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# **Hitachi Zosen Corporation**

## **Waste to Energy**

### **14<sup>th</sup> November 2018**

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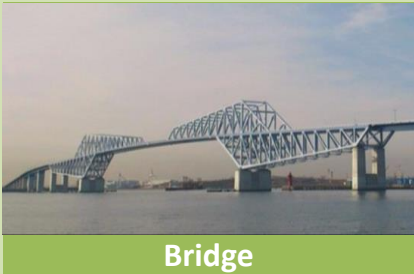
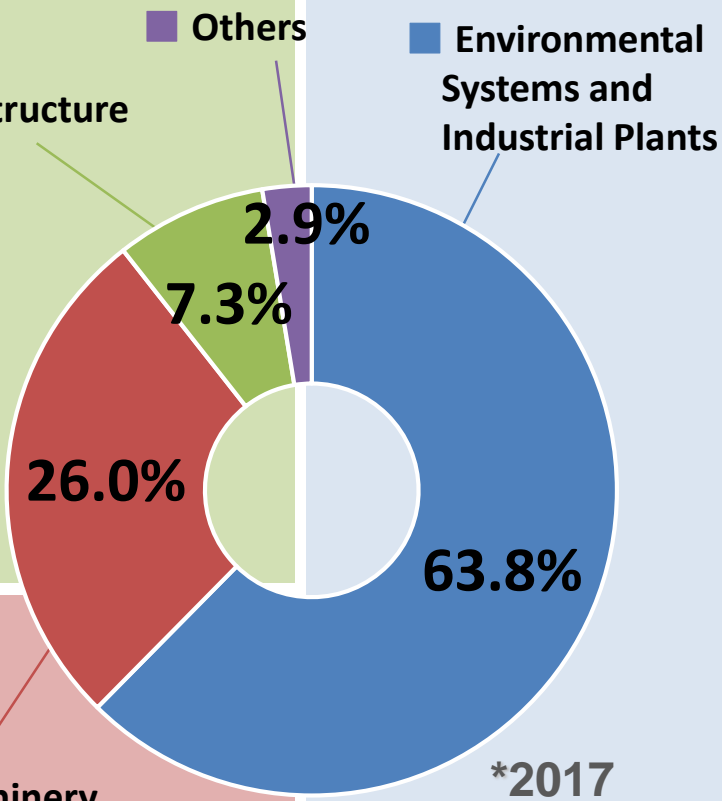
<b>Company Name</b>	HITACHI ZOSEN CORPORATION (Hitz)
<b>Founded</b>	1881 by E. H. Hunter (from UK)
<b>Incorporated</b>	1934
<b>Headquarters</b>	Osaka and Tokyo, Japan
<b>Employee*</b>	10,370
<b>Paid-in Capital*</b>	45.4 billion yen (≒415 million US\$)
<b>Net Sales*</b>	376 billion yen (≒3,438 million US\$)
<b>Net Income*</b>	2.1 billion yen (≒19 million US\$)



1 JPY = 0.009 US\$

\*(As of March 31, 2018)

# Sales Structure by Product



# History for Waste to Energy Business



**Hitz**

Hitachi Zosen  
Name was changed



1st WtE plant  
(Osaka, Japan)

- 2019: 1st WtE plant in THAILAND
- 2018: 1st WtE plant in MALAYSIA
- 2016: 1st WtE plant in INDIA
- 2016: 1st WtE plant in VIETNAM

Osaka Iron Works  
(currently Hitachi  
Zosen Corporation)  
(JAPAN)

1943



1st waste incineration plant  
(Dordrecht, Netherlands)

1939

License Agreement

1965

**Hitz**

**AE&E Inova**  
(Von Roll)

Integration



**Hitz**  
Hitachi Zosen

Hitachi Zosen  
INOVA

Von Roll Company  
(SWITZERLAND)



- 2009: 1st WtE plant in CHINA
- 1997: 1st WtE plant in TAIWAN
- 1987: 1st WtE plant in KOREA

