



CLEAN ENERGY SOLUTIONS

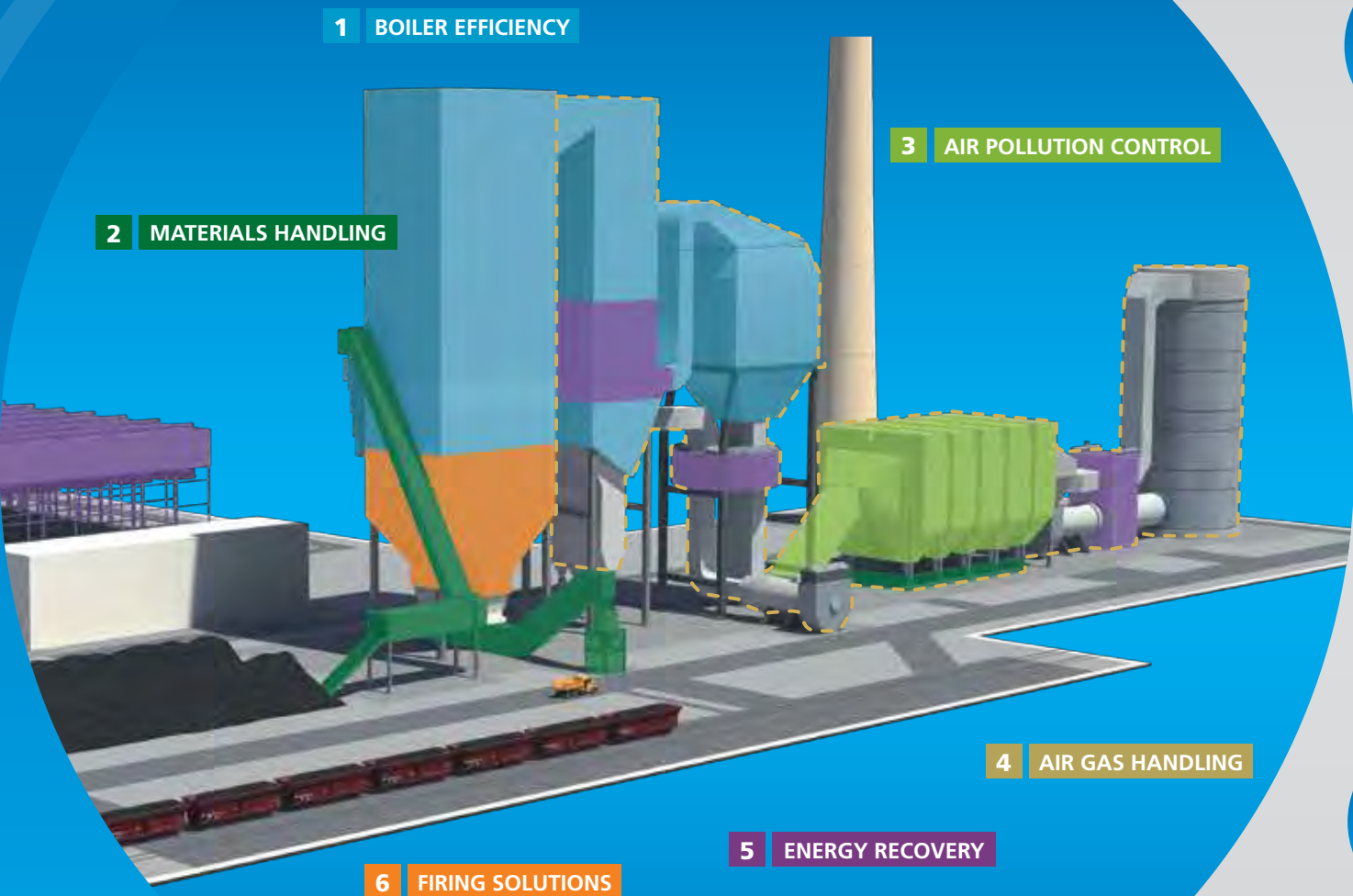
For Energy Related Industries

Partnering Together for Clean Energy

The Clyde Bergemann Power Group is a global enterprise, providing innovative products and services for energy related industries. "CLEAN ENERGY SOLUTIONS" describes a powerful portfolio of products and systems summarized in six business fields:

