

# Environmental Services



# Increasing performance, reducing emissions and creating value.

Today, minimizing air emissions is as important as maximizing productivity—and reaching both goals using existing assets only adds to the challenge. GE Energy's Environmental Services team offers integrated and flexible air quality solutions to help you achieve these goals.

Whether you are focused on reducing nitrogen oxides (NO<sub>x</sub>), particulate matter (PM), acid gases or mercury (Hg), GE Energy has a wide range of technologies and services to meet your exact needs. Our diagnostic tools, system upgrades, and replacement parts can minimize air pollutant formation and improve air pollution collection efficiency and performance across your entire operation.

Our approach to air pollution control is solution-based—we evaluate your entire process and apply the right technology to improve the performance of your assets. This method creates value by providing cost-effective alternatives to buying new equipment or systems. Our solutions are also designed to minimize operating and maintenance costs, providing higher performance for longer periods of time. With GE Energy's Environmental Service offerings, you can simultaneously focus on emissions goals and improved performance.

With more than 100 years of experience in power generation, GE Energy offers the expertise to help power producers and users worldwide reduce air emissions. Now, with our expanded portfolio, GE Energy has a global team of environmental professionals able to provide innovative solutions to more than fifty industries. By combining exceptional customer service with integrated, advanced technology products and services, GE Energy can be your preferred choice for environmental solutions.

# environmental

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Helping you reach new heights in air emissions control.

# solutions.





We're working tirelessly to create new solutions to help meet your emissions reduction goals.

sizzling technology.

# NO<sub>x</sub> Control

World-class technologies and expert services provide a customized solution.

From the fuel source to the stack, GE Energy offers integrated solutions to reduce NO<sub>x</sub> emissions while increasing combustion performance. With an extensive portfolio of state-of-the-art technologies, GE can help you select the right combination of fuel controls, engineered modifications, burners, and sensors to help meet your specific reduction goals.

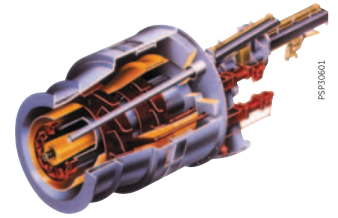
## Boiler solutions

GE Energy's unique Zonal™ combustion solutions for coal-fired plants provide improved monitoring and control of the combustion process as a whole, as well as the local furnace-zone level. GE Energy has implemented both field tunable and automatic combustion tuning systems for continuous coal combustion optimization. With this approach, you can typically achieve NO<sub>x</sub> reduction goals at a lower cost than SCR systems, while improving boiler efficiency and reliability.

## Gas turbine solutions

For gas combustion, GE offers world-class burner and tuning technology that enables earlier vintage GE turbines to meet current NO<sub>x</sub> emissions requirements. GE's dry low NO<sub>x</sub> systems, for example, use lean-premixed combustion technology to minimize the generation of nitrogen oxides during the combustion process, resulting in lower NO<sub>x</sub> levels.

To monitor NO<sub>x</sub> emissions performance, we offer advanced technology CEMS systems as well as emissions testing services, which are compliant with many regulatory reporting needs.



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Cost-effective NO<sub>x</sub> control can be achieved by applying advanced GE technology and expertise to a coal-fired or gas-fired combustion process.

## glowing reviews.

### Fuel optimization

- Fuel evaluation
- Coal flow balancing
- Coallogic® software
- Fuel trim controls

### Combustion/main process

- Combustion modifications
- Burner controls
- Dampers
- Low NO<sub>x</sub> burners
- Overfire air
- Coal-fired, oil, gas reburn
- Zonal™ combustion tuning
- SNCR

### Turbine related

- GT dry low NO<sub>x</sub> (DLN)
- Remote DLN tuning
- Remote combustion control
- Combustion dynamics monitoring
- Closed loop emissions control

### Post combustion solutions

- SCR design & optimization
- Acoustic cleaners
- SCR lifecycle management

### Stack

- Emissions testing
- CEMS
- DAHS
- PEMS
- Parts & maintenance

# Reducing Particulate Matter

The finest filtration offerings provide the highest levels of control.

Particulate matter (PM) control is achievable with GE Energy's comprehensive line of products and services for improving the performance of fabric filter collectors and electrostatic precipitators. With PM regulations in effect in most parts of the world, power producers and a wide variety of industrial manufacturers (including cement, steel, paper and chemical) face growing challenges to meet regulatory requirements without sacrificing productivity. GE Energy can help maximize system operation by applying expert application knowledge and new technology parts, electronic controls, and cost-effective accessory products.

