GE VERNOVA

PERFORMANCE PREDICTIONS

Generation Optimization Software

Gain visibility into near term generation potential across your fleet with AI/ML insights for thermal and renewable power plants.

Learn more

Enhanced Performance Predictions, Improved Decision-Making

Performance Predictions from GE Vernova employs OEM agnostic AI/ML digital twin technology for fully automated software that delivers day-ahead and intraday plant capacity. Enhance the accuracy of renewable and thermal generation performance forecasting and empower your plant managers, power marketers, energy traders, and operations with up-to-date insights.

BENEFITS

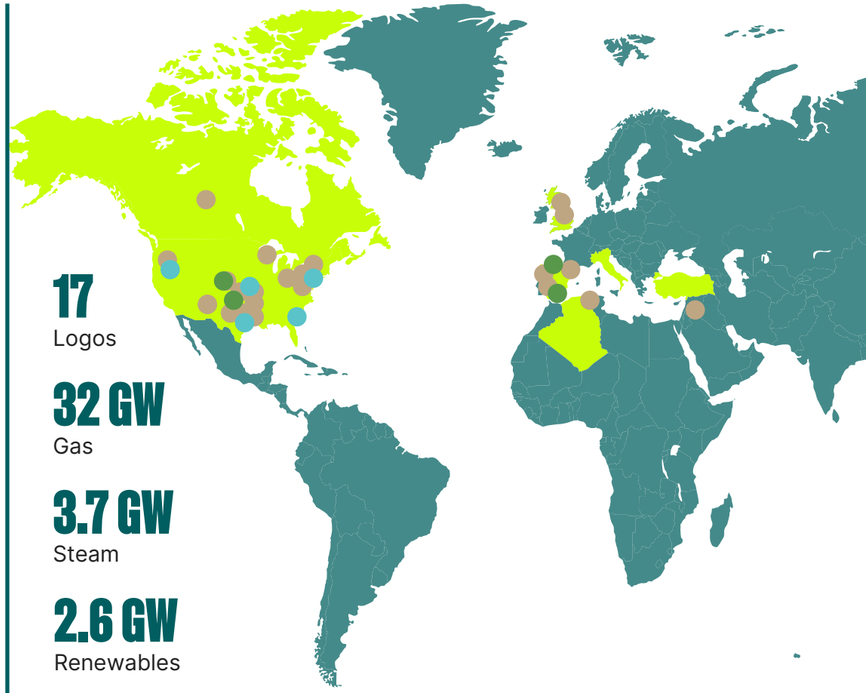
- Replace static curves from the OEM or performance tests with self-learning models for increased accuracy.
- Improve dispatch position for thermal assets with more accurate capacity forecasts
- Reduce fleet performance uncertainty for marketing and trading risk management
- Enhanced productivity with AI/ML automating models, standardization and data transparency

Optional Add-on:

- Reduce risk of imbalances fee with fuel demand forecasts and nomination advice

KEY FEATURES

- Automates week-ahead, day-ahead, day-of, hour-ahead, and 15 minute-ahead visibility for each unit, block, plant in the fleet
- Quantifies uncertainty around nominal predictions (e.g., P10, P50, P90 visibility)
- Availability editor to align model to expected outages
- Connect to APM for automatic availability updates and ticketing when issues are detected
- Easily access and communicate predictions via UI, email or API



HOW IT WORKS

Predicting plant performance more accurately with weather and supplementary power, Performance Predictions enables better trading and operational strategies. Performance Predictions uses operational data from the generating site to continuously train its neural net-based AI Digital Twin. The software delivers day-ahead and intraday insights into each power plant's capacity.

- For thermal plants, this entails minimum and maximum capacity, with and without power augmentation capabilities, as well as heat rate at various load points.
- For renewable plants, this includes expected performance as well as customer defined uncertainty bounds such as P10 and P90.

By using this information, power marketers and traders can make more informed decisions related to energy and ancillary marketplace opportunities.

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CASE STUDY

Client

Competitive Power Ventures

Action

They use Performance Predictions and Fuel Nominations to plan Day Ahead bids on 7 natural-gas-fired plants they manage which deliver 5,300 MWs to PJM, ISO-NE & NYISO. This improved the accuracy of the performance predictions by 2% and replaced a cumbersome, manual Excel-based process to compile weather and plant status to predict MW output, increasing accuracy while reducing man-hours and potential for errors.