1881

1933

1960

2010

## Map of overseas offices

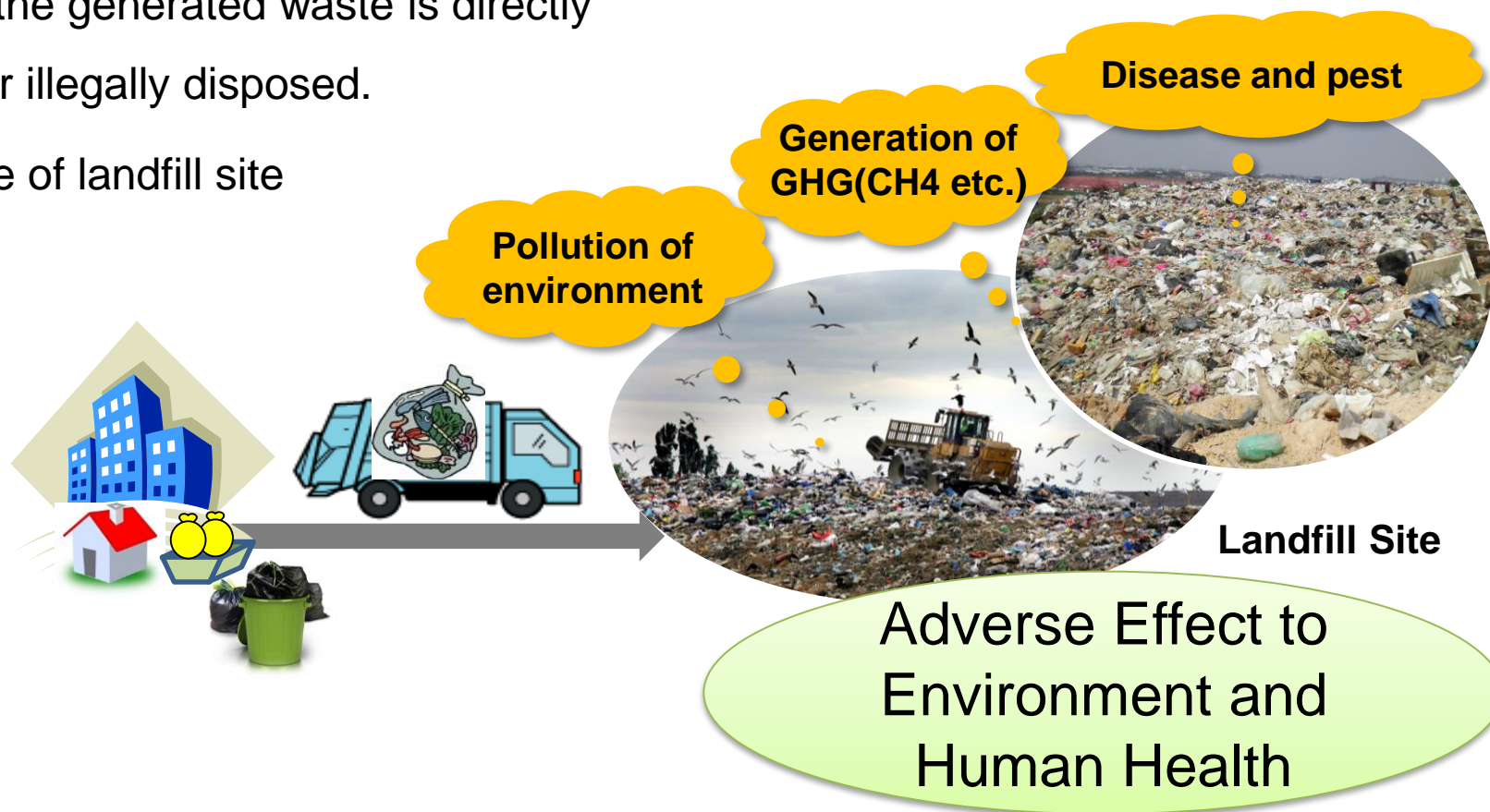


## Environmental Issues by Inappropriate Disposal

### Current situation

- Most of the generated waste is directly landfill or illegally disposed.
- Shortage of landfill site

