

Creating clean energy from waste

Power and automation solutions for waste-to-energy plants

Power and productivity
for a better world™

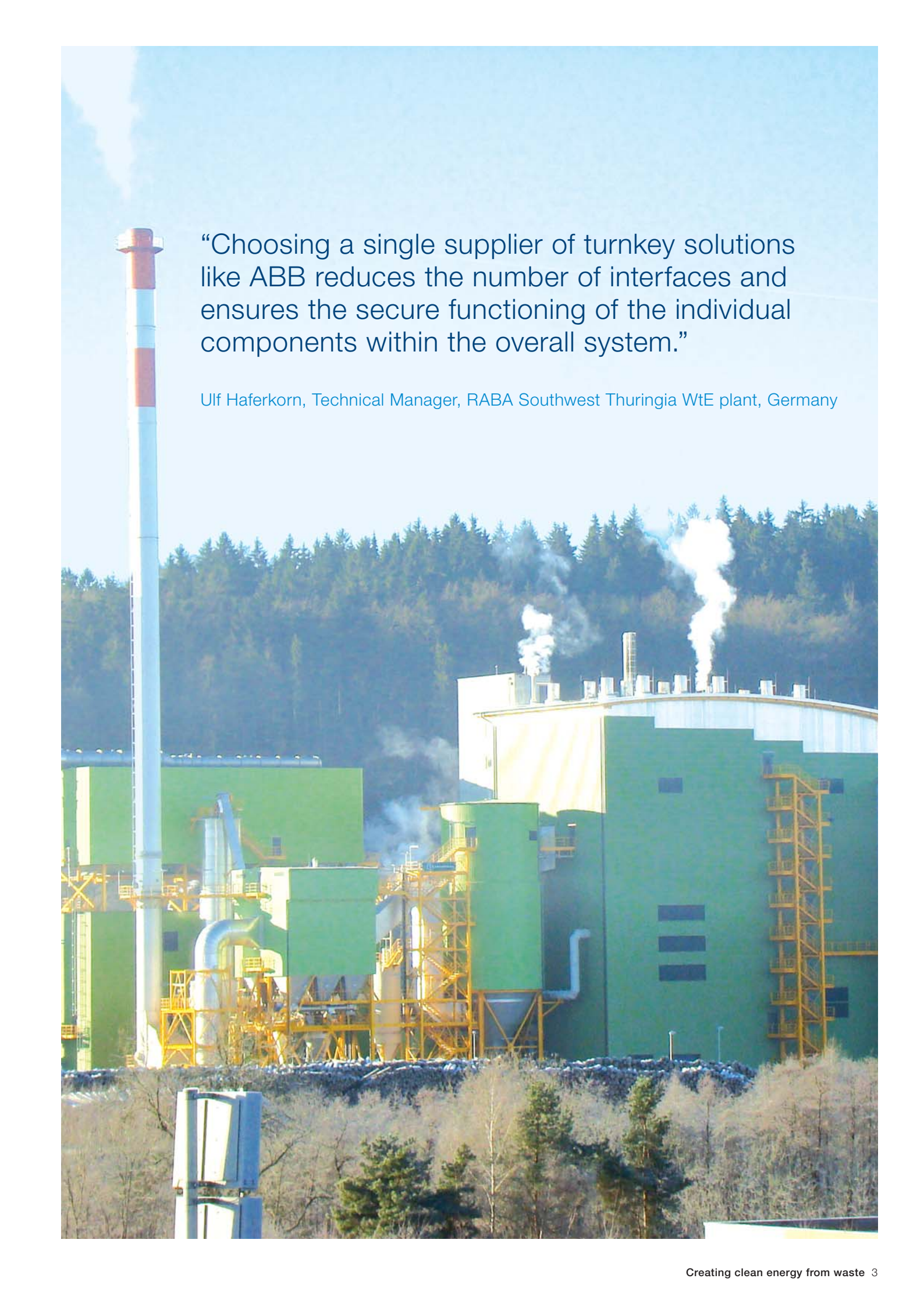


40 years of waste-to-energy expertise

ABB has been supplying turnkey electrical and automation solutions for waste-to-energy (WtE) plants for more than 40 years, longer than most other companies in the energy-from-waste business.

