

Multi-Brand Aftermarket Services Capabilities

For waste and biomass plants, regardless of OEM



RENEWABLE | ENVIRONMENTAL | THERMAL

Reliable, Flexible Expertise

Exceptional service and maintenance means improved availability and performance.

Parts wear out. Technologies change. Needs change. Throughout the useful lifetime of a waste-to-energy or biomass plant there will be many reasons to call a service specialist. And not just for service, but for plant improvements, upgrades, troubleshooting, and maintenance activities, too.

B&W Renewable's **multi-brand aftermarket service capabilities** are available for waste- and biomass-to-energy plants, **regardless of original equipment manufacturer (OEM).**

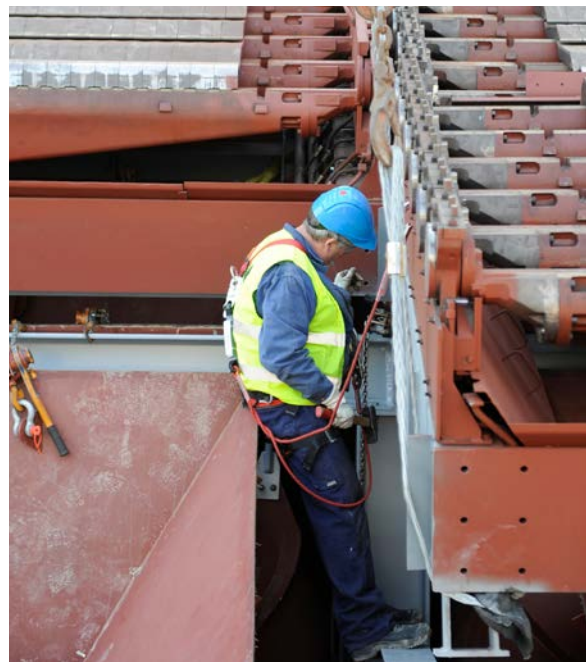


Our wide range of services can help keep your facility functioning smoothly and productively, both for short-term and long-term plant operation.

- Maintenance and service agreements
- Unscheduled maintenance and equipment repairs
- 24/7 emergency assistance
- Troubleshooting
- Startup and commissioning services
- Plant staffing and training
- Operating procedures
- Long-term plant operation
- Safety and quality control programs
- Environmental compliance and permitting assistance
- Plant improvements and upgrades
- Replacement and spare parts
- Inventory control
- Assessment surveys
- Feasibility studies
- Computational fluid dynamics (CFD modeling)

Our expertise covers components and systems throughout the plant.

- Ash, slag and siftings systems
- Boiler cleaning
- Combustion systems and controls
- Fuel feeding
- Grates
- Inconel® cladding
- Pressure parts
- Water-cooled wear zones
- Emissions control systems



Maintenance and Shutdown Management

No two plants are identical. That's why our services are custom designed for your specific needs, whether for one shutdown cycle or yearly maintenance requirements.

What is included in our maintenance and shutdown services?

Our services include planning, site management, inspection, condition assessment, installation, repairs, reporting and follow-up. You can choose to package a complete turnkey support program or select any of our individual services which match your strategy for planned stoppages and maintenance shutdown periods. Either option can be extended as required with service visits and additional support.

You'll receive:

- A high degree of predictability regarding maintenance costs
- Planning and coordination of all maintenance activities
- Corrective maintenance such as repairs and modifications
- Preventive maintenance such as inspections and condition assessment
- Detailed reports of completed inspections
- Direct access to our expertise with on-site, on-line, and telephone support
- Spare and replacement part solutions
- 24/7 service



Planning, coordination and assessment

Annual maintenance planning – At the start of the year a service engineer participates with key personnel from your operating and maintenance team. Detailed schedules and resource needs are established.

Maintenance shutdown planning and coordination – We take charge of the day-to-day management and coordination of current and upcoming tasks with subcontractors, as well as clearly outline required safety specifications and expectations.

Assessment of maintenance shutdown and inspection – A follow-up meeting will be held among key operating and maintenance personnel and our service engineer to discuss findings and take initial steps toward developing a strategy for the following year.

Inspection, condition assessment, maintenance optimization

After a thorough inspection of the boiler, combustion equipment, and auxiliary systems we will use our findings and the history of the equipment to predict future maintenance needs. Following each inspection, we will provide recommendations for an ongoing operation and maintenance strategy.



24/7 access

You have 24/7 access to technical support when additional resources or special skills are required. In emergencies we can offer our service engineers' assistance via our telephone hotline. This service means that we can begin repairs or replacements within 24 hours.

Additional support services

Start-up after maintenance – Functional testing of affected systems is necessary after larger maintenance shutdowns. In most cases it will also be necessary to test the plant's safety interlocks. In consultation with your operating personnel, our engineer will carry out functional testing and will assist in the initial start-up after maintenance shutdown.

