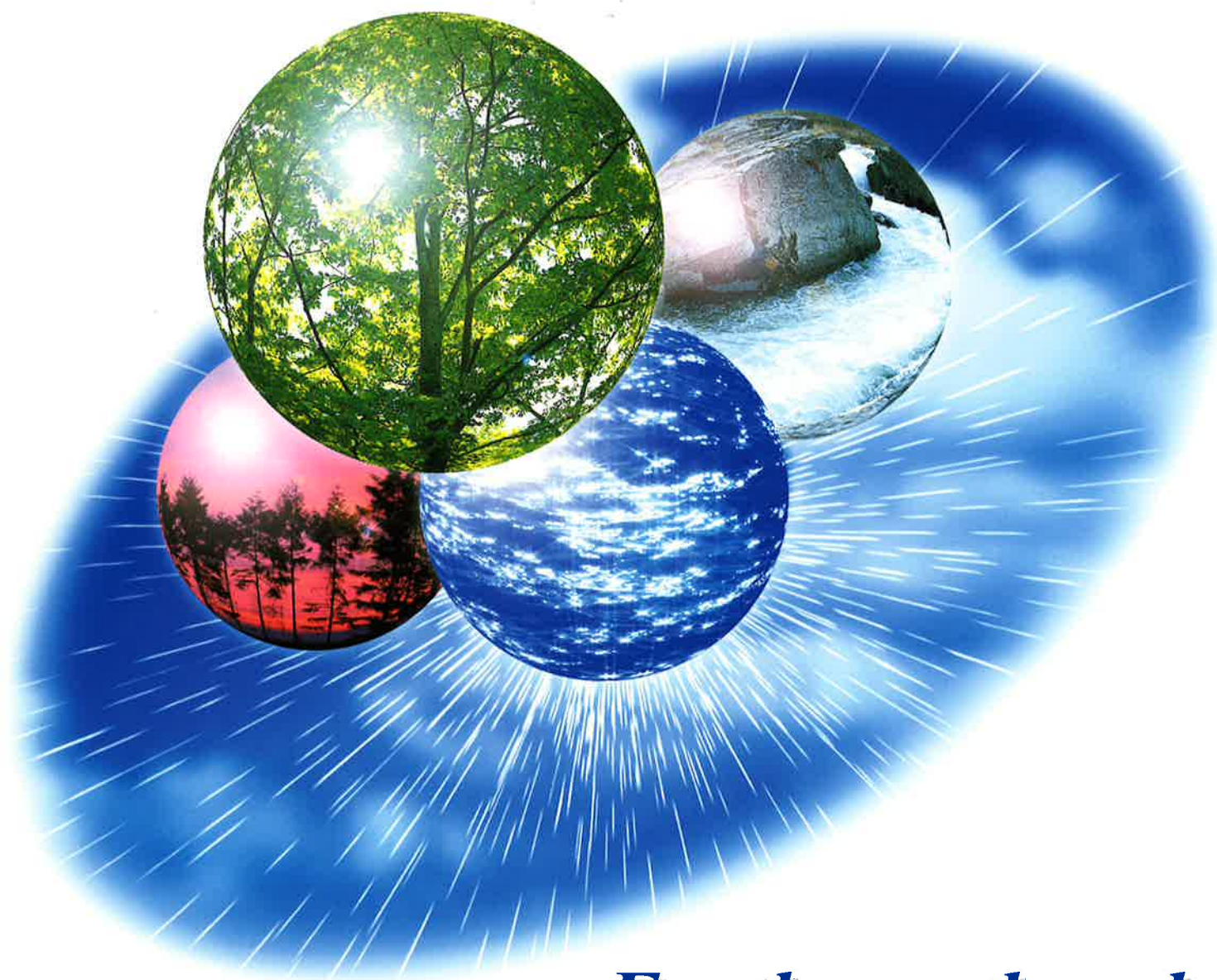


Hitachi Zosen

Overview of the Environmental Business



*For the earth and
earth people*

A positive relationship between daily life and nature

We at Hitachi Zosen are working to solve environmental problems with our integrated engineering skills.

In 1962, Hitachi Zosen constructed the first large-scale municipal refuse incineration plant in Japan with power generation. In the 40 years since then, we have developed and improved our engineering skills by grappling with every kind of environmental problems such as waste treatment.

Today, we have an extensive experience both in Japan and overseas, and we are contributing greatly to the creation of comfortable communities.

We will continue to create 'beautiful planet' by providing integrated systems, bringing together our technology and know-how, and acting as a general environmental engineering company.

Basic Environmental Policy

Through the sales, development, design, construction, operation, maintenance and after services for our environmental systems and products, we do protect the environment of our irreplaceable earth, to ensure that a abundant future is passed on the next generation.

