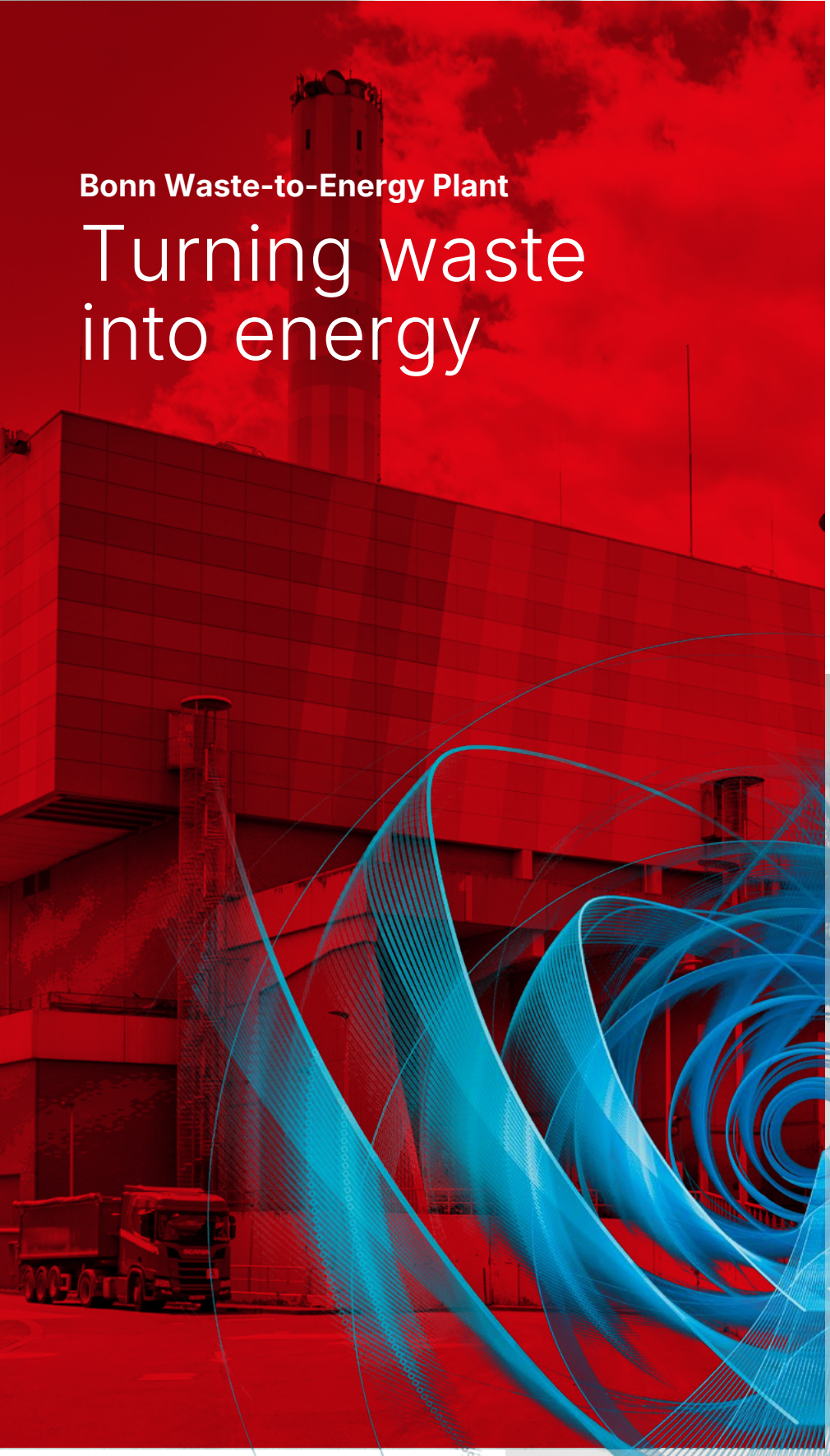
REITZ RETROFIT

Bonn Waste-to-Energy Plant

Turning waste into energy



Case study

reitzgroup.com



Bonn Waste-to-Energy Plant

Since its commissioning in the early 1990s, the Bonn waste-to-energy plant has been one of Germany's landmark thermal waste treatment facilities. Less than three kilometres from Bonn city centre, the plant processes large volumes of municipal and commercial waste every day, making an important contribution to safe waste disposal, energy supply and resource conservation.

