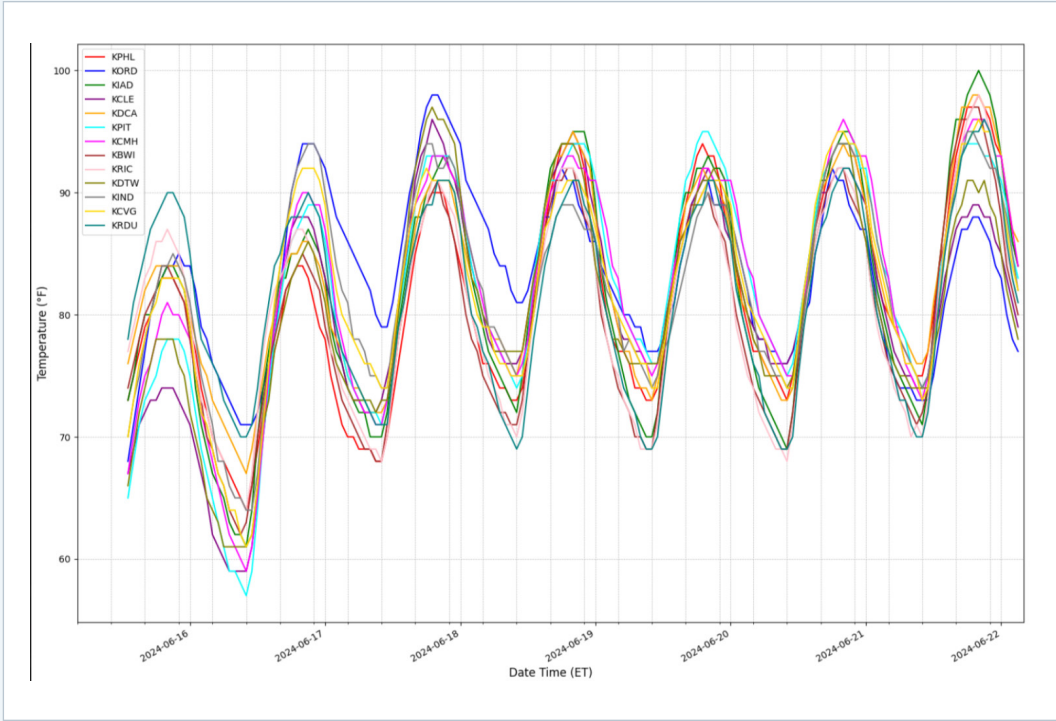
■ Climavision Horizon AI Point for June 16-22, shown in a meteogram output.
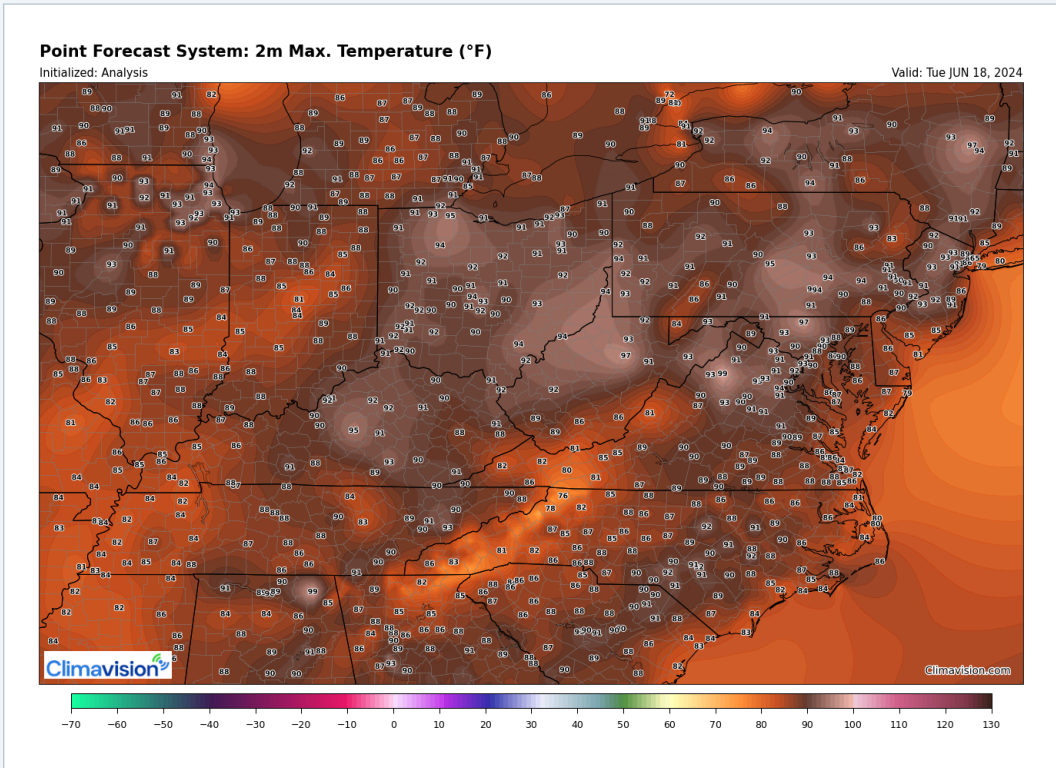
■ Climavision Horizon AI Point for June 18th, shown in custom Climavision graphics.