### Environmental Impacts



# Advantages of Waste to Energy

- Sanitary waste treatment
  - ➔ Improvement of residential environment & Health
- Quick treatment of large quantity of waste
- Good adaptability for treatment of various wastes
- Volume reduction of Waste
  - ➔ Landfill life-extension
- Heat utilization & Power generation from waste energy
- Greenhouse gas emission reduction
- Education for next generation
- Job creation

- Reduce of Environmental impacts
- Effective Utilization of Unused Energy
- Improvement of Living Standard

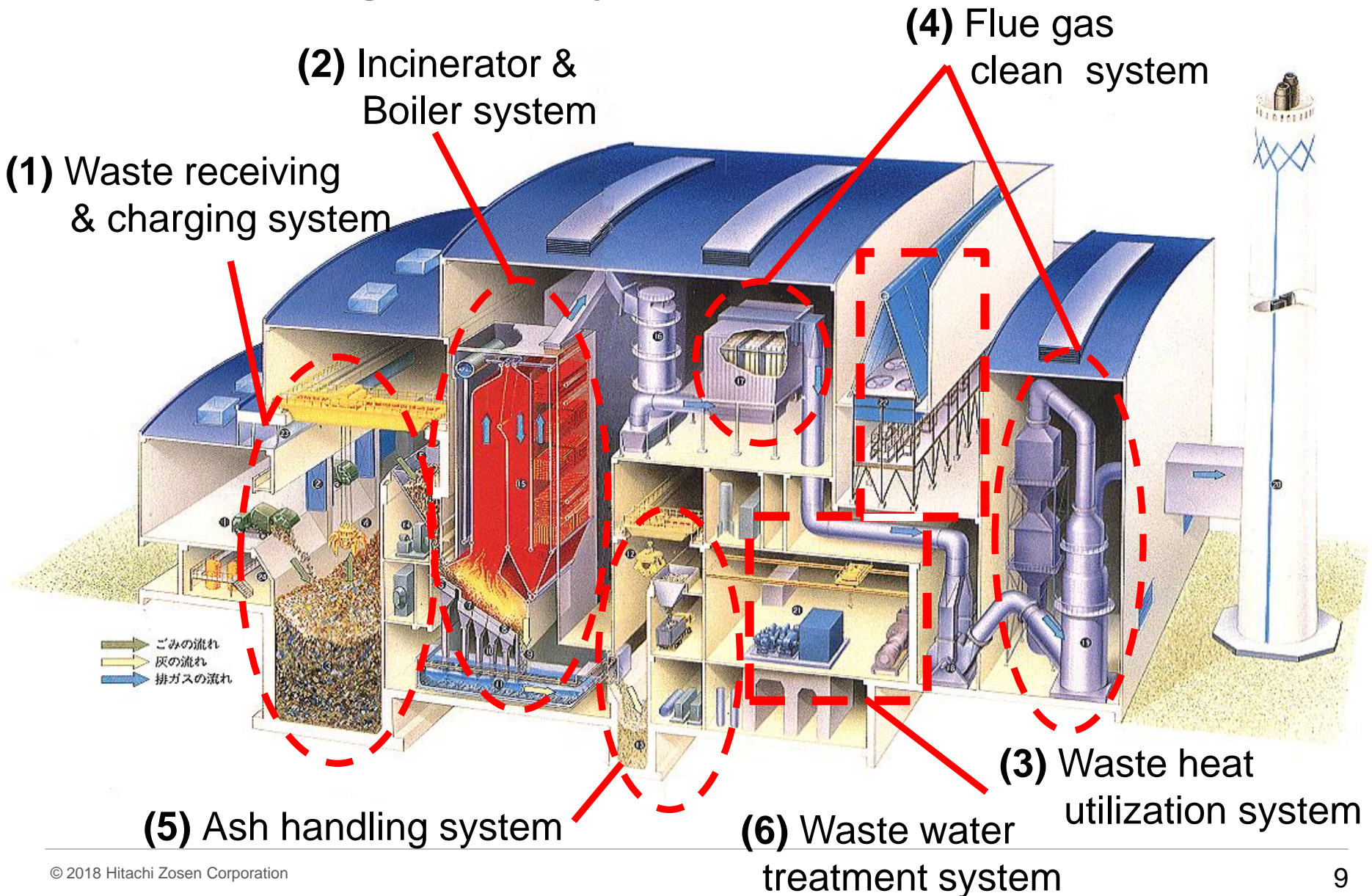
**Power Generation**  
400 - 800 kWh/t-waste

