

Hitachi Zosen  
INOVA

Sevenside / UK  
Energy-from-Waste Plant



2 x 21.85 t/h, 2 x 62.6 MW

## Sevenside Energy Recovery Centre – Another Milestone for the Leading EPC Turnkey Provider in the UK

The energy-from-waste (EfW) plant at Sevenside in South Gloucestershire (SERC) epitomizes Hitachi Zosen Inova's continuity as a reliable EPC turnkey partner for the construction of thermal waste treatment facilities. The two-line facility commissioned by the West London Waste Authority (WLWA) is designed to convert West London's non-hazardous waste into energy.

### | Deliverability under Public-Private Partnership Initiatives

In November 2013, the WLWA awarded a consortium led by SUEZ (formerly Sita UK) the Public-Private Partnership (PPP) contract for the construction and operation of SERC. The facility was to treat up to 400,000 tonnes per year of municipal solid waste generated by the 1.6 million people living in the western boroughs of London. In its role as EPC contractor, Hitachi Zosen Inova (HZI) fully supported the consortium during the entire tender process through to the signature of the PPP contract.

### | Energy from Continuity

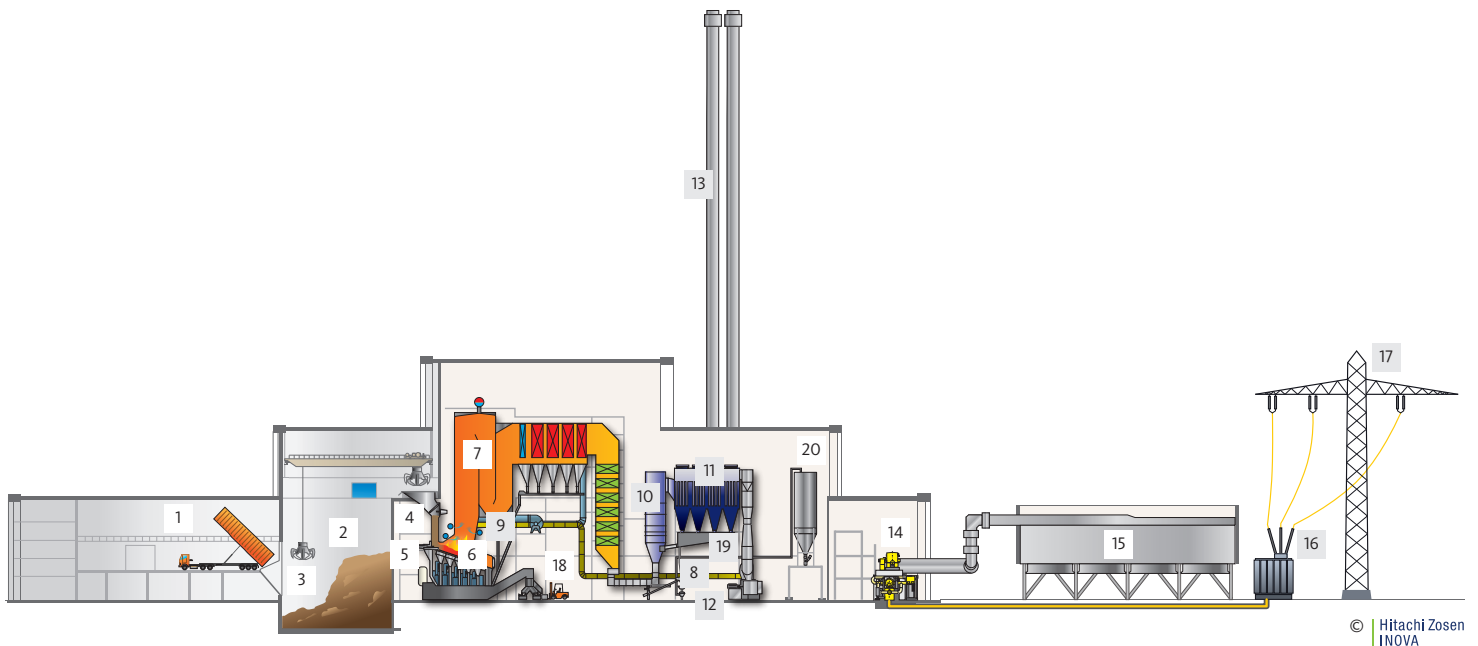
Located adjacent to the Severn Estuary, the 34 MW electrical facility produces enough electricity to power the equivalent of around 50,000 homes and could also provide heat, thus further increasing its environmental performance. This solution enables the West London Waste Authority to divert 96% of its waste from landfill, and is expected to save two million tonnes of CO<sub>2</sub> equivalents over the duration of the contract. This thermal waste treatment facility symbolizes HZI's continuous efforts to make the most efficient and safest use of the valuable resources in residual waste.

