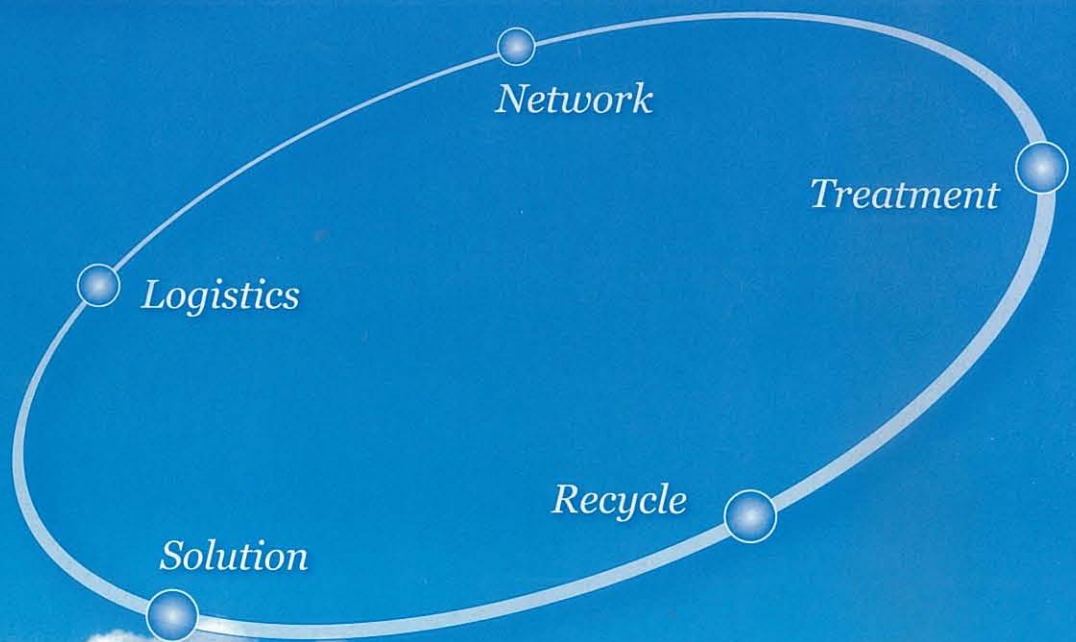




JFE Kankyo Corporation

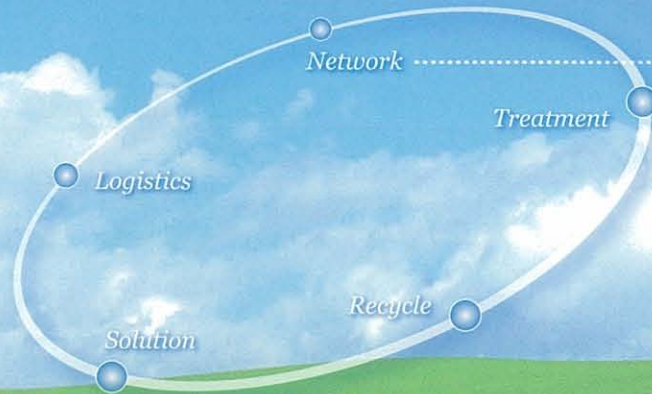
JFE



# An expert in environmental solutions employing its wide experience and abilities in contributions to the development of a resource recycling society

## [Integrated environmental solutions]

Combining the technical abilities of the JFE Group, JFE KANKYO provides a total solution as an integrated recycling business company in a wide range of fields, from environmental consulting to collection and transport, intermediate processing, and recycling.



## [Management Philosophy]

1. Contributions to a resource recycling society
2. Development and innovation in recycling technology
3. Strict compliance

## [Environmental Policy]

To contribute to the development of an environmental-friendly society, while fulfilling its responsibility to society