Results

$1.8M/YR

of value through Performance Predictions and Fuel Nominations

PERFORMANCE PREDICTIONS BY GENERATION TYPE

Thermal

Smart power augmentation based on installed upgrades and physical limits. Provides Output, Heat Rate, Fuel Volume and Steam Capacity predictions for 15 minutes to 5 days ahead.

Technology Overview:

- Maximum capacity at baseload and with supplementary power (Power Gen Plant – MWs; Cogen Plant - MWs and process steam)
- Heat rate at various load points
- Forecasted weather conditions (Temperature, Relative Humidity, Barometric Pressure)
- Assumed power sources
- Asset availability, de-rate adjustments; including Notes, Save & Email for changes made
- Web-based User Interface
- Data Delivery via .xlsx and/or web service JSON file
- Data visibility for plant, virtual unit, and/or fleet level

Renewables (Wind, Solar)

Neural net based AI model continuously training on actual performance, not OEM provided power curves. Output with probabilistic data for 15 minutes to 5 days ahead.

Overview:

- Predicted output (MWs)
- Forecasted weather conditions (e.g., Wind Speed, Wind Direction, Temperature, Relative Humidity, Barometric Pressure, Irradiance/Cloud Cover)
- Asset availability, de-rate adjustments; including Notes, Save & Email for changes made Configured data delivery
- Web-based User Interface
- Data Delivery via .xlsx and/or web service JSON file
- Data visibility for plant, virtual unit, and/or fleet level

ON-SITE REAL-TIME PERFORMANCE PREDICTIONS (OPTIONAL CAPABILITY)

Performance Predictions can be deployed on-site (on-prem on plant controls network) to provide real-time performance predictions based on current ambient conditions. Meet the needs of plant operators who need to communicate performance capabilities to a balancing authority or grid operator in real-time:

- Max capacity predictions for gas plants that are used by the balancing authority/grid operator to understand real-time capacity headroom on a unit or block.

Overview

- Real-time, performance predictions that update every 5 to 10 min (configured per customer requirement), deployed on virtual machine on server connected to plant controls network
- Default predictions include maximum capacity at baseload and with supplementary power (per unit or block, as required)
- Additional software outputs/calculations that use predictions in conjunction with other sensor data sets can be quoted on project specific basis
- Data delivery configured to communicate to DCS 2.1.3

Technical Specifications

No software prerequisites

Site operational data can be provided through one of three paths:

- Centralized customer historian that GE Vernova can query
- Existing pathway to GE Vernova (e.g. Monitoring and Diagnostics Center)
- Edge Server deployed to site as hardware or VM

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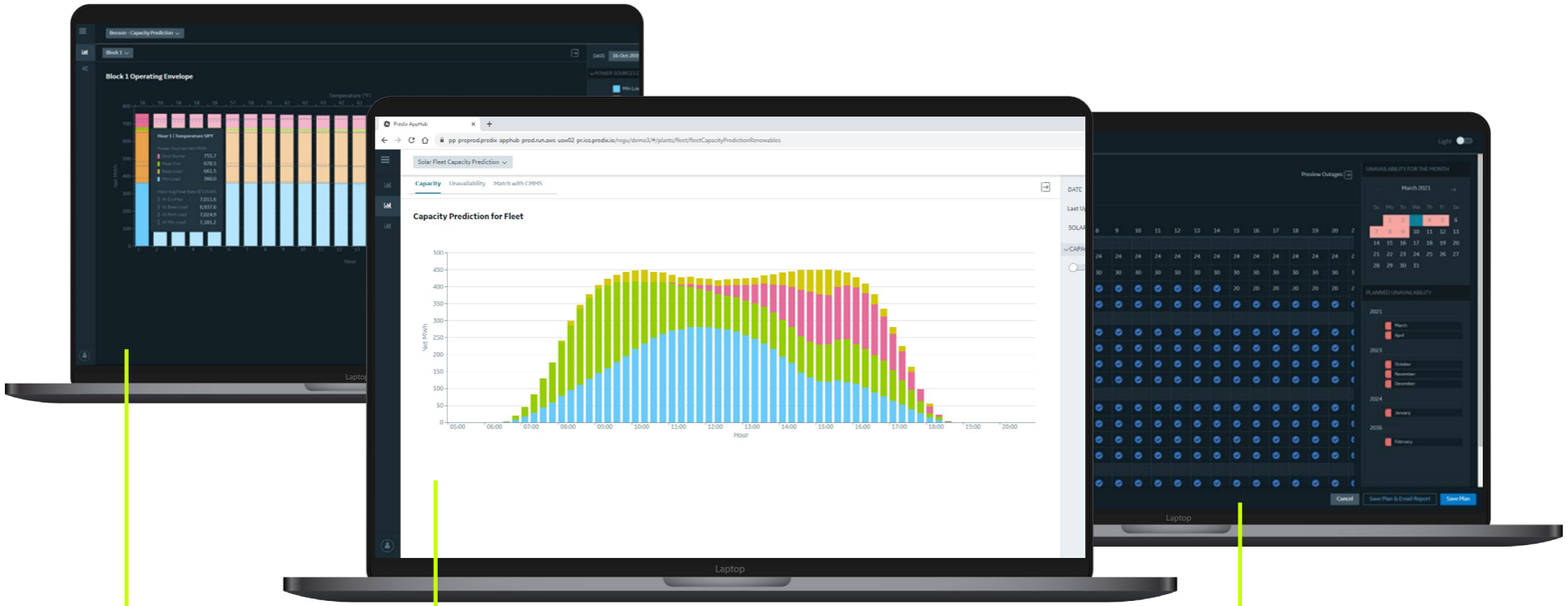


