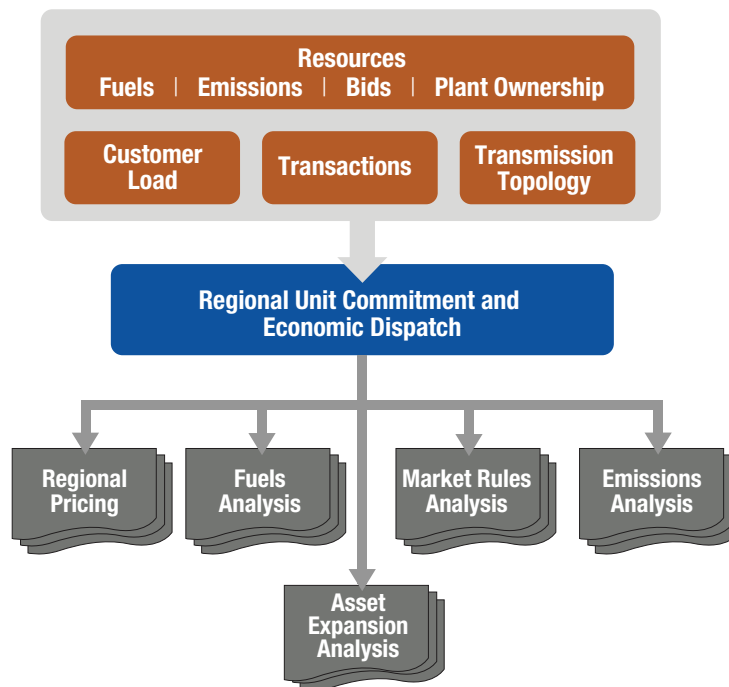


# MARKET ANALYTICS – ZONAL ANALYSIS

## SOLUTION FOR REGIONAL PRICE FORMATION

**The Energy Portfolio Management (EPM) Market Analytics - Zonal Analysis is your total solution for fundamental market modeling, generation analysis and price forecasting for energy, ancillary services, and capacity markets globally on a zonal basis as a transportation problem.**

The Market Analytics module is a powerful application that allows users to forecast electric wholesale prices by simulating the operation of individual generation units, utilities and control areas within a particular region while taking into account various system and operational constraints. This analytical platform provides the flexibility to forecast discrete (deterministic) and stochastic spot market prices for the different wholesale pricing markets currently in place and in development across the world to assess the other aspects in the energy markets.



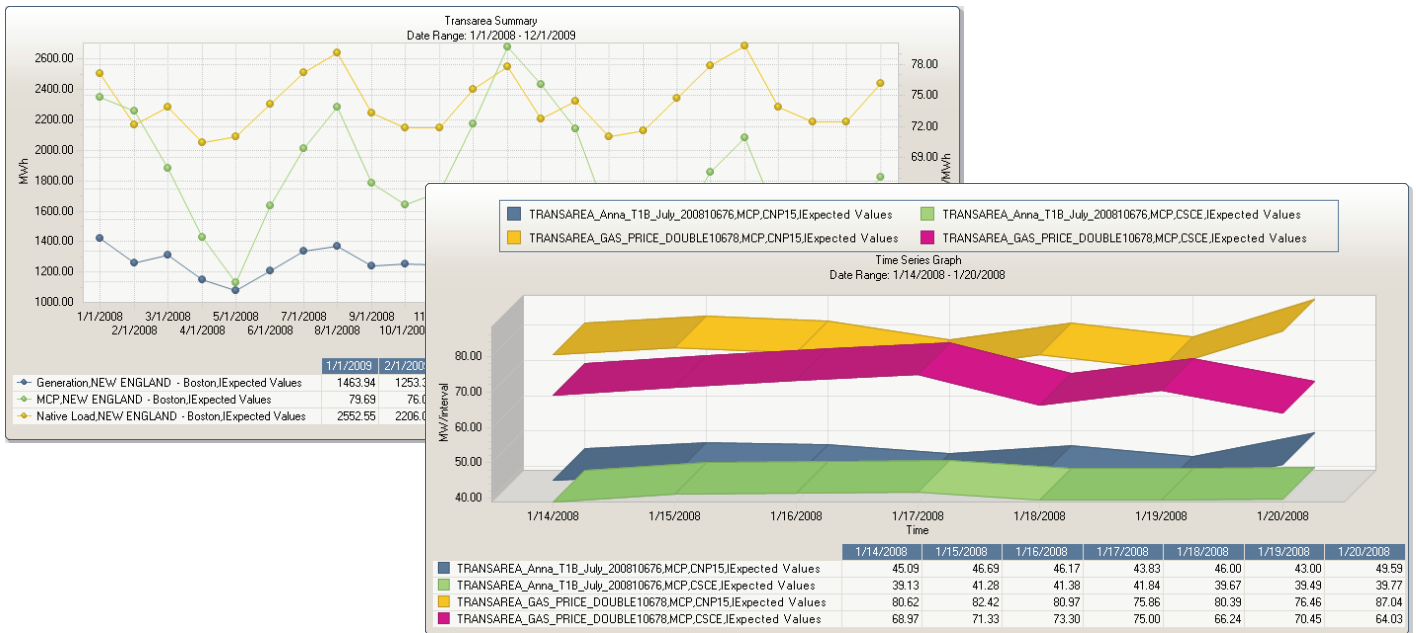
Market Analytics - Zonal Analysis is powered by PROSYM -- the industry's leading chronological simulation engine that is used by over 130 customers worldwide for over three decades.