**GHG emission reduction**  
150 - 250 kg-CO<sub>2</sub>/t-waste

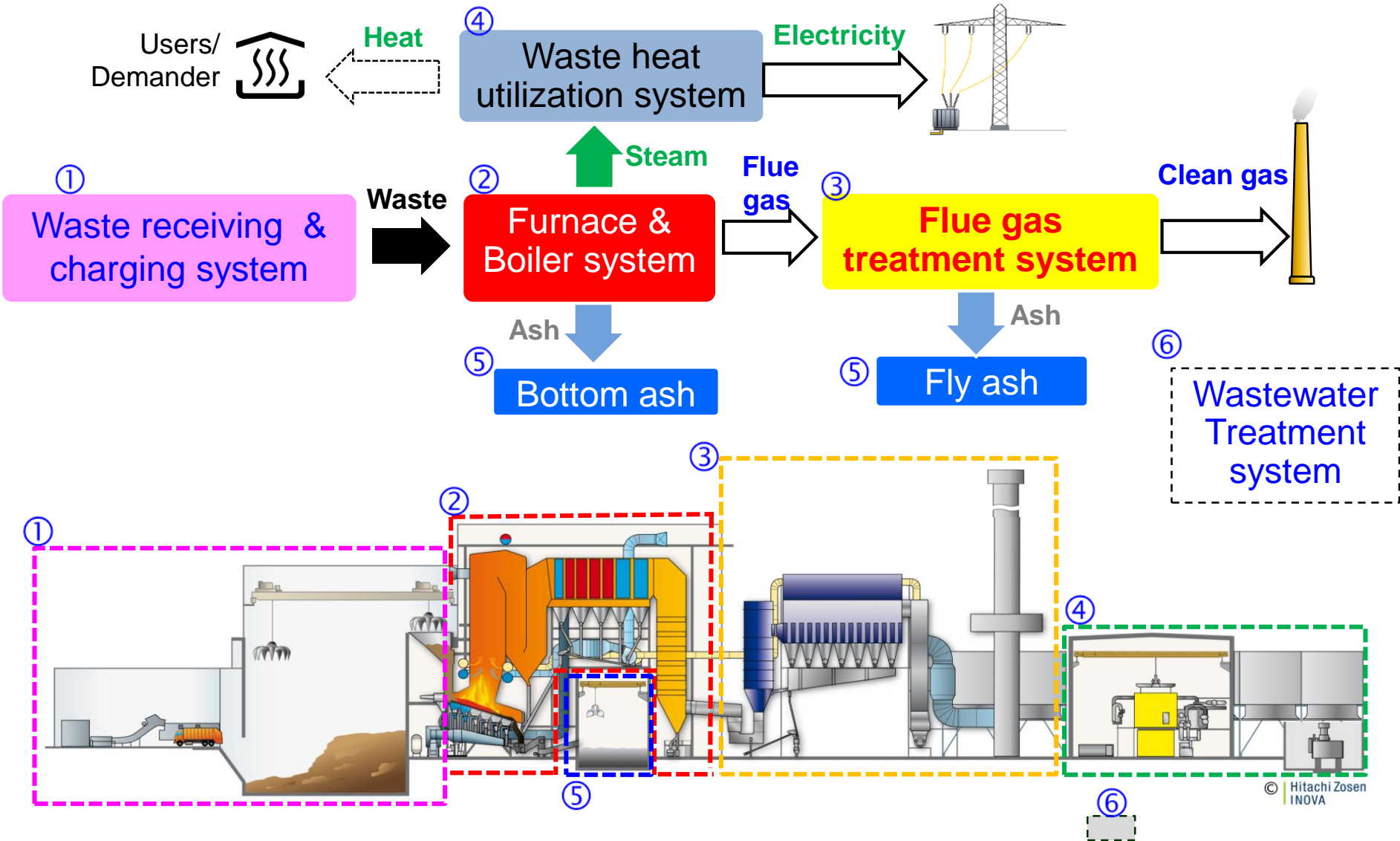




## Overview image of WtE plant