## [ISO14001]



Chemical Division - Sendai Plastics Plant

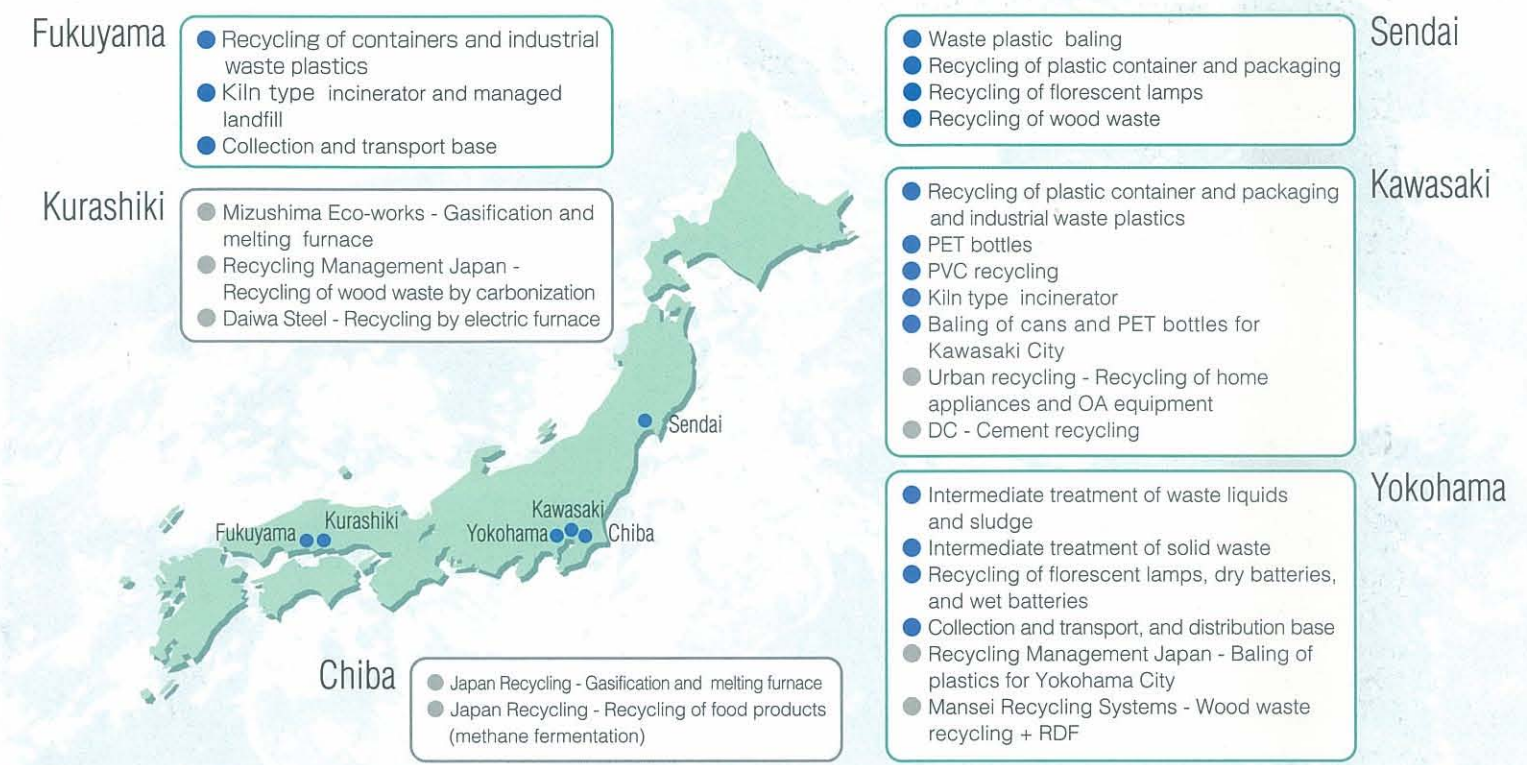
## JFE KANKYO Corporation

- Treatment of waste liquids and sludge ..... 3
- Recycling of florescent lamps, dry batteries, and wet batteries ..... 4
- Recycling of solid waste ..... 5
- Recycling of wood waste ..... 5
- Kiln type incinerator ..... 6
- Plastics recycling ..... 7  
(baling of waste for local municipalities, materials recycling, conversion to raw materials for steel plants)
- Collection and transport division ..... 10
- Solutions business ..... 11

## JFE Group Network

- Gasification and melting furnace
- Recycling of home appliances and OA equipment
- Recycling of food products
- Wood waste + RDF
- Cement recycling
- Recycling with electric furnaces
- Recycling of wood waste by carbonization

## Integrated Environmental Solutions Network



# Treatment of waste liquids and sludge

## Treatment of waste liquids, waste alkalis, and sludge

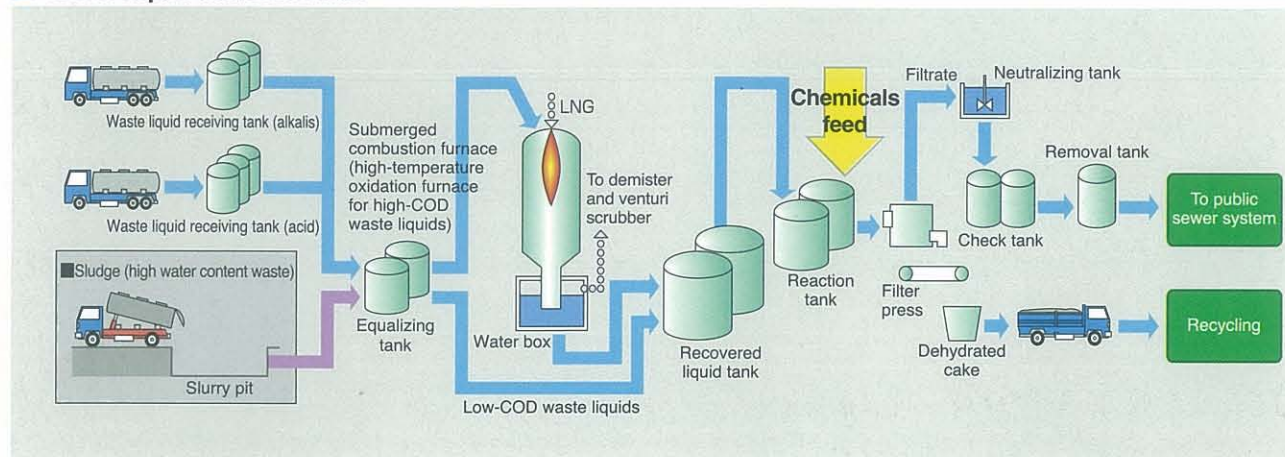
Treatment of toxic liquids and sludge (including high-COD waste acid, heavy metals) using the company's wide experience and sophisticated technology.



**Submerged combustion furnace**  
High-temperature oxidation furnace for high-COD waste liquids

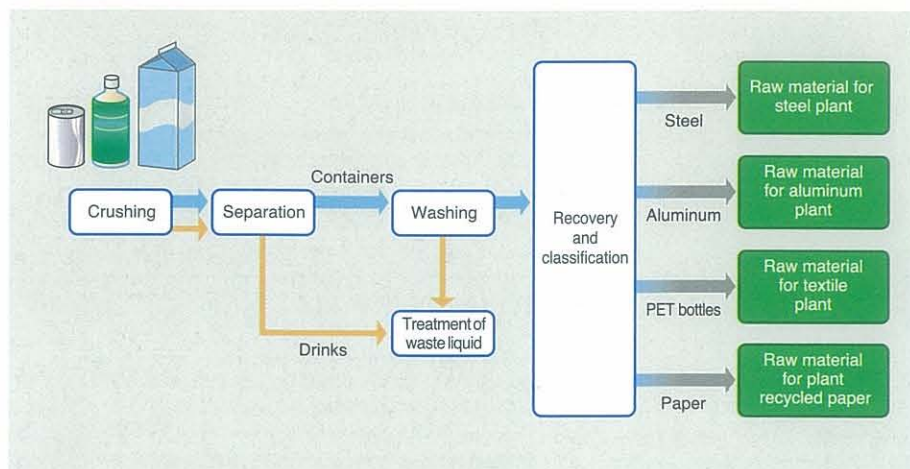
**Chemicals plant**  
Processing capacity: 7,000m<sup>3</sup>/month  
For low-COD and high-COD toxic waste liquids

### Waste liquid treatment flow



## Treatment of waste drinks

Treatment of drinks and recycling of containers.



**Crushing facility**  
Processing capacity: 1,500 tons/month

# Florescent lamps, dry cell batteries, and wet cell batteries

## Florescent lamps recycled

Safe recovery of mercury, and recycling of florescent lamps of various shapes, using advanced recycling technology.