The PROSYM simulation engine optimizes unit commitment and economic dispatch to meet the load for an interconnected electric system, considering the reserve requirements and other aspects of the electric system. PROSYM uses Lagrangian relaxation coupled with an exhaustive search for marginal units. Market Analytics includes multi-area unit commitment functionality and supports cost or bid based dispatch as well as ancillary services price forecasting simultaneously optimized with energy. The highly flexible user interface on our EPM platform enables users to determine the granularity of the market to be analyzed – from ten minute to four hourly time steps - from single control areas to entire continents.

**Sample Module Uses:**

**Assess Market Prices** The ability to accurately forecast market prices for any period from one week to 40 years into the future is the key to robust regional market analysis.

**Study Competitive Electric Markets** Market Analytics provides you with the ability to interpret the key drivers that shape markets – deregulation and liberalization impacts, market structure, energy policy, generation retirements, capacity expansion plans, impacts of green house gas emissions etc., by accurately modeling economic relationships of supply, demand and transport capability. It also allows you to study bidding strategies, price spikes due to supply scarcity and market power.



**Input to Decision Support Systems** A sound forecast of market clearing prices is fundamental to many corporate decisions. Inherent market uncertainty and poor liquidity is putting increasing pressure on the need for robust, well understood market forecasts developed using industry standard tools. Analytical support for Trading and Risk Management; fundamental market modeling for forward curve analysis and gap filling; power plant valuation, including power supply/purchase agreement and merchant plant investment valuation; budgeting, planning, emissions analysis and portfolio optimization are all prominent examples of activities in which a key role is played by the price forecasts from Market Analytics.

**Analyze the Effect of Market Uncertainty** The complexities in today's energy environment require that uncertainty in all key drivers should be accounted for in market analysis and price formation. Decisions on scheduling resources, power acquisitions, and market hedging and origination are all driven by price expectations. Market Analytics includes the ability to assess the impact of underlying drivers such as fuel prices, plant outages, load uncertainty, hydro availability and emissions on resulting market prices.

### **Unparalleled Coverage of the Electric Power, Natural Gas, Coal, and Emission Markets**

The solution also includes comprehensive market data sets for the United States of America, Europe, and key Asia Pacific markets at unit level detail which provide a unique insight into these external drivers and enable clients to get a quick start assessment of the markets that are of interest. In addition, our experienced advisors are constantly monitoring and updating our datasets and frequently utilizing them to provide market forecasts and key issue analysis on behalf of clients.

### **Regional Data Sets**

Market Analytics includes five proprietary regional datasets for North America required to perform fundamental market price forecasting on a zonal basis. These datasets have been prepared for the following topological configurations: WECC (CAISO), Midwest (SPP, MISO, PJM), Southeast, Northeast (NYISO, ISO NE, ONTARIO), and ERCOT using a very disciplined data management approach and is widely deployed as Zonal Simulation Databases. Ventyx's proprietary Electric Power Market Regional datasets represent years of research, documentation, and testing of the data for market simulation purposes.

Market Analytics is built on the Energy Portfolio Management (EPM) Framework, providing a wide array of data and run management features designed to ease the workflow associated with managing vast amounts of regional electric market data. The interface allows users to manage data and conduct price evaluations at the zonal level, and manage the results of these investigations seamlessly through graphs and custom reporting.

Results management is provided with both summary reports and drill down options to hourly level using the latest technologies available for data management and display.

### Recent Enhancements to Market Analytics include:

- **Modeling of intermittent capacity (e.g., wind generation)**
- **Enhanced emissions modeling**
- **Improved stochastic modeling capabilities**
- **Improved user interface and integration capabilities**
- **Enhanced audit and control features**
- **Multiple CPU processing (Grid Computing) capability (for faster processing speed)**
- **Both input and output to be extracted simultaneously for reporting, exports to ODBC databases for regulatory filing and other data transfers**
- **Transferring the output (e.g., Prices) into input as indices for further analyses in other modules such as Planning and Risk**
- **Optimized capacity expansion directly published from EPM System Optimizer<sup>1</sup> with the given the multi-layered RPS and EPS constraints**
- **Emission price forecasts published off from System Optimizer with the multi-layered GHG regulations**
- **Indication of the changes in the fuel mixes also published from System Optimizer**
- **Enhanced CHP modeling with additional Heat Area Topology**
- **Quad core execution**

### Summary

EPM Market Analytics – Zonal Analysis is the most comprehensive fundamental market modeling solution available with Enterprise Data Management capabilities using the Energy Portfolio Management tools, which are compliant with Sarbanes Oxley and capable of working together with the operations, planning, risk management and trading systems that are available within EPM or other external systems.

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<sup>1</sup> For more details refer to the System Optimizer Cutsheet.