

Demand Forecasting for Power Utilities Using Machine Learning

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Introduction

- Introduction
 - Manage demand-supply ratios
 - Managing overall power flow

Context

- Context
 - Beforehand power flow management
 - Accurate demand forecasting
 - Artificial intelligence (AI)/ Machine learning (ML) based models

Relevance

- Relevance
 - Smartgrid requirements
 - Optimum demand-response
 - Sustainability

- AI/ML model for one of the utilities (TSNPDCL)
- Data made available via API for 5 years
- The features extracted for model development
 - time stamp,
 - maintenance schedules,
 - consumer profiles,
 - consumer counts,
 - holidays,
 - weather data

Presentation on the Topic

- Extreme gradient boosting (XGBOOST) model deployment
- Computationally cost-effective model
- Easier deployment of models

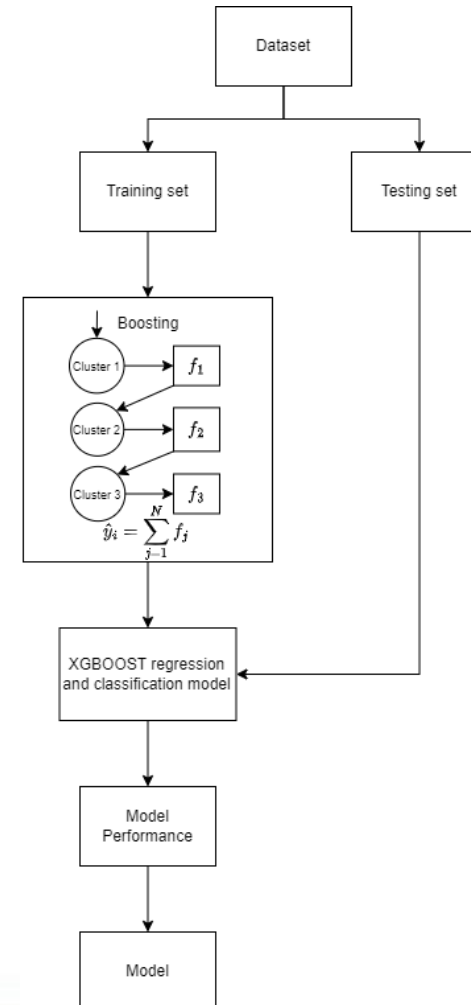


Fig. 1. Basic structure of XGBOOST model deployment.