Around 260,000 tonnes of waste per year produce approximately 500,000 megawatt-hours of high-temperature steam. At the adjacent SWB Energie und Wasser combined heat and power plant, the steam is converted into electricity and district heating. In this way, MVA Bonn supplies the equivalent of around 19,000 households with electricity and approximately 10,000 apartments, swimming pools, public buildings, the university and Bonn's Old Town Hall with district heating.





Process

At the Bonn waste-to-energy plant, residual waste that cannot otherwise be recycled is treated thermally. It is first collected and mixed in waste bunkers before being fed into the furnace. On the moving grate, the waste burns at around 1,000 °C, sometimes reaching 1,100 °C, usually without additional fossil fuels.

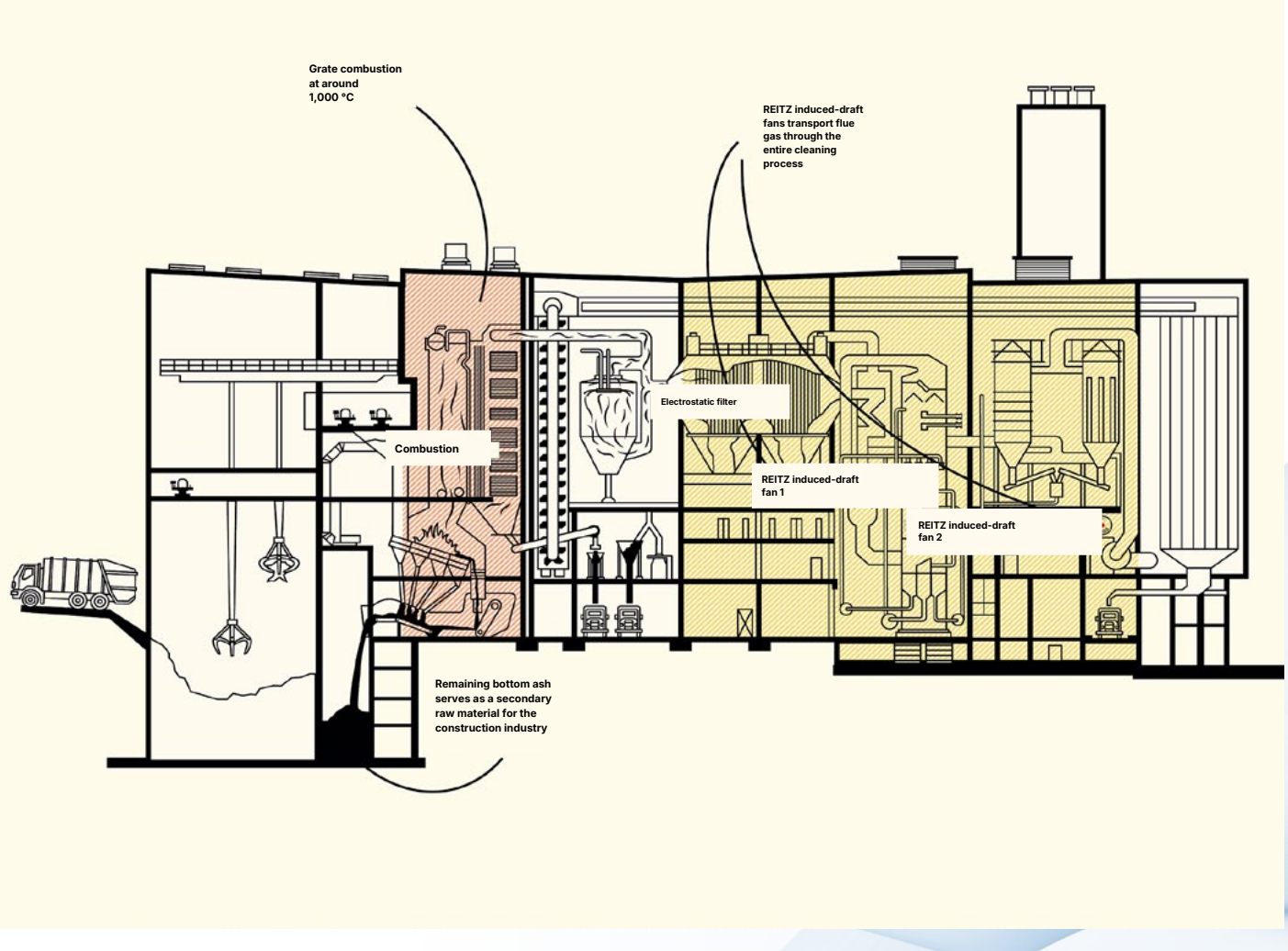
The resulting heat generates steam at approximately 400 °C. This steam is transferred by pipeline to the adjacent combined heat and power plant, where turbines generate electricity and waste heat is fed into the district heating network.