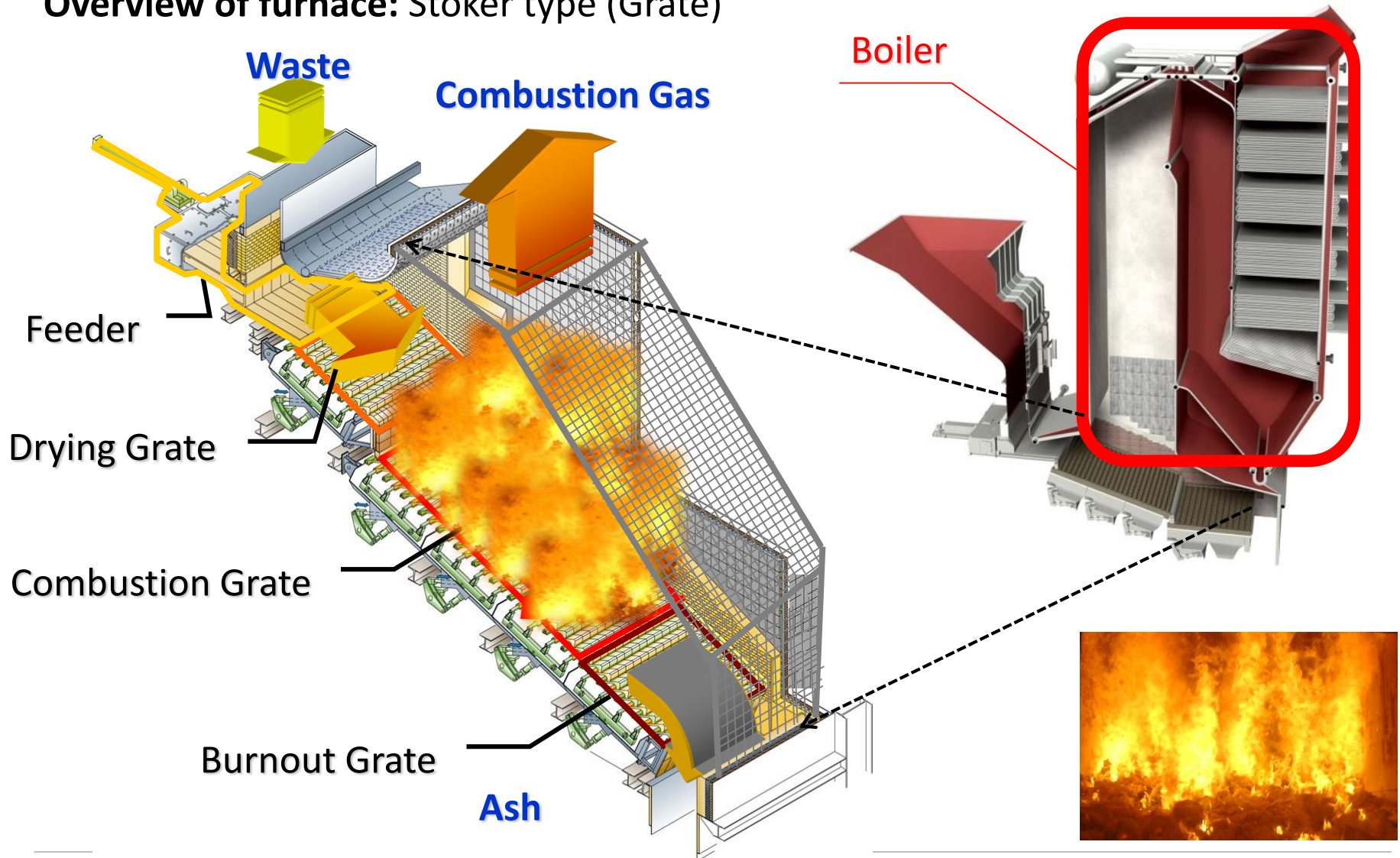


## Overview image of WtE plant



## Incinerator (Grate Mass Burn) and Boiler system

Overview of furnace: Stoker type (Grate)



