

Hitachi Zosen
INOVA

Poznań / Poland
Waste to Energy Plant



2 x 13.2 t/h, 63 MW

The First Waste to Energy Plant Built by Hitachi Zosen Inova in Poland

The new Waste to Energy (WtE) plant in Poznań underscores Hitachi Zosen Inova's success as experienced and reliable technology partner for public-private partnerships, and its leading position in the production of thermal energy from municipal solid waste. The plant is designed to convert about 216,000 tonnes of waste per year into electricity and district heat.

Reliability under Public-Private-Partnership Initiatives

In April 2013, Sita Zielona Energia, a joint venture between Sita Polska and Maguerite Fund, was chosen by the city of Poznań to carry out the design, construction, financing, and operation of the plant over a period of 25 years. On the same date, Sita Zielona Energia entrusted the EPC contractor role to Hitachi Zosen Inova (HZI) as part of a consortium. Under the leadership of HZI, consortium partner Hochtief became responsible for the civil works design and for the construction of the plant. In its role as nominated contractor, the consortium fully supported the client until the common contract award in this first public-private-partnership project in the waste sector in Poland.

Cutting-Edge Technology

The plant is located in an industrial zone in the vicinity of the city of Poznań. The process technology of the plant features the HZI grate, with the latest innovations in grate combustion for improved combustion control, and DyNOR®, a proprietary SNCR-based system that makes it possible to reduce nitrogen dioxide levels to half the current EU limit with minimal ammonia slip.

Electricity and Heat for the Region

The thermal energy released by the combustion process is recovered in a four-pass boiler producing superheated steam. The carefully selected steam parameters enhance

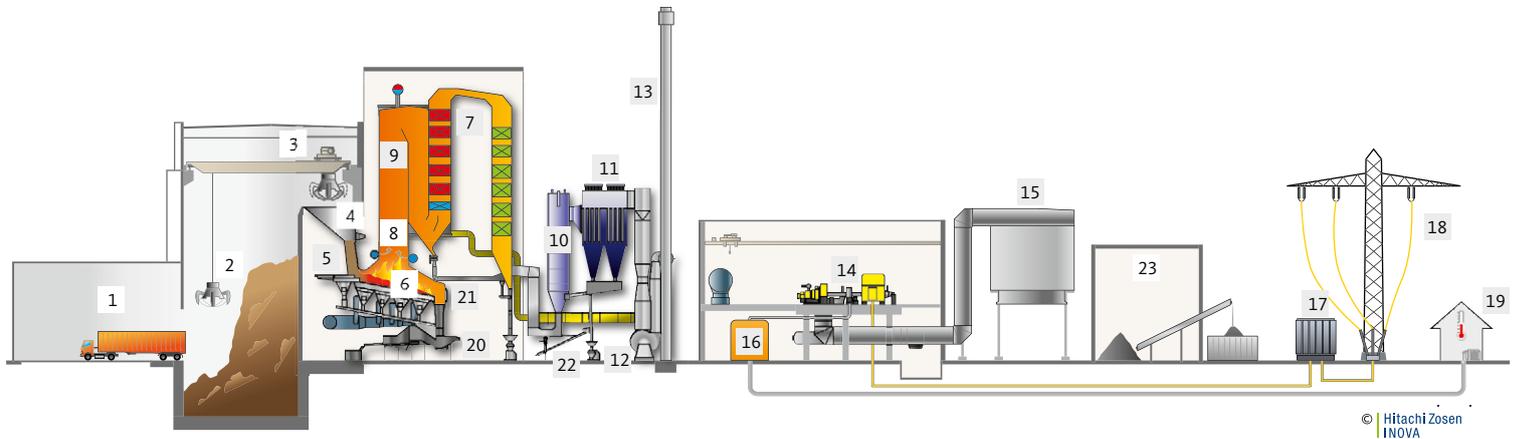
both energy efficiency and reliability of the boiler. With a thermal input from waste of two times 31.5 MW, net electrical energy of up to 15 MW and district heat of up to 34 MW can be exported. The two-line plant is designed to convert about 216,000 tonnes of waste per year into electricity and district heat for the local grid. The new plant will thus make a contribution to the local supply of energy.

Effective Flue Gas Treatment

The proven and simple HZI SemiDry® System allows for effective and safe removal of hazardous substances, such as HCl, SO₂, dioxins, and furans, as well as heavy metals, and keeps the plant in full compliance with the stringent flue gas emission limits. The hazardous substances are concentrated in the solid flue gas treatment residues, which amount to about 4% of the waste input. The flue gas treatment residues are stabilized on site for safe disposal.

Integrated Thermal and Material Recycling

Adjacent to the energy from waste plant is a treatment facility that handles the bottom ash. Various fractions of aggregates as well as most of ferrous and non-ferrous materials in the bottom ash are separated for re-use.



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Waste Receiving and Storage

- 1 Delivery hall
- 2 Waste bunker
- 3 Waste crane

Combustion and Boiler

- 4 Feed hopper
- 5 Ram feeder
- 6 HZI Grate
- 7 Four-pass boiler
- 8 Start-up burner

Flue Gas Treatment

- 9 Urea injection
in boiler (DyNOR®
System)
- 10 SemiDry reactor
- 11 Fabric filter
- 12 Induced draught fan
- 13 Stack

Energy Recovery

- 14 Turbine & generator
- 15 Air cooled
condenser
- 16 District heat
exchanger
- 17 Transformer
- 18 Electricity export
- 19 Heat export

Residue Handling and Treatment

- 20 Bottom ash
extractor
- 21 Boiler ash conveying
- 22 Residue conveying
system
- 23 Bottom ash
treatment plant

General Project Data

Owner	Sita Zielona Energia Sp. z o.o.
Operator	Sita Energia z Odpadów Sp. z o. o.
Commissioned	2016
Total investment	PLN 725 million
Scope of HZI	EPC turnkey contractor for entire plant, excluding civil works
General contractor	Hitachi Zosen Inova in consortium with Hochtief Polska / Hochtief Solutions AG
Plant design	Hitachi Zosen Inova

Technical Data

Annual capacity	216,000 t (nom.)
Number of lines	2
Throughput per line	13.2 t/h (nom.)–15 t/h (max.)
Calorific value of waste	6.0 MJ/kg (min.)–12.1 MJ/kg (max.)
Thermal capacity per line	31.5 MW
Waste type	Municipal and commercial solid waste

Combustion System

Grate type	HZI Grate
Grate size	Length: 10.8 m, width: 5.2 m
Grate cooling	Air cooled

Boiler

Type	Four-pass boiler, vertical
Steam quantity per line	38.5 t/h
Steam pressure	61.5 bar (a)
Steam temperature	422 °C

Flue Gas Treatment

Concept	DyNOR®, SNCR DeNO _x , HZI SemiDry® system
Flue gas volume per train	66,000 m ³ /h
Flue gas temperature	145 °C (at stack)

Energy Recovery

Concept	Extraction-condensation turbine
Electric power generation	17.6 MW (max.)
District heating output	34 MW (max.)

Residues

	Bottom ash treatment and fly ash stabilization on site
Bottom ash	65,000 t/a
Flue gas treatment residues	9,000 t/a (including fly ash and boiler ash)