Combustion leaves bottom ash, fly ash and flue gas. The bottom ash is processed to recover valuable materials, while the remaining fractions are used, among other things, as secondary raw materials for the construction industry.

Flue Gas Cleaning

After combustion, the flue gas undergoes multi-stage cleaning. MVA Bonn uses wet flue-gas treatment with several filtration stages, including flue-gas scrubbers and electrostatic precipitators. Pollutants and dust are reliably removed.

REITZ induced-draft fans play a central role: they convey the flue gas through the entire cleaning process. This ensures that only slightly warmed, largely purified air is released through the stack. According to the plant, the exhaust air contains less fine particulate matter than the surrounding ambient air.



Project Scope

Reitz Retrofit was commissioned to modernise the air-handling equipment at the Bonn waste-to-energy plant. The fans were converted to variable-speed operation as early as 2010. The objective was to reduce electricity consumption significantly while maintaining reliable performance throughout the flue-gas cleaning process.

The project marked a major step towards greater energy efficiency and laid the foundation for a long-term, trusted partnership between MVA Bonn and Reitz Retrofit. Since then, the existing induced-draft fans have been maintained and serviced regularly. Typical tasks include vibration and temperature measurements, for example with a thermal imaging camera.

Challenge

Thermal waste treatment is a highly complex, continuous process. MVA Bonn's three lines operate around the clock, 365 days a year. This places particularly high demands on the availability, operational reliability and efficiency of the ventilation equipment.

The induced-draft fans must convey flue gas reliably through the entire cleaning process. At the same time, large fans are among the plant's biggest energy consumers. The challenge was to reduce electricity consumption considerably without compromising process safety, cleaning performance or plant availability.

The upgrade also had to be integrated into the existing plant structure. The goal was a retrofit solution that would deliver major customer benefits with a comparatively low investment.



Solution

Reitz Retrofit equipped the fans at MVA Bonn with frequency-converter-based speed control. This allows the induced-draft fans to operate according to demand rather than continuously at full output, matching airflow more precisely to actual process requirements.

This is the core idea behind retrofit: targeted replacement and upgrades make existing installations more capable, efficient and future-proof. The Reitz Retrofit team considers the entire plant, not just individual fans, and develops solutions that jointly address energy consumption, costs, service life and operational reliability.

The potential savings were already clear during the 2010 upgrade: frequency-converter-based ventilation technology saved around EUR 85,000 per line per year.

Reitz Retrofit has remained closely involved with MVA Bonn ever since. Alongside maintenance of the existing induced-draft fans, REITZ energy experts regularly advise on further optimisation. This ensures continuous maintenance and the identification of additional efficiency potential.





Benefits of the Upgrade

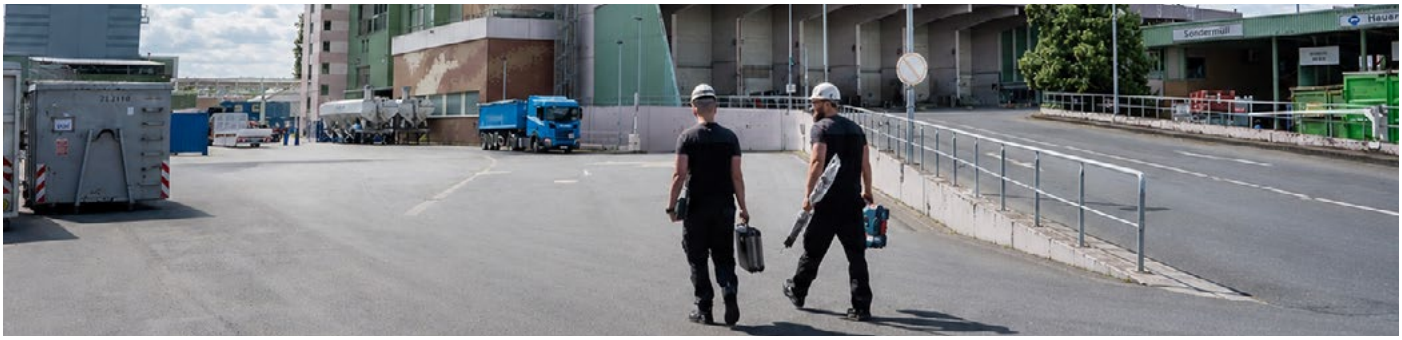
Modernising the fans allowed MVA Bonn to reduce its energy consumption significantly while maintaining the high process reliability of flue-gas cleaning. The variable-speed ventilation technology enables demand-based operation of the induced-draft fans, ensuring that major electrical consumers can be operated more efficiently.

