

Hitachi Zosen  
INOVA

Issy-les-Moulineaux / France  
Energy from Waste Plant



2 x 35 t/h, 85.1 MW

# Isséane: Environmentally Friendly Plant with a View of the Eiffel Tower

The Isséane energy-from-waste facility is located in a densely populated Parisian suburb on the banks of the River Seine, with a view of the Eiffel Tower. Alongside environmentally friendly technology, the planners placed great emphasis on attractive architecture.

With its red exposed masonry, the plant – located only a few kilometers away from downtown Paris – blends harmoniously into the surrounding urban architecture. Although it is 52 meters high, only 21 meters of the building are visible, roughly equivalent to the height of a six-story residential property. The remaining 31 meters are underground and invisible to passers-by. Another basic planning requirement was that there would be no plume from the stack of the plant in Issy-les-Moulineaux, one of the most densely populated conurbations in Europe.

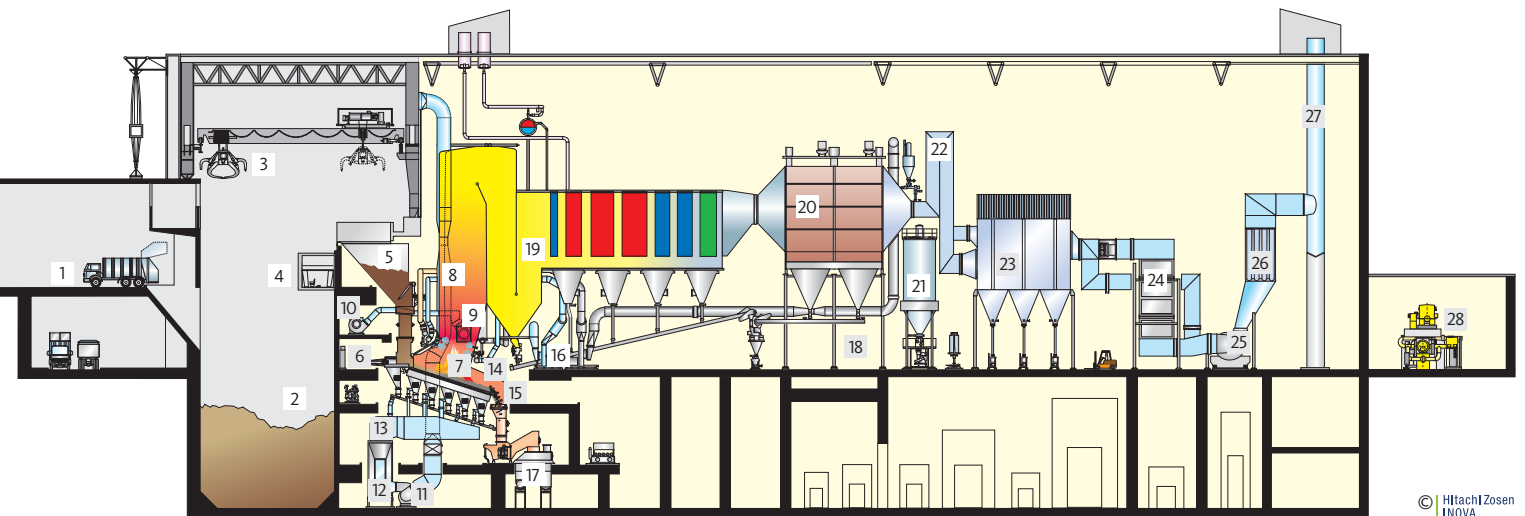
Syctom, the builder and owner of the plant, is an inter-communal association established to process the household waste of Greater Paris. It operates three EfW plants that serve 85 French communities with a total of 6 million inhabitants. Isséane, the most modern of the three facilities, handles the waste generated by 1.45 million residents of 22 communities in the Paris region.

## Modern Incineration Technology for Paris Suburb

The Isséane energy-from-waste plant consists of two lines with a rated capacity of 30.5 t/h each for a total of around 500,000 t/a. The waste receiving area and the combustion system are subterranean, so the plant produces neither noise nor odor emissions.

Municipal waste is collected and brought by truck to the reception hall and tipped into the waste bunker. After fully automatic mixing in the bunker it is incinerated on two five-zone HZI grates. An integrated combustion control system permanently adjusts the combustion parameters to changes in waste composition on a fully automated basis.

The hot incineration gases flow from a secondary combustion chamber to a three-pass evaporator into a fourth, horizontal convection pass, where they superheat the saturated steam and preheat the feed water. The superheated live steam goes to an extraction condensing turbine and is converted into electricity.



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#### Waste Receiving and Storage

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

#### Combustion and Boiler

- 5 Feed hopper
- 6 Ram feeder
- 7 HZI grate
- 8 Infrared camera
- 9 Start-up and auxiliary burner
- 10 Combustion air fan
- 11 Primary air fan

#### Flue Gas Treatment

- 12 Primary air preheater
- 13 Primary air distribution
- 14 Secondary air fan
- 15 Secondary air and flue gas recirculation nozzles
- 16 Flue gas recirculation fan
- 17 Bottom ash conveying
- 18 Fly ash conveying
- 19 Four-pass boiler

#### Energy Recovery

- 20 Electrostatic precipitator
- 21 Sodium bicarbonate silo
- 22 Dry reactor
- 23 Fabric filter
- 24 Catalyzer
- 25 Induced draught fan
- 26 Silencer
- 27 Stack

#### Residue Handling and Treatment

- 28 Turbine and generator

#### District Heating for 80,000 Homes

About half of the energy is fed into the district heating network, covering the requirements of around 80,000 households in Paris. This efficient use of the process steam enables savings of some 110,000 metric tons of heating oil. The other half of the steam is relaxed in the turbine and used to generate electricity by means of a generator. A small portion of the electricity is used to operate the plant; the rest is exported to the grid.

#### Environmentally Friendly Thanks to Efficient Flue Gas Treatment

The flue gas treatment section is composed of several stages: an electrostatic precipitator, a dry sorption reactor with injection of sodium bicarbonate and lignite coke, a fabric filter, and a selective catalytic reduction (SCR) for NOx removal. The plant's design outperforms the European directives and the strict local rules in every respect, setting the standard in terms of environmentally-friendly plant engineering.

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#### General Project Data

Owner and operator	Syctom Paris
Start of operation	2007
Scope of Hitachi Zosen Inova AG	Complete combustion part, boiler, flue gas treatment

#### Technical Data

Annual capacity	500,000 t/a
Number of trains	2
Throughput per train	30.5 t/h (nom)
Calorific value of waste	10.1 MJ/kg (nom)
Thermal capacity per train	85.2 MW
Waste type	Municipal solid waste

#### Waste Handling

Waste bunker capacity	20,000 m <sup>3</sup>
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#### Combustion System

Grate type	Hitachi Zosen Inova grate
Grate design	4 rows with 5 zones per row
Grate size	Length: 10 m, width: 10 m

#### Boiler

Type	Four-pass boiler, horizontal
Steam quantity per train	104.0 t/h
Steam pressure	50 bar
Steam temperature	400 °C
Flue gas outlet temperature	195 °C

#### Flue Gas Treatment

Concept	Electrostatic precipitator, dry sorption with sodiumbicarbonat, fabric filter, SCR DeNOx (low temperature)
Flue gas volume per train	151,000 m <sup>3</sup> /h

#### Energy Recovery

Type	Extraction-condensing turbine
Electric power generation	52 MW
Thermal power	200 t/h