During that time we have supplied electrical, control, instrumentation and optimization solutions for a large number of WtE plants all over the world and for all types of incineration and combustion: fixed and moving grate, rotary kiln and fluidized bed.

Our widely proven solutions enable municipalities, waste management companies, utilities and financial institutions to generate more energy, more efficiently and more cost-effectively from their waste-to-energy investments.



“Choosing a single supplier of turnkey solutions like ABB reduces the number of interfaces and ensures the secure functioning of the individual components within the overall system.”

Ulf Haferkorn, Technical Manager, RABA Southwest Thuringia WtE plant, Germany

One supplier, one interface

Integrated instrumentation, control and electrical solutions

ABB is the world's leading supplier of just about every product and system in the electrical and automation scope of a waste-to-energy plant.

This unique single-source capability enables ABB to supply complete and fully integrated instrumentation, control and electrical solutions that reduce the time, cost and risk of WtE projects and get maximum efficiency and availability from each system.

Our scope of supply encompasses the entire project, from consulting, design and engineering to project management, commissioning and grid connection.

Electrical Balance of Plant (EBoP)

ABB's electrical balance of plant capability covers the entire power path, from the generator terminals to the high-voltage grid connection.

Our competencies extend from plant engineering to project and site management, installation, commissioning, testing, and lifecycle maintenance and support.

And, as the world's leading supplier of power transmission technologies, we draw on our close working relationships with grid operators and utilities worldwide to ensure correct compliance with the applicable grid codes.

Plant automation

ABB's powerful, versatile and scalable automation and control platforms are designed to maximize plant efficiency and reliability by automating, integrating and optimizing the entire plant. Due to their scalability, they enable integration of the plant's electrical, business and maintenance systems as requirements evolve over time.

- Integration of the automation and electrical systems into a single control environment
- Support of the latest interface protocols like IEC 61850 and IEC 60870-5-101 and -104
- Allowing the integration of a wide variety of third-party devices and systems through an open architecture
- Highly scalable – including different levels of redundancies - and therefore eminently suitable for both the smallest and most complex of configurations in new and existing plants
- Offering a comprehensive suite of functionality at the plant control level, as well as all the necessary functionalities to ensure safe operation and straightforward troubleshooting
- Integrating equipment, instrumentation and protection systems by using the standard open protocols of all leading bus systems



“It was very important to get everything from one company for standardization reasons. ABB was one of the very few companies that could provide us with all the electricals and the control system, as well as maintenance and service afterwards. It really is an ABB plant here.”

Jonas Eek, Energy Manager, Sysav WtE plant, Malmö, Sweden

Boiler protection and burner management systems

ABB works with customers and industrial standards organizations to establish the highest possible safety and reliability standards for boilers, turbine generators and chemical processes.

Our boiler protection and burner management systems are among the most widely used in the world, and have demonstrated their superior performance in numerous installations involving many different fuel and burner combinations.

Turbine automation

ABB has supplied more than 1,200 turbine automation solutions for most turbine manufacturers. Our solutions cover control, protection and turbine supervisory equipment, and are tightly integrated with the plant automation system to provide seamless integration of operational, engineering and diagnostic functions.

Instrumentation and continuous emission monitoring systems

ABB offers an unrivalled range of world-class instruments for all types of measurement: temperature, pressure, flow, analytical, recorders and controllers, and actuators and positioners.

We provide complete TÜV certified solutions for waste-to-energy emission monitoring, tailored to specific needs and designed to meet municipal and national requirements.

And as a turnkey supplier of instrumentation, control and electrical solutions for WtE plants, ABB provides a comprehensive offering including installation, erection, commissioning and service.

More power at lower cost

Plant efficiency and energy efficiency

ABB brings vast experience of successfully completed WtE plants to each energy-from-waste project. Our core competencies of process and product expertise enable us to deliver solutions that maximize the efficiency and reduce the energy consumption of the plant while increasing plant availability.

