

## **Toward Sustainable Society**

# **Kitakyushu City's Best Practices and Available Technologies in the 3Rs**

**Yasumitsu KONDO  
Environment Bureau  
The City of Kitakyushu**



# Waste Turned Valuable

Treatment plant for Municipal solid waste produces Materials for construction and iron



10% created from waste



1% created from waste <sup>2</sup>

## Utilization of Slag



Concrete drainage ditch



Concrete block on the pedestrian road

Slag in Shinmoji treatment plant is certified  
by Japanese Industrial Standards (JIS)

**JIS A 5031 (Concrete product)**

**JIS A 5032 (Asphalt paved road)**

Main contents of the standard

1. Contents of hazardous materials

Cadmium, Lead, Chromium, Mercury, etc.

2. Contents of chemical materials

Calcium, Sulfur, Iron, Chloride, etc.

3. Physical character

Density, Water absorption, Shape, etc.

# Shaft furnace type gasification and melting furnace

Waste  
Coke 5% of the quantity waste  
Limestone 4% of the quantity waste

Steam turbine Generator  
Electric power  
Generation efficiency 21%

Drying and preheating zone

Pyrolysis and gasification zone

Melting zone

240t/day × 3

Molten materials

Magnetic separator

Granulating equipment

Slag Metal

Slag: 10% of the quantity waste  
Metal: 1% of the quantity waste

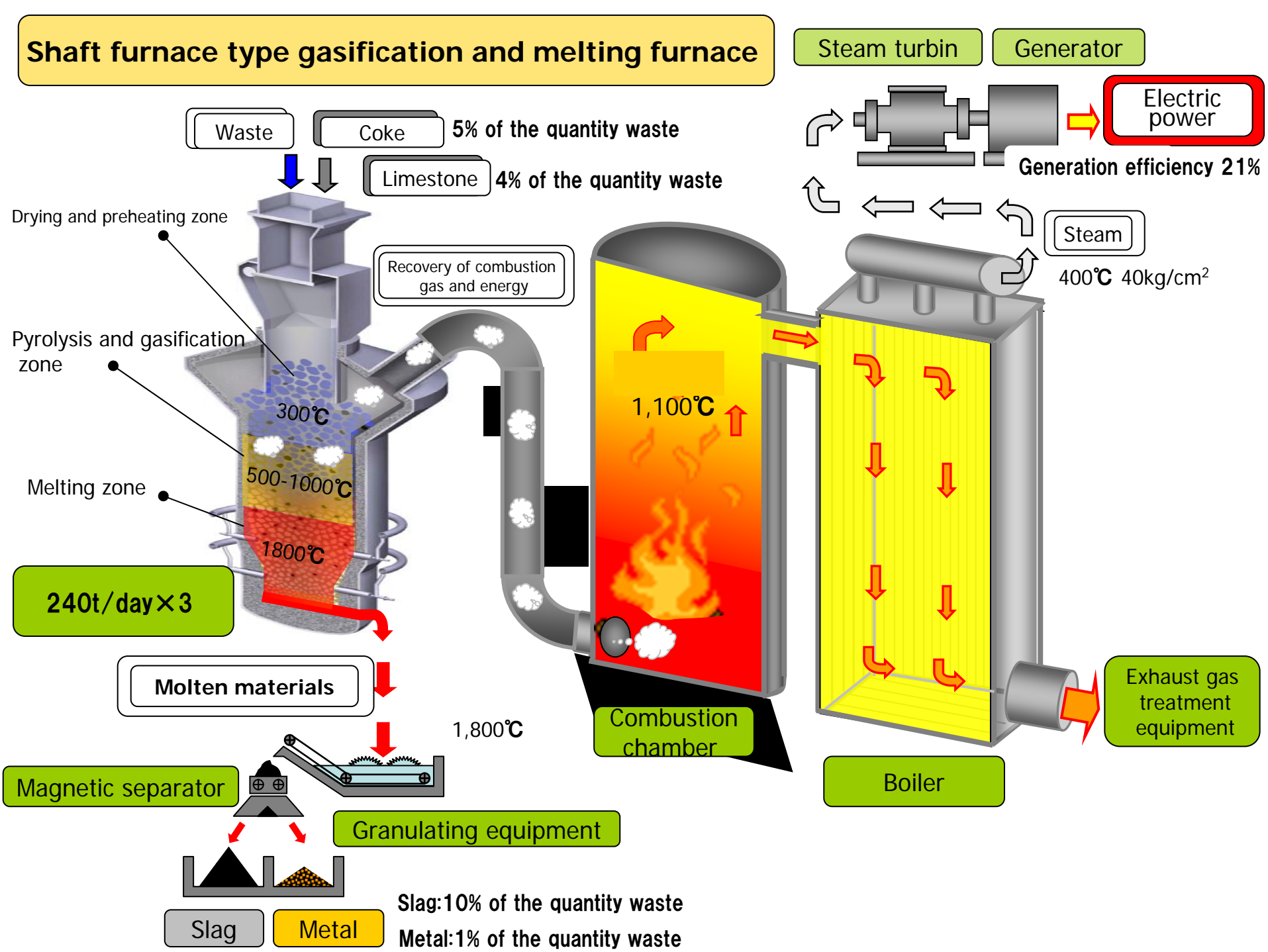
Recovery of combustion gas and energy

1,100°C  
Combustion chamber

Steam  
400°C 40kg/cm<sup>2</sup>

Boiler

Exhaust gas treatment equipment



# Generation of Electricity in Shinmoji Plant in 2010

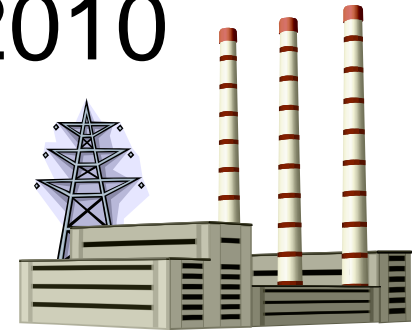
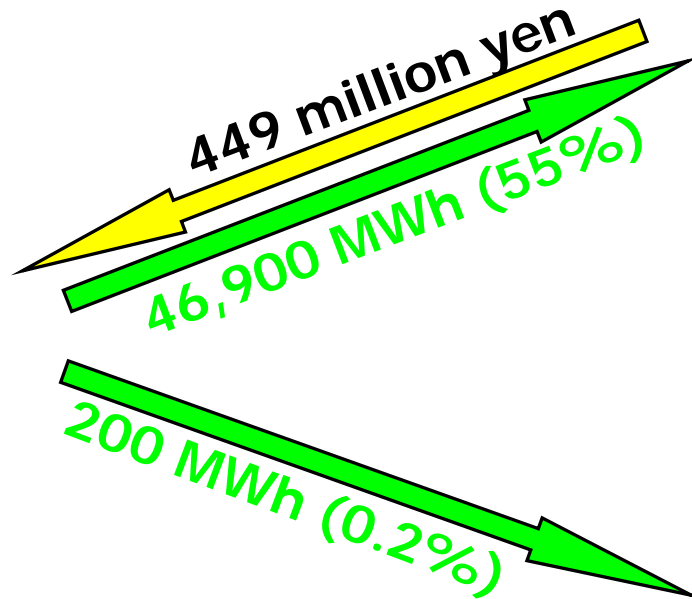
Generation  
85,700 MWh



Shinmoji Incineration Plant

Consumption

38,600 MWh (45%)