Our business activities do reduce the load on the environment, and contribute to society through technologies, products and services for environment safeguards.



ISO9001 approval



JMAQA-076
JMAQA-E340



QS Accreditation

ISO9001 approval
ISO14001 approval

Outline of Hitachi Zosen's environmental technology

① Incineration and Melting System

- Stoker type refuse incinerator*1
- Hitz superstoker (next-generation municipal refuse incineration plant)
- Fluidized bed furnace*2
- Fluidized bed type gasification melting furnace*3
- Kiln type gasification melting furnace
- Melting rotary kiln
- Rotary kiln incinerator
- Vertical incinerator
- Circulating Fluidized bed incinerator



Stoker type refuse incinerator*1

② Waste Heat Utilization and Electric Power Generation System

- High efficiency refuse burning power generation system*4
- Combined power generation plant using gas turbines and refuse incineration facility
- Power generation system for small capacity refuse incinerator
- The heat providing system recovered from refuse incinerator



Fluidized bed furnace*2



Fluidized bed type gasification melting furnace*3



Indirect heating Kiln system*16



Wind power generation system*17

③ Flue Gas Treatment System

- Spray type gas cooler
- Bag filter*5
- Semi-dry scrubber
- Wet scrubber
- Activated carbon absorber
- De-NOx facility
- De-SOx facility