### Yokohama



**Yokohama florescent lamp recycling plant**

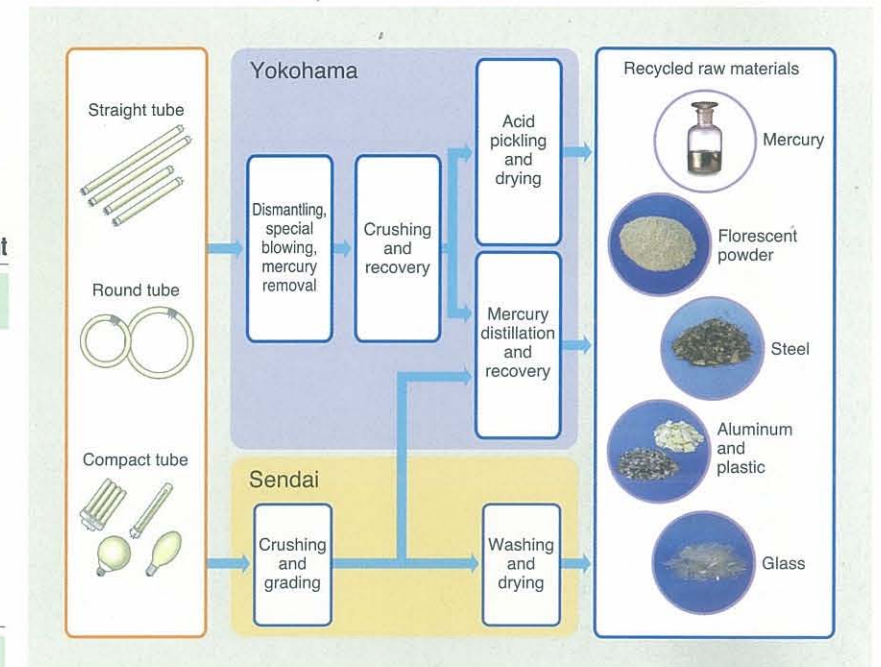
Processing capacity: 5,000 tons/year, expandable to 12,000 tons/year

### Sendai



**Sendai florescent lamp recycling plant**

Processing capacity: 1,200 tons/year

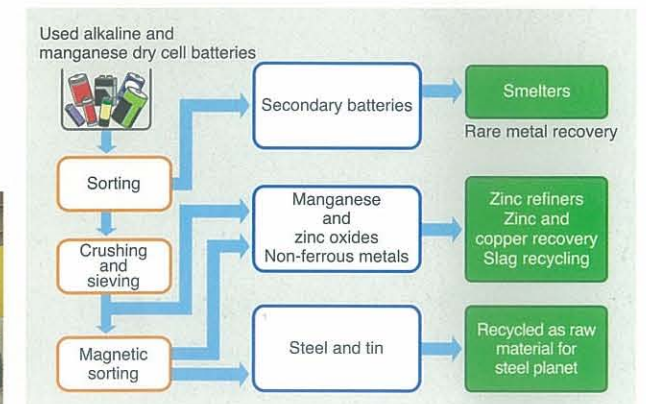


## Dry cell battery recycling

Steel recovered as raw material for steel plant, zinc recovered in smelter.

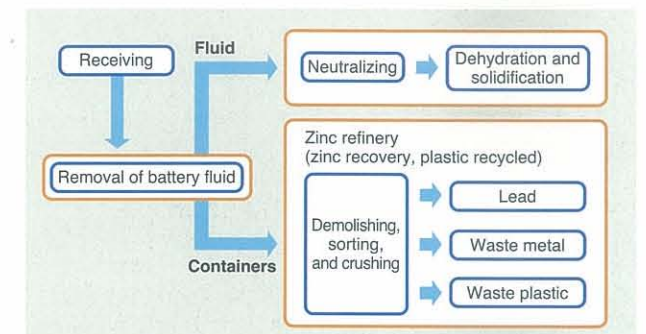
### Equipment for processing used dry cell batteries

Processing capacity: 1,500 tons/year



## Wet cell battery recycling

Waste liquid treatment and zinc recovery, container recycling



# Solid waste recycling

## Recycling of construction and industrial waste products

From sophisticated classification to recycling - all operations integrated within the JFE Group



Pneumatic sorter



Melting reducer

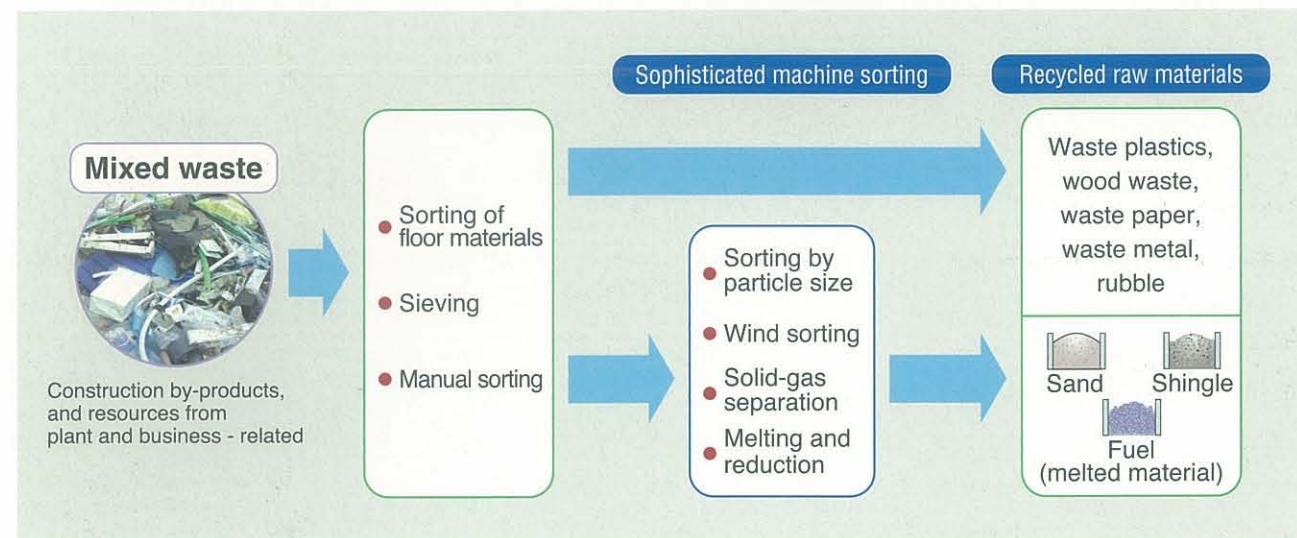


Compressing and packing machine



**Yokohama Clean Resource Recycling Plant**

Processing capacity: Approximately 100,000 tons/year  
For waste plastic, wood waste, waste metal, glass waste, ceramic waste, rubble, waste paper, textile waste, waste rubber.