Online operating support – When connecting to your plant's DCS, our service engineer's expertise is available for troubleshooting, condition assessment, functional testing, and system optimization.



Service visits: performance optimization and/or operator training

Performance optimization – If the conditions of your plant's operation change, it may be necessary to optimize the process controllers and regulation of the plant.

In collaboration with your plant's operating personnel, our service engineers inspect and adjust the process controllers to optimize emissions and other key performance factors. Any limits will be identified and, based on the latest developments in process and regulation concepts, optimization measures will be recommended to ensure that your plant is up to date.

Operator training – We offer training for operating personnel and assistance in the training of new employees. Depending on needs and requirements, our trainers put together both theoretical and practical training programs. Programs can be as short as a single day or up to several weeks, depending on your requirements.



Assessments, Upgrades & Optimization



Give your energy plant new life! Through upgrades and/or optimization services, we can help you obtain a stable operation, increased energy output, and reduced emission levels.

Nearly every plant operating with older technology has the potential to improve performance. Innovative technology provides many opportunities for existing plants to improve performance while meeting stricter emission requirements.

We have more than 80 years of experience with designing, constructing, commissioning and operating waste-to-energy and biomass energy plants. Each energy plant is unique, and we can assist you with assessing current operation and providing recommendations for optimization or upgrades.

Our upgrades may include equipment modernization or complete replacement of the combustion grate and/or the installation of water-cooled wear zones. Other major components often redesigned and upgraded to improve performance are superheater or economizer sections, combustion air systems, sootblowers, and ash handling systems.

Our focus is on improving your plant's energy production and availability.



Plant upgrades and improvements

- Design and engineering
- Inconel® corrosion protection
- Computational Fluid Dynamics (CFD) analysis of combustion and boiler flue gas
- Fuel conversions
- Capacity increases
- Combustion and efficiency improvements
- Emissions reduction
- Increased availability and operating time
- Equipment life extension
- Safer working environment for operating personnel



Spare & Replacement Parts

We manufacture and maintain an inventory of critical spare parts to ensure availability for daily operations and unexpected shutdowns when needed. Immediate availability minimizes downtime for your plant.

We are continuously innovating to improve upon our already proven technologies.

In addition to our own production facility, we utilize qualified and experienced sub-suppliers to offer a wide array of original spare parts for many types of plant equipment, including:

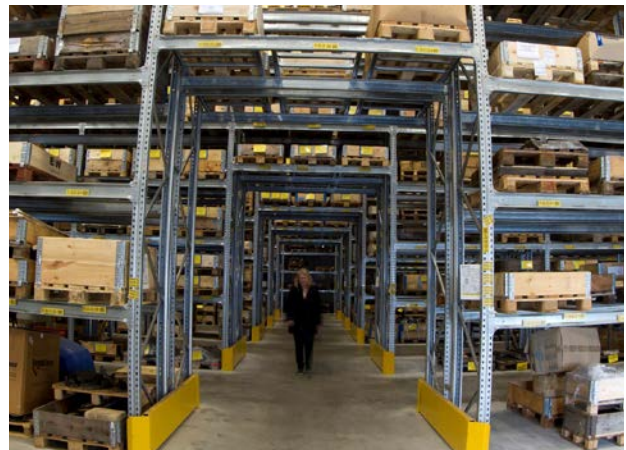
- Combustion grates of most brands, including B&W's DynaGrate® and Vølund® technologies.
- Fuel-feeding systems
- Boiler systems
- Ash and slag handling systems
- Emissions control



Flexible options for all your parts needs

Spare part management – We can manage and count your spare part usage after a maintenance shutdown. Based on this count and the latest inspection report, we prepare a report to maintain expected usage levels. The storage inventory is continuously adapted to estimates and recommendations from the inspection reports as well as your general maintenance strategy.

If preferred, we can also place the pre-packed container at your plant. Each time you use spare parts from the container, we will replace with new parts. This solution gives you the best possible accessibility without commitments.



Labor Management

The success, cost, quality and schedule of a project depends on the availability and effective supervision of qualified labor to perform the work. Our site management teams and labor force are staffed by highly experienced personnel with expertise of successful performance on a variety of maintenance and shutdown projects.



We...

- possess all necessary certifications, including the latest health, safety and environment (HSE) requirements,
- retain a pool of qualified grate fitters and welders, including those with extensive experience with Inconel,
- work with a variety of temporary agencies to accommodate labor needs during peak seasons,
- adhere to rigorous safety standards with Target Zero, an in-house program which reflects our commitment to a safe work environment for everyone, and
- employ in-house quality assurance and welding inspection personnel.

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Established in 1867, B&W is a global leader in renewable, environmental and thermal technologies and services for power and industrial applications.

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