
ENERGY PORTFOLIO MANAGEMENT

Nostradamus

Short-term renewable, demand and price forecasting.



Short-term prediction is critical. Nostradamus makes it possible.

From predicting the output of a wind farm, to system demand forecasting for a power utility, or even to predicting solar generation from rooftop solar, short-term prediction is essential for many functions and industries.

Understanding the upcoming generation, energy demand, gas demand, or even day-ahead prices is critical for operating assets reliably and cost-effectively. Nostradamus is specifically designed to overcome these challenges. Deployed closest to those that know the problems best, Nostradamus is an easy-to-use application that employs modeling techniques built and designed by industry experts.



Key features

Machine learning technology

Nostradamus employs sophisticated programming and mathematical techniques, but prior experience or understanding of machine learning is not necessary to produce highly-accurate forecasts. The solution leverages a combination of different learning techniques to provide the most accurate forecasts, including neural networks, piecewise linear regression, dynamic learning, statistical error adjustment, and post-forecast smoothing techniques.

Nostradamus can recognize relationships and applies this knowledge to produce accurate forecasts. This process can be executed automatically or on an ad-hoc basis.

Automated scheduling

Automated scheduling provides event-driven or time-based automation. Event-driven scheduling allows the user to schedule data acquisition, prepare forecasts, and disseminate results, whenever new data is made available to the system. Users can also produce forecasts for multiple independent geographical regions and generate customized reports based on up-to-the-minute weather, demand, generation and price data. In addition, the automation has the ability to schedule FTP tasks, custom executables, and even run the same forecast model repeatedly with different input data to support ensemble forecasting.

Forecast models

Users can create, adjust and maintain similar models to allow for easier use, including neural network inputs, error configuration settings and holidays. This reduces model build and maintenance time.

Nostradamus is a neural network, short-term renewable, demand, and price forecasting system, designed specifically for power and gas utilities, transmission system operators, power pools, cooperatives, energy marketers and gas pipelines.

Comprehensive statistics

Utilize the sensitivity of the neural network to track changes in data for a better understanding of relevant inputs and more accurate capture of forecast peaks and valleys. Users can also evaluate historical data to identify data anomalies and set up rules for error handling.

Rules-based error handling

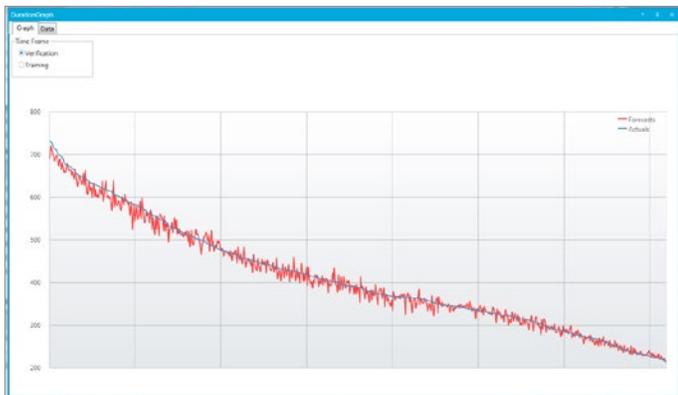
Data issues are the rule, not the exception. Missing or “bad” data can come from any number of sources: meter reads, data historian/SCADA system, an enterprise database, etc. To counteract poor data quality, Nostradamus utilizes rules-based error handling and e-mail alert notification to identify, cleanse, and manage data in a way that can still produce accurate forecasts. Rules can be configured to utilize different data models in instances and situations identified by the user.

Data interaction

Nostradamus provides many ways to visualize and interact with the data. All time-series data can be displayed and edited through the application via standard data grids. All data can be visualized graphically and exported to Microsoft® Excel® or to comma-, semicolon-, or tab-delimited files. Nostradamus can also be easily integrated with standard business intelligence solutions such as Microsoft Power BI™ for more customized data visualization.

Load duration with corresponding forecast

The load duration curve is an excellent starting point for ensuring that the newly-constructed model properly meets the peaks and valleys of the respective load patterns.



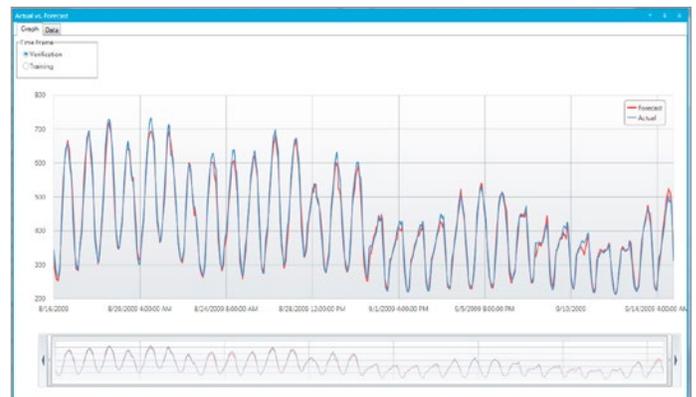
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Load duration curve

Regional and local support

Nostradamus provides full regional and local support including fully-translatable software supporting double-byte characters. Regional date and numerical formats, daylight savings time for any time zone, and time interval forecasts of daily, hourly, 30 minutes, 15 minutes, 10 minutes and 5 minutes are all supported. Nostradamus has been deployed in over 20 countries and 6 continents.

Actual vs. forecast

Actual vs. forecast plotted over time gives the finest detail needed to clearly isolate specific points in time where the new model is not measuring up, which allows users to make necessary changes.



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Actual vs. forecast screen

Error by timeframe

Viewing MAPE (mean absolute percent error) and MPE (mean percent error) values plotted over certain timeframes can indicate outlying months, days or hours, as well as isolate where adjustments need to occur.

Scatter plot

A scatter plot of the actual versus forecast can depict outer points immediately.

Flexible data integration

Users can quickly create a customized model setup, forecast execution and results processing. Users can integrate Nostradamus with most other third-party applications and data historians.



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