



Frequently Asked Questions About PowerEye™ Predictive Analytics Service

PowerEye™ from Camfil Power Systems is the first predictive analytics service that quantifies the impact of ambient conditions on the performance of air intake filters and gas turbines. These insights drive higher power output, improve capacity forecasting and reduce operational expenses.

Here are answers to frequently asked questions about this revolutionary predictive analytics service.



What is PowerEye?

PowerEye is an advanced predictive analytics service that helps power plant operators understand the impact that environmental conditions, changing weather patterns and filter status have on the health and performance of gas turbines.

Users get access to PowerEye through an annual subscription with three levels of service to choose from: **Lite**, **Pro** or **Max**. The program is backed by a dedicated team of filtration specialists from Camfil Power Systems who provide actionable reports, analysis and critical insights into the status of your filters and the performance of your engines.

With the information gained from PowerEye, you'll have data to help you maintain better control of your facilities and make strategic decisions that will improve power output across your fleet and increase profits.

Why did Camfil develop PowerEye?

Camfil has always been dedicated to helping customers focus on the importance of gas turbine intake filters and the impact they can have on engine performance. To enhance service to customers, the company developed analytics to enable optimal performance of its filters. PowerEye is the latest, patented innovation from the air filtration experts at Camfil.

In 2002, they developed LCC software, the first lifecycle cost filter analysis software. Next came CamLab on-site data, the first mobile filter test trailers. Then they designed their Test & Learn Event in a laboratory environment, the most comprehensive gas turbine and filtration training classes for GT operators and stakeholders.

With PowerEye, there is now a way for operators to see the connection between filters, environmental conditions and gas turbine performance in real time.



How does PowerEye work?

PowerEye collects data from the site and the equipment, which is then analyzed to deliver optimization insights. This data is collected from three main sources – the Air Monitoring Station (a proprietary device provided by Camfil), the facility site historian and an online weather service.

The Air Monitoring Station is installed on the dirty side of the filter house, and it captures temperatures, humidity and particulate level of the turbine environment. The device is small (size of a shoebox) and easy to install.

All data is transferred back to the central PowerEye server for analysis. Engine performance data is sent via a hyper-secure, read-only connection.

Once collected in the central analysis server, all data is run through the PowerEye Predictive Analytics Engine, which features intelligence from Camfil's extensive proprietary filtration database.

Information in the database comes from decades of field-testing experience on a variety of filter types across all types of environments. Using this data, Camfil developed an algorithm to predict how different filters will react to diverse atmospheric conditions and affect the performance of gas turbines.

All of this analysis is delivered to you in real time through a web-based dashboard available to you 24/7. You get insights on turbine performance, accurate next-day power predictions, pressure drop trends, water wash schedules, filter life predictions and change recommendations.

Is PowerEye a product or a service?

PowerEye is an integral part of our TurboConnect 360 filtration and air quality management services. It provides data-supported intelligence backed by a dedicated team of filtration specialists. You get analysis, actionable reports and insights on filter status and engine performance.

Camfil offers three PowerEye packages, each providing different levels of service, so plant operators can select the option that best fits their needs: Lite, Pro or Max.

What is the difference between Lite, Pro and Max?

All three provide real-time environment and filter monitoring, pressure drop prediction and weather station and pressure transmitter hardware.

The Pro tier adds days-ahead and hourly power output forecast, economic optimization for filter change-out, engine performance monitoring and alerts, 24/7 real-time fleet level view dashboard access, and PI Cloud Connect or Edge Device hardware.

The Max package includes all the above plus online filter efficiency test, offline compressor water wash optimization and downstream particle counter hardware.



What installation is required with PowerEye?

Although PowerEye is an advanced, powerful analytical service, installation requires only three main steps:

1. Mount the Air Monitoring Station

Camfil will deliver the units for your maintenance teams to install. They should be mounted to a wall or other structure near the air inlet for each turbine with a similar elevation and orientation as the inlet and shielded from direct sunlight and precipitation.

2. Map out engine data from the historian

To monitor engine performance and accurately predict power output, PowerEye Pro and Max need access to a set of site data points from the historian. Camfil provides a detailed list of the 20-40 data points that are required – including fuel consumption and power outputs.

3. Establish a secure connection to PowerEye

Camfil will provide your IT team with a diagram of the PowerEye Pro or Max connection architecture. This document maps out the connections that enable the flow of data from your historian to the PowerEye Analysis Server. If your facility already uses OSIsoft PI, the process is even more straightforward.

How does PowerEye keep my engine and control data safe?

The PowerEye connection architecture is designed to maximize the safety of your data, your equipment and your facility. No data is ever sent to your operator system. PowerEye never connects directly to any of your critical systems.

PowerEye does not use any Camfil proprietary software for data encryption or transmission. All secure connections are established by OSIsoft PI – a system that is already vetted, used and trusted by major power generation utilities worldwide.

Can I use PowerEye to forecast power output?