The upgrade also laid the foundation for the long-term partnership between MVA Bonn and Reitz Retrofit. The successful project developed into continuous support combining maintenance, performance analysis and energy consulting.

- **Significantly reduced electricity consumption** for flue-gas transport
- **Savings of around EUR 85,000 per line per year** from variable-speed technology
- **Demand-based operation** of induced-draft fans through speed control
- **Reliable flue-gas transport** throughout the entire cleaning process
- **High cleaning performance** and plant availability maintained
- **Long-term support** with maintenance, measurements and energy advice
- Contribution to resource conservation

Services at a Glance

Engineering:	Analysis of the air-handling system Energy advice and assessment of further savings potential
Fans:	Conversion of fans to variable-speed operation Optimisation of induced-draft fans for flue-gas cleaning
Plant engineering:	Integration of frequency-converter-based air systems Modifications to existing air-handling systems
Service & installation:	Maintenance of existing induced-draft fans Vibration and temperature measurements Continuous support and advice for MVA Bonn



Reitz Retrofit at MVA Bonn: Project Timeline

Year	Work carried out	Scope of supply
2011 2012 2013	Retrofit of induced-draft fans on all three lines, fans 1 and 2 on each line	New fans including transformer, variable-frequency drive and motor; removal and installation; cabling and commissioning
2014 2015	Conversion of ash discharge in the second and third passes on all three lines	Discharge screw with emergency ash removal and downstream twin-roll crusher; electrical and control systems; dismantling and installation; cabling and commissioning
2015	Upgrade of bottom-ash discharge on all three lines	Slag discharge chute with shut-off slide, ram-type ash extractor, apron conveyor and double-flap valves; dismantling and installation
2017	Exhaust air system from the boiler house to the new waste bunker	Ductwork, axial fans; installation and commissioning
2017 2018	New mechanical conveying system for boiler ash and FGD ash from all three lines to shared silos	Drag-chain conveyors, crushers, bucket elevators, screw conveyors, silos, steelwork, electrical and control systems; dismantling, installation and commissioning
2017 2018 2019	Replacement of start-up and support firing systems on all three lines	New burners and burner gas trains; piping, fans and ducts; electrical and control systems as a turnkey package; individual burner acceptance by TÜV; dismantling, installation and commissioning

More performance from your plant?

We identify the retrofit potential in your system and show how targeted upgrades improve efficiency, performance and operational reliability.

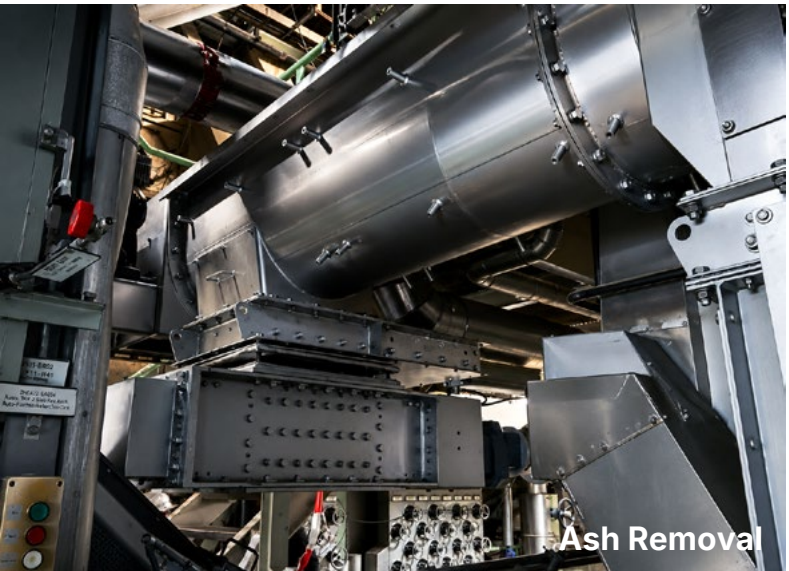
+49 214 404 990 40 retrofit@reitzgroup.com