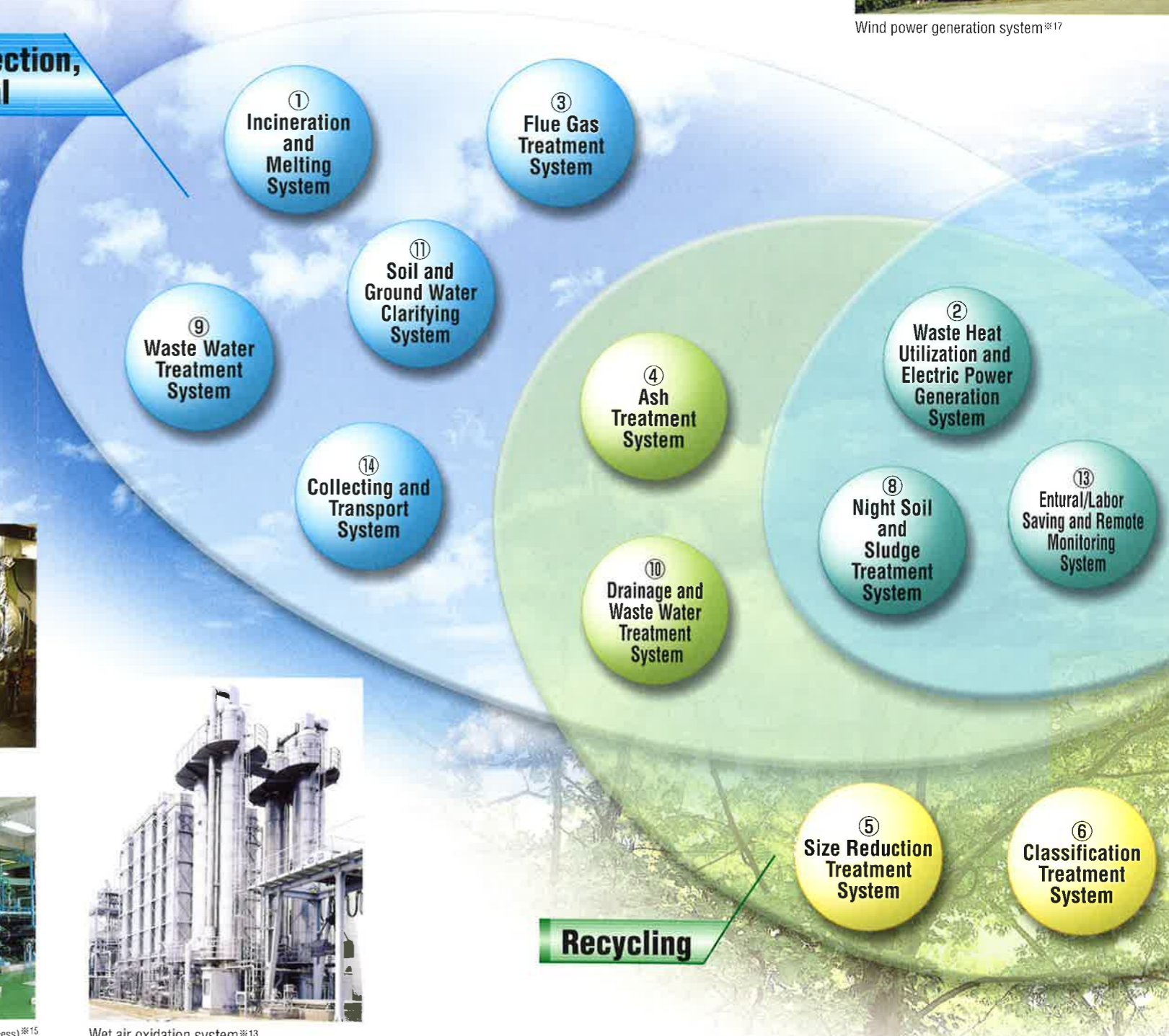


Plasma type ash melting furnace*6

④ Ash Treatment System

- Burner type ash melting furnace
- Plasma type ash melting furnace*6
- Europlasma type ash melting furnace
- Eco-burner type ash melting furnace
- Dioxins thermal decomposition system*7
- Heavy metals stabilization system
 - Solidification with cement
 - Kneading with chelating agent
 - Leaching out in acid condition

Environmental Protection, Appropriate Disposal



⑤ Size Reduction Treatment System

- Unconfined shredder
- Rotary shear shredder
- Vertical rotary crusher
- Horizontal rotary crusher*8
- Shear shredder
- Bag breaker and bag collector*9
- Non-processables detector and remover



Bag filter*5



Dioxins thermal decomposition system*7

⑥ Classification Treatment System

- Automatic container turn machine
- Automatic glass bottle sorting machine*10
- Automatic plastic bottle sorting machine
- PVC detector and remover
- Dry process cleaning machine
- Electrostatic separator
- 3 to 7 sorting system
- Cullet separator
- Specific gravity separator



Aqua life support system*14



Sea water desalination system (Reverse osmosis process)*15

⑦ Recycling Treatment System

- RDF/RPF manufacturing system*11
- Waste plastic oil reclamation system
- Waste plastic shredding/granule system
- Waste PET plastic sheet molding system
- Tree trimming activated charcoal fiber manufacturing system
- High speed Garbage-to-Resource Conversion System
- Feednizing system of food waste
- Composting system of garbage
- Sludge recycling system
- Hitz-Seghers sludge dryer-palletizer*12
- Sludge granulating system
- Inorganic sludge resource recovery system



Wet air oxidation system*13

Recycling



High efficiency refuse burning power generation system^{*4}

New Energy

12 Natural Energy

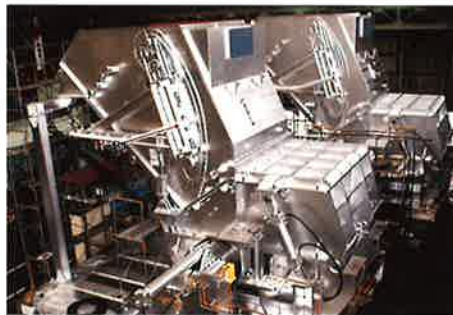
7 Recycling Treatment System



RDF/RPF manufacturing system^{*11}



Hitz-Seghers sludge dryer-palletizer^{*12}



Horizontal rotary crusher^{*8}



Bag breaker and bag collector^{*9}



Automatic glass bottle sorting machine^{*10}

9 Night Soil and Sludge Treatment System

- Methane fermentation system
- REM system
- BTA system
- Uhde system
- Renaisa system
- Compogas system
- Carbonization system
- Wet air oxidation system^{*13}
- Sludge concentration/dewatering unit

9 Waste Water Treatment System

- Oxidation Ditch system
- Sequencing batch reactor process
- Contact aeration system
- Biological treatment using immobilized media
- Biological membrane method
- JARUS system (Rural community sewerage)
- Biological nitrogen removal system

10 Drainage and Waste Water Treatment System

- Aqua life support system^{*14}
- Membrane filtration combined with BAC
- Sea water desalination system
- Multistage flash evaporation process
- Multistage evaporation process
- Reverse osmosis process^{*15}
- Distilled deionized water system
- Industrial waste water treatment system
- Leachate treatment system for landfill disposal site
- Waste water evaporation treatment system
- Water treatment system for refuse disposal facilities
- Advanced water purification system
- Coagulation sedimentation process
- Filtration process
- Adsorption process
- Dioxins destruction system for SS containing water (Catalyst & ozone process)

11 Soil and Ground Water Clarifying System

- Direct heating Kiln system
- Indirect heating Kiln system^{*16}
- Soil washing system (Spiral soil washer)
- Bioremediation process

12 Natural Energy

- Wind power generation system^{*17}
- Solar power generation system

13 Entural/Labor Saving and Remote Monitoring System

- Sophisticated automatic combustion/control system
- Plant remote monitoring system
- Collection truck monitoring system
- Large refuse collection system