Many times, the solution for increased PM efficiency in a fabric filter collector is to change filtration technology. GE Energy offers a wide range of filtration products to capture extremely fine particulate at lower pressure drops.

To increase precipitator performance, a smart solution is to upgrade to GE voltage controls and data acquisition software. And through remote monitoring, GE technicians can evaluate your precipitator's performance 24/7, alerting you to problems before they become serious.

Sometimes, the solution involves major upgrades to the control equipment. In addition to supplying internal parts and engineering, GE Energy offers complete construction management and technical direction services. GE project managers can help you plan and execute any size rebuild project.

To monitor PM emissions performance, we offer continuous particulate monitors and PM CEMS systems, as well as emissions testing services.



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PSR0085-02



PSR0085-05



PSR0085-14

GE Energy solutions are designed to help reduce emissions, increase throughput and maximize the operating efficiency of existing assets.

## Post-combustion

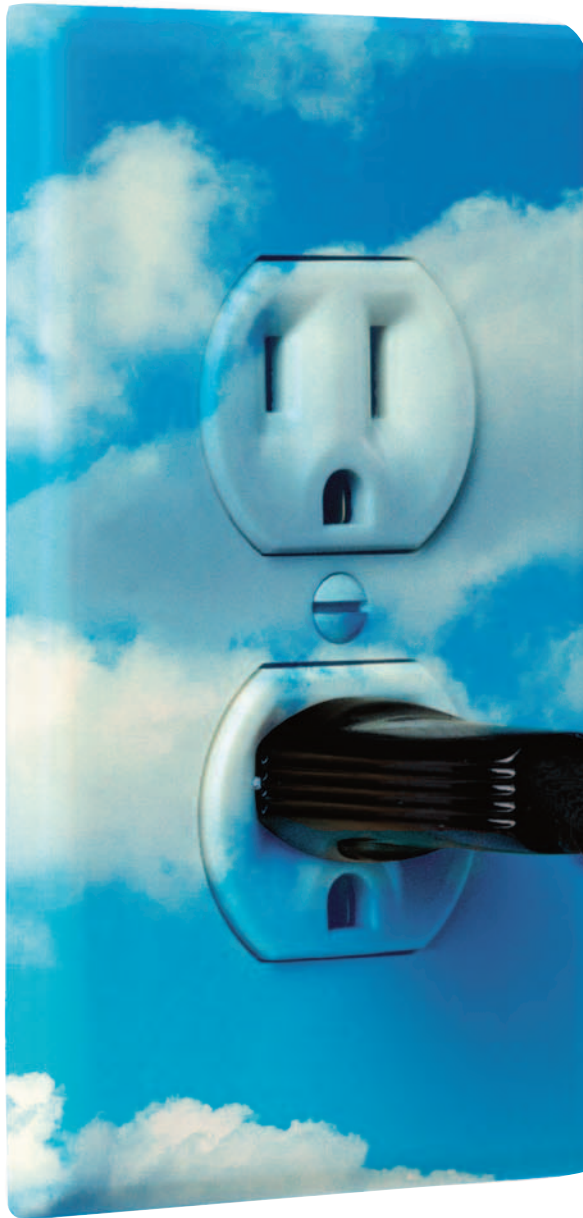
- Baghouse parts & services
- BHA-TEX® ePTFE membrane filters
- BHA PulsePleat® filter elements
- BHA ThermoPleat® high temp. elements
- APC rebuilds and conversions
- Precipitator controls, parts, & services
- Installation and maintenance services
- Engineered services
- Project management
- BHA Powerwave® acoustic cleaners
- Max-9™ electrostatic fabric filter
- Troubleshooting seminars