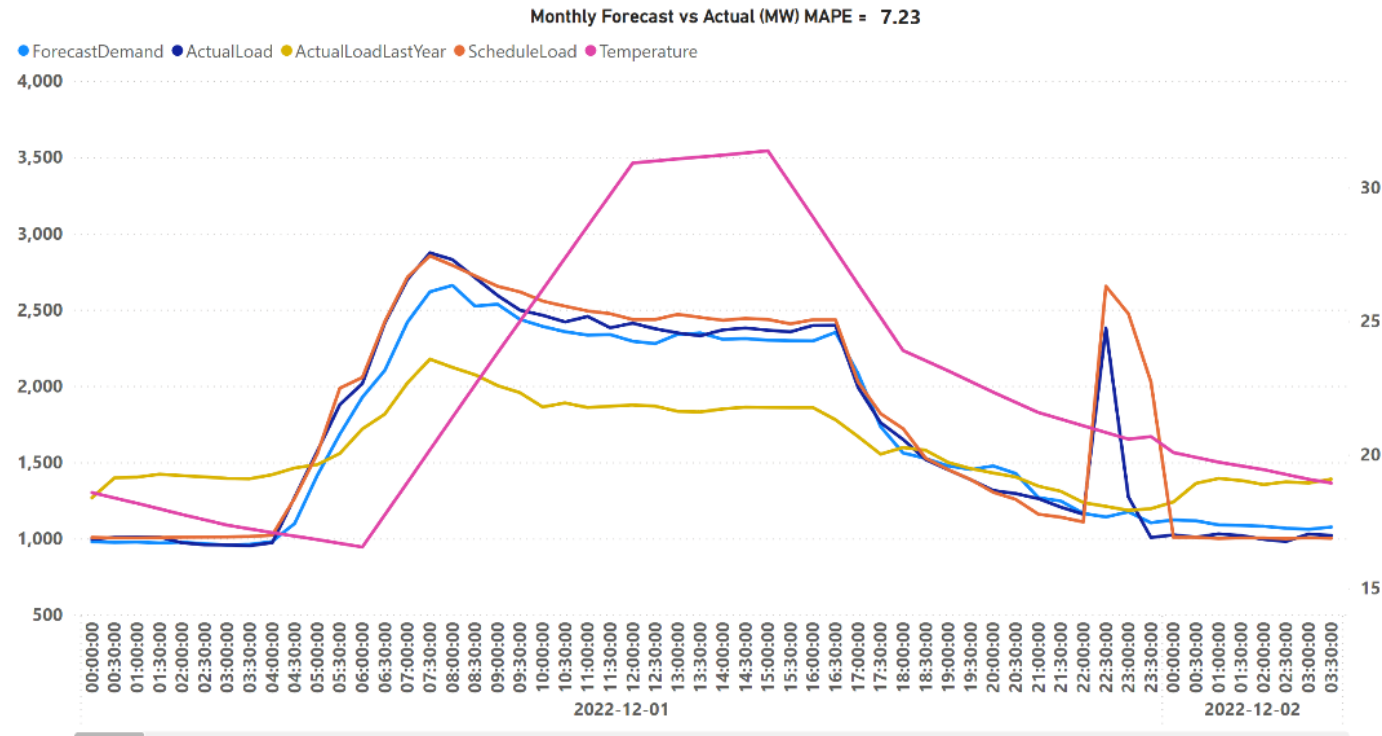


Fig. 2. Load forecast vs actual (Monthly data).

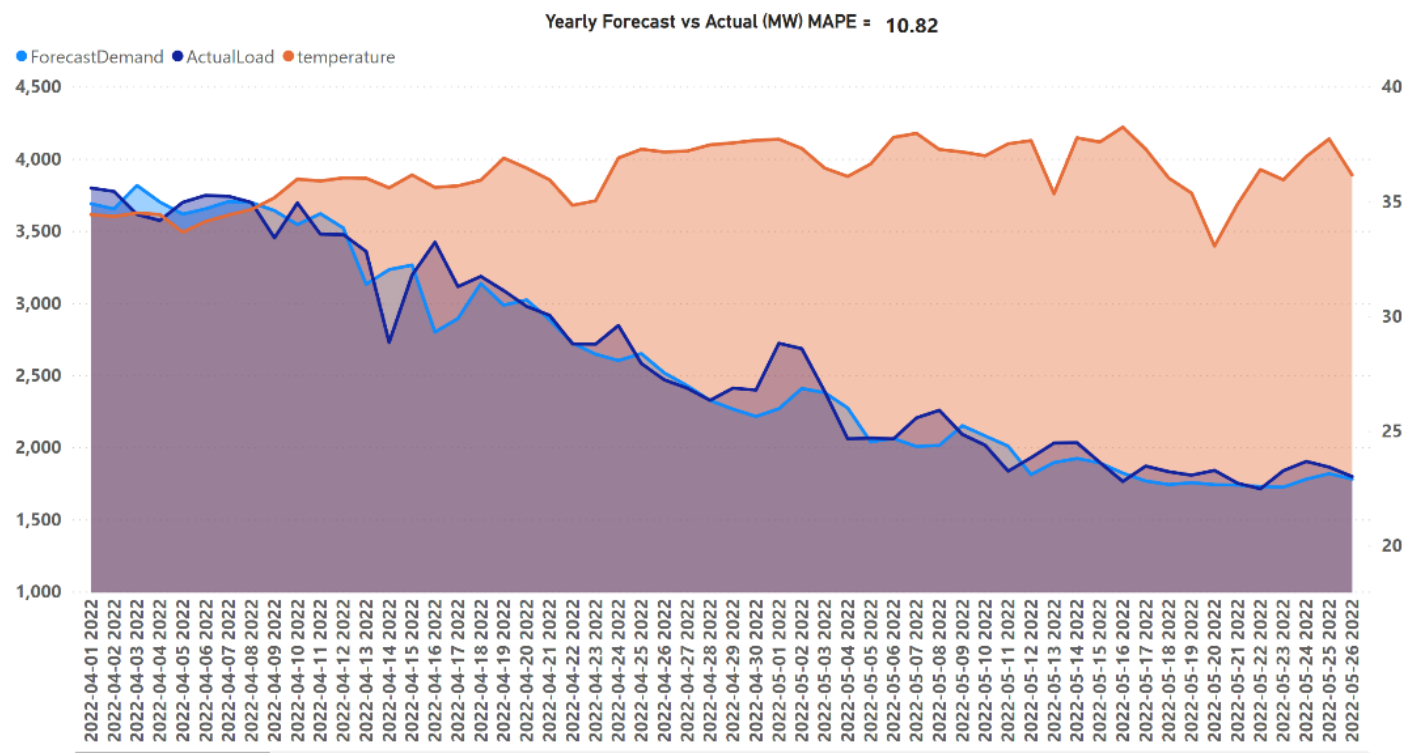


Fig. 3. Load forecast vs actual (Yearly data).