PowerEye Pro and Max enable your facilities to predict future power output with a high degree of accuracy. As a result, your facility can make commitments and deliver power to the grid with confidence, meet contractual obligations and avoid penalties and other costs of under-delivering.

You get up-to-the-hour insights on how the temperature, humidity and particulate levels in the air will affect the performance of your engines, combined with independent weather forecasting data. Unlike static predictive models, only PowerEye takes into account the state of degradation of your engines and inlet filters and monitors trends to always provide the most up-to-date snapshot of engine status.

Can I use PowerEye to better manage my intake filters?

Your maintenance teams will be able to monitor pressure drop trends and plan the timing of filter change-outs to minimize overall operational costs. Additionally, you can also avoid lost revenue due to unplanned outages.

Before you make any filter investment, PowerEye can provide hyper-accurate predictive models and life cycle costs analyses that show how different filter change-outs and water wash schedules will impact your budget.

How can I benefit from PowerEye?

Your time and resources are limited. Analyzing data is time- and personnel-intensive. We designed PowerEye to be your on-site data analyst that helps you get out of “reactive mode” and into “predictive mode.”

PowerEye helps you improve your bottom line by generating game-changing insights for your plant or fleet. It provides real-time insights you can act on to improve revenue and reduce operating costs.

In addition, by also improving your fuel efficiency, you can reduce carbon emissions.

How does PowerEye help save me money?

There are three main ways PowerEye can help you save money and increase profits:

1. Increase engine availability

PowerEye helps you be predictive instead of reactive. It monitors the performance of your filters as they age and the change in atmospheric conditions around your plant in real time, so you can predict and prevent problems before they impact your power output.

2. Optimize filter change-outs

PowerEye puts you in control of your filters – delivering the continuous monitoring you need to predict the optimal change-out point. PowerEye is an on-site data analyst that helps you to maximize your OPEX savings and your profits.

3. Improve capacity forecasting

PowerEye provides data collection, analysis and actionable insights that give you the most accurate capacity forecasting available.

Can PowerEye be used anywhere in the world?

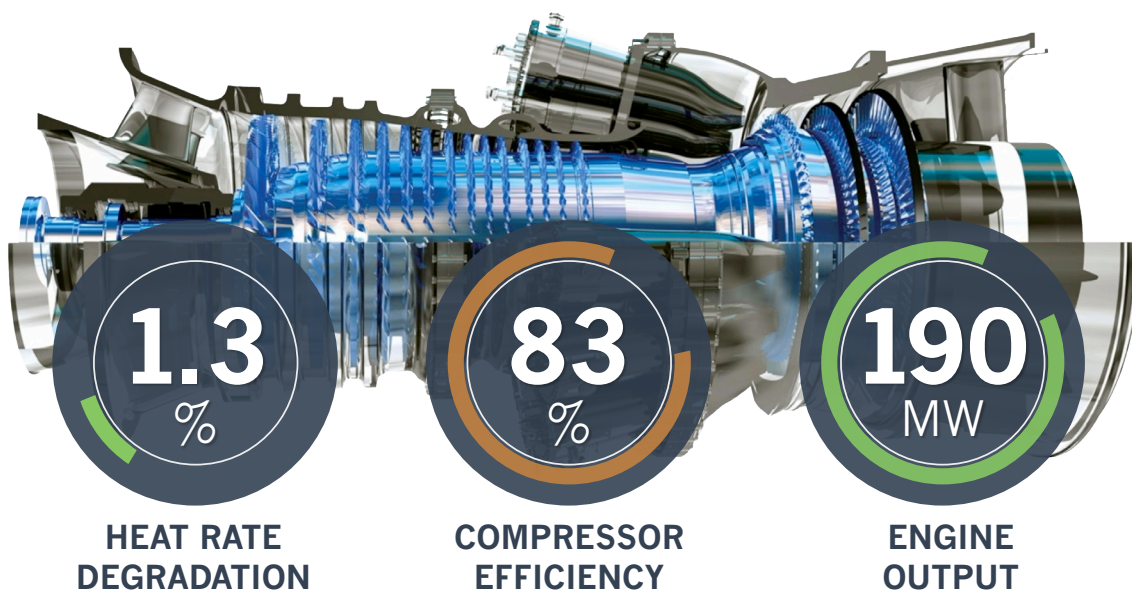
PowerEye can help you maintain and manage your fleet around the world. Your gas turbine fleet is spread across many locations with different weather and environmental conditions. Each environmental condition has a different impact on the performance of the intake filters and the engines. PowerEye gives you the vision to see which locations and assets are underperforming so that you can allocate resources and take action where it will have the most impact.

Who should use PowerEye?

Power companies around the world that generate electricity using gas turbines. PowerEye is especially beneficial for commercial managers, operations managers, plant managers, rotating equipment engineers, fleet engineers, combined cycle operators, maintenance managers, performance engineers, reliability engineers and anyone associated who works with gas turbines.



To learn more about how the revolutionary PowerEye predictive analytics service can help you maximize the performance of your engines and make more profit, visit <https://www.camfil.com/en/support-and-services/services/power-systems/powereye>.



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