

# Operations Performance Management

For Power Generators

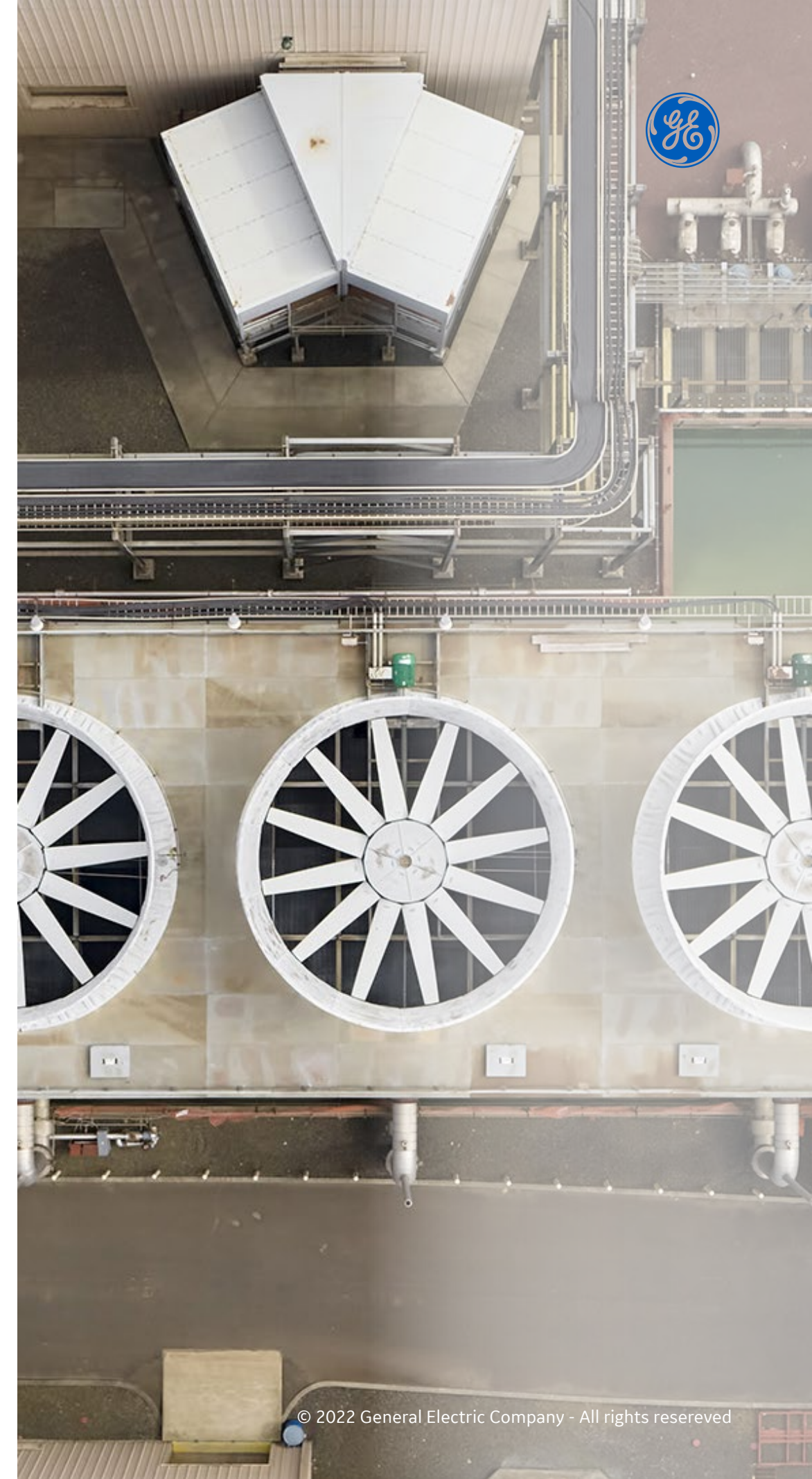
Increase revenue, improve margins, and manage risk across your generation fleet.

Operations Performance Management (OPM) provides visibility, decision support and advanced edge controls to optimize performance and operations across your generation fleet.

Each individual solution provides critical decision support to achieve goals such as improving fuel savings and meeting climate regulations. OPM solutions analyze historical data, plant and other data sources to: monitor and diagnose issues or areas of improvement; predict capacity and its cost to improve day ahead and intraday planning; and deliver actionable advice or close the loop to drive desired outcomes for better efficiency, flexibility, capacity and emissions.