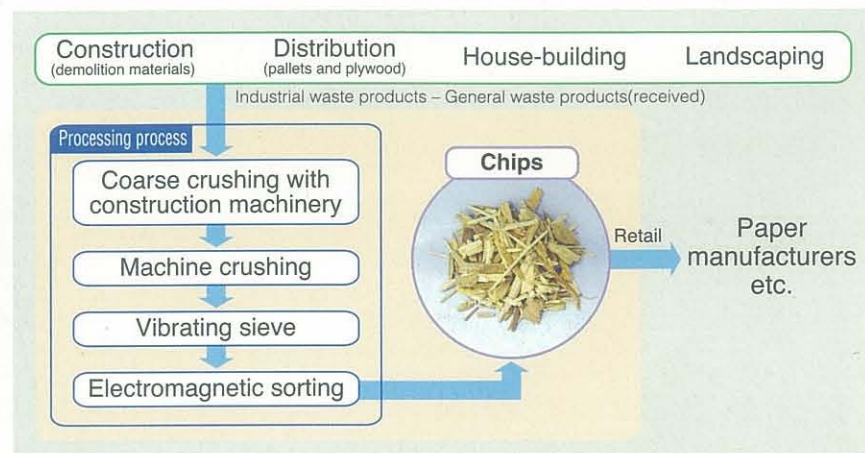
## Recycling of wood waste

Recycling of wood waste into fuel chips and chipped raw material of paper plant



**Sendai Clean Resource Recycling Plant**

Processing capacity: 18,000 tons/year  
For wood waste



# Incinerator

## Kiln Type Incinerator

Measures for safe processing of exhaust gases such as dioxins using the waste processing facility in the steel plant.

Yokohama-Fukuyama



Ohgishima Kiln Type Incinerator

**Ohgishima Kiln Type Incinerator**

Processing capacity: 120 tons/day  
Exhaust gas processing: Soot and dust, HCl, SO<sub>x</sub>, NO<sub>x</sub>, dioxins  
For sludge, waste oil, waste acid, waste alkalis, waste plastics, waste rubber, waste paper, wood waste, textile waste, animal and vegetable residue, waste metal, glass waste, ceramic waste

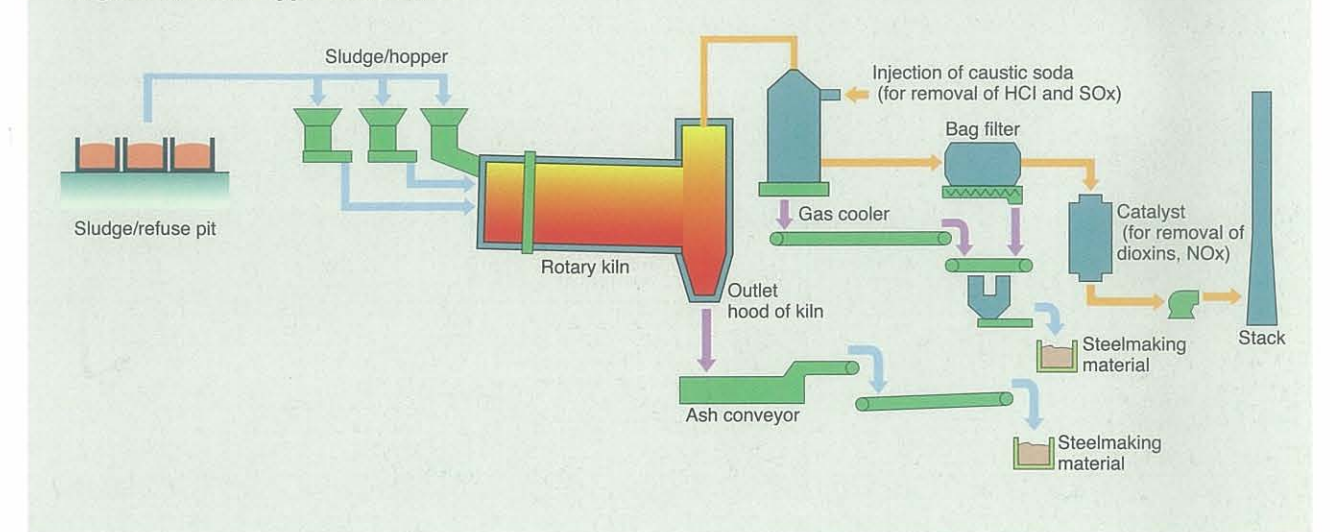
**Fukuyama Kiln Type Incinerator**

Processing capacity: 85.2 tons/day  
Exhaust gas processing: Soot and dust, HCl, SO<sub>x</sub>, NO<sub>x</sub>, dioxins  
For sludge, waste oil, waste alkalis, waste plastics, waste paper, infectious industrial waste products