- 1 Boiler Efficiency** – improved boiler efficiency and effective on-load boiler cleaning
- 2 Materials Handling** – fly and bottom ash handling and dry sorbent injection systems
- 3 Air Pollution Control** – reliable flue gas cleaning
- 4 Air Gas Handling** – equipment comprising dampers, expansion joints, and gas turbine exhaust systems
- 5 Energy Recovery** – includes economizer and heat exchanger solutions as well as air cooled condenser
- 6 Firing Solutions** – customized burners

The worldwide network of in-house experts uniquely enables Clyde Bergemann's entire network to offer a complete array of individual products, entire systems and turnkey solutions customized precisely to the customer's specific application challenges.



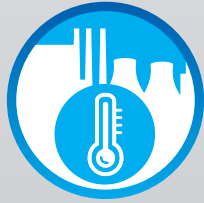
Industrial



Waste to Energy



Marine



Thermal Processing



Clyde Bergemann provides quality products, systems and services to a broad range of industries illustrated here.

Boiler Efficiency

Ash deposits from the combustion of solid and liquid fuels create significant challenges during the operation of thermal power plants, industrial boilers, waste incinerators and similar thermal processes. Without the installation of on-load cleaning, frequent outages are inevitable. Solving this problem has been the principal goal of the Clyde Bergemann Power Group for many years.

Boiler Efficiency includes solutions for boiler process optimization as well as systems for on-load boiler cleaning of heating and reaction surfaces. Clyde Bergemann was the first in the industry to leverage the advantages of demand-driven boiler cleaning, performed according to the actual deposit-situation instead of following a fixed cleaning scheme. As a result, a whole new philosophy has evolved out of the advantages of this demand-driven boiler cleaning, called "SMART Clean". These cleaning systems, capable of removing all residues of solid and liquid fuels safely and effectively while plants are operating, complete the Clyde Bergemann product offerings.

Our Scope of Supply:

- Boiler and fired heater process optimization
- Combustion simulation based on CFD-modelling
- Boiler diagnostics & analysis
- Intelligent on-load boiler cleaning
- Sootblower
- Water cannon
- Shower-Clean system
- Rapping system
- Explosion generators
- Sonic horns

Customer Benefits:

- Increased plant availability
- Improved boiler and fired heater efficiency
- Controlled deposit build-up regardless of flexible boiler operation and changing fuel mixture or varying fuel quality
- Reduced emissions
- Steam savings
- Optimized combustion process
- Increased energy recovery effectiveness



Materials Handling

High Performance Ash and Bulk Material Conveying

Materials Handling includes a range of solutions for cost-effective and efficient removal of bottom ash, coarse and fine fly ash, and mill rejects in the utility power, industrial power, petrochemical, pulp & paper, waste to energy, biomass, mineral and thermal processing industries. Clyde Bergemann has proven expertise in mechanical feed systems for solid fuels and various sorbent injection technologies for emission reduction. The commitment to research and development of environmentally friendly, innovative materials handling solutions has generated cutting-edge products such as DRYCON™, Dome/Spheri Valve and eXTreme Feeders.

Clyde Bergemann takes a team approach, working with customers from project conception through delivery, and on-going operations. This integrated delivery approach, along with extensive capabilities across all elements of a project's lifecycle, ensures projects deliver on time, on budget and to exacting standards of excellence.

Our Scope of Supply:

- Pneumatic conveying – lean and dense phase
- Mechanical conveying
- Bottom ash removal – dry and wet
- Fly ash removal
- Silo systems and storage
- Pyrites removal
- Biomass handling systems
- Railcar & truck – loading & unloading
- Injection technologies
- System engineering
- Consultancy, design, erection, commissioning
- Service and spare parts

Customer Benefits:

- High performance materials handling solutions
- Comprehensive engineering expertise for turnkey installation of conveying systems
- Cost-effective projects that meet client requirements on time and within budget
- Proven success from our extensive reference list



Boiler Efficiency / Materials Handling:
Industry Range of Product and System Applications

Air Pollution Control

Clyde Bergemann technology controls particulate, acid gas, dioxin/furans, mercury and other heavy metal emissions from the flue gases produced by the combustion of fossil fuels. Particulate control technologies include Electrostatic Precipitators, both dry and wet, and Fabric Filters. These are provided to major industries and offered either as standalone device to control particulate matter, or in combination with dry scrubbers, which simultaneously control acid gas emissions.

