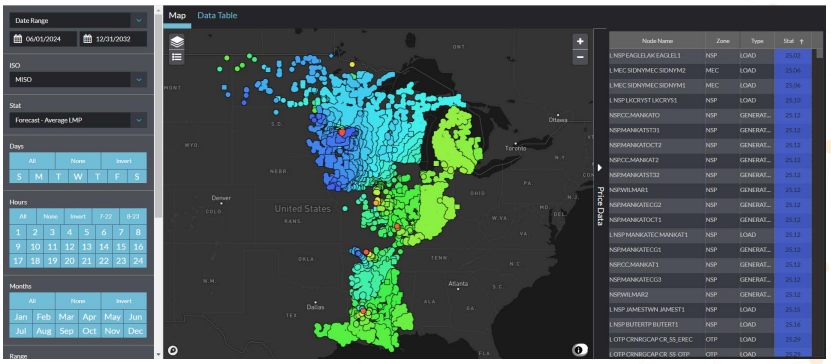
Long Term Nodal LMP Forecast

UNLOCK FUTURE MARKET INSIGHTS WITH A LONG TERM NODAL LMP FORECAST

The Long Term Nodal LMP Forecast from Horizons Energy offers a powerful tool for understanding future market dynamics across 100,000 nodes in the U.S. power grid. Key deliverables methodology, and assumptions are covered below.



Key Deliverables

- Hourly LMP & components, 2024 - 2050 for 100k nodes across the U.S.
- Updated twice per year
- Includes all Gen Buses and all Load Buses 69 kV+ across all U.S. ISOs (10k ERCOT Buses, 20k WECC Buses, 70k EI Buses)
- Viewable on Yes Energy maps and Time Series charts
- Includes supporting assumptions

Methodology

The Long Term Nodal LMP Forecast is a bankable forecast produced by Horizons Energy using the EnCompass Long Term Planning Model. Specific methodologies for the zonal and nodal components of the forecast are described below.

Zonal Methodology: A long-term zonal price forecast is produced in EnCompass for the areas in Figure 1 taking into account the below market drivers:

- Regional forecasts of electricity demand
- Economic growth rate
- Efficiency, BTM, DR, DEG, EV
- Fuel prices – natural gas, coal, uranium and oil
- The economics of candidate resources
- Capital costs of renewables and storage
- Existing resources, retirements, known additions
- Transfer limits between market areas
- Market rules, tariff and interchange between BA's

All forecast prices are benchmarked for accuracy against historical prices, as seen in Figure 2.