Gas Cooler

**Ohgishima Kiln Type Incinerator**



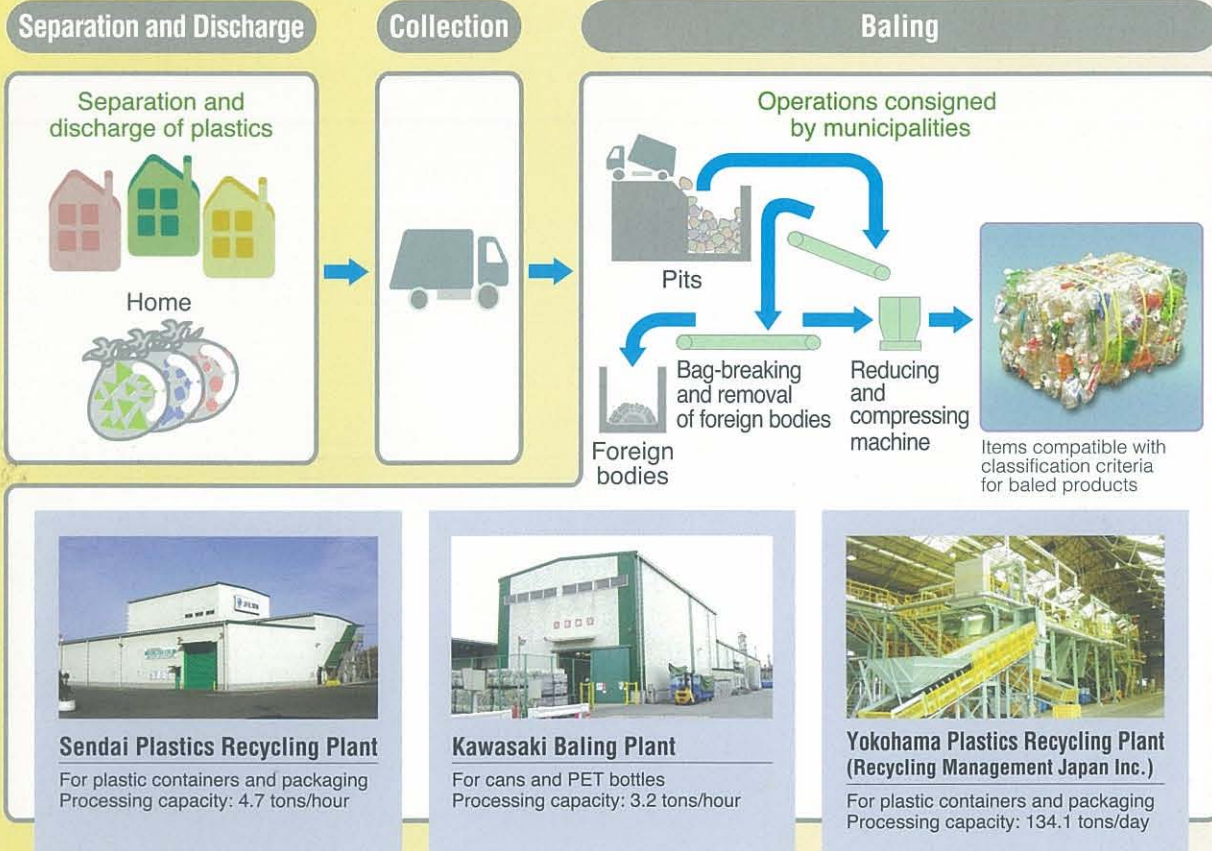
# Plastics Recycling-1

Baling and Recycling Operations - Business operations under the 'Container and Packaging Recycling Law'

Demonstrating comprehensive abilities in plant and technology for recycling of used plastics.

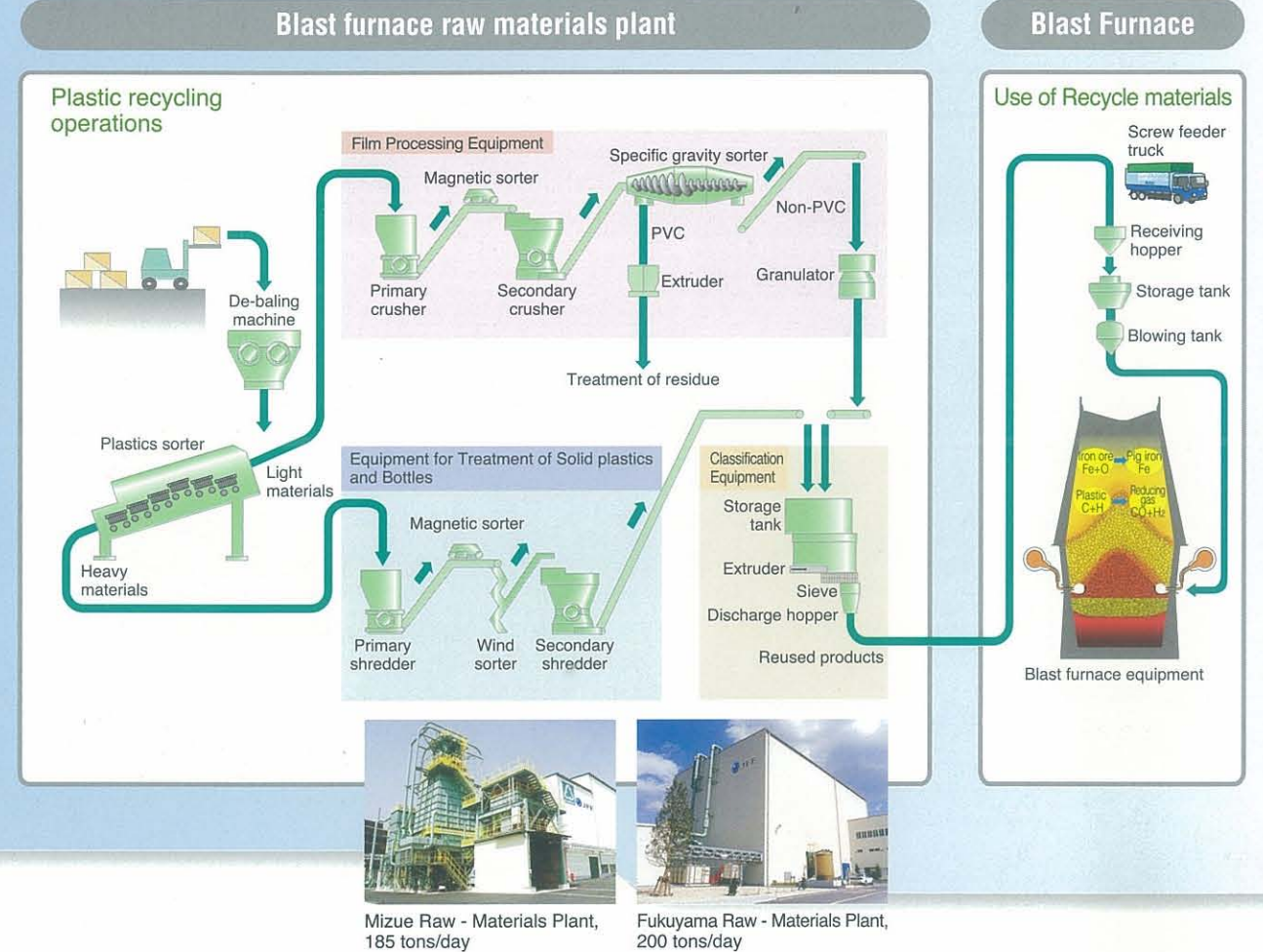
## Baling operations (for municipalities)

Separated and collected containers and packaging are sorted, compressed, and packed, and delivered to recycling plants.