## Benefits

1. Improve bottom lines and meet operational targets
2. Improve process efficiency, reduce fuel costs and environmental impact
3. Improve operational plant capabilities
4. Reduce the risk of not meeting generation demands
5. Improve dispatch efficiency process improvements



# OPM Portfolio of Digital Solutions



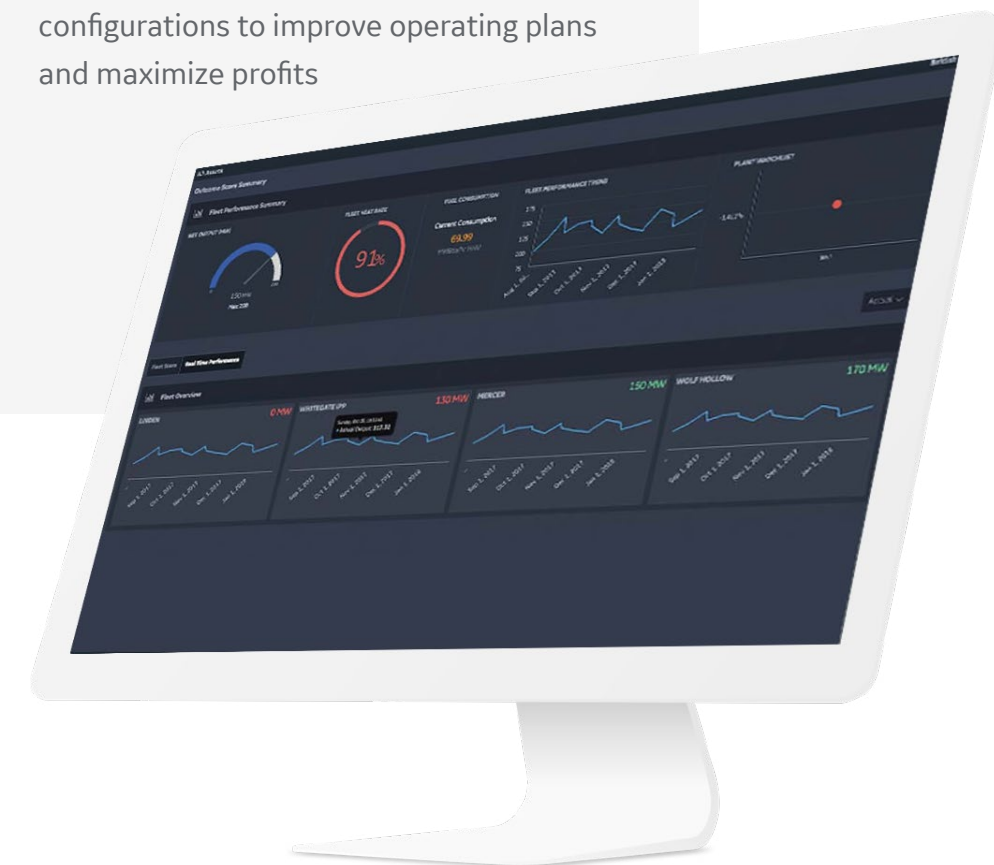
## 01 Performance Intelligence

Gain visibility into your plant's true performance by leveraging GE's power domain and OEM expertise in on-line thermal performance monitoring software. OPM PI is designed to provide visibility, insights and advice across the operating range to enable data-based information for improved decision support.

- Thermal models and analytics configured to your actual plant and equipment designs
- Models and analytics deployed in a runtime environment operating on the plant sensor and controller data inputs
- Available on premise or in the cloud with options for ongoing expert support

### Modules

- **Operational & Thermal Performance Monitoring (Base Scope)** - thermodynamic models providing an on-line heat and mass balance engine which provides visibility to equipment and process performance relative to expected performance levels
- **Flexibility Performance Monitoring** - operational profile and operating mode analytics detect and analyze key plant maneuvers such as startup, ramping and minimum load, and provide visibility to actual vs. expected performance for performance improvements across the entire operational envelope
- **Alerts and Diagnostic Advice** - automated performance analytics detect anomalies and provide root cause analysis to pinpoint areas of degradation, overall plant capability impacts, and recovery advice
- **Economic Trade Off Advice** - Automated tools provide automated detection and analysis of historical performance recoveries from maintenance and provide advice for optimal timing of future activities to maximize performance based on actual plant performance degradations and recoveries
- **What-If Scenario Modeling** - Tools providing user-defined operational scenario and performance inputs to evaluate the impact of variable operating conditions, equipment conditions and plant configurations to improve operating plans and maximize profits