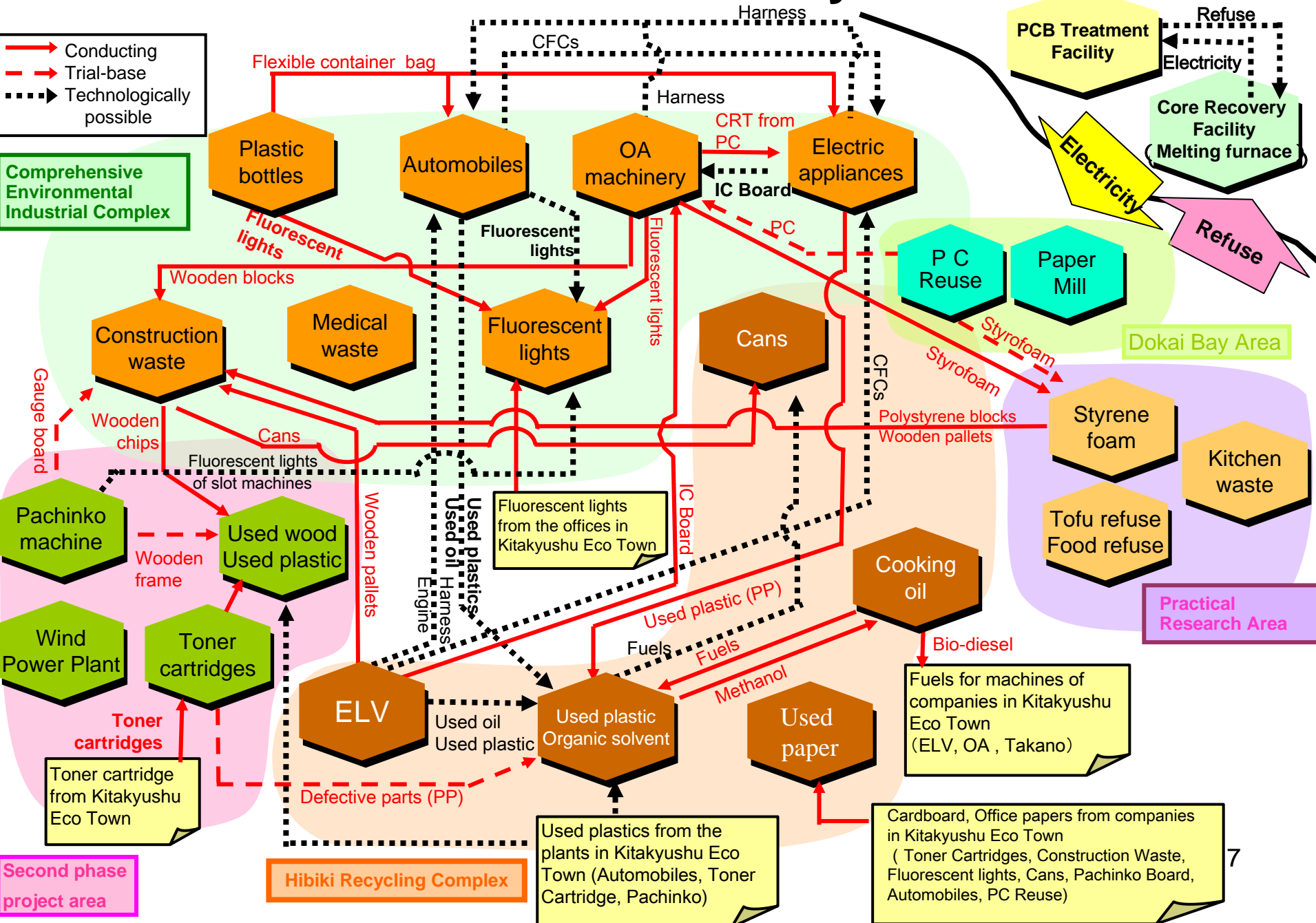


Electric Power  
Company

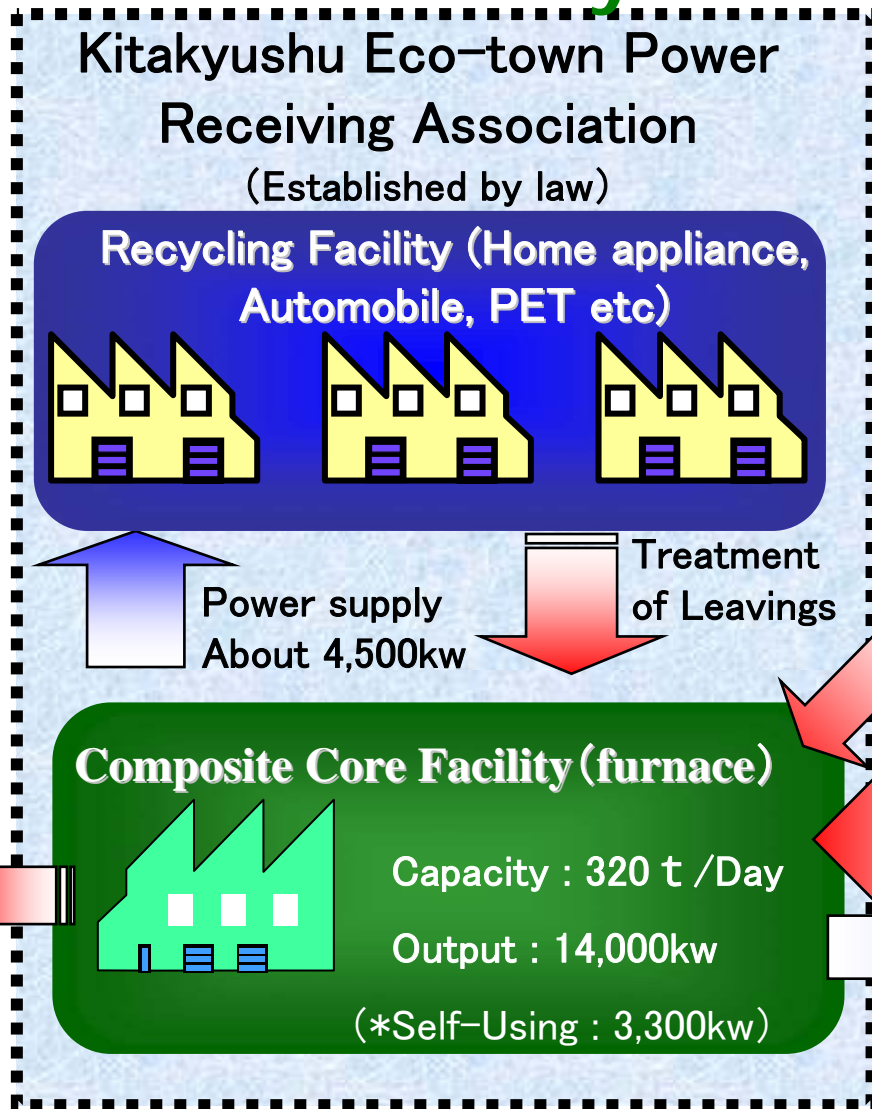


Collection Office

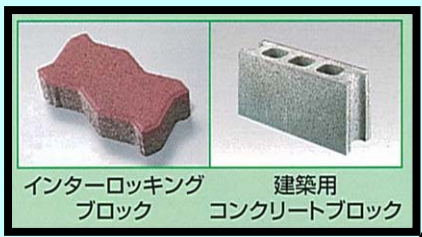
# Mutual Collaboration in Kitakyushu Eco-Town



# Power Supply From Composite Core Facility



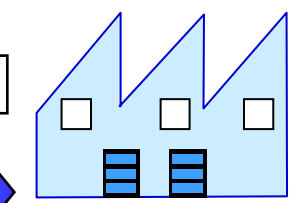
Resource Recovery of Slag and Metal



インターロッキングブロック 建築用コンクリートブロック



建設機械用カウンターウェイト 鉄・非鉄原料



PCB Treatment Facility 8



# The reduction effect immediately after the revision of the collection system of household-related waste

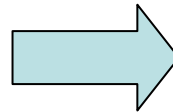
(The total amount of waste collected from July to December, 2006)