By selecting the best and most appropriate system for each stage of the process, correctly sizing the equipment and systems, optimizing the combustion process, integrating the control and management systems, and attending to the plant's service needs throughout its operating life, ABB will enable your plant to generate more power at lower cost over its entire lifecycle.

Maximum availability, maximum reliability, maximum output

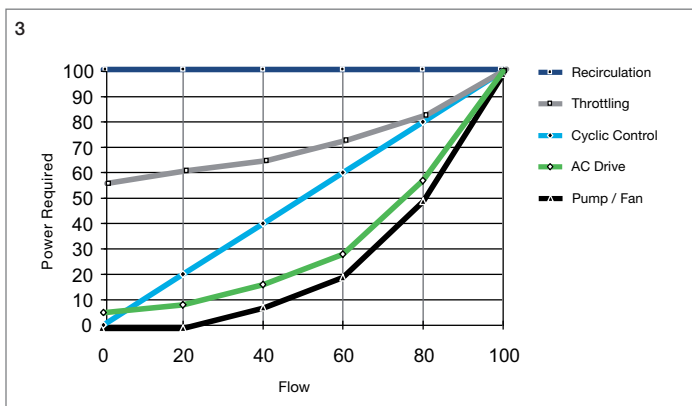
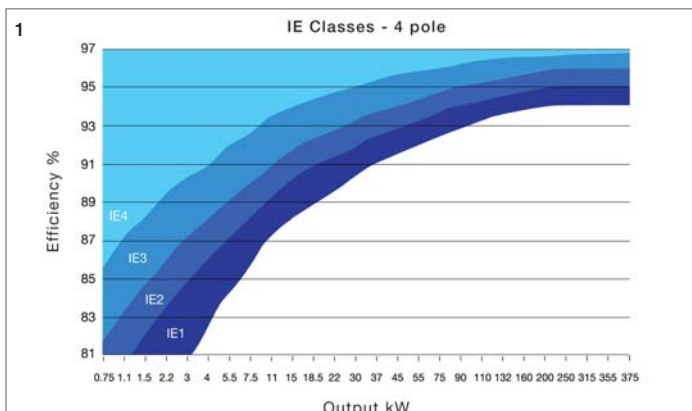
ABB's integrated solutions are designed to enable you to meet your plant objectives of maximum availability, maximum reliability, and maximum output at lowest possible cost.

We help you achieve those objectives by ensuring that the plant works optimally at each stage of the process and throughout its entire lifecycle.

The key is process know-how, product and system expertise, and the ability to combine them into integrated solutions that cover the entire scope of supply in power and automation, instrumentation, plant optimization and lifecycle management. Among the many efficiency-enhancing features of ABB's integrative engineering approach are the following:

- Integration of the plant electrical and automation systems
- Integrated safety and protection systems
- Advanced functionality and asset health monitoring
- Integrated plant optimization systems
- Integrated instrumentation and emission monitoring systems
- Integrated information management systems
- Integrated grate analysis and combustion control

1 Energy efficiency with various motor classes | 2 High efficiency motor | 3 Energy requirements with various control concepts for pumps and fans | 4 ABB medium and low-voltage drives



Improving plant energy efficiency

Waste-to-energy plants consume between 8 and 15 percent of their generated energy.

The biggest sources of energy loss in a WtE plant can be found in transformers, motors that power pumps and fans (often inefficiently), and oversized electrical systems. A proper integrative engineering approach can improve equipment efficiency by reducing energy losses by between 10 and 30 percent.