Figure 1 - North America Area Definitions

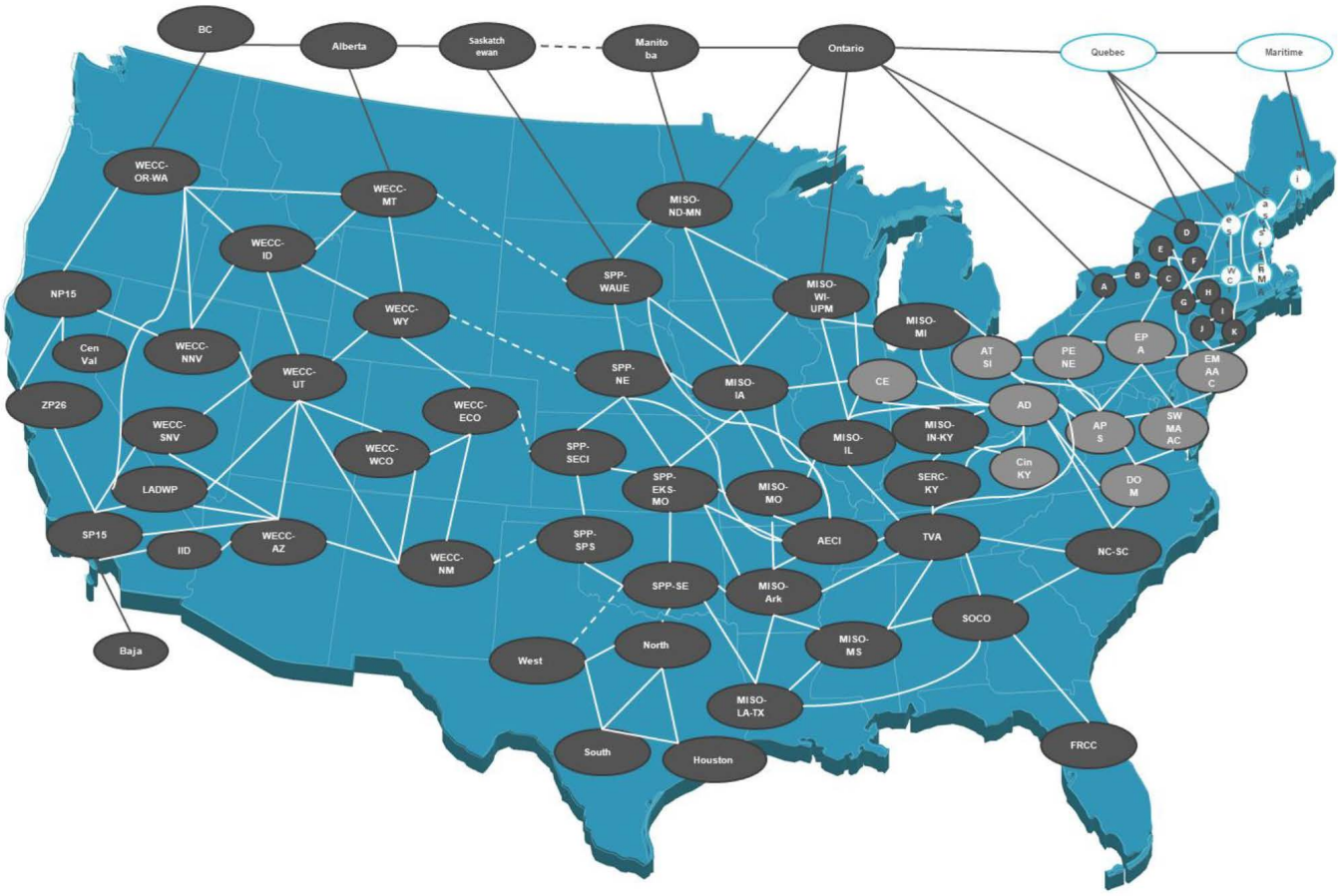
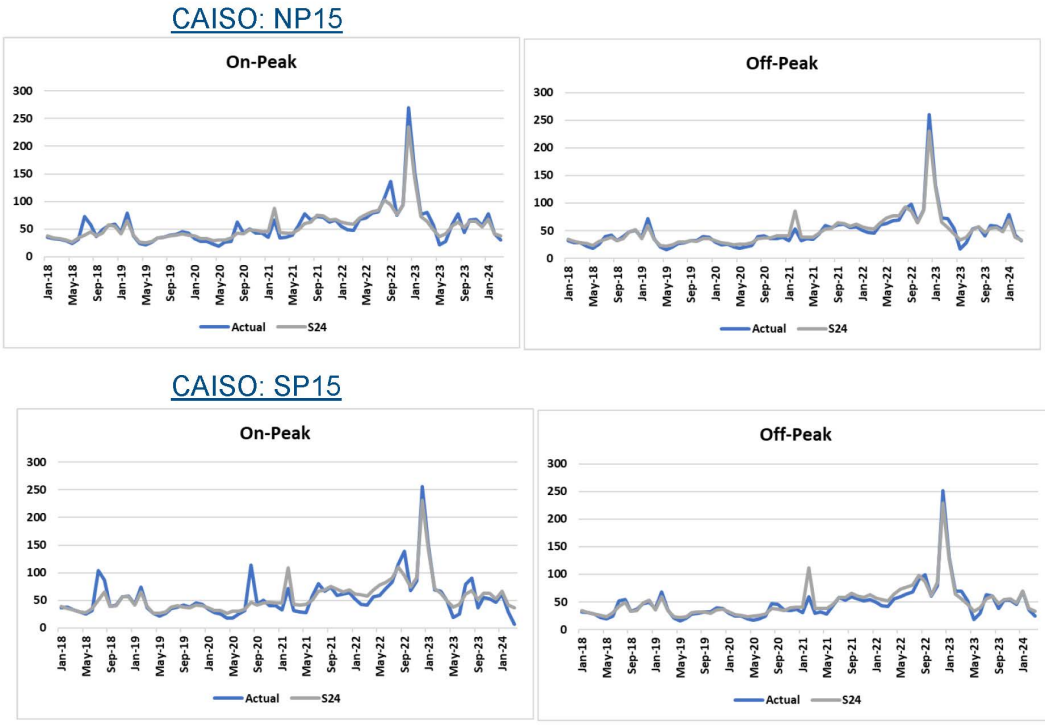


Figure 2 - Zonal Price Benchmarking Example



Zonal to Nodal Methodology: EnCompass uses topology from interconnect-published power flow models to run a full nodal simulation for select future years (see Table 1). Nodal prices are then regressed against zonal prices, resulting in a monthly regression equation for each node, accounting for both low- and high-congestion hours. These regression equations are applied to the zonal price forecast (discussed above) for the years listed in Table 1. Figures 3 and 4 provide an overview of this process.