From July to December, 2006	(For comparison) From July to December, 2003
93,484 tons	126,815 tons

→ **Reduction of about 33,300 tons, with the reduction rate of 26%**



Right before the revision



Immediately after the revision

# The early-morning manner improvement campaign



**A scene of the starting day of the sorting system of plastic containers and packaging**

- **About 13,200 persons attended the early-morning guidance throughout the city.  
(About 11,700 citizens, 1,550 city employees)**
- **The total number of attendants during the 10 days from 6:30 to 8:30 am counted to about 100,000 persons.  
(There is no similar example in other cities of the same size.)**

# **Basic concept of the revision on Domestic waste collection system**

- 1. Further promotion of recycling and reduction of waste**
- 2. Securement of fairness of the cost sharing**
- 3. Sharing of a certain degree of responsibility by the citizens as the dischargers**
- 4. A large amount of cost related to waste treatment and recycling**

**Enrichment of the recycling and separation system**

**Improvement of the awareness toward reduction by the revision of the charge**

**Putting the two schemes together**

**To aim at the reduction of waste by 20%**

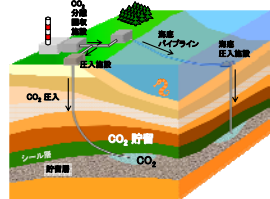
# Technology transfer of Kitakyushu Asian Center for Low Carbon Society

## Establishing business model for technology transfer, from packaging of technology to financial support

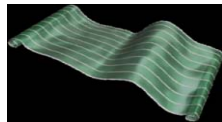
### Energy business



【Multipurpose coal gas manufacturing technology of Electric Power Development Co., Ltd.】



【Geological survey by Japan CCS Co., Ltd.】



【Organic thin-layer solar panel by Mitsubishi Chemical Corporation】



【Inverter of Yaskawa Electric Corporation】

### Recycling business



**Kitakyushu Eco-Town**  
Zero-emission type resource recycling base by collaboration of projects

### Water business



**Water Plaza**  
Water reclamation plant for sewage membrane treatment and seawater desalination (Hiagari Water Purification Center)

## Kitakyushu Asian Center for Low Carbon Society

Packaging technologies  
Improvement of technologies to satisfy the needs  
Marketability survey  
Support demonstration experiment  
Support application for subsidy  
Financial and information support  
Dispatch business mission, etc.

**Technology transfer to Asia**

### Utilization of city-to-city network

**Institute for Environment Cities of Asia**

(62 cities of 18 countries of Asia-Pacific region)

**The Organization for the East Asia**

**Economic Development**

(10 cities of Japan, China and Korea)



# Major projects promoted

As the Japanese government promotes the export of eco-friendly infrastructure, we aim at building a model of the “export of city infrastructure” through our major projects in Indonesia, India and China.



## 1 Indonesia (Surabaya City project)

**Surabaya is the second largest city in Indonesia, with three million population.**

Surabaya has difficulties in industrialization, due to its low quality and unstable supply of electricity.

- Sophistication of national industrial estates, etc; Introduction of advanced systems of waste water and material treatment

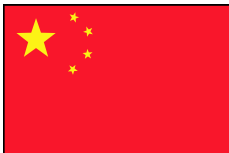


## 2 India (Promotion of industrial artery project in Delhi, Mumbai)

**Gujarat State (Surat City, Dahej district) is a major industrial area in India.**

Not only the introduction of excellent Japanese environmental technologies but also the building of an eco-city is expected.

- Support for the construction of an eco-town (Surat City), Participation in the Smart community project (Dahej district)



## 3 China (MOU Conclusion with China Beijing Environment Exchange, Cooperation regarding Dalian eco-town, etc.)

**Dalian City is an ecological model city in China.**

The goal is to build an eco-city by developing residential areas beyond the framework of the Recycling Industrial Park.

- Support for eco-town planning; Participation of Japanese companies in individual recycling projects