## Business achievement

(As of Mar 31, 2018)

Hitz is a global leader company:

✓ **Global:**

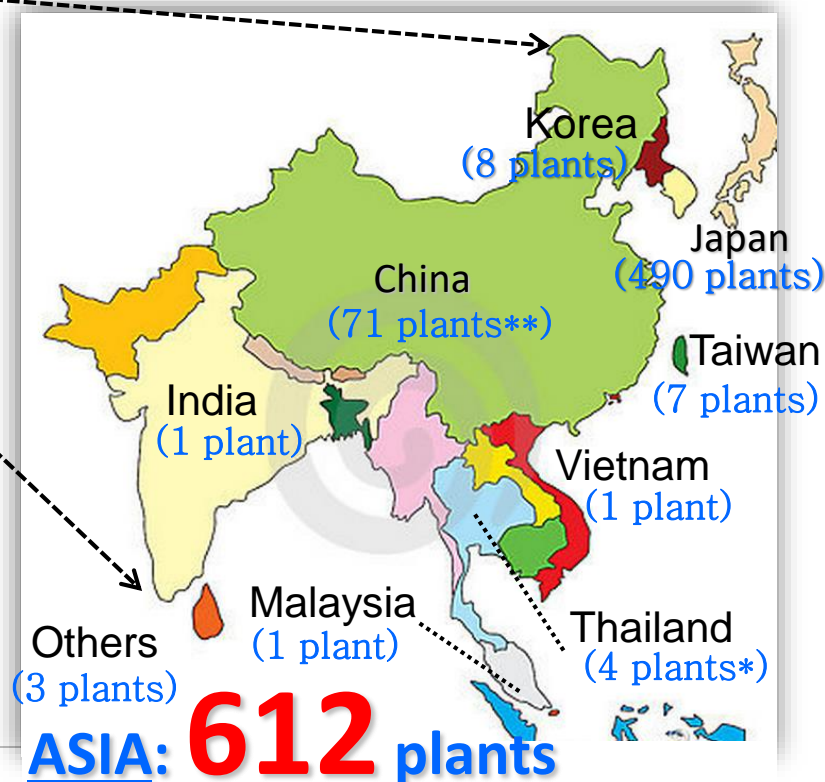
- Largest share of processing capacity
- Largest plant's capacity (3,000 t/d)

✓ **Japan:**

- Construction of the first municipal waste to energy plant (1965)
- Largest energy generation of WtE



**GLOBAL: 911 plants**



**ASIA: 612 plants**

Remarks:

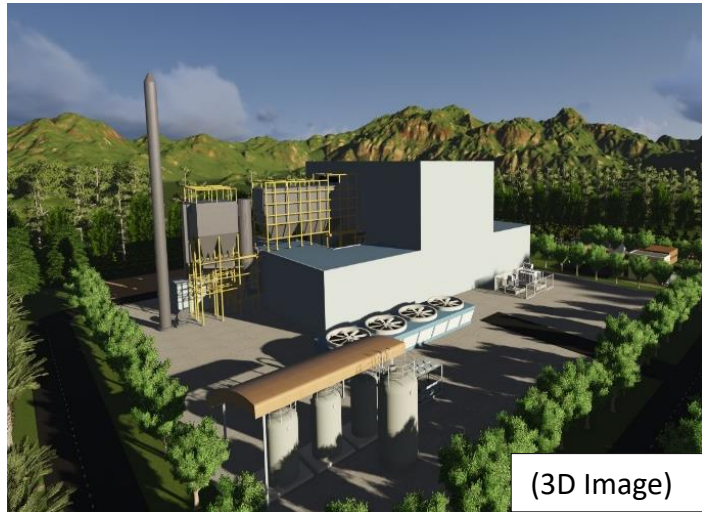
\* Thailand: 2 plants by Licensees

\*\* China : 13 plants by Hitachi Zosen Group and 64 plants by Licensees



<b>Client</b>	The New Energy and Industrial Technology Development Organization (NEDO, JAPAN)
<b>Counterpart in Vietnam</b>	URENCO
<b>Completion</b>	April 2017
<b>Technology</b>	
Furnace	Rotary kiln + Grate
Energy recovery	Boiler, Steam Turbine & Generator
Flue gas treatment	Dry process(BF) + SCR
<b>Technical Data:</b>	
Fuel	Industrial Waste
Treatment Capacity	75t/d
Generator Capacity	1,930kW