14 Collecting and Transport System

- Vacuum transport equipment
- Loading station
- Final disposal site
- Refuse relay transport system

Waste treatment/Power generation plants



■ Osaka City, Maishima Plant <Completed April 2001>
Stoker type refuse incinerator
(Treatment volume: 450t/day x 2 incinerators, Power generated: 32,000kW)



■ Citizen Association of TOKYO 23, Chuo Incineration Plant <Completed July 2001>
Stoker type refuse incinerator
(Treatment volume: 300t/day x 2 incinerators, Power generated: 15,000kW)



■ Sakurai City Clean Park <Completed November 2002>
Fluidized bed type gasification melting furnace
(Treatment volume: 75t/day x 2 furnaces, Power generated: 1,990kW)



■ North Ishikawa RDF center <Completed March 2003>
Fluidized bed type gasification melting furnace
(Treatment volume: 80t/day x 2 furnaces, Power generated: 7,000kW)



■ Fukuoka City, Clean Park Rinkai <Completed March 2001>
Stoker type refuse incinerator
(Treatment volume: 300t/day x 3 incinerators, Power generated: 25,000kW)



■ Taipei City, Government Environment Agency <Completed July 1998>
Stoker type refuse incinerator
(Treatment volume: 450t/day x 4 incinerators, Power generated: 48,000kW)



■ Yoshidacho-Haibaracho Regional Facility Union, San-R <Completed March 1999>
Fluidized bed furnace (Treatment volume: 33.5t/day x 2 furnaces)



■ Kashima Joint Resource Recovery Center <Completed March 2001>
Rotary kiln type incinerator
(Treatment volume: 100t/day x 2 furnaces, Power generated: 3,000kW)



■ Resource and Environment United-Cities of Saitama East, Plant #1 <Completed September 1995>
Stoker type refuse incinerator
(Treatment volume: 200t/day x 4 incinerators, Power generated: 12,000kW x 2 facilities)



■ Minami-Kawachi Incineration Facility Union, #2 Incineration Plant <Completed March 2000>
Stoker type refuse incinerator (Treatment volume: 95t/day x 2 incinerators)
Burner type ash melting furnace (Treatment volume: 38t/day x 1 furnace)



■ Niigata Prefecture, Environmental Protection Foundation (EcoPark Izumozaki) <Completed March 1999>
Rotary kiln type incinerator (Treatment volume: 50t/day)



■ Company N (medical waste treatment center) <Completed July 2000>
Vertical incinerator (Treatment volume: 14t/8h x 2 incinerators)

Water treatment related plants



■ Saudi Arabia Desalination Foundation Al Khobar <Completed March 2001>
(Treatment capacity: 35,000m³/day x 8 systems)



■ Nara Municipal Water Purification Center, Sludge reconditioning and treatment facility
<Completed March 2003>
(Treatment volume: Human waste 31kL/day, Purification tank sludge 59kL/day, Organic kitchen waste: 3.4t/day)



■ Ichibanya Co. Ltd., Tochigi Plant, Food product manufacturing waste water treatment facility
<Completed September 1999> (Treatment capacity: 300m³/day)



■ Asashina Purification Center <Completed March 1996>
(Treatment capacity: 1,340m³/day x 2 systems)



■ Matsukawacho General Waste Landfill Disposal Site <Completed March 2001>
Leachate treatment system (Treatment capacity: 25m³/day)



■ Hiroshima Prefecture, Jinseki County, Jinsekicho, Rural community sewerage Treatment facility <Completed March 2001> (Treatment capacity: 392m³/day)

Recycling plants and Others



■ Citizen Association of TOKYO 23, Chubo nonflammable refuse treatment center
<Completed September 1996> (Treatment volume: 900t/19h x 2 systems)



■ Ube Municipal Recycling Plaza <Completed March 1995>
(Treatment volume: 70t/5h)



■ Okunoto Refuse Recycling Center, Refuse derived fuel manufacturing facility
<Completed March 2003> (Treatment capacity: 24t/day x 2 systems)



■ Osaka Prefectural Central Wholesale Market, High speed garbage-to-resource conversion system <Completed August 2001> (Treatment volume: 50t/day)



■ Tokyo Electric Power Company, Futsu Power Generation Plant, Selective catalytic reduction (De-NOx Facility) <Completed February 2000>
(Treatment capacity: 1,250,000Nm³/h x 14 systems)



■ Osaka Tempozan Aquarium "Kaiyukan", Aquarium water treatment facility
<Completed August 1990> (Total water volume in aquarium: 11,000m³)

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