Solar Predictions

UI* depicting operating envelope forecast for a Gas Plant

*UI representative only and may vary with project scope

UI* depicting asset availability for a Plant

*UI representative only and may vary with project scope

FAQ

Q: Which assets does the software provide data for?

A: All thermal assets types, including steam. All renewables (wind, solar, hydro and storage)

Q: How often are the digital twins retrained?

A: Daily. Can request every 15min.

Q: How long to retrain models after an outage?

A: It takes about 2-3 months for the model to train to provide accurate predictions with low marginal error. You can request to use synthetic data while retraining

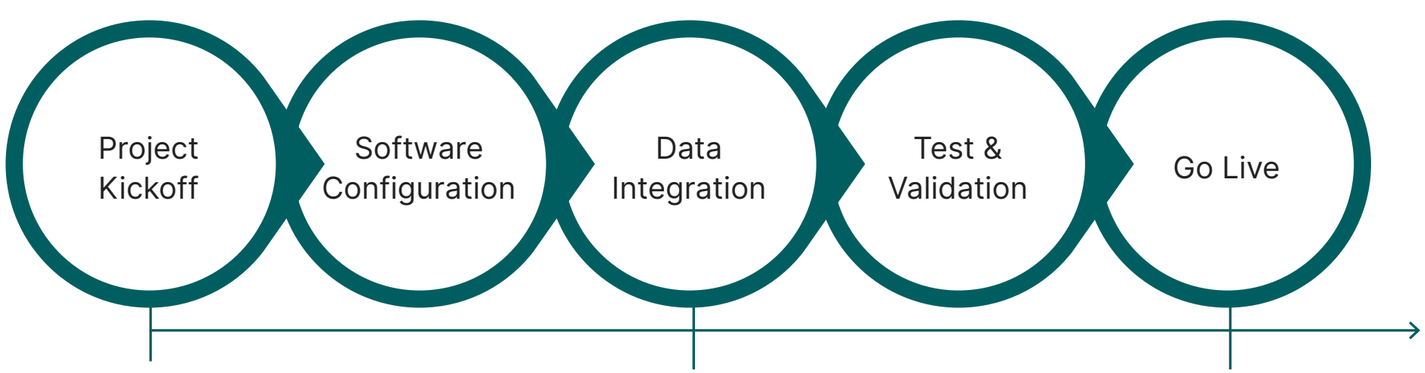
Q: What error can be expected for these predictions?

A: 1% MAPE for thermal and 8%-12% nMAE for renewables

Q: What if we have a problem with the model and/or data?

A: Any user of the software at your company can submit a ticket and it will be responded to under 24 hours 7 days a week

DEPLOYMENT FROM KICK OFF MEETING TO IMPLEMENTATION



2 weeks*
To finalize data integration

2-6 months
Based on fleet size & complexity

*Time to implement may vary based on project scope

CLAIM YOUR FREE CONSULTATION

to learn how enhanced performance predictions can optimize generation across your fleet.

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