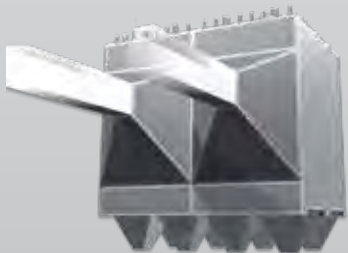
Dry Sorbent Injection Systems and Spray Dryer Absorber Systems are offered for acid gas control. Technologies to control mercury and dioxin/furan emissions via adsorption using Powdered Activated Carbon (PAC) Injection are also part of the range. This technology, also known as Activated Carbon Injection (ACI), can achieve greater than 95% removal of these pollutants in combination with the particulate matter control system.

Our Scope of Supply:

- Electrostatic Precipitators – dry and wet
- Fabric Filters
- Dry Scrubbing
- Circulating Dry Scrubbing
- Spray Dryer Absorber
- Sorbent Injection Systems
- Portable Sorbent Injection Testing
- Stacked Air Systems
- Consultancy, design, erection, commissioning
- Rebuilds, upgrades and retrofits of existing equipment
- Service and spare parts

Customer Benefits:

- High performance systems with demonstrated designs
- Engineering and project management expertise for turnkey supply of flue gas cleaning systems
- Comprehensive expertise in optimizing and modernization programs at existing plants
- Optimized particulate and acid gas removal to air emissions requirements
- Balance of plant engineering capabilities
- Turnkey capabilities: erection capabilities & construction services
- State of the art engineering capabilities: CFD modeling & 3D drafting
- Advanced controls



Air Gas Handling

Advanced Combustion Gas and Process Air Control

Clyde Bergemann has earned a preeminent position in the world market for custom engineered solutions integrating damper systems, expansion joints, and gas turbine exhaust systems, including combined cycle repowering conversion.

Incorporating proven Bachmann™ technologies and drawing upon decades of experience, Clyde Bergemann designs, fabricates and installs high performance equipment for a diverse range of industries and applications.

Clyde Bergemann provides exceptional engineered solutions from the initial design concepts through site erection assistance and commissioning of the supplied equipment. The Air-Gas Handling equipment provides dependable operation throughout the world in critical and non-critical systems. State-of-the-art engineering capabilities, including FEA, Steady State Thermal Analysis, CFD, and 3D computer modeling, ensure that each Clyde Bergemann design meets or exceeds the customer’s expectations.

Our scope of supply:

- Dampers
 - Diverters
 - Guillotines
 - Louvers
 - Poppets
 - Butterflies/Flaps
 - Specialty
- Expansion joints (metallic & non-metallic)
- Gas turbine exhaust and bypass systems
 - Simple cycle exhaust systems (non-convertible and convertible)
 - Combined cycle bypass systems
 - Repowering systems and solutions

Customer Benefits:

- Custom-engineered solutions
- Reliable performance over a long service life
- Trusted Bachmann™ technologies
- Decades of empirical and operational experience
- Economical life cycle costs
- Reduced plant downtime and operating cost



Air Pollution Control / Air Gas Handling:
Industry Range of Product and System Applications

Energy Recovery

Solutions for Energy Recovery and Heat Exchange

Energy Recovery comprises designed and manufactured economizers and other specialized products which maximize the re-use of process heat.

Clyde Bergemann has constantly developed waste heat recovery applications for clean exhaust gas from gas fired engines or turbines – onshore and offshore.

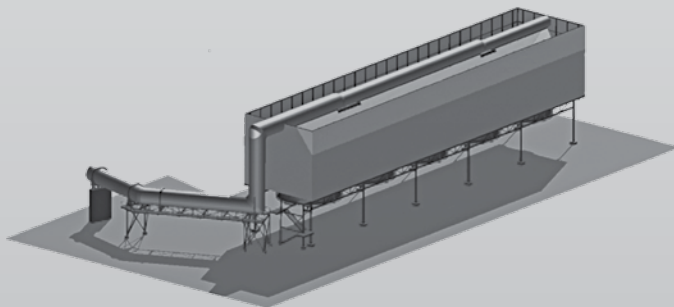
Additionally, Clyde Bergemann Termotec supplies air-cooled turbine exhaust steam condensers (ACC) for all plant sizes.

