Hitachi Zosen INOVA

Zorbau / Germany

Energy-from-Waste Plant

Turnkey Plant 2 x 21 t/h, 53.6 MW

Zorbau – a regional-scale plant for centralised waste treatment

The triangle formed by the states of Saxony-Anhalt, Saxony, and Thuringia is one of Germany's industrial growth areas. This makes orderly local processing of waste an important concern. The AVS Zorbau waste treatment plant, located some 30 km southwest of Leipzig, has been providing reliable around-the-clock treatment of domestic, commercial, and industrial wastes since June 2005. At 300,000 t/a, AVS Zorbau is among the largest capacity plants in Germany.

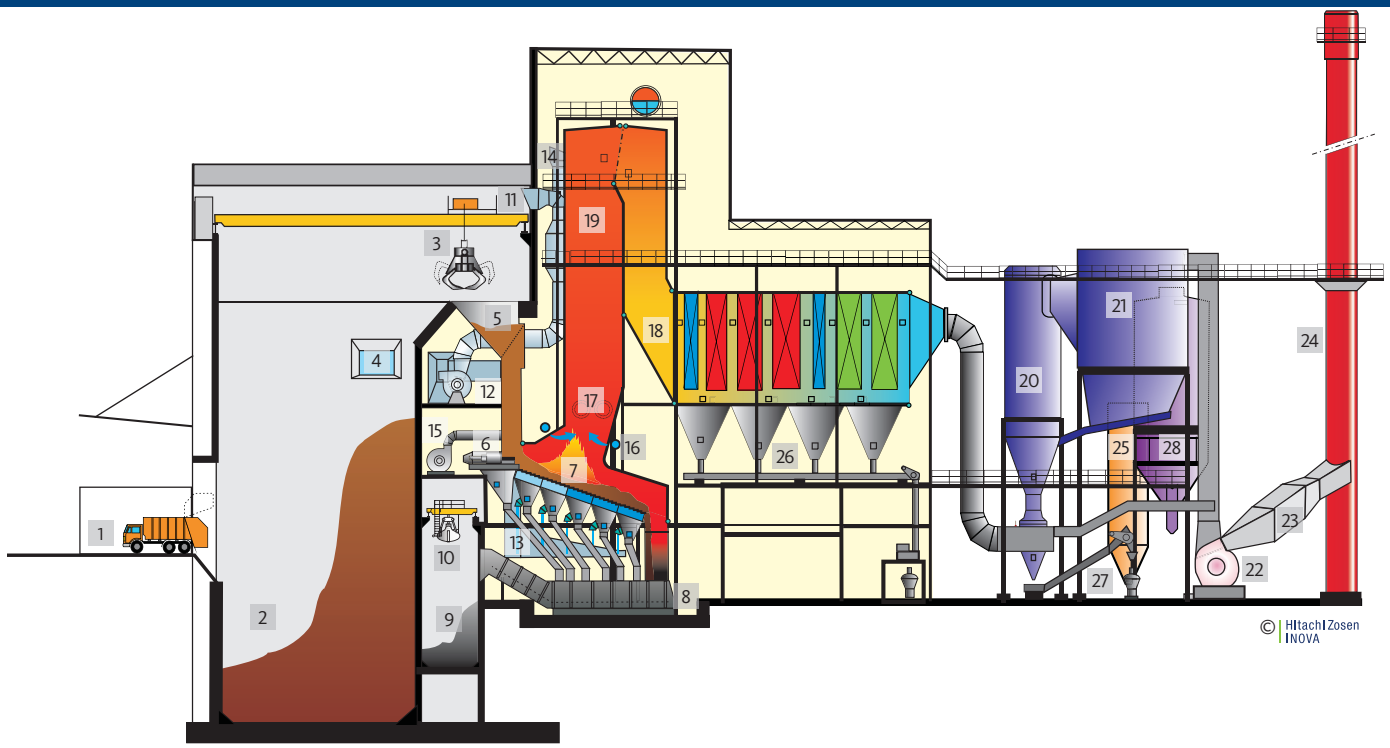
The facility is owned and operated by SITA Abfallverwertung GmbH, a subsidiary of SITA Deutschland GmbH and Stadtwerke Gera AG. As general contractor, Von Roll Inova, today's Hitachi Zosen Inova, handled the overall development, from planning through to on-time commissioning in early 2005. Construction took about two and a half years, and commercial service began while the plant was still in trial run.

