Creating Clean Energy from Waste (EfW)

Power and automation solutions for Waste-to-Energy (WtE) plants
50 years of waste-to-energy expertise

ABB has been supplying electrical and automation solutions for waste-to-energy (WtE) plants for over 50 years. 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.
**Solutions for today, tomorrow**

You need your plant to be at the forefront of a constantly evolving power market. We provide industry-leading solutions for industry-leading plants.

As the power generation industry becomes more efficient, your plant needs to do the same. You need reliability. You need consistently available energy and you need your plant to accomplish all of this in a heavily regulated market.

We provide solutions to achieve this, and we provide support for our solutions too. From security solutions that enhance reliability and minimize risk, to skills support that builds competence within your plant, we systematically enhance our systems to create a comprehensive, effective solution for your power plant.

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**Integrated electrical and automation solutions**

Latest technology, broad functionality, operational reliability are hallmarks of ABB’s electrical and automation systems portfolio. Continuous enhancements aim at improving user friendliness, cost effectiveness, functionality and quality. With decades of experience for all types of power plants, ABB is consistently ranked as the number one DCS supplier worldwide.

ABB’s future-oriented platforms for automation and electrical systems have open interfaces for new technologies which provide consistent, intuitive operator stations with power plant specific functionality. The well-structured levels of plant information hierarchy levels, intelligent cross-links and efficient alarm and event schemes give guidance to plant operators for smooth and trouble-free plant handling.

ABB’s solutions are designed for the seamless integration of electrical and automation systems with few well-defined interfaces and protocols, facilitating maintenance, repair and spare parts handling throughout the whole plant life, so they can be applied across the entire electrical and automation value chain.

**Digital for power generation**

Our digital solutions provide scalable, tangible results that drive your business. We will deliver integrated and secure digital systems, services and solutions to automate and optimize its performance.

After more than a century within integrated power and automation solutions has given us deep knowledge of processes in the energy industries, which we couple today with a powerful digital portfolio. Improved operations and sustainable progress are guaranteed.

Cyber security solutions are paramount for power generation. Our digital technology allows you to adopt different modes of operation that enhance your plant and fleet ability. ABB will work closely with you to find effective solutions to challenges in your control-based systems, and solutions for infrastructure and industry.

**Instrumentation**

For several decades, ABB has been one of the world’s leading providers of combustion monitoring and safety systems, delivering cost efficient and technologically advanced solutions designed to meet the needs of both retrofit and greenfield markets.

With ABB Ability™ Symphony® Plus all this experience comes together in its combustion instrumentation to take ABB’s offering to a new unmatched level of functionality and performance.

Our solutions are certified to international standards, and a worldwide network of manufacturing plants and strategically situated calibration labs. ABB provides a wide variety of high performance instrumentation products, including FOUNDATION Fieldbus, PROFIBUS and HART-enabled instrumentation.
You need to run secure and reliable solutions for your power plant.

We provide a comprehensive range of automation applications to do exactly that.

ABB is your reliable partner for world-class, plant-wide automation system solutions. We devise a flexible package aligned with your needs and budget to provide new systems, and service and evolve your plant’s existing electrical and automation assets.

Our bespoke service includes scalable and flexible architecture that allows single and multi-system configurations, and gives you peace of mind that your unique requirements are met. And that leaves you to focus on the important things - like leading the way in your market.

Solutions for excitation and synchronization

Power output stability is a crucial cornerstone of any power generation plant. This has become even more true today with the growing injection of renewable power into national grids, raising fluctuation levels and prompting stricter rules to allow connection to the grid.

The excitation system sits right at the core of any power generation plant. It is in fact in charge of producing the direct current that generates the magnetic field that, which controls the machine terminal voltage, thus reactive power to the network. Fast and dynamic control of the magnetic field enables stable control even in case of severe network faults.

ABB is the world leading supplier of high-quality indirect (brushless) and static excitation systems, synchronizing equipment as well as consultancy packages like simulation and grid code compliance studies.

ABB’s UNITROL® and SYNCHROTACT® solutions for excitation and synchronization are part of a comprehensive suite of automation, electrical, rotating machine control, motors and generators that combine over 125 years of engineering experience and thousands of installations around the world.
Adaptable, integrated optimization

Your entire fleet. Your plant. Your turbine. Your boiler. Whatever it is, protecting your investments can be a challenge. Working with utilities to integrate power plant optimization, we help you meet these demands.

Using our process acumen and technological advances in software engineering, we have developed ABB Ability™ optimization packages for asset management and predictive maintenance to ensure your operations are the best they can be.

Boiler optimization
Plants today face requirements not only for increased efficiency and operational flexibility, but also for significantly more start-ups and load changes.

ABB’s solutions for boiler lifetime monitoring, optimal control of main and reheat temperature and optimized soot-blowing regime go above the expected requirements.

These solutions are tailor-made for each plant and include advanced control algorithms which provide results far better than with conventional PID control.

Plant optimization
ABB has decades of experience in power plant process and related technologies, offering solutions for optimization, monitoring, and maintenance of power plants. The suite provides options for monitoring and diagnosis of plant equipment, what-if simulation for plant operation and performance, optimization of unit start-up and unit ramp rates as well as fleet management for multiple-unit operation.

Continuous improvement of existing optimization packages provides maximum benefit for plant investor. ABB’s solutions are based on dynamic optimization and can satisfy requirements that are beyond the reach of conventional closed-loop control, including features like non-linear, Model Predictive Control.

Turbine optimization
Your turbine sits right at the heart of your plant. As one of the most critical assets, it requires advanced control options as well as in-depth knowledge of how to maintain it to extend its life cycle.

ABB’s automation solutions for turbines—gas, steam (both utility and industrial), and hydro—are complemented by a wider and fully integrated portfolio of excitation and synchronization equipment, electrical systems, optimization and digital packages like predictive maintenance and advanced diagnostics.

You can count of ABB’s experts unparalleled knowledge across our Global Excellence Centers for rotating machines.

Fleet optimization
OPTIMAX® for Virtual Power Plants, a powerful online dynamic optimization solution, connected directly to the automation network, allows for real time control and optimization of the plant production.

Simple and intuitive engineering tools allow for defining the optimization problem according to project or customer needs. For single power plants, OPTIMAX improves the efficiency of the plant by maximizing the power production considering wake effects or minimizing losses in the collector grid.

For a fleet of plants, it ensures an operation that is always run at the economic best point, maximizing plant and fleet efficiency. It enables participation in secondary and tertiary control, intraday optimization and direct trading of renewable power. It supports the planned production of generation assets, enabling human operators to take a supervisory role.

Moreover, OPTIMAX helps integrate renewable generation into power systems, transforming them into a flexible and dispatchable source of energy.

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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. 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, Chief Manager - Energy Department

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. ABB supplied proven and robust technology, which is also an advantage for plant maintenance and the number of spare parts to be kept."
Ulf Haferkorn, Plant Technical Manager

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.

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.

Commenting on ABB’s control system:

"The system is very powerful, stable and user-friendly. Our operating experience up to now confirms this."
Ulf Haferkorn, Plant Technical Manager