Reducing power losses in transformers

ABB is the world's leading supplier of transformers, with a comprehensive portfolio that includes uniquely efficient and innovative products like our EcoDry family of dry-type transformers, which reduce no-load losses by 65 percent and load losses by 33 percent

Saving energy with premium efficiency motors

90 percent of the lifecycle cost of a motor comes from its consumption of electricity. High efficiency motors consume and lose less power. They generate less heat and less noise, and have less need for maintenance. They also have a significantly longer operating life. ABB's latest award-winning motor class (premium or IE4) is up to 5 percent more efficient than comparable standard motors

Controlling pumps and fans with variable speed drives

Controlling the speed of a motor with a variable speed drive leads to a reduction in the energy consumption of a fan or pump application by as much as 50 percent. ABB is the world's leading supplier of AC and DC drives, and has a comprehensive portfolio for all industrial applications. ABB drives are equipped with an integrated low harmonic capability that helps reduce grid distortion, and a unique and patented Direct Torque Control (DTC) technology that reduces hammering in pipes and allows for a soft start of the application

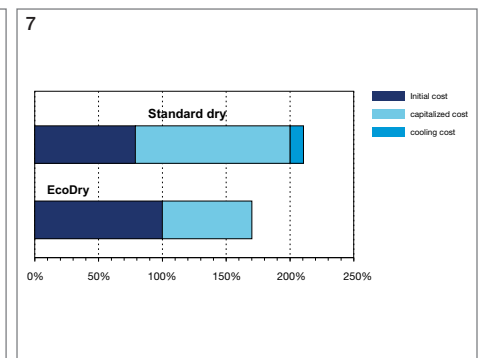
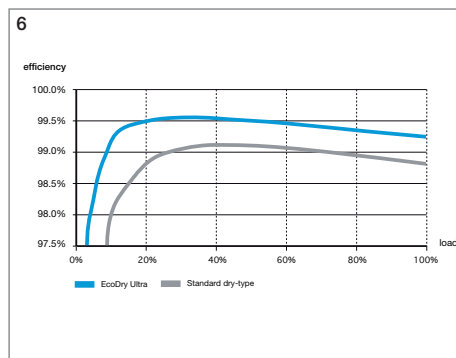
Correct sizing of equipment

Oversized equipment is a widespread problem, particularly in high-energy consumers like motors, pumps and fans. It is caused by a fear of undersizing and an overly cautious approach to project engineering. Considerable energy savings are to be made through the correct sizing of equipment

Energy efficiency tools

ABB has developed a variety of software tools like PumpSave and FanSave to enable customers to compare the energy consumption of pumps and fans controlled by ABB drives with those controlled by traditional methods. ABB drives can be equipped with built-in calculators that continuously measure how much energy the drive has saved, both in kWh and in various currencies

5 EcoDry is ABB's product family of ultra-efficient dry-type transformers | 6 Efficiency comparison for 1000 kVA transformers | 7 With an approximate payback time of only 4 years, the savings are considerable with ABB's EcoDry transformers



Lifecycle management for waste-to-energy plants

ABB supports its customers with a complete portfolio of lifecycle services to ensure the efficient and cost-effective operation of their waste-to-energy power assets.

Our service portfolio is geared to provide customers with all the support they need across the entire field of lifecycle management, from troubleshooting, spare parts and equipment repair to training, remote monitoring and lifetime extension.

ABB service contracts are tailored to meet every customer need. They are available all over the world, and are supported by a strong network of local service resources.

Service contract and asset management

ABB provides lifecycle assessments of critical plant equipment, including component reliability calculation analysis. Our assessments equip waste-to-energy companies with the information required to make cost-effective, long-term decisions on overall system operation and maintenance. ABB service contracts guarantee that our experts are only a phone call away.

Evolution

New generations of software and system components increase operating efficiency and extend system life. ABB offers low-risk evolution strategies for a broad range of products and systems that are designed to ensure maximum return on investment while enhancing equipment and plant availability and performance.

Upgrades and retrofits

ABB focuses on stepwise programs to upgrade existing systems and equipment, integrating installed and new system and control components to provide operational improvements.

Environmental services

ABB offers recycling solutions for decommissioned equipment and systems. ABB takes care of the proper disposal or recycling of installed or returned parts in compliance with all applicable regulations and requirements.

Training

ABB offers comprehensive training for engineers, operators, programmers and maintenance personnel, providing leading-edge technical expertise for products, processes and technology advances. Training is available at ABB training facilities worldwide, at your plant site or online.

Troubleshooting

ABB service engineers are trained and certified to provide expert knowledge for root cause analysis and troubleshooting to bring the plant back to normal operation again.

