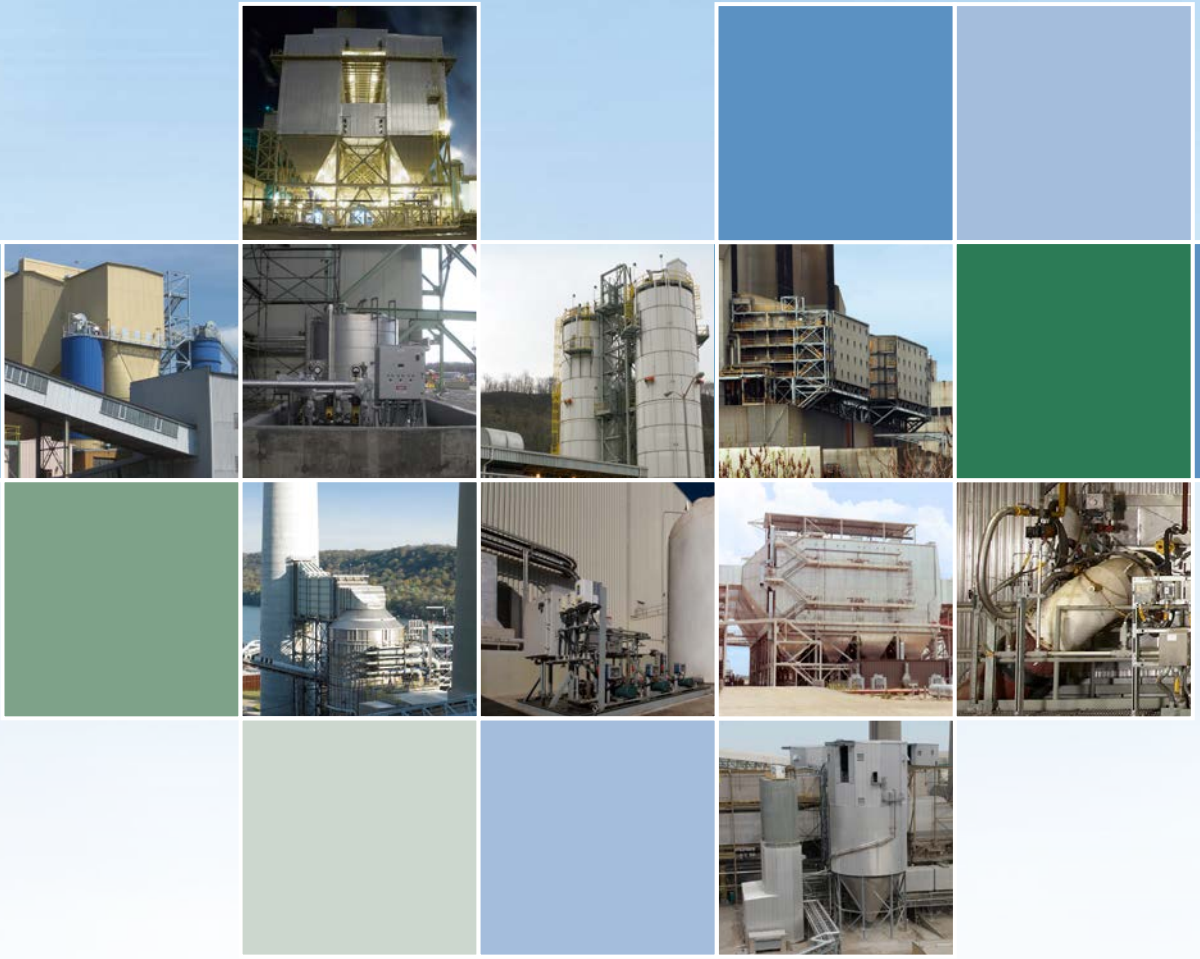
Customized Solutions for Effective Emissions Control

Combining proven experience, technology and reliable performance for our customers



B&W BABCOCK & WILCOX

ENERGY | ENVIRONMENTAL

Current and pending environmental regulations are becoming increasingly more stringent and intricate, encompassing more air emissions than ever before. Utility and industrial boiler operators require solutions to help keep their steam generating assets online.

Babcock & Wilcox (B&W) provides a full suite of options and technologies to meet these challenges. We have the proven experience, know-how and responsiveness to control a wide range of emissions.

Sulfur Dioxide (SO_2)

Sulfur Trioxide (SO_3)

Acid Mist (H_2SO_4)

Nitrogen Oxides (NO_x)

Carbon Monoxide (CO)

Mercury (Hg)

Hydrogen Chloride (HCl)

Hydrogen Fluoride (HF)

Particulate Matter (PM)

Hazardous Air Pollutants (HAPs)

Non-Mercury Metals –
Pb, Be, Sb, As, Cd, Cr, Co, Mn, Ni, Se

Proven Full-Scope Provider

B&W applies our experience, innovation and responsiveness to provide a proven portfolio of advanced and integrated emissions control solutions that are customized to meet your needs. We offer single-point responsibility that minimizes your project execution risk and provides greater price and schedule certainty.