Pricing

As demand soared, wholesale electricity prices skyrocketed. On June 22nd, PJM's Eastern Hub hit $93.68 per MWh, well above the typical $30-$50 range. If Climavision's forecasts had been used, energy providers could have adjusted their strategies, avoiding price surges and minimizing financial risks.

The forecast data would have enabled energy traders to make profitable decisions in the day-ahead and real-time markets by anticipating the impact of weather on energy demand and pricing.

Peak hourly electricity demand for each day, PJM (Jun 18–Jun 26, 2019–2024) megawatthours
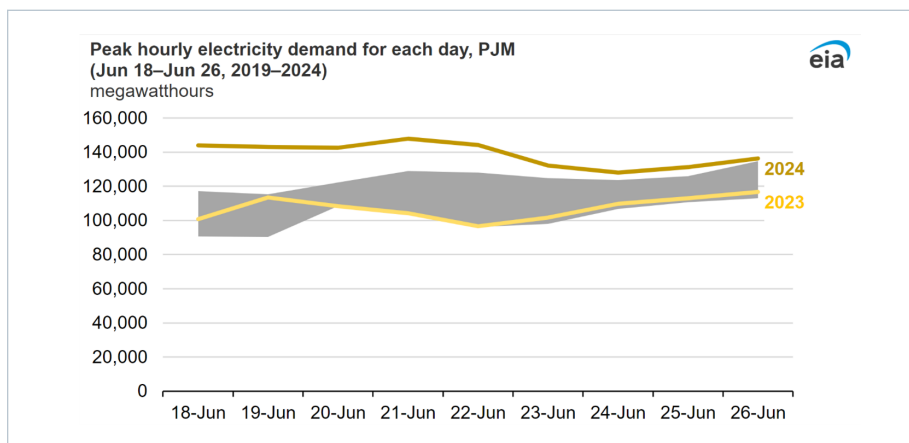
■ PJM faced higher electricity demand in June 2024 vs June 2023 (eia).

Conclusion

In today's volatile energy market, leveraging accurate weather forecasting can be the key to minimizing risks and maximizing profitability. Although Climavision's Horizon AI Point Forecast wasn't applied during the June 2024 PJM heatwave, the data provided by our AI-infused model could have empowered energy market participants to navigate demand surges, optimize operations, and avoid financial losses.

Whether you're a grid operator, energy trader, or utility, the insights offered by Horizon AI Point can transform the way you manage weather-driven challenges. Contact us today to learn more about how our AI-powered weather forecasting could benefit your organization.

■ Sources:
https://www.eia.gov/todayinenergy/detail.php?id=62410
https://insidelines.pjm.com/pjm-issues-hot-weather-alerts-for-june-16-21/
https://www.eia.gov/todayinenergy/detail.php?id=62403

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About Climavision

Climavision is a well funded, Louisville-based startup, rebuilding climate technology from the ground up and combining terrestrial sensors with space-based observations. Our team of renowned meteorologists, leading scientists, and passionate weather enthusiasts are changing weather forecasting as we know it by uncovering the clearest, most accurate picture of weather intelligence. Our offerings put next-generation climate technology to work to fundamentally change weather forecasting.

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