- Govt. to Govt. model project between Vietnam (HPC & MONRE) and Japan (NEDO)
- 1st industrial waste incineration & power generator plant in Vietnam
- Hitz Scope of Work is off-shore equipment supply, basic & detail design and SV service
- Plant construction & demonstration operation has completed.



**Client**

WPGE Phetchaburi Co., Ltd

**Completion**

2019

**Technology**

Furnace

Grate

Energy recovery:

Boiler, Steam Turbine & Generator

Flue gas treatment

Semi Dry, EGR

**Technical Data**

Fuel

MSW, RDF

Treatment Capacity

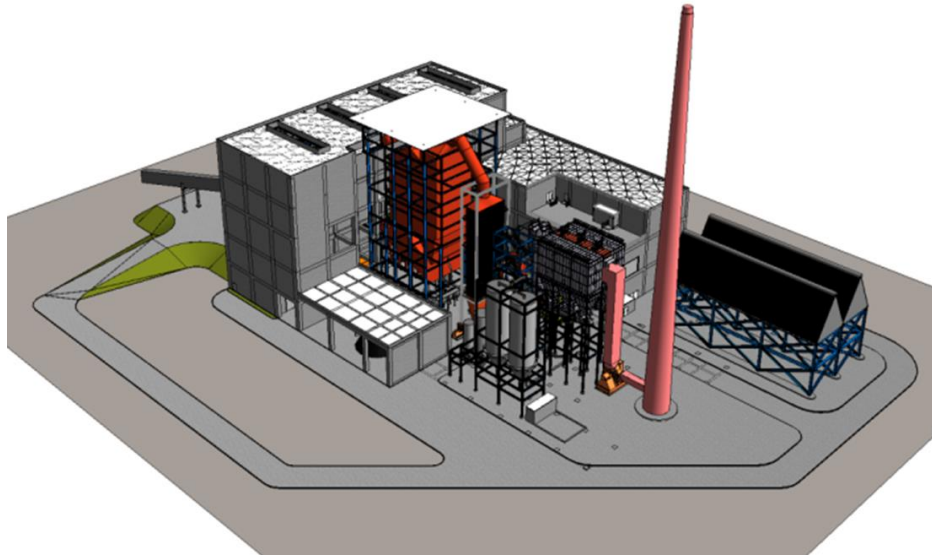
476t/d

Generator Capacity

7,900kW



- ! The plant owner is a joint investment company by STP&I and WP Green Energy.
- ! Our scope of work is basic design for entire plant and key component supply (Grate, Flue gas treatment, steam turbine & generator, Air cooled condenser).
- ! Not only construction phase, but also operation stage, our know-how for proper operation and maintenance is expected as well.