Table 1 - Model Topology Used for Nodal Forecasting

Interconnect	Model Year(s)	Model Name	Notes
ERCOT	2026, 2028, 2031	Steady State Working Group Summer 1 model (SSWG)	Currently using 2031 topology for zonal to nodal relationships. Will add additional years in Q2 2025.
WECC	2028, *2029, 2034*	Heavy Summer 2 model	Currently using 2028 topology for zonal to nodal relationships. Will add additional years in Q2 2025.
EI	2025, *2026, 2029, 2034*	Multiregional Model Working Group Summer Peak Load Case (MMWG)	Currently using 2025 topology for zonal to nodal relationships. Will add additional years in Q2 2025.

Figure 3 - Zonal to Nodal Methodology

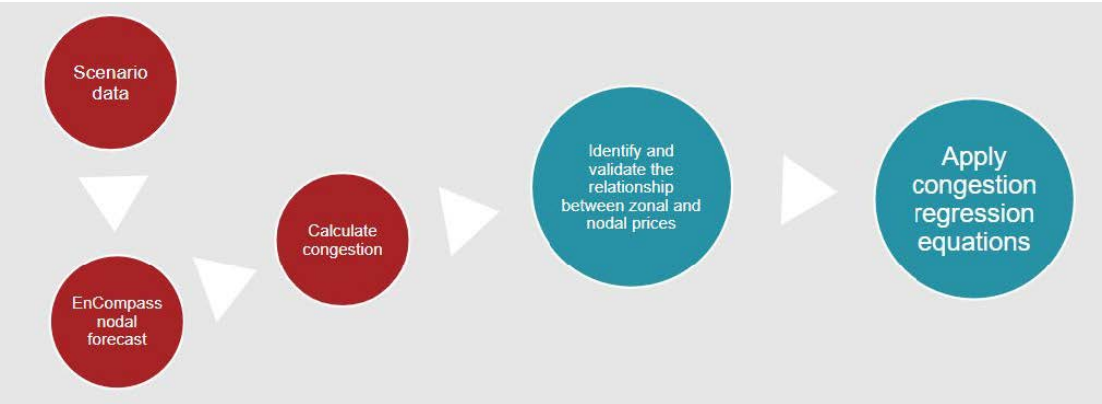
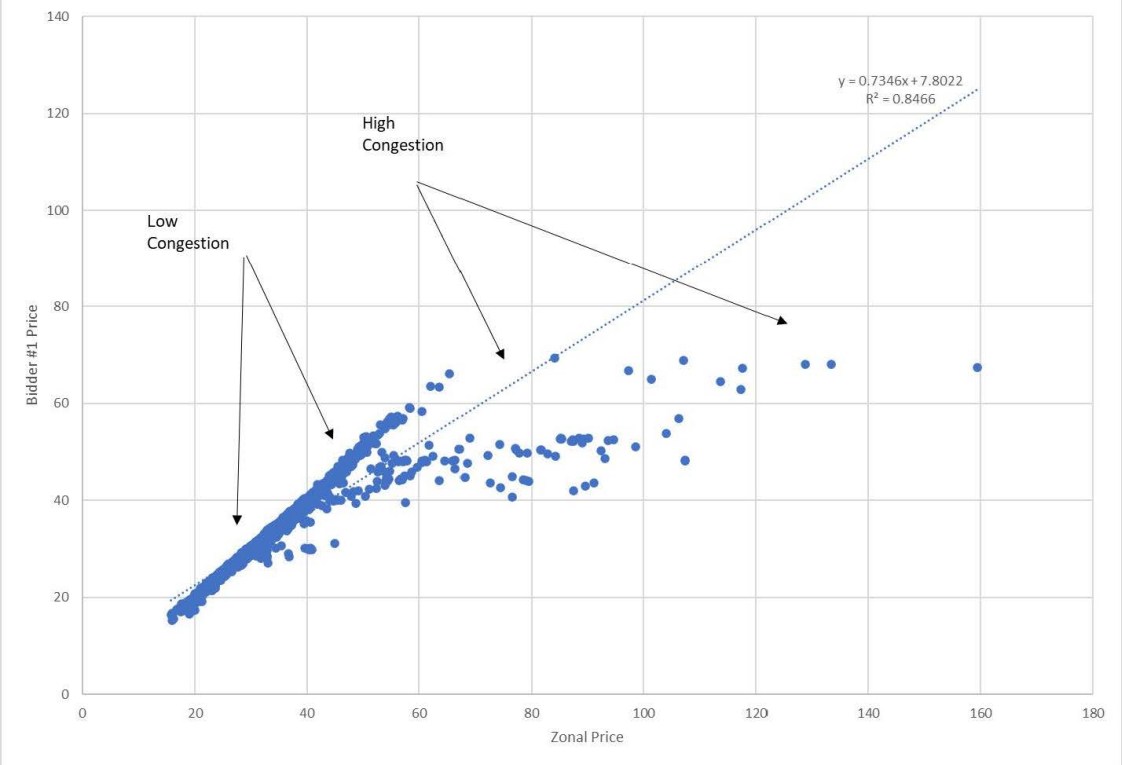
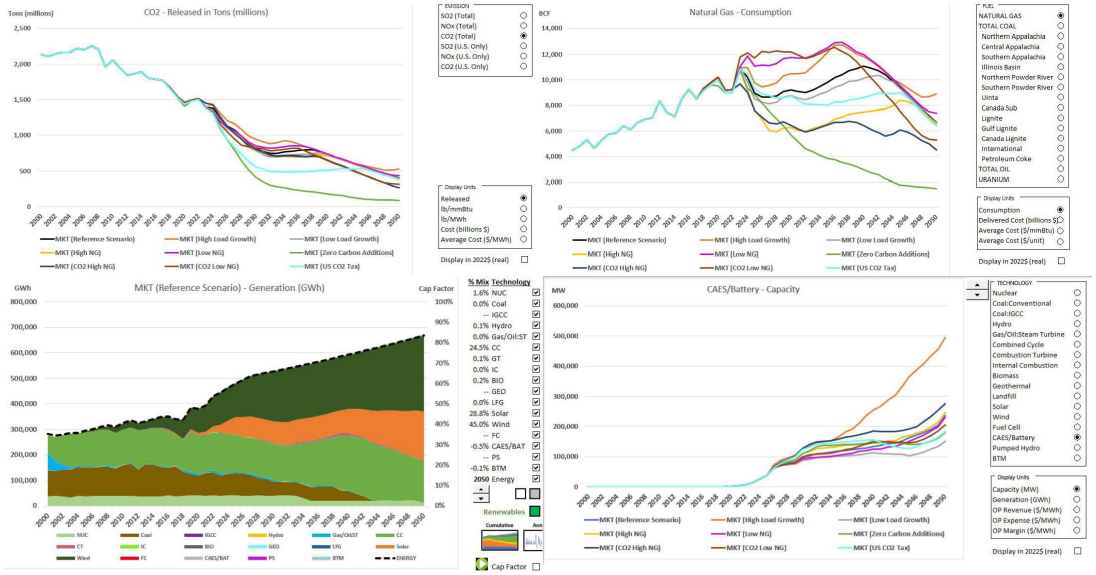