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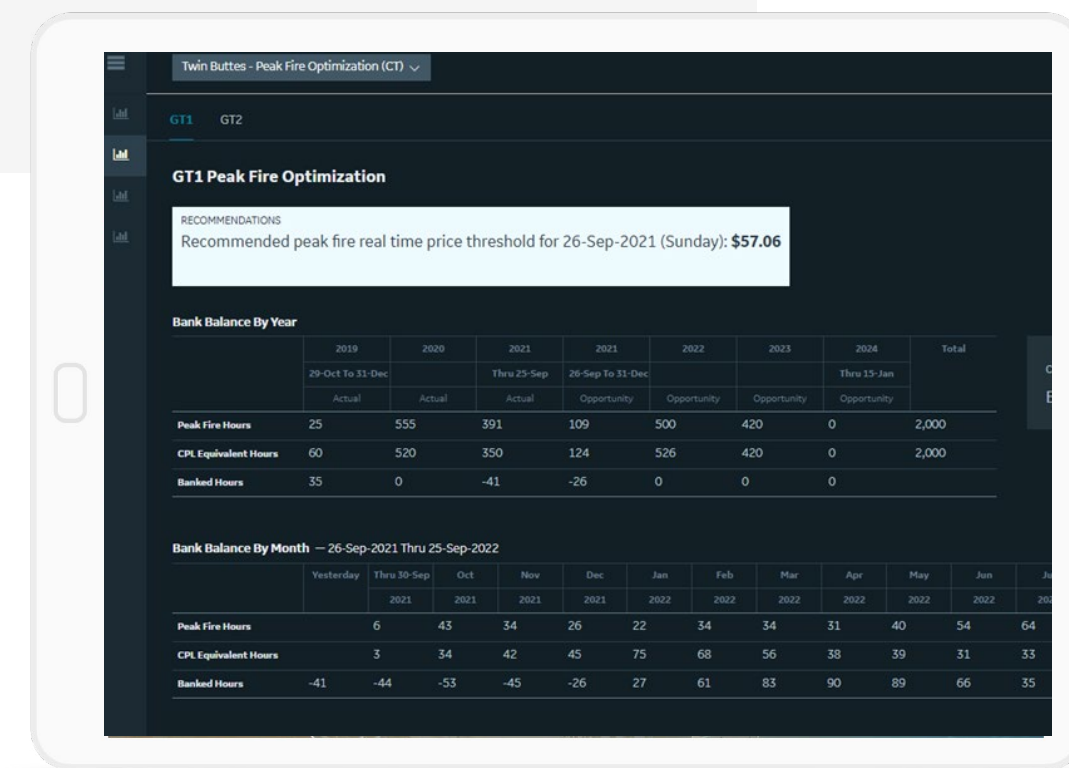
## 02 Performance Optimization

Improve your return on assets with optimization that enables more flexible and efficient equipment performance to achieve production targets. Automated, real-time optimizers, OPM Performance Optimization closes the loop to provide automated machine response to changing market demands.

- Improves efficiency by improving heat rate and managing operating margins across the fleet
- Increases flexibility with insights and recommendations that identify the optimal configuration, start faster with lower start fuel costs, speed ramp up and achieve lower turndown
- Boosts capacity and the ability to raise baseload output with a power reserve or achieve peak capacity at lower operating costs

### Modules

- **Autonomous Tuning** - automated gas turbine tuning uses equipment models and AI/ML to continuously find optimal flame temperatures and fuel splits to minimize emissions, reduce fuel use and improve availability
- **BoilerOpt** - for steam plants uses closed loop supervisory controls to improve boiler efficiency, reduce fuel consumption and carbon production. Analytics-based (AI/ML) supervisory controls improve boiler process conditions to optimize for best-achievable fuel efficiency. Boiler control settings and events include fuel/air settings and soot-blowing
- **Capacity Dispatch Optimizer and Capacity Trader** - for GE F-class gas turbines improve energy production at times of peak demand for increased plant dispatch without costly maintenance adders or adversely impacting the maintenance interval
- **Duct Burner Optimizer** - automates and optimizes the dispatch of duct burners using AI-enabled predictions of near-term demand to improve flexibility of plant operations and reduce fuel consumption



# OPM Portfolio of Digital Solutions



## 03 Production Planning

Accurate forecasting powers better bidding and dispatching strategies. By predicting the day-ahead and intraday “real-time” capacity and heat rate of a plant, Production Planning makes the most profitable use of your capacity through improved commitment preparations, dispatch planning and fuel nomination.