Support and remote services

Remote services provide assistance for a wide range of support needs. From telephone and self-service web support, to direct and secure system interaction – we provide real-time, online access to global service experts 24 hours a day, seven days a week.

Maintenance

Effective preventive and corrective maintenance services improve the reliability of plant equipment. Our service technicians utilize the most advanced diagnostic and repair practices to maximize equipment performance and availability.

Repairs

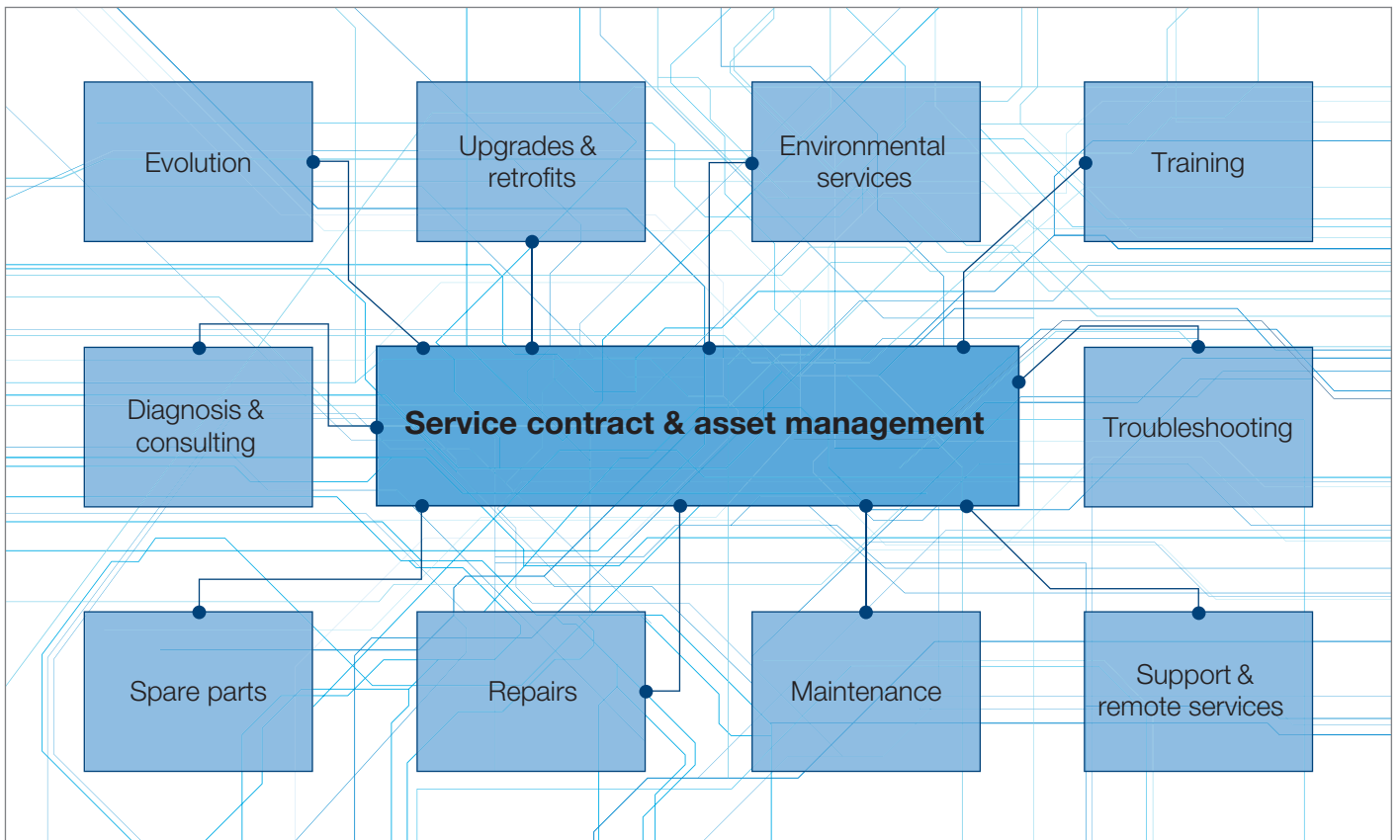
Reliable and efficient repair processing and logistics are key to efficient operations. Our repair services are ISO 9001 certified, provide timely repairs and advanced logistic services to satisfy specific customer needs.