## Stack

- Emissions testing
- Particulate monitors
- CEMS
- DAHS
- Parts & maintenance

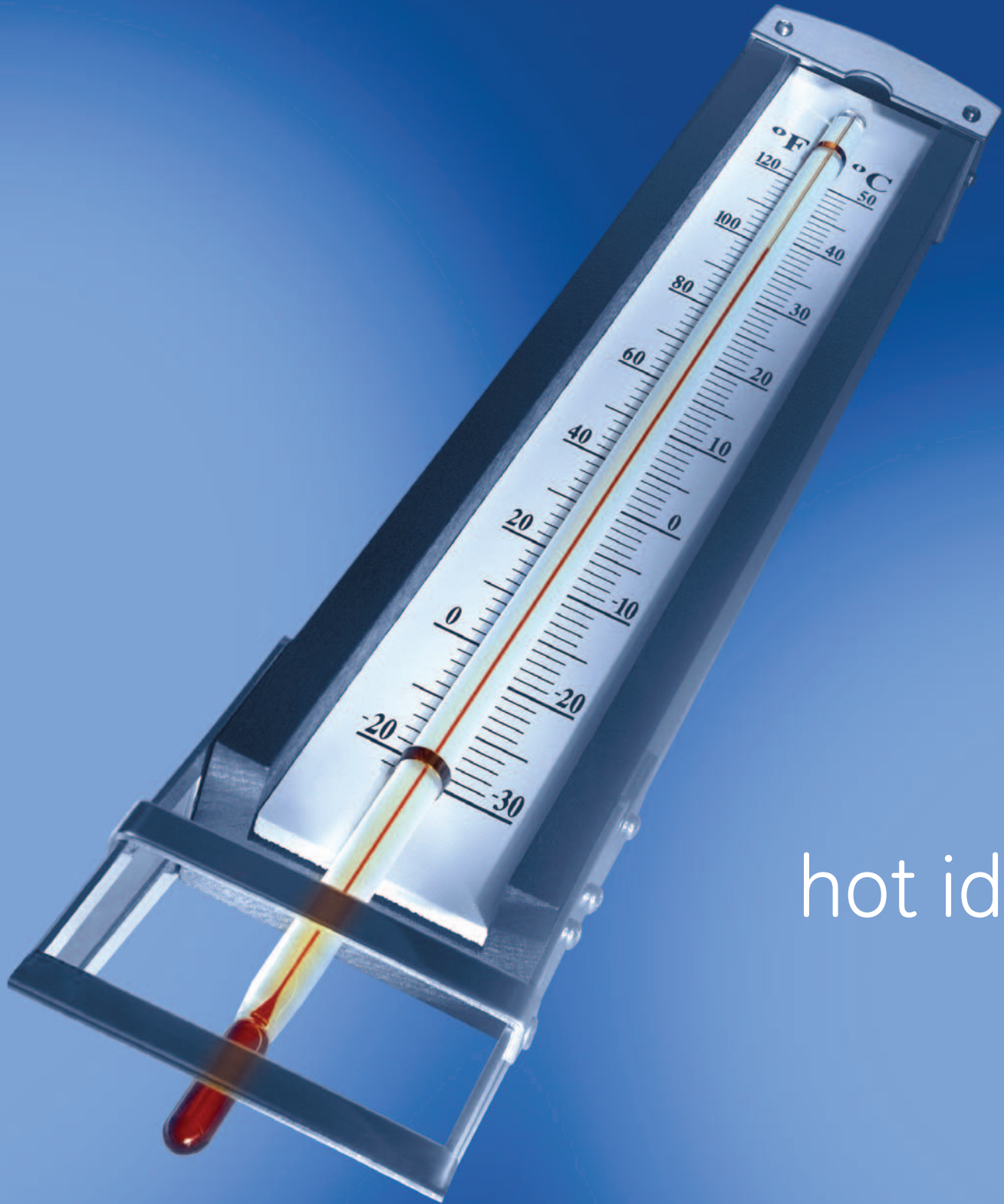
# trusted solutions.

We're plugged in to your needs, and always on.



# dedicated execution.

Count on our support 24/7 to keep your systems performing.



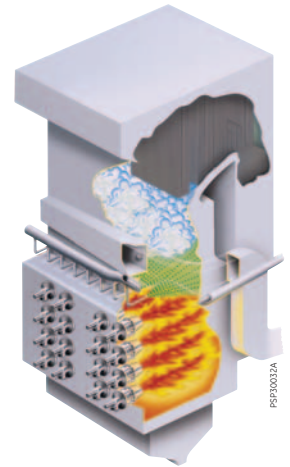
hot ideas.

# Mercury Solutions

Solutions to help you meet newer, tougher standards.

