Hitachi Zosen India



12th Edition of Environmental and Energy Conclave

Hiroyuki Ito, Head of Engineering

Date: Thursday, 29 August 2019 Venue: ITC Sonar, Kolkata





- Hitachi Zosen Corporation is one of the oldest engineering company in the world founded in the year 1881 (138 years ago).
- Today Hitachi Zosen an undisputed world leader in Energy from Waste Technologies with 17 Overseas Offices, 115 Consolidated Subsidiaries, 10,377 Specialist Employees with Total 43 Overseas Subsidiaries and affiliates.
- Hitachi Zosen has a successful track record of building more than 900 Solid Waste Incineration Plants all over the world. Hitachi Zosen has established a dedicated Engineering and Project management office in Hyderabad to support India operations.

Sales Structure by Product





Our activity in India



We have 2 local offices & 1 joint venture with local company.

We aim to develop WtE, Process Equipment & Tunnel Boring machine business.



History of our Environmental Business





Gepyright Hitachi Zosen Corp.

5

Our worldwide Solid Waste Incineration reference





* Reference including subsidiaries and technical partners.

(as of Mar 31, 2019)

India-HZ First plant in Jabalpur 11th May 2016.





Hitachi Zosen Reference Project India - Jabalpur (MP)





Client **Essel Infraprojects Limited** Commissioned May 2016 In operation : Since May 2016 (two and half years of Operation). Technology Standard Local Plus / FGT Type II Concept Furnace Grate furnace (air-cooled) 4-pass vertical boiler, turbine Energy recovery Flue gas treatment Evaporation Cooler / Bag Filter, lime injection **Technical Data** Fuel Municipal Solid Waste Waste capacity 600 t/d (1 line) 6.9 MJ/kg Net calorific value Thermal capacity 1 x 48 MW Steam 1 x 57 t/h (46 bar, 410° C)

11.5 MW

Gross Power

- First Hitachi Zosen Corporation reference plant in India, located in Jabalpur (Central India)
- Standardized plant design to meet Indian Price level.
- HZIND is consortium leader with overall responsibility for EPC coordination
- Components sourced from India.
- Engineering and Support done from Hyderabad Office.

Necessity of hygienic waste disposal

Hitachi Zosen

Environmental issues by inappropriate disposal

Current situation

- Directly landfill or illegally disposed
- Shortage of landfill site

Environmental Impacts

Disease caused by ground collapse

Pollution of environment (Offensive odor, Leachate)

Fire by spontaneous fire



Generation of GHG(CH₄ etc.)

Shortage of disposal site Landfill Site

Pest Infectious disease

Necessity of hygienic waste disposal



To reduce the environmental impacts

- □ Sanitary waste treatment
- Prevention of disease and pest
- Prevention of environmental pollution
- □ Heat utilization & power generation from waste
- Reduction of greenhouse gas emission



It is most important to adopt the proven technology that has a stable operating experience over many years. Waste-to-Energy

- Proven and reliable technology with energy recovery system
- Sanitary method in whole process including flue gas treatment
- Reduce 70-85% weight & 90-95% volume of waste to extend landfill lifetime
- 1-ton waste can generate 400-800 kWh electricity







The waste sector in India has emitted **57.73 million tons of CO₂ eq.** in 2007.

The incineration of waste and generating electricity can contribute to the suppression of Greenhouse Gas emissions from landfill and thermal power plants.



Agriculture: includes GHG emissions from livestock, rice cultivation, agricultural soils and burning of crop residue.

Waste: includes GHG emissions from municipal solid waste (MSW), industrial and domestic waste water.

LULUCF: includes GHG emissions and removals from changes in forest land, crop land, grass land, well and, settlements and combustion of fuel wood in forests.

*Figures on top indicate the emissions by sectors and in brackets indicate % of emission of the category with respect to the net CO₂ equivalent emissions.

Source : Clean Air Management Profile, 2010 Edition

Contribution to CO₂ reduction in Jabalpur WtE plant

	GHG reduction	Ratio for waste sector
Incineration	104,214 tons CO ₂ eq./year	0.2%
Generating electricity	34,155 tons CO ₂ eq./year	0.1%

Proposed our Technology for MSW





Combustion technology



Plant in operation without use of auxiliary fuel.

- Large grate area
- 1 grate drop
- Internal heat cycle preheats combustion air without additional fue
- Minimised heat losses in furnace, high thermal inertia → adiabatic combustion chamber
- Above "950°C/2 sec.":
 - Refractory in post combustion chamber, preheating of secondary ai



Flue gas treatment concept





Concept with fabric filter

- Evaporation cooler (reactor)
 - water injection
 - \rightarrow flue gas conditioning.
 - lime(Calcium Hydroxide) injection \rightarrow acid gas (HCl, SO₂) removal
 - activated carbon injection
 → Dioxin and Mercury removal
- Fabric filter
 - Dust and Heavy Metal removal
 - Additional reaction time of gas with additives on bag filter surface
 - \rightarrow Lower emissions



- Volume and weight reduced (approx. 90% vol. and 75% wt reduction)
- Waste treatment is immediate, no long term residency required
- Destruction in second where Land Fill may requires more than 100 years
- Integrated Controlled Combustion can be done at generation site
- The lower emissions meet with high Combustion Control and Flue Gas Treatment System
- Grate combustion technology has 80 years proven track record
- Ash residue is usually non-putrescible, sterile, inert and can be converted into value added products like Bricks and pavement blocks



Thank You

