

Case Study: Utilities

Large energy provider saves \$15M+ with demand forecasting

An intelligent energy demand forecasting solution saved a large US energy provider 79% in yearly net energy imbalance costs by reducing penalty payments and credit back losses.

The challenge

One of the largest energy providers in North America is under contract with another energy provider to fulfill the energy demands of a city located in the southern US.

The provider was unable to forecast optimal hourly energy demands with their existing model, especially during months with weather fluctuations, which resulted in significant penalty charges and credit back losses (per the signed contract).

The solution

A completely automated machine learning (ML) solution was developed to forecast consumer's energy demands based on previous demand patterns.

Forecasting, generation and supply pipelines were completely automated to avoid human intervention and reduce costs. Forecast numbers were regulated based on changing weather conditions. Accuracy

issues with the third-party provider were managed using the weather forecast models and real-time performance metrics, allowing the provider to make well-informed decisions based on energy demand.

AWS EC2 machines were used to set up an RStudio integrated development environment (IDE) for R—to develop the time series forecasting model—hosting data on Oracle from visualizations. The ML inference jobs were scheduled through BMC Control-M on an hourly basis.

Architectural attributes

The intelligent energy demand forecasting solution used best practices such as:

- A master dataset was created by combining historical energy demand data, current weather data and forecasted weather data for the next seven days.
- A multi-seasonality time series was created based on inputted data and augmented with external features like weather attributes.

- Multi-collinearity situations were managed using techniques like principal component analysis (PCA) due to their high correlated with weather attributes.
- An automated regressive neural network model was built to forecast upcoming energy demands (on an hourly basis).
- Data was forecasted to display real-time hourly forecasts and then stored in Oracle for detailed key performance index (KPI) and model metrics derivation.
- All data preprocessing and preparation steps were repeatable and reusable to be quickly customized for most forecasting problems.

Business outcomes

The energy provider engaged Cognizant to implement an automated energy demand forecasting solution and, as a result, experienced significant savings for their operations and customers.

The forecast model deployed for the southern US city helped the provider's customers reduce an average of net losses incurred by \$375K per year (ranging from \$94K to \$441K).

By reducing the yearly net energy imbalance costs by 79%, penalty payments were reduced by 93% and credit back losses reduced by 60%. Overall, the projected yearly cost savings for the energy provider was \$15M per region.

About the partnership

Cognizant engineers modern businesses to improve everyday life. Our unique industry-based, consultative approach helps clients transform technology, re-imagine processes and transform experiences ensuring businesses remain agile, relevant and ready to run more innovative and efficient enterprises.

With AWS as our partner, we focus on the outcomes that matter most to businesses and underpin our solutions with deep industry experience and market-leading IP. Cognizant brings more than 6,000 AWS certified professionals, dedicated AWS certified consultants in 43 countries, hundreds of customer launches and successes, and more than 70 transformational blueprints to drive innovation beyond cloud migration.

As a premier consulting partner, Cognizant hold numerous AWS competencies, including AWS Mainframe Migration, AWS SAP, AWS Migration, AWS Financial Services, AWS Healthcare, and AWS Life Sciences. Partner programs include AWS Well Architected, AWS Managed Service Provider, AWS Marketplace Seller, AWS Solution Provider Program, and AWS Public Sector Solution Provider.

About Cognizant

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