Spare parts

Timely access to spare parts is essential for maintenance and plant availability - both bind working capital. ABB operates a global spare parts logistics system to minimize customers' capital investment and maximize plant utilization. Our spare parts web shop makes ordering both efficient and convenient.

Diagnosis and consulting

ABB experts have a profound knowledge of global best practices in a wide range of business and engineering operations. We develop and implement service solutions based on industry-specific technologies and competencies to help customers improve overall equipment effectiveness and return on investment.



Helping our customers achieve their targets

ABB has supplied solutions for hundreds of waste-to-energy plants all over the world.

Our solutions are proven in all types of incineration and combustion. They enable some of the world's largest cities (Berlin, London, Singapore and Vienna) as well as small and mid-sized local authorities to generate energy from their municipal waste - efficiently, cost-effectively and safely.

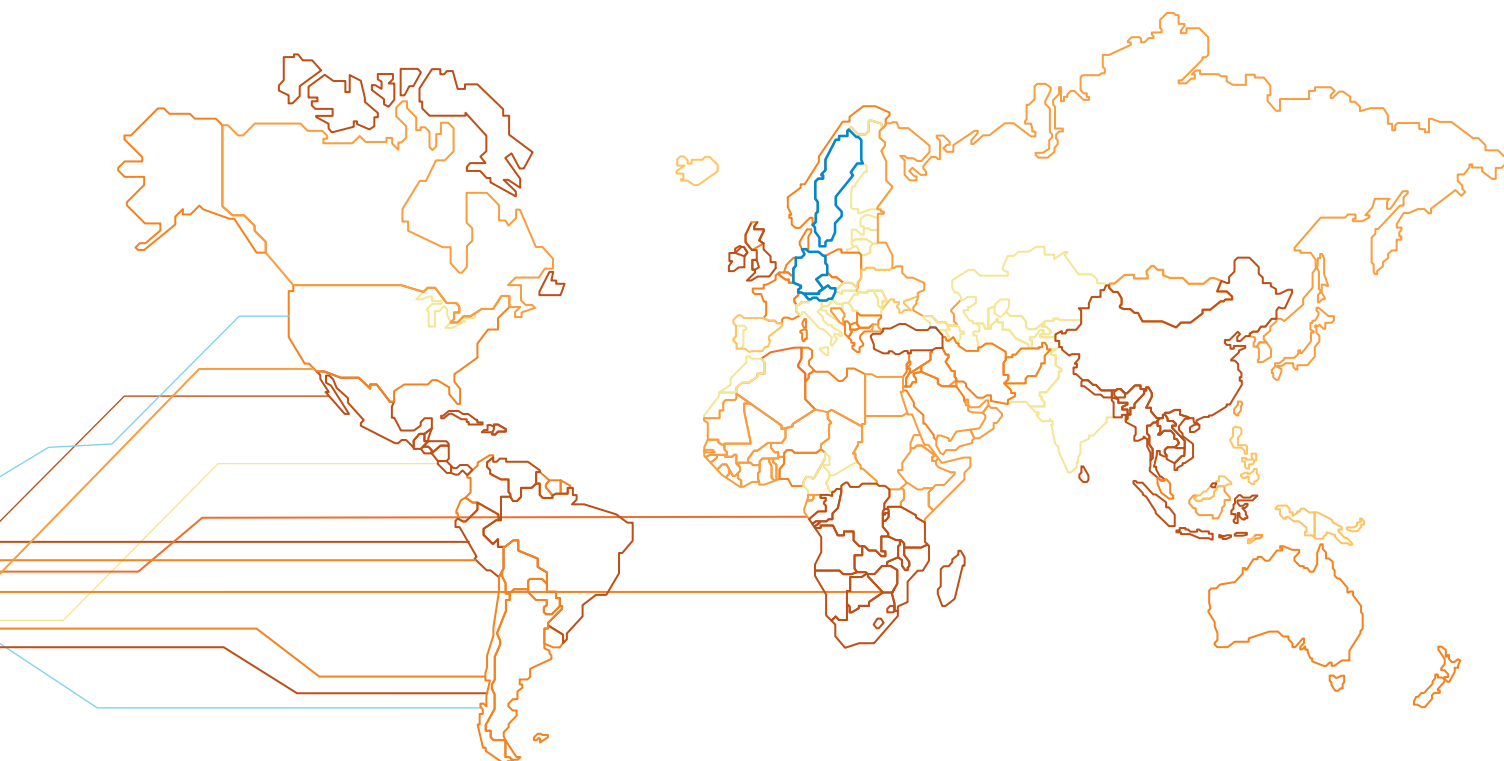
Sysav WtE plant, Malmö, Sweden

The Sysav waste-to-energy plant in Malmö converts the waste of Sweden's third largest city into heat for almost half the 300,000 residents and electricity for around 17,000 households.

ABB was selected to provide an integrated instrumentation, control and electrical package, as well as emission monitoring and plant optimization systems, for a third incineration unit at the plant. The unit can handle up to 200,000 tons of waste a year. Commissioned in 2003, it produces 45 MW of heat and 26 MW of electricity. Sysav required a solution with the following operating criteria: low emissions, optimal thermal utilization of the waste, high availability, staff safety and economical operation.

"It was very important to get everything from one company for standardization reasons," says Jonas Eek, chief manager of Sysav's energy department. "ABB was one of the very few companies that could provide us with all the electricals and the control system, as well as maintenance and service afterwards. It really is an ABB plant here."

The range of ABB products and systems in the solution includes the distributed control system, field instrumentation, medium-voltage switchgear, transformers, motors, drives, low-voltage switchgear, turbine controller, emission monitoring system, plant optimization system, service and remote support.



RABA Southwest Thuringia WtE plant, Germany

