

The Increasing Need and Value of Long- and Short-term Price Forecasts

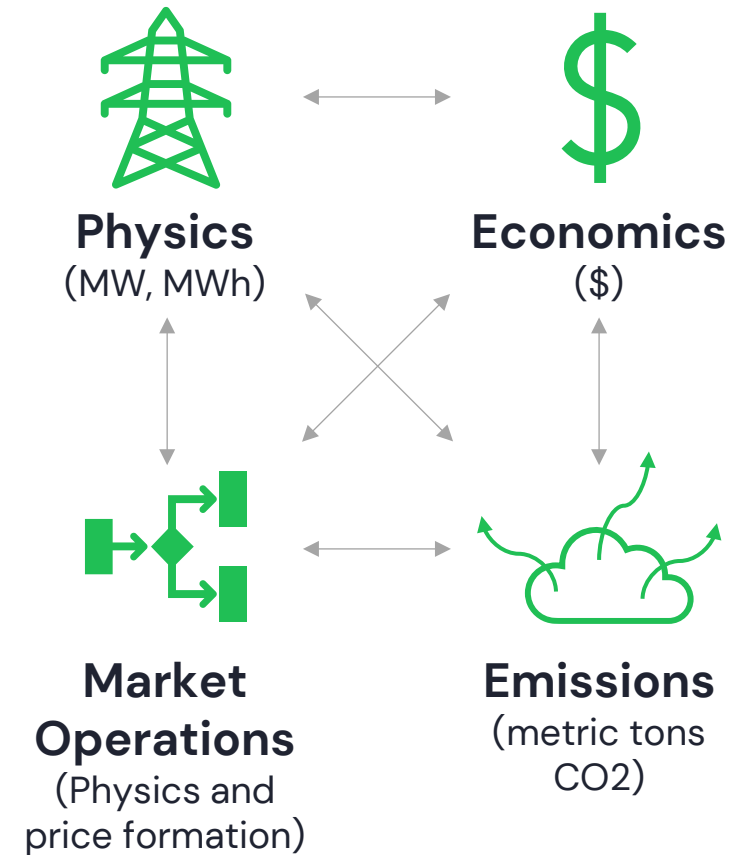
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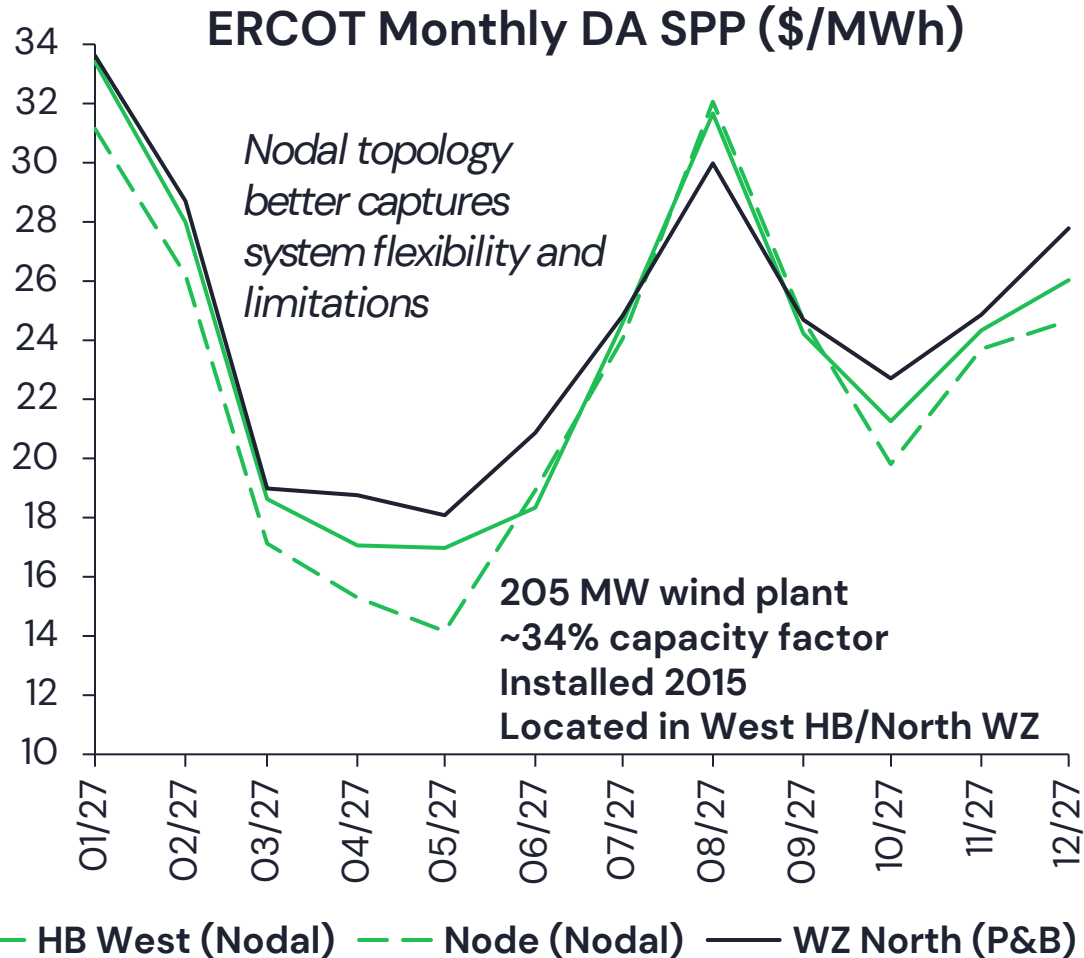
June 25, 2025

Forecast granularity and consistency is key to reliable decision making

- Valuable forecasts must reflect **rigorous consistency between physics, economics, market operations, and emissions**
- Locational marginal price forecasting and locational marginal emission rate forecasting relies on detailed power system modeling
 - Models should follow **fundamental physics and power system constraints** at the hourly level
 - Zonal pipe and bubble type models fail to capture system topology that is essential to model accuracy
- When using forecasts for multiple variables (*ex. prices, emissions, and generation*), it is **vital to use forecasts based on a single internally consistent methodology** for informed and consistent decision-making



Adding nodal forecasts gives us better information



Revenue Comparison

Model Type	Location	Zero/Negative Priced Hours	Revenues (\$)	Risk
Nodal	West HB	158 (2% of hours)	11.5M	Risk \$2.1M (19%)
	Node	783 (9% of hours)	9.3M	
Zonal Pipe & Bubble	North WZ	367 (4% of hours)	13M	Risk \$3.7M (28%)

Over the single year horizon, a difference of **over 2-5X** in curtailed hours and varied settlement point pricing leads to a **19-28% overvaluation** of generator revenues

What makes a forecast useful?

Granularity



- Properly capture system physics and engineering all the way to price formation
- Capture the dynamics of decision-making under uncertainty

Consistency



- Data and assumptions match throughout the modeling process
- Inputs and results are calibrated to historical data



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