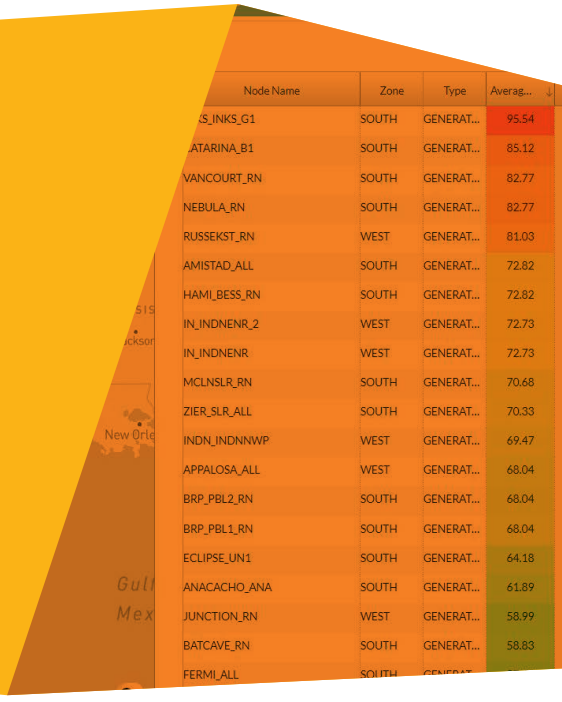
Figure 4 - Zonal to Nodal Regression Example



Included Assumptions

- Generation mix changes
- Gen production
- Load growth
- Fuel prices
- Emission prices
- Policy
- Assumptions explorable in Yes Energy and documented in release notes





About Horizons Energy

With over 50 years of combined experience in North American power markets, the Horizons team is recognized as experts in advanced integrated resource planning and regional power market analytics. Their expertise includes asset valuation, market intelligence, environmental analysis, public policy, and integrated resource planning. Their client base includes municipalities, investor-owned utilities (IOUs), state utility regulators, banks, and developers.

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