Located in the state of Thuringia in central Germany, the RABA Southwest Thuringia waste-to-energy plant produces up to 30 MW of district heating and 14 MW of electric power from 160,000 tons of waste a year. The plant was commissioned in 2008.

Working in collaboration with consortium partners MARTIN (Germany) and Integral (Austria), ABB supplied a complete electrical, control and instrumentation solution for the plant, as well as the emission monitoring, HVAC (heating, ventilation and air conditioning) and fire protection systems.

“Choosing a single supplier of turnkey solutions like ABB reduces the number of interfaces and ensures the secure functioning of the individual components within the overall system,” said Ulf Haferkorn, the plant’s technical manager. “ABB supplied proven and robust technology, which is also an advantage for plant maintenance and the number of spare parts to be kept.”

In addition to the complete instrumentation, control and electrical package, ABB was also responsible for design, engineering, installation, integration and commissioning of the solution, as well as for subsequent service and remote support.

Commenting on ABB’s control system, Ulf Haferkorn said: “The system is very powerful, stable and user-friendly. Our operating experience up to now confirms this.”

Pfaffenau WtE plant, Vienna, Austria

Pfaffenau is Vienna’s largest waste-to-energy plant. The plant processes up to 250,000 tons of waste a year. This is converted into some 65 GWh of electricity for 5,300 households and 410 GWh of district heating for 12,000 households in the Austrian capital. Pfaffenau was commissioned in 2008.

ABB was selected by the Viennese municipal environmental agency to provide a complete electrical and control solution for the facility and its two incineration grates.

The solution includes a wide range of ‘Made in ABB’ equipment, including medium-voltage switchgear, transformers, low-voltage switchgear and drives. The plant is controlled by an ABB plant control system and includes ABB’s Power Generation Information Management system, as well as an emission monitoring system.

Pfaffenau is located at the huge Simmering waste treatment facility, which is a showcase installation for the Viennese municipality. Besides the waste-to-energy plant, the facility includes a biogas plant where the city’s biodegradable waste is converted into energy, and a wastewater plant that treats almost 100 percent of the city’s wastewater.

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