Reducing mercury emissions is a necessity for an increasing number of industrial and utility boilers, smelting, and waste operations worldwide. However, reducing mercury emissions can be technically and economically challenging. GE Energy offers combustion modification technologies to reduce mercury emissions and continues to invest in mercury control research and development.

GE Energy provides customized mercury control solutions that are integrated with your existing equipment and can simultaneously improve combustion performance and help control NO<sub>x</sub> and PM emissions. GE's mercury solutions are tailored to the unique fuel characteristics of your system. We offer a patented staging technology that can minimize NO<sub>x</sub> emissions while enhancing the naturally occurring removal of mercury on fly ash. We also offer sorbent injection trim technologies when deeper mercury control is required. GE Energy's unique Max-9™ technology combines electrodes with fabric filtration to achieve excellent mercury and PM removal efficiencies. To monitor mercury emission performance, GE Energy can provide mercury field-testing services, CEMS and DAHS that meet US EPA certification and reporting requirements.



By applying GE technology in key stages throughout your process, you can reliably achieve mercury reduction goals at lower operating costs than other approaches.

## Fuel optimization

Fuel analysis

## Combustion/main process

Low NO<sub>x</sub> burners  
Overfire air  
Reburn  
Advanced combustion sensors  
Intelligent control systems  
Zonal™ mercury control technology

## Post-combustion

Max-9™ Electrostatic fabric filter  
BHA-TEX® ePTFE membrane filters

## Stack

Emissions testing  
CEMS  
DAHS  
Parts & maintenance

# cool innovations.

Inspired to create technologies that truly serve our customers' needs—beyond expectations.



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PSP0138-03

Using data and advanced technology, GE's monitoring and tuning services help you maximize the operating performance of turbines, air pollution control systems, and your entire process.

# Enhancing Performance

GE monitoring and tuning services help maximize system performance.

In addition to providing technology solutions to reduce air emissions, GE Energy offers a variety of services that focus on improving the operating performance of your fuel, combustion, and post-combustion processes.

By extracting data from ongoing operations, GE Energy technicians can evaluate current performance and provide recommendations for improvement. Our expertise covers simple-cycle gas turbines, combined-cycle plants, industrial steam turbine plants, large fired-boiler steam turbine plants, and nuclear steam turbines.

Our OnSite Support<sup>SM</sup> and remote capabilities offer flexibility for fast response and plant operational enhancement. These performance services enable power producers to increase fuel efficiency and output while decreasing operating expenses. And by improving combustion efficiency, GE services also provide emissions reductions.

In addition to turbine monitoring and tuning, GE also offers inspection services for combustion and post-combustion equipment, steam path and ventilation system audits, precipitator remote monitoring, and many other services. We can even perform a complete plant inspection to help you discover performance gain areas across your entire system.

### Fuel optimization

- RotorProbe<sup>®</sup> coal flow measurement
- Coal flow balancing
- Coalogic<sup>®</sup> software
- Dirty air pitot probe
- Fuel trim controls
- Coal fire detection
- Zonal<sup>™</sup> combustion tuning system
- Combustion performance services

### Combustion/main process

- Boiler tuning

### Stack

- CEMS hardware/software service
- Fleet testing

### Turbines

- Steam path audit
- Turbine balancing
- GT inlet filters
- OpFlex<sup>™</sup> remote monitoring
- Combustion dynamics monitoring
- Acoustic testing
- Condenser audit
- Evaporative cooling
- Chillers

### Post-combustion

- SCR tuning
- Equipment inspections
- Ventilation system audit
- Remote diagnostics

# serving needs.

A large, snow-capped mountain peak, likely Mount Fuji, dominates the lower half of the frame. The mountain is covered in white snow, with some rocky outcrops visible. The sky above is a clear, vibrant blue. The overall composition is clean and minimalist, emphasizing the natural beauty and scale of the mountain.

reaching goals.

GE Energy will be there to help you meet your air quality goals—today and tomorrow.

Providing environmental solutions for more than fifty industries worldwide, including:

Power Generation  
Waste-to-Energy  
Pulp & Paper/Wood  
Carbon Black

Cement  
Lime  
Aluminum  
Mining  
Steel  
Foundry  
Gypsum  
Asphalt

Chemical  
Food  
Pharmaceutical  
Plastics  
Paints & Pigments  
Grain Processing  
TiO<sub>2</sub>  
Rubber  
Soaps & Detergents  
Battery/Lead  
Oil & Gas Production  
Petroleum Refining

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