Our environmental technologies are working every day in utility and industrial steam generation applications around the world. These facts speak for themselves:

- Wet FGD installations of nearly 120,000 MW
- Dry FGD installations of more than 17,000 MW
- Leader in long bag fabric filter technology, with more than 8,000 MW of utility pulse jet fabric filters installed in the U.S.
- New and retrofit SCR installations of more than 32,000 MW
- Wet and dry ESP utility installations of nearly 33,000 MW

In addition to our system solutions, we provide a wide range of aftermarket products and services, including:

- Equipment inspections, troubleshooting and optimization
- Remote diagnostics services
- Engineering studies
- Engineered equipment upgrades
- Construction
- Startup and commissioning services
- Performance testing and optimization
- Emissions monitoring
- Replacement parts

Customized Solutions

Your operations are unique. You need custom solutions. Our extensive experience and proven portfolio of air quality control systems enable us to help you determine the optimal combination of technologies with the specific application to provide customized solutions.

We examine many parameters to tailor your solution to meet a range of requirements and life-cycle cost considerations. Every facet of an existing plant is considered—fuel type, combustion technology, water quality and availability, existing environmental equipment, space constraints, performance and emission requirements, and other customer and site specific requirements—to provide the right combination of technologies for your application.

In addition, our vast experience with boiler design and combustion fundamentals makes us uniquely qualified to consider how the overall power plant and chosen environmental solution will affect performance and operation of existing and new equipment.

We also have the expertise to supply, construction and engineer-procure-construct (EPC) project execution for all of our technology solutions. Our unique design, supply and construct capabilities enable us to deliver customized solutions for the lowest total life-cycle cost.

Selected Solution Options

To control SO_2, SO_3, HCl, HF, PM, Hg, CO, NO_x and other HAP emissions

BASIC TECHNOLOGY	CONFIGURATIONS	CONSIDERATIONS
Mercury Technologies	MercPlus™ Absorption Plus (Hg)™ PAC	• MercPlus fuel additive for enhanced mercury capture and reduced PAC usage • Absorption Plus (Hg) injection to control mercury re-emission • Evaluation of the many varieties of PAC available to remove mercury • Evaluation of co-benefits from scrubber and NO_x technologies
NO_x Technologies	Low NO_x Burners Overfire Air SCR SCR Additives	• Any arrangement of technology options can be combined with advanced low NO_x burners, overfire air and SCR • Fuel additives to mitigate SCR catalyst poisoning and to enhance mercury oxidation across the catalyst bed, reducing the cost of mercury emissions compliance

The mercury and NO_x technologies listed above can be combined with the selected wet or dry scrubber technology.

BASIC TECHNOLOGY	CONFIGURATIONS	CONSIDERATIONS
Wet Scrubber and Particulate Technologies	DSI Existing ESP Wet FGD	• Well-performing ESP (upgrade may be required) • Reagent decision: limestone, lime, magnesium enhanced lime • Inhibited oxidation or forced oxidation • Wastewater consideration • Wet stack required • Water availability or cost
	DSI FF Wet FGD	• For marginal-performing ESP applications • Reagent decision: limestone, lime, magnesium enhanced lime • Inhibited oxidation or forced oxidation • Wastewater consideration • Wet stack required

BASIC TECHNOLOGY	CONFIGURATIONS	CONSIDERATIONS
Dry Scrubber and Particulate Technologies	DSI FF	• Limited SO_2 removal needed • Limited HCl in flue gas due to low chlorine in coal • Reuse existing stack • No wastewater treatment required • Trona/sodium bicarbonate/hydrated lime reagent • Byproduct disposal
	DSI Existing ESP	• Well-performing ESP (upgrade may be required) • Limited SO_2 removal needed • Limited HCl in flue gas due to low chlorine in coal • Reuse existing stack • No wastewater treatment required • Trona/sodium bicarbonate/hydrated lime reagent • Byproduct disposal
	DSI Toxecon™ FF	• Limited SO_2 removal needed • Limited HCl in flue gas due to low chlorine in coal • Limited chlorine in coal • Reuse existing stack • No wastewater treatment required • Trona/sodium bicarbonate/hydrated lime reagent • Byproduct disposal
	SDA FF	• Low water consumption • Any size unit • High SO_2 removal capability • Reuse existing stack • No wastewater treatment required • Lime reagent
	CDS FF	• High SO_2 removal capability • Low water consumption • Reuse existing stack • No wastewater treatment required • Lime reagent
	SDA HLI FF	• High SO_2 removal capability • Low water consumption • Reuse existing stack • No wastewater treatment required • Lime and hydrated lime reagent

Acronyms:

DSI - dry sorbent injection
ESP - electrostatic precipitator
HLI - hydrated lime injection
PAC - powdered activated carbon
SDA - spray dry absorption
FGD - flue gas desulfurization
FF - fabric filter
CDS - circulating dry scrubber
SCR - selective catalytic reduction

As a technology leader, we possess the right combination of experience and responsiveness to provide a total package of proven, reliable and effective environmental control solutions.

- Spray dry absorption
- Circulating dry scrubbers
- Wet flue gas desulfurization
- Fabric filters
- Electrostatic precipitators
- Selective catalytic reduction
- Low NO_x burners and overfire air
- Dry sorbent injection
- Powdered activated carbon
- MercPlus™
- Absorption Plus (Hg)™
- Hydrated lime injection
- Dry lime injection
- Ash handling

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Established in 1867, Babcock & Wilcox is a global leader in advanced energy and environmental technologies and services for the power, industrial and renewable markets.

For more information or to contact us, visit our website at www.babcock.com.

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