**Client:** Cypark Sdn. Bhd.

**Start-up:** 2018

## **Technology**

Furnace: grate furnace

Energy recovery: boiler, turbine

Flue gas treatment: semi-dry

## **Technical Data**

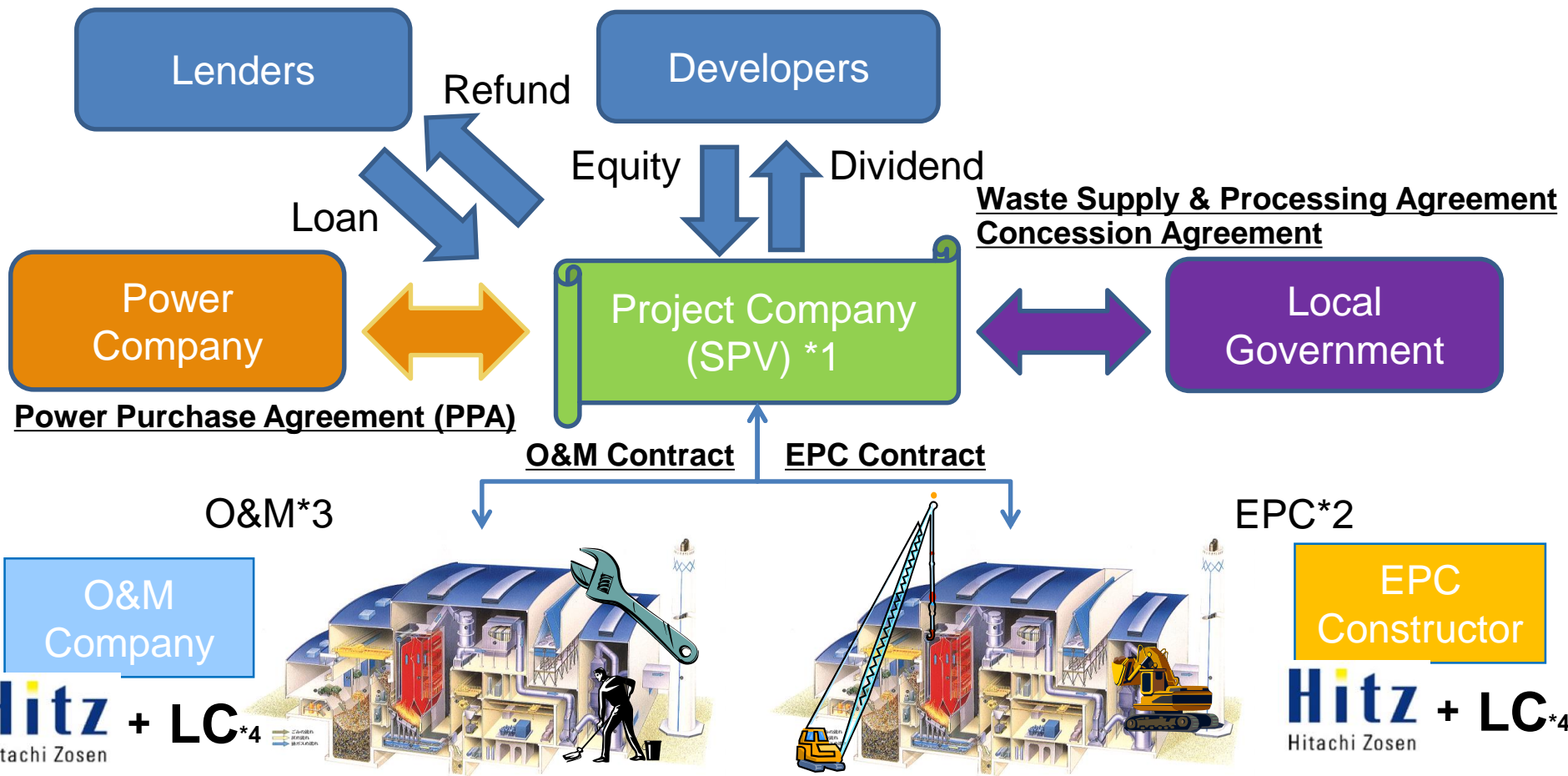
Fuel: MSW

Waste capacity: 600t/d (600t/dx1)

Generator capacity: 18.0 MW

- 1st WtE plant engineered by Japanese company.
- Scope of work: basic design, supply and erection of equipment, dispatch of supervisor
- Malaysia Government entrusted construction and operation of WtE plant and landfill site to Cypark Sdn. Bhd. using PPP scheme.

## Example of project scheme (PPP project)



### Annotation

- \*1 SPV : Special Purpose Vehicle
- \*2 EPC : Engineering, Procurement & Construction
- \*3 O&M : Operation and Maintenance
- \*4 LC : Local Companies





# Technology for People, the Earth, and the Future

**Hitachi Zosen creates links between mother nature and our future**

Mr. Gatot Subagyo

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Hitachi Zosen Corporation

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