

Improve energy forecasting with advanced modeling and analytics



Business Impact

“An accurate estimation of future load variation is of great significance for competitive and deregulated electricity markets, where load prediction is an important guide, both for power companies and electricity consumers, to make decisions and in operations.”

When Weather Matters: IoT-Based Electrical Load Forecasting for Smart Grid.
IEEE Communications Magazine
(Volume: 55, Issue: 10, October 2017)

Challenges

- **Data volumes and data quality.**
Utilities need to harness new data streams to improve immediate responses to changing use patterns.
- **Generation transformation.**
A market shift toward distributed energy resources affects assumptions about generation-fleet availability and cost, increasing reliance on load forecasting accuracy.
- **New consumption profiles.**
Demand-response programs, smart appliances, plug-in hybrid electric vehicles and home area networks will require more robust forecasting capabilities.

The Issue

The utilities industry has more available data for forecasting than ever before. Real-time weather feeds, near-real time customer consumption data, sensors on renewable assets, etc. This flood of data can be harnessed for powerful new insights that can dramatically improve operational efficiency. In addition, this data will offer utility forecasters many new opportunities to optimize resource allocations, predict future growth and provide deeper insights into the utility planning process. The ability to predict the volume, magnitude and location of demand - along with improved revenue projections - will bring significant financial rewards to companies that glean predictive insight from their data.

Our Approach

Forecasting is increasingly important as utilities grapple with the complexities of their value chain. From new distributed generation resources - particularly renewables - to disruptive customer technologies, utilities require more flexibility and automation in their forecasting process to handle these new scenarios. We approach the problem by providing software and services to help you:

- Analyze and forecast trends, now and over time. Whether you want to understand past trends, forecast the future or better understand how your business functions, we provide a wide range of analytical tools that help ensure your success.
- Identify which factors improve forecast accuracy versus which ones to exclude. With multiple views of trends and correlations, you can improve understanding of the effects of climate, economic factors and other forecasting variables.
- Quickly build forecast models for shorter time increments or for assets within the system. With our flexible and powerful modeling, you can anticipate needs for investment and expansion.
- Develop predictive modeling capabilities. Take the insights from forecasts and better predict the effects that changes to the independent variables will have on demand, load and revenue for improved planning and risk mitigation.

With SAS®, utilities can boost the speed and accuracy of forecasting models to predict future energy needs.

SAS solutions for utility companies combine our award-winning software with leading industry expertise to deliver analytical insights that are easy to use, trusted and governed. SAS provides:

- **Superior data integration capabilities.** This enables companies to extract and transform data from nearly any source, identify analytically relevant variables and describe the underlying patterns and characteristics of a data set.
- **A proven track record in helping industries adapt to change.** SAS has many years of experience working with a wide range of markets that have faced new forecasting challenges. SAS can support generation, transmission and distribution resource planning, capital and O&M budgeting, revenue forecasting, retail marketing, call center staffing, customer management and risk assessment.
- **A proven solution.** You can generate large quantities of high-quality forecasts quickly and automatically, enabling organizations to plan more effectively for the future. Forecasts are provided through a user-friendly graphical interface. Analysts can generate forecasts that reflect the realities of business, improving your ability to plan future events with confidence, and improve forecasting performance across all products and locations - at any level of aggregation.

Old Dominion Electric Cooperative (ODEC)

Situation

The ability to forecast for future demand is critical for cooperatives like ODEC that buy a majority of their power from the energy market. Currently, ODEC produces 47 percent of the power it provides. It needs to purchase the remaining 53 percent months in advance - or operate at the mercy of the market.

Better forecasting not only means more reliable service, but it can also help companies keep costs down. For ODEC, this translates into cost savings and lower energy costs for member companies. ODEC provides wholesale power to 11 nonprofit member distribution cooperatives in Virginia, Maryland and Delaware, serving 1.4 million customers in the rural and suburban areas of those states.

Solution

SAS Energy Forecasting enables ODEC to forecast more efficiently and accurately. Depending on the prices, ODEC buys power from six months to three years in advance. Using SAS, the co-op could identify the best times to buy blocks of power at lower prices.

Because the forecasting is automated, analysts are no longer required to be programmers to run the forecasting process. The system automatically builds the most appropriate model for the data, allowing ODEC to forecast with greater accuracy.

Results

In the last two years, ODEC used SAS to produce forecast budgets within 1 percent of accuracy.

To give its members the best value, ODEC uses SAS Energy Forecasting to manage and analyze a wealth of data on weather, demand and population growth. The results are

substantial. Within two years of implementation, ODEC reduced its rates four times, saving members millions of dollars along the way.

"Our rates are low and have stayed low, because the accuracy of our forecasts is extremely good," says David Hamilton, Manager of Load Forecasting at ODEC.

What if you could ...

Analyze and forecast trends, now and over time

What if you could understand patterns in historical load and accurately forecast future demand?

Identify influential indicators and quantify their impact

What if you could improve forecast accuracy by modeling multiple factors and hierarchies?

Maximize value of data from connected devices

What if you could harness new data streams to improve your energy forecasts?

Increase forecasting process automation and flexibility

What if you could dynamically build forecast models for shorter time increments and smaller customer segments?

SAS Facts

- Our software is installed at more than 83,000 business, government and university sites.
- SAS works with over 500 energy customers worldwide, including 160 investor-owned utilities in North America.

Learn more about SAS software and services for utilities at: sas.com/utilities

To contact your local SAS office, please visit: sas.com/offices