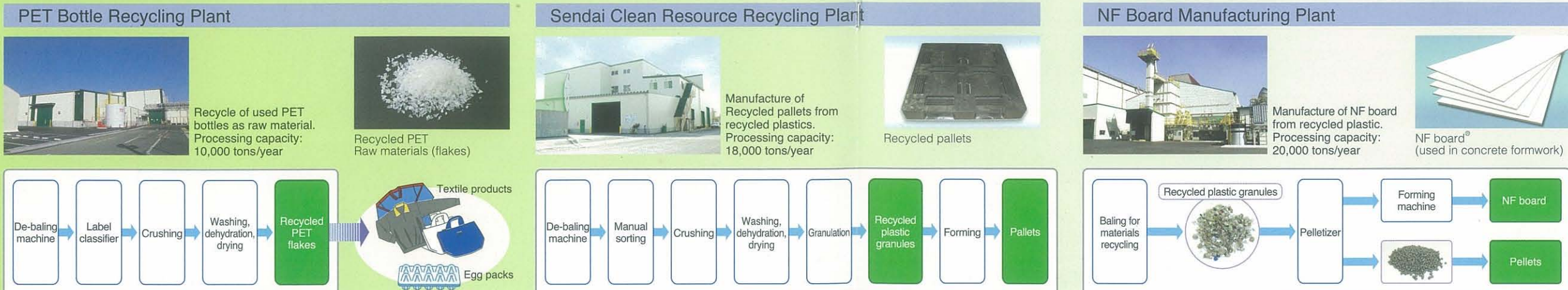
## Chemical Recycling

Recycling of plastic as raw material for steel plant.



## Materials Recycling

Recycle of used plastics as raw materials for plastic products.



# Plastics Recycling-2

## Waste Plastic Recycling as Steel Plant Feedstock

A revolutionary recycling system employing steelmaking technology, which provides benefits in reducing consumption of resources and energy, and protection of the environment.

Kawasaki-Fukuyama



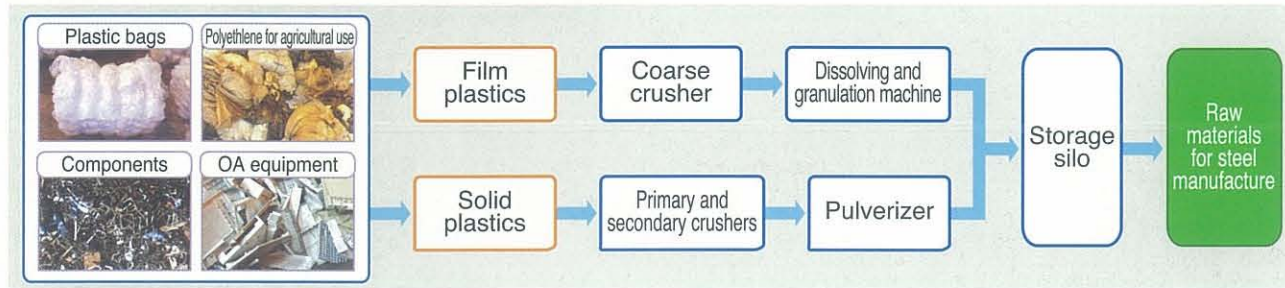
Ohgishima Crushing and Granulation Equipment

### Ohgishima Raw Materials Plant

Processing capacity: 140 tons/day

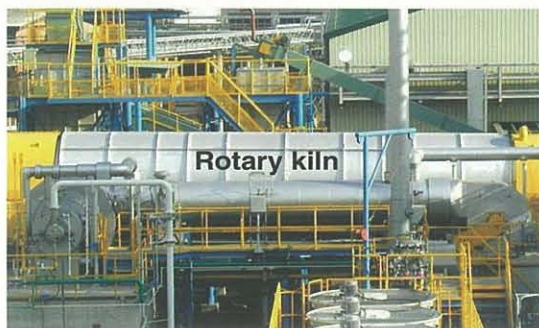
### Fukuyama Raw Materials Plant

Processing capacity: 20 tons/day



# PVC Recycling

Recycling of used PVC into raw materials for blast furnace feed and for hydrochloric acid.

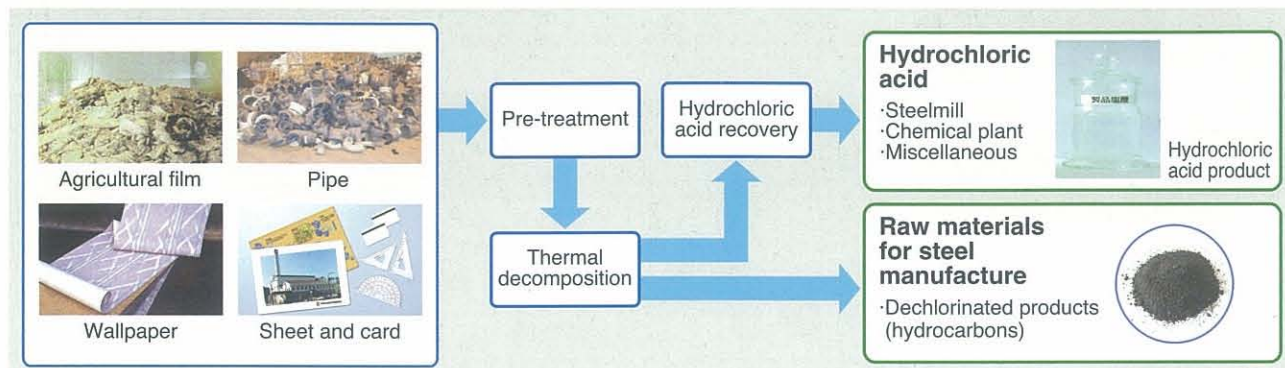


### Rotary kiln

Processing capacity: 6,000 tons/year



Hydrochloric acid recovery equipment



# Collection and Transport Division

## Collection and transport of waste products

A wide variety of vehicles are available to ensure safe and efficient transport of various types of waste products.