Exhaust Air System


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Ash Removal


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ZARGES
Ash Removal


Silo System



Silo System


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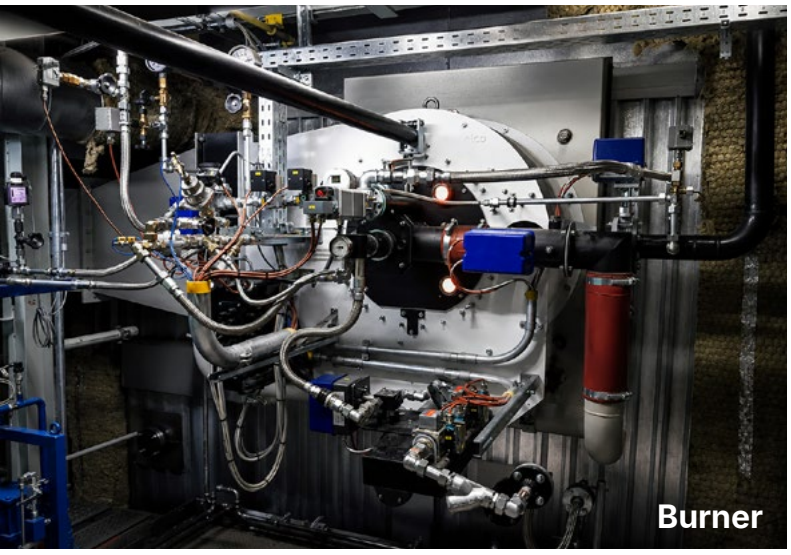
Induced-Draft Fan

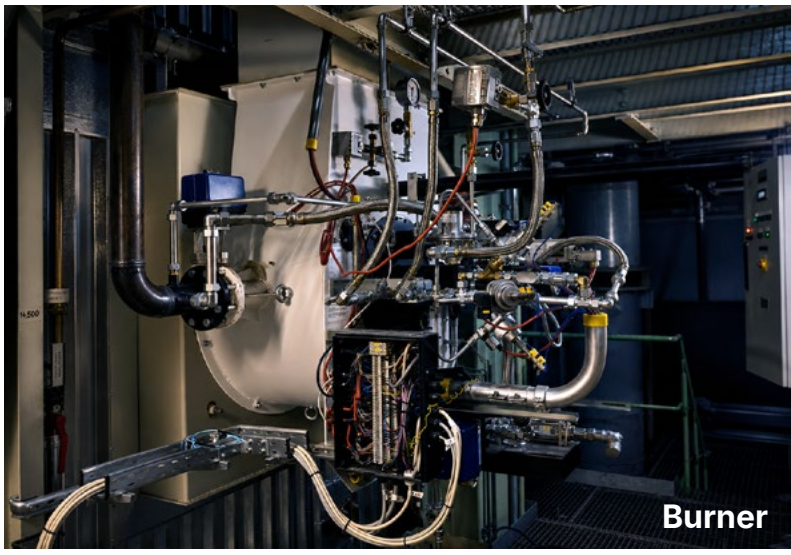


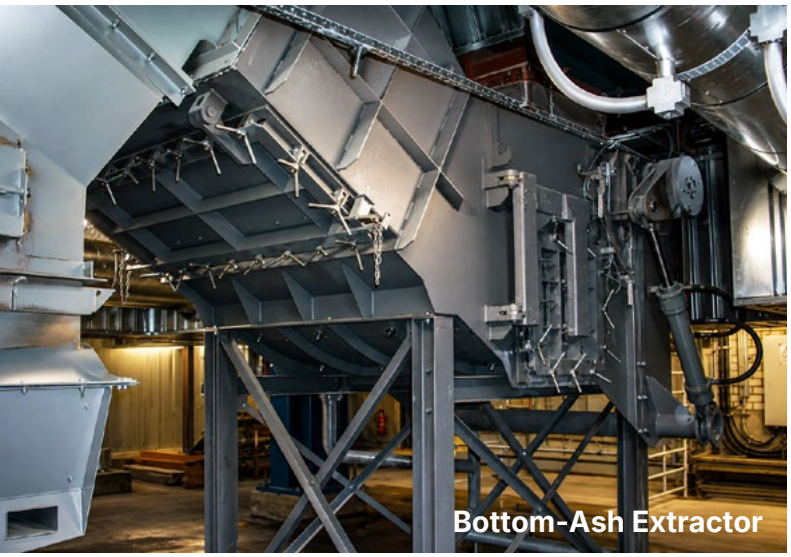
Induced-Draft Fan


Induced-Draft Fan VFD


Induced-Draft Fan Transformer


Burner


Burner


Bottom-Ash Extractor


Cooling Unit


Combustion Pump Station


Combustion Gas Pressure Control