Our Scope of Supply:

- Economizers
- Air preheaters
- Mill air coolers
- U-tube heat exchangers
- Heat Recovery Steam Generators (HRSG's)
- Waste heat recovery units
- Thermal oil heaters
- Air cooled condenser:
 - Preliminary designs of ACCs – optimization of the cold end to achieve best efficiency
 - Basic and detail engineering: P&I diagram and functional description
 - Turnkey solutions: from project management to commissioning and training

Customer Benefits:

- Economizer and Heat Exchanger:
 - Recovery of valuable process heat for re-use
 - Savings of primary energy
 - Robust, low maintenance, long lasting solutions
- Air cooled condenser:
 - Long term well experienced team
 - Cutting edge tailor-made economical design
 - Sustainable high quality
 - Anti-freeze protection
 - Maximal availability



Firing Solutions

Customized Burners

To help customers apply low emission technologies, Clyde Bergemann started a low NOx Burner business for power plants in China under the Steinmueller Engineering license. With this advanced primary measure, customers can achieve lower NOx emission level in flue gas which meets the new enforced emission limitation.

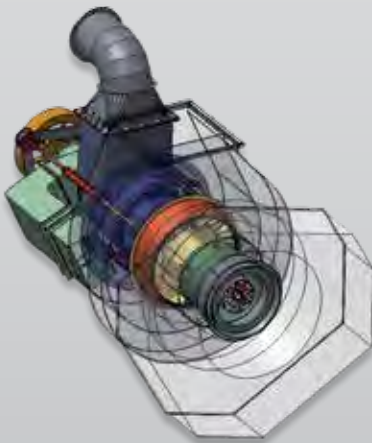
Clyde Bergemann offers a complete low NOx firing system for opposed wall fired boilers burning bituminous coal.

Our Scope of Supply:

- Low NOx firing system

Customer Benefits:

- Low NOx emission level
- Stable coal ignition
- Higher burnout performance
- Optimized furnace water wall protection
- Reliable structure and easy maintenance



Energy Recovery:
Products and systems for all ten industries shown

Firing Solutions:
Customized burner for utility and industrial power plants

Service & Aftermarket

An Upgrade for Customers Facilities

The Clyde Bergemann Power Group offers a wide spectrum of services to accompany the entire lifecycle of its customers' facilities to ensure the equipment maintains its value and is also fitted according to their individual demands.

Spare Parts

Individual parts suffer wear and tear. For this reason, Clyde Bergemann provides all replacement and spare parts and makes them readily available, allowing customers to have complete confidence in their plant capacity and rely on continuous product quality.

The Range of Products and Services Includes:

- Consultation for the selection of spare parts
- Start-up kits for new installations
- Custom-made individual packages
- Full maintenance support
- Original replacement and spare parts
- Fast worldwide delivery



Service, Maintenance and Inspections

With Clyde Bergemann solutions for inspection and maintenance, customers receive a complete and professional service which guarantees a maximum availability of equipment. With regional service centers, our people are there when you need us, offering a full range of services to help keep production up and running.

Clyde Bergemann Offers:

- Periodic plant inspection contracts
- Agreements defining a customer-focused, plant-specific range of services and spare parts which are then made available "on demand"
- Fixed-price maintenance contracts: Based on an initial detailed review of the equipment, desired parameters are defined jointly with the customer. These may include an equipment availability guarantee, spare parts storage plans, an on-call response service or staff training. A custom fixed-price offer addressing this specific scope is then developed by our service team.

Customer Benefits:

- Reduced administrative procedures at the ordering and payment stages
- Short repair response times
- Fixed cost for annual budgeting purposes
- High availability is contractually guaranteed

Training

Training personnel to operate and maintain equipment properly and safely is the most effective way to ensure reliable plant performance. We offer a variety of training programs for our systems for your operations and maintenance personnel.

Clyde Bergemann's Offer Includes:

- Full training programs designed to instruct your personnel to operate, overhaul and maintain the equipment supplied
- Individual training to create more efficient personnel
- Lectures as well as hands-on-training
- On-site mobile training

Clyde Bergemann is represented in over 40 countries worldwide.



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