10 ton tank truck



10 ton wing truck



10 ton arm rolled truck



4 ton UNIC truck



10 ton flat bed truck



10 ton compacting refuse collector



Yokohama City 2 ton compacting refuse collector



100 ton mobile crane



31 ton trailer

### Vehicle Type

Tractor	10 ton cargo crane	10 ton flat bed truck	3 ton covered truck
36 ton semi trailer	10 ton arm rolled truck	4 ton dump truck	2 ton CNG rear compacting refuse collector
31 ton semi trailer	10 ton wing truck	4 ton cargo crane	1.5 ton powered lift truck
28 ton semi trailer	10 ton tanker	4 ton rear compacting refuse collector	Microbus
25 ton semi trailer	10 ton screw-feeder truck	4 ton flat bed truck	

### Wheeled Construction Machinery

100 ton truck crane	25 ton rough terrain crane	Hydraulic shovel
50 ton rough terrain crane	Extensible jib crane	Wheeled bucket loader
45 ton rough terrain crane	7 ton rough terrain crane	Forklift

## Environmental Consulting

Submission of optimum solutions using environmental surveys and analysis based on legislation.



Research and Development Center

- Environmental consulting
- Environmental surveys and analysis
- Measurement certification work

## JFE Group Network

Provision of comprehensive solutions employing both JFE Kankyo's recycling equipment and technology, and the JFE Group network.

Gasifying and Melting Furnace

### Japan Recycling Corp.

- Address : 1 Kawasakimachi, Chuo-ku, Chiba City, Chiba Prefecture
- Capacity : Thermoselect system  
300 tons/day (150 tons/day x 2 units)
- Type of wastes : waste plastics, wood waste, waste paper, textile waste etc.



Chiba Recycling Center

Gasifying and Melting Furnace

### Mizushima Eco-works Inc.

- Address : 1-14-5 Kawasaki Dori, Mizushima, Kurashiki City, Okayama Prefecture
- Capacity : Thermoselect system  
185 tons/day x 3 units
- Type of wastes : waste plastics, wood waste, paper waste, textile waste etc.



Mizushima Eco-works Inc.

Food Product Recycling

### Japan Recycling Corp.

- Address : 1 Kawasakimachi, Chuo-ku, Chiba City, Chiba Prefecture
- Capacity : 30 tons/day (solid concentration 30%)
- Type of wastes : animal and vegetable residue, contaminated sludge, waste oil



Chiba Biogas Center

Recycling of Home Appliances and OA Equipment

### JFE Urban Recycling Inc.

- Address : 6-1 Mizue-cho, Kawasaki-ku, Kawasaki City, Kanagawa Prefecture
- Capacity : 79 tons/day
- Type of wastes : used home appliances, PCs, OA equipment Domestic appliance recycling plant



Domestic appliance recycling plant

Wood Waste and RDF Recycling

### Mansei Recycling Systems Inc.

- Address : 17-3 Torihama-cho, Kanazawa-ku, Yokohama City, Kanagawa Prefecture
- Capacity : Chip manufacturing facility 384 tons/day  
RDF manufacturing facility 55.2 tons/day
- Type of wastes : waste plastics, wood waste, waste paper, textile waste, waste rubber etc.



Mansei Recycling Systems Inc.

Recycling Wood Waste by Carbonization

### Recycling Management Japan Inc.

- Address : 1-14-1 Kawasaki Dori, Mizushima, Kurashiki City, Okayama Prefecture
- Capacity : 65 tons/day (19,500 tons/year)
- Type of wastes : wood waste



Kurashiki office

Recycling with Electric Furnace

### Daiwa Steel Inc.

- Address : 1-14-5 Kawasaki Dori, Mizushima, Kurashiki City, Okayama Prefecture
- Capacity : 1,500 tons/day x 2 units
- Type of wastes : waste metal, glass and ceramic waste, ash and dust, cinders



DC arc furnace

Cement Recycling

### DC Co. Ltd. Environmental Recycling Division

- Address : 1-1 Asano-machi, Kawasaki-ku, Kawasaki City, Kanagawa
- Capacity : 3,300 tons/day
- Type of wastes : contaminated soil, waste plastic, waste acid