### | Eco-Friendly Waste Transport

The majority of the waste destined for SERC arrives at the plant by train at a custom-built railhead on site. The closed transport containers are unloaded from the train onto trucks, and transported to a reception hall where the waste is tipped into a bunker to begin the thermal waste treatment process.

### | Using the Latest HZI Technologies for Higher Efficiency

SERC features cutting-edge thermal waste treatment technologies. It operates an advanced combustion process that requires lower oxygen levels. Combined with HZI's proven grate combustion system, this further increases SERC's efficiency while at the same time still reducing CO and raw NOx emissions. The thermal power released by the combustion process is recovered in a five-pass boiler, producing superheated steam. The carefully selected steam parameters combine energy efficiency and boiler reliability. The electricity produced covers the needs of the facility, with approximately 90% of the remaining power generated being exported to the local grid.



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#### Waste Receiving and Storage

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

#### Combustion and Boiler

- 4 Feed hopper
- 5 Ram feeder
- 6 Hitachi Zosen Inova grate
- 7 Five-pass boiler
- 8 Flue gas recirculation
- 9 Secondary air injection

#### Flue Gas Treatment

- 10 SemiDry reactor
- 11 Fabric filter
- 12 Induced draft fan
- 13 Stack

#### Energy Recovery

- 14 Condensation turbine
- 15 Air cooled condenser
- 16 Transformer
- 17 Electricity export

#### Residue Handling and Treatment

- 18 Bottom ash extractor
- 19 Boiler ash
- 20 Residue silo

#### | Full Compliance with Strictest Emission Limits

Responding to tighter legislative requirements, the DyNOR system reduces the nitrogen dioxides safely below 150 mg/Nm<sup>3</sup> at minimal ammonia slip.

HZI's proven SemiDry system allows for effective and safe removal of hazardous substances, while keeping the plant in full compliance with the stringent flue gas emission limit values.

#### | Integrated Thermal and Material Recycling

Adjacent to the EfW plant is a treatment facility handling all of the bottom ash. Various fractions of aggregates as well as most of the ferrous and non-ferrous material in the bottom ash are separated for re-use.

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#### General Project Data

Owner	Sita West London Limited
Operator	SUEZ Recycling and Recovery UK
Commissioned	2016
Total investment	GBP 240 million
Scope of HZI	EPC turnkey contractor for entire Energy Recovery Centre, including civil works

#### Technical Data

Annual capacity	350,000 t/a (nom)
Number of lines	2
Throughput per line	21.85 t/h (nom) – 24.24 t/h (max)
Calorific value of waste	7.5 MJ/kg (min) – 12.5 MJ/kg (max)
Thermal capacity per line	62.6 MW
Waste type	Residual municipal and commercial solid waste

#### Waste Handling

Bunker volume	21,200 m <sup>3</sup>
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#### Combustion System

Grate type	Hitachi Zosen Inova grate
Grate design	3 grate lanes, 5 zones per lane
Grate size	Length: 10.25 m, width: 7.8 m
Grate cooling	Air cooled

#### Boiler

Type	Five-pass boiler, horizontal
Steam quantity per line	77.9 t/h
Steam pressure	62 bar
Steam temperature	422 °C
Flue gas outlet temperature	180 °C (max)

#### Flue Gas Treatment

Concept	DyNOR SNCR DeNOx, HZI SemiDry
Flue gas volume per line	126,000 Nm <sup>3</sup> /h

#### Energy Recovery

Concept	Condensation turbine
Electric power generation	37.5 MW (max)
Heat export capability	10 MW heat (max)

#### Residue Treatment

Concept	Bottom ash treatment on site
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#### Residues

Bottom ash	102,000 t/a
Flue gas treatment	13,900 t/a including fly ash