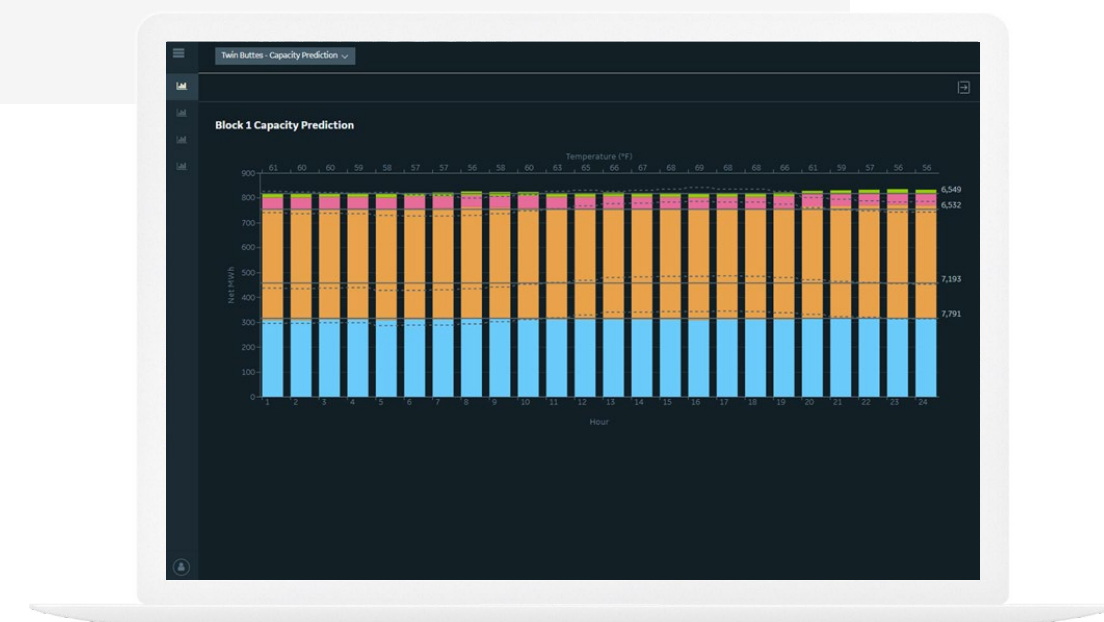
- Minimize real-time exposure with intra-day updates and reduce risk of imbalance fees with fuel demand forecasts and advice
- Improve dispatch efficiency and reduce fuel costs with automated data capture and analysis to provide more accurate capacity and heat rate predictions
- Process efficiency with standardization, automation and data transparency

### Modules

- **Performance Predictions** - Predicts the week, day, and hour-ahead plant capacity and heat rate (for thermal sites) using AI/ML plant-specific models and weather forecasts
- **Trader Advice** - For plants that offer MWs in a competitive, deregulated wholesale energy market, this integrates performance predictions with energy and fuel price predictions to provide a configurable cost-based offer curve and Day Ahead “award” forecast that is used for offer optimization and fuel nomination
- **Economic Dispatch Advice** – Provides economic dispatch advice for a plant or fleet of generating sites to improve energy efficiency by optimizing hourly dispatch

of assets to reliably meet a power and/or steam demand in the most efficient way. By integrating performance predictions with a unit commitment optimization engine, it analyses combinations of plants and assets to determine the most efficient dispatch using advanced numerical methods, such as mixed-integer linear programming. It also provides the likely fuel demand to most efficiently source the fuel needed

- **Outage Scheduling Advice** – Predicts when gas turbine outages will be needed based on an operations forecast and maintenance factor analytics, considering both fired hours and starts impact to outage timing





## Gas Power Plant Case Study

Learn how CPV is using OPM to improve their bottom line. [Watch the video](#)

## Steam Power Plant Case Study

Learn how OMU in Kentucky reduces emissions and improve heat rate with GE's Operation Performance Management. [Watch the video](#)

Find out how Operations Performance Management can help you align operations priorities to business strategy across fleet, regardless of OEM.

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