Use Case/Case Study

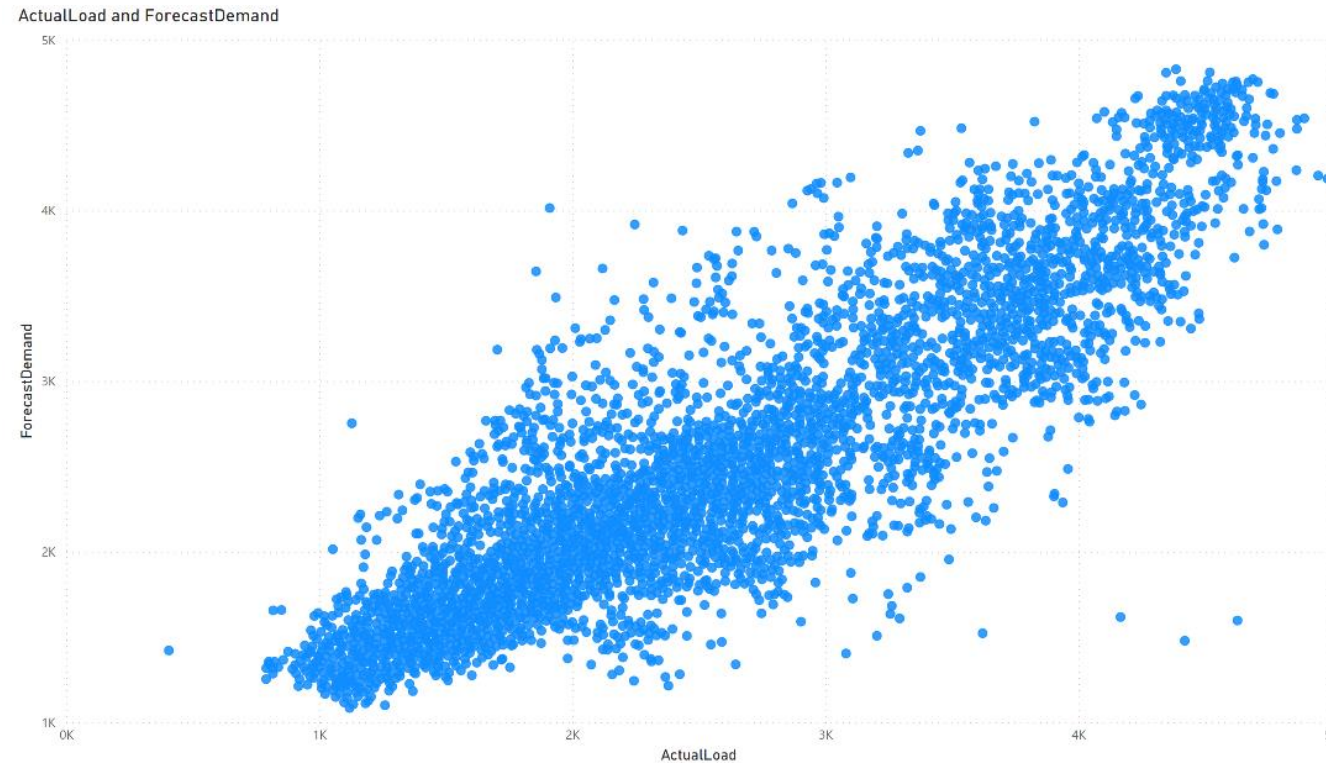


Fig. 4. Load forecast vs actual (Yearly data).

- Key Takeaways/Recommendations
 - Accurate demand forecasting tool in modern power grids
 - Optimum demand response
 - Managing demand-supply
 - Distributed energy sources integration
 - Sustainability

Thank You!

For discussions/suggestions/queries email: pbajaria@orxagrid.com