Logistical concept for waste delivery boosts availability.
A high-performance logistics concept regulates the efficient unloading of the 100 to 120 vehicles that arrive daily from the region. Ten tipping bays at the waste pit shorten waiting times and two waste cranes assure that the two combustion trains can be fed sufficiently at any time.

For times of restricted capacity, as during overhauls, AVS Zorbau has its own interim storage for waste that cannot be treated immediately. A machine charged from the waste pit compacts such waste into bales and wraps it in plastic film. In this way, waste can be held for several weeks. The bales are then retrieved and included in the incineration charge when the plant is running at full capacity again.

Up-to-date technologies for safe and economical waste treatment.
The incineration plant comprises two process trains, each with a maximum waste capacity of 21 t/h. Waste is combusted on a three-row Hitachi Zosen Inova grate with water cooling in the first two zones. A "calorific value navigator" integrated into the instrumentation and control system adjusts the combustion conditions rapidly and reliably to deal with continuously changing waste fractions. This technique ensures optimal burnout of the most varied wastes.

The pollution section control keeps the plant in compliance with the limits of European emission regulations at all times, even when handling waste with elevated levels of pollutants. This operation takes place in two stages: destruction of nitrogen oxides by SNCR (selective non-catalytic reduction) followed by Semi-dry treatment for safe removal of gaseous pollutants as well as heavy metals and dioxins. A fully automated loading system specially designed for AVS Zorbau loads bottom ash into trucks for offsite treatment.



Waste receiving and storage	Combustion and boiler	Flue gas treatment	Flue gas treatment	Residue handling and treatment
1 Tipping hall	5 Feed hopper	12 Primary air fan	19 SNCR injection levels	25 Lime silo
2 Waste pit	6 Ram feeder	13 Primary air distribution	20 Semi-dry reactor	26 Ash conveying
3 Waste crane	7 Hitachi Zosen Inova grate	14 Secondary air intake	21 Fabric filter	27 Residue conveying
4 Crane control cabin	8 Bottom ash discharger	15 Secondary air fan	22 Induced draft fan	28 Residue silo
	9 Bottom ash pit	16 Secondary air injection	23 Silencer	
	10 Bottom ash crane	17 Start-up burner	24 Stack	
	11 Primary air intake	18 Three-pass boiler		

Energy from Waste.
The energy produced in the combustion process is currently used to supply electricity for 40,000 households. After three years of operation, in August 2008, AVS Zorbau also successfully commissioned a CHP connection for the delivery of heat to a nearby industrial park and several villages.

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Zorbau / Germany Energy-from-Waste Plant

General project data

Owner and operator	SITA Abfallverwertung GmbH, Zorbau
Start of operation	2005
Scope of Hitachi Zosen Inova AG	General contractor for entire plant, including civil works
Plant design	Hitachi Zosen Inova AG

Technical data

Annual capacity	300,000 t/a
Number of trains	2
Throughput per train	19.3 t/h (min), 21.0 t/h (max)
Calorific value of waste	10.0 MJ/kg (nom), 7–15 MJ/kg (min/max)
Thermal capacity per train	53.6 MW
Waste type	Domestic and industrial waste as well as bulky waste

Waste delivery

Waste pit capacity	15,000 m^3

Combustion system

Grate type	Hitachi Zosen Inova grate
Grate design	3 rows with 5 zones per row
Grate size	Length: 10.25 m, width: 6.60 m
Grate cooling	First two zones water-cooled (Aquaroll®)

Boiler

Type	Three-pass boiler, horizontal
Steam quantity per train	62.5 t/h
Steam pressure	40 bar
Steam temperature	400°C
Flue gas outlet temperature	210°C

Flue gas treatment

Concept	SNCR DeNOx, Semi-dry system
Flue gas volume per train	118,000 m^3/h (i.N.)

Energy recovery

Type	Extraction-condensation turbine
Electric power output	Max. 28.3 MW

Residue treatment

Concept	Bottom ash treatment off site

Residues

Bottom ash	70,000 t/a
Flue gas treatment	10,000 t/a including fly ash

Special features

Plant for baling of waste during overhauls, throughput 40 t/h, fully automated bottom ash loading