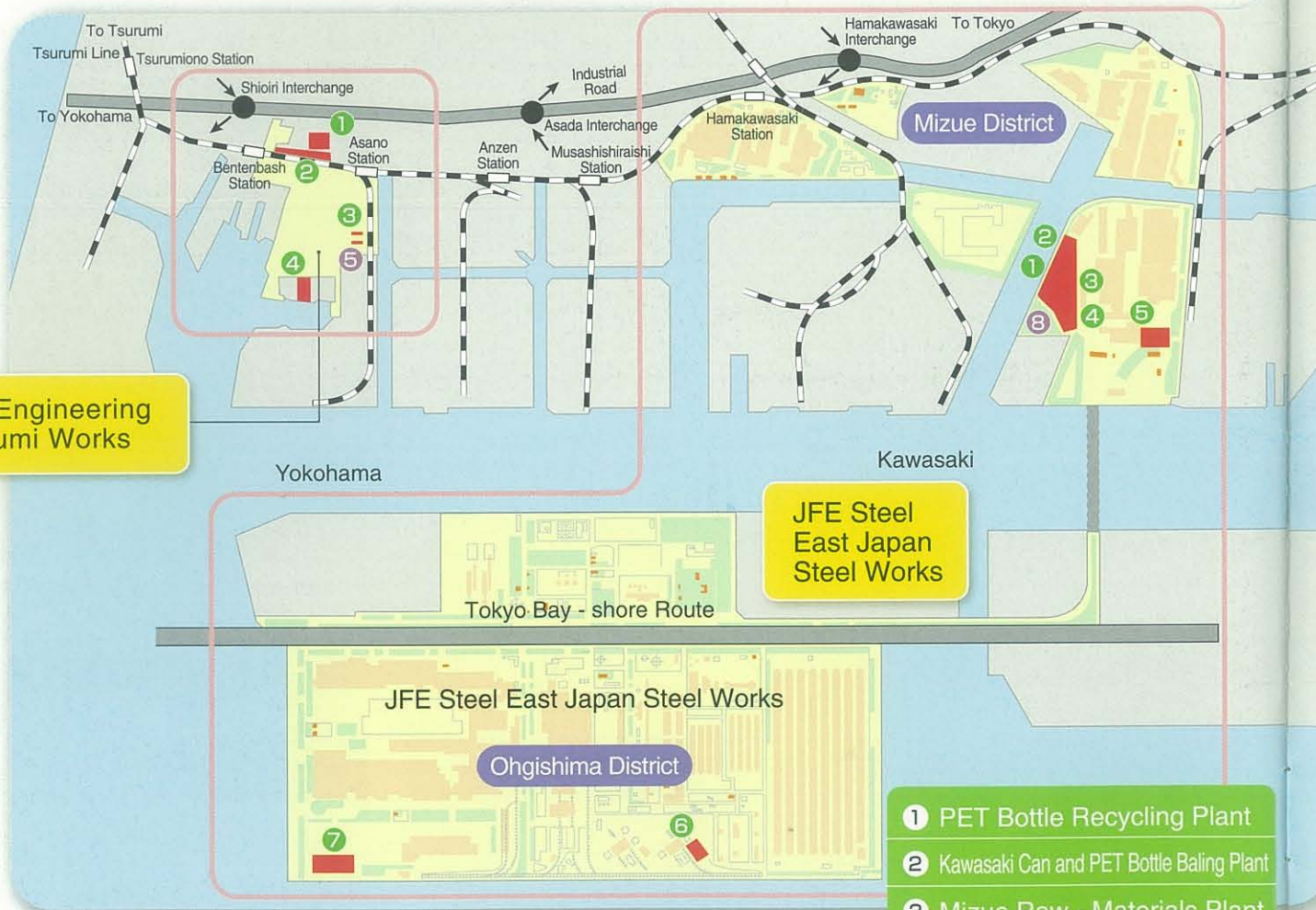
Kawasaki plant

# Location of Facilities

## Tsurumi District

- 1 JFE Kankyo Head Office
- 2 Chemical Plant
- 3 Florescent Lamp Recycling Plant
- 4 Yokohama Clean Resource Recycling Plant
- 5 Recycling Management Japan Inc. Yokohama Baling Plant

JFE Engineering Tsurumi Works



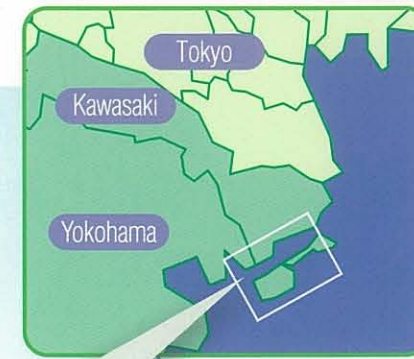
JFE Steel East Japan Steel Works

JFE Steel East Japan Steel Works

Ohgishima District

## Keihin District

- 1 PET Bottle Recycling Plant
- 2 Kawasaki Can and PET Bottle Baling Plant
- 3 Mizue Raw - Materials Plant
- 4 PVC Recycling Plant
- 5 NF Board Manufacturing Plant
- 6 Ohgishima Raw - Materials Plant
- 7 Ohgishima Incineration Plant
- 8 JFE Urban Recycling Inc. Home Appliance Recycling Plant



## Sendai District

- 1 Sendai City Plastic Baling Plant
- 2 Sendai Clean Resource Recycling Plant (Recycled plastic containers, florescent lamps, wood waste)

## Fukuyama District

- 1 Fukuyama Raw - Materials Plant
- 2 Fukuyama Incinerator
- 3 RDF Power Generation (operation)







# JFE Kankyo Corporation

Head Office	Management Division	3-1 Benten-cho, Tsurumi-ku, Yokohama-shi, Kanagawa 230-0044 TEL.045-505-7949 FAX.045-504-6405
Business Planning Division		3-1 Benten-cho, Tsurumi-ku, Yokohama-shi, Kanagawa 230-0044 TEL.045-502-4036 FAX.045-504-6405
East Japan Division	Plastic Recycling Operations Department Keihin Resource Operations Department Sendai Operations Department · Sendai Clean Resource Recycling Plant · Sendai Plastics Recycling Plant	5-1 Mizue-cho, Kawasaki-ku, Kawasaki-shi, Kanagawa 210-0866 TEL.044-299-5193 FAX.044-299-5365 TEL.044-287-1361 FAX.044-299-5365 1-6-1 Minato, Miyagino-ku, Sendai-shi, Miyagi 983-0001 TEL.022-258-5931 FAX.022-258-5933 TEL.022-258-5930 FAX.022-388-8110
West Japan Division	Fukuyama Operations Department	1 Koukan-cho, Fukuyama-shi, Hiroshima 721-8510 TEL.084-945-3097 FAX.084-945-4079 113 Minooki-cho, Fukuyama-shi, Hiroshima 721-0956 TEL.084-981-3160 FAX.084-981-3170
Tsurumi Division	Chemical Operations Department Tsurumi Resource Operations Department · Yokohama Clean Resource Recycling Plant	3-1 Benten-cho, Tsurumi-ku, Yokohama-shi, Kanagawa 230-0044 TEL.045-503-5661 FAX.045-504-6405 2-1-5 Suehiro-cho, Tsurumi-ku, Yokohama-shi, Kanagawa 230-0045 TEL.045-505-7610 FAX.045-505-7611
Transportation Division	Distribution Sales Department Collection and Transport Section Transportation Section	3-1 Benten-cho, Tsurumi-ku, Yokohama-shi, Kanagawa 230-0044 TEL.045-504-8393 FAX.045-502-4097 TEL.045-503-5661 FAX.045-504-6405 TEL.045-502-3860 FAX.045-502-4097
Sales Division	No.1 and No.2 Sales Department Sales Operations Department	3-1 Benten-cho, Tsurumi-ku, Yokohama-shi, Kanagawa 230-0044 TEL.045-502-1470 FAX.045-502-2881 TEL.045-503-5661 FAX.045-504-6405