

E-20	Keywords	Y3	equipment or facility	Z1/2	solid fuels/oil	S5	renewable energy
						D	construction

NIPPON STEEL ENGINEERING CO., Ltd.

## Waste to Energy Facility(Shaft Type Gasification Melting Furnace)

### Features

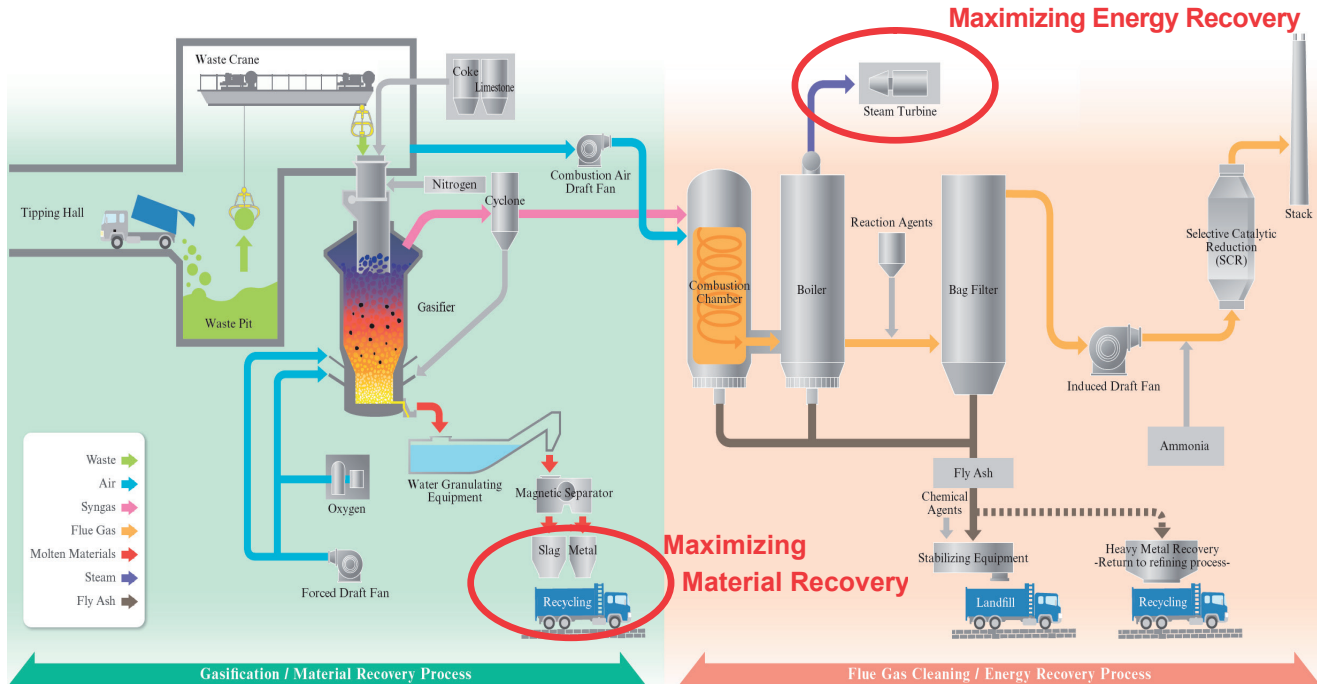
NSE's Direct Melting System (DMS) is an alternative to conventional Waste to Energy facility.

#### 1. Maximizing Energy Recovery

Highly efficient plants

#### 2. Maximizing Material Recovery (=Minimizing Final Landfill Amount)

High-quality slag and metal are stably produced



### Basic Concept or Summary

#### I. Sustainability

##### 1) Energy Recovery

- a) Power generation is the most important issue in Waste to Energy plants. NSE has developed highly efficient plants in Japan.

##### 2) Material Recovery (Slag and Metal)

- a) High-temperature gasification produces high-quality slag and metal. The produced slag has almost the same quality as natural sand. Recycling 100 % of produced Slag and metal contributes to the minimization of the final landfill residuals taken to.

		Slag (Example)	Natural Sand (Example)	Japanese Standard limited value
Pb(lead)	mg/kg	5~20	1~15	< 150
Arsenic	mg/kg	< 0.5	~2	< 150
Cd	mg/kg	< 0.1	< 0.1	< 150
T-Hg	mg/kg	< 0.05	< 0.05	< 15
Chromium	mg/kg	< 1	< 1	< 250
Selenium	mg/kg	< 0.2	< 0.2	< 150

[JIS-K0058-2]

#### < Slag and Metal >



#### II. Stability

- 1) Able to process a variety of waste

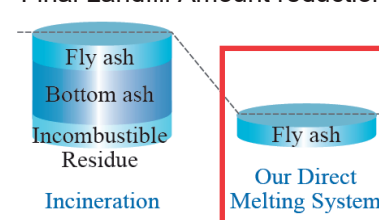
#### III. Purity

- 1) Low Dioxins Emissions  
 2) Less HCl and SO2 Emissions

#### IV. Reliability

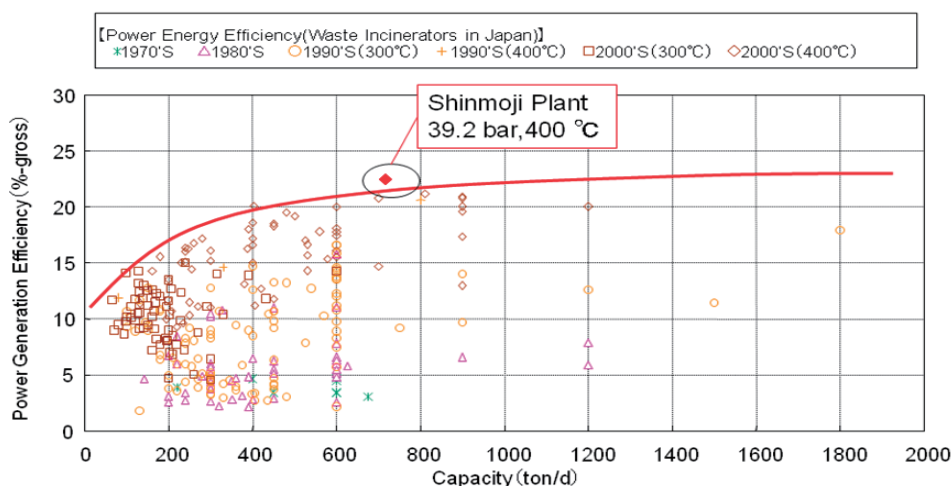
- 1) More than 34 years operation & maintenance  
 2) 42 commercial references

#### < Final Landfill Amount reduction >



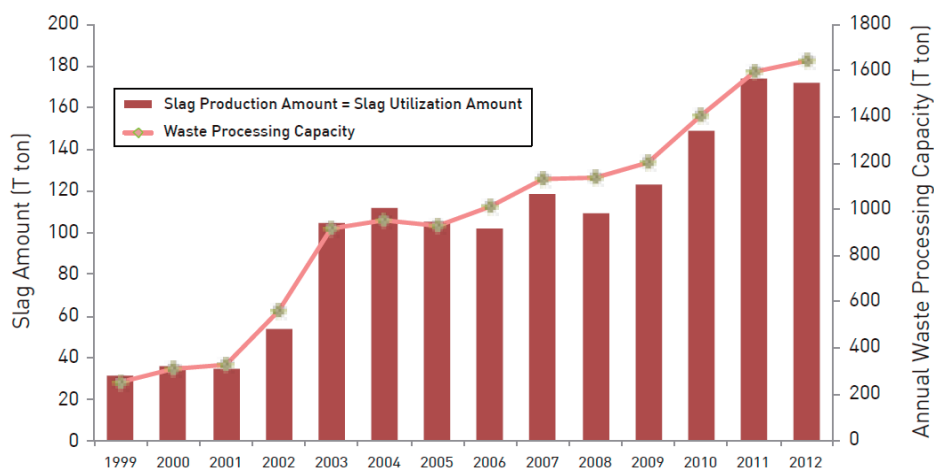
## I. Power Energy Efficiency

NSE has developed highly efficient plants in Japan.



## II. Waste Processing Capacity and Slag Utilization Amount

All amounts of slag produced is utilized.



## Installation in Practice or Schedule

**Domestic** The world's **highest number** of facilities (**43 orders**) (40 plants in Japan)  
The world's **most long-term operation** (**34 years**)

[Shin-moji plant – the world's **largest** gasification plant]

Completion	April 2007
Capacity	10 t/h X 3 lines (230,000 t/annual ≈ 720 t/day)
Processing Waste	Municipal Solid Waste, Incombustibles, Sewage sludge
Power Generation	23.5 MW Gross



**Overseas** 2 plants in South Korea

[Yangsan plant] Capacity : 8.4 t/h X 2 lines    Start of operation : 2008

[Goyang plant] Capacity : 12.6 t/h